

Highways Department

**Agreement No. HMW
5/2009 (EP) Traffic
Improvements to Tuen
Mun Road Town Centre
Section**

Quarterly Environmental
Monitoring and Audit
Summary Report
(February 2012 to April
2012)

Final

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Executive Summary

This is the fifth quarterly Environmental Monitoring and Audit (EM&A) summary report prepared by Ove Arup & Partners Hong Kong Limited (Arup), the designated Environmental Team (ET), for the Project "Traffic Improvements to Tuen Mun Road Town Centre Section". This report presents the results of EM&A works conducted for the period from 1 February 2012 to 30 April 2012.

Environmental Monitoring Works – Breaches of Action and Limit Levels

Air Quality

All 24-hour TSP measurements during the reporting period were below the Action and Limit Level. No exceedance of Action and Limit Level was found.

Noise

Totally 7 limit level exceedances (4 in February, 3 in March and 0 in April 2012) of noise monitoring were recorded during the reporting period. Based on the on-site observations and interpretation from the results, noise exceedances were not related to the construction activities. No particular remedial work is required.

However, two noise complaints (In March 2012), hence, two Action Level exceedances, were recorded in the reporting period.

Construction works were carried out during the restricted hours, the conditions stipulated in CNPs of related construction works were strictly followed by the Contractor. No non-compliance was recorded.

Landscape and Visual Audit

In the reporting period, landscape and visual site audit in accordance with the requirements stipulated in the EM&A manual were conducted. Total 521 trees were felled and the pruning of the transplanted trees was carried out during the reporting period, no substantial change of LR, LCA and VSR was noted.

Waste Disposal

Inert C&D materials with actual amount of 12,636.000 m³ were generated and disposed of at public fills at Tuen Mun Area 38 in the reporting period. 326.625 m³ general refuse were generated and disposed of at WENT landfill during the reporting period.

Environmental Auditing

The environmental site audits were conducted on a weekly basis. No non-conformance to the environmental requirements was identified during the reporting period.

Complaint Log

Four environmental complaints (4 in March 2012) regarding the construction noise and water quality were recorded during the reporting period. After the investigation, it is concluded that all complaints were attributable to the Contractor. The corresponding mitigation measures due to the complaints were recommended to carry out by the Contractor. Nevertheless, the Contractor was reminded to implement proper mitigation measure as stipulated in EM&A Manual to minimize any environmental implication.

Notifications of Summons and Successful Prosecutions

No summonses or prosecution related to the environmental issues were made against the Project in the reporting period.

1 Project Information

1.1 Project Background and Programme

Ove Arup & Partners Hong Kong Limited (Arup) was appointed by Highways Department (HyD) as the Environmental Team (ET) for *Agreement No. CE22/2005 (HY) Supplementary Agreement 1 Traffic Improvements to Tuen Mun Road Town Centre Section* (the Project) under Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section. The Project was commenced on August 2010 and to be completed on January 2014. Location of the works area is indicated in **Figure 1.1**.

The Project involves widening the following sections of TMR from dual-two carriageway to dual-three carriageway:

- Wong Chu Road Section, (from Wong Chu Road Interchange to Tuen Hing Road);
- Tuen Mun Town Plaza Section, (from Yan Oi Town Square to Tuen Hing Road).

The Project is a designated project under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499). Environmental Monitoring and Audit (EM&A) work is required in accordance with the conditions stipulated in the Environmental Permit (EP) (EP-342/2009/C) and the EM&A Manual of the Project.

The rolling construction programme during the reporting period is attached in **Appendix A**. The major construction activities carried out by the Contractor in the reporting period are summarized in **Table 1.1**.

Table 1.1 Construction activities in the reporting period

Locations	Major Works Undertaken
All area	Site clearance, ground investigation, footbridge construction, noise barrier construction; piling works, underground utilities and drainage diversion

1.2 Project Organization

The Project organization structure in relation to the environmental management is shown in **Figure 1.2**. Contacts of key environmental staff of the Project are shown in **Table 1.2**.

Figure 1.2 Project Organization – Environmental Management

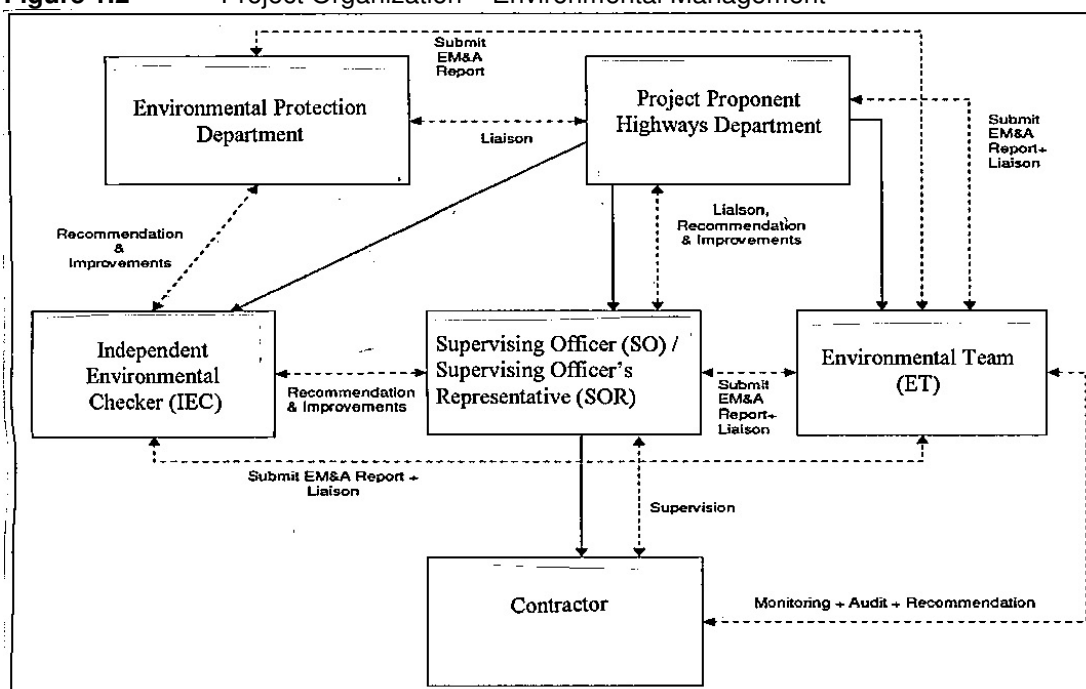


Figure 1.1 Location of works area and air, noise environmental monitoring stations

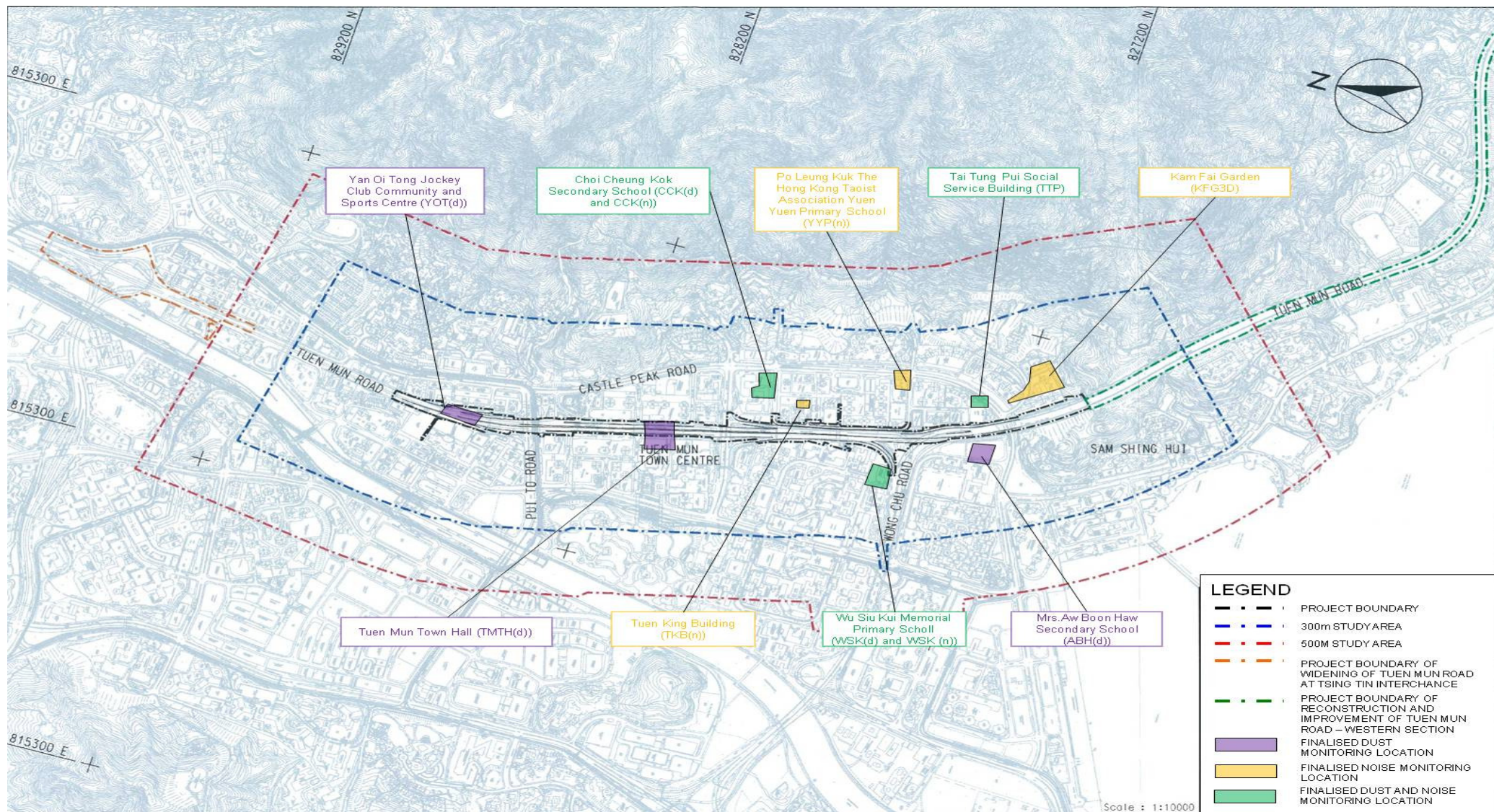


Table 1.2 Contacts of key environmental staff

Organization	Name	Telephone
Environmental Protection Department		
Environmental Protection Officer (Strategic Assessment)22	Thomas To	2835 1103
Project Proponent		
Highways Department: Senior Engineer	Kenneth Chan	2762 3422
Supervising Officer / Supervising Officer's Representative		
AECOM Asia Co. Ltd.: Chief Resident Engineer	Patrick Lee	2969 9200
Independent Environmental Checker		
ENVIRON Hong Kong Limited: Independent Environmental Checker	David Yeung	3743 0717
Environmental Team		
Ove Arup & Partners Hong Kong Ltd: Environmental Team Leader	Coleman Ng	2268 3097
Contractor		
China Harbour Engineering Company Limited		
Site Agent	W.S. Ng	2403 0529
Environmental Officer	Marko Chan	2403 0527

2 EM&A Requirements

2.1 Monitoring Parameters

Air quality monitoring shall be measured in terms of the TSP levels for 24-hour periods. For noise monitoring, construction noise shall be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). Furthermore, the monitoring of the implementation of the landscape and visual mitigation measures shall be checked to ensure that they are fully required. **Table 2.1 and Figure 1.1** show the names and locations of the monitoring locations. The monitoring parameters, frequency and performance limits are summarised in **Table 2.2**.

Table 2.1 Summary of air and noise monitoring stations

ID	Premise
Air	
AM1	Chung Sing Benevolent Society Mrs. Aw Boon Haw Secondary School
AM2	Tung Wah Group of Hospitals Tai Tung Pui Social Service Building
AM3	Shun Tak Fraternal Association Wu Siu Kui Memorial Primary School
AM4	The Chinese Manufacturers' Association Of Hong Kong Choi Cheung Kok Secondary School
AM5	Tuen Mun Town Hall
AM6	Yan Oi Tong Jockey Club Community and Sports Centre
Noise	
N1	Kam Fai Garden
N2	Tung Wah Group of Hospitals Tai Tung Pui Social Service Building
N3	Po Leung Kuk The Hong Kong Taoist Association Yuen Yuen Primary School
N4	Shun Tak Fraternal Association Wu Siu Kui Memorial Primary School
N5	Tuen King Building
N6	The Chinese Manufacturers' Association Of Hong Kong Choi Cheung Kok Secondary School

Table 2.2 Monitoring parameters, frequency, locations and performance limits

Monitoring	Parameters	Frequency	Location	Action Level	Limit Level
Air	1-hour TSP	3 times every 6 days (Note 1)	AM1	290 µg/m ³	500 µg/m ³
			AM2	291 µg/m ³	
			AM3	287 µg/m ³	
			AM4	292 µg/m ³	
			AM5	286 µg/m ³	
			AM6	290 µg/m ³	
	24-hour TSP	Once every 6 days	AM1	146 µg/m ³	260 µg/m ³
			AM2	151 µg/m ³	
			AM3	150 µg/m ³	
			AM4	150 µg/m ³	
			AM5	146 µg/m ³	
			AM6	147 µg/m ³	
Noise	0700 - 1900 hour on normal weekdays - L _{eq} (30min)	Once per week	N1, N2 & N5	When one documented complaint is received	75 dB(A)
			N3, N4 & N6		70/65 (Note 3)
	0700 - 2300 hours on holiday; and 1900 - 2300 hours on all other days - L _{eq} (5min) (Note 2)	--	N1, N2, N3, N4, N5 & N6		--
					2300 - 0700 hours of next day - L _{eq} (5min) (Note 2)
Landscape and Visual	Landscape resources (LR), landscape character area(LCA) and view sensitive receiver (VSR) (Note 4)	Twice site audit per month	Entire site area	N/A	N/A

Notes:

- 1-hr TSP monitoring would be required in case of receiving complaints
- If works are to be carried out during restricted hours, the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority have to be followed.
- For normal day-time working hours, the noise criteria are 70 dB(A) and 65 dB(A) for normal reaching periods and examination period respectively.
- The details of each LR, LCA and VSR are summarized in **Appendix F**.

2.2 Environmental Quality Performance Limits

All the monitoring results will be checked against the Action and Limit levels described in the Baseline Monitoring Report, of which they are summarised in **Table 2.1**.

2.3 Environmental Mitigation Measures

The environmental mitigation measures carried out were basically followed the requirements described in the EIA Report. Major mitigation measures during the construction phase in relation air quality, noise, water quality, ecology, waste management as well as landscape and visual are summarised in **Appendix B**.

3 Implementation Status

3.1 Implementation Status of Mitigation Measures

Environmental site inspections were carried out on a weekly basis to monitor environmental issues on the construction sites to ensure that all mitigation measures were implemented timely and properly. Key mitigation measures observed were: vehicles were washed to remove any dusty materials from its body and wheels before leaving a construction site, quiet powered mechanical equipment (QPME) were used as well as sufficient waste disposal points were provided and regular collection for disposal.

Table 3.1 summaries the site inspections in the reporting period and corresponding follow-up status by the Contractor.

Table 3.1 Key findings of weekly environmental site audit in the reporting period

Monitoring Parameter	Location	Inspection Date	Key Observations & Recommendations	Contractor's Follow-Up Status
Air Quality	Central Median under Yan Oi Bridge	16 Feb 12	As those cements were ready in the cement mixing zone, the contractor was reminded to keep well coverage (3 sided with top enclosure) to the cement mixing during operation.	The reminder has been noted. Closed on 23 Feb 12.
	Rosedale Garden	1 Mar 12	All idling power mechanical equipment should be turned off.	The reminder has been noted. Closed on 8 Mar 12.
	Yan Ching Street	1 Mar 12	Enclosure should be provided for cement mixing area during operation.	Enclosure has been provided. Closed on 8 Mar 12.
	On Ting Estate	22 Mar 12	The contractor should promote the awareness of water spraying practice among site workers especially in sunny day for all unpaved haul roads and exposed earth, in order to suppress the generation of fugitive dust.	Regular water spraying has been practiced. Closed on 29 Mar 12.
	Kam Fai Fa Yuen	1 Mar 12	The contractor was reminded to arrange maintenance to the air compressor and generator regularly to avoid dark smoke emission.	The reminder has been noted. Closed on 8 Mar 12.
	Pui To Road	12 Apr 12	The contractor was reminded to cover the stockpiles, which was for back-filling purpose, after daily works.	The reminder has been noted. Closed on 19 Apr 12.
Water Quality	Pui To Road	2 Feb 12	The contractor was reminded that any vehicles or machine leaving from site shall get the wheels washed, preventing muds bringing out to the carriage road.	The reminder has been noted. Closed on 9 Feb 12.
	On Ting Estate	2 Feb 12	More sand bag bundings should be provided along the carriage way to avoid muddy water overflow.	Sand bags have been provided. Closed on 9 Feb 12.

Monitoring Parameter	Location	Inspection Date	Key Observations & Recommendations	Contractor's Follow-Up Status
Water Quality	On Ting Estate	9 Feb 12	Runoff from site was discharged to manholes. The contractor should increase the height of sand bag bundings preventing the runoff overflow.	More Sand bag bundings have been provided. Closed on 16 Feb 12.
	On Ting Estate	9 Feb 12	The contractor should ensure all runoffs to be collected by adequate pump and discharged via sedimentation tank.	Adequate pumps have been provided. Closed on 16 Feb 12.
	Waldorf Garden	23 Feb 12	Open stockpiles should be covered by tarpaulin to minimize the runoff generation prior to raining.	Tarpaulin cover has been provided. Closed on 1 Mar 12.
	Kam Fai Fa Yuen	1 Mar 12	The contractor should increase the capacity of sedimentation tank and AquaSed to ensure the large generation of muddy water from piling works is well treated prior to discharging.	Sedimentation tank with adequate capacity has been provided. Closed on 8 Mar 12.
	Kam Fai Fa Yuen	8 Mar 12	The contractor was reminded that all surface runoff was collected, treated and discharged via adequate sedimentation tanks.	The reminder has been noted. Closed on 15 Mar 12.
	Rosedale Garden	15 Mar 12	Stagnant muddy water was observed in the drainage channel. The contractor should clear the water to avoid accumulation.	The drainage channel has been cleared. Closed on 22 Mar 12.
	All areas	22 Mar 12	Temporary drainage system should be well prepared prior to rain season.	The reminder has been noted. Closed on 29 Mar 12.
	All areas	22 Mar 12	The contractor was reminded to clear all debris, general refuse and muds in public drainage systems to avoid blockage of water flow.	The reminder has been noted. Closed on 29 Mar 12.
	Yan Ching Bridge	29 Mar 12	A large area of excavated soil was stored for back filling purpose. However, the contractor should ensure to cover the exposed surface entirely and place bundings surrounding it prior to rain storm.	Tarpaulin has been provided. Closed on 5 Apr 12.
	Tuen Mun Road under TMT Plaza	5 Apr 12	The stockpile should be reallocated to avoid generating muddy water to public drainage system as far as practicable.	Reallocation of stockpile has been done. Closed on 12 Apr 12.

Monitoring Parameter	Location	Inspection Date	Key Observations & Recommendations	Contractor's Follow-Up Status
Water Quality	Kam Fai Fa Yuen	5 Apr 12	Water flow was observed in the blocked U-channel. The contractor was reminded to verify the status of the water channel.	The reminder has been noted. Closed on 12 Apr 12.
	Central median under Yan Oi Bridge	19 Apr 12	A small amount of muddy water was accumulated outside the water barrier in central median. The contractor should clean the muddy water and prevent the water from entering manholes directly by the use of sand bag bundings.	Sand bag bundings have been provided. Closed on 26 Apr 12.
	All areas	19 Apr 12	The contractor was reminded to turn on all pumps in site prior to rainstorm in a view to alleviate water accumulation and overloading.	The reminder has been noted. Closed on 26 Apr 12.
	All areas	26 Apr 12	The contractor was reminded to avoid temporary storage of excavated soil near roadside. Sand bag bundings should be provided in case no alternatives.	The reminder has been noted. Closed on 3 May 12.
Noise	Tsing Hoi Carpark	2 Feb 12	Valid noise label should be attached to the compressor according to the NCO requirement.	Valid noise label has been provided. Closed on 9 Feb 12.
	On Ting Estate	22 Mar 12	The condition of generator should be maintained. All doors in generator should be closed to minimize noise disturbance to the nearest NSR, primary school.	The condition of generator has been maintained. Closed on 29 Mar 12.
	All areas	26 Apr 12	The contractor was reminded to review the noise mitigation measures, especially for the generators near NSRs.	The reminder has been noted. Closed on 3 May 12.
Landscape and Visual	Rosedale Garden	16 Feb 12	The contractor was reminded to provide protection material to unfenced tree inside the construction site.	Fencing has been provided. Closed on 23 Feb 12.
Waste / Chemical Management	Yan Ching Street & On Ting Estate	9 Feb 12	The contractor was reminded to provide drip trays for chemical containers placing.	Drip trays have been provided. Closed on 16 Feb 12.
	Central Median under Yan Oi Bridge	16 Feb 12	Oil stain was observed under air compressor. The contractor should rectify the oil remains and provide a drip tray for avoidance of oil leakage.	Oil stain has been rectified. Closed on 23 Feb 12.
	Waldorf Garden	23 Feb 12	General refuse should be disposed regularly to avoid accumulation.	The refuse has been collected and disposed of. Closed on 1 Mar 12.
	Tsing Hoi Circuit	23 Feb 12	Drip tray should be provided for air compressor.	The reminder has been noted. Closed on 1 Mar 12.

Monitoring Parameter	Location	Inspection Date	Key Observations & Recommendations	Contractor's Follow-Up Status
Waste / Chemical Management	New Yan Ching Bridge	15 Mar 12	Chemical container with diesel oil should be stored in designated storage area.	Drip trays have been provided. Closed on 22 Mar 12.
	Rosedale Garden	29 Mar 12	Chemical containers should be placed with drip tray to avoid potential contamination to excavated soil underneath.	Drip tray has been provided. Closed on 5 Apr 12.
	Pui To Road	29 Mar 12	The contractor was reminded to clear the general refuse accumulated in the drainage channel.	The refuse has been collected and disposed of. Closed on 5 Apr 12.
	Central Median under Yan Oi Bridge	5 Apr 12	The contractor should provide a drip tray for air compressor.	The reminder has been noted. Closed on 12 Apr 12.
	Under Yan Ching Bridge	12 Apr 12	Chemical containers, such as lubricant oil container, should be stored in the designated storage area.	Chemical containers have been stored in designated storage area. Closed on 19 Apr 12.

4 Environmental Monitoring Results

4.1 Air Monitoring Results and Observations

4.1.1 Air Quality Monitoring Results

Monitoring of 24-hour TSP were conducted at monitoring stations AM1, AM2, AM3, AM4, AM5 and AM6 in the reporting period. All monitoring data and graphical presentation of the monitoring results are provided in **Appendix C** and are summarised in **Table 4.1**. Wind data obtained from the Hong Kong Observatory – Tuen Mun anemometer station during the reporting period is presented in **Appendix D**.

Table 4.1 Summary of 24-hour TSP monitoring results in the reporting period

Location	Average 24-hour TSP Concentration, $\mu\text{g}/\text{m}^3$ (Range)			
	Feb 12	Mar 12	Apr 12	Mean
AM1	18 (12 – 27)	50 (19 – 107)	20 (10 – 29)	28 (10 – 107)
AM2	33 (12 – 51)	56 (33 – 107)	20 (9 – 38)	36 (9 – 107)
AM3	28 (15 – 36)	39 (24 – 51)	22 (14 – 29)	30 (14 – 51)
AM4	29 (19 – 44)	64 (47 – 114)	25 (11 – 50)	39 (11 – 114)
AM5	30 (22 – 38)	59 (34 – 106)	19 (11 – 26)	36 (11 – 106)
AM6	25 (14 – 36)	46 (41 – 63)	22 (9 – 30)	31 (9 – 63)

All 24-hour TSP measurements during the reporting period were below the Action/Limit Level. No exceedance of action and limit level was found.

4.1.2 General Observations

Major construction works including site clearance, site hoarding construction, ground investigation and underground utilities diversion were implemented during the reporting period.

4.2 Noise Monitoring Results and Observations

4.2.1 Noise Monitoring Results

Non-restricted Hours

Monitoring of the construction noise level was conducted during non-restricted hours in the reporting period at monitoring locations N1, N2, N3, N4, N5 and N6. All monitoring data and graphical presentation of the monitoring results are provided in **Appendix E** and are summarised in **Table 4.2**.

Table 4.2 Summary of impact noise monitoring in the reporting period

Location	Noise Level, $L_{eq(30min)}$, dB(A) (Range)			
	Feb 12	Mar 12	Apr 12	Mean
N1	75 (73 – 77)	75 (73 – 78)	74 (72 – 75)	75 (72 – 78)
N2	76 (74 – 78)	76 (75 – 78)	74 (73 – 75)	76 (73 – 78)
N3	67 (67 – 67)	67 (66 – 68)	68 (67 – 69)	67 (66 – 69)
N4	65 (64 – 66)	66 (65 – 67)	66 (65 – 66)	66 (64 – 67)
N5	70 (69 – 70)	69 (69 – 70)	70 (69 – 70)	70 (69 – 70)
N6	68 (68 – 69)	68 (68 – 69)	68 (68 – 70)	68 (68 – 70)

Restricted Hours

In the reporting period, the construction works and activities such as mobilization of materials and plants etc were carried out during restricted hours. The granted Construction Noise Permits (CNPs) were issued by EPD for the related activities before the works commencement, the Contractor strictly followed the conditions stipulated in the CNPs. There was no non-compliance recorded during the reporting period.

4.2.2 Exceedance of Limit and Action Levels for Construction Noise

Totally 7 limit level exceedances (4 in February, 3 in March and 0 in April 2012) were recorded for noise measurement during non-restricted hours in the reporting period and are summarized in **Table 4.3**.

Table 4.3 Summary of exceedance of Limit Levels for construction noise in the reporting period

Location (Note 1)	No. of exceedance of Limit Level			
	Feb 12	Mar 12	Apr 12	Total
N1	2	2	0	4
N2	2	1	0	3

Notes:

- No Limit Level exceedance was recorded at monitoring location N4 and N5 during the reporting period.

Based on the field observations, it was revealed that the exceedances were mainly caused by traffic vehicles along Tuen Mun Road. It was therefore concluded that the noise exceedances were not related to the construction activities. The details of the limit level exceedances had been presented in the corresponding monthly EM&A report (Feb 2012 to Apr 2012).

Two noise complaints (In March 2012), hence, two Action Level exceedances, were recorded in the reporting period

Summary of above exceedance investigation of the Project is provided in the following Section 6.4 and **Appendix G**.

4.2.3 General Observations

The construction site had been under normal operation during the noise monitoring period and no unusual operation was observed. Traffic noise had been noticed at the monitoring location during the noise monitoring period.

4.3 Landscape and Visual Monitoring Audit Results

In the reporting period, landscape and visual site audit in accordance with the requirements stipulated in the EIA Report was conducted during the routine monthly site audit. The details of each LR, LCA and VSR are summarized in **Appendix F**. The implementation and maintenance of landscape and visual mitigation measures, listed in EIA Report, were checked during the site audit. During the reporting period, no substantial change of LR, LCA and VSR was noted, no non-compliance has been triggered, total 514 trees were felled and the pruning of the transplanted trees was carried out in accordance with the Specification for Tree Protection and Transplanting Works in Landscape Plan. The summary reports are presented in the corresponding monthly EM&A report (Feb 2012 to Apr 2012).

5 Waste Disposal

The amounts of different types of waste generated by the activities of the Project in the reporting period are shown in **Table 5.1**. It is anticipated that the amount of different types of waste will be increased in the forth-coming month due to the increasing of the scale of construction works, attention should be paid and the mitigation measures recommended in the EIA Report should be implemented and maintained. No liquid waste was generated in the reporting period.

Table 5.1 Amounts of waste generated in reporting period

Waste Type	Amount				Disposal Locations
	Feb 12	Mar 12	Apr 12	Total	
Inert C&D Materials	0 m ³	0 m ³	0 m ³	0 m ³	Broken concrete (Note 1)
	0 m ³	209.625 m ³	0 m ³	209.625 m ³	Reused in the Contract
	0 m ³	141.375 m ³	0 m ³	141.375 m ³	Reused in other Projects
	4,314.375 m ³	4,709.250 m ³	3,612.375 m ³	12636 m ³	Disposal of at public fill at Tuen Mun Area 38
Chemical Waste	0 kg	0 kg	0 kg	0 kg	N/A
Paper / cardboard packaging	235.00 kg	0 kg	0 kg	235.00 kg	Recycler
Plastic	0 kg	0 kg	0 kg	0 kg	
Metal	5,866.00 kg	70.15 kg	665.00 kg	6601.15 kg	
General Refuse	107.250 m ³	136.500 m ³	82.875 m ³	326.625 m ³	Disposal of at WENT landfill

Notes:

1. Broken concrete for recycling into aggregates.

6 Environmental Performance

6.1 Non-Compliance Record

There was no non-compliance received in the reporting period.

6.2 Review of Reasons of Non-Compliance

Totally 7 limit level exceedances (4 in February, 3 in March and 0 in April 2012) of noise monitoring were recorded from the monitoring data at locations N1 and N2 during the reporting period, which triggered the Event and Action Plan for remedial action. Based on the on-site observations and interpretation from the results, it was revealed that the exceedances were mainly caused by traffic noise along Tuen Mun Road and was not related to the construction activities. No particular remedial work is required.

6.3 Notification of Summons and Successful Prosecution

No summons or prosecutions related to environmental issues were received or made against the Project in the reporting period.

6.4 Complaint Record

Four environmental complaints (4 in March 2012) regarding the construction noise and water quality were recorded during the reporting period.

The **first** complaint was received by ICC on 8 Mar 12 regarding mud drop from the site on the carriageway in Tuen Mun Road (Tsuen Wan Bound) near Pui To Road.

As confirmed by the Contractor and Supervising Officer's Representative, the complaint was related to mud drop from the site to the carriageway on 8 Mar 12.

Immediate investigation has been conducted by Contractors. It was found that the mud in Tuen Mun Road (Tsuen Wan Bound) near Pui To Road was dropped on the carriageway due to vehicles leaving from site with insufficient wheel washing time. Actions have been taken by the contractors. Mud drops has been cleared immediately following the complaint. All vehicles' bodies and wheels are ensured to be cleaned of muds before leaving the site. Weekly site inspections by ET on 15 Mar and 22 Mar 22 revealed that the site condition was satisfactory and no muddy trail was observed on the carriageway.

Based on the above information, it is therefore concluded that the complaint was work related under the Project.

In view of this, ET recommended that the Contractor should undertake following mitigation measures to minimize the nuisance.

1. Raise wheel washing awareness among the site workers.
2. Sufficient wheel washing time is required.
3. Frequent inspections should be carried out on-site to ensure vehicles are cleaned of muds before leaving.
4. Site entrance cleaning should be regular enough that runoff from the site could be minimized.
5. All site exit points should be paved with concrete, bituminous materials or hardcores.

The **second** complaint was received by ICC on 11 Mar 12 regarding noise nuisance of night works on Tuen Mun Road (Between New Town Mansion and Parklane Square)

As confirmed by the Contractor and Supervising Officer's Representative, the related night works was carried out in Tuen Mun Road (Between New Town Mansion and Parklane Square). The noise nuisance was mainly caused by road paving works. On Saturday **Midnight**, 1 unit of road marking material boiler enclosed with movable acoustic enclosures,

1 unit of paver (QPME), 1 unit of roller (QPME), 1 unit of generator and 1 unit of roller equipped with sound baffles and silencers, and 2 units of lorries have been deployed.

The relevant construction noise permit (CNP) no. GW-RW0840-11 was obtained for the road paving works in the designated area prior to commencement. The conditions stipulated in the CNP were strictly followed by the Contractor. EPD had been informed prior to the work commencement. No abnormal activities were observed during the complaint period. In addition, the road paving work in Tuen Mun Road (Between New Town Mansion and Parklane Square) has been completed that night, which is a one-off event. Based on the above-mentioned information, it is concluded that the complaint was work-related under the Project.

In order to minimize the potential noise nuisance generated from the road paving works, ET recommended that the Contractor should undertake following mitigation measures to minimize the noise nuisance.

1. Well maintain the machines condition to minimize noise nuisance;
2. Relocate operating machinery as far as possible from nearby sensitive receivers;
3. Machines that may be in intermittent use should be shut down between work periods or should be throttled down; and
4. Improve the working practices; minimize the noise nuisance during the working activities as far as possible.

The **third** complaint was received by ICC on 14 Mar 12 regarding noise nuisance of night works on Tuen Mun Road (Near Tuen Mun Town Hall)

As confirmed by the Contractor and Supervising Officer's Representative, the related night works was carried out in Tuen Mun Road (Near Tuen Mun Town Hall). The noise nuisance was caused by road breaking work for the installation of Cat's Eye using hand-held breaker (mass < 10kg).

Prior to commencement, the relevant construction noise permit (CNP) no. GW-RW0840-11 was obtained for the road breaking works in the designated area. The duration for the use of breaker is restricted within 1 hour. During the operation, the breaker is enclosed with acoustic material properly as stipulated in the CNP. The conditions stipulated in the CNP were strictly followed by the Contractor. No abnormal activities were observed during the complaint period. Based on the above-mentioned information, it is concluded that the complaint was work-related under the Project.

In order to minimize the potential noise nuisance generated from the road breaking works, ET recommended that the Contractor should undertake following mitigation measures to minimize the noise nuisance.

1. Screen the hand-held breaker from the residential with acoustic material as far as practicable;
2. Relocate hand-held breaker as far as possible from nearby sensitive receivers; and
3. Maintain the condition of hand-held breaker.

The **fourth** complaint was received by ICC on 24 Mar 12 regarding water spillage from the site to the carriageway on Tuen Mun Road (Kowloon Bound) near Chi Lok Fa Yuen.

As confirmed by the Contractor and Supervising Officer's Representative, the complaint was related to water spillage from the site to the carriageway on 24 Mar 12.

In the complaint location, the contractor was carrying out the foundation works for noise barrier. Immediate checking has been done by site workers after receiving complaint. It was found that water spillage in Tuen Mun Road (Kowloon Bound) near Chi Lok Fa Yuen was occurred due to regular cleaning for the drilling machine. As advised by the Supervising Officer's Representative, the contractor has ensured the drilling machine is fully enclosed with tarpaulin cover either in operation or during cleaning process. The site workers were

also instructed to follow the guidance of contractors. Weekly site inspection by ET on 29 Mar 12 revealed that the site condition was satisfactory and no water spillage was observed.

Based on the above information, it is therefore concluded that the complaint was work related under the Project. The Contractor was reminded to take necessary resources to ensure review for subcontractor performance and prevent re-occurrence.

In view of this, ET recommended that the Contractor should undertake following mitigation measures to minimize the nuisance.

1. Maintain good site practice by ensuring well enclosure to the drilling machine either in operation or during cleaning.
2. Site workers should be well trained for operating the drilling machine.

The recommendations that advised by ET had been noted by the Contractor and would be implemented as far as possible. The updated statistical summary of complaint is presented in **Table 6.1**. The updated complaint logs (C020 to C023) of the Project in the reporting period are shown in **Appendix G**.

Table 6.1 Summary of complaints for the contract

Reporting Period	Complaint Statistics		Area of Concern	Validity to the Project	Status
	Number	Cumulative			
02/08/10 – 31/10/10	0	0	-	-	-
01/11/10 – 30/11/10	1	1	Noise	Yes (Ref.: C001)	Closed on 30 Nov 10.
01/12/10 – 31/01/11	0	1	-	-	-
01/02/11 – 28/02/11	1	2	Noise	Yes (Ref.: C002)	Closed on 2 Mar 11.
01/03/11 – 31/03/11	0	2	-	-	-
01/04/11 – 30/04/11	2	4	Water	Yes (Ref.: C003)	Closed on 16 Apr 11.
			Noise	Yes (Ref.: C004)	Closed on 16 May 11.
01/05/11 – 31/05/11	1	5	Water	Yes (Ref.: C005)	Closed on 10 Jun 11.
01/06/11 – 30/06/11	1	6	Air	Yes (Ref.: C006)	Closed on 23 Jun 11.
	1	7	Noise	Yes (Ref.: C007)	Closed on 24 Jun 11.
	1	8	Water	Yes (Ref.: C008)	Closed on 4 Jul 11.
	1	9	Air	Yes (Ref.: C009)	Closed on 14 Jul 11.
01/07/11 – 31/07/11	1	10	Noise	Yes (Ref.: C010)	Closed on 4 Aug 11.
	1	11	Water	Yes (Ref.: C011)	Closed on 4 Aug 11.
01/08/11 – 31/08/11	0	11	-	-	-
01/09/11 – 30/09/11	1	12	Noise	Yes (Ref.: C012)	Closed on 29 Sep 11.

Reporting Period	Complaint Statistics		Area of Concern	Validity to the Project	Status
	Number	Cumulative			
	1	13	Water	Yes (Ref.: C013)	Closed on 14 Oct 11.
	1	14	Water	Yes (Ref.: C014)	Closed on 14 Oct 11.
01/10/11 – 31/10/11	1	15	Water	Yes (Ref.: C015)	Closed on 28 Oct 11.
01/11/11 – 30/11/11	1	16	Noise	Yes (Ref.: C016)	Closed on 24 Nov 11.
	1	17	Noise	Yes (Ref.: C017)	Closed on 30 Nov 11.
01/12/11 – 31/12/11	0	17	-	-	-
01/01/12 – 31/01/12	1	18	Water	Yes (Ref.: C018)	Closed on 6 Feb 12.
	1	19	Water	Yes (Ref.: C019)	Closed on 6 Feb 12.
01/02/12 – 29/02/12	0	19	-	-	-
01/03/12 – 31/03/12	1	20	Water	Yes (Ref.: C020)	Closed on 22 Mar 12.
	1	21	Noise	Yes (Ref.: C021)	Closed on 28 Mar 12.
	1	22	Noise	Yes (Ref.: C022)	Closed on 5 Apr 12.
	1	23	Water	Yes (Ref.: C023)	Closed on 5 Apr 12.
01/04/12 – 30/04/12	0	23	-	-	-

7 Conclusions and Recommendations

7.1 Conclusions

The construction phase of the Project was commenced on 2 August 2010. The EM&A programme has been implemented since then, including air quality, noise, landscape and visual and environmental site audits.

No Action and Limit Level exceedance was recorded for impact air quality monitoring in the reporting period.

Totally 7 limit level exceedances (4 in February, 3 in March and 0 in April 2012) of noise monitoring were recorded during the reporting period. Based on the field observations and interpretation of the results, the noise exceedance the exceedances were mainly caused by traffic vehicles along Tuen Mun Road. It was concluded that the exceedance were not project related and no particular remedial work is required. Two noise complaints (In March 2012), hence, two Action Level exceedances, were recorded in the reporting period

Four environmental complaints (4 in March 2012) regarding the construction noise and water quality were recorded in the reporting period. After the investigations, it is concluded that the complaints were attributable to the Contract. The corresponding mitigation measures due to the complaints were recommended to carry out by the Contractor. Nevertheless, the Contractor was reminded to implement proper mitigation measure as stipulated in EM&A Manual to minimize any environmental implication.

No summons or prosecution related to environmental issues was received in the reporting period.

In accordance with the requirements stipulated in the EM&A manual, landscape and visual site audit was conducted regularly during the reporting period. Total 521 trees were felled and the pruning of the transplanted trees was carried out. No substantial change of LR, LCA and VSR was noted.

Weekly environmental site audit was carried out during the reporting period. The major environmental concerns were related to air quality, noise, water quality, waste management and tree maintenance.

7.2 Recommendations

Impact monitoring will be continued to carry out in the following month and followed by the requirement stipulated in the EM&A manual. Attention will be paid to environmental issues identified in EIA Report and weekly site audit. Mitigation measures recommended in EIA Report and Implementation Schedule of Mitigation Measure will be fully implemented.

Construction noise is one of the key environmental issues especially in restricted hours. The conditions stipulated in CNPs should be strictly followed when the construction works were carried out during the restricted hours.

Construction dust is another key environmental issue. The implemented construction dust mitigation measures including covering of exposed slope / soil with tarpaulin sheet etc., should be maintained and improved as necessary. Adequate water spraying should be provided for the unpaved area to minimize dust disturbance.

Water quality impact is also key environmental issue. The drainage system should be well maintained. The solid and liquid waste management should be strictly followed in accordance with the requirements described in the EIA report.

The retained trees should be protected and fenced properly. The Contractor was reminded to avoid trunks damage during construction works and, take the proper remedial measures immediately when damage was observed.

Moreover, the corresponding mitigation measures due to the complaints were recommended to carry out by the Contractor and are presented in Section 6.4. The Contractor was reminded to implement proper mitigation measure to minimize any environmental nuisance.

8 Reference

- [1] AECOM Asia Co. Ltd. December 2008. Agreement No. CE 22/2005 (HY) Supplementary No. 1 Traffic Improvements to Tuen Mun Road Town Centre Section – Environmental Monitoring & Audit Manual.
- [2] Ove Arup & Partners Hong Kong Limited. July 2010. Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section – Baseline Monitoring Report (Revision_4)
- [3] Ove Arup & Partners Hong Kong Limited. Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section – Monthly Environmental Monitoring and Audit Report – February 2012 (Final)
- [4] Ove Arup & Partners Hong Kong Limited. Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section – Monthly Environmental Monitoring and Audit Report – March 2012 (Final)
- [5] Ove Arup & Partners Hong Kong Limited. Agreement No. HMW 5/2009 (EP) Traffic Improvements to Tuen Mun Road Town Centre Section – Monthly Environmental Monitoring and Audit Report – April 2012 (Final)