

---

**Improvements to  
San Tin Interchange  
(Contract No. HY/2004/09)**

**Monthly Environmental  
Monitoring & Audit Report**

**Report No. 15**

August 2006

---

**ATKINS**

<b>1</b>	<b>Environmental Status</b> .....	<b>1</b>
1.1	Works undertaken during the Reporting Period.....	1
1.2	Environmental Permit and Licences.....	1
1.3	Environmental Document Submissions to EPD .....	1
1.4	Environmental Monitoring Locations .....	2
<b>2</b>	<b>Environmental Measures and Implementation Status</b> .....	<b>2</b>
<b>3</b>	<b>Monitoring Results</b> .....	<b>2</b>
3.1	Noise Monitoring.....	2
3.2	Water Quality Monitoring .....	4
3.3	Landscape and Visual Resources.....	4
3.4	Ad-hoc Air Quality Monitoring .....	5
3.5	Waste Management .....	5
<b>4</b>	<b>Environmental Audits</b> .....	<b>5</b>
4.1	Site Inspection and Audit .....	5
4.2	Environmental Exceedances .....	6
4.3	Environmental Complaint and Prosecution .....	6
<b>5</b>	<b>Forecast and Schedule</b> .....	<b>6</b>
5.1	Key Issues for the Coming Months.....	6
5.2	Monitoring Schedules for the Next Month .....	7
<b>6</b>	<b>Conclusion</b> .....	<b>7</b>

### **List of Annexes**

Annex A	Contractor's Works Programme
Annex B	Mitigation Measures Checklist
Annex C	Calibration Certificates
Annex D	Noise Monitoring Results
Annex E	Water Quality Visual Inspection Reports
Annex F	Landscape & Visual Resources Inspection Reports
Annex G	Weekly Site Inspection Reports
Annex H	Notification of Environmental Exceedances and Non-Compliance Forms
Annex I	Action and Limit Levels
Annex J	Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

### **List of Tables**

Table 1.1	Details of Permits and Licenses issued in August 2006
Table 1.2	Summary of Environmental Submissions to EPD in August 2006
Table 1.3	Noise Monitoring Stations
Table 3.1	Summary of Noise Monitoring Results during Normal Working Hours
Table 3.2	Summary of Noise Monitoring Results during Restricted Hours – All days during the evening (1900 to 2300 hours), and general holidays (including Sundays) during the day-time and evening (0700-2300 hours)
Table 3.3	Summary of Noise Monitoring Results during Restricted Hours – All days during the night-time (2300 to 0700 hours)
Table 3.4	Summary of Waste Disposal for August 2006
Table 5.1	Proposed Noise Monitoring Schedule for September 2006

### **List of Figures**

Figure 1	Site Plan & Locations of Noise and Air Quality Monitoring Stations
----------	--

## **Executive Summary**

Atkins China Limited (ACL) has been appointed by Chun Wo Construction & Engineering Co., Ltd. to implement the Environmental Monitoring and Audit (EM&A) programme for the construction works under Contract No. HY/2004/09 Improvements to San Tin Interchange (hereinafter, the Project).

The construction of the Project commenced since 21<sup>st</sup> June 2005. This report is the fifteenth monthly EM&A report for the Project which summarises the monitoring results and audit findings during the reporting period from 1<sup>st</sup> to 31<sup>st</sup> August 2006.

### ***Environmental Monitoring and Audit Progress***

The monthly EM&A programme was undertaken in accordance with the EM&A Manual. A summary of the monitoring activities in this reporting period is listed below:

- Weekly site inspections were undertaken jointly with the Contractor and Engineer's Representative (ER) on 3<sup>rd</sup>, 10<sup>th</sup>, 15<sup>th</sup>, 24<sup>th</sup> and 31<sup>st</sup> August 2006. The Independent Environmental Checker (IEC) joined the site inspection on 24<sup>th</sup> August 2006.
- Noise monitoring at three designated monitoring stations was undertaken on 1<sup>st</sup>, 11<sup>th</sup>, 17<sup>th</sup>, 23<sup>rd</sup> and 30<sup>th</sup> August 2006 during normal working hours; and on 6<sup>th</sup>, 13<sup>th</sup>, 17<sup>th</sup>, 20<sup>th</sup>, 27<sup>th</sup> and 31<sup>st</sup> August 2006 during the restricted hour periods on a weekly basis when there were construction activities scheduled during those periods. One ad-hoc monitoring was undertaken on 12<sup>th</sup> August 2006 following an exceedance of Limit Level recorded on 11<sup>th</sup> August 2006.
- Visual site surveillance for water quality was undertaken three times a week.
- Site inspections for landscape and visual resources were undertaken on 18<sup>th</sup> and 30<sup>th</sup> August 2006.

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

There were totally seven environmental exceedances recorded during the reporting period, of which six were recorded during restricted hours noise monitoring on 6<sup>th</sup>, 13<sup>th</sup>, 17<sup>th</sup>, 20<sup>th</sup>, 27<sup>th</sup> and 31<sup>st</sup> August 2006, and one was recorded during normal working hours noise monitoring on 11<sup>th</sup> August 2006.

For the restricted hours noise monitoring, the exceedances were proved not to have been caused by the site activities of the Contractor and were attributable to the high ambient traffic noise from San Tin Highway.

The environmental exceedance recorded during the normal working hours noise monitoring was due to the measured Leq (30min) at Monitoring Station CM1 exceeding the Limit Level of 75dB(A), which was not in compliance with the requirements mentioned in EIA Report and EM&A Manual. During the measurement period, concrete breaking using a breaker was being undertaken at the Slip Road A works area. The Contractor was advised to stop the concrete breaking works in the concerned area immediately to avoid further exceedances. Following the Event and Action Plan for construction noise, additional noise measurement was conducted on the following day (12<sup>th</sup> August 2006) during which no concrete breaking activity was being undertaken. The measured Leq (30min) noise level was found to be 67dB(A). Thus, the Contractor was advised to provide mitigation measures as necessary such as movable noise barriers to avoid exceedances caused by any further concrete breaking works in the concerned area. Further to discussion with the Contractor, no further concrete breaking activities will be required in the concerned area.

### ***Complaint Log***

No environmental complaints were received during this reporting period.

### ***Notifications of Summons and Prosecutions***

There were no notifications of summons or prosecutions received during this reporting period.

### ***Reporting Changes***

This report has been developed in compliance with the reporting requirements for the subsequent monthly EM&A reports as required by the Project EM&A Manual.

### ***Future Key Issues***

Installation of viaduct segments will continue in September 2006.

Further sampling at Site A in response to ER's comments on the Contamination Assessment Report (CAR) and Remediation Action Plan (RAP) of Site A and Site E was conducted in August 2006. The CAR and RAP will be finalized upon receipt of the analysis results.

## 1 ENVIRONMENTAL STATUS

### 1.1 Works undertaken during the Reporting Period

The major construction activities undertaken during this reporting period are summarised below:

- Percussive piling;
- Bored piling;
- Laying of drainage pipes;
- Road widening works;
- Trench works;
- Storage and preparation of precast viaduct segments; and
- Erection of precast viaduct segments.

The site plan of the Project is shown in Figure 1. The Contractor's works programme is provided in Annex A.

### 1.2 Environmental Permit and Licences

There were no changes or clarification to the Environmental Permit (EP-190/2004) during the reporting period.

Seven Construction Noise Permits (CNP) were issued in August 2006. Details of the CNP are summarised in Table 1.1. One CNP (Permit No. PP-RN0026-06) for carrying out percussive piling works from 15<sup>th</sup> August 2006 to 13<sup>th</sup> November 2006 was issued on 31<sup>st</sup> July 2006 and received by the Contractor in August 2006.

**Table 1.1 Details of Permits and Licenses issued in August 2006**

Permit / License	Reference No.	Issue Date	Expiry Date
Construction Noise Permit for general construction work	GW-RN0410-06	15 <sup>th</sup> August 2006	30 <sup>th</sup> September 2006
Construction Noise Permit for general construction work	GW-RN0411-06	16 <sup>th</sup> August 2006	21 <sup>st</sup> November 2006
Construction Noise Permit for general construction work	GW-RN0427-06	22 <sup>nd</sup> August 2006	3 <sup>rd</sup> March 2007
Construction Noise Permit for general construction work	GW-RN0428-06	23 <sup>rd</sup> August 2006	10 <sup>th</sup> March 2007
Construction Noise Permit for general construction work	GW-RN0431-06	24 <sup>th</sup> August 2006	7 <sup>th</sup> September 2006
Construction Noise Permit for general construction work	GW-RN0435-06	29 <sup>th</sup> August 2006	30 <sup>th</sup> September 2006
Construction Noise Permit for general construction work	GW-RN0436-06	29 <sup>th</sup> August 2006	11 <sup>th</sup> October 2006

### 1.3 Environmental Document Submissions to EPD

A summary of the status of the submissions to EPD as provided during the month of August 2006 is presented in Table 1.2.

**Table 1.2 Summary of Environmental Submissions to EPD in August 2006**

Item No.	Document Title	Date of Submission
1	Monthly EM&A Report No. 14 for July 2006	14 <sup>th</sup> August 2006

#### 1.4 Environmental Monitoring Locations

Noise monitoring was undertaken at three monitoring stations CM1, CM2 and CM3. The locations are shown on Figure 1. Description of these monitoring stations is provided in Table 1.3.

**Table 1.3 Noise Monitoring Stations**

Monitoring Station ID	Description	Easting	Northing
CM1	Village house near San Tin Highway	826133	839839
CM2	Village house near San Tin Highway	826291	839918
CM3	Village house near Kwu Tung Road	826605	840076

## 2 ENVIRONMENTAL MEASURES AND IMPLEMENTATION STATUS

The mitigation measures listed in the Project EIA Report, EM&A Manual and Environmental Permit and the implementation status are provided in Annex B.

During the normal working hours noise measurement conducted on 11<sup>th</sup> August 2006, the measured Leq(30 min) noise level was found to exceed the Limit Level of 75dB(A), which was not in compliance with the requirements mentioned in EIA Report and EM&A Manual. During the measurement period, concrete breaking using a breaker was being undertaken in the Slip Road A works area which is about 30m away from CM1. The concrete breaking activity was observed to be the key noise source. The Contractor was advised to stop the concrete breaking works in the concerned area immediately. Following the Event and Action Plan of noise monitoring, the ET notified the IEC, ER and the Contractor accordingly of the non-compliance. During the additional noise measurement conducted on the following day (12<sup>th</sup> August 2006) when no concrete breaking activity was being undertaken, the measured Leq (30min) noise level was found to be 67dB(A) which complied with the Limit Level. Further to discussion with the Contractor, no further concrete breaking activities will be required in the Slip Road A works area. To avoid further noise exceedance, the Contractor was advised to implement necessary noise mitigation measures such as movable noise barriers (following the recommendations in Section 3.47 and Figure 3.5 of the Project EIA Report) prior to any potential noisy site works in concerned area.

## 3 MONITORING RESULTS

### 3.1 Noise Monitoring

#### 3.1.1 Noise Monitoring Equipment

The details of the noise monitoring equipment are listed below and the calibration certificates are presented in Annex C:

- Sound level meter ONO-SOKKI LA-5110

- Acoustical calibrator ONO-SOKKI SC-2110
- Hand-held anemometer

### 3.1.2 Noise Monitoring Methodology

The sound level meter was calibrated with an acoustical calibrator prior to each measurement. It was set on a tripod at 1.2 m above local ground level at the monitoring station. Measurement of the A-weighted  $L_{eq(30 \text{ minutes})}$  noise level for normal daytime hours was undertaken. Three consecutive A-weighted  $L_{eq(5 \text{ minutes})}$  noise levels were measured for restricted hours monitoring. Wind speed was checked during the monitoring period using the hand-held anemometer to ensure steady wind speed did not exceed 5 m/s, or gusts did not exceed 10 m/s. After the noise measurement the sound level meter was re-calibrated using the acoustical calibrator.

### 3.1.3 Noise Monitoring Results

Noise monitoring was undertaken on a weekly basis when noise generating activities were underway. The noise monitoring results obtained in August 2006, during the normal working hours, restricted hours from 1900 to 2300 hours on normal working days and from 0700 to 1900 hours on general holidays, and restricted hours from 2300 to 0700 hours of next day are summarised in Table 3.1, Table 3.2 and Table 3.3, respectively. There was one environmental exceedance of the Limit Level for noise monitoring recorded during the normal daytime hours within the reporting period and six exceedances were recorded during the restricted hours.

Details of the monitoring time period and weather condition during the monitoring period and the graphical presentation of the noise monitoring results are provided in Annex D.

**Table 3.1 Summary of Noise Monitoring Results during Normal Working Hours**

Date of Monitoring	Normal Hours. Noise Monitoring Results $L_{eq(30 \text{ minutes})}$ dB(A)		
	CM1	CM2	CM3
1 <sup>st</sup> August 2006	67	73	62
11 <sup>th</sup> August 2006	<u>77</u>	72	61
12 <sup>th</sup> August 2006	67	-	-
17 <sup>th</sup> August 2006	67	72	61
23 <sup>rd</sup> August 2006	68	72	62
30 <sup>th</sup> August 2006	67	72	64

**Remarks:**

- (1) CM2 is a non-façade measurement location. A positive correction of 3dB(A) has been applied to the measured noise level at CM2 according to EPD's guideline.
- (2) Ad-hoc monitoring was conducted at CM1 on 12<sup>th</sup> August 2006 due to an exceedance of Limit Level recorded on 11<sup>th</sup> August 2006 that may have been caused by the works.
- (3) Underlined figure indicates exceedance of the Limit Level of 75dB(A).



**Table 3.2 Summary of Noise Monitoring Results during Restricted Hours – All days during the evening (1900 to 2300 hours), and general holidays (including Sundays) during the day-time and evening (0700-2300 hours)**

Date of Monitoring	Restricted Hours Noise Monitoring Results $L_{eq(15\text{ minutes})}$ dB(A)		
	CM1	CM2	CM3
6 <sup>th</sup> August 2006	63	<u>66</u>	61
13 <sup>th</sup> August 2006	65	<u>69</u>	62
17 <sup>th</sup> August 2006	65	<u>70</u>	57
20 <sup>th</sup> August 2006	63	<u>69</u>	61
27 <sup>th</sup> August 2006	62	<u>68</u>	63
31 <sup>st</sup> August 2006	65	<u>70</u>	59

**Remark:**

- (1) CM2 is a non-façade measurement location. A positive correction of 3dB(A) has been applied to the measured noise level at CM2 according to EPD's guideline.
- (2) Underlined figure indicates exceedance of the Limit Level of 65dB(A).

**Table 3.3 Summary of Noise Monitoring Results during Restricted Hours – All days during the night-time (2300 to 0700 hours)**

Date of Monitoring	Restricted Hours Noise Monitoring Results $L_{eq(15\text{ minutes})}$ dB(A)		
	CM1	CM2	CM3
17 <sup>th</sup> August 2006	<u>65</u>	<u>69</u>	<u>59</u>
31 <sup>st</sup> August 2006	<u>65</u>	<u>70</u>	<u>55</u>

**Remark:**

- (1) CM2 is a non-façade measurement location. A positive correction of 3dB(A) has been applied to the measured noise level at CM2 according to EPD's guideline.
- (2) Underlined figure indicates exceedance of the Limit Level of 50dB(A).
- (3) Time of measurement at CM3 started after 23:59 hours (midnight) of the "Date of Monitoring" stated in the table. Therefore, the "Date of Monitoring" for CM3 refers to 18<sup>th</sup> and 1<sup>st</sup> September 2006, respectively.

### 3.2 Water Quality Monitoring

Visual site surveillances for water quality were undertaken three times a week. Based on the visual inspection results, the Contractor has followed all necessary site practices for the maintenance of the site drainage system, including:

- Regular and prompt removal of stagnant water pools to prevent mosquito breeding.
- Replacing the broken sandbags barrier to better control surface runoff.

The details of the water quality visual inspection reports are provided in Annex E.

### 3.3 Landscape and Visual Resources

Two site inspections on the landscape and visual resources were undertaken in August 2006.

Weeds were found growing inside the two transplantation nurseries in the N1 and N2 Division areas. The Contractor was reminded to clear up the weeds as proper maintenance for the nursery.

Sandbags barrier encircling the transplantation nursery in the N1 Division area was seen to have been damaged. Some construction materials were seen to have accumulated on top of the soil inside the nursery. The Contractor was reminded to clear up the construction materials and place them in an appropriate storage area. Damaged sandbags should be replaced by new ones to contain the soil inside the nursery and prevent soil erosion.

Several trees inside the transplantation nursery in the N2 Division area were found to have fallen down due to the typhoon event in early August 2006. The Contractor was reminded to replant these trees in the nursery to ensure their survival.

The details of the landscape and visual resources inspection reports are provided in Annex F.

### 3.4 Ad-hoc Air Quality Monitoring

No ad-hoc air quality monitoring was required during the reporting period.

### 3.5 Waste Management

The Contractor has adopted a trip ticket system for the disposal of construction wastes. According to the records provided by the Contractor, the disposal of construction waste within the reporting period is summarised in Table 3.4.

**Table 3.4 Summary of Waste Disposal for August 2006**

Waste Type	Destination	No. of Trips	Quantity
C&D Waste	NENT Landfill	37	185 m <sup>3</sup>
C&D Waste	WENT Landfill	4	20 m <sup>3</sup>
Building debris	CEDD's Tuen Mun Area 38 Fill Bank	609	3,045m <sup>3</sup>
	CEDD's Tuen Mun Area 38 C&D Materials Recycling Facility	15	75 m <sup>3</sup>
Chemical Waste	Collected by Dunwell Enviro-Tech (Holdings) Ltd.	1	900 L
Chemical Toilet Waste	Collected by Proenvironmental Services Ltd.	26	-
Sewage Holding Tank Waste	Collected by Waylung Waste Services Ltd.	14	-

## 4 ENVIRONMENTAL AUDITS

### 4.1 Site Inspection and Audit

Site inspections were undertaken on 3<sup>rd</sup>, 10<sup>th</sup>, 15<sup>th</sup>, 24<sup>th</sup> and 31<sup>st</sup> August 2006, and jointly with the IEC on 24<sup>th</sup> August 2006. Specific locations within the site were identified during the inspection for improvements in proper implementation of the environmental mitigation measures. These include:

- Regular and prompt removal of stagnant water pools to prevent mosquito breeding.
- Replacing damaged sandbags barrier encircling transplantation nursery with new ones to properly contain the soil inside the nursery and prevent soil erosion.
- Provision of additional sandbags to properly control the site runoff.

- Removal of top soil stained by lubricant oil leaked from equipment and disposed of as chemical waste.
- Provision of drip tray and impervious sheet cover for chemicals (such as coagulant) containers when storing temporarily in the works area.
- Daily cleaning up of general refuse / rubbish on site for site cleanliness and tidiness.
- Clearing up the construction materials in the transplantation nursery.

The record of the weekly site inspection findings is provided in Annex G.

#### **4.2 Environmental Exceedances**

During the reporting period, there were totally seven exceedances of Limit Level. Six of which were noise exceedances of the Limit Level during restricted hours noise monitoring recorded on 6<sup>th</sup>, 13<sup>th</sup>, 17<sup>th</sup>, 20<sup>th</sup>, 27<sup>th</sup> and 31<sup>st</sup> August 2006, and one was recorded during normal hours noise monitoring recorded on 11<sup>th</sup> August 2006.

For the exceedances of the Limit Level during restricted hours noise monitoring, the project-related works being undertaken during the measurement period were located at a distance away (at least over 100m) from the monitoring stations. The exceedances were due to the high ambient background noise caused by road traffic on San Tin Highway. Thus, the noise exceedances recorded were found not to be attributable to project works.

For the exceedances of the Limit Level during normal working hours noise monitoring at CM1 on 11<sup>th</sup> August 2006, concrete breaking was being undertaken at the Slip Road A works area which is about 30m away from CM1. The Contractor was advised to stop the concrete breaking works in the concerned area immediately. Following the Event and Action Plan for construction noise, additional noise measurement was conducted on the following day (12<sup>th</sup> August 2006) in which no concrete breaking activity was being undertaken. The measured Leq (30min) noise level was found to be 67dB(A). Thus, the exceedance may have been caused by the concrete breaking activities. Further to discussion with the Contractor, no further concrete breaking activities will be required in the Slip Road A works area. Nonetheless, the Contractor was advised to implement necessary noise mitigation measures such as movable noise barriers (as recommended in the Project EIA Report) to avoid further exceedances that would be caused by potential noisy site works in the concerned area.

Records of the notification of environmental exceedances and the non-compliance forms are provided in Annex H. The Action and Limit Levels for impact monitoring are provided in Annex I.

#### **4.3 Environmental Complaint and Prosecution**

During the reporting period, no environmental complaints, prosecutions or summons were received. Cumulative statistics on complaints, notifications of summons and successful prosecutions for the Project are provided in Annex J.

### **5 FORECAST AND SCHEDULE**

#### **5.1 Key Issues for the Coming Months**

The key issues with respect to the works in the forthcoming 2 months include:

- Laying of drainage pipes;
- Road widening works;
- Trench works;
- Storage and preparation of precast viaduct segments; and
- Erection of precast viaduct segments.

The Contamination Assessment Report (CAR) and Remediation Action Plan (RAP) of Site A and Site E will be finalized upon receipt of the analysis results of the further sampling conducted at Site A.

## 5.2 Monitoring Schedules for the Next Month

The proposed schedule for noise monitoring in September 2006 is provided in Table 5.1 below:

**Table 5.1 Proposed Noise Monitoring Schedule for September 2006**

<b>Date</b>	<b>Noise Monitoring Station</b>
5 <sup>th</sup> September 2006 (Tuesday)	CM1, CM2 and CM3
13 <sup>th</sup> September 2006 (Wednesday)	CM1, CM2 and CM3
21 <sup>st</sup> September 2006 (Thursday)	CM1, CM2 and CM3
29 <sup>th</sup> September 2006 (Friday)	CM1, CM2 and CM3

## 6 CONCLUSION

There was no environmental non-compliance attributable to the Project works during reporting period.

There were six exceedances of the Limit Level recorded during the restricted hours noise monitoring during the reporting period. However, they were found not to be attributable to project works.

There was one non-compliance of the Limit Level recorded during the normal hours noise monitoring due to concrete breaking activities in project works area during the reporting period.

No environmental complaints, prosecutions or summons was received during the reporting period.