

**Contract No. : DC/2007/06**  
**River Improvement Works in Upper Lam Tsuen, She  
Shan River and Upper Tai Po River**

ENVIRONMENTAL MONITORING AND AUDIT

**MONTHLY EM&A REPORT of**

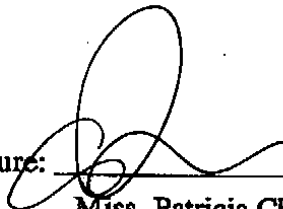
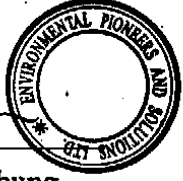
**UPPER TAI PO RIVER**


**for March 2010**

Environmental Pioneers & Solutions Limited  
8/F, Chaiwan Industrial Centre Building  
20 Lee Chung Street, Chaiwan, Hong Kong  
Tel: 28890569 Fax: 2856 2010

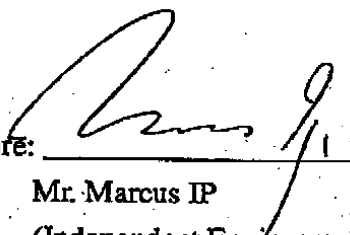
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Certified by:

Signature:   Date: 19/4/2010  
Miss. Patricia Chung  
(Environmental Team Leader)

Signature:  Date: 19/4/2010  
Dr. Mark Shea  
(Ecologist)

and Verified by:

Signature:  Date: 18/4/2010  
Mr. Marcus IP  
(Independent Environment Checker)

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### **Executive summary**

This is the nineteenth monthly Environmental Monitoring and Audit (EM&A) Report for the river improvement works at Upper Tai Po River under Drainage Services Department Contract No. DC/2007/06 entitled “River Improvement Works in Upper Lam Tsuen River, She Shan River and Tai Po River”. This report concludes the impact monitoring for the activities undertaken during the period from 1<sup>st</sup> March 2010 to 31<sup>st</sup> March 2010. The major site activities in this reporting month were mainly site access formation, construction of footbridges, retaining walls and gabion walls.

The Environmental Team (ET) is responsible for the EM&A works required in the EM&A manual. Site inspections were carried out on weekly basis to investigate and audit the equipment and work methodologies with respect to pollution control and environmental mitigation. The weekly inspections records and photos taken were kept.

The last ecological impact monitoring was carried out in January 2010 and the next ecological impact monitoring was arranged in July 2010. The summary of ecological site inspection findings and implementation status of environmental protection and mitigation for ecology, prepared by the Ecologist, are provided in table 6.2 and Appendix G respectively.

Environmental Team had carried out construction noise monitoring on weekly basis. Exceedance of limit level was recorded during routine measurement conducted on 5<sup>th</sup> March 2010. Findings from the investigation showed exceedance was mainly caused by concrete breaking activities by the other construction project. Noise monitoring records for the reporting month and the data is presented in Section 4. The location plan and the graphical plots presenting the data are provided in Appendix D.

Piling works were not scheduled for this month. Therefore, no vibration monitoring was conducted by ET during the reporting month.

There was no non-compliance recorded for this reporting month.

There was no breach of action and limit levels for this month.

There was one formal complaint recorded on 12 March 2010 regarding muddy effluent discharge from site activities to the river channel. For further details of the complaint please refer to Section 2.7 and Appendix J.

There was no reporting change for this month.

Site works proposed to be carried out in the upcoming month will be mainly finishing works for the footbridges, construction of retaining walls and gabion walls, removal of noise barriers then evacuation works will be followed.

ET has reminded the contractor to provide environmental pollution control measures wherever necessary and to keep a good environmental management at site practice.

## 1.0 Introduction

This is the nineteenth monthly Environmental Monitoring and Audit (EM&A) Report for the river improvement works at Upper Tai Po River under Drainage Services Department Contract No. DC/2007/06 entitled “River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper Tai Po River”. The site layout plan is shown in Figure 2.1. The Environmental Team, Environmental Pioneers & Solutions Limited appointed by Chiu Hing Construction and Transportation Company Limited, prepares the report. The report is to be submitted to the Contractor, the Engineer and the IEC.

This report presents the results of the environmental monitoring of the project activities for Upper Tai Po River conducted during the month of March 2010. This included regular site inspections once per week for verification of implementation of the mitigation measures as recommended in the Environmental Permit (EP-223/2005/A) (EP), EM&A Manual and the Contractor’s Environmental Management Plan (EMP).

## 2.0 Environmental status

### 2.1 Project area

The location of the project site – Upper Tai Po River starting from Ta Tit Yan of Yai Mo Shan, the Upper Tai Po River flows from southeast to northeast alongside Wilson Trail, turning northward before joining the Lam Tsuen River and then runs towards Tai Po Market. To the east of the river, there are active and abandoned cultivated lands. While the village settlements are mainly located on the west and northeast side of the river bank, where the San Uk Ka and Lai Chi Shan establishment also lie. The Project site is indicated in **Figure 2.1**.

### 2.2 Construction programme

Approximately 0.6km of Upper Tai Po River will be improved to enhance the hydraulic performance of the river. The improvement works comprise the following:

- (1) Re-profiling and realignment of the Channel;
- (2) Inclusion of gabions and retaining wall for bank protection whilst providing a natural channel bed; and
- (3) Re-provisioning of footbridges and footpaths along the channel

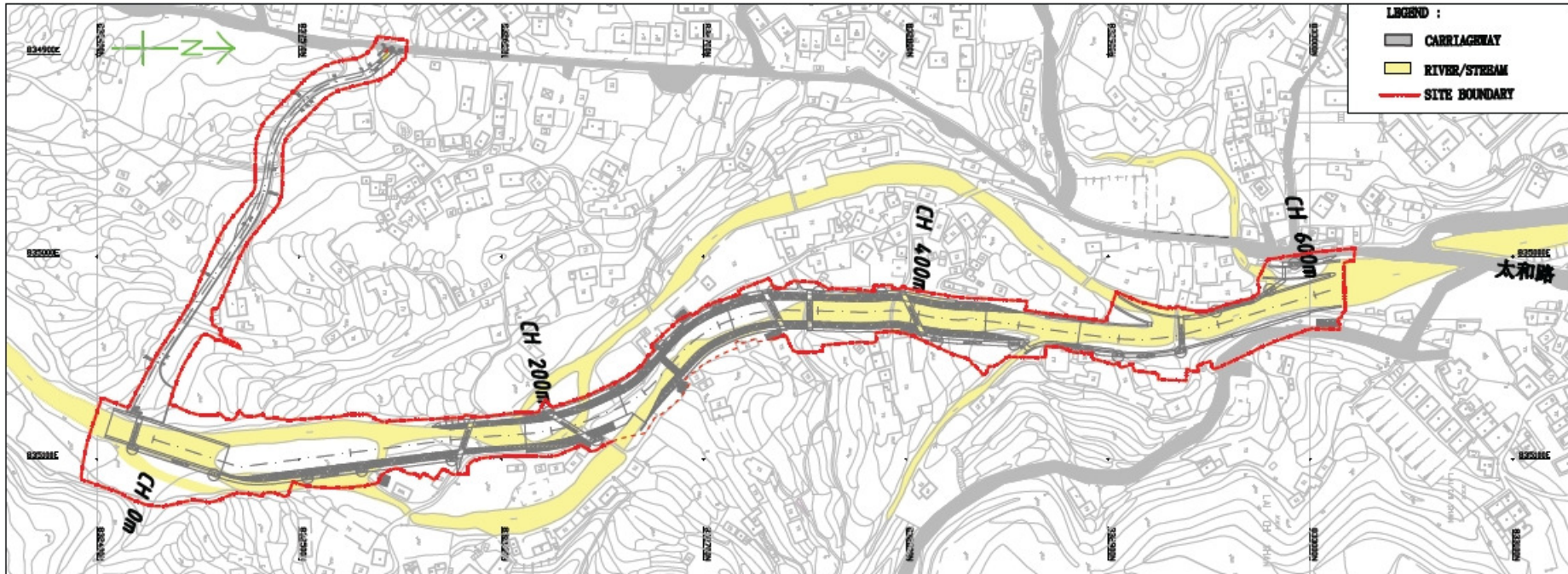
The construction of the proposed improvement works for Upper Tai Po River has been commenced on September 15<sup>th</sup> 2008 and anticipated to complete in April 2011.

### **2.3 Proposed construction sequences**

The proposed construction sequence is shown in the following sequences:

- (1) Site clearance and preparation works
- (2) Construction of the maintenance access which involves the construction of retaining walls
- (3) River channel construction and excavation, involving the excavation works, construction of retaining walls and gabion walls
- (4) Re-provisioning of footbridges
- (5) Construction of footpaths
- (6) Landscaping works

Fig 2.1 Layout of construction area



Upper Tai Po River



## **2.4 Construction activities for the reporting period**

Major construction activities carried out by the contractor during the reporting month include:

- (1) Haul access formation
- (2) Construction of footbridges
- (3) Construction of retaining walls
- (4) Construction of gabion walls

## **2.5 Construction activities for the next reporting period**

Major construction activities carried out by the contractor anticipated for the coming month include:

- (1) Finishing works for footbridges
- (2) Construction of retaining walls
- (3) Construction of gabion walls
- (4) Removal of noise barriers
- (5) Evacuation works

## **2.6 Non-compliance with the environmental performance limits**

There was one exceedance event on the construction noise was recorded in monitoring station UTP4 on 5<sup>th</sup> March 2010. ET has conducted investigation on the same day and found that major cause of exceedance was due to the concrete breaking activities carried out by the other project of Highways Department. Therefore, such exceedance was concluded to be invalid and no further follow up action was taken. The event and action plan for Ecology is shown in Appendix A. The action and limit level for Noise is shown in Appendix B. The reference standards for vibration are shown in Appendix C.

## **2.7 Summary of complaints**

There was one formal complaint recorded in this reporting month. A complaint regarding muddy effluent discharge from the project site was referred by EPD on 12 March 2010. ET has prepared the complaint log and report to resolve the complaint. For further information of the findings and suggestion given in the report and log please refer to the Appendix J.

Totally, six complaints had been received since the commencement of this project. The cumulative complaint log is shown in the Appendix F.

## **3.0 Ecological monitoring results**

There was no ecological impact monitoring or capture survey scheduled within this reporting month and the upcoming month.

#### 4.0 Noise monitoring results

In accordance with the EM&A Manual, monitoring locations were established at 11 N.S.R. locations. The description of all 11 N.S.R. are shown in Table 4.1.

**TABLE 4.1 Description of Noise Sensitive Receivers**

<b>Sensitive Receiver No.</b>	<b>Location and Description</b>
UTP1	54B, Sheung Wun Yiu
UTP2	Village House in Lai Chi Shan
UTP3	Village House near Upper Tai Po River
UTP4	Village House near Upper Tai Po River
UTP5	Village House near Upper Tai Po River
UTP6	Village House near Upper Tai Po River
UTP7	Village House near Upper Tai Po River
UTP8	Village House near Upper Tai Po River
UTP9	49A, Pun Shan Chau
UTP10	Village House near the proposed access road
UTP11	49G, San Uk Ka

Noise monitoring was carried out by the Environmental Team on weekly basis for this reporting month on 5<sup>th</sup>, 12<sup>th</sup>, 19<sup>th</sup> and 26<sup>th</sup> March 2010. Due to the adverse rainy weather, monitoring on 12<sup>th</sup> March 2010 was not conducted at six of the monitoring stations including UTP1, 3, 4, 9, 10 and 11.

Measured  $L_{eq(30min)}$  results ranged from 50.4dB(A) to 78.8dB(A). Result that exceeded the limit level was recorded at monitoring station UTP4 on 5<sup>th</sup> March 2010. ET conducted investigation during the course of measurement and found that exceedance was mainly attributing to concrete breaking activities next to the monitoring station. Such activity was conducted by the other construction project belonged to Highways Department. And therefore, ET concluded the exceedance was invalid that was not caused by the project.

For further details of the monitoring results, graphical plots and the location plan, please refer to the Appendix D.

## 5.0 Vibration monitoring results

There was no vibration monitoring results for this reporting month. Vibration monitoring will be started once the piling works start in Upper Tai Po River.

## 6.0 Environmental issues and actions

### 6.1 Site inspections and key environmental issues

Site inspections were undertaken routinely to inspect the construction activities in Upper Tai Po River to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. Implementation status of environmental protection and mitigation measures is shown in Appendix G.

Within this reporting month, site inspections were conducted on 3<sup>rd</sup>, 10<sup>th</sup>, 17<sup>th</sup>, 24<sup>th</sup> and 31<sup>st</sup> March 2010. A detailed checklist of each site inspection together with comments and relevant photos have been filed and kept. The findings from inspection were summarized in Table 6.1.

Ecological inspections by the Ecologist Dr. Mark Shea were carried out on 1<sup>st</sup>, 8<sup>th</sup>, 15<sup>th</sup> and 22<sup>nd</sup> March 2010. Details of findings were summarized in Table 6.2.

Table 6.1 Summary results of site inspections findings

Date	Findings	Identification	Advice from ET	Action taken	Closing date	Remarks
22 Feb & 03 Mar 2010	Site water discharged from de-silting tank at ch.50 was observed to be turbid	Observation	To maintain treatment effectiveness, Contractor was advised to clean up the de-silting tank regularly.	The concerned de-silting tank has been removed prior to the inspection on 10 Mar 2010	10 Mar 2010	--
03 & 17 Mar 2010	Surface of Haul access D was found stained with oil leaked from idling roller	Observation	Contractor was requested to collect the contaminated soil and handled as chemical wastes for storage and disposal		Ongoing	--
10 Mar 2010	Accumulation of stagnant water was observed in the wheel washing bay at the site entrance of ch.700	Observation	Contractor was advised to clean up the wheel washing bay regularly to prevent mosquito breeding and site water leakage	Follow up action was taken as advised prior to the inspection on 24 Mar 2010	24 Mar 2010	--
17 Mar 2010	Site surface was observed to be dry and dusty	Observation	Contractor was advised to implement regular water spraying to the dusty static area to minimize air quality impact from site works	Follow up action was taken as advised prior to the inspection on 24 Mar 2010	24 Mar 2010	--
24 Mar 2010	No particular observation	N/A	N/A	N/A	N/A	--

Date	Findings	Identification	Advice from ET	Action taken	Closing date	Remarks
31 Mar 2010	Open stockpile of earth material was observed at the haul access D	Observation	Contractor was advised to provide tarpaulin coverings to the concerned stockpile as to prevent erosion and dust generation	To be followed in the next reporting period	Ongoing	--
31 Mar 2010	The new formed diversion channel for river water at ch.50 was in unsatisfactory condition	Observation	Contractor was advised to provide proper bund walls and barriers at both sides of the diversion channel to prevent surface runoff and erosion from surround bare earth surface	To be followed in the next reporting period	Ongoing	--

The summary of ecological inspection prepared by the Ecologist, Dr. Mark Shea is shown in Table 6.2.

Date	Observations	Advice from Ecologist	Action Taken	Closing Date
01 Mar 2010	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A
08 Mar 2010	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A
15 Mar 2010	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A
22 Mar 2010	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A

## **6.2 Non-compliance**

There was no non-compliance recorded for the month of March 2010.

## **6.3 Recommendations**

Contractor was reminded for the issue of oil and chemical spillage on site. In order to prevent oil leakage from causing contamination to the surrounding area, on-site maintenance should be prevented as far as practicable. Protective measures such as drip pan and/or absorbing materials should be provided for refueling to the equipments. On-site storage of fuels and chemicals should be prevented otherwise secondary containment of drip pan should be provide to avoid chemical spillage to the site ground and/or water bodies.

Contractor was reminded on the issue of implementation of protecting the water quality. Sufficient site water treatment facility should be provided on site for excavation and channel reformation. River-based site activities especially for excavation and channel diversion should be provided with proper bund walls and/or barriers to prevent erosion and site water seepage from causing water quality impact.

## **6.4 Implementation status and effectiveness of the mitigation measures**

Refer the previous table 6.1, contractor has implemented mitigation measures to address those problems as advised by ER, IEC and ET. Some of the measures taken by the contractor were considered as effective to minimize negative impact to the environment. Ongoing investigation will be carried out to observe performance and effectiveness of those measures. Outstanding environmental items will be inspected in the follow month.

As there were some ongoing follow up practices, contractor was reminded to regularly review and rectify the discrepancy once found and maintain good site condition.

## 7.0 Waste management status

It is the contractor's responsibility to ensure that all wastes produced during construction phase for the drainage improvement works are handled, stored and disposed of in accordance with good waste management practices and EPD's regulation and requirement. Waste materials generated during construction activities such as construction and demolition(C&D) material, chemical wastes and general refuse, are recommended to be audited at regular intervals to ensure that proper storage, transportation and general reuse are recommended to be audited to ensure that proper storage, transportation and disposal practices are being implemented.

**Table 7.1** is the Waste Disposal recorded by the Contractor in this month.

Table 7.1 Summary of Waste Disposal for the reporting month

Type of waste	Inert Waste	Non-Inert Waste	Chemical Waste
March 2010	0	0	0

The cumulative waste flow table is shown in Appendix H.

## 8.0 Status of environmental licensing and permit

This project requires different permits and licenses to be run legally. **Table 8.1** is the summary of permits/ licenses for this project.

**Table 8.1 Summary of Environmental Licensing and Permit Status**

Description	License / Permit No.	Date of Issue	Date of Expiry	Remarks
Environmental Permit	EP-223/2005	31 <sup>st</sup> Aug, 2005	N/A	Superseded
Amended Environmental Permit	EP-223/2005/A	18 <sup>th</sup> Nov, 2008	N/A	Issued
Construction Noise Permit	N/A	N/A	N/A	N/A
Effluent Discharge License	3678	14 <sup>th</sup> Mar, 2008	31 <sup>st</sup> Mar, 2013	Issued
Registration as a Chemical Waste Producer	5213-724-C3251-03	19 <sup>th</sup> Dec, 2007	Not applicable	Issued
Billing Account for Disposal of Construction Waste	7006101	N/A	N/A	N/A

## **9.0 Future key issues**

As informed by contractor, major construction activities in the upcoming month will include finishing works to the footbridges, construction of retaining walls and gabion walls. Then, removal of noise barriers and evacuation works will be conducted for the wet season. The construction activities for these items will generate several environmental impacts. These include air, noise, water and waste management.

Construction activities such as backfilling, earth movement and boulder breaking may generate dust impact to the vicinity of sensitive receivers. Contractor is advised to provide sufficient water spraying for the dusty static area. Stockpiling may be found on site and those should be covered with tarpaulin sheets to prevent erosion.

Sufficient site water treatment facilities should be provided for muddy water, runoff and any waste water arising from construction activities.

Heavy plants and vehicles may be deployed and those would generate certain noise impacts to the sensitive receivers. Noisy activities should be well planned and scheduled to avoid parallel operation of multiple plants, so as to minimize noise impacts to the nearby sensitive receivers.

Construction activities may generate wastes on site. Contractor is advised to assign a site area for temporary waste storage and segregation. Wastes accumulation should be prevented on site; licensed waste collection and disposal should be implemented regularly for hygiene issues.



## 10.0 Conclusion

Major site activities carried out by the Contractor in this reporting period included haul access formation, construction of footbridges, retaining walls and gabion walls.

Regular site meetings and inspection audits led by the seniors for discussing environmental issues were held among project proponent, Contractor and the ET on weekly basis.

Environmental Team had carried out construction noise monitoring on weekly basis. Exceedance of limit level was recorded during the construction noise monitoring on 5<sup>th</sup> March 2010. Such result was concluded to be caused by construction activity by the other project and therefore no further follow up action was required.

Piling works were not scheduled for this month. Therefore, no vibration monitoring was conducted during the reporting month.

From the summary of ecological site inspection findings and implementation status of environmental protection and mitigation for ecology, prepared by the Ecologist Dr. Mark Shea, there is no abnormal finding observed in the reporting month. The ecologist has no further advice and no action suggested to the contractor.

There was no non-compliance recorded for the reporting month.

A formal complaint regarding muddy effluent discharge from site was recorded on 12<sup>th</sup> March 2010. The complaint was logged and detailed complaint log as well as investigation report please refer to Appendix J

ET has reminded the contractor to provide environmental pollution control measures wherever necessary; and to keep a good environmental management at site practice.

The ET will continue to implement the environmental monitoring & audit programme in accordance with the EM&A Manual and Environmental Permit requirement.

## **Appendix A: Event and action plan for ecology**

**Event and action plan for ecology**

In the event of non-compliance, the Event / Action plan prepared by the ecologist shall be followed. Detailed Event/ Action plan was shown in **Appendix Table 1** for reference.

It is not proposed to set population size of the three species (i.e. Three-lined Chinese Stream Catfish, Predaceous and the Hong Kong Newt) or other faunal species for the Action Level and Limit Level in the revised EM&A manual in considering the following reasons:

- I. The schedule capture surveys would let to decrease in the populations of the target species; and
- II. The planned drainage works would also temporally de-fauna the stream habitat.

It is considered logical and appropriate to audit non-compliance events in relation with ecological mitigation measures, which were specified in the EP and the PS of the project.

**APPENDIX TABLE 1** Event / Action plan table for Ecology

Event	Action			
	ET	ER	IEC	Contractor
<b>Non-conformity on one occasion</b>	1. Identify Source 2. Inform the IEC and the ER 3. Discuss remedial actions with the IEC, the ER and the Contractor 4. Monitor remedial actions until rectification has been completed	1. Check report 2. Check the Contractor's working method 3. Discuss with the ET and the Contractor on possible remedial measures, 4. Advise the Contractor on effectiveness of proposed remedial measures 5. Check implementation of remedial measures	1. Ensure Remedial measures are properly implemented	1. Amend working methods 2. Rectify damage and undertake any necessary replacement
<b>Repeated Non conformity</b>	1. Identify Source 2. Inform the IEC and the ER 3. Increase monitoring frequency 4. Discuss remedial actions with the IEC, the ER and the Contractor 5. Monitor remedial actions until rectification has been completed 6. If exceedance stops, cease additional monitoring	1. Check monitoring report 2. Check the Contractor's working method 3. Discuss with the ET and the Contractor on possible remedial measures 4. Advise the Contractor on effectiveness of proposed remedial measures 5. Check implementation of remedial measures	1. Ensure Remedial measures are properly implemented	1. Amend working methods 2. Rectify damage and undertake any necessary replacement

**Appendix B: Action and limit level for construction noise**

The Action and Limit levels for construction noise are defined in **Appendix Table 2**

**Appendix Table 2:** Action and Limit Levels for Construction Noise

Time Period	Action	Limit
0700 – 1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A)*
0700 – 2300hrs on holidays; and 1900 – 2300 hrs on all other days		Subject to the control of Noise Control Ordinance
2300 – 0700 hrs of next day		Subject to the control of Noise Control Ordinance

\*Limit level set in accordance with Particular Specification Section 26

## **Appendix C: Reference standards for vibration**

Guidance regarding vibration limits is provided by the following British Standards (or their equivalent ISO standards):

BS 7385 - Measurement and evaluation of vibration in buildings. Part 2: Guide to damage levels from ground borne vibration.

BS 7385 suggests vibration levels, below which damage is unlikely to occur in 95% of buildings. For cosmetic damage, the level is 15 mm/s at 4 Hz, increasing to 20 mm/s at 15 Hz, increasing to 50 mm/s at 40 Hz and above. Minor structural damage is possible at vibration levels twice those given above, major damage at four times the levels given.

**Appendix Table 3:** Transient vibration guide values for cosmetic building damage (BS7385:Part 2 1993)

	Type of Building	Peak component particle velocity (mm/s) in frequency range of predominant pulse
1	Reinforced or framed structures	50 at 4 Hz and above
2	Un-reinforced or light framed structures	15 at 4 Hz, increasing to 20 at 15 Hz, increasing to 50 at 40 Hz and above.

The vibration magnitudes and frequencies refer to Peak Particle Velocities (PPV) occurring in any single direction, measured on the ground level of the building concerned.



**Appendix D: Noise monitoring results, graphical plots and location plan**

Location	L <sub>90</sub> 30min	L <sub>10</sub> 30min	Leq 30min	Date	Time Duration	Major Construction Noise	Other Noise source	Weather	Location description
UTP 1	56.1	68.8	65.6	5-Mar-10	10:22-10:52	The measured noise level was dominated by the background noise in the immediate vicinity of the monitoring location due to its large distance from the construction activities	Background noise from traffic	Sunny	Façade
UTP 2	43.8	63.7	61.3	5-Mar-10	10:58-11:28	The measured noise level was dominated by the background noise in the immediate vicinity of the monitoring location due to its large distance from the construction activities	Background noise from traffic	Sunny	Façade
UTP 3	45.7	61.4	58.0	5-Mar-10	15:43-16:13	Boulder breaking	N/A	Sunny	Façade
UTP 4	53.5	83.8	78.8	5-Mar-10	15:09-15:39	Boulder breaking	Exceedance was mainly caused by concrete breaking activities from Highways Department	Sunny	Façade
UTP 5	52.2	74.0	68.8	5-Mar-10	14:37-15:07	Boulder breaking and excavation works	N/A	Sunny	Façade
UTP 6	50.8	69.4	65.2	5-Mar-10	14:05-14:35	Boulder breaking and excavation works	N/A	Sunny	Façade
UTP 7	46.8	54.3	52.9	5-Mar-10	13:31-14:01	Boulder breaking	N/A	Sunny	Façade
UTP 8	46.5	56.7	53.4	5-Mar-10	13:00-13:30	Boulder breaking	N/A	Sunny	Façade
UTP 9	41.6	55.3	54.7	5-Mar-10	10:00-10:30	Operation of backhoe	N/A	Sunny	Façade
UTP 10	41.7	50.5	50.4	5-Mar-10	09:24-09:54	Operation of backhoe	N/A	Sunny	Façade
UTP 11	43.8	54.2	54.4	5-Mar-10	08:51-09:21	The measured noise level was dominated by the background noise in the immediate vicinity of the monitoring location due to its large distance from the construction activities	N/A	Sunny	*Freefield

Note\* An Additional of 3dB(A) had been added to the measurement result due to Free Field Correction

Location	L <sub>90</sub> 30min	L <sub>10</sub> 30min	Leq 30min	Date	Time Duration	Major Construction Noise	Other Noise source	Weather	Location description
UTP 1	N/A	N/A	N/A	12-Mar-10	N/A	Measurement was cancelled due to the adverse rainy weather	N/A	Rainy	Façade
UTP 2	56.1	63.6	61.2	12-Mar-10	13:00-13:30	Boulder breaking	Background noise from traffic	Cloudy	Façade
UTP 3	N/A	N/A	N/A	12-Mar-10	N/A	Measurement was cancelled due to the adverse rainy weather	N/A	Rainy	Façade
UTP 4	N/A	N/A	N/A	12-Mar-10	N/A	Measurement was cancelled due to the adverse rainy weather	N/A	Rainy	Façade
UTP 5	45.1	52.9	50.9	12-Mar-10	11:30-12:00	Operation of backhoe	N/A	Cloudy	Façade
UTP 6	45.7	60.2	56.3	12-Mar-10	10:58-11:28	Operation of backhoe	N/A	Cloudy	Façade
UTP 7	45.7	54.4	53.1	12-Mar-10	10:26-10:56	Operation of backhoe	N/A	Cloudy	Façade
UTP 8	48.3	60.9	57.1	12-Mar-10	09:55-10:25	Boulder breaking	N/A	Cloudy	Façade
UTP 9	N/A	N/A	N/A	12-Mar-10	N/A	Measurement was cancelled due to the adverse rainy weather	N/A	Rainy	Façade
UTP 10	N/A	N/A	N/A	12-Mar-10	N/A	Measurement was cancelled due to the adverse rainy weather	N/A	Rainy	Façade
UTP 11	N/A	N/A	N/A	12-Mar-10	N/A	Measurement was cancelled due to the adverse rainy weather	N/A	Rainy	*Freefield

Note\* An Additional of 3dB(A) had been added to the measurement result due to Free Field Correction

Location	L <sub>90</sub> 30min	L <sub>10</sub> 30min	Leq 30min	Date	Time Duration	Major Construction Noise	Other Noise source	Weather	Location description
UTP 1	45.7	66.4	63.1	19-Mar-10	10:54-11:24	The measured noise level was dominated by the background noise in the immediate vicinity of the monitoring location due to its large distance from the construction activities	N/A	Cloudy	Façade
UTP 2	45.8	64.2	60.4	19-Mar-10	11:28-11:58	Boulder breaking	Background noise from traffic	Cloudy	Façade
UTP 3	41.7	53.8	53.4	19-Mar-10	15:42-16:12	The measured noise level was dominated by the background noise in the immediate vicinity of the monitoring location due to its large distance from the construction activities	N/A	Cloudy	Façade
UTP 4	43.7	55.2	53.6	19-Mar-10	16:14-16:44	Boulder breaking	N/A	Cloudy	Façade
UTP 5	47.3	67.6	63.9	19-Mar-10	15:08-15:38	Boulder breaking	N/A	Cloudy	Façade
UTP 6	44.7	57.6	58.2	19-Mar-10	14:05-14:35	Boulder breaking	N/A	Cloudy	Façade
UTP 7	44.9	57.2	54.8	19-Mar-10	13:32-14:02	Boulder breaking	N/A	Cloudy	Façade
UTP 8	47.2	56.7	54.4	19-Mar-10	13:00-13:30	Boulder breaking	N/A	Cloudy	Façade
UTP 9	46.3	58.0	57.3	19-Mar-10	09:56-10:26	The measured noise level was dominated by the background noise in the immediate vicinity of the monitoring location due to its large distance from the construction activities	N/A	Cloudy	Façade
UTP 10	41.7	54.5	54.3	19-Mar-10	09:18-09:48	The measured noise level was dominated by the background noise in the immediate vicinity of the monitoring location due to its large distance from the construction activities	N/A	Cloudy	Façade
UTP 11	47.4	56.1	56.1	19-Mar-10	08:45-09:15	The measured noise level was dominated by the background noise in the immediate vicinity of the monitoring location due to its large distance from the construction activities	N/A	Cloudy	*Freefield

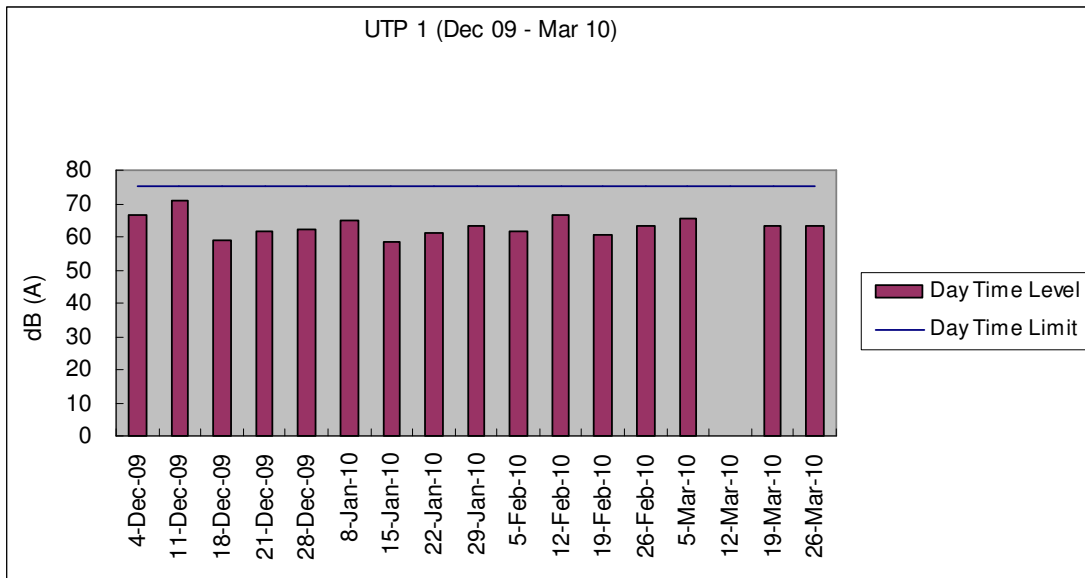
Note\* An Additional of 3dB(A) had been added to the measurement result due to Free Field Correction

Location	L <sub>90</sub> 30min	L <sub>10</sub> 30min	Leq 30min	Date	Time Duration	Major Construction Noise	Other Noise source	Weather	Location description
UTP 1	45.9	66.8	63.5	26-Mar-10	10:51-11:21	Boulder breaking	Background noise from traffic	Sunny	Façade
UTP 2	43.4	61.2	60.4	26-Mar-10	10:14-10:44	Boulder breaking	Background noise from traffic	Sunny	Façade
UTP 3	53.6	78.9	73.8	26-Mar-10	15:45-16:15	Boulder breaking	N/A	Sunny	Façade
UTP 4	51.4	60.7	58.5	26-Mar-10	14:37-15:07	Boulder breaking	N/A	Sunny	Façade
UTP 5	45.1	74.8	74.2	26-Mar-10	11:24-11:54	Boulder breaking and excavation works	N/A	Sunny	Façade
UTP 6	47.8	62.2	58.5	26-Mar-10	14:05-14:35	Boulder breaking and excavation works	N/A	Sunny	Façade
UTP 7	47.6	58.4	55.7	26-Mar-10	15:09-15:39	Boulder breaking	N/A	Sunny	Façade
UTP 8	43.4	58.4	54.3	26-Mar-10	13:33-14:03	Boulder breaking	N/A	Sunny	Façade
UTP 9	41.6	55.3	54.6	26-Mar-10	13:00-13:30	Operation of backhoe	N/A	Sunny	Façade
UTP 10	41.4	52.9	52.7	26-Mar-10	09:23-09:53	Operation of backhoe	N/A	Sunny	Façade
UTP 11	45.0	54.5	54.7	26-Mar-10	08:45-09:15	The measured noise level was dominated by the background noise in the immediate vicinity of the monitoring location due to its large distance from the construction activities	N/A	Sunny	*Freefield

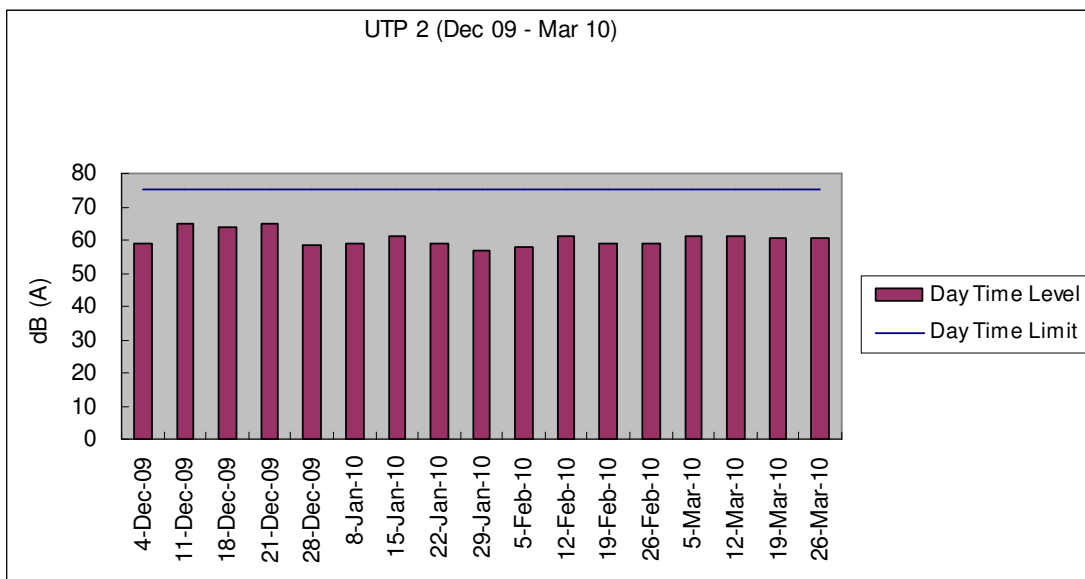
Note\* An Additional of 3dB(A) had been added to the measurement result due to Free Field Correction

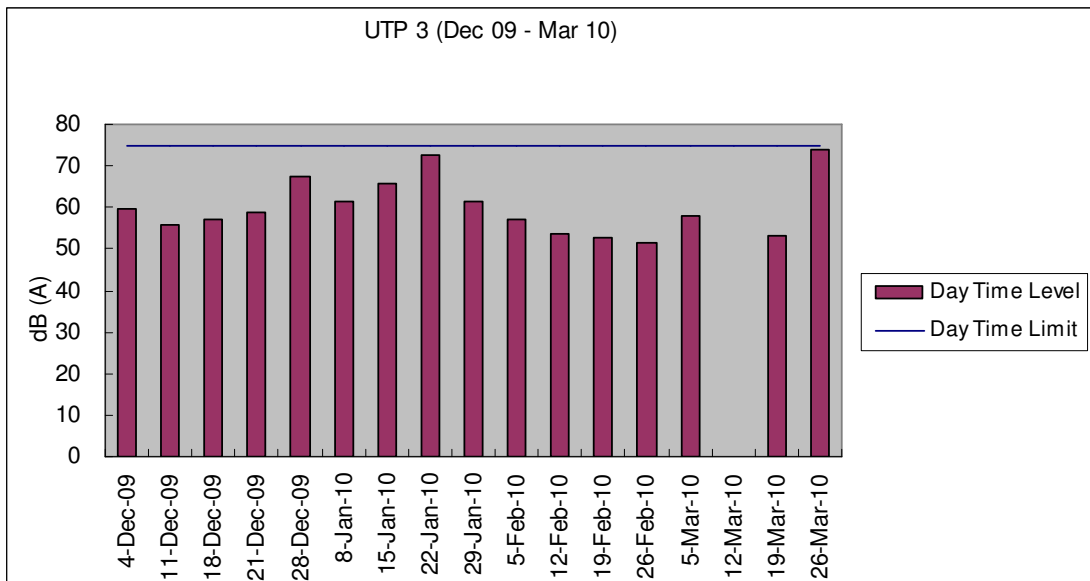
**Graphical plot for noise measurements**

The followings were the graphical plots for the 11 monitoring locations. Each plot showed the date of measurement taken, day time limit of 75 dB(A) as well as the measured daytime level for each location. The graphs contain the data recorded from December 2009 to March 2010.

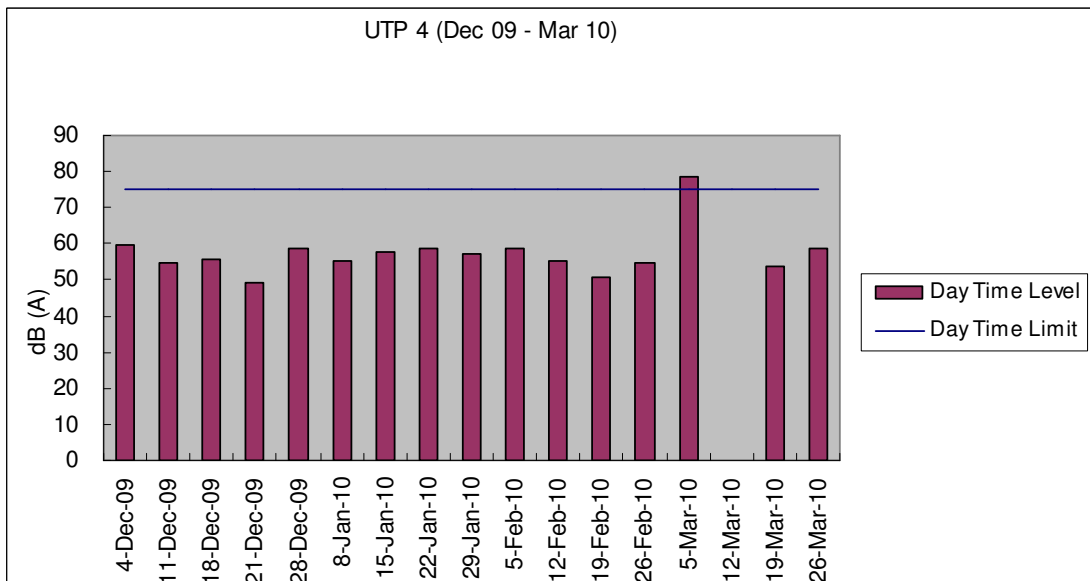


Noise monitoring for 12<sup>th</sup> March 2010 was cancelled due to heavy rain

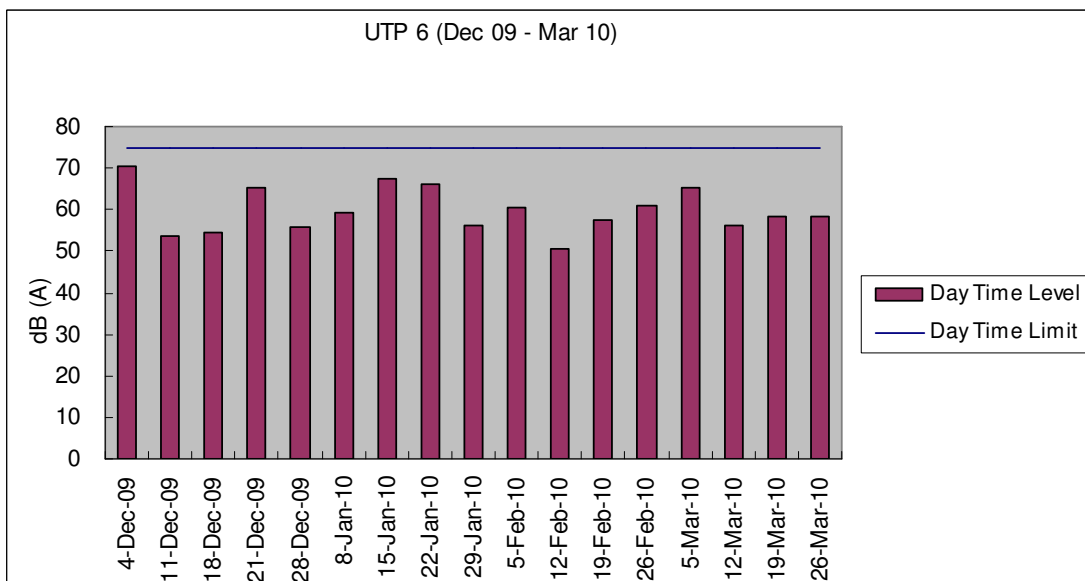
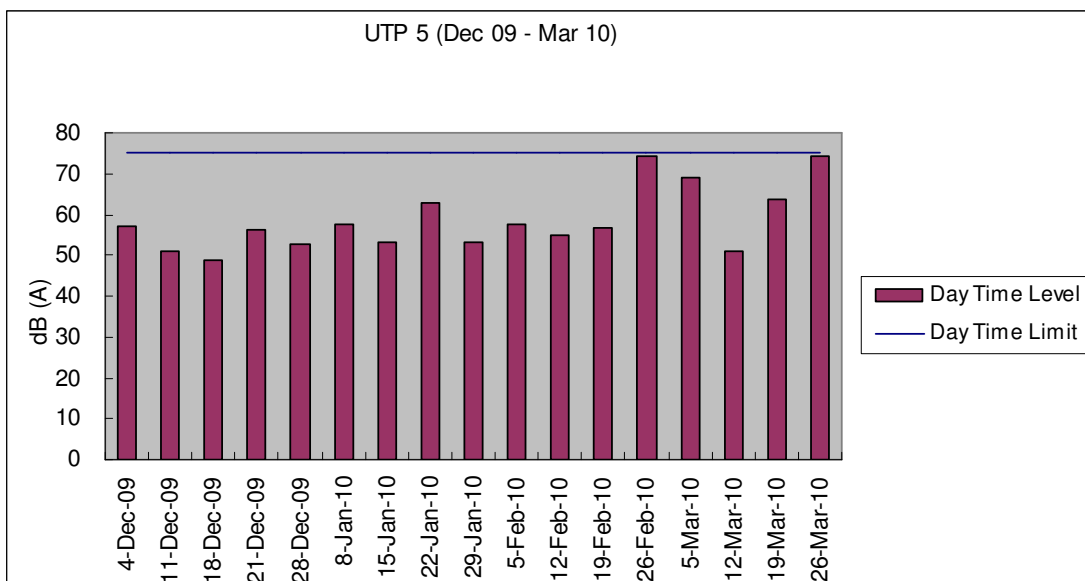




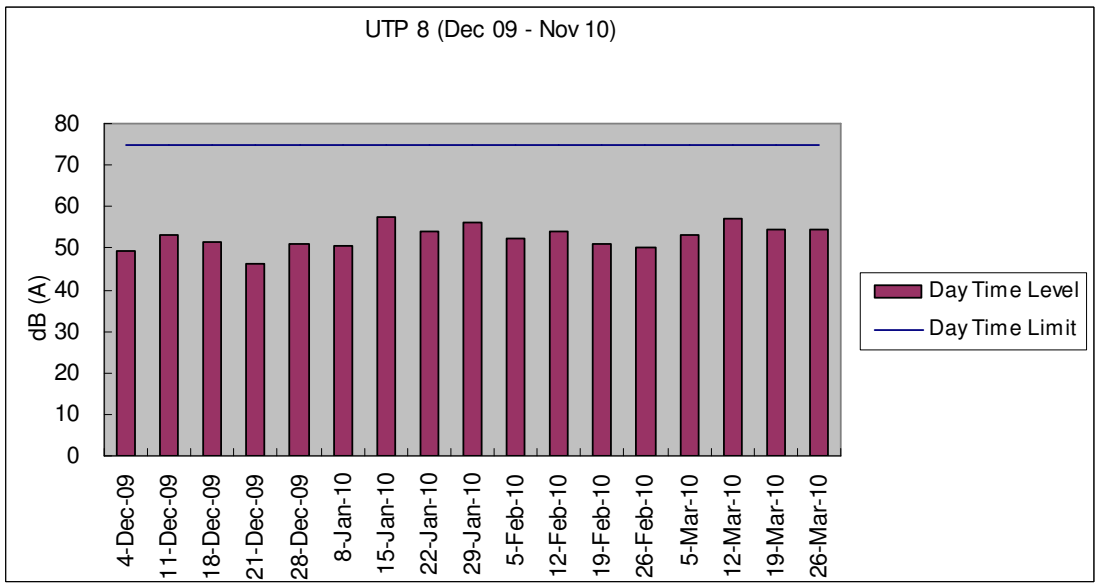
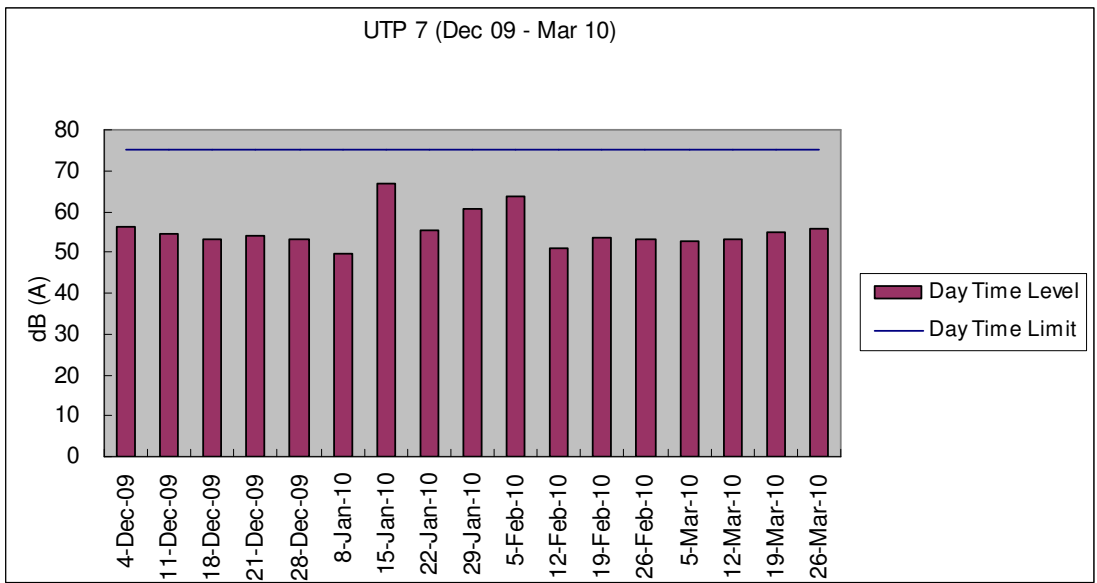
Noise monitoring for 12<sup>th</sup> March 2010 was cancelled due to heavy rain

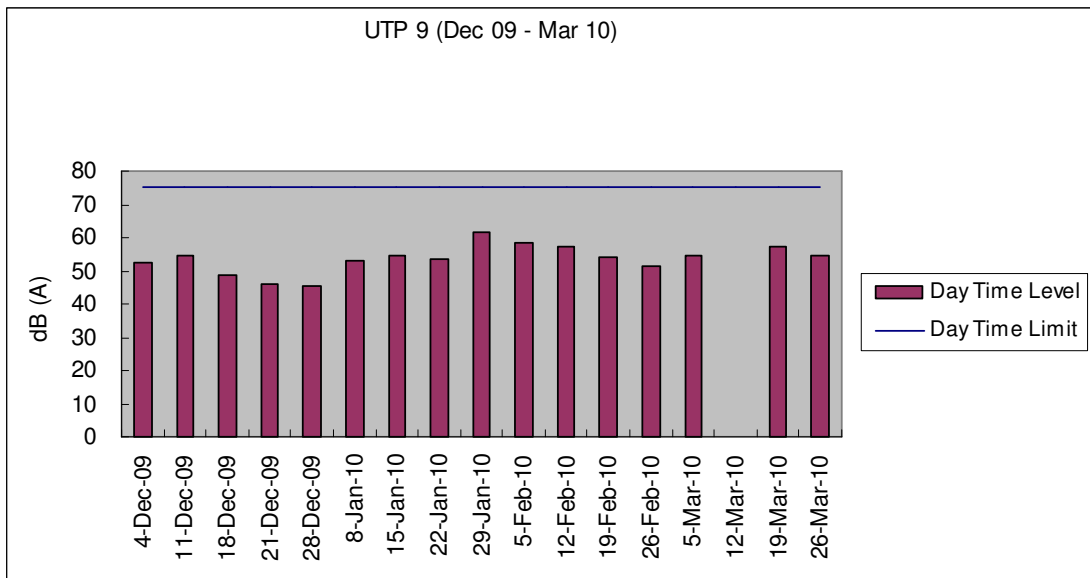


Noise monitoring for 12<sup>th</sup> March 2010 was cancelled due to heavy rain

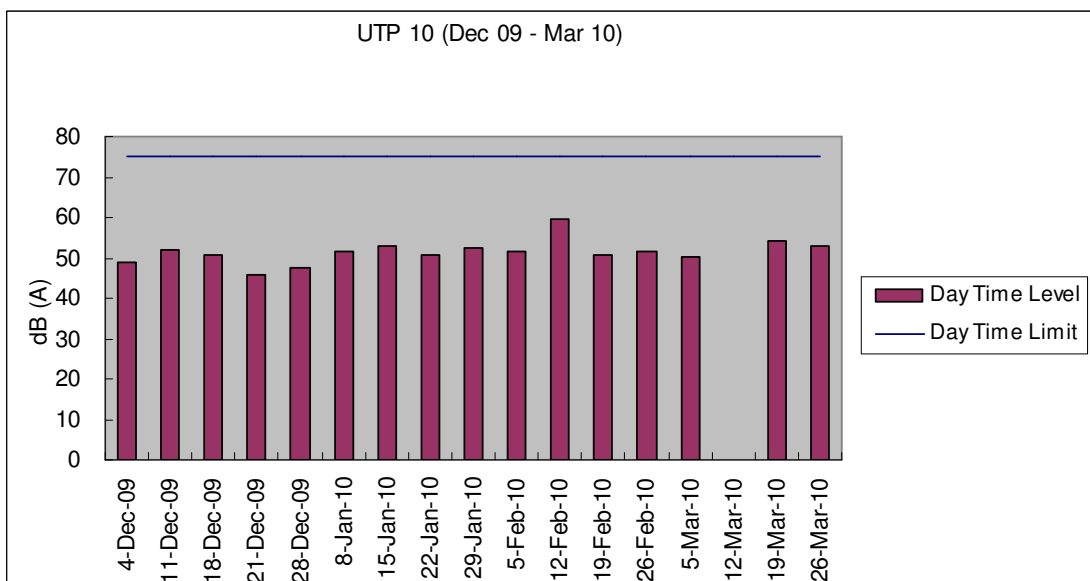




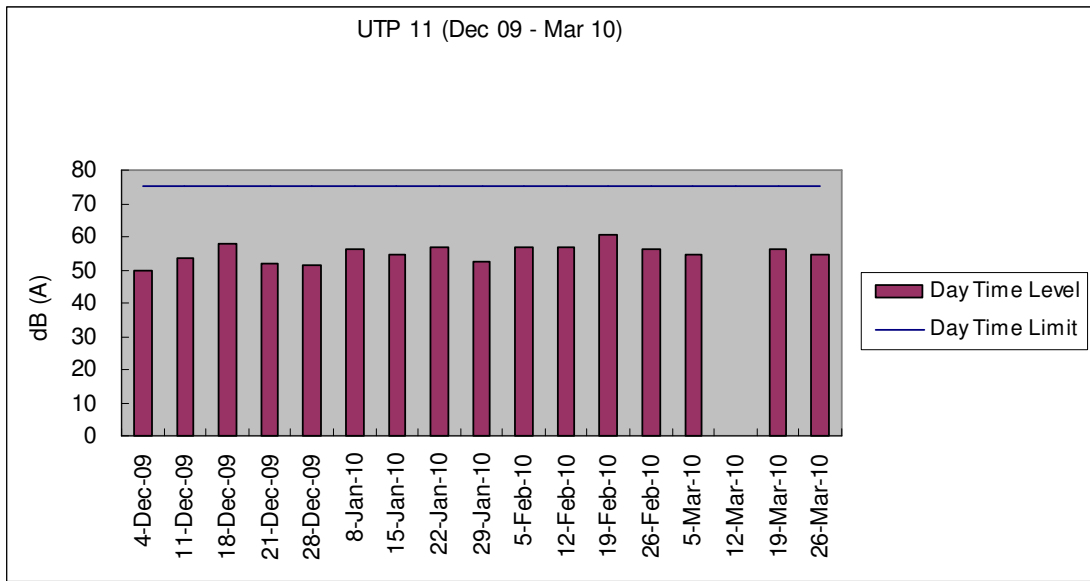




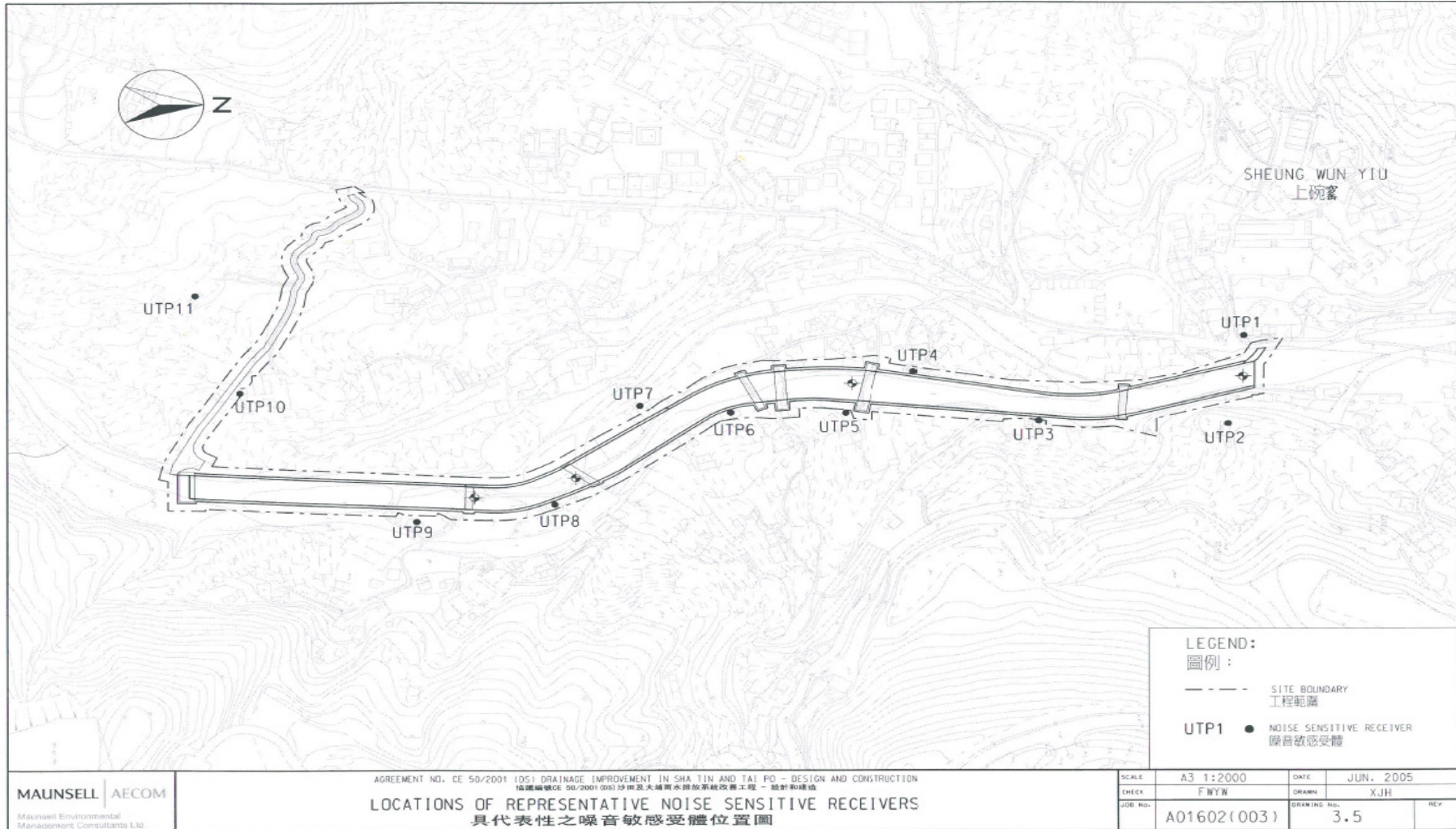
Noise monitoring for 12<sup>th</sup> March 2010 was cancelled due to heavy rain



Noise monitoring for 12<sup>th</sup> March 2010 was cancelled due to heavy rain



Noise monitoring for 12<sup>th</sup> March 2010 was cancelled due to heavy rain



**Appendix E: Monitoring schedule for the present and next reporting period**

**Master Schedule of EM&A works in March 2010**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	01/03	02/03	03/03	04/03	05/03	06/03
			Site inspection at afternoon		Noise monitoring	
07/03	08/03	09/03	10/03	11/03	12/03	13/03
			Site inspection at afternoon		*Noise monitoring	
14/03	15/03	16/03	17/03	18/03	19/03	20/03
			Site inspection at afternoon		Noise monitoring	
21/03	22/03	23/03	24/03	25/03	26/03	27/03
			Site inspection and SSEMC at morning		Noise monitoring	
28/03	29/03	30/03	31/03			
			Site inspection at afternoon			

Remark\*: Measurement for monitoring station UTP 1, 3, 4, 9, 10 and 11 was cancelled due to heavy rain.

**Master Schedule of EM&A works in April 2010**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				01/04	02/04	03/04
			Site inspection at afternoon	Noise monitoring		
04/04	05/04	06/04	07/04	08/04	09/04	10/04
			Site inspection at afternoon		Noise monitoring	
11/04	12/04	13/04	14/04	15/04	16/04	17/04
			Site inspection at afternoon		Noise monitoring	
18/04	19/04	20/04	21/04	22/04	23/04	24/04
			Site inspection and SSEMC at morning		Noise monitoring	
25/04	26/04	27/04	28/04	29/04	30/04	
			Site inspection at afternoon		Noise monitoring	

**Appendix F: Cumulative complaint log**

<b>Environmental Parameters</b>	<b>Cumulative no. Brought forward</b>	<b>No. of complaint March 2010</b>	<b>Overall Total</b>
Air/Dust	1	0	1
Noise	2	0	2
Water	2	1	3
House Keeping Hygiene	0	0	0
Chemical waste	0	0	0
<b>Total</b>	<b>5</b>	<b>1</b>	<b>6</b>

\* ET received a public enquiry referred by EPD, regarding river water quality and loss of vegetation within construction site, on 3<sup>rd</sup> July 2009.



**Appendix G: Implementation status of environmental protection and mitigation measures**

Implementation status of environmental protection and mitigation

Environmental Aspect	Protection / Mitigation Measures	Implementation status	Follow-up action
Construction Noise	No percussive piling shall be carried out	Implemented	Not required
	-Use well maintained construction plant	Implemented	Not required
	-Shut down plants between work periods	Implemented	Not required
	-Install silencers on construction equipment	Implemented	Not required
	-Locate mobile plant far away from NSRs	Implemented	Not required
	-Quiet plants should be used	Implemented	Not required
	-2m high temporary noise barriers, as stipulated in EP condition 2.9, shall be installed	Implemented	Not required
Fugitive Dust Emission	-Implement regular watering and vehicle washing facilities	Improvement required	Rectified
	-Cover excavated or stockpile of dusty material by impervious sheeting or sprayed with water	Improvement required	Ongoing
	-Use tarpaulin to cover dusty materials on vehicles	Implemented	Not required
Water Quality	Excavation works within the Tai Po River within the Project shall be carried out in stages and excavation area for each stage shall be limited to section of half width of the channel and less than 100m long at any one time in order to maintain water flow within the river during construction stage	Implemented	Not required
	Land-based plant shall be employed and site run-off shall be directed towards regularly cleaned and maintained silt traps and oil / grease separators to minimize leakage and loss of sediments during excavation	Implemented	Not required
	Large boulders removed from the Tai Po River within the Project during excavation shall be re-instated upon completion of works A section of 150m long natural riverbank on the western side of the river channel (Ch0 –Ch150) shall be retained	Implemented	Not required
	The excavation area shall be enclosed with bunds or barriers and dewatered prior to excavation to minimize the impacts upon the downstream of the Tai Po River	Implemented	Not required

	Provide silt trap and oil interceptor to remove the oil, lubricants, grease, silt, grit and debris from the wastewater before pumped to the public storm water drainage system	Improvement required	Rectified
	Provide site toilet facilities	Implemented	Not required
Waste Management	Reuse excavated material as far as possible	Implemented	Not required
	Recycle scrap metals or abandoned equipment	Implemented	Not required
	Adopt a trip ticket system for the disposal of C&D materials	Implemented	Not required
	All general refuse should be segregated and stored in enclosed bins or compaction units	Implemented	Not required
Vibration	Percussive piling is to be replaced by bore-hole piling to minimize vibration impacts to the two identified Declared monuments	Not applicable at this stage	Not required
	Carrying out of vibration monitoring to ensure that vibration associated with the construction phase do not exceed the threshold limit otherwise contractor have to review the work method and construction activities have to be slow down or rescheduled to reduce the impacts	Not applicable at this stage	Not required
	Close monitoring and measurement on the cracks of the external wall of Fan Sin Temple during construction works will be carried out. Any changes on the cracks will be recorded for the contractor to slow down the construction activities accordingly; and to review the work methods and equipments immediately	Not Applicable at this stage	Not required

Implementation status of environmental protection and mitigation for ecology,  
prepared by the Ecologist, Dr. Mark Shea.

Environmental Aspect	Protection / Mitigation Measures	Implementation status	Follow-up action
Ecology	Large boulders will be returned to the riverbed following the excavation works.	Not applicable	Not required
	Construction works from Ch. 0.0m – Ch. 150m would be along one side of the river only	Not applicable	Not required
	Approximately 150m of the existing natural riverbank on the western side of the river would be retained.	Implemented	Not required
	Excavation works within the river channel should be restricted to an enclosed dewater section of the river, and would be limited to sections 50-100m long at any one time.	Implemented	Not required
	Flows to the area downstream shall be maintained at all times during the construction phase	Implemented	Not required
	Capture survey shall be conducted within the Tai Po River before commencement of works. The captured target species shall be relocated to areas of the watercourse upstream of the watercourse upstream of the Tai Po River	Capture surveys had been conducted at the beginning of the Contract, during the wet season July/August 2008, 4 <sup>th</sup> November 2008 and 27 <sup>th</sup> , 28 <sup>th</sup> October 2009	Not required
	Temporary noise barriers should be constructed to control noise impacts to habitats and associated wildlife within and adjacent to the proposed works area	Implemented	Not required
	Excavation works shall be carried out by land based plant within enclosed dry section of river channel.	Implemented	Not required
	Compensatory planting of trees and other vegetation along the banks of the newly improved drainage channel should be provided to compensate for the loss of riparian vegetation.	Not applicable	Not required
Operation phase activities in the improved drainage channel would be limited to periodic channel maintenance such as de-silting.	Not applicable	Not required	

**Appendix H: Cumulative waste flow table**Cumulative waste flow table since 15<sup>th</sup> September 2008

Type of waste	Inert Waste	Non-Inert Waste	Chemical Waste
September 2008	0	0	0
October 2008	0	2 tonnes	0
November 2008	36m <sup>3</sup>	0	0
December 2008	0	0	0
January 2009	0	0	0
February 2009	0	0	0
March 2009	0	0	0
April 2009	0	0	0
May 2009	0	0	20kg*
June 2009	0	0	0
July 2009	0	0	0
August 2009	0	0	0
September 2009	0	0	0
October 2009	0.9m <sup>3</sup>	0	0
November 2009	0	0	0
December 2009	0	0	0
January 2010	0	0	0
February 2010	0	0	0
March 2010	0	0	0
Total	36.9m <sup>3</sup>	2 tonnes	20kg

Remark\*: Chemical wastes generated from the project sites including Upper Tai Po River, Lam Tsuen River and She Shan River were centralized for disposal.

## **Appendix I: Construction programme**







**Appendix J: Complaint Investigation Report and Log**



大成環境科技拓展有限公司  
Environmental Pioneers & Solutions Limited

Our ref. no.: DC0706-CL-100312(EPD)

By Fax and Email  
18 March 2010

To: Distribution List

Dear Sirs or Madams,

**Contract No. DC/2007/06**

**Drainage Improvement works in Upper Tai Po River, Lam Tsuen River and She Shan River**

**Complaint Investigation Report and Log**

Based on the complaint incident received from EPD with details of:

EPD complaint ref.: EP3/N05//RN/00004775-10  
Date received: 12 March 2010  
Incident location: Upper Tai Po River nearby Sheung Wun Yiu  
Description: Observation of muddy water

Enclosed please find the complaint investigation reports and log sheets of the incident concerning contamination of the river water for your record.

Yours faithfully,

Patricia Chung  
ET leader

Environmental Pioneers and Solutions Limited

c.c. SRE/Maunsell (Mr. KY Chan)  
RE/Maunsell (Mr. Adrian Ng)  
IEC/ERM (Mr. Marcus Ip)  
Chiu Hing Project Manager (Mr. Samson Lam)  
Chiu Hing Site Agent (Mr. Daniel Tai)  
Chiu Hing Environmental Officer (Mr. Chester Lam)

8/F., Chai Wan Industrial Centre Building, 20 Lee Chung Street, Chai Wan, HK 香港柴灣利眾街20號柴灣中心工業大廈8樓  
Tel: (852) 2889 0569 Fax: (852) 2856 2010 Website: <http://www.epsl.com.hk>

COMPLAINT / CONCERN LOG

Ref: DC0706-CL-100312(EPPD)

Log Ref	Event Date/Location	Complainant/Date of Contact	Details of Complaint	Investigation/Mitigation Action	File Closed
<p>Our Ref: DC0706-CL-100312 (EPPD)</p> <p>EPPD complaint Ref: EP3/N05//RN/00004775-10</p>	<p>12<sup>th</sup> March 2010, A complaint was recorded for the observation of muddy water at the section of Upper Tai Po River nearby Sheung Wun Yiu</p>	<p>A complaint received via EPPD on 12<sup>th</sup> March 2010</p>	<p>Complaint on Muddy water arisen by drainage improvement works of the project at Upper Tai Po River (UTPR)</p>	<p>1) A complaint on 12 March 2010 was recorded that muddy water was found in the section of UTPR nearby Sheung Wun Yiu. ET was informed by Engineer Representative (ER) on the same day.</p> <p>2) As per the EM&amp;A Manual section 9.3, ET arranged a site investigation with the representatives from the Contractor, on 12 March 2010 to resolve the above complaint.</p> <p>3) During the investigation, generation of muddy water was ceased and source was not observed. Generally, river water was observed to be clear.</p> <p>4) Geo-textile coverings for the earth/rock bunds were found drifted, and some of the riverbanks were exposed without geo-textile coverings during the investigation. As such, contractor was advised to rectify such discrepancies immediately to minimize soil erosion and surface run-off from the project site.</p> <p>5) To further trace the source and investigate implementation of improvement works, ET conducted another site investigation on 17 March 2010 with the representatives from Independent Environmental Checker (IEC), ER and Contractor.</p> <p>6) Defective site practices, causing direct site water</p>	<p>Yes</p>

				<p>discharge and runoff, were not found during investigation on 17 March 2010. As follow up actions, improvements were made for the site water diversion channel at ch.0 to 50, also application of de-silting tank was observed for the construction activities at the boulder trap site.</p> <p>7) A follow up meeting was held at site with participation of the ET, representatives from IEC, ER and Contractor after the second investigation of the same day.</p> <p>8) As reported by the Contractor, collapse of earth bunds within river channel and haul access at approximately ch.50 of the project site was the major cause of water pollution found at the morning on 12 March 2010. This caused erosion from the gabion structure and site water seepage to the river channel. Immediate follow up action was taken once found and deterioration of water quality was ceased during ET's investigation at the afternoon on 12 March 2010.</p> <p>9) The following suggestions were recommended to the contractor:</p> <ul style="list-style-type: none"> <li>- Containment measures such as bund wall and barriers should be implemented within the existing river channel and excavated area (or haul access) to prevent site water runoff.</li> <li>- The contractor shall always check the performance of bunds and barriers in order to ensure no muddy water was discharged to the</li> </ul>	
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				<ul style="list-style-type: none"> <li>- river by site works.</li> <li>- Site water and/or muddy water pumped out from excavation should be diverted into proper silt removal facilities before discharging into the river channel and/or storm water drains.</li> <li>- Contractor should regularly provide training/ toolbox talk on environmental topics, especially about the river water quality to their site staffs and sub-contractor.</li> <li>- Contractor should keep good site practice on regularly checking the environmental performance on sites, especially paying serious attention on any sudden changes of river water quality.</li> <li>- Contractor is reminded again to take serious notice on the complaint and always keep good environmental management at site.</li> </ul>	
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Filed by Environmental Team Leader:



Date: 16<sup>th</sup> March 2010

**DSD Project – River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper Tai Po River**

**Report for Complaint/ Concern**

**Ref: DC0706-CL-100312(EPD)**

**EPD Complaint Ref: EP3/N05//RN/00004775-10**

**Sheet: 1 of 6**

**RECIPIENT**

Name: Chiu Hing Construction & Transportation Co., Ltd,

Details: EPD formally informed Drainage Services Department on 12<sup>th</sup> March 2010 regarding a complaint on Muddy water arisen by drainage improvement works at Upper Tai Po River (UTPR) nearby Sheung Wun Yiu.

Received Date: 12<sup>th</sup> March 2010

Received Time: \_\_\_\_\_

**COMPLAINANT / Concern**

Name: N/A

Tel: N/A

Address: N/A

**COMPLAINT**

Noise   Air quality/Dust   Water   Odour   Environment   Traffic/Pedestrian  
Safety   Others

Event Date and Time: 12 March 2010

Location: Section of UTPR nearby Sheung Wun Yiu

**INVESTIGATION RESULTS & MITIGATION MEASURES**

1. A complaint on 12 March 2010 was recorded that muddy water was found in the section of UTPR nearby Sheung Wun Yiu. ET was informed by Engineer Representative (ER) on the same day.
2. As per the EM&A Manual section 9.3, ET arranged a site investigation with the representatives from Contractor, on 12 March 2010 to resolve the above complaint.
3. During the investigation, generation of muddy water was ceased and source was not observed. Generally, river water was observed to be clear (Fig.3.1 to 3.4).
4. Geo-textile coverings for the earth/rock bunds were found drifted, and some of the riverbanks were exposed without geo-textile coverings during the investigation (Fig.4.1 & 4.2). As such, contractor was advised to rectify such discrepancies immediately to minimize soil erosion and surface run-off from the project site.
5. To further trace the source and investigate implementation of improvement works, ET conducted another site investigation on 17 March 2010 with the representatives from Independent Environmental Checker (IEC), ER and Contractor.
6. Defective site practices, causing direct site water discharge and runoff, were not found during investigation on 17 March 2010. As follow up actions, improvements were made for the site water diversion channel at ch.0 to 50 (Fig.6.1), also application of de-silting tank was observed for the construction activities at the boulder trap site (Fig.6.2).
7. A follow up meeting was held at site with participation of the ET, representatives from IEC, ER and Contractor after the second investigation of the same day.

8. As reported by the Contractor, collapse of earth bunds within river channel and haul access at approximately ch.50 of the project site was the major cause of water pollution found at the morning on 12 March 2010. This caused erosion from the gabion structure and site water seepage to the river channel. Immediate follow up action was taken once found and deterioration of water quality was ceased during ET's investigation at the afternoon on 12 March 2010.
9. ET has reminded the Contractor again to be cautious on not arising muddy water in the future construction works along the river.

### **RECOMMENDATIONS**

1. Containment measures such as bund wall and barriers should be implemented within the existing river channel and excavated area (or haul access) to prevent site water runoff.
2. The contractor shall always check the performance of bunds and barriers in order to ensure no muddy water was discharged to the river by site works.
3. Site water and/or muddy water pumped out from excavation should be diverted into proper silt removal facilities before discharging into the river channel and/or storm water drains.
4. Contractor should regularly provide training/ toolbox talk on environmental topics, especially about the river water quality to their site staffs and sub-contractor.
5. Contractor should keep good site practice on regularly checking the environmental performance on sites, especially paying serious attention on any sudden changes of river water quality.
6. Contractor is reminded again to take serious notice on the complaint and always keep good environmental management at site.

Signed:



Date: 18-03-2010

Fig.3.1 – River water at ch.50, at the afternoon on 12 March



Fig.3.2 – River water at ch.500, at the afternoon on 12 March



Fig.3.3 – River water at ch.600, at the afternoon on 12 March



Fig.3.4 – Branch of UTPR, at the afternoon on 12 March



Fig.4.1 – Site water diversion channel at ch.50 was exposed without geo-textile coverings



Fig.4.2 – Some of the haul access was not completely protected with proper earth bund and/or barriers





Fig.6.1 – Barriers with geo-textile coverings were provided along the site diversion channel at ch.50



Fig.6.2 – De-silting tank was provided for site water treatment

