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

December 2008

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APPROVAL SHEET

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Dr. Mark Shea
(Ecologist)

EM&A Manual in relation to 2-year post construction monitoring program for Upper Tai Po River

Endorsed by: **IEC(Environmental Resources Management)

Signature: _____ Date: _____

Mr. Marcus IP
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TABLE OF CONTENTS

EXECUTIVE SUMMARY

This is the fourth monthly Environmental Monitoring and Audit (EM&A) Report for the river improvement works at Upper Tai Po River under Drainage Service 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 form 1st December 2008 to 31st December 2008. The major construction activities carried out by the contractor during this reporting period include construction of boulder trap and gabion wall.

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.

Environmental Team had carried out construction noise monitoring on weekly basis and no exceedance was found. 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 F.**

Piling works were not scheduled for this month. Therefore, Environmental Team had not carried out vibration monitoring during the month.

Ecological monitoring is not scheduled for this month. The summary of ecological site inspection findings and implementation status of environmental protection and mitigation for ecology, prepared by the Ecologist Dr. Mark Shea, are provided in table 6.2 and **Appendix H** respectively.

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

There was one formal public complaint received in the reporting month. For further details, please refer to **section 2.7** of this report. For the complaint reports and logs, please refer to **Appendix A** of this report.

There was no breach of Action and Limit levels for this month.

There was no reporting change for this month

Key construction activities in the coming month will include construction of boulder trap and gabion wall. It is expected that noise impacts, runoff impacts and waste disposal will be generated on site.

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 fourth monthly Environmental Monitoring and Audit (EM&A) Report for the river improvement works at Upper Tai Po River under Drainage Service 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 was 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 December 2008. This included regular site inspections once per week for verification of implementation of the mitigation measures as recommended in the 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 hydralic 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

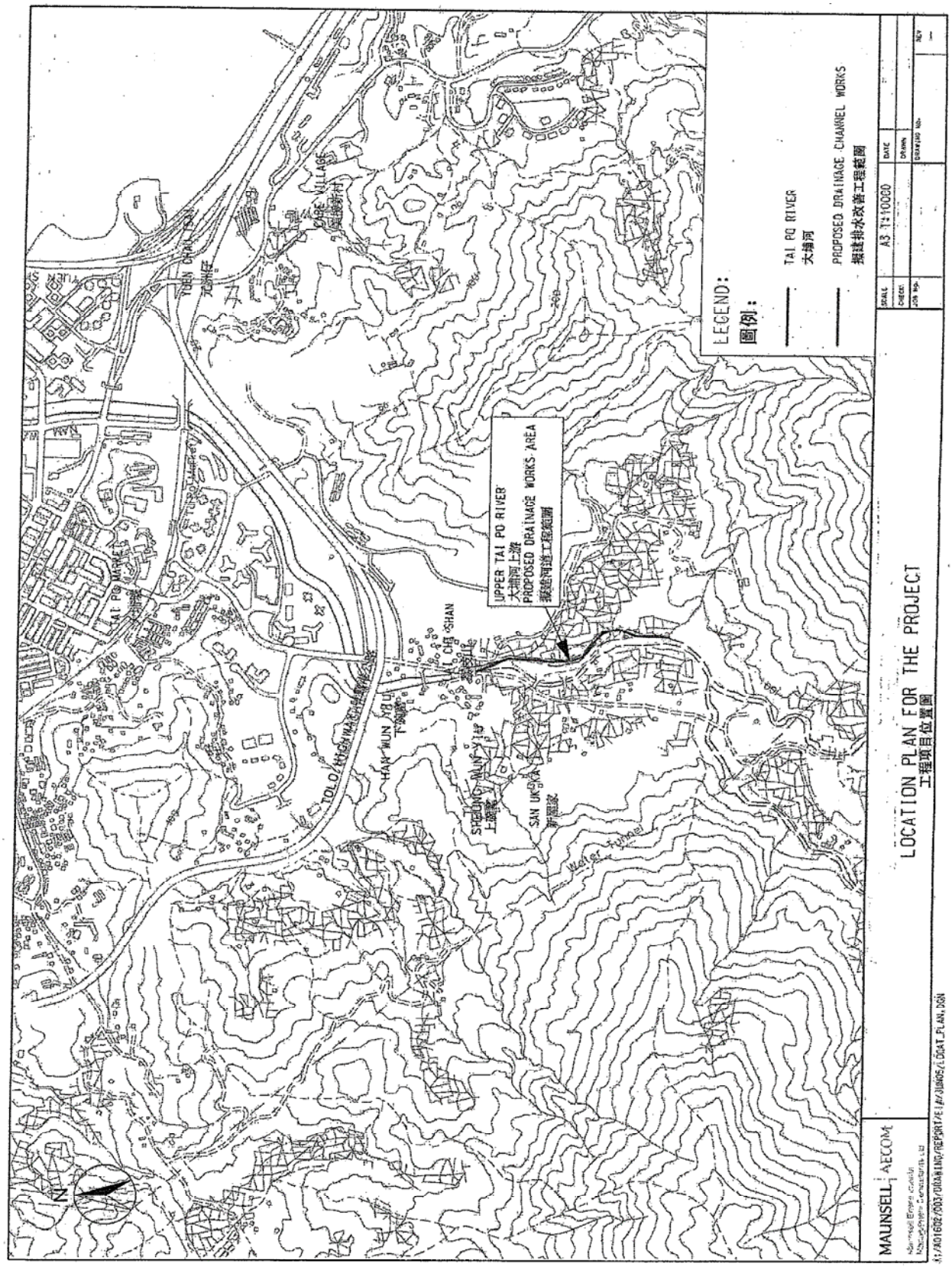
been commenced on September 15th 2008 and anticipated to complete in April 2011.

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



2.4 Construction activities for the reporting period

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

(1) Construction of boulder trap
(2) Construction of gabion wall

2.5 Construction activities for the next reporting period

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

(1) Construction of boulder trap
(2) Construction of gabion wall

2.6 Non-compliance with the environmental performance limits

There was no non-compliance with the environmental performance limits for this reporting month. The event and action plan for Ecology is shown in **Appendix B**. The action and limit level for Noise is shown in **Appendix C**. The reference standards for vibration is shown in **Appendix D**.

2.7 Summary of Complaints

There was one complaint for the month of December 2008. Cumulative complaint log is shown in **Appendix G**.

The complaint on Dec 15th 2008 was regarding muddy water discharged from river improvement work site at LTR, mal-practices of construction activities were also reported in SSR and UTPR.

ET arranged a site investigation and a follow up meeting with the representative from the contractor to resolve the incident on Dec 16th 2008. The investigation result was found that muddy water was caused by several reasons. They include:

1. Site water was directly discharged to the branch without proper treatment
2. Disturbance of sediments in diverted river channel, caused by the river –based activities.
3. Discharge from defective de-silting facilities and
4. Deficiency of barrier bunds installed along the river, which cannot effectively

protect the river from runoff.

The Haul road/ works area beside of the river channels should be well enclosed by applying proper mitigation measures to prevent site runoff entering the river channels and cause water pollution. The contractor should provide effective barrier bunds and weirs that meet the design stated in method statement proposed for runoff control before any river based works start.

For the detailed complaint report and log, please refer to Appendix A of this report.

3.0 Ecological Monitoring Results

Capture survey and ecological impact monitoring conducted by Dr. Mark Shea was not scheduled for this month. The next ecological impact monitoring is scheduled in January 2009 and the next capture survey is scheduled in November 2009.

4.0 Noise Monitoring Results

Noise monitoring was carried out by the Environmental Team for this month from Dec 1st to Dec 31st. The Leq (30min) results ranged from 47.8dB(A) to 71.6dB(A). For further details of the monitor results and graphical plots, please refer to **APPENDIX E.**

4.1 Noise Monitoring Location

In accordance with the EM&A Manual, noise monitoring locations were established at 11 N.S.R. locations**.** The location plan is shown in **Appendix E.** During this month of monitoring, an additional monitoring at Fan Sin Temple on Dec 4th was carried out and it is a façade measurement location. The Environmental Technician could not monitor UTP2 on Dec 30th due to the threat caused by the snake warning. The following **table 4.1** is the description of those 11 N.S.R. and the additional temporary monitoring location at Fan Sin Temple on Dec 4th.

TABLE 4.1 Description of Noise Sensitive Receivers

Sensitive Receiver No.	Location and Description
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
Fan Sin Temple	Temporary measurement requested by RE at Fan Sin Temple on Dec 4th only.

5.0 Vibration monitoring Results

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

6.0 Environmental issues and Actions

6.1 Site inspections and key environmental issues

As mentioned in Section 8.1 of the EM&A manual, 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 H.

Site inspections were conducted on 3, 10, 17, 24th and 31st of December 2008. A detailed checklist of each site inspection together with comments and relevant photos have been filed and kept. The inspections were summarized in Table 6.1, the ecological inspection prepared by the Ecologist, Dr. Mark Shea were summarized in Table 6.2.

Table 6.1 Summary results of site inspection findings

Date	Observations	Observation or Non-compliance	Advice from ET	Action Taken	Closing date	Remarks
Dec 3rd	Site inspection was carried out to investigate the compliant recorded on 28th Nov 2008 regarding deposition of mud/ dust.	Observation	Details refer to Appendix B 0f EM&A report for November 2008.	Details refer to Appendix B 0f EM&A report for November 2008.	Dec 10th	--
Dec 10th	1. Coverage of the geo-textiles was found defective in TRP ch.20.	1. Observation	1. Contractor was reminded to be cautious of the effectiveness of barriers formed by bunds/rocks and geo-textile	1. Action was taken as advised by the contractor by replacing the defective geo-textile prior to the Dec 17th inspection in ch20.	Dec 17th	--
	2. Junction of site entrance and public road at TPR, should be regularly cleaned for deposition of earth materials and debris of bitumen from site.	2. Observation	2. Contractor was reminded to cleaned up the deposition of earth materials and debris of bitumen from site regularly.	2. Action was not taken as advised completely as the soil/ mud was found at the site entrance during the Dec 17th site inspection.	Dec 17th	--
	3. Segregation labels in waste storage area in TPR was found	3. Observation	3 Contractor was reminded to provide proper label to identified	3. Action taken as advised by the contractor by providing proper label in	Dec 17th	--

	damaged, contractor was reminded to replace the label and clear the waste regularly.		the materials that are stored in the storage area.	the storage area prior to the Dec 17th inspection.		
Dec 17th	1. Tracks of soil/mud left by vehicles were observed at the public access (Wilson Trail)	1 Observation	1. Contractor was reminded again to clean up the deposition of earth materials and debris of bitumen from site regularly.	1. Action taken as advised by the contractor by cleaning up the mud that was left on the access road prior to the December 24th inspection.	Dec 24th	--
	2. Insufficient coverage of Barrier Bund was found at UTPR Ch. 25	2. Observation	2. Contractor was advised to keep the barriers in effective condition to avoid muddy water being discharged into the river.	2. Action was not taken completely as other defective barriers were fond during the Dec 24th site inspection.	Dec 24th	--
	3. Chemical Drum without drip pan was found.	3 Observation	Contractor was advised to place a drip tray pan for all the chemical container.	3. The chemical container was removed prior to the Dec 24th site inspection.	Dec 24th	

Date	Observations	Observation or Non compliance	Advice from ET	Action Taken	Closing date	Remarks
Dec 24th	1. Pit that collected domestic discharge was not covered.	1Observation	1. Contractor was reminded to cover the pit that collect domestic discharge for hygiene and visual issue.	1. Action was taken as advised by covering the pit prior to the Dec 31st site inspection.	December 31st	--
	2 Retaining tree without proper protection was found at Upper Tai Po River	2 Observation	2.Contractor was reminded to review the status of the retaining plants from construction activities nearby.	2. The contractor has taken remedial action by applying protection around the tree prior to the Dec 31st site inspection	December 31st	--
	3 Outlet of the drip tray was closed by geo-textile	2. Observation	3.Contractor was reminded to use proper stop plug to replace the geo-textile	3. The drip tray has been removed prior to the Dec 31st site inspection.	December 31st	--
	4. Defective bunds without complete coverage was found	4. Observation	4. Contractor was reminded again to keep the barriers in effective condition to avoid muddy water being discharged into the river	4. Action was not taken properly as advised as bunds without coverage of geo-textile found during December 31st site inspection	December 31st	--

Dec 31st	1. Bunds without cover of geo-textile at ch.220 was found. 2. Defective machines were found on site.	1. Observation 2 Observation	2. Contractor was reminded to cover the bunds with geo-textile as the design stated. 3. Contractor was advised to regularly check and provide maintenance to the desilting tanks occupying on sites, as such the facilities could be operated under effective condition.	1. Action was taken as advised by the contractor as the contractor used geo-textile to cover the bunds prior to the Jan 7th 2009 inspection. 2. Action was taken as advised by the contractor as the contractor de-silting tanks was removed and cleaned prior to the Jan 7th site inspection.	January 7th 2009 January 7th 2009	-- --

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

Table 6.2 Summary results of ecological site inspection findings

Date	Observations	Advice from Ecologist	Action Taken	Closing Date
Dec 3rd	No Major findings for this inspection	No Advice is required	No Action is required to be taken	Dec 10th
Dec 10th	No Action is required to be taken	No Advice is required	No Action is required to be taken	Dec 17th
Dec 17th	No Action is required to be taken	No Advice is required	No Action is required to be taken	Dec 24th
Dec 24th	No Action is required to be taken	No Advice is required	No Action is required to be taken	Dec 31st
Dec 31st	No Action is required to be taken	No Advice is required	No Action is required to be taken	Jan 2nd

6.2 Non-compliance

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

6.3 Recommendations

Proper coverage of barriers formed by bunds/rocks and geo-textile was the major concern for this month of monitoring. The contractor should always ensure that there are enough barriers coverage formed by bunds/rocks and geo-textile along the stream. Effective barriers should be implemented to the site along the construction area to avoid muddy water or runoff being discharged into the stream by any chance. The contractor should take the advice as recommended by ET.

Drip trays for the chemical container should be provided, the contractor should also pay attention to the outlet of the drip tray to avoid the leakage of chemicals to the surrounding area. The drip tray outlet should be closed with proper stop plug instead of the temporary usage of geo-textile to minimize the chemical impact to the surround area.

The mud, debris and soil that was left on the public area should be cleaned regularly

to avoid dust concern that may raise to public and the environment.

The contractor should also keep proper maintenance of the machines and to ensure the machines are in effective condition when using.

6.4 Implementation status and effectiveness of the mitigation measures

During the site investigation, it was found that the contractor needs to have continuous improvement on the barriers formation along the stream, the defective barriers formed by bunds/ rocks and geo-textile should be properly maintained. Contractor should extend the coverage of barriers formed by bunds/rocks and geo-textile along the stream of the construction zone to avoid muddy water and runoff being discharged directly into the stream.

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 recorded on December 2008.

Table 7.1 Summary of Waste Disposal in December 2008

Type of waste	Inert Waste	Non-Inert Waste	Chemical Waste
November 2008	0	0	0

8.0 Status of Permits and Licenses Obtained

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

Table 8.1 Status of Permits and Licenses Obtained

Description	License / Permit No.#	Date of Issue	Date of Expiry	Remarks
Environmental Permit	EP-223/2005	31st Aug, 2005	N/A	Issued
Amended Environmental Permit	EP-223/2005/A	18th Nov, 2008	N/A	Issued
Construction Noise Permit	N/A	N/A	N/A	N/A
Effluent Discharge License	3678	14th Mar, 2008	31st Mar, 2013	Issued
Registration Chemical Producer	5213-724-C3251-03	19th Dec, 2007	Not applicable	Issued
Registration of C&D Waste Producer	N/A	N/A	N/A	N/A

9.0 Future Key issues

Key construction activity in the coming month will be the construction of boulder trap and gabion wall. The construction activities for these items will generate some environmental impacts. They include air, noise, water and waste.

The construction site and the site entrance may generate dust. Therefore, proper water spraying, tarpaulin covering and wheel washing at the site entrance are recommended.

The boulder trap construction will generate construction noise due to the fact that boulder has to be broken by the hydraulic breaker. Since the hoarding (noise barriers) for the construction section was completed, proper wrapping of the hydraulic breaker is required to reduce the noise impact.

The construction boulder trap and the gabion wall may generate runoff and water concern at the site. The contractor shall implement proper barriers formed by bunds, rocks and geo-textile or wastewater treatment facilities to avoid muddy water being discharged into the stream.

It is expected that construction waste would be generated on site for the boulder trap and the gabion wall construction. Contractor shall assign proper site storage area with proper label to indicate the relative construction materials.

Drip trays are recommended to be provided on site and ready to be used when there are diesel containers placed on site. The contractor should use proper closing cap at the outlet to avoid any chemical leakage that may affect the surrounding environment.

10.0 Conclusion

The major construction activities carried out by the contractor during this reporting period include construction of boulder trap and gabion wall.

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 and no exceedance was found.

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.

There was one complaint in the reporting month regarding muddy water. ET has followed the compliant procedure, and conducted site investigation and meeting, and submitted the compliant report accordingly. Remedial actions and recommendations have been proposed to the contractor for follow-up.

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: Complaint report and Log on December 15th 2008

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-081112(EPD)

Sheet: 1 of 6

RECIPIENT

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

Details: EPD formally informed Chiu Hing Construction & Transportation Co., Ltd, on 15th December 2008 regarding a complaint on Muddy water caused by river improvement works along Lam Tsuen River (LTR), She Shan River (SSR) and Upper Tai Po River (UTPR).

Received Date: 15 December 2008 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: 15 December 2008

Location: A complaint was recorded for muddy water discharged from river improvement work site at LTR, mal-practices of construction activities were also reported in SSR and UTPR

INVESTIGATION RESULTS & MITIGATION MEASURES

1. A complaint on 15 December 2008 was recorded that muddy water was discharged into the river from the river improvement work sites at LTR, SSR and UTPR. ET was informed by contractor on 15 December 2008

2. As per the EM&A Manual section 9.3, ET arranged a site investigation with the representatives from Contractor, on 16 December 2008 to resolve the above complaint. The investigation covered the site areas along LTR.

3. Findings from the investigation showed that several mal-practices caused turbid to the river water included:
   - Site water was directly discharged to the branch of LTR (ch.250~300 approximately) without proper treatment (Fig.1 & 2);
   - Disturbance of sediments in diverted river channel, caused by the river-based activities at ch.750 (Fig.3);
   - Discharge from defective desilting facilities at LTR road B ch.950~1000 (Fig.4); and
   - Deficiency of Barrier Bunds installed along the river, which cannot effectively protect the river from runoff (Fig.5 & 6).

4. Contractor was urged to carry out necessary remedial actions to rectify the non-compliance as soon as possible.

5. A follow up meeting was held at site with participation of the ET, representatives from Contractor after the investigation of the same day.

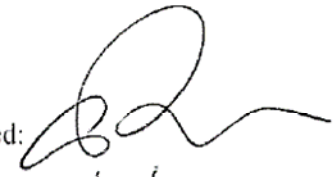
6. On 17 December 2008, another site investigation was carried out with representatives of ET, IEC, ER and Contractor to the site areas of UTPR, LTR and SSR.

7. During the investigation, new sediments were observed accumulated at the river bed, of SSR ch.1500 approximately (Fig.7). Also turbid river water was observed at UTPR ch.100 (Fig.8).

8. For the above issues, contractor was strongly advised to review all of their site activities being carried out along three rivers. Should any non-compliance of water quality occur the contractor have to take necessary mitigation measures to minimize impacts to the rivers.

RECOMMENDATIONS

1. Contractor should consider of using desilting tank instead of soak-away pond to effectively treat the site water before entering the river channels at ch.250-300 of LTR.
2. Haul road / works area beside of the river channels should be well enclosed by applying proper mitigation measures to prevent site runoff entering the river channels and cause water pollution.
3. Contractor should provide effective barrier bunds and weirs that meet the design stated in method statement proposed for runoff control before any kind of river-based works start.
4. With the provision in 3, contractor should by any proper means minimize disturbance of sediments wherever any works carried out in the river.
5. Contractor is reminded again to take serious notice on the complaint and always keep good environmental management at site.

Signed: 

02/01/09

Date: 18-12-2008

Fig.1 Site water was directly discharged to the branch of LTR (at ch.250~300)

Fig.2 Discharge from the branch to the river channel of LTR (at ch.250~300)

Fig.3 Disturbed riverbed from works carried out by site staffs

Fig.4 Defective desilting facilities found at LTR road B ch.950~1000

Fig.5 Bunds without coverage of geo-textile at ch.0 of LTR

Fig.6 Insufficient height of barrier bunds at LTR

Fig.7 new sediments were formed at the riverbed of SSR ch.1500 approximately

Fig.8 muddy water was being entered the river channel, located ch.100 of UTPR approximately

COMPLAINT / CONCERN LOG

Ref: DC0706-CL-081112(EPD)

Log Ref	Event Date/Location	Complainant/ Date of Contact	Details of Complaint	Investigation/Mitigation Action	File Closed
DC0706-CL-081112 (EPD)	15th Dec 08, muddy water caused by river improvement works at Lam Tsuen River (LTR), mal-practices of construction activities were also reported in She Shan River (SSR) and Upper Tai Po River (UTPR)	A complaint received by contractor via EPD on 15th Dec 08, regarding muddy water discharged from river improvement work site at LTR	A complaint was recorded for muddy water discharged from river improvement work site at LTR, SSR and UTPR.	1) Site investigation was carried out with the representatives from Contractor, on 16 December 2008 to resolve the above complaint. The investigation covered the site areas along LTR. 2) Muddy water was mainly generated by several mal-practices included: - Site water was directly discharged to the branch of LTR (ch.250~300 approximately) without proper treatment; - Disturbance of sediments in diverted river channel, caused by the river-based activities at ch.750; - Discharge from defective desilting facilities at LTR road B ch.950~1000; and - Deficiency of Barrier Bunds installed along the river, which cannot effectively protect the river from runoff. 3) Contractor was urged to carry out necessary remedial actions to rectify the non-compliance as soon as possible. 4) On 17 December 2008, another site investigation was carried out with representatives of ET, IEC, ER and Contractor to the site areas of UTPR, LTR and SSR. 5) New sediments were observed accumulated at the river bed, of SSR ch.1500 approximately. Also turbid river water was observed at UTPR ch.100. 6) For the above issues, contractor was strongly advised to review all of their site activities being carried out	Yes

				along three rivers. Should any non-compliance of water quality occur the contractor have to take necessary mitigation measures to minimize impacts to the rivers. 7) The following suggestions are recommend to the contractor: - Contractor should consider of using desilting tank instead of soak-away pond to effectively treat the site water before entering the river channels at ch.250-300 of LTR. - Haul road / works area beside of the river channels should be well enclosed by applying proper mitigation measures to prevent site runoff entering the river channels and cause water pollution. - * Contractor should provide effective barrier bunds and weirs that meet the design stated in method statement proposed for runoff control before any kind of river-based works start. - With the provision in previous advice *, contractor should by any proper means minimize disturbance of sediments wherever any works carried out in the river. - Contractor is reminded again to take serious notice on the complaint and always keep good environmental management at site.	

Filed by Environmental Team Leader: _____ Date: 18th Dec 08

02/01/09

Appendix B: 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 provided on **Appendix table 1**.

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
Non-conformity on one occasion	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
Repeated Non conformity	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 C: 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 D: 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 E: Noise monitoring results, graphical plots and Location Plan

Location		L90 30min	L10 30min	Leq 30min	Date	Time Duration	Major Construction Noise	Other Noise source	Weather	Location description
UTP	1	54.3	67.9	65.6	Dec 4th 2008	13:00-13:30	Construction site is too far away from NSR	1 Public noise, 2 River noise, 3 Transportation noise	Fine	Façade
UTP	2	43.2	51.7	50.2	Dec 4th 2008	16:40-17:10	Construction site is too far away from NSR	1 Transportation noise	Fine	Façade
UTP	3	43.2	51.9	50.4	Dec 4th 2008	16:05-16:35	Construction site is too far away from NSR	1 River flowing noise	Fine	Façade
UTP	4	54.6	59.6	58.1	Dec 4th 2008	14:15-14:45	Construction site is too far away from NSR	1. River flowing noise, 2. Dog's noise	Fine	Façade
UTP	5	50.3	55.7	54.5	Dec 4th 2008	14:50-15:20	Construction site is too far away from NSR	1 River flowing noise	Fine	Façade
UTP	6	46.2	56.2	51.2	Dec 4th 2008	15:30-16:00	Construction site is too far away from NSR	1 Water flowing noise	Fine	Façade
UTP	7	45.8	58.9	55.1	Dec 4th 2008	11:30-12:00	1Boulder Breaking noise, 2 Excavator noise	1 Public noise, 2 Bird's noise, 3 Water Flowing noise	Fine	Façade
UTP	8	53.0	58.8	56.4	Dec 4th 2008	10:20-10:50	1. Boulder Breaking, 2 Excavator Noise, 3 Boulder removing	1. River flowing noise	Fine	Façade
UTP	9	50.1	58.7	55.7	Dec 4th 2008	10:55-11:25	1. Boulder Breaking, 2 Excavator Noise, 3 Boulder removing	1. River flowing noise	Fine	Façade
UTP	10	52.0	65.7	61.8	Dec 4th 2008	9:42-10:12	1. Boulder Breaking, 2 Excavator Noise, 3 Boulder removing	1. Bird's noise	Fine	Façade
UTP	11	46.4	57.8	57.3	Dec 4th 2008	9:05-9:35	1. Boulder Breaking, 2 Excavator Noise, 3 Boulder removing	1. Residential noise, 2 Dog's noise	Fine	***Free field**

Fan Sin Temple: Additional requested by R.E.

L90 30min	L10 30min	Leq 30min	Date	Time Duration	Major Construction Noise	Other Noise source	Weather	Location description
61.1	53.5	59.1	Dec 4th 2008	13:40-14:10	1. Boulder Breaking, 2 Excavator Noise, 3 Boulder removing	1. Bird's noise	Fine	Façade

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

Location		L90 30min	L10 30min	Leq 30min	Date	Time Duration	Major Construction Noise	Other Noise source	Weather	Location description
UTP	1	53.7	69.2	66.2	Dec 9th 2008	13:40-14:10	Construction site is too far away from NSR	1 Hand breakign noise from other sites, 2 Traffic noise, 3 Public noise	Fine	Façade
UTP	2	54.6	67.1	64.2	Dec 9th 2008	13:00-13:30	Construction site is too far away from NSR	1 Traffic noise, 2 Public Noise, 3 Water flowing noise	Fine	Façade
UTP	3	44.4	53.4	50.7	Dec 9th 2008	15:22-15:52	1. Boulder breaking noise, 2 Excavator noise	1 River flowing noise, 2 Public noise	Fine	Façade
UTP	4	54.1	58.0	57.8	Dec 9th 2008	14:15-14:45	Construction site is too far away from NSR	1. River flowing noise, 2. Public noise	Fine	Façade
UTP	5	49.7	64.2	62.3	Dec 9th 2008	14:50-15:20	Construction site is too far away from NSR	1 Public noise, 2 Bird's noise, Traffic noise	Fine	Façade
UTP	6	45.7	51.5	49.3	Dec 9th 2008	15:55-16:25	1 Excavator noise, 2 Boulder breaking noise	1 Water flowing noise, 2 Public noise	Fine	Façade
UTP	7	53.4	69.5	66.7	Dec 9th 2008	16:29-16:59	1Boulder Breaking noise, 2 Excavator noise, 3 Boulder moving noise	1 Public noise, 2 Bird's noise, 3 Water Flowing noise	Fine	Façade
UTP	8	53.4	69.5	66.7	Dec 9th 2008	11:25-11:55	1. Boulder Breaking, 2 Excavator Noise, 3 Boulder removing	1. River flowing noise, 2. Dog's noise	Fine	Façade
UTP	9	49.6	60.7	57.4	Dec 9th 2008	10:50-11:20	1. Boulder Breaking, 2 Excavator Noise, 3 Boulder removing	1. Public noise, 2 Dog's noise	Fine	Façade
UTP	10	52.2	66.6	63.0	Dec 9th 2008	10:05-10:35	1. Boulder Breaking, 2 Excavator Noise, 3 Boulder removing	1. Public noise	Fine	Façade
UTP	11	51.3	64.6	61.1	Dec 9th 2008	9:30-10:00	1. Boulder Breaking, 2 Excavator Noise, 3 Boulder removing	1. Rbird's noise, 2 Construction noise from other sites, 3 Public noise	Fine	***Free field**

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

Location		L90 30min	L10 30min	Leq 30min	Date	Time Duration	Major Construction Noise	Other Noise source	Weather	Location description
UTP	1	54.2	66.5	65.8	Dec 16th 2008	13:00-13:30	Measuring point is too far away from the NSR	1 Public noise, 2. Traffic noise, 3. Noise from other construction activity, 4. Hammer noise and mini excavator noise	Fine	Façade
UTP	2	54.7	66.8	63.5	Dec 16th 2008	14:15-14:45	Measuring point is too far away from the NSR	1 Public noise, 2. Traffic noise, 3. Birds noise	Fine	Façade
UTP	3	44.1	50.4	49.3	Dec 16th 2008	15:30-16:00	Measuring point is too far away from the NSR	1 Dog barking noise, 2 Water flowing noise, 3 Public noise	Fine	Façade
UTP	4	54.0	61.1	59.6	Dec 16th 2008	13:35-14:05	Measuring point is too far away from the NSR	1 Public noise, 2 Water flowing noise	Fine	Façade
UTP	5	49.3	54.6	52.4	Dec 16th 2008	14:55-15:25	Measuring point is too far away from the NSR	1 Public noise, 2 Water flowing noise, 3 Dog barking noise	Fine	Façade
UTP	6	45.7	55.0	54.8	Dec 16th 2008	16:05-1635	1. Excavator Noise, 2 Boulder Breaking, 3 Boulder removing	1 Public noise, 2 Dog barking noise, 3 Water flowing noise	Fine	Façade
UTP	7	45.1	48.9	47.8	Dec 16th 2008	11:20-11:50	Measuring point is too far away from the NSR	1 Public noise, 2 Water Flowing noise, 3 Bird's noise, 4 Dog barking noise	Fine	Façade
UTP	8	53.0	67.5	64.3	Dec 16th 2008	10:10-10:40	1. Excavator Noise, 2 Boulder Breaking, 3 Boulder removing	1 Public noise	Fine	Façade
UTP	9	46.7	56.4	53.9	Dec 16th 2008	10:45-11:15	1. Excavator Noise, 2 Boulder Breaking, 3 Boulder removing	1. Public noise, 2 Water flowing noise, 3 Dog barking noise	Fine	Façade
UTP	10	53.0	66.8	63.2	Dec 16th 2008	16:45-17:15	1. Boulder Breaking, 2 Excavator Noise, 3 Boulder removing	1. Public noise	Fine	Façade
UTP	11	42.4	58.2	54.7	Dec 16th 2008	09:30-10:00	1. Excavator Noise, 2 Boulder Breaking, 3 Boulder removing	1. Dog barking noise, 2 Hammer noise from other activity, 3 bird noise	Fine	***Free field**

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

Location		L90 30min	L10 30min	Leq 30min	Date	Time Duration	Major Construction Noise	Other Noise source	Weather	Location description
UTP	1	54.2	68.0	65.7	Dec 23rd 2008	13:35-14:05	Measuring point is too far away from the NSR	1 Hand breaking noise from other construction activity, 2 Traffic noise, 3 Public noise	Fine	Façade
UTP	2	54.1	62.3	61.5	Dec 23rd 2008	13:00-13:30	Measuring point is too far away from the NSR	1 Hand breaking noise from other construction activity, 2 Traffic noise, 3 Public noise	Fine	Façade
UTP	3	44.4	53.7	50.7	Dec 23rd 2008	15:20-15:50	Measuring point is too far away from the NSR	1 Public noise, 2 Dog barking noise, 3 Water flowing noise, 4 Public noise	Fine	Façade
UTP	4	54.1	59.2	58.1	Dec 23rd 2008	14:10-14:40	Measuring point is too far away from the NSR	1 Public noise, 2 Traffic noise. 3 Water flowing noise, 4 Bird's noise	Fine	Façade
UTP	5	49.3	54.9	54.0	Dec 23rd 2008	14:42-15:12	Measuring point is too far away from the NSR	1 Public noise, 2 Water flowing noise, 3 Bird's noise	Fine	Façade
UTP	6	45.0	57.0	53.9	Dec 23rd 2008	16:30-17:00	Measureing point is too far away from the NSR	1 Dog barking noise, 2 Water flowing noise, 3 Public noise	Fine	Façade
UTP	7	46.0	51.6	49.6	Dec 23rd 2008	15:55-16:25	Measuring point is too far away from the NSR	1 Public noise, 2 Water Flowing noise, 3 Bird's noise	Fine	Façade
UTP	8	48.8	56.6	55.0	Dec 23rd 2008	11:15-11:45	1. Excavator Noise, 2 Boulder Breaking, 3 Boulder removing	1, Public noise, 2 Water flowing noise, 3 Birds noise	Fine	Façade
UTP	9	52.2	61.3	60.1	Dec 23rd 2008	10:40-11:10	1. Excavator Noise, 2 Boulder Breaking, 3 Boulder removing	1. Public noise, 2 Water flowing noise, 3 Dog barking noise	Fine	Façade
UTP	10	52.1	64.0	60.6	Dec 23rd 2008	10:05-10:35	1. Boulder Breaking, 2 Excavator Noise, 3 Boulder removing	1. Public noise	Fine	Façade
UTP	11	49.2	56.7	54.7	Dec 23rd 2008	09:30-10:00	1. Excavator Noise, 2 Boulder Breaking, 3 Boulder removing	1. Public noise, 2 Birds noise, 3 Dog barking noise	Fine	***Free field**

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

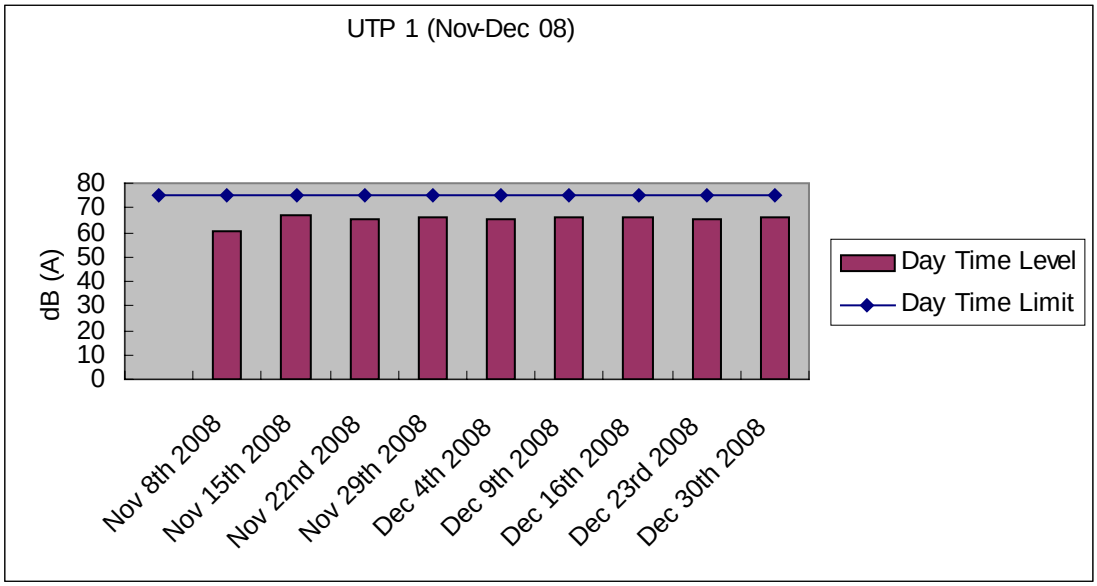
Location		L90 30min	L10 30min	Leq 30min	Date	Time Duration	Major Construction Noise	Other Noise source	Weather	Location description
UTP	1	54.4	68.6	66.2	Dec 30th 2008	13:10-13:40	Measuring point is too far away from the NSR	1 Traffic noise, 2 Public noise, 3 Birds noise	Cloudy	Façade
UTP	2	**Note 1***	**Note 1***	**Note 1***	**Note 1***	**Note 1***	**Note 1***	**Note 1***	Cloudy	Façade
UTP	3	48.1	56.0	53.2	Dec 30th 2008	15:20-15:50	Measuring point is too far away from the NSR	1 Public noise, 2 Water flowing noise, 3 Public noise	Cloudy	Façade
UTP	4	68.1	73.5	71.6	Dec 30th 2008	13:50-14:20	Measuring point is too far away from the NSR	1 Traffic noise, 2 Public noise. 3 Water flowing noise, 4 Power generator noise and cutting machine from other construction activity near the measuring point	Cloudy	Façade
UTP	5	58.3	67.2	66.1	Dec 30th 2008	14:25-14:55	Measuring point is too far away from the NSR	1 Public noise. 2 Power generator noise and cutting machine from other construction activity near the measuring point	Cloudy	Façade
UTP	6	48.6	56.8	56.2	Dec 30th 2008	15:40-16:10	Boulder breaking noise	1 Dog barking noise, 2 Bird's noise, 3 Public noise	Cloudy	Façade
UTP	7	48.0	56.7	53.8	Dec 30th 2008	15:55-16:25	1. Boulder breaking noise, 2 Excavator noise	1 Public noise, 2 Bird's noise	Cloudy	Façade
UTP	8	48.1	63.3	61.5	Dec 30th 2008	11:20-11:50	1. Excavator noise, 2 Boulder breaking noise, 3 Boulder removing noise	1, Public noise, 2 Mini truck noise	Cloudy	Façade
UTP	9	53.7	66.2	62.1	Dec 30th 2008	10:45-11:15	1. Excavator noise, 2 Boulder breaking noise, 3 Boulder removing noise	1. Dog barking noise	Cloudy	Façade
UTP	10	52.7	70.8	66.1	Dec 30th 2008	10:10-10:40	1. Excavator noise, 2 Boulder breaking noise, 3 Boulder removing noise	1. Public noise	Fine	Façade
UTP	11	49.1	59.6	56.5	Dec 30th 2008	09:30-10:00	1. Excavator Noise, 2 Boulder Breaking noise, 3 Boulder removing noise	1. Public noise, 2 Birds noise, 3 Dog barking noise	Fine	**Note 2*Free field**

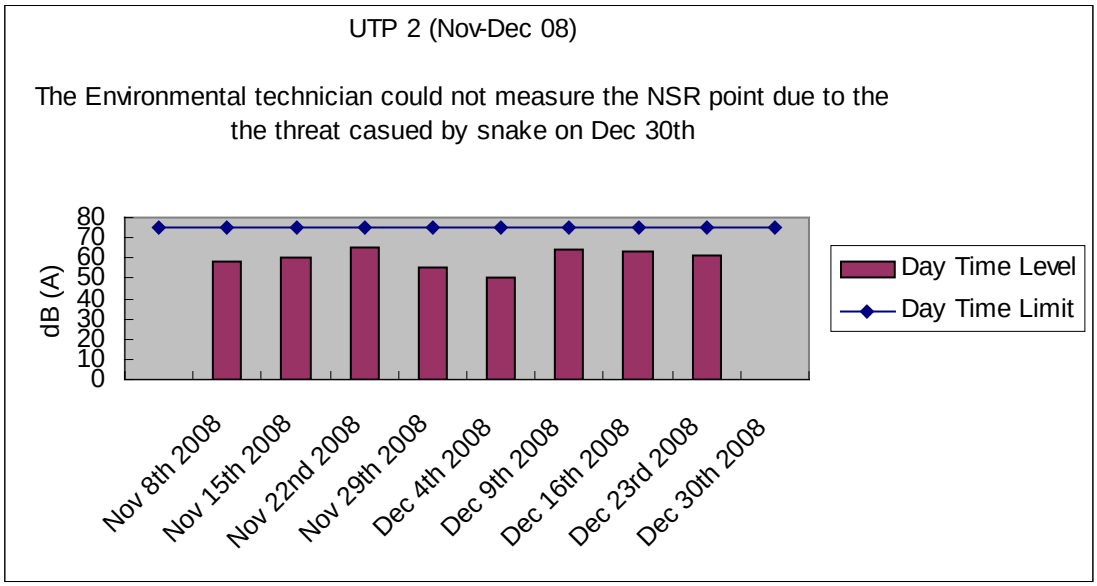
Note1* The environmental technician could not conduct noise monitoring due to the threat caused by the snake's warning

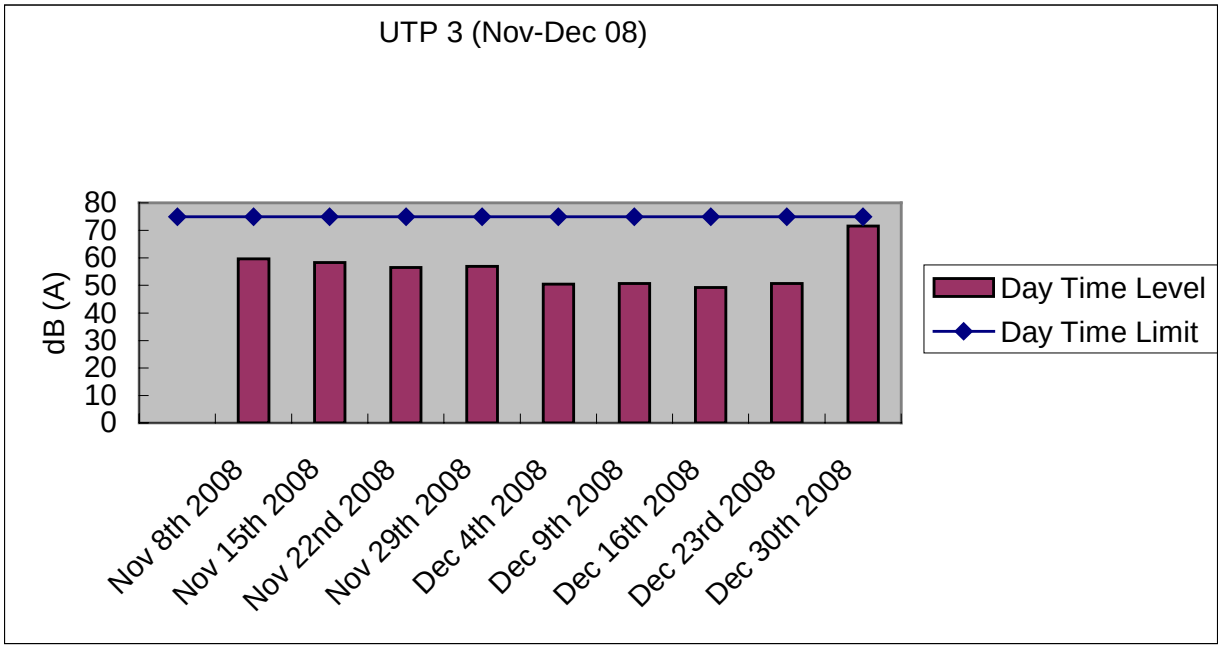
Note2* An Additional of 3dB(A) had been added to the measurement result due to Free Field Location status

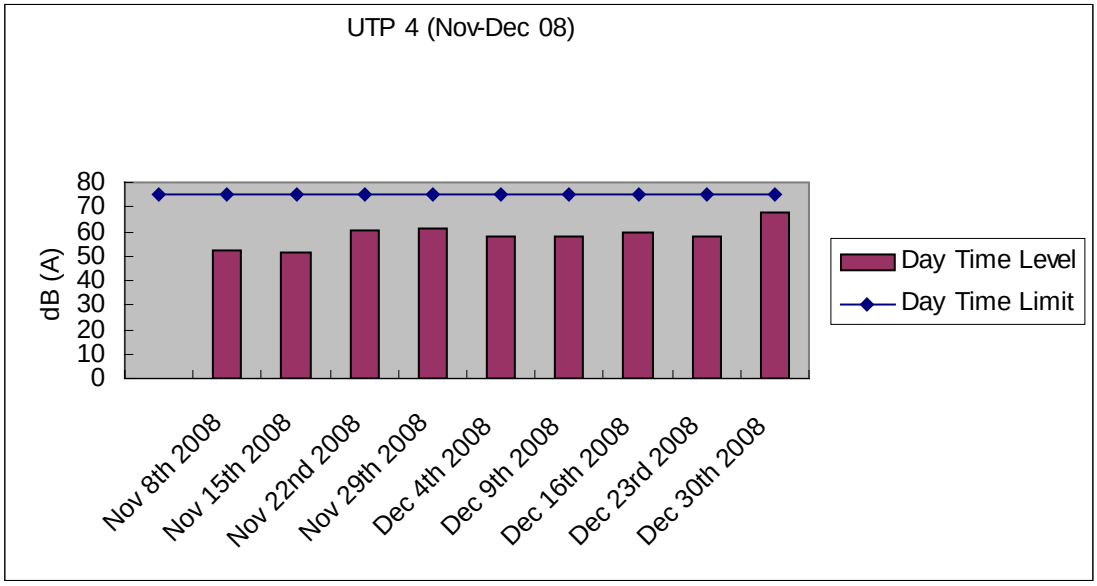
Graphical plot for Noise Measurements

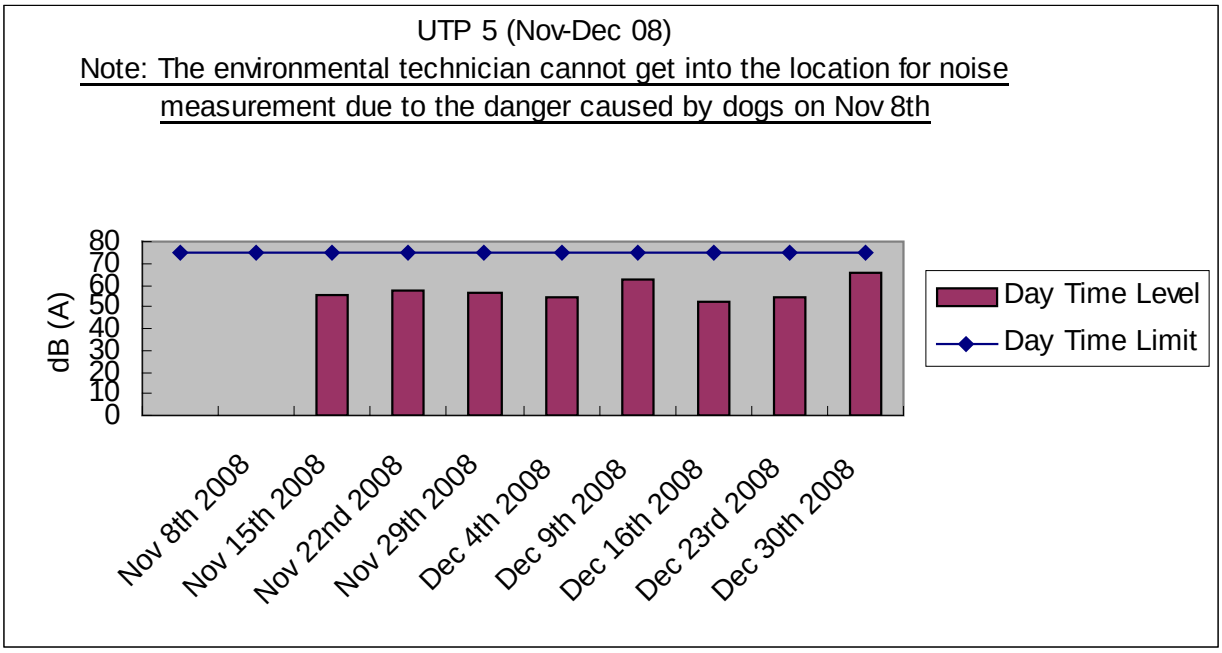
The following plots were the graphical plots for the 11 monitoring locations with the additional monitoring location requested by RE on Dec 4th. Each plot showed the day time limit 75 dB(A), day time level, date and the measured dB (A) results as in Leq 30min for each location. The graph contains the data recorded from Nov2008 to Dec 2008

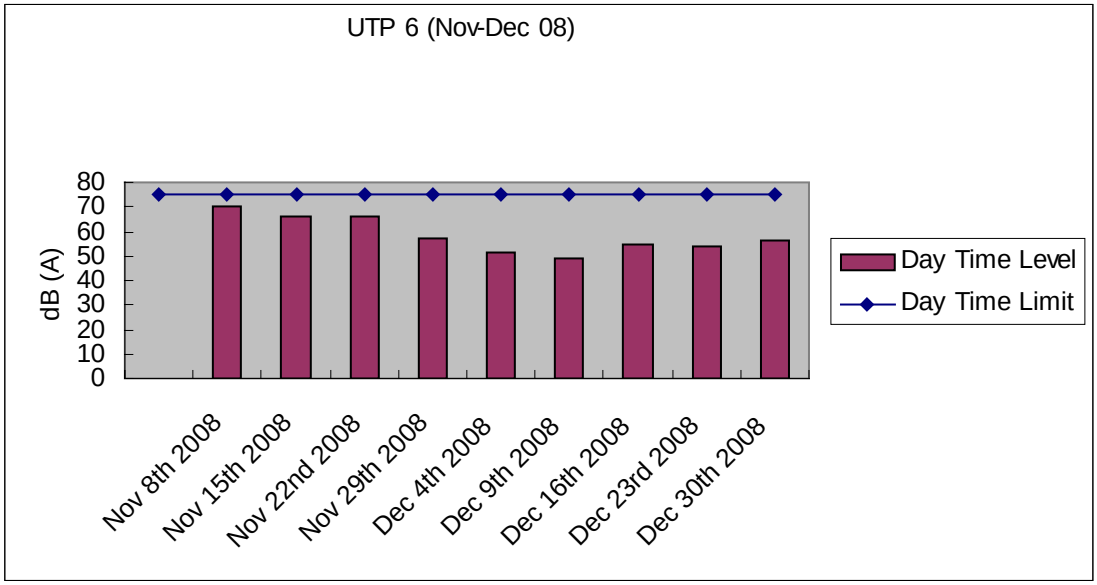


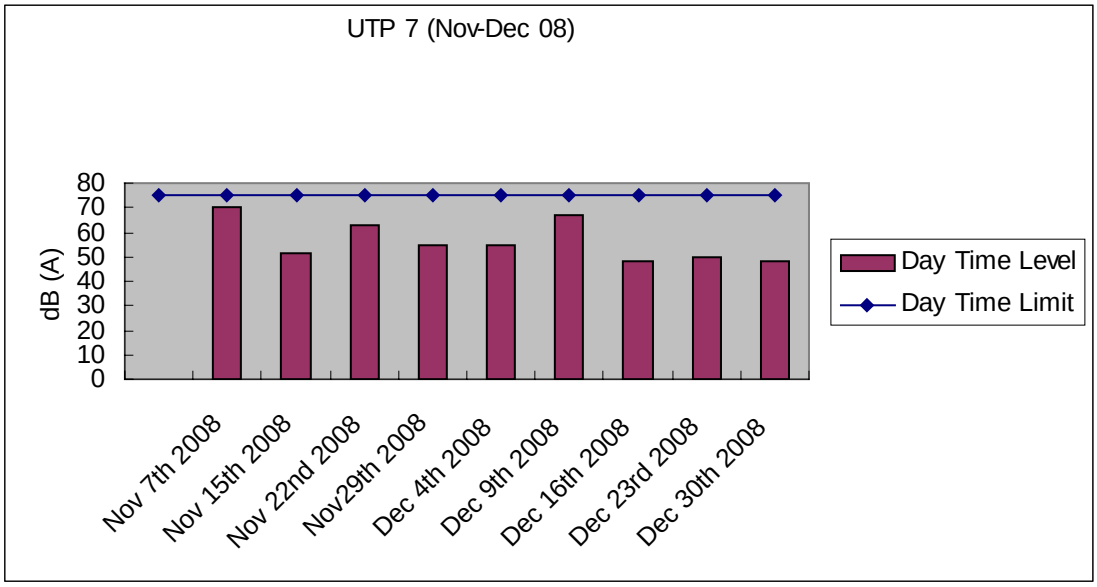


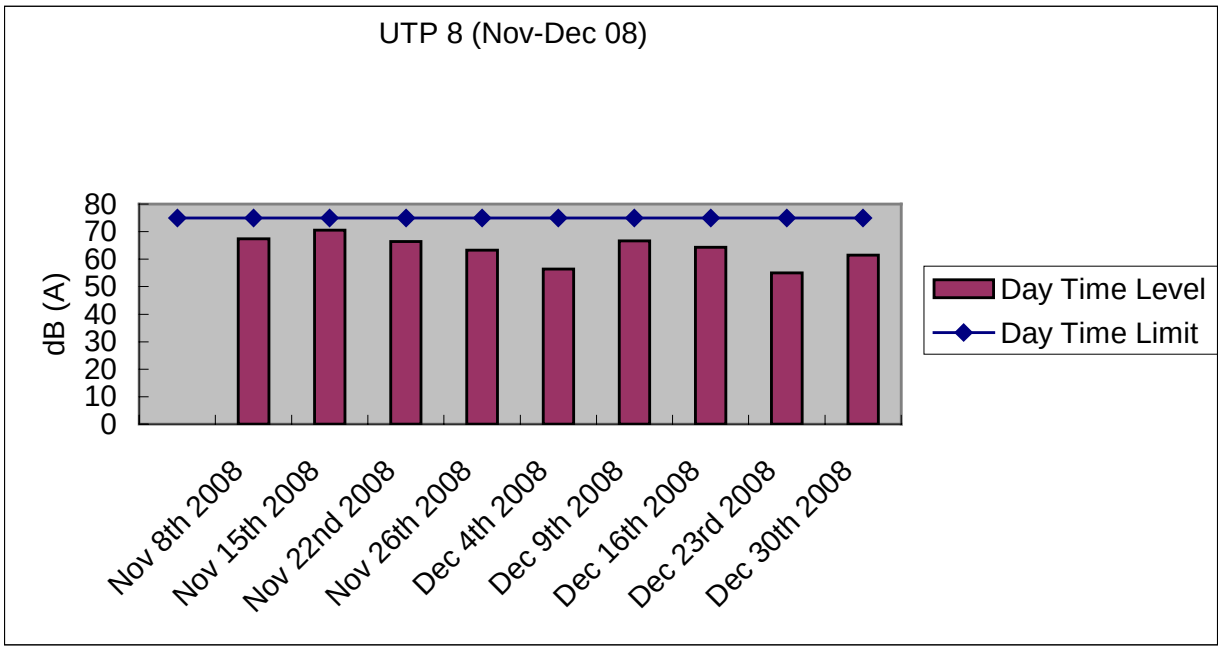

UTP 3 (Nov-Dec 08)
dB (A)
80
70
60
50
40
30
20
10
0
Nov 8th 2008
Nov 15th 2008
Nov 22nd 2008
Nov 29th 2008
Dec 4th 2008
Dec 9th 2008
Dec 16th 2008
Dec 23rd 2008
Dec 30th 2008
Day Time Level
Day Time Limit

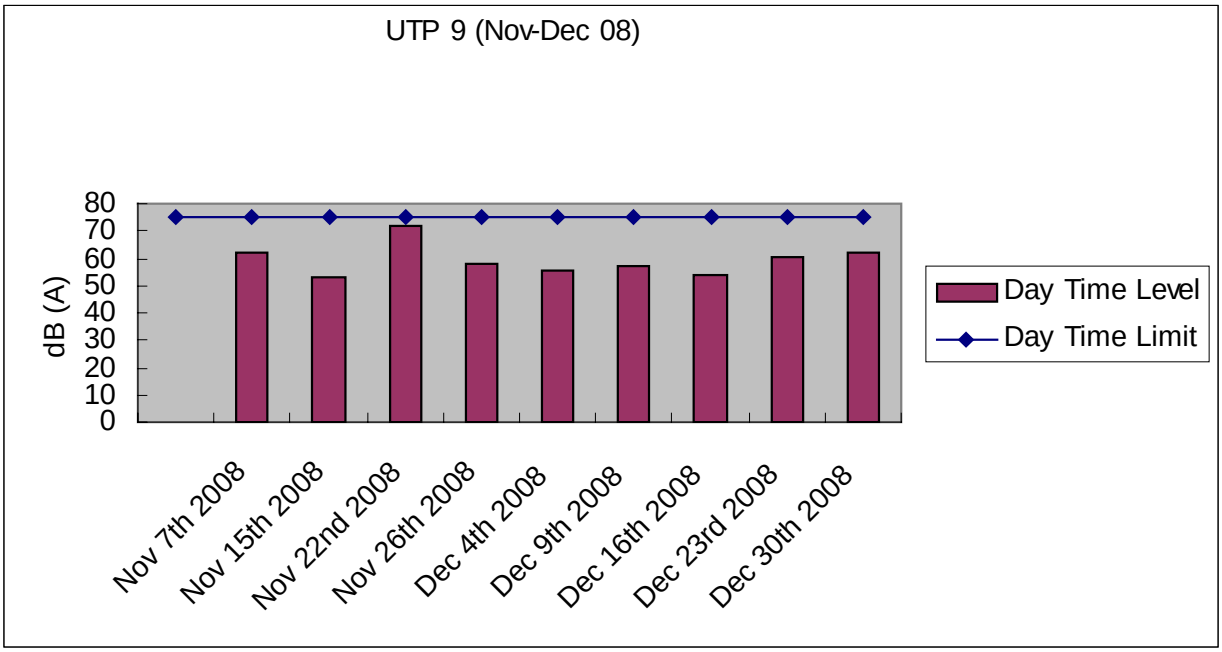

UTP 4 (Nov-Dec 08)
dB (A)
80
70
60
50
40
30
20
10
0
Nov 8th 2008
Nov 15th 2008
Nov 22nd 2008
Nov 29th 2008
Dec 4th 2008
Dec 9th 2008
Dec 16th 2008
Dec 23rd 2008
Dec 30th 2008
Day Time Level
Day Time Limit

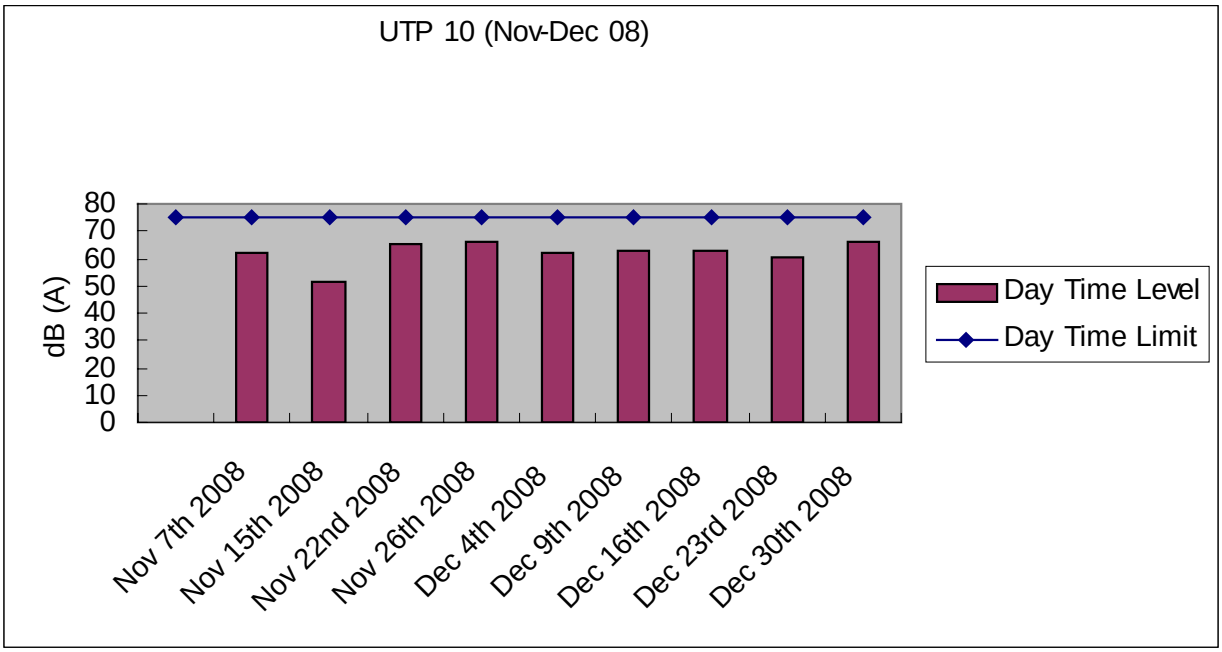

UTP 5 (Nov-Dec 08)
Note: The environmental technician cannot get into the location for noise measurement due to the danger caused by dogs on Nov 8th
dB (A)
80
70
60
50
40
30
20
10
0
Nov 8th 2008
Nov 15th 2008
Nov 22nd 2008
Nov 29th 2008
Dec 4th 2008
Dec 9th 2008
Dec 16th 2008
Dec 23rd 2008
Dec 30th 2008
Day Time Level
Day Time Limit

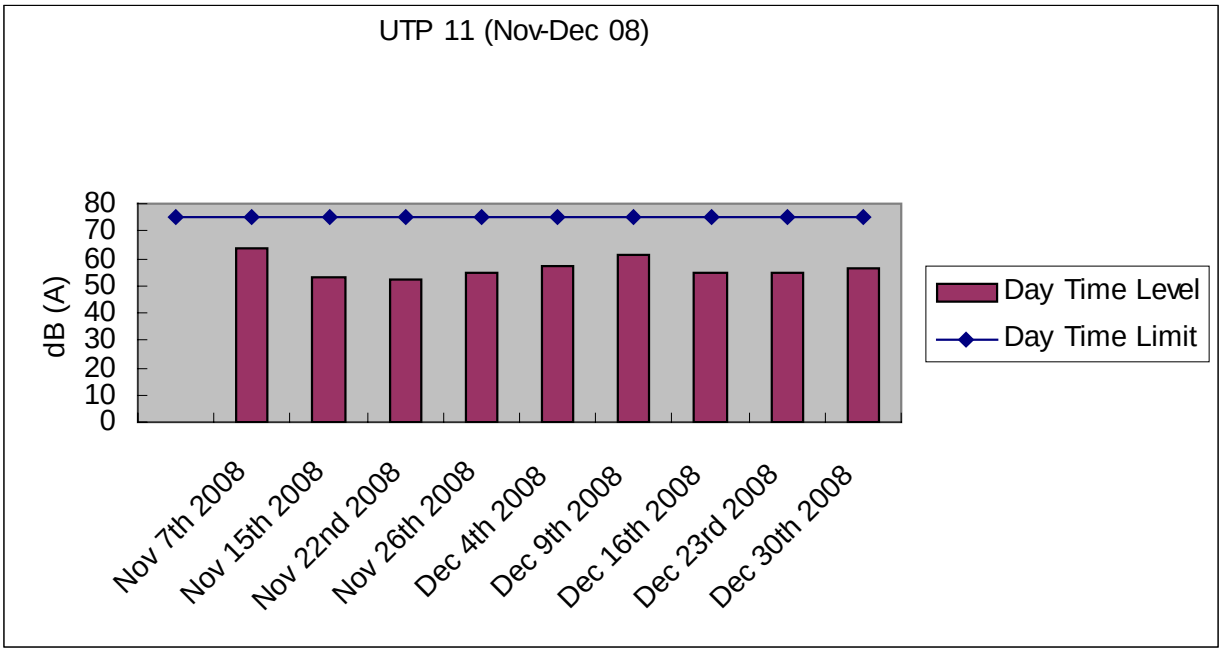

UTP 6 (Nov-Dec 08)
dB (A)
80
70
60
50
40
30
20
10
0
Nov 8th 2008
Nov 15th 2008
Nov 22nd 2008
Nov 29th 2008
Dec 4th 2008
Dec 9th 2008
Dec 16th 2008
Dec 23rd 2008
Dec 30th 2008
Day Time Level
Day Time Limit

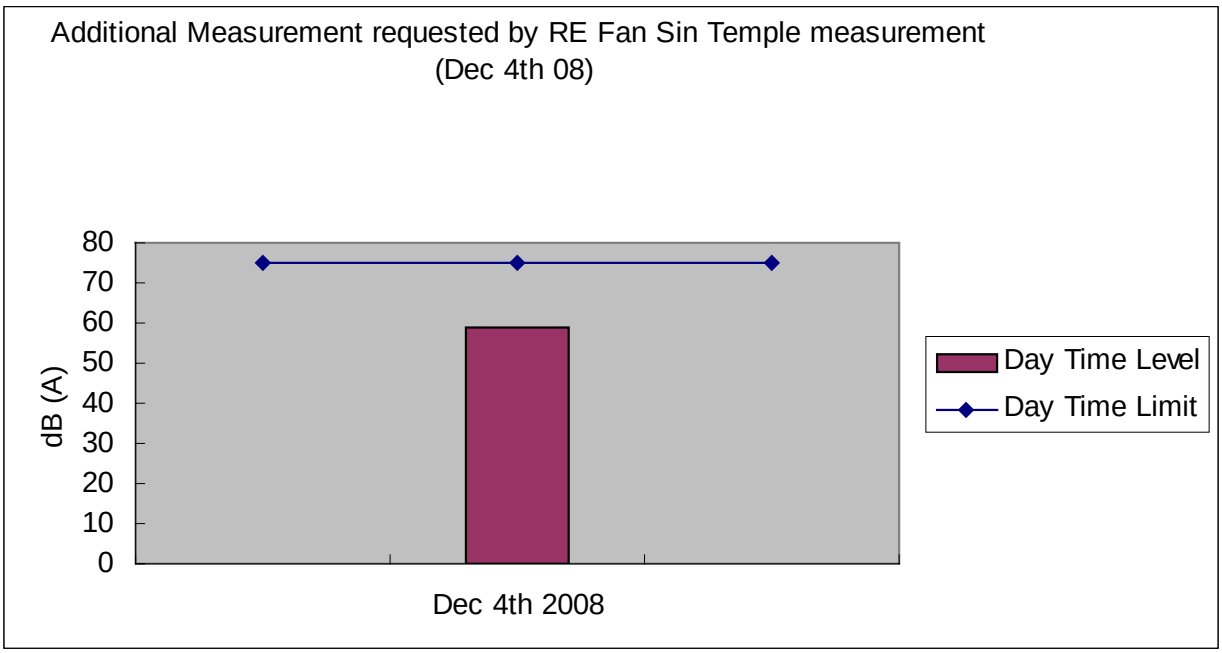

UTP 7 (Nov-Dec 08)
dB (A)
80
70
60
50
40
30
20
10
0
Nov 7th 2008
Nov 15th 2008
Nov 22nd 2008
Nov29th 2008
Dec 4th 2008
Dec 9th 2008
Dec 16th 2008
Dec 23rd 2008
Dec 30th 2008
Day Time Level
Day Time Limit

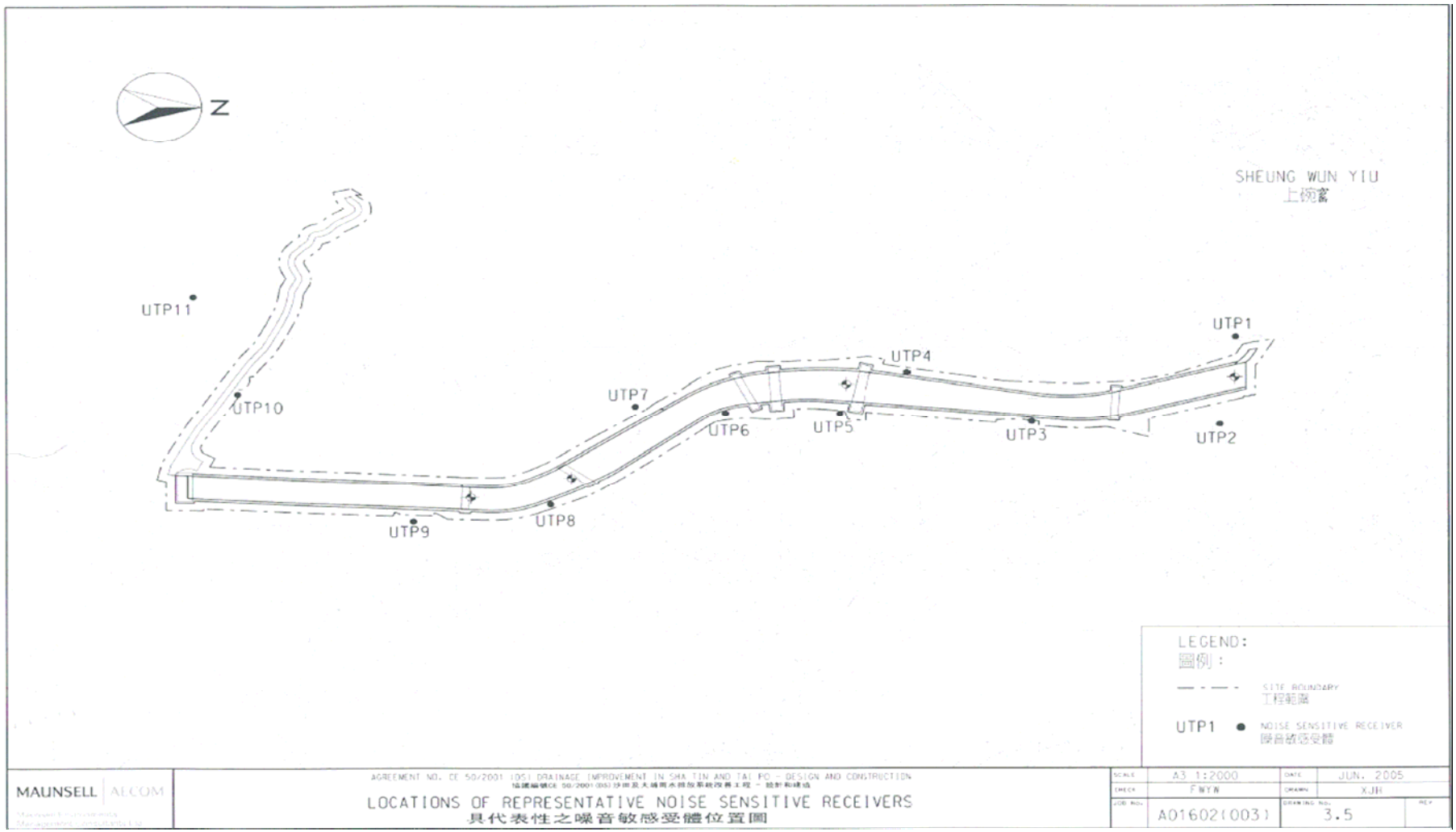

UTP 8 (Nov-Dec 08)
dB (A)
80
70
60
50
40
30
20
10
0
Nov 8th 2008
Nov 15th 2008
Nov 22nd 2008
Nov 26th 2008
Dec 4th 2008
Dec 9th 2008
Dec 16th 2008
Dec 23rd 2008
Dec 30th 2008
Day Time Level
Day Time Limit


UTP 9 (Nov-Dec 08)
dB (A)
80
70
60
50
40
30
20
10
0
Nov 7th 2008
Nov 15th 2008
Nov 22nd 2008
Nov 26th 2008
Dec 4th 2008
Dec 9th 2008
Dec 16th 2008
Dec 23rd 2008
Dec 30th 2008
Day Time Level
Day Time Limit


UTP 10 (Nov-Dec 08)
dB (A)
80
70
60
50
40
30
20
10
0
Nov 7th 2008
Nov 15th 2008
Nov 22nd 2008
Nov 26th 2008
Dec 4th 2008
Dec 9th 2008
Dec 16th 2008
Dec 23rd 2008
Dec 30th 2008
Day Time Level
Day Time Limit


UTP 11 (Nov-Dec 08)
dB (A)
80
70
60
50
40
30
20
10
0
Nov 7th 2008
Nov 15th 2008
Nov 22nd 2008
Nov 26th 2008
Dec 4th 2008
Dec 9th 2008
Dec 16th 2008
Dec 23rd 2008
Dec 30th 2008
Day Time Level
Day Time Limit


Additional Measurement requested by RE Fan Sin Temple measurement
(Dec 4th 08)
dB (A)
80
70
60
50
40
30
20
10
0
Dec 4th 2008
Day Time Level
Day Time Limit


N
SHEUNG WUN YIU
上碗窰
UTP11
UTP10
UTP9
UTP8
UTP7
UTP6
UTP5
UTP4
UTP3
UTP2
UTP1
LEGEND:
圖例：
SITE BOUNDARY
工程範圍
UTP1
NOISE SENSITIVE RECEIVER
噪音敏感受體
MAUNSELL AECOM
AGREEMENT NO. CE 50/2001 (DS) DRAINAGE IMPROVEMENT IN SHA TIN AND TAI PO - DESIGN AND CONSTRUCTION
LOCATIONS OF REPRESENTATIVE NOISE SENSITIVE RECEIVERS
具代表性之噪音敏感受體位置圖
SCALE A3 1:2000
DATE JUN. 2005
CHECK FWYW
DRAWN XJH
JOB NO. A016021003
DRAWING NO. 3.5
REV.

Appendix F: Monitoring schedule for the present and next reporting period

Master Schedule of EM&A works in December 2008

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	12/1	12/2	12/3	12/4	12/5	12/6
		Noise Monitoring	Site inspection in the afternoon			
12/7	12/8	12/9	12/10	12/11	12/12	12/13
		Noise Monitoring	Site inspection in the afternoon			
12/14	12/15	12/16	12/17	12/18	12/19	12/20
		Noise Monitoring	Site inspection in the afternoon			
12/21	12/22	12/23	12/24	12/25	12/26	12/27
		Noise Monitoring	Site inspection in the afternoon			
12/28	12/29	12/30	12/31			
		Noise Monitoring	Site inspection in the afternoon			

Master Schedule of EM&A works in January 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1/1	1/2	1/3
1/4	1/5	1/6	1/7	1/8	1/9	1/10
		Noise Monitoring	Site inspection in the afternoon			
1/11	1/12	1/13	1/14	1/15	1/16	1/17
		Noise Monitoring	Site inspection in the afternoon			
1/18	1/19	1/20	1/21	1/22	1/23	1/24
		Noise Monitoring	Site inspection in the afternoon			
1/25	1/26	1/27	1/28	1/29	1/30	1/31
				Site inspection in the afternoon	Proposed date for noise monitoring	

Appendix G: Cumulative Complaint log

Environmental Parameters	**Cumulative no. Brought forward**	**No. of complaint December 2008**	**Overall Total**
Air/Dust	1	0	1
Noise	0	0	0
Water	1	1	2
House Keeping Hygiene	0	0	0
Chemical waste	0	0	0
Total	2	1	3

Appendix H: Implementation status of environmental protection and mitigation measures

Implementation status of environmental protection and mitigation

Environmental Aspect	Protectection / Mitigation Measures	Implementation status	Follow-up action
Construction Noise	No percussive piling shall be carried out	Not applicable	Not required
	-Use well maintained construction plant	Implemented	Not required
	-Shut down plants between	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	Implemented	Not required
	-Cover excavated or stockpile of dusty material by impervious sheeting or sprayed with water	Implemented	Not required
	-Use tarpaulin to cover dusty materials on vehicles	Implemented	In progress
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	Not applicable at this stage	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	Needs further improvement	To be followed up
	Provide silt trap and oil interceptor to remove the oil, lubricants, grease, silt, grit and debris from the wastewater before pumped to the public stormwater drainage system	Implemented	Not required
	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 and also during the wet season July/August 2008	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
	Site runoff should be directed towards regularly cleaned and maintained silt traps to minimise the risk of sedimentation and pollution of river water.	Implemented	Not required
	Excavation works shall be carried out by land based plant within enclosed dry section of river channel.	Implemented	Not required

Ecology continue	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 I: Cumulative waste flow table

Cumulative waste flow table since September 15th to December 2008

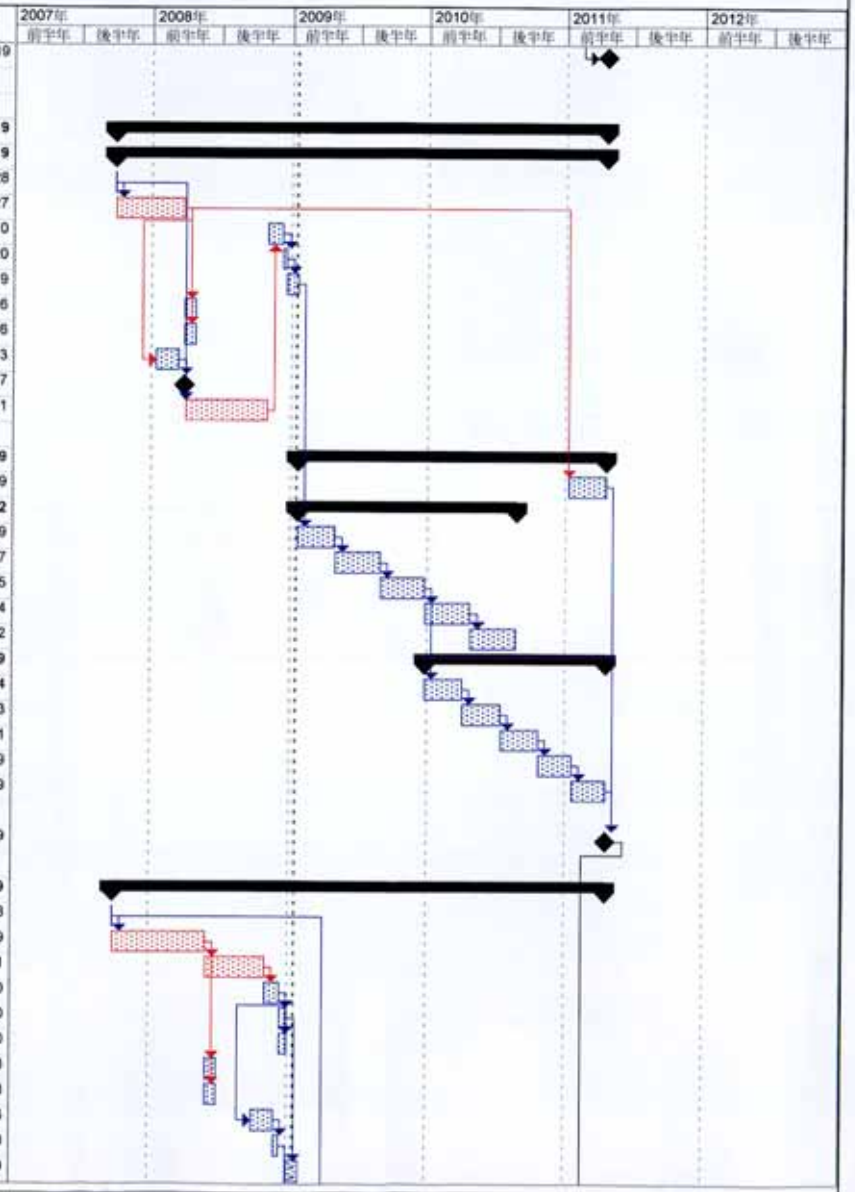
Type of waste	Inert Waste	Non-Inert Waste	Chemical Waste
September 2008	0	0	0
October 2008	0	2 tonnes	0
November 2008	$36m^3$	0	0
December 2008	0	0	0
Total	$36m^3$	2 tonnes	0

Appendix J: Construction programme

Drainage Services Department

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

識別碼	Task Name	工期	最早開始時間	最早完成時間	開始時間	完成時間
654	Completion of Work at Section 2	0 days	2011/4/19	2011/4/19	2011/4/19	2011/4/19
655						
656						
657	**Section 3 - Upper Tai Po River (Area L, N & P)**	**1300 days**	**2007/9/28**	**2011/4/19**	**2007/9/28**	**2011/4/19**
658	**Section 3 - Upper Tai Po River (Area L)**	**1300 days**	**2007/9/28**	**2011/4/19**	**2007/9/28**	**2011/4/19**
659	Commencement of Work	1 day	2007/9/28	2007/9/28	2007/9/28	2007/9/28
660	Possession to Portion of the Site (Area L)	181 days	2007/9/29	2008/3/27	2007/9/29	2008/3/27
661	Temp. Site Access	40 days	2008/11/1	2008/12/10	2008/11/1	2008/12/10
662	Site Clearance	10 days	2008/12/11	2008/12/20	2008/12/11	2008/12/20
663	Chainlink Fencing Work / Hoarding	30 days	2008/12/21	2009/1/19	2008/12/21	2009/1/19
664	Initial Survey	30 days	2008/3/28	2008/4/26	2008/3/28	2008/4/26
665	Condition Surveys / Set up markers	30 days	2008/3/28	2008/4/26	2008/3/28	2008/4/26
666	Preparation of Temporary Works Design	60 days	2008/1/14	2008/3/13	2008/1/14	2008/3/13
667	Approval of Temporary Works Design	0 days	2008/3/27	2008/3/27	2008/3/27	2008/3/27
668	Wet Season (April to Oct 2008)	214 days	2008/4/1	2008/10/31	2008/4/1	2008/10/31
669						
670	**Chainage from CH 0 to CH130**	**820 days**	**2009/1/20**	**2011/4/19**	**2009/1/20**	**2011/4/19**
671	Access to the Site	100 days	2011/1/10	2011/4/19	2011/1/10	2011/4/19
672	**Boulder Trap**	**580 days**	**2009/1/20**	**2010/8/22**	**2009/1/20**	**2010/8/22**
673	Excavation	100 days	2009/1/20	2009/4/29	2009/1/20	2009/4/29
674	Rockfill & Blinding Layer	120 days	2009/4/30	2009/8/27	2009/4/30	2009/8/27
675	Base Slab Structure	120 days	2009/8/28	2009/12/25	2009/8/28	2009/12/25
676	Wall Structure	120 days	2009/12/26	2010/4/24	2009/12/26	2010/4/24
677	Cut/Fill Slope	120 days	2010/4/25	2010/8/22	2010/4/25	2010/8/22
678	**Footbridge, Platform and Fill Slope**	**480 days**	**2009/12/26**	**2011/4/19**	**2009/12/26**	**2011/4/19**
679	Footing for footbridge	100 days	2009/12/26	2010/4/4	2009/12/26	2010/4/4
680	Gabion Wall	100 days	2010/4/5	2010/7/13	2010/4/5	2010/7/13
681	Footbridge (TB1)	100 days	2010/7/14	2010/10/21	2010/7/14	2010/10/21
682	Platform & Fill Slope & Maintenance stairway	90 days	2010/10/22	2011/1/19	2010/10/22	2011/1/19
683	Footpaths	90 days	2011/1/20	2011/4/19	2011/1/20	2011/4/19
684						
685	Completion of Area L	0 days	2011/4/19	2011/4/19	2011/4/19	2011/4/19
686						
687	**Section 3 - Upper Tai Po River (Area P)**	**1300 days**	**2007/9/28**	**2011/4/19**	**2007/9/28**	**2011/4/19**
688	Commencement of Work	1 day	2007/9/28	2007/9/28	2007/9/28	2007/9/28
689	Possession to Portion of the Site (Area P)	244 days	2007/9/29	2008/5/29	2007/9/29	2008/5/29
690	Wet Season	155 days	2008/5/30	2008/10/31	2008/5/30	2008/10/31
691	Temp. Site Access	40 days	2008/11/1	2008/12/10	2008/11/1	2008/12/10
692	Site Clearance	20 days	2008/12/11	2008/12/30	2008/12/11	2008/12/30
693	Chainlink Fencing Work	20 days	2008/12/11	2008/12/30	2008/12/11	2008/12/30
694	Initial Survey	30 days	2008/5/30	2008/6/28	2008/5/30	2008/6/28
695	Condition Surveys / Set up markers	30 days	2008/5/30	2008/6/28	2008/5/30	2008/6/28
696	Preparation of Temporary Works Design	60 days	2008/9/28	2008/11/26	2008/9/28	2008/11/26
697	Approval of Temporary Works Design	14 days	2008/11/27	2008/12/10	2008/11/27	2008/12/10
698	S.I. Works	30 days	2008/12/31	2009/1/29	2008/12/31	2009/1/29



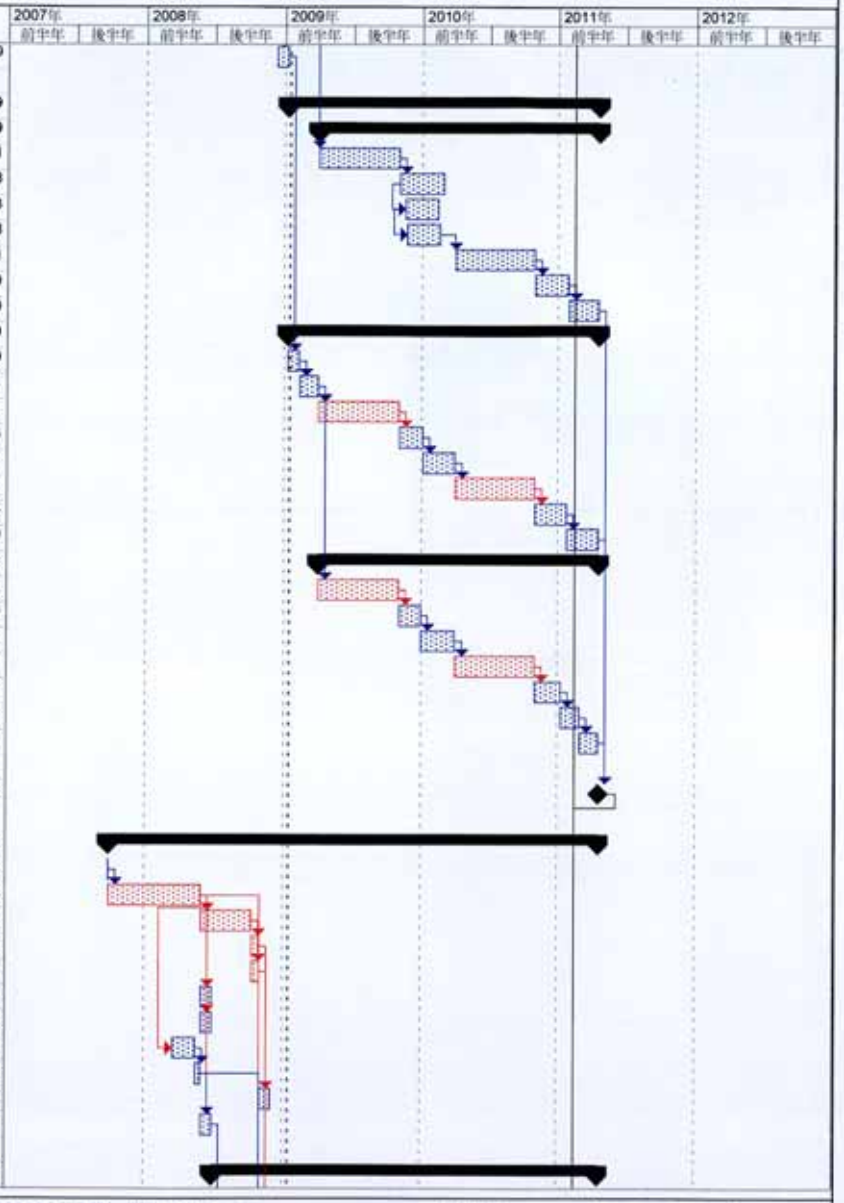
Project: Master Programme (REV.6)
Data Date: Jun 2008
Consultant: MCAL

Task | Task Progress | Critical Task | Critical Task Progress | Milestone | Summary | Rolled Up Task | Rolled Up Critical Task | Rolled Up Milestone | Rolled Up Progress | Split | External Tasks | Project Summary

Drainage Services Department

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

識別碼	Task Name	工期	最早開始時間	最早完成時間	開始時間	完成時間
699	Temp. Shoring Works	30 days	2008/12/11	2009/1/9	2008/12/11	2009/1/9
700						
701	**Chainage from CHL 250 to CHL 130**	**830 days**	**2009/1/10**	**2011/4/19**	**2009/1/10**	**2011/4/19**
702	**From CHL 250 to CHL 130**	**749 days**	**2009/4/1**	**2011/4/19**	**2009/4/1**	**2011/4/19**
703	Wet Season (April to Oct 2009)	214 days	2009/4/1	2009/10/31	2009/4/1	2009/10/31
704	Excavation	120 days	2009/11/1	2010/2/28	2009/11/1	2010/2/28
705	Rockfill & Blinding	90 days	2009/11/16	2010/2/13	2009/11/16	2010/2/13
706	Base Slab Structure	90 days	2009/11/21	2010/2/18	2009/11/21	2010/2/18
707	Wet Season (April to Oct 2010)	214 days	2010/4/1	2010/10/31	2010/4/1	2010/10/31
708	Wall Structure	90 days	2010/11/1	2011/1/29	2010/11/1	2011/1/29
709	Gabion Wall	80 days	2011/1/30	2011/4/19	2011/1/30	2011/4/19
710	**Footbridge, Platform and Cut/Fill Slope**	**830 days**	**2009/1/10**	**2011/4/19**	**2009/1/10**	**2011/4/19**
711	Demolition of existing structure	31 days	2009/1/10	2009/2/9	2009/1/10	2009/2/9
712	Footing for Footbridge (TB3)	50 days	2009/2/10	2009/3/31	2009/2/10	2009/3/31
713	Wet Season	214 days	2009/4/1	2009/10/31	2009/4/1	2009/10/31
714	Dwarf Wall	65 days	2009/11/1	2010/1/4	2009/11/1	2010/1/4
715	Footbridge (TB3)	86 days	2010/1/5	2010/3/31	2010/1/5	2010/3/31
716	Wet Season	214 days	2010/4/1	2010/10/31	2010/4/1	2010/10/31
717	Platform & Cut/Fill Slope & Maintenance Stairway	85 days	2010/11/1	2011/1/24	2010/11/1	2011/1/24
718	Footpaths	85 days	2011/1/25	2011/4/19	2011/1/25	2011/4/19
719	**Footbridge, Platform and Cut/Fill Slope**	**749 days**	**2009/4/1**	**2011/4/19**	**2009/4/1**	**2011/4/19**
720	Wet Season	214 days	2009/4/1	2009/10/31	2009/4/1	2009/10/31
721	Footing for Footbridge (TB2)	60 days	2009/11/1	2009/12/30	2009/11/1	2009/12/30
722	Dwarf Wall	91 days	2009/12/31	2010/3/31	2009/12/31	2010/3/31
723	Wet Season	214 days	2010/4/1	2010/10/31	2010/4/1	2010/10/31
724	Footbridge (TB2)	70 days	2010/11/1	2011/1/9	2010/11/1	2011/1/9
725	Platform & Cut/Fill Slope & Maintenance Stairway	50 days	2011/1/10	2011/2/28	2011/1/10	2011/2/28
726	Footpaths	50 days	2011/3/1	2011/4/19	2011/3/1	2011/4/19
727						
728	Completion of Area P	0 days	2011/4/19	2011/4/19	2011/4/19	2011/4/19
729						
730	**Section 3 - Upper Tai Po River (Area N)**	**1300 days**	**2007/9/28**	**2011/4/19**	**2007/9/28**	**2011/4/19**
731	Commencement of Work	1 day	2007/9/28	2007/9/28	2007/9/28	2007/9/28
732	Possession to Portion of the Site (Area N)	244 days	2007/9/29	2008/5/29	2007/9/29	2008/5/29
733	Temp. Site Access (XP/TTA)	135 days	2008/5/30	2008/10/11	2008/5/30	2008/10/11
734	Site Clearance	20 days	2008/10/12	2008/10/31	2008/10/12	2008/10/31
735	Chainlink Fencing Work	20 days	2008/10/12	2008/10/31	2008/10/12	2008/10/31
736	Initial Survey	30 days	2008/5/30	2008/6/28	2008/5/30	2008/6/28
737	Condition Surveys / Set up markers	30 days	2008/5/30	2008/6/28	2008/5/30	2008/6/28
738	Preparation of Temporary Works Design	60 days	2008/3/17	2008/5/15	2008/3/17	2008/5/15
739	Approval of Temporary Works Design	14 days	2008/5/16	2008/5/29	2008/5/16	2008/5/29
740	S.I. Works	30 days	2008/11/1	2008/11/30	2008/11/1	2008/11/30
741	Temp. Shoring Works	30 days	2008/5/30	2008/6/28	2008/5/30	2008/6/28
742						
743	**Chainage from CHL 230 to CHL 600**	**1025 days**	**2008/6/29**	**2011/4/19**	**2008/6/29**	**2011/4/19**



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Consultant: MCAL

Task | Task Progress | Critical Task | Critical Task Progress | Milestone | Summary | Rolled Up Task | Rolled Up Critical Task | Rolled Up Milestone | Rolled Up Progress | Split | External Tasks | Project Summary