

**Drainage Service Department**

**Monthly Environmental Monitoring & Auditing report for**

**Contract No.DC/2006/11**

**Drainage Improvement in Southern Lantau**

**October 2010**

**Environmental Pioneers & Solutions Limited**

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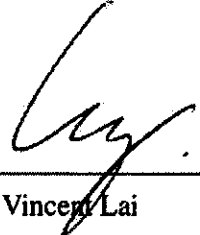
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## **EXECUTIVE SUMMARY**

This is the twenty-sixth monthly environmental Monitoring and audit (EM&A) report for “Drainage Improvement in Southern Lantau Investigation”. The environmental permit number is “EP-237/2005/B”. The report concludes the impact monitoring for the activities undertaken during the period of 1 October 2010 to 31 October 2010. The major activities in this reporting month include construction of fish ladder at Pak Ngan Heung (PNH) River, construction of inlet of Luk Tei Tong (LTT) bypass channel and provision of granite facing to concrete structures constructed.

Noise, water quality and ecological monitoring were performed. Results obtained were checked against the previously established Action / Limit (A/L) levels. Additionally, the implementation status of environmental mitigation measures, event / action plan and environmental complaint handling procedures were inspected during weekly site environmental audit.

In general, waste management was satisfactory during the reporting month.

Impact monitoring for construction noise was conducted in the reporting period. No exceedance of A/L level was reported.

Furthermore, impact monitoring for water quality was conducted. Total 22 non-compliance events of water quality criteria were recorded in this reporting period. No particular observation of defective site activities were found causing water contamination and such conditions were believed to be mainly attributed by natural fluctuation.

During ecological monitoring survey, no White-shouldered Starling was recorded breeding in the watch tower. There was no sign of disturbance from the Project to the watch tower. The watch tower may not be suitable for birds as nesting habitat. In addition, no disturbance on the flora and fauna in the river channels were observed during the ecological monitoring.

There was no complaint, notification of any summons and successful prosecutions against the project received during the reporting period.

Construction activities being carried out in this reporting period will be continued in the upcoming month. It is expected that noise, air and water quality impacts will be resulted from the works. With reference to the EM&A manual and mitigation measure report, mitigation measures are proposed to be taken, if necessary.

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

## **1. Introduction**

This is the twenty-sixth monthly Environmental Monitoring and Audit (EM&A) Report for “Drainage Improvement in Southern Lantau Investigation” project (Environmental Permit No. EP-237/2005/B)

## **2. Project Information**

### **2.1 Construction program**

The “Drainage Improvement in Southern Lantau Investigation” project will be completed by January 2011. The project comprises the following:

- Construction of approximately 80m long gabion with natural bed in Pak Ngan Heung River, approximately 180m of three cells 3m x 2m box culvert and approximately 100m of rectangular channel at Pak Ngan Heung River;
- Construction of approximately 250m of 0.75m wide U-Channel at Ling Tsui Tau Village in Mui Wo;
- Construction of bypass channel of about 350m and 240m long of gabion channels at Luk Tei Tong River respectively; and
- Widening three existing bottlenecks with gabion lined at Tai Tei Tong (TTT) River

Appendix A shows the construction program and location plan of the project.

## 2.2 Project organization

The Main Contractor, Yick Hing Construction Company Limited, has commissioned Environmental Pioneers & Solutions Limited and Ecosystems Limited as the Environmental Team, which comprises the environmental team leader, the ecologists and the environmental technicians to undertake the environmental monitoring and audit work for this project.

The environmental management structure and is shown in Fig 2.2.1.

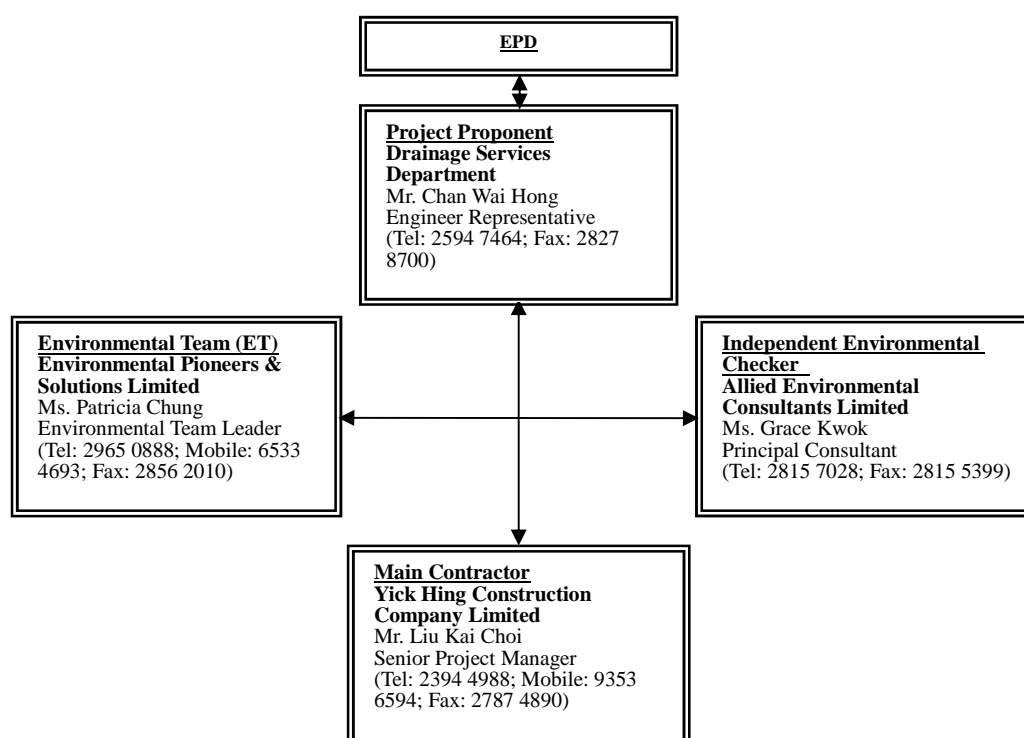


Figure. 2.2.1 Environmental Management structure for the project

## 2.3 Key personal contact information chart

Detailed contact of key persons involved in environmental aspect of the project is shown in Appendix B.



### **3. Construction Stage**

#### **3.1 Construction activities in the reporting month**

Major activities in the reporting month included the followings:

1. Construction of the inlet of LTT bypass channel.
2. Construction of gabion wall at PNH River, fish ladder section.
3. Construction of granite facing for concrete structures.

#### **3.2 Construction activities for the coming month**

Proposed key construction works in the coming month will include:

1. Construction of inlet of LTT bypass channel.
2. Construction of gabion wall at PNH River, fish ladder section.
3. Construction of surface channel at PNH, fish ladder section.
4. Construction of gabion wall at TTT River bottleneck A.
5. Landscaping works.

#### **3.3 Environmental Status**

Appendix A shows the drawing of the project area.

Locations of the monitoring and control stations with environmental sensitive receivers are presented in Section 4.3, 5.3 and 6.3 for noise, water and ecological monitoring respectively.

## 4. Noise Monitoring

### 4.1 Monitoring Parameters and Methodology

The construction noise level was measured in terms of the A-weighted equivalent continuous sound pressure level ( $L_{eq}$ ).  $L_{eq(30minutes)}$  was used as the monitoring parameter for the impact monitoring in the time period between 0700 to 1900 hours on normal weekdays. For all other time period,  $L_{eq(5minutes)}$  was employed for comparison with the Noise Control Ordinance (NCO) criteria.

Noise measurement results obtained from each monitoring location were recorded in the Construction Noise Monitoring Data Sheet (Appendix E) immediately after the measurement. As supplementary information for data auditing, statistical results  $L_{10}$  and  $L_{90}$  were also be recorded for reference.

In case of non-compliance with the construction noise criteria, more frequent monitoring, as specified in the Action plan in Table 4.5.2, shall be carried out. This additional monitoring shall be carried out until the recorded noise levels are rectified or proved to be irrelevant to the construction activities.

### 4.2 Monitoring Equipment

The sound level meters and calibrators comply with the International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1) specifications as referred to in the Technical Memorandum (TM) to the Noise Control Ordinance was deployed as monitoring equipment for noise measurement.

Noise measurement was not be made in the presence of fog, rain, wind with a steady speed exceeding  $5ms^{-1}$  or wind with gust exceeding  $10ms^{-1}$ . Thus wind speed was checked by the portable wind speed indicator capable of measuring the wind speed in m/s. Table 4.2.1 summarizes the equipment list for noise monitoring

Table 4.2.1 Equipment List for Noise Monitoring

Equipment	Manufacturer & Model No.	Precision Grade	Qty
Integrated sound level meter	ACO Japan, model 6224	IEC 651 Type 1 IEC 804 Type 1	1
Windscreen	Microtech gefell model W2	N/A	1
Acoustical calibrator	Castle GA607	IEC 942 Type 1	1
Wind speed indicator	Kestrel K1000	N/A	1
Remarks: Calibration details for the sound level meter is given in Appendix C for reference			

### 4.3 Monitoring Locations

According to the Baseline Monitoring Report issued in May 2008 for the captioned project, four locations were alternative from the locations proposed in EM&A manual, were designated for baseline noise monitoring. For the data validation, impact noise monitoring was undertaken in the same locations during the construction phase of the project. The proposed monitoring locations are summarized in Table 4.3.1. Figure 4.3.1 shows the Noise Monitoring Locations

Noise measurement in each monitoring locations were taken at a point 1m from the exterior of the selected premises and at a height with no disturbance to the dweller and least obstructed view.

Table 4.3.1 Noise Monitoring Locations during Construction Phase

Identification No.	Noise Monitoring Locations
N1	No. 73, Village House, Ling Tsui Tau Tsuen (ground level)
N2	No. 31, Village House, Ling Tsui Tau Tsuen (ground level)
N3	Fence wall outside No. 5 village house adjacent to Luk Tei Tong River Outlet (ground level)
N4	No. 23, Village House, Tai Tei Tong River (ground level)

In accordance with the requirements in the EM&A manual, weekly impact monitoring was conducted. For the time period between 0700 and 1900 hours on normal weekdays, and noise parameter of  $L_{eq(30minutes)}$  was measured. As if the construction works were carried out during restricted period (ie. 1900-2300, 2300-0700 of next day and Sundays / general holiday), impact monitoring that comprises 3 consecutive  $L_{eq(5minutes)}$  would be carried out.

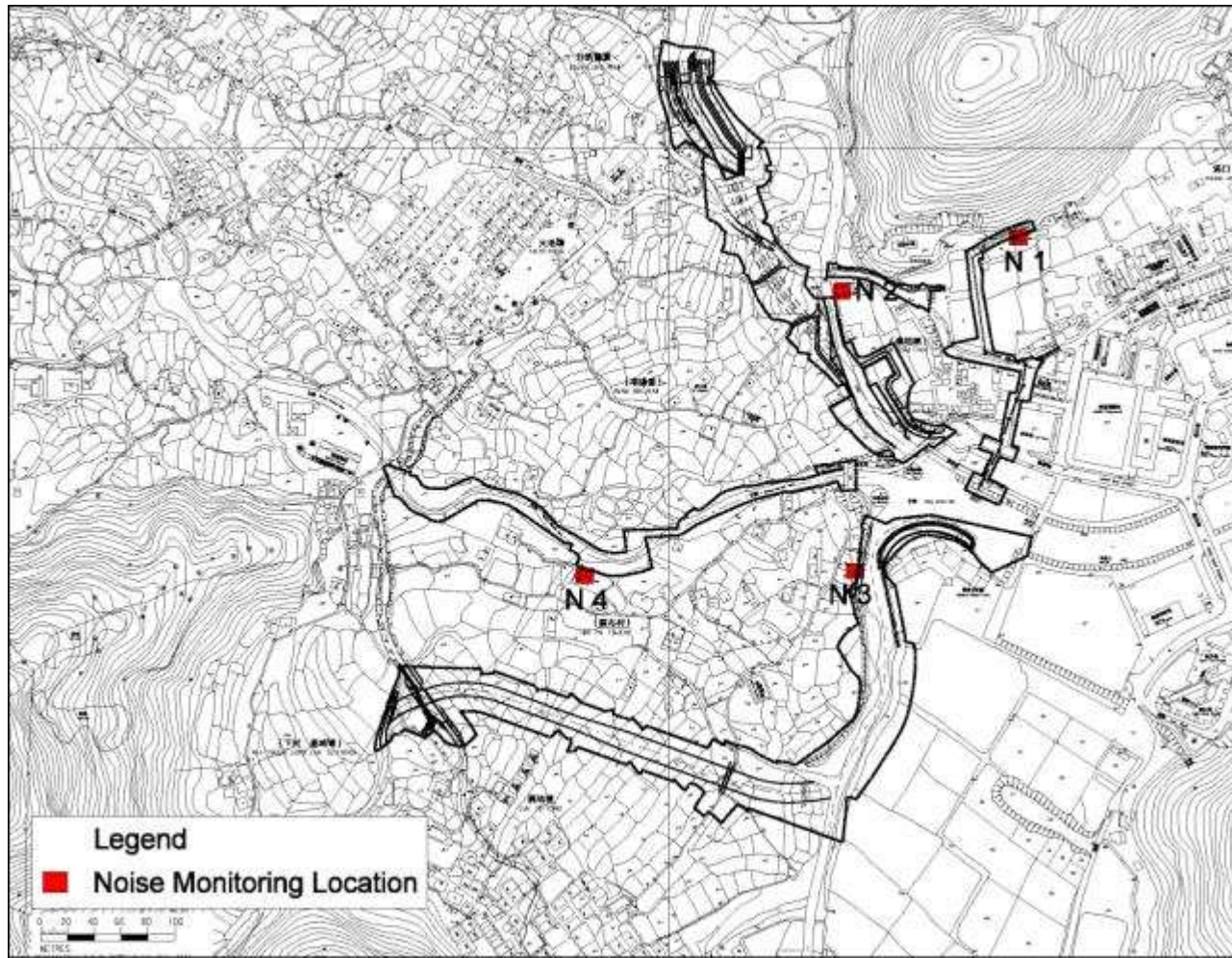


Figure 4.3.1 Impact noise monitoring locations

#### 4.4 Monitoring Results and Interpretation

Relevant details of the noise monitoring results are presented in Table 4.4.1. The results, ranged between 46.2 dB(A) and 60.7 dB(A), were within the limit levels and therefore, no exceedance was found.

Table 4.4.1 Noise monitoring results

Table 4.4.1 Noise Monitoring Results for the reporting month							
Location	Parameter	Date	Time	L <sub>Aeq</sub> dB(A)	Limit dB(A)	Exceedance	Weather
N1	L <sub>eq</sub> 30mins	4-Oct-10	15:50	60.7	75	N	Cloudy
N1	L <sub>eq</sub> 30mins	11-Oct-10	12:15	51.5	75	N	Cloudy
N1	L <sub>eq</sub> 30mins	18-Oct-10	14:35	52.3	75	N	Sunny
N1	L <sub>eq</sub> 30mins	25-Oct-10	12:45	54.7	75	N	Sunny
N2	L <sub>eq</sub> 30mins	4-Oct-10	15:16	46.2	75	N	Cloudy
N2	L <sub>eq</sub> 30mins	11-Oct-10	11:40	50.9	75	N	Cloudy
N2	L <sub>eq</sub> 30mins	18-Oct-10	14:00	49.3	75	N	Sunny
N2	L <sub>eq</sub> 30mins	25-Oct-10	12:10	44.7	75	N	Sunny
N3*	L <sub>eq</sub> 30mins	4-Oct-10	14:45	53.5	75	N	Cloudy
N3*	L <sub>eq</sub> 30mins	11-Oct-10	13:25	47.4	75	N	Cloudy
N3*	L <sub>eq</sub> 30mins	18-Oct-10	13:25	56.6	75	N	Sunny
N3*	L <sub>eq</sub> 30mins	25-Oct-10	11:35	50.5	75	N	Sunny
N4	L <sub>eq</sub> 30mins	4-Oct-10	14:10	50.3	75	N	Cloudy
N4	L <sub>eq</sub> 30mins	11-Oct-10	12:50	50.3	75	N	Cloudy
N4	L <sub>eq</sub> 30mins	18-Oct-10	12:50	48.9	75	N	Sunny
N4	L <sub>eq</sub> 30mins	25-Oct-10	10:55	56.3	75	N	Sunny

Remarks: Raw datasheet for noise monitoring are attached in Appendix E for reference.

Remark\*: The equivalent noise level of N3 is corrected by +3 dB from the raw data result due to the fact that free field measurement was carried out in the location.

#### 4.5 Action and Limit level for Construction noise

The Action and Limit (A/L) levels for construction noise are defined in Table 4.5.1. Should non-compliance of the criteria occur, action in accordance with the Action Plan in Table 4.5.2 should be carried out.

There was no exceedance recorded in the reporting month.

Table 4.5.1 Action and Limit Levels for Construction noise		
Time Period	Action Level	Limit Level
0700 – 1900 hours on normal weekdays	When one documented complaint is received	75dB(A)
Remarks: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.		

Table 4.5.2 Event / Action Plan for Construction Noise

EVENT	ACTION			
	ET	IC(E)	ER	Contractor
Action Level	<ol style="list-style-type: none"> <li>1. Notify IC(E) and Contractor;</li> <li>2. Carry out investigation;</li> <li>3. Report the results of investigation to the IC(E), ER and Contractor;</li> <li>4. Discuss with the Contractor and formulate remedial measures;</li> <li>5. Increase monitoring frequency to check mitigation effectiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the analysed results submitted by the ET;</li> <li>2. Review the proposed remedial measures by the Contractor and advise ER accordingly;</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem;</li> <li>4. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to IC(E);</li> <li>2. Implement Noise mitigation proposals.</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Identify source;</li> <li>2. Inform IC(E), ER, EPD and Contractor;</li> <li>3. Repeat measurements to confirm findings;</li> <li>4. Increase monitoring frequency;</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>6. Inform IC(E), ER and EPD the causes and actions taken for the exceedances;</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results</li> <li>8. If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem;</li> <li>4. Ensure remedial measures properly implemented;</li> <li>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to IC(E) within 3 working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Resubmit proposals if problem still not under control;</li> <li>5. Stop the relevant portion of works as determined by the ER until the exceedance is abated</li> </ol>

#### **4.6 Noise Mitigation Measures**

The following mitigation measures were observed from the weekly site inspection in the reporting month:

- Use of quiet powered mechanical equipment (PME)
- Implementation of the following good site practices:
  - Only well-maintained and regularly serviced plant should be operated on site;
  - Silencers or mufflers on construction equipment;
  - Mobile plant, if any, should be sited as far from noise sensitive receivers as possible; and
  - Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.

## **5. Water Monitoring**

### **5.1 Water Quality Monitoring Parameters and methodology**

Turbidity in Nephelometric Turbidity Unit (NTU), Dissolved Oxygen (DO) in mg/L and Suspended Solids (SS) in mg/L are required to measure in this project. Turbidity, DO was measured in-situ while water samples were delivered to Accredited HOKLAS Laboratory for analysis of SS.

Other relevant data such as monitoring location, time, water depth, temperature, salinity, weather conditions and any other special phenomena and work underway at the construction site were recorded during sampling.

According to the requirement of the EM&A manual, two consecutive measurements for parameters of DO concentration, DO saturation and Turbidity are required to be taken at each monitoring location. When the difference in value between the first and second reading of DO or Turbidity is more than 25%, the reading would be discarded and further reading would be taken.

### **5.2 Monitoring Equipment**

Turbidity, DO, Salinity, pH and temperature was measured by an instrument complied with the following requirements:

The instrument is a portable as well as weatherproof multimeter complete with cable and uses a DC power source. It is capable of measuring:

- A turbidity between 0-800NTU;
- A dissolved Oxygen level in the range of 0-20mg/L and 0-200% saturation;
- A temperature of 0-50°C;
- Salinity in the range of 0-40ppt;
- pH in the range of 0-14.

Suspended solid was determined by the water samples collected from the monitoring locations for further analysis in accredited HOKLAS laboratory. Water samples were contained by polythene bottles, packed in ice (cooled in 4°C without frozen) and delivered to the laboratory for analysis as soon as possible after collection. Duplicate samples from each independent sampling event were undertaken during impact monitoring.

Detailed calibration records of the multimeter were shown in Appendix C for reference.



### **5.3 Monitoring Locations**

Seven locations included a control station in upstream of each stream/ river, a monitoring station at the end of each stream/ river of the works area and a monitoring station at Silver River were proposed for the impact water quality monitoring. Water samples were collected at mid-depth of each proposed monitoring stations for measurements and sample collection. The Location Plan is shown in Figure 5.3.1 for reference.

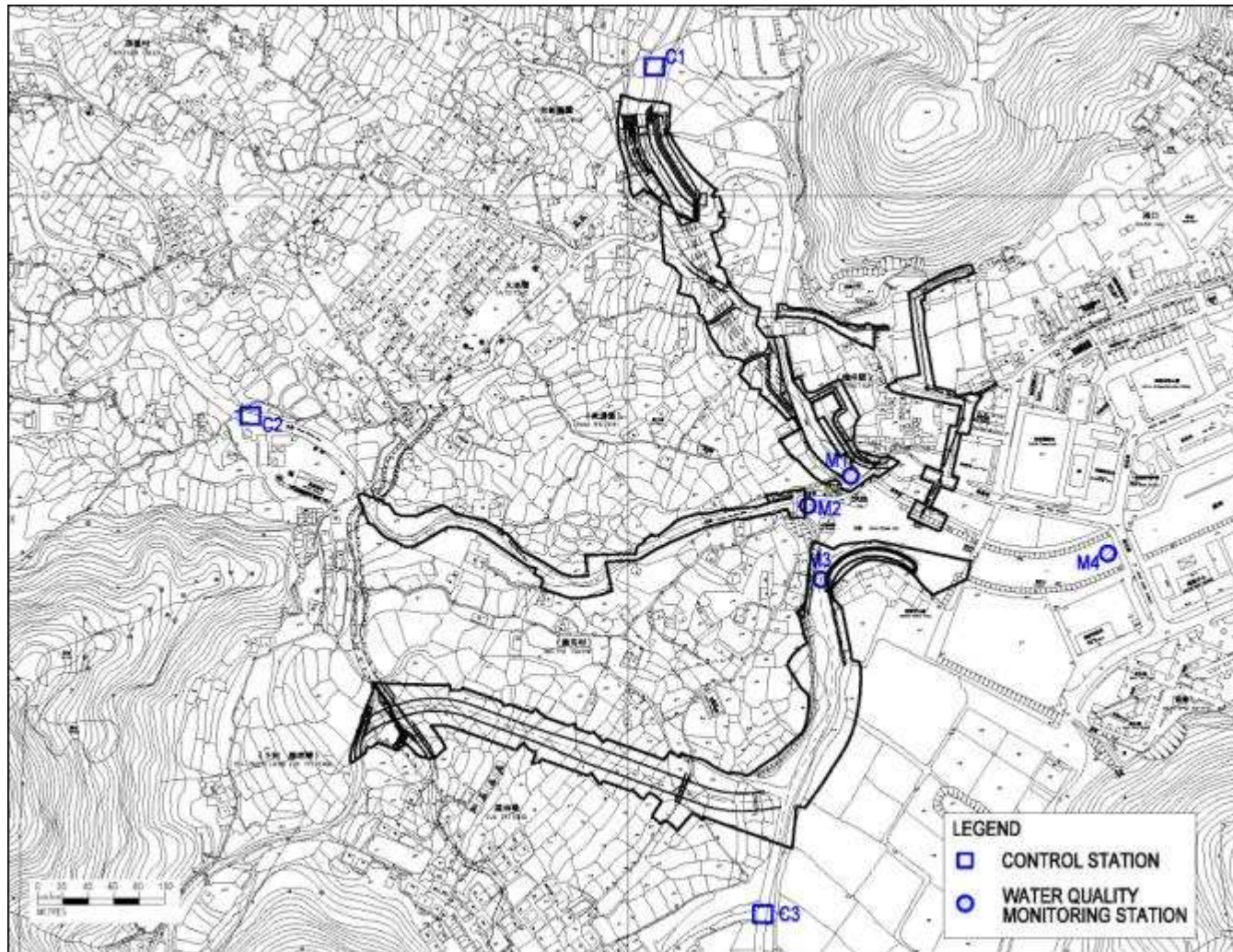


Figure 5.3.1 Water Quality Monitoring Locations

#### **5.4 Monitoring Frequency**

Impact water quality monitoring was undertaken three days per week and at ebb tides during the course of the construction river works. Upon the completion of the construction works, the monitoring exercises at the designated monitoring stations will be continued for four weeks in the same manner as the impact monitoring.

#### **5.5 Monitoring Results and Interpretation**

Water quality monitoring was carried out fifteen times in this reporting month. Detailed on-site measurements and laboratory analysis reports including QA/QC results are shown in Appendix F1 and F2 respectively, while Table 5.5.1 presents consolidated results throughout the reporting month.

Total 22 non-compliance events of water quality limits (Turbidity and Suspended Solids) were recorded in this reporting month according to the established level. ET has arranged site investigations for the exceedance events. No particular observations of defective site activities were found causing the exceedance and such conditions were believed to be attributed by natural fluctuation.

Detailed information of the exceedance events and action taken were presented in Section 7.

Table 5.5.1 Water quality monitoring results in October 2010

	M1			M2			M3			M4		
	MIN	MAX	Ave	MIN	MAX	Ave	MIN	MAX	Ave	MIN	MAX	Ave
Turbidity (NTU)	0.0	7.1	1.0	0.0	0.0	0.0	0.0	12.5	2.8	0.0	10.3	1.9
DO (mg/l)	8.5	10.2	9.0	8.2	9.7	8.8	6.1	10.1	8.5	6.6	10.4	8.6
Suspended Solid (mg/l)	1.3	5.5	3.1	1.0	3.1	1.8	1.2	8.5	4.7	2.9	11.0	4.6

	C1			C2			C3		
	MIN	MAX	Ave	MIN	MAX	Ave	MIN	MAX	Ave
Turbidity (NTU)	0.0	1.4	0.3	0.0	1.8	0.4	2.4	13.8	6.8
DO (mg/l)	8.1	9.9	8.8	8.1	9.7	8.7	7.4	8.8	7.9
Suspended Solid (mg/l)	1.0	3.9	1.8	1.0	2.9	1.5	4.6	12.8	7.2

\* Remarks: Detection limit for Turbidity, DO and SS are 1 NTU, 0.1 mg/L and 1 mg/L respectively.

## 5.6 Action and limit level for Water Quality

Based on the criteria stipulated in EM&A manual Section 4.8 and baseline water quality monitoring data obtained, the A/L levels are shown in Table 5.6.1 and Table 5.6.2. If the water quality monitoring results at any impact stations exceeded the criteria, the actions in accordance with the Event and Action Plan in Table 5.6.3 should be taken.

Table 5.6.1 Water quality criteria for monitoring

Parameters	Action	Limit
DO in mg/L (mid-depth)	- 5%-ile of baseline data	- 4mg/L
SS in mg/L (mid-depth)	- 95%-ile of baseline data; or - 120% of control station's SS on the same day of measurement	- 99%-ile of baseline; or - 130% of control station's SS on the same day of measurement
Turbidity in NTU (mid-depth)	- 95%-ile of baseline data; or - 120% of control station's turbidity on the same day of measurement	- 99%-ile of baseline; or - 130% of control station's turbidity on the same day of measurement

Table 5.6.2 Action and Limit Levels established according to baseline data

Parameters	Monitoring locations							
	M1		M2		M3		M4	
	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level
Turbidity (NTU)	15.2	16.9	5.3	6.5	16.8	26.0	16.2	18.0
DO (mg/L)	5.7	4.0	6.2	4.0	5.9	4.0	5.9	4.0
SS (mg/L)	12.2	12.8	3.1	4.2	12.4	17.7	13.9	15.2

Remarks:

For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits

For SS and turbidity, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

Table 5.6.3 Event and action Plan for Water Quality

EVENT	ACTION			
	ET	IC(E)	ER	Contractor
Action Level being exceed by one sampling day	<ol style="list-style-type: none"> <li>1. Repeat in <i>situ</i> measurement to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform IC(E) and Contractor;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Discuss mitigation measures with IC(E) and Contractor;</li> <li>6. Repeat measurement on next day of exceedance.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with ET and Contractor on the mitigation measures;</li> <li>2. Review proposals in mitigation measures submitted by Contractor and advise the ER accordingly;</li> <li>3. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with IC(E) on the proposed mitigation measures;</li> <li>2. make agreement on the mitigation measures to be implemented;</li> <li>3. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the ER and confirm notification of the non-compliance in writing;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes of working methods;</li> <li>5. Discuss with ET and IC(E) and propose mitigation measures to IC(E) and ER;</li> <li>6. Implement the agreed mitigation measures.</li> </ol>
Action level being exceed by more than two consecutive sampling days	<ol style="list-style-type: none"> <li>1. Repeat in <i>situ</i> measurement to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform IC(E) and Contractor;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Discuss mitigation measures with IC(E) and Contractor;</li> <li>6. Ensure mitigation measures are implemented; prepare to increase the monitoring frequency to daily</li> <li>7. Repeat measurement on next day of exceedance</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with ET and Contractor on the mitigation measures;</li> <li>2. Review proposals in mitigation measures submitted by Contractor and advise the ER accordingly;</li> <li>3. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with IC(E) on the proposed mitigation measures;</li> <li>2. make agreement on the mitigation measures to be implemented;</li> <li>3. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the ER and confirm notification of the non-compliance in writing;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes of working methods;</li> <li>5. Discuss with ET and IC(E) and propose mitigation measures to IC(E) and ER within three working days;</li> <li>6. Implement the agreed mitigation measures.</li> </ol>
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>1. Repeat in <i>situ</i> measurement to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform IC(E) and Contractor;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Discuss mitigation measures with IC(E) and Contractor;</li> <li>6. Ensure mitigation measures are implemented;</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit Level</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with ET and Contractor on the mitigation measures;</li> <li>2. Review proposals in mitigation measures submitted by Contractor and advise the ER accordingly;</li> <li>3. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with IC(E) on the proposed mitigation measures;</li> <li>2. make agreement on the mitigation measures to be implemented;</li> <li>3. Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the ER and confirm notification of the non-compliance in writing;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes of working methods;</li> <li>5. Discuss with ET and IC(E) and propose mitigation measures to IC(E) and ER;</li> <li>6. Implement the agreed mitigation measures.</li> </ol>

## **5.7 Water Quality Mitigation Measures**

### **Construction Run-off and Drainage**

The site practices outlined in ProPECC PN 1/94 ‘Construction Site Drainage’ should be followed as far as practicable during both construction and operation phase of the drainage improvement works in order to minimize surface runoff and the chance of erosion, and also to retain and reduce any suspended solids prior to discharge.

As recommended in the final EM&A manual, attention would be paid especially construction run-off and drainage, general construction activities, sewage discharged from construction workforce and river channel excavation works.

Contractor was recommended to provide sufficient water treatment facilities for accumulated site water and excavation activities carried out nearby river channel. Earth bunds should be provided to the construction site in / next to the river channel to form an enclosed, dry environment to minimize water quality impact.

## **5.8 Water Monitoring Schedule for the Next reporting period**

Water monitoring scheduled for the next reporting period are 2, 3, 5, 8, 10, 11, 17, 18, 19, 22, 24, 26 and 29 November 2010.

## **6. Ecology Monitoring**

### **6.1 Ecological Monitoring Parameters**

According to the Final EM&A Manual, a specific ecological monitoring programme of the improved section of PNH and LTT Rivers is recommended. The monitoring parameters required to measure in this project and survey methodology are described below:

- (1) Avifauna species and abundance: Birds will be surveyed quantitatively using transect count method. Birds within the river channel and on the riverbank will be identified and their abundance will be recorded.
- (2) Aquatic macroinvertebrate community species composition and abundance: Survey on aquatic fauna will focus on determination of the diversity and abundance of stream aquatic communities. Sampling methods, such as active searching, direct observation, netting, and kick sampling, will be determined according to the site conditions during field survey.
- (3) Fish community species composition and abundance: Sampling methods, such as active searching, direct observation, and hand netting, will be determined according to the site conditions during field survey.
- (4) Adult odonate community species composition and abundance: Adult dragonfly will be surveyed quantitatively using transect count method. Adult dragonflies within the river channel and on the riverbank will be identified and their abundance will be recorded. Species requiring close examination will be netted.
- (5) Aquatic, emergent and riparian vegetation community species composition and abundance: The area will be walked through. Plant species composition and their relative abundance will be recorded.
- (6) Surveys of White-shouldered Starling *Sturnus sinensis* will be conducted at the disused watchtowers next to LTT river. Breeding of the White-shouldered Starlings will be determined by checking signs of attempt to breed or sign of breeding which include carrying nesting materials, to-and-fro movement of adults carrying food, presence of recently fledged juveniles, etc. The number of breeding pairs and the site observation will be recorded whenever possible.



Water Quality Monitoring along LTT and PNH River as well as LTT bypass channel was carried out. Water quality monitoring will include Turbidity in Nephelometric Turbidity Unit (NTU), Dissolved Oxygen (DO) in mg/L and Suspended Solids (SS) in mg/L are required to measure in this project. Moreover, additional water monitoring parameters will be taken for the purposes of ecological monitoring of water quality in this project. The added information will include: BOD, Ammonia, Nitrate and Phosphate concentrations. Turbidity, DO, pH and water flow will be measured in-situ while water samples will be delivered to Accredited HOKLAS Laboratory accredited laboratory and the analyses followed the standard methods according to APHA Standard Methods for the Examination of Water and Wastewater, 20<sup>th</sup> Edition, or equivalent for analysis of SS, BOD, Ammonia, Nitrate and Phosphate concentrations.

Other relevant data such as monitoring location, time, water depth, temperature, salinity, weather conditions and any other special phenomena and work underway at the construction site will be recorded during sampling.

According to the requirement of the EM&A manual, two consecutive measurements for parameters of DO concentration, DO saturation and Turbidity are required to be taken at each monitoring. When the difference in value between the first and second reading of DO or Turbidity is more than 25%, the reading will be discarded and further reading will be taken.

## **6.2 Monitoring Equipment and Methodology**

Turbidity, DO, Salinity, pH and Temperature will be measured by a instrument complied with the following requirements:

The instrument is a portable as well as weatherproof multimeter complete with cable and uses a DC power source. It is capable of measuring:

- A turbidity between 0-800NTU;
- A dissolved Oxygen level in the range of 0-20mg/L and 0-200% saturation;
- A temperature of 0-50°C;
- Salinity in the range of 0-40ppt;
- pH in the range of 0-14.

Suspended solid was determined by the water samples collected from the

monitoring locations for further analysis in accredited HOKLAS laboratory. Water samples were contained by polythene bottles, packed in ice (cooled in 4°C without frozen) and delivered to the laboratory for analysis as soon as possible after collection. Duplicate samples from each independent sampling event were undertaken during impact monitoring.

### **6.3 Monitoring Locations**

According to the Final EM&A Manual, the improved section of the river channels will be divided into 50m long sections, and ecological survey will be carried out in each of the 50m sections. A total of nine sections will be divided for the two rivers which include:

- Two sections for existing upstream of PNH river (i.e. the proposed 80m long trapezoidal channel)
- Two sections for existing downstream of PNH river (i.e. the proposed 100m long rectangular channel)
- Five sections for existing Luk Tei Tong River (i.e. the proposed 240m long trapezoidal channel)

The disused watchtowers are located at the confluence of the three rivers and next to LTT river.

The Location Plan for ecological is shown in Figure 6.1 for reference.

The improved sections of the river channels require to carrying out water quality monitoring for the ecological purpose. The sampling points for impact monitoring was undertaken in the same place as the baseline monitoring proposed, where include:

- Three points for existing of PNH river
- Three points for existing of Luk Tei Tong River

The Location Plan for ecological water monitoring is shown in Figure 6.2 for reference.

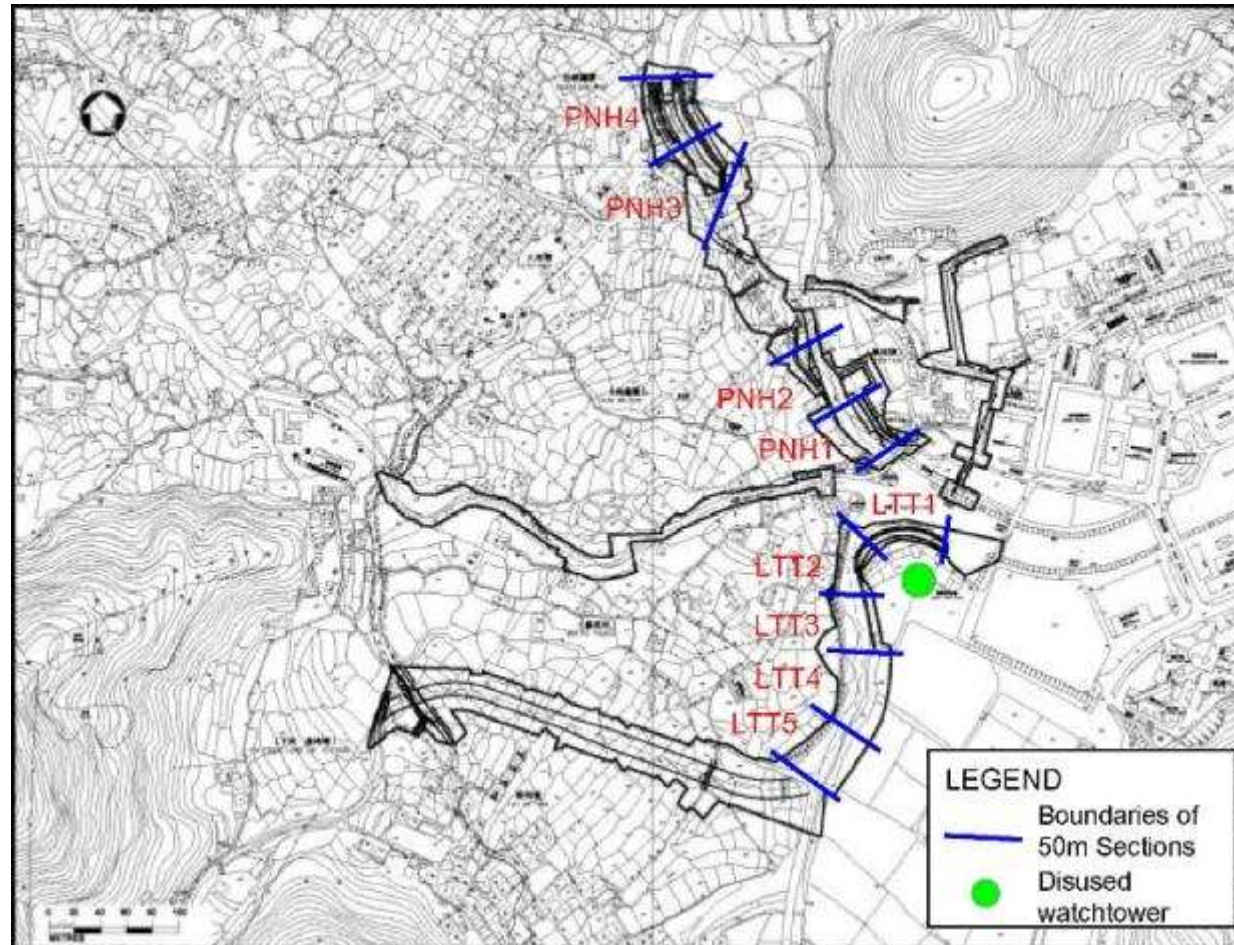


Figure 6.1 Ecological Monitoring Locations

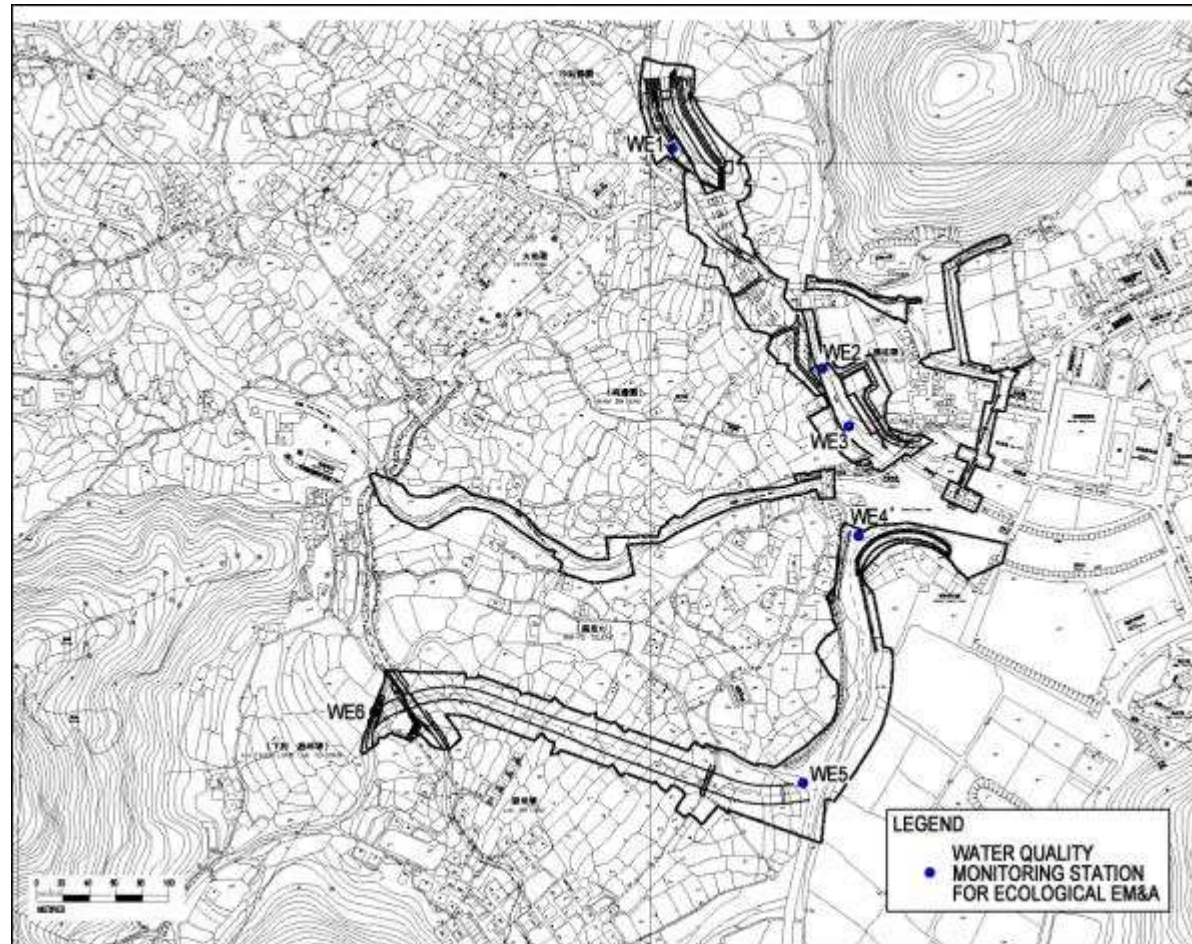


Figure 6.2 Ecological Water Quality monitoring locations

## **6.4 Monitoring Frequency**

As proposed, ecological impact monitoring was carried out once for each monitoring location in the reporting month.

## **6.5 Monitoring results**

### **Pak Ngan Heung Stream N and S sections**

#### **Vegetation**

Surveys were conducted on 27 October 2010. During the current monitoring session, new rock gabion wall was under construction. Stream bank and stream bed of PNH3 was completely cleared. Stream bank of PNH4 was mostly cleared and the old weir and associated vegetation was removed as part of the site clearance works under the project.

During the current monitoring session, construction work is almost completed along PNH N section. The walk through survey recorded a total of 27 species, including 13 trees, 5 herb and 3 grass species (Appendix D1) on PNH N section. 19 of the species recorded are natives, while 8 were exotics. Remnants of vegetation including native trees (e.g. *Macaranga tanarius*) and grasses species (e.g. *Microstegium ciliatum*) were still seen along the east stream bank. No species of conservation interest was recorded. No quantitative surveys were carried out on both PNH3 and PNH4 due to vegetation clearance and construction works on stream banks as part of the site clearance works under the project.

During the current monitoring session, construction work is almost completed along PNH S section. Vegetation was only found on remnants of the old concrete bank. A total of 5 species recorded, 3 of which were native and 2 were exotic. It was composed of isolated individuals of mangrove (*Kandelia obovata*), exotic shrub (*Lantana camara*) and native trees (*Ficus supbera*) (Appendix D2). No species of conservation interest was recorded.

### ***Terrestrial Fauna***

Surveys were conducted on 29 October 2010.

Three species of birds were recorded in the proposed work area of the Pak Ngan Heung River (Table 6.5.2). All are common in Hong Kong.

**Table 6.5.2 Avifauna in Pak Ngan Heung**

Common names	Latin names	PNH 1	PNH 2	PNH 3	PNH 4	Commonness & distribution
Chinese Bulbul	<i>Pycnonotus sinensis</i>			2		CW
Yellow-browed	<i>Phylloscopus borealis</i>				1	CW
Japanese White-eye	<i>Zosterops japonica</i>				6	CW

CW = common and widespread

Two species dragonfly was recorded in the proposed work area of the Pak Ngan Heung River (Table 6.5.3) in September 2010. Both are common in Hong Kong.

**Table 6.5.3 Dragonfly in Pak Ngan Heung River**

Common names	Latin names	PNH 1	PNH 2	PNH 3	PNH 4	Commonness & distribution
Green Skimmer	<i>Orthetrum sabina</i>				2	C
Wandering Glider	<i>Pantala flavescens</i>	12			25	A

A = abundant

### ***Aquatic fauna and fish***

The major construction works for the fish ladder inside PNH3 have been finished, and the flow in this section was restored. Therefore the PNH 3 was covered by the present monitoring again. 7 species of fish and 2 crustacean were recorded in the 4 sections at PNH. All are common and widespread in Hong Kong. Though Predaceous Chub was observed, the another one fish species of conservation concern reported in the EIA report, i.e. Flagtail *Kuhlia marginata*, was not recorded in PNH during the present monthly monitoring survey. Predaceous Chub was recorded in the recently finished fish ladder and

it demonstrated that the design of the fish ladder could provide habitat for stream fish.

**Table 6.5.4 Aquatic Invertebrates and fish in Pak Ngan Heung**

Common names	Scientific names	PNH 1	PNH 2	PNH3	PNH4
<b>Invertebrates</b>					
Atyid shrimp	<i>Caridina elongata</i>				++
Palaemond shrimp	<i>Macrobrachium hainanensis</i>			+	+
Crab	<i>Varuna litterata</i>				
Mitten Crab	<i>Eriocheir japonica</i>				
<b>Fish</b>					
Mosquito fish	<i>Gamusia affinis</i>				+
Goby	<i>Rhinogobius duospilus</i>				
Barcheek Goby	<i>Rhinogobius giurinus</i>				
Swordtail	<i>Xiphophorus hellerii</i>				
Six-banded Barb	<i>Puntius semifasciolatus</i>				+
Unidentified Cichlid fish			+		
Tilapia		+	+++		
Predaceous Chub	<i>Parazacco spilurus</i>			++	+
Jarboa Terapon	<i>Terapon jarbua</i>	++	+		
Common Silver-biddy	<i>Gerres oyena</i>				
Mullet	<i>Mugil cephalus</i>	+	+++		
Broken-band Hillstream Loach	<i>Liniparhomaloptera disparis</i>				

+ = Occasional, less than 5 individuals were found; ++ = Common, 5 – 20 individuals were found; +++ = Abundant, more than 20 individuals were found.

## **Luk Tei Tong Stream Section**

### **Vegetation**

Surveys were conducted on 27 October 2010. During the current survey, construction of concrete channel bank and rock gabions are completed. Some remnants of vegetation and mangroves remained at both LLT1 and LLT2 respectively.

The walk through survey recorded a total of 20 species, including 7 tree, 4 herb and 7 grass species (Appendix D3). 13 species recorded are natives, while 7 were exotics. No quantitative survey was carried out due to vegetation clearance on stream banks as part of the site clearance works under the project.

### ***Terrestrial Fauna***

The proposed work area of Luk Tei Tong River was divided into 5 sections. All recorded avifauna and dragonfly species are common in Hong Kong

Surveys were conducted on 29 October 2010.

A total of four species of birds were recorded in these sections (Table 6.5.6). All are common in Hong Kong.



**Table 6.5.6 Avifauna in Luk Tei Tong River**

Common names	Latin names	LTT	LTT	LTT	LTT	LTT	Commonness & distribution
		1	2	3	4	5	
Little Egret	<i>Egretta garzetta</i>	2					CW
Common Sandpiper	<i>Actitis hypoleucos</i>	2					CW
Chinese Bulbul	<i>Pycnonotus sinensis</i>				2	4	CW
Rufous-backed Shrike	<i>Lanius schach</i>			1			CW

CW = common and widespread,

Two species of dragonfly were recorded in the Luk Tei Tong River in September 2010 (Table 6.5.7). Both are common in Hong Kong (Wilson 2004).

**Table 6.5.7 Dragonfly in Luk Tei Tong River**

Common names	Latin names	LTT	LTT	LTT	LTT	LTT	Commonness & distribution
		1	2	3	4	5	
Green Skimmer	<i>Orthetrum sabina</i>				2		C
Wandering Glider	<i>Pantala flavescens</i>	19			12	16	A

A = abundant, C = common

#### **Aquatic invertebrates and fish**

4 species of fish, and 4 species of mollusks were recorded in the 5 sections at LTT. All are common and widespread in Hong Kong. The two fish species of conservation concern reported in the EIA report, i.e. Flagtail *Kuhlia marginata* and Predaceous Chub *Parazacco spilurus* were not recorded in LTT during the present monitoring as well as the baseline monitoring survey.

**Table 6.5.8 Aquatic invertebrates and fish in Luk Tei Tong River**

Common names	Scientific names	LTT1	LTT2	LTT3	LTT4	LTT5
<b>Invertebrates</b>						
Mangrove clam	<i>Geloina erosa</i>					
Rock oyster	<i>Saccostrea cuculata</i>	++	++			
Snail	<i>Melanoides tuberculata</i>				+++	+++
Snail	<i>Terebralia</i> sp.					
Snail	<i>Nerita</i> sp.	+	+		+	
Snail	<i>Littoraria articulata</i>	+	+			
Crab	<i>Varuna litterata</i>					
Fiddler crab	<i>Uca lactea</i>					
Fiddler crab	<i>Uca arcuata</i>					
Fiddler crab	<i>Uca crassipes</i>					
Crab	<i>Perisesarma bidens</i>					
Mangrove mud crab	<i>Scylla paramamosain</i>					
Mitten crab	<i>Eriocheir japonica</i>					
<b>Fish</b>						
Common mudskipper	<i>Periophthalmus cantonensis</i>					
Tilapia		++	++	++		
Jarboa terapon	<i>Terapon jarbua</i>			+		
Mullet	<i>Mugil cephalus</i>	++	+++	+++		
Common Silver-biddy	<i>Gerres oyena</i>					
Barcheek Goby	<i>Rhinogobius giurinus</i>				+	

+ = Occasional, less than 5 individuals were found; ++ = Common, 5 – 20 individuals were found; +++ = Abundant, more than 20 individuals were found.

### **Disused Watchtowers**

Surveys were conducted on 29 October 2010.

There was no sign (e.g., adults carrying food or nesting materials) of use of the watchtower as nesting habitat by White-shouldered Starling.

White-shouldered Starling was not observed during the October 2010 monitoring. No bird of other species was observed entering the watchtower.

Since the monitoring surveys commenced in August 2008, no bird was observed entering the watchtower. It seems the birds do not prefer the watchtower as nesting habitat.

### **Ecological Water Quality Monitoring (EWQM)**

EWQM was conducted on 6 October 2010. Monitoring results are summarized in Table 6.9. Detailed on-site measurements and laboratory report are presented in Appendix D4 and D5.

Table 6.10 shows the baseline results of Ecological Water Quality Monitoring, from the information given in Baseline Monitoring Report.

To review the results in Table 6.9 in general, the measured results of Suspended Solids and Turbidity measured at WE5 and WE6 at LTT River were higher than the results taken at baseline monitoring shown in Table 6.10. Such condition was believed to be caused by construction of inlet of LTT bypass channel and contractor was advised to implement corrective actions as soon as possible.

**Table 6.9 Summarized Ecological water quality monitoring results (6 October 2010)**

Parameters	Limit of detection	WE1	WE2	WE3	WE4	WE5	WE6
Suspended Solid (mg/l)	1	2.65	3.90	4.85	5.50	17.50	57.70
Nitrogen (Ammonia) (mg/l)	0.01	0.06	0.06	0.38	0.19	0.55	0.04
Nitrogen (Nitrate) (mg/l)	0.01	0.18	0.24	0.22	0.24	0.20	0.15
Phosphorous (mg/l)	0.01	0.04	0.04	0.06	0.06	0.10	0.06
BOD <sub>5</sub> (mg/l)	1	1.00	1.00	1.00	1.00	1.00	1.00
DO (mg/l)	0.01	8.79	7.89	8.52	6.08	7.49	8.75
Turbidity (NTU)	0.1	0.05	0.00	0.00	0.00	14.50	64.10
Temperature (oC)	0.1	24.0	24.4	24.8	26.0	26.0	24.8
pH	0.01	8.3	7.5	7.7	7.3	6.7	7.0
Salinity (ppt)	0.1	0.6	0.1	4.7	14.6	3.1	0.0
Conductivity (ms/m)	0.1	100.0	34.0	628.0	24000.0	576.0	4.1
Water Flow (m/s)	N/A	0.100	0.1	0.1	0.1	0.1	0.1

**Table 6.10 Baseline Results of Ecological water quality monitoring**

Parameters	WE1	WE2	WE3	WE4	WE5	WE6
Suspended Solid (mg/l)	1.0	2.0	3.0	3.0	<1	<1
Nitrogen (Ammonia) (mg/l)	0.07	0.12	0.11	0.23	0.03	0.02
Nitrogen (Nitrate) (mg/l)	0.12	0.13	0.13	0.31	0.04	0.05
Phosphorous (mg/l)	0.04	0.06	0.06	0.09	0.06	0.05
BOD <sub>5</sub> (mg/l)	<2	<2	<2	<2	<2	<2
DO (mg/l)	6.58	6.82	6.37	7.61	6.87	5.70
Turbidity (NTU)	4.44	5.12	5.93	6.96	4.65	2.73
PH	6.4	7.1	7.0	6.8	6.6	6.1
Salinity (ppt)	<0.1	0.1	0.3	7.6	0.1	<0.1

### 6.6 Action and Limit level for Monitoring of White-shouldered Starlings

A simple Event and Action Plan is shown in Table 6.6.1. Should the Event occur, action in accordance with the Action Plan should be carried out.

There was no recorded event in the reporting month.

Table 6.6.1 Event / Action Plan for Monitoring of White-shouldered Starlings

EVENT	ACTION	
	ET Leader	Contractor
Identification of disturbance to breeding White-shouldered Starlings	1. Increase frequency of monitoring to twice weekly	1. Check all construction actions and working methods
	2. Notify Site Engineer	2. Submit proposals for remedial action to prevent abandonment of the breeding site.
	3. Review construction activities of previous week.	3. Implement remedial action.
	4. Identify any changes in construction activities in previous week	4. Liaise with ET regarding effectiveness of remedial actions.
	5. Discuss remedial actions with Site Engineer	

### 6.7 Ecological monitoring Schedule

The next ecological surveys are scheduled on 19 and 30 November 2010, while ecological water quality monitoring is scheduled on 5 November 2010.

## **7. Action taken in Event of Exceedence**

If the measurements (Noise, Water, Ecology) exceed the action / limit level, exceedance details will be reported and follow-up actions will be taken by relevant parties involved.

During the reporting period there was no exceedance for noise, ecological measurements recorded; therefore no actions were taken.

Total 22 non-compliance events of water quality limits (Turbidity and Suspended Solids) were recorded in this reporting month according to the established level. ET has arranged site investigations for the exceedance events. No particular observations of defective site activities were found causing the exceedance and such conditions were believed to be attributed by natural fluctuation.

## 8. Construction waste disposal

It is the contractor's responsibility to ensure that all wastes produced during the 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 disposal practices are being implemented.

Contractor has completed the registration of Waste Producer under the Waste Disposal (Chemical Waste)(General) Regulation. The Waste Producer Number, WPN 5213-950-Y2443-03 was assigned by EPD on 12 Aug 2008. The Contractor would be responsible for the implementation of any mitigation measure to minimize waste or redress problems arising from the waste materials.

Table 8.1 is a summary of figures of the construction wastes disposal provided by Contractor.

**Table 8.1 Summary of Construction Waste Disposal**

Month	Amount of Construction Waste disposed		
	Inert Waste (to Public Fill)	Non-inert Waste (to Landfill)	Chemical Waste (to treatment plant)
1 <sup>st</sup> to 31 <sup>st</sup> Oct 10	70.70 (ton)	0	Nil
Total	32080.86 (ton)	212.93 (ton)	0

## 9. Status of Permits and Licenses obtained

Table 9.1 is the updated status of environmental related permits/ license obtained for the construction activities

Table 9 .1 Status of Permits and Licenses Obtained

Description	License / Permit No.#	Date of Issue	Date of Expiry	Remarks
Environmental Permit	EP-237/2005/A	05 Mar 2007	--	Issued
Varied Environmental Permit	EP-237/2005/B	23 April 2009	--	Issued
Registration of C&D Waste Producer	7006521	--	--	Issued
Chemical Waste Producer	5213-950-Y2443-03	12 Aug 2008	--	Issued
Construction Noise Permit	N/A	N/A	N/A	N/A
Effluent Discharge License	EP890/W2/XG032 EP890/W2/XG033 EP890/W2/XG034 EP890/W2/XG035 EP890/W2/XG036 EP890/W2/XG037 EP890/W2/XG038 EP890/W2/XG039 EP890/W2/XG040 EP890/W2/XG041	23 Oct 2008	31 Oct 2013	Issued

The contractor implemented various environmental mitigation measures as recommended in the Environmental Permit and Final Mitigation Measures Report. The implemented schedule is presented in Appendix H.



## 10. Complaint Log

There was no formal complaint received during the reporting month.

	Noise	Water	Ecology	Cultural	Others
October 2010	0	0	0	0	0
Total	0	1	0	0	0

## 11. Site Environmental Audits

### Site Inspection

With an intention to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented, regular environmental site inspections have been scheduled.

Within the reporting month, site inspections were conducted on 7, 18, 21 and 28 October 2010.

A detailed checklist of each site inspection together with comments, relevant photos and maps have been filed and kept. A summary of observation and follow-up action is shown in Table 11.1

Table 11.1 Summary of site inspection

Date	Observations	Advice from ET	Action taken	Closing Date
31 Aug 10, 9 & 28 Sept 10	Accumulation of stagnant water was observed at the wheel washing bay at PNH fish ladder site	Contractor was advised to remove grey water accumulated in the wheel washing bay regularly as to prevent mosquito breeding	Stagnant water was removed prior to the inspection on 7 Oct	7 Oct 10
Sept, 7, 18, 21 & 28 Oct 10	Issue of follow up actions in removing abandoned site materials and wastes within site area was still outstanding	Contractor was reminded to implement necessary rectification as soon as possible	Still outstanding. To be followed during the next reporting period	Ongoing
Sept 10	Open stockpiles of C&D wastes and earth materials were observed at PNH fish ladder site	Contractor should prevent excessive storage of earth materials on site otherwise tarpaulin coverings should be provided to prevent erosion and runoff	The concerned stockpiles were removed prior to the inspection on 7 Oct 10	7 Oct 10
18 Oct 10	Soil debris was deposited to the public access nearby entrance to LTT inlet A	Contractor was advised to provide water sprayer for vehicle washing	Follow up action was taken as advised prior to the inspection on 21 Oct	21 Oct 10
21 Oct 10	Open stockpile of earth material was observed at PNH fish ladder site	Contractor was advised to provide tarpaulin covering as to avoid erosion and dust generation	Follow up action was taken as advised prior to the inspection on 28 Oct	28 Oct 10
28 Oct 10	River water of LTT River (section nearby LTT bypass inlet A) was observed to be muddy during inspection	Contractor was recommended to trace the source causing condition observed and implement corrective whenever necessary	To be followed during the next reporting period	Ongoing

## **11.2 Compliance with legal and Contractual requirement**

ET leader has reviewed the progress and programme of the works to check any relevant environmental laws has not violated.

## **11.3 Environmental Complaint and follow up actions**

During this reporting period, there was no documented complaint received. Therefore, follow up actions for the environmental complaint is not required.

Findings of monthly survey was still pending therefore relevant was not provided in this reporting month.

## **12. Future key issues**

Construction of inlet of LTT bypass, gabion wall and surface channel for PNH fish ladder and landscaping works will be major construction activities to be carried out in the upcoming month. It is expected that several impacts on environmental aspects will be generated on-site. With reference to the EM&A manual, mitigation measure report as well as the environmental permit, proper mitigation measures are proposed to be taken, if necessary.

Contractor was reminded to provide proper measures to mitigate water quality impacts to the river channels due to construction works. River based construction sites should be well enclosed by bunds in dry condition, as to prevent surface run-off and site water seepage to the stream. Bare soil surface, which is directly exposed to the river channel in the site area, should be completely covered with geo-textile to prevent soil erosion. For river-based and any construction activities carried at riverside, contractor should implement proper protection measures such as barriers and/or silt curtains to prevent surface run-off from entering water bodies.

Underground water and site water may be accumulated on site. Contractor is recommended to treat the accumulated site water by proper silt removal facilities before discharging to the designated discharge point; reuse of site water should be considered also. Channel, trench and manholes connected with project sites should be sealed to prevent site water and any construction materials entering public drainage and causing water quality impact.

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

Heavy plants and vehicles may be deployed for the construction 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 and operation of site equipments may require use of chemicals and fuel on site. Secondary containment and spillage preventative measures should be implemented to such chemicals using on site.

### **13. Conclusions**

In this reporting month, major site activities included construction of inlet of LTT bypass, construction of gabion wall and surface channel at section of PNH fish ladder and provision of granite facing for concrete structure.

Regular site meetings and inspection audits led by the seniors for discussing site environmental matters were held among Project Proponent, Contractor and the ET on weekly basis. Also monthly site meeting and inspection audits with the above parties and IEC were carried out on 28 October 2010.

For noise level monitoring, all results were within the established A/L limits.

For water quality monitoring, total 22 non-compliance events of water quality limits (Turbidity and Suspended Solids) were recorded in this reporting month according to the established level. ET has arranged site investigations for the exceedance events. No particular observations of defective site activities were found causing the exceedance and such conditions were believed to be attributed by natural fluctuation.

During ecological monitoring survey, no White-shouldered Starling was recorded breeding in the watch tower. Drainage improvement near the watchtower on inter-tidal areas at downstream of Luk Tei Tong River (LTT1) was mostly completed. The absence of nesting of White-shouldered Starling in the watch tower did not seem to be related to construction works in Luk Tei Tong River. A bird species nests in village houses should be to certain extent disturbance tolerant.

No bird was observed entering the watchtower since the monitoring surveys commenced in August 2008. Also, no breeding was recorded in the baseline survey in September 2007. It appears that the birds do not prefer to roost or nest in the watch tower.

Also, there were not any notifications of summons recorded during the reporting period. Furthermore, there were not any formal prosecution and complaints recorded.

Site water control was the major concern in this reporting month. Therefore, ET recommended the contractor to implement sufficient and effective

mitigation measures to minimize water quality impact from site works. Proper de-silting facilities should be provided for site water treatment. To prevent surface run-off and soil erosion from site activities, earth bunds with complete coverage of geo-textile materials should be formed at river-based and/or riverside project sites. Contractor should be cautious on change of river water quality, immediate corrective action was required once muddy effluent discharge, or disturbance of sediment was found from site works.

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**

**Construction**

**Programmer and**

**Location plan**














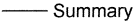




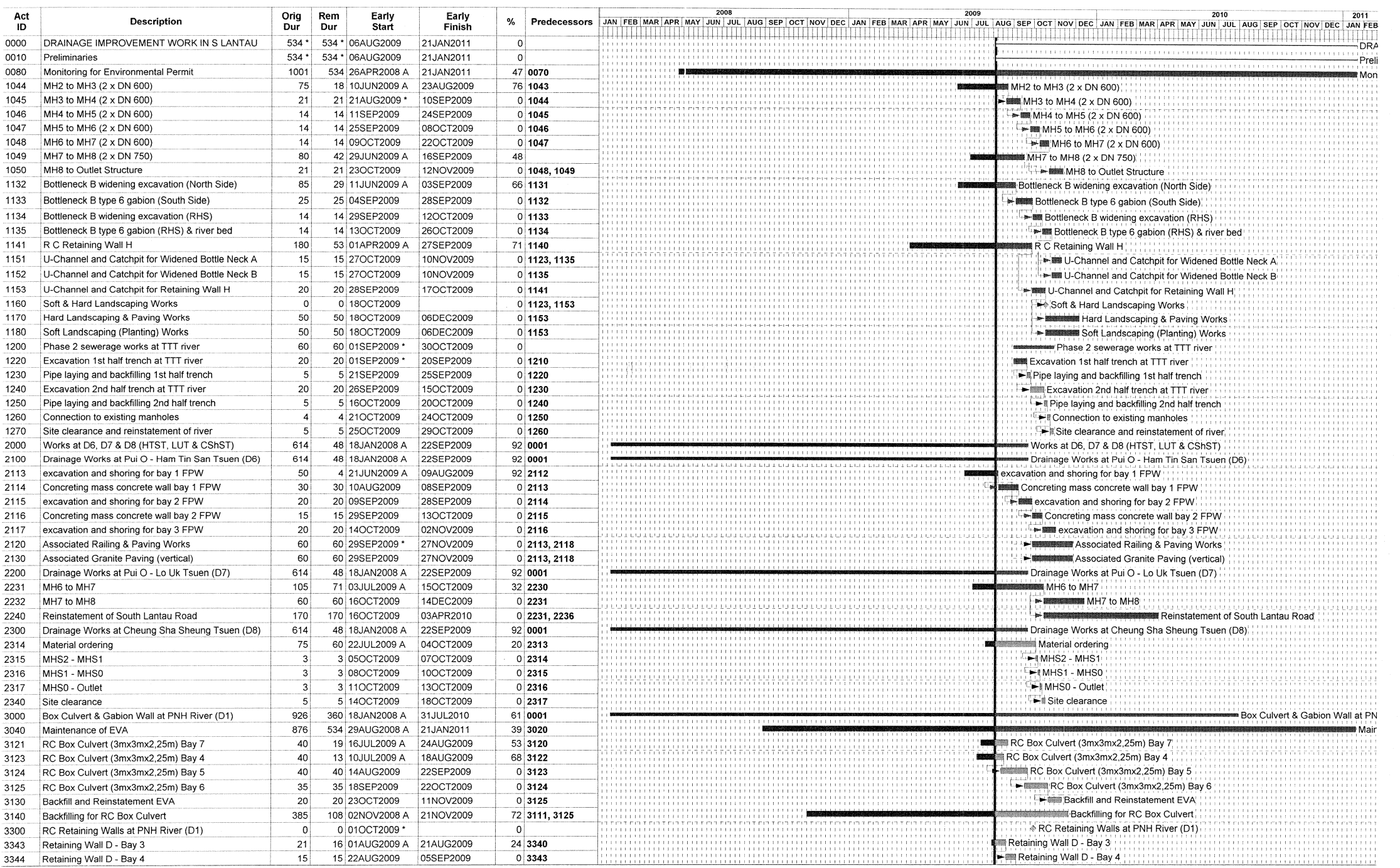
Act ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish	%	Predecessors	2008												2009												2010												2011											
								JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB										
7010	Preparation for works (Minor Portion)	131	0	18JAN2008 A	27MAY2008 A	100	0001	Preparation for works (Minor Portion)																																															
7020	Non-working Period at TWT Beach (1)	196	0	01APR2008 A	13OCT2008 A	100		Non-working Period at TWT Beach (1)																																															
7030	uPVC Sewer (DN160-400) M/H A16 - M/H A34	465	30	28MAY2008 A	04SEP2009	94	7010	uPVC Sewer (DN160-400) M/H A16 - M/H A34																																															
7040	uPVC Sewer (DN160-400) M/H A15 - M/H A13	50	0	14OCT2008 A	02DEC2008 A	100	7020	uPVC Sewer (DN160-400) M/H A15 - M/H A13																																															
7050	uPVC Sewer (DN160-400) M/H A11 - M/H A7	50	0	03DEC2008 A	21JAN2009 A	100	7040	uPVC Sewer (DN160-400) M/H A11 - M/H A7																																															
7060	uPVC Sewer (DN160-400) M/H A1 - M/H A3	65	0	22JAN2009 A	27MAR2009 A	100	7050	uPVC Sewer (DN160-400) M/H A1 - M/H A3																																															
8000	Sewerage works at PNH (S4)	772	206	18JAN2008 A	27FEB2010	73	0001	Sewerage works at PNH (S4)																																															
8010	Preparation of works	168	0	07JAN2008 A	22JUN2008 A	100		Preparation of works																																															
8020	uPVC Sewer (DN160-400) M/H ED2 -D28 - D118	320	0	23JUN2008 A	08MAY2009 A	100	8010	uPVC Sewer (DN160-400) M/H ED2 -D28 - D118																																															
8030	uPVC Sewer (DN160-400) M/H D1 - D27	280	191	09MAY2009 A	12FEB2010	32	8020	uPVC Sewer (DN160-400) M/H D1 - D27																																															
9000	Preservation & Protection of Exist Trees	534 *	534 *	06AUG2009	21JAN2011	0	0001	Preservation & Protection of Exist Trees																																															
9010	Preparton for works	100	0	07JAN2008 A	15APR2008 A	100		Preparton for works																																															
9020	Protection & Transplanting Works	1011	534	16APR2008 A	21JAN2011	47	9010	Protection & Transplanting Works																																															

Start date 07JAN2008  
 Finish date 21JAN2011  
 Data date 06AUG2009  
 Run date 15AUG2009  
 Page number 6A  
 Primavera Systems, Inc.

Yick Hing Construction Co. Ltd.

Drainage Improvement Work in South Lantau  
 and Construction of Mui Wo Village Sewerage Phase 1  
 Master Programme (Rev.9b)

-  Early bar
-  Progress bar
-  Critical bar
-  Summary bar
-  Start milestone point
-  Finish milestone point



Start date 07JAN2008  
 Finish date 21JAN2011  
 Data date 06AUG2009  
 Run date 15AUG2009  
 Page number 1A  
 Primavera Systems, Inc.

Yick Hing Construction Co. Ltd.

Drainage Improvement Work in South Lantau  
 and Construction of Mui Wo Village Sewerage Phase 1  
 3-Month Rolling Programme (Rev.9b)

- Early bar
- Progress bar
- Critical bar
- Summary bar
- Start milestone point
- Finish milestone point









## Appendix B Key Personal Contact information chart

<b>Organization Name</b>	<b>Role</b>	<b>Title</b>	<b>Name</b>	<b>Telephone</b>	<b>Fax Number</b>
Drainage Service Department	Project Proponent	Engineering Representative	Mr. Chan Wai Hong	2594 7464	2827 8700
Ellied Environmental Consultants Limited	Independent Environmental Checker (IEC)	Principal Consultant	Ms. Grace Kwok	2815 7028	2815 5399
Yick-Hing Construction Company Limited	Main Contractor	Senior Project Manager	Mr. Liu Kai Choi	2394 4988	2787 4890
Environmental Pioneers & Solutions Limited	Environmental Team (ET)	Environmental Team Leader	Ms. Patricia Chung	2965 0888	2856 2010

## Appendix C

# **Calibration Certificates for Measuring Equipments**

積分形精密騒音計  
Integrating Precision Sound Level Meter  
TYPE 6224

検査成績書  
INSPECTION CERTIFICATE

本体製造番号  
Serial No. of body: 100104  
マイクロホン製造番号  
Serial No. of Microphone: 39967  
Ver:1.6E-09-11

年月日: 平成22年1月7日  
Date: January 7, 2010

承認 Approved	点検 Passed	担当 Inspected
J. Yasukage	T. Matsumoto	S. Imoue

株式会社 アコー  
ACO CO., LTD.

1. 検査年月日 Inspection Date

平成22年1月7日                      January 7, 2010

2. 検査条件 Inspection Condition

- 1) 温度    Temperature    :            20 °C
- 2) 湿度    Humidity            :            44 %
- 3) 気圧    Barometric pressure :            987 hPa

3. 検査項目及び結果 Inspection Results

1) RANGE 切換誤差検査 The RANGE Shifting Error

RANGE : 20-100dB 70dB 入力基準 ±0.5dB以下

Within ±0.5dB of the value at 70dB input, Range 20-100dB.

RANGE (dB)	入力レベル Input level (dB)	周波数    Frequency (Hz)		
		31.5	1000	8000
20-80	50	-0.1	-0.1	-0.1
20-90	60	0.0	-0.1	-0.1
20-100	70	0.0	0.0	0.0
20-110	80	0.0	0.0	0.0
30-120	90	-0.1	0.0	0.0
40-130	100	-0.1	0.0	0.0
判定	Passed	Pass		

2) 安定性特性検査      Stability Characteristic

RANGE : 20-100dB 1分後基準 ±0.5dB以下

Within ±0.5dB of the value one minute later, Range 20-100dB.

	10分後 ten minutes later
誤差    Error (dB)	0.0
判定    Passed	Pass

3) 目盛誤差特性検査 The Scale Error

RANGE : 20-110dB 65dB入力基準

Error of the value at 65dB input, Range 20-110dB.

入力 Input (dB)	規格 Standard (dB)	周波数 Frequency (Hz)		
		31.5	1000	8000
110	±0.7	0.0	0.1	0.1
105	±0.7	-0.1	0.0	-0.1
100	±0.7	-0.1	0.0	-0.1
95	±0.7	0.0	0.0	0.0
90	±0.7	0.0	0.2	0.1
85	±0.7	0.2	0.2	0.2
80	±0.7	0.2	0.1	0.1
75	±0.7	0.0	0.1	0.0
70	±0.7	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0
60	±0.7	0.1	0.0	0.0
55	±0.7	0.0	-0.1	-0.1
50	±0.7	0.0	0.0	0.0
45	±0.7	0.0	0.0	0.0
40	±0.7	0.0	0.0	0.0
35	±0.7	0.1	0.0	0.0
30	±0.7	0.0	-0.1	-0.1
25	±0.7	0.1	0.0	0.0
判定	Passed	Pass		

4) 動特性検査 Dynamic Characteristic

RANGE : 20-100dB 100dB、1kHz 入力基準

When 100dB input, Range 20-100dB at 1kHz.

	規格 Standard	測定値 Measured Value
FAST	-1.0+0.5 -1.0 (dB)	-1.5
SLOW	-4.0±1.0 (dB)	-4.5
判定	Passed	Pass

5) 周波数特性検査 Frequency Response

RANGE : 20-100dB 95dB入力基準(マイクを含む)

When 95dB input, including Microphone value, Range 20-100dB.

周波数 Frequency (Hz)	A特性			C特性			FLAT(Z)特性	許容差 Tolerance
	規格 Standard (dB)	レスポンス Response (dB)	偏差 Deviation (dB)	規格 Standard (dB)	レスポンス Response (dB)	偏差 Deviation (dB)	レスポンス Response (dB)	
20	-50.5	-49.1	1.4	-6.2	-5.3	0.9	-0.9	±3.0
40	-34.6	-34.0	0.6	-2.0	-1.8	0.2	-0.2	±1.5
100	-19.1	-18.6	0.5	-0.3	-0.2	0.1	0.1	±1.0
250	-8.6	-8.4	0.2	0.0	0.0	0.0	0.1	±1.0
500	-3.2	-3.1	0.1	0.0	0.0	0.0	0.1	±1.0
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.1	±1.0
2k	1.2	1.2	0.0	-0.2	-0.2	0.0	0.1	±1.0
4k	1.0	0.9	-0.1	-0.8	-0.8	0.0	0.2	±1.0
5k	0.5	0.7	0.2	-1.3	-1.1	0.2	0.4	±1.5
6.3k	-0.1	0.1	0.2	-2.0	-1.7	0.3	0.5	+1.5 -2
8k	-1.1	-0.9	0.2	-3.0	-2.8	0.2	0.3	+1.5 -3
10k	-2.5	-2.4	0.1	-4.4	-4.2	0.2	-0.1	+2 -4
12.5k	-4.3	-3.6	0.7	-6.2	-5.4	0.8	-0.1	+3 -6
16k							0.0	
20k							-1.6	
判定 Passed		Pass						

6) 実効値指示誤差検査 Effective Value Error

RANGE : 20-100dB 波高率3のバースト信号に対して1.0dB以内

Within 1.0dB on the Burst signal of the peak factor 3, Range 20-100dB.

周波数 Frequency 2kHz、繰り返し周波数 Repeat frequency 40Hz

実効値指示誤差 Effective value Error (dB)	判定
0.3	Pass

7) 自己雑音特性検査 Self-noise

RANGE : 20-80dB (マイクを含む)

RANGE : 20-80dB (Including Microphone value)

RANGE : 20-80dB (Including Microphone value)	A特性	C特性	FLAT(Z)特性
規格 Standard (dB)	18以下 Below 18	29以下 Below 29	32以下 Below 32
自己雑音 Self-noise (dB)	16.4	23.6	26.0
判定 Passed	Pass		



## CERTIFICATE OF CALIBRATION

Certificate No.: 10CA0306 01

Page: 1 of 2

### Item tested

Description: Acoustical Calibrator (Class 1)  
Manufacturer: Castle  
Type/Model No.: GA607  
Serial/Equipment No.: 039543  
Adaptors used: -

### Item submitted by

Customer: Geotechnics & Concrete Engineering (H.K.) Ltd.  
Address of Customer: 6 Ko Shan Road, Ground FL., Hung Hom, Kowloon, Hong Kong  
Request No.: RS/10/023-PO  
Date of request: 06-Mar-2010

Date of test: 06-Mar-2010

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	23-Jun-2010	SCL
Preamplifier	B&K 2673	2239857	15-Dec-2010	CEPREI
Measuring amplifier	B&K 2610	2346941	11-Dec-2010	CEPREI
Signal generator	DS 360	61227	22-Jun-2010	CEPREI
Digital multi-meter	34401A	US36087050	03-Dec-2010	CIGISMEC
Audio analyzer	8903B	GB41300350	07-Dec-2010	CEPREI
Universal counter	53132A	MY40003662	23-Jun-2010	CEPREI

### Ambient conditions

Temperature:  $22 \pm 1$  °C  
Relative humidity:  $60 \pm 5$  %  
Air pressure:  $1005 \pm 5$  hPa

### Test specifications

- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

### Test results

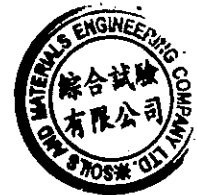
Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:

  
Huang Jian-Min/Feng Jun Qi

Date: 09-Mar-2010

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.







## Report for Calibration of Hand-held Water Quality Meter WQC-24

Calibration Reference No. : GCE/CAL/2010/MW/WQM/C1

Client : ENVIRONMENTAL PIONEER AND SOLUTION LIMITED

Equipment No. : WQC-24 Location : Mui Wo Site

Manufacturer : DKK-TOA Serial No.: 640274

Calibration Date : 11 to 15-09-2010 Due Date : 10-12-2010

### Criterion: (Repeatability, Linearity)

pH : Both within  $\pm 0.05$  pH  
 Dissolved oxygen : Both within  $\pm 0.1$  mg/L  
 Electric conductivity : Both within  $\pm 1\%$  FS  
 Turbidity : Repeatability : within  $\pm 3\%$  FS  
 Temperature : Repeatability  $\pm 0.25^\circ\text{C}$ ; Linearity  $\pm 0.5^\circ\text{C}$ ; (Ambient  $5\sim 45^\circ\text{C}$ )

### Electric Conductivity (Salinity converted from EC):

(Reference : APHA 20ed 2510 B, ISO 7888 - 1985 (E) and DKK-TOA Hand-held Water Quality Meter WQC-24 Instruction Manual)

Concentration of KCl Standard Solution (M)	Reference conductivity value at $25.0^\circ\text{C}$	Indicated value by meter	Linearity ( $R^2$ )
0	0.0 mS/m*	0.0 mS/m	1.0000
0.001	14.7 mS/m	15.1 mS/m	
0.005	71.8 mS/m	72.4 mS/m	Acceptance Criterion  $R^2 > 0.995$ Within $\pm 1\%$ F.S. against calibration standard value 71.8 mS/m, 0.667 S/m and 5.87 S/m.
0.01	0.141 S/m	0.145 S/m	
0.05	0.667 S/m	0.671 S/m	
0.1	1.29 S/m	1.30 S/m	
0.5	5.87 S/m	5.88 S/m	
Repeatability	1 <sup>st</sup> time	0.00, 5.88 S/m	Within $\pm 1\%$ F.S. against average value
	2 <sup>nd</sup> time	0.00, 5.88 S/m	
	3 <sup>rd</sup> time	0.00, 5.88 S/m	
	Ave.: 0.00, 5.88	Ave.: 0.00, 5.88	

\*  $1 \text{ S/m} = 10^4 \mu\text{mhos/cm} = 10^3 \text{ mS/m}$

Remark: For repeatability, the maximum difference from the average value of 3 measurements was taken.



**Dissolved Oxygen:**

(Reference : APHA 20ed 4500-O B&C, ISO 5814:1990(E) and DKK-TOA Hand-held Water Quality Meter WQC-24 Instruction Manual)

DO value evaluated by Iodometric Method (mg/L)	Indicated value by meter (mg/L)	Linearity (R <sup>2</sup> )	
0.00	0.00	0.9999	
3.20	3.26		
5.70	5.77	Acceptance Criterion R <sup>2</sup> > 0.995 Within ± 0.1 mg/L against standard value	
8.50	8.55		
10.45	10.39		
13.20	13.12		
Repeatability	1 <sup>st</sup> time	0.00 , 8.57	Within ± 0.1 mg/L against average value
	2 <sup>nd</sup> time	0.00 , 8.55	
	3 <sup>rd</sup> time	0.00 , 8.53	
	0.00 , 8.50	Ave.: 0.00 , 8.55	

Remark: For repeatability, the maximum difference from the average value of 3 measurements was taken.

**pH Value:**

(Reference : APHA 20ed 4500-H<sup>+</sup> B, ISO 10523:1994(E) and DKK-TOA Hand-held Water Quality Meter WQC-24 Instruction Manual)

pH buffer for Meter Calibration (20°C)	Input value (pH buffer) (20°C)	Indicated pH value by meter (20°C)	Linearity (R <sup>2</sup> )
pH = 4.00	1.67	1.64	0.9999
pH = 6.88	4.00	4.01	Acceptance Criterion R <sup>2</sup> > 0.995 Within ± 0.05 pH against standard value
pH = 7.00	6.88	6.85	
pH = 9.22	7.00	7.03	
pH = 10.00	7.43	7.45	
	9.22	9.19	
	10.00	9.97	
	12.64	12.60	
Repeatability	1 <sup>st</sup> time	4.01 , 9.96	Within ± 0.05 pH against average value
	2 <sup>nd</sup> time	4.01 , 9.97	
	3 <sup>rd</sup> time	4.02 , 9.98	
	pH 4.00 , 10.00	Ave.: 4.01 , 9.97	

Remark: For repeatability, the maximum difference from the average value of 3 measurements was taken.



**Temperature:**

(Reference : APHA 20ed 2550 B, In-house method and DKK-TOA Hand-held Water Quality Meter WQC-24 Instruction Manual)

Setting Temperature (°C)	Indicated value by meter (°C)		Linearity (R <sup>2</sup> )
5.0	4.7		0.9999
15.0	14.7		
25.0	24.7		Acceptance Criterion R <sup>2</sup> > 0.995 Within ± 0.5°C against standard value
35.0	34.8		
45.0	45.2		
55.0	55.4		
Repeatability	1 <sup>st</sup> time	14.7, 45.3	Within ± 0.25°C against average value
	2 <sup>nd</sup> time	14.7, 45.2	
	3 <sup>rd</sup> time	14.6, 45.2	
	15.0, 45.0	Ave.: 14.7, 45.2	

Remark: For repeatability, the maximum difference from the average value of 3 measurements was taken.

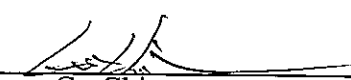
**Turbidity:**

(Reference : APHA 20ed 2130 B and DKK-TOA Hand-held Water Quality Meter WQC-24 Instruction Manual)

Formazin Standards (NTU)	Indicated value by meter (NTU)		Linearity (R <sup>2</sup> )
0.0	0.0		1.0000
20.0	19.5		Acceptance Criterion R <sup>2</sup> > 0.995 Within ± 3% F.S. against span calibration value 100.0 and 400.0 NTU
100.0	98.3		
400.0	396.9		
800.0	795.9		
Repeatability	1 <sup>st</sup> time	0.0, 796.2	Within ± 3% F.S. against average value
	2 <sup>nd</sup> time	0.0, 795.5	
	3 <sup>rd</sup> time	0.0, 795.9	
	0.0, 800.0	Ave.: 0.0, 795.9	

Remark: For repeatability, the maximum difference from the average value of 3 measurements was taken.

Comments : Pass, (comply with the criteria)

Tested by : Ho Tin Kau Certified by :   
 Gu Chin  
 Chemist

Checked by : Gu Chin Date : 15-9-2010

Appendix D1 Plant species recorded at Pak Ngan Heung River (N)

<i>Species</i>	Habit	Native	Relative Abundance	Occurrence	
				PNH3	PNH4
<i>Acacia confusa</i>	tree	no	occasional		+
<i>Achyranthes aspera</i>	herb	yes	scarce		+
<i>Alangium chinensis</i>	tree	yes	scarce		+
<i>Alocasia macrorrhiza</i>	herb	yes	occasional		+
<i>Annoa squamosa</i>	tree	no	scarce		+
<i>Bidens pilosa</i>	herb	no	occasional		+
<i>Bridelia tomentosa</i>	tree	yes	scarce		+
<i>Celtis sinensis</i>	tree	yes	scarce		+
<i>Dimocarpus longan</i>	tree	no	occasional		+
<i>Ficus microcarpa</i>	tree	yes	scarce		+
<i>Ficus superba</i>	tree	yes	occasional		+
<i>Hedychium coronarium</i>	herb	no	occasional		+
<i>Litsea glutinosa</i>	tree	yes	scarce		+
<i>Lygodium japonicum</i>	fern	yes	scarce		+
<i>Macaranga tanarius</i>	tree	yes	occasional		+
<i>Microcos paniculata</i>	tree	yes	scarce		+
<i>Microstegium ciliatum</i>	grass	yes	common		+
<i>Mikania micrantha</i>	climber	no	occasional		+
<i>Phyllanthus urinaria</i>	shrub	yes	scarce		+
<i>Syzygium jambos</i>	tree	no	scarce		+
<i>Smilax lanceifolia</i>	climber	yes	scarce		+
<i>Lophatherum gracile</i>	grass	yes	scarce		+
<i>Panicum maximum</i>	grass	no	scarce		+
<i>Pteris vittata</i>	fern	yes	scarce		+
<i>Pueraria phaseloides</i>	climber	yes	scarce		+
<i>Sida rhombifolia</i>	herb	yes	scarce		+
<i>Sterculia lanceolata</i>	tree	yes	scarce		+

Appendix D2 Plant species recorded at Pak Ngan Heung River (S)

Species	Habit	Native	Relative Abundance	Occurrence	
				PNH1	PNH2
<i>Ficus superba</i>	tree	yes	occasional		+
<i>Ipomoea cairica</i>	climber	yes	occasional		+
<i>Kandelia obovata</i>	tree	yes	scarce	+	
<i>Lantana camara</i>	shrub	no	scarce		+
<i>Panicum maximum</i>	grass	no	common		+

Appendix D3 Plant species recorded at Luk Tei Tong River

Species	Habit	Native	Relative Abundance	Occurrence				
				LLT1	LLT2	LLT3	LLT4	LLT5
<i>Acanthus ilicifolius</i>	shrub	yes	scarce		+			
<i>Achyranthes aspera</i>	herb	yes	scarce		+			
<i>Apluda mutica</i>	grass	yes	scarce		+			
<i>Bidens pilosa</i>	herb	no	scarce	+				
<i>Celtis sinensis</i>	tree	yes	scarce	+				
<i>Crotalaria pallida</i>	herb	yes	scarce		+			
<i>Cyperus sp.</i>	sedge	yes	scarce		+			
<i>Dactyloctenium aegyptium</i>	grass	yes	scarce		+			
<i>Eupatorium catarium</i>	herb	no	scarce		+			
<i>Ficus microcarpa</i>	tree	yes	scarce	+				
<i>Ficus superba</i>	tree	yes	scarce	+				
<i>Hibiscus tiliaceus</i>	tree	yes	scarce	+	+			
<i>Kandelia obovata</i>	tree	yes	occasional		+			
<i>Leucaena leucocephala</i>	tree	no	scarce	+				
<i>Macaranga tanarius</i>	tree	yes	scarce	+				
<i>Mikania micrantha</i>	climber	no	scarce	+				
<i>Mimosa pudica</i>	herb	no	scarce		+			
<i>Neyraudia reynaudiana</i>	grass	yes	scarce		+			
<i>Panicum maximum</i>	grass	no	scarce	+	+			
<i>Panicum repens</i>	grass	yes	scarce		+			
<i>Rhynchelytrum repens</i>	grass	no	scarce	+				
<i>Saccharum arundinaceum</i>	grass	yes	scarce	+				

## **Appendix D4**

### **Ecological Water Monitoring Results (on-site measurements)**



**Environmental Pioneers & Solutions Limited**  
**Ecological Water Quality Monitoring - Summary of On-site measurement results**

Date of Sampling: 6/10/2010

Weather Condition: Cloudy

Monitoring Location	WE1			WE2			WE3			WE4			WE5			WE6		
Time (hhmm)	1110			1140			1045			1055			1230			1210		
Tide Mode	ebb			ebb			ebb			ebb			ebb			ebb		
River Condition	Normal			Normal			Normal			Normal			Normal			Muddy		
Water Depth (m)	< 1.0			< 1.0			< 1.0			< 1.0			< 1.0			< 1.0		
pH value	8.32			7.46			7.70			7.33			6.73			7.03		
Temperature (oC)	24.0			24.4			24.8			26.0			26.0			24.8		
Salinity (ppt)	0.6			0.1			4.7			14.6			3.1			0.0		
Conductivity (ms/m)	100.0			34.0			628.0			24000.0			576.0			4.1		
Water flow (m/s)	0.100			0.100			0.100			0.100			0.100			0.100		
Turbidity (NTU)	0.0	0.1	Average	0.0	0.0	Average	0.0	0.0	Average	0.0	0.0	Average	14.4	14.6	Average	64.2	64.0	Average
			0.05			0.00			0.00			0.0			14.50			64.1
DO (mg/l)	8.78	8.80	Average	7.88	7.89	Average	8.51	8.52	Average	6.07	6.08	Average	7.48	7.50	Average	8.73	8.76	Average
			8.79			7.89			8.52			6.08			7.49			8.75
DO Saturation (%)	104	104	Average	98	98	Average	103	103	Average	75	75	Average	94	94	Average	105	105	Average
			104			98			103			75			94			105

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
6/10/2010

remark or observation: Muddy water was observed at location WE6 due to the construction work between WE5 and WE6.

## **Appendix D5**

### **Ecological Water Monitoring Results (lab report)**



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER**

Report No. : GCC101000151 Date of Issue : 19-10-2010

---

Client\* : Environmental Pioneers & Solutions Limited Date Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 06-10-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 07-10-2010

GCE Serial No. : WQM102010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	497	495	0.4	26.1
Acceptance Criteria			<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	WE1	WE1 Duplicate	WE2	WE2 Duplicate	WE3	WE3 Duplicate		
	Sampling Date/Time	06 Oct 2010 / 11:10		06 Oct 2010 / 11:40		06 Oct 2010 / 10:45			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	2.8	2.5	3.8	4.0	4.8	4.9	

TEST RESULTS	Sample ID	WE4	WE4 Duplicate	WE5	WE5 Duplicate	WE6	WE6 Duplicate		
	Sampling Date/Time	06 Oct 2010 / 10:55		06 Oct 2010 / 12:30		06 Oct 2010 / 12:10			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	5.5	5.5	16.4	18.6	56.4	59.0	

\* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : Location M1 & WE3 and Location M3 & WE4 are the same location.

---- End ----

Tested By : K.L FONG

Approved Signatory :   
 Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC101000614 Date of Issue : 04-11-2010

---

Client\* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 06-10-2010

W.O. No.\* : -- Contract No.\* : -- Date Completed : 22-10-2010

GCE Serial No. : WQM102010 Sampling Date\* : 06-10-2010/11:10 Sample Type\* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.\* : WE1

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <sup>+</sup> B	--
Colour TCU	APHA 20ed 2120 B	--
Turbidity NTU	APHA 20ed 2130 B	--
Conductivity at 25°C μS/cm	APHA 20ed 2510 B	--
Salinity g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia) mg/L	APHA 20ed 4500-NH <sub>3</sub> D	0.06
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.18
Phosphorus mg/L	APHA 20ed 4500-P D	0.04
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	< 1
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client


**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 06 Oct 2010.

**REMARKS :** Sample Location WE1.

----- End -----

Tested By : T.W. Lam, K.L. Fong

Certified By :   
 Name : Gu Chin

Checked By : Gu Chin

Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC101000622 Date of Issue : 04-11-2010

Client\* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 06-10-2010

W.O. No.\* : -- Contract No.\* : -- Date Completed : 22-10-2010

GCE Serial No. : WQM102010 Sampling Date\* : 06-10-2010/11:10 Sample Type\* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.\* : WE1 Duplicate

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <sup>+</sup> B	--
Colour TCU	APHA 20ed 2120 B	--
Turbidity NTU	APHA 20ed 2130 B	--
Conductivity at 25°C μS/cm	APHA 20ed 2510 B	--
Salinity g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia) mg/L	APHA 20ed 4500-NH <sub>3</sub> D	0.05
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.18
Phosphorus mg/L	APHA 20ed 4500-P D	0.04
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	< 1
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client

**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 06 Oct 2010.

**REMARKS :** Sample Location WE1.

----- End -----

Tested By : T.W. Lam, K.L. Fong

Certified By : 

Name : Gu Chin

Checked By : Gu Chin

Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC101000630 Date of Issue : 04-11-2010

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Client\* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 06-10-2010

W.O. No.\* : -- Contract No.\* : -- Date Completed : 22-10-2010

GCE Serial No. : WQM102010 Sampling Date\* : 06-10-2010 / 11:40 Sample Type\* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.\* : WE2

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <sup>+</sup> B	--
Colour TCU	APHA 20ed 2120 B	--
Turbidity NTU	APHA 20ed 2130 B	--
Conductivity at 25°C μS/cm	APHA 20ed 2510 B	--
Salinity g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia) mg/L	APHA 20ed 4500-NH <sub>3</sub> D	0.06
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.23
Phosphorus mg/L	APHA 20ed 4500-P D	0.04
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	<1
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client

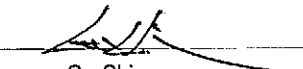
**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 06 Oct 2010.

**REMARKS :** Sample Location WE2.

----- End -----

Tested By : T.W. Lam, K.L. Fong

Certified By :   
 Name : Gu Chin

Checked By : Gu Chin

Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER**

Report No. : GCC101000648 Date of Issue : 04-11-2010

---

Client\* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 06-10-2010

W.O. No.\* : -- Contract No.\* : -- Date Completed : 22-10-2010

GCE Serial No. : WQM102010 Sampling Date\* : 06-10-2010 / 11:40 Sample Type\* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.\* : WE2 Duplicate

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <sup>+</sup> B	--
Colour TCU	APHA 20ed 2120 B	--
Turbidity NTU	APHA 20ed 2130 B	--
Conductivity at 25°C μS/cm	APHA 20ed 2510 B	--
Salinity g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia) mg/L	APHA 20ed 4500-NH <sub>3</sub> D	0.06
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.24
Phosphorus mg/L	APHA 20ed 4500-P D	0.04
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	< 1
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client

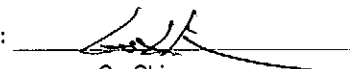
**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 06 Oct 2010.

**REMARKS :** Sample Location WE2.

----- End -----

Tested By : T.W. Lam, K.L. Fong

Certified By :   
 Name : Gu Chin

Checked By : Gu Chin

Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER**

Report No. : GCC101000656 Date of Issue : 04-11-2010

---

Client\* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

---

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 06-10-2010

W.O. No.\* : -- Contract No.\* : -- Date Completed : 22-10-2010

GCE Serial No. : WQM102010 Sampling Date\* : 06-10-2010 / 10:45 Sample Type\* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.\* : WE3

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <sup>+</sup> B	--
Colour TCU	APHA 20ed 2120 B	--
Turbidity NTU	APHA 20ed 2130 B	--
Conductivity at 25°C μS/cm	APHA 20ed 2510 B	--
Salinity g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia) mg/L	APHA 20ed 4500-NH <sub>3</sub> D	0.38
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.21
Phosphorus mg/L	APHA 20ed 4500-P D	0.06
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	< 1
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client


**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 06 Oct 2010.

**REMARKS :** Sample Location WE3.

----- End -----

Tested By : T.W. Lam, K.L. Fong

Certified By :   
 Name : Gu Chin

Checked By : Gu Chin

Post : Chemist





## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC101000664 Date of Issue : 04-11-2010

---

Client\* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 06-10-2010

W.O. No.\* : -- Contract No.\* : -- Date Completed : 22-10-2010

GCE Serial No. : WQM102010 Sampling Date\* : 06-10-2010 / 10:45 Sample Type\* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.\* : WE3 Duplicate

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <sup>+</sup> B	--
Colour TCU	APHA 20ed 2120 B	--
Turbidity NTU	APHA 20ed 2130 B	--
Conductivity at 25°C μS/cm	APHA 20ed 2510 B	--
Salinity g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia) mg/L	APHA 20ed 4500-NH <sub>3</sub> D	0.38
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.22
Phosphorus mg/L	APHA 20ed 4500-P D	0.06
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	<1
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--


\* : Information provided by client

**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 06 Oct 2010.

**REMARKS :** Sample Location WE3.

----- End -----

Tested By : T.W. Lam, K.L. Fong Certified By :   
Name : Gu Chin  
Checked By : Gu Chin Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Page 1 of 1

Report No. : GCC101000672

Date of Issue : 04-11-2010

Client\* : Environmental Pioneers & Solutions Limited

Order Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon.

Date Started : 06-10-2010

W.O. No.\* : --

Contract No.\* : --

Date Completed : 22-10-2010

GCE Serial No. : WQM102010

Sampling Date\* : 06-10-2010 / 10:55

Sample Type\* : River Water

GCE Reg. No. : GCE 081096

Test Unit No. : CH 08258

Sample I.D.\* : WE4

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <sup>+</sup> B	--
Colour TCU	APHA 20ed 2120 B	--
Turbidity NTU	APHA 20ed 2130 B	--
Conductivity at 25°C μS/cm	APHA 20ed 2510 B	--
Salinity g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia) mg/L	APHA 20ed 4500-NH <sub>3</sub> D	0.18
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.24
Phosphorus mg/L	APHA 20ed 4500-P D	0.06
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	1
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client

**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 06 Oct 2010.

**REMARKS :** Sample Location WE4.

----- End -----

Tested By : T.W. Lam, K.L. Fong

Certified By : 

Name : Gu Chin

Checked By : Gu Chin

Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER**

Report No. : GCC101000680 Date of Issue : 04-11-2010

---

Client\* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 06-10-2010

W.O. No.\* : -- Contract No.\* : -- Date Completed : 22-10-2010

GCE Serial No. : WQM102010 Sampling Date\* : 06-10-2010 / 10:55 Sample Type\* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.\* : WE4 Duplicate

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <sup>+</sup> B	--
Colour TCU	APHA 20ed 2120 B	--
Turbidity NTU	APHA 20ed 2130 B	--
Conductivity at 25°C µS/cm	APHA 20ed 2510 B	--
Salinity g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia) mg/L	APHA 20ed 4500-NH <sub>3</sub> D	0.19
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.24
Phosphorus mg/L	APHA 20ed 4500-P D	0.06
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	1
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client

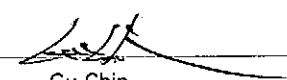
**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 06 Oct 2010.

**REMARKS :** Sample Location WE4.

----- End -----

Tested By : T.W. Lam, K.L. Fong

Certified By :   
 Name : Gu Chin

Checked By : Gu Chin

Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER

Report No. : GCC101000698 Date of Issue : 04-11-2010

---

Client\* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 06-10-2010

W.O. No.\* : -- Contract No.\* : -- Date Completed : 22-10-2010

GCE Serial No. : WQM102010 Sampling Date\* : 06-10-2010 / 12:30 Sample Type\* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.\* : WE5

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <sup>+</sup> B	--
Colour TCU	APHA 20ed 2120 B	--
Turbidity NTU	APHA 20ed 2130 B	--
Conductivity at 25°C μS/cm	APHA 20ed 2510 B	--
Salinity g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia) mg/L	APHA 20ed 4500-NH <sub>3</sub> D	0.56
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.20
Phosphorus mg/L	APHA 20ed 4500-P D	0.10
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	<1
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client


**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 06 Oct 2010.

**REMARKS :** Sample Location WE5.

----- End -----

Tested By : T.W. Lam, K.L. Fong

Certified By :   
 Name : Gu Chin

Checked By : Gu Chin

Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER**

Report No. : GCC101000703 Date of Issue : 04-11-2010

---

Client\* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 06-10-2010

W.O. No.\* : -- Contract No.\* : -- Date Completed : 22-10-2010

GCE Serial No. : WQM102010 Sampling Date\* : 06-10-2010 / 12:30 Sample Type\* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.\* : WE5 Duplicate

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <sup>+</sup> B	--
Colour TCU	APHA 20ed 2120 B	--
Turbidity NTU	APHA 20ed 2130 B	--
Conductivity at 25°C μS/cm	APHA 20ed 2510 B	--
Salinity g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia) mg/L	APHA 20ed 4500-NH <sub>3</sub> D	0.54
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.20
Phosphorus mg/L	APHA 20ed 4500-P D	0.10
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	<1
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client

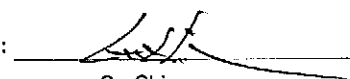
**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 06 Oct 2010.

**REMARKS :** Sample Location WE5.

----- End -----

Tested By : T.W. Lam, K.L. Fong

Certified By :   
 Name : Gu Chin

Checked By : Gu Chin

Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER**

Report No. : GCC101000711 Date of Issue : 04-11-2010

---

Client\* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 06-10-2010

W.O. No.\* : -- Contract No.\* : -- Date Completed : 22-10-2010

GCE Serial No. : WQM102010 Sampling Date\* : 06-10-2010 / 12:10 Sample Type\* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.\* : WE6

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <sup>+</sup> B	--
Colour TCU	APHA 20ed 2120 B	--
Turbidity NTU	APHA 20ed 2130 B	--
Conductivity at 25°C μS/cm	APHA 20ed 2510 B	--
Salinity g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia) mg/L	APHA 20ed 4500-NH <sub>3</sub> D	0.04
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.14
Phosphorus mg/L	APHA 20ed 4500-P D	0.06
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	<1
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client

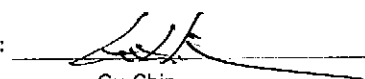
**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 06 Oct 2010.

**REMARKS :** Sample Location WE6.

----- End -----

Tested By : T.W. Lam, K.L. Fong

Certified By :   
 Name : Gu Chin

Checked By : Gu Chin

Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER**

Report No. : GCC101000729 Date of Issue : 04-11-2010

---

Client\* : Environmental Pioneers & Solutions Limited Order Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 06-10-2010

W.O. No.\* : -- Contract No.\* : -- Date Completed : 22-10-2010

GCE Serial No. : WQM102010 Sampling Date\* : 06-10-2010 / 12:10 Sample Type\* : River Water

GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258 Sample I.D.\* : WE6 Duplicate

Description : River Water

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	--
Odour	APHA 20ed 2150 B	Odour Characteristics : --
		Threshold Odour Number (TON) : --
pH Value at temperature [ ] °C	APHA 20ed 4500-H <sup>+</sup> B	--
Colour TCU	APHA 20ed 2120 B	--
Turbidity NTU	APHA 20ed 2130 B	--
Conductivity at 25°C μS/cm	APHA 20ed 2510 B	--
Salinity g/L	APHA 20ed 2520 B	--
Nitrogen (Ammonia) mg/L	APHA 20ed 4500-NH <sub>3</sub> D	0.04
	APHA 20ed 4500-NH <sub>3</sub> E	--
	APHA 18ed 4500-NH <sub>3</sub> C	--
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.15
Phosphorus mg/L	APHA 20ed 4500-P D	0.06
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	<1
Chemical Oxygen Demand (COD) mg/L	APHA 20ed 5220 D	--
Total Suspended Solid mg/L	APHA 20ed 2540 D	--

\* : Information provided by client

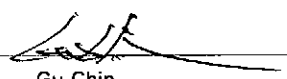
Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Sample received on 06 Oct 2010.

REMARKS : Sample Location WE6.

----- End -----

Tested By : T.W. Lam, K.L. Fong

Certified By :   
 Name : Gu Chin  
 Post : Chemist

Checked By : Gu Chin

# **Appendix E**

## **Construction Noise Monitoring Data Sheet**





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

Construction Noise Monitoring Data Sheet

Monitoring Location		N1	N2
Description of Location		Façade	Façade
Date of Monitoring		4/10/2010	
Measurement Start Time (hhmm)		15:50	15:16
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.2	0.2
Measurement Results	L90 (dB(A))	44.8	41.6
	L10 (dB(A))	61.2	48.3
	Leq (dB(A))	60.7	46.2
Weather condition:		Cloudy	
Major Construction Noise Source(s) During Monitoring		No construction works are being carried out during measurement.	No construction works are being carried out during measurement.
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise	1. Public noise 2. Traffic noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

4/10/2010



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

Construction Noise Monitoring Data Sheet

Monitoring Location		N3	N4
Description of Location		Freefield	Facade
Date of Monitoring		4/10/2010	
Measurement Start Time (hhmm)		14:45	14:10
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.2	0.2
Measurement Results	L90 (dB(A))	44.7	48.0
	L10 (dB(A))	54.8	51.8
	Leq (dB(A))	53.5	50.3
Weather condition:		Cloudy	
Major Construction Noise Source(s) During Monitoring		No construction works are being carried out during measurement.	No construction works are being carried out during measurement.
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise	1. Public noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

4/10/2010



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

Construction Noise Monitoring Data Sheet

Monitoring Location		N1	N2
Description of Location		Façade	Façade
Date of Monitoring		11/10/2010	
Measurement Start Time (hhmm)		12:15	11:40
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.4	0.4
Measurement Results	L90 (dB(A))	41.7	42.1
	L10 (dB(A))	53.4	53.3
	Leq (dB(A))	51.5	50.9
Weather condition:		Cloudy	
Major Construction Noise Source(s) During Monitoring		No construction works are being carried out during measurement.	No construction works are being carried out during measurement.
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise	1. Public noise 2. Traffic noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

11/10/2010



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

Construction Noise Monitoring Data Sheet

Monitoring Location		N3	N4
Description of Location		Freefield	Facade
Date of Monitoring		11/10/2010	
Measurement Start Time (hhmm)		13:25	12:50
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.3	0.3
Measurement Results	L90 (dB(A))	41.1	46.1
	L10 (dB(A))	48.8	51.3
	Leq (dB(A))	47.4	50.3
Weather condition:		Cloudy	
Major Construction Noise Source(s) During Monitoring		No construction works are being carried out during measurement.	No construction works are being carried out during measurement.
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise	1. Public noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

11/10/2010



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

Construction Noise Monitoring Data Sheet

Monitoring Location		N1	N2
Description of Location		Façade	Façade
Date of Monitoring		18/10/2010	
Measurement Start Time (hhmm)		14:35	14:00
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.4	0.5
Measurement Results	L90 (dB(A))	41.7	37.6
	L10 (dB(A))	54.4	53.1
	Leq (dB(A))	52.3	49.3
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		No construction works are being carried out during measurement.	No construction works are being carried out during measurement.
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise	1. Public noise 2. Traffic noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

18/10/2010



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

Construction Noise Monitoring Data Sheet

Monitoring Location		N3	N4
Description of Location		Freefield	Facade
Date of Monitoring		18/10/2010	
Measurement Start Time (hhmm)		13:25	12:50
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.4	0.4
Measurement Results	L90 (dB(A))	49.4	45.6
	L10 (dB(A))	58.5	50.5
	Leq (dB(A))	56.6	48.9
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		1. Excavator noise	No construction works are being carried out during measurement.
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise	1. Public noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

18/10/2010



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

Construction Noise Monitoring Data Sheet

Monitoring Location		N1	N2
Description of Location		Façade	Façade
Date of Monitoring		25/10/2010	
Measurement Start Time (hhmm)		12:45	12:10
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.3	0.3
Measurement Results	L90 (dB(A))	41.1	34.1
	L10 (dB(A))	57.4	46.8
	Leq (dB(A))	54.7	44.7
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		1. Truck noise 2. Excavators noise	No construction works are being carried out during measurement.
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise	1. Public noise 2. Traffic noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

25/10/2010



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

Construction Noise Monitoring Data Sheet

Monitoring Location		N3	N4
Description of Location		Freefield	Facade
Date of Monitoring		25/10/2010	
Measurement Start Time (hhmm)		11:35	10:55
Measurement Time Length (mins.)		30 mins	
Noise Meter Model/ Identification		ACO Japan, model 6224	
Calibrator Model/ Identification		Castle Group, GA607	
Wind Speed (m/s)		0.4	0.3
Measurement Results	L90 (dB(A))	39.4	44.0
	L10 (dB(A))	51.4	54.6
	Leq (dB(A))	50.5	56.3
Weather condition:		Sunny	
Major Construction Noise Source(s) During Monitoring		No construction works are being carried out during measurement.	No construction works are being carried out during measurement.
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise	1. Public noise
Remarks			

Name & Designation

Signature

Date:

Prepared by:

Jimmy Cheng

25/10/2010



# **Appendix F1**

## **Water Quality**

### **Monitoring Data Sheet**

**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 4/10/2010

Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1055			1100			1110			1050			1130			1140			1150		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.2			<1			<1			<1		
pH value	8.26			8.90			7.80			7.81			7.12			6.98			6.60		
Temperature (oC)	23.7			24.2			23.2			25.5			23.2			23.8			24.4		
Salinity (ppt)	0.1			0.6			6.0			7.1			0.0			0.0			0.1		
Turbidity (NTU)	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.9	0.9	Average 0.9	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	2.4	2.4	Average 2.4
DO (mg/l)	9.38	9.38	Average 9.38	9.42	9.40	Average 9.41	9.24	9.20	Average 9.22	8.85	8.87	Average 8.86	9.11	9.11	Average 9.11	9.07	9.09	Average 9.08	7.48	8.21	Average 7.85
DO Saturation (%)	112	112	Average 112	113	113	Average 113	108	108	Average 108	109	109	Average 109	107	107	Average 107	108	108	Average 108	90	90	Average 90

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
4/10/2010

remark or observation: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 6/10/2010

Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1045			1050			1055			1040			1110			1155			1220		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.3			<1			<1			<1		
pH value	7.70			7.70			7.33			7.35			8.32			7.18			6.71		
Temperature (oC)	24.8			25.2			26.0			25.1			24.0			24.7			26.3		
Salinity (ppt)	4.7			3.8			14.6			10.8			0.6			0.0			2.1		
Turbidity (NTU)	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	9.4	9.4	Average 9.4
DO (mg/l)	8.51	8.52	Average 8.52	8.45	8.43	Average 8.44	6.07	6.08	Average 6.08	6.61	6.62	Average 6.62	8.78	8.80	Average 8.79	8.74	8.76	Average 8.75	7.67	8.21	Average 7.94
DO Saturation (%)	103	103	Average 103	102	102	Average 102	75	75	Average 75	81	81	Average 81	104	104	Average 104	105	105	Average 105	95	95	Average 95

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
6/10/2010

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 8/10/2010

Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1200			1205			1215			1225			1130			1140			1150		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	< 1			< 1			< 1			1.4			< 1			< 1			< 1		
pH value	6.97			7.04			7.35			7.57			7.58			6.96			6.66		
Temperature (oC)	24.9			24.9			25.8			25.9			23.2			23.6			24.2		
Salinity (ppt)	1.9			8.4			14.3			7.9			0.1			0.0			1.5		
Turbidity (NTU)	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	6.0	6.0	Average 6.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	8.9	8.9	Average 8.9
DO (mg/l)	8.47	8.49	Average 8.48	8.33	8.37	Average 8.35	7.67	7.67	Average 7.67	8.09	8.06	Average 8.08	8.82	8.80	Average 8.81	8.80	8.74	Average 8.77	6.69	8.21	Average 7.45
DO Saturation (%)	102	102	Average 102	101	101	Average 101	95	94	Average 95	100	100	Average 100	104	104	Average 104	104	104	Average 104	80	80	Average 80

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
8/10/2010

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 11/10/2010      Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1455			1500			1505			1450			1515			1530			1540		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	< 1			< 1			< 1			1.4			< 1			< 1			< 1		
pH value	8.04			7.58			7.05			7.69			7.94			7.45			6.74		
Temperature (oC)	26.2			26.2			27.4			26.8			26.4			25.8			26.2		
Salinity (ppt)	0.3			0.2			4.9			3.5			0.2			0.0			0.3		
Turbidity (NTU)	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	2.9	2.9	Average 2.9	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	1.6	1.7	Average 1.7	6.7	6.7	Average 6.7
DO (mg/l)	8.58	8.59	Average 8.59	8.17	8.19	Average 8.18	8.43	8.40	Average 8.42	8.80	8.84	Average 8.82	8.09	8.07	Average 8.08	8.39	8.36	Average 8.38	6.77	8.21	Average 7.49
DO Saturation (%)	106	106	Average 106	102	102	Average 102	107	107	Average 107	111	111	Average 111	101	101	Average 101	104	104	Average 104	84	84	Average 84

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
11/10/2010

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 12/10/2010      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1555			1600			1610			1550			1640			1630			1620		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.2			<1			<1			<1		
pH value	8.09			7.66			6.27			7.53			6.91			7.23			6.95		
Temperature (oC)	26.5			27.0			26.3			28.4			27.4			26.6			26.8		
Salinity (ppt)	0.4			0.1			7.7			3.3			0.0			0.0			0.0		
Turbidity (NTU)	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	2.5	2.5	Average 2.5
DO (mg/l)	8.50	8.52	Average 8.51	8.37	8.39	Average 8.38	6.41	6.37	Average 6.39	8.40	8.46	Average 8.43	8.05	8.05	Average 8.05	8.11	8.11	Average 8.11	7.29	8.21	Average 7.75
DO Saturation (%)	107	107	Average 107	106	106	Average 106	80	80	Average 80	108	108	Average 108	102	102	Average 102	101	101	Average 101	91	91	Average 91

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
12/10/2010

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 13/10/2010      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1515			1520			1525			1505			1400			1410			1420		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.3			<1			<1			<1		
pH value	7.75			7.24			6.69			6.83			6.88			6.55			6.54		
Temperature (oC)	27.5			28.1			29.2			28.5			25.2			26.0			25.0		
Salinity (ppt)	0.3			0.1			3.7			3.9			0.0			0.0			0.2		
Turbidity (NTU)	2.9	2.9	Average 2.9	0.0	0.0	Average 0.0	12.5	12.5	Average 12.5	0.4	0.4	Average 0.4	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	8.7	8.7	Average 8.7
DO (mg/l)	8.67	8.67	Average 8.67	8.26	8.28	Average 8.27	9.08	9.09	Average 9.09	8.38	8.37	Average 8.38	8.57	8.59	Average 8.58	8.35	8.39	Average 8.37	6.52	8.21	Average 7.37
DO Saturation (%)	110	110	Average 110	106	106	Average 106	119	119	Average 119	108	108	Average 108	104	104	Average 104	104	104	Average 104	79	79	Average 79

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
13/10/2010

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: **18/10/2010**      **Sunny**

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1005			1010			1020			1000			1030			1040			1050		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.2			<1			<1			<1		
pH value	6.88			6.78			7.09			7.38			7.63			7.16			6.68		
Temperature (oC)	22.9			23.0			23.4			21.6			23.2			23.2			24.6		
Salinity (ppt)	0.5			1.9			11.9			10.8			0.0			0.0			0.5		
Turbidity (NTU)	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	9.2	9.2	Average 9.2
DO (mg/l)	9.07	9.09	Average 9.08	8.97	8.91	Average 8.94	8.85	8.81	Average 8.83	8.90	8.86	Average 8.88	8.72	8.72	Average 8.72	8.73	8.73	Average 8.73	6.62	8.21	Average 7.42
DO Saturation (%)	106	106	Average 106	104	104	Average 104	104	104	Average 104	102	102	Average 102	102	102	Average 102	102	102	Average 102	87	87	Average 87

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
18/10/2010

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 20/10/2010      Cloudy

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1050			1100			1110			1040			1120			1130			1140		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.4			<1			<1			<1		
pH value	8.00			7.95			9.65			7.78			8.60			7.72			7.04		
Temperature (oC)	25.6			25.0			25.9			25.3			24.1			24.5			26.3		
Salinity (ppt)	13.2			7.8			15.2			14.6			0.4			0.0			1.0		
Turbidity (NTU)	0.0	0.0	Average	0.0	0.0	Average	0.4	0.4	Average	0.0	0.0	Average	1.4	1.4	Average	0.0	0.0	Average	13.8	13.8	Average
			0.0			0.0			0.4			0.0			1.4			0.0			13.8
DO (mg/l)	8.90	8.92	Average	8.77	8.73	Average	7.84	7.86	Average	7.92	7.91	Average	8.83	8.85	Average	8.67	8.71	Average	8.27	8.21	Average
			8.91			8.75			7.85			7.92			8.84			8.69			8.24
DO Saturation (%)	109	109	Average	106	108	Average	97	97	Average	97	97	Average	105	105	Average	104	104	Average	102	102	Average
			109			107			97			97			105			104			102

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
20/10/2010

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: **23/10/2010**      **Sunny**

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1200			1205			1210			1150			1235			1225			1215		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.4			<1			<1			<1		
pH value	8.18			7.78			7.53			7.61			7.21			7.66			8.11		
Temperature (oC)	24.1			24.1			25.0			25.0			22.7			24.1			25.6		
Salinity (ppt)	2.8			5.3			15.9			18.7			0.0			0.1			1.7		
Turbidity (NTU)	7.1	7.1	Average 7.1	0.0	0.0	Average 0.0	1.5	1.5	Average 1.5	10.2	10.3	Average 10.3	0.9	0.9	Average 0.9	1.8	1.8	Average 1.8	5.4	5.4	Average 5.4
DO (mg/l)	9.27	9.29	Average 9.28	8.68	8.69	Average 8.69	8.69	8.64	Average 8.67	8.08	8.01	Average 8.05	8.86	8.83	Average 8.85	8.52	8.54	Average 8.53	8.89	8.21	Average 8.55
DO Saturation (%)	111	111	Average 111	104	104	Average 104	105	105	Average 105	98	98	Average 98	103	103	Average 103	102	102	Average 102	109	109	Average 109

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
23/10/2010

remark or  
observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: **25/10/2010**      **Sunny**

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1350			1355			1405			1340			1515			1525			1535		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.2			<1			<1			<1		
pH value	8.50			7.73			7.05			7.47			8.10			7.40			6.88		
Temperature (oC)	25.4			25.4			27.6			27.1			24.5			24.8			25.3		
Salinity (ppt)	0.4			0.5			4.8			7.7			0.2			0.0			0.3		
Turbidity (NTU)	0.2	0.2	Average 0.2	0.0	0.0	Average 0.0	3.1	3.2	Average 3.2	9.5	9.5	Average 9.5	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	8.4	8.4	Average 8.4
DO (mg/l)	9.45	9.40	Average 9.43	9.06	9.07	Average 9.07	9.86	9.84	Average 9.85	9.72	9.73	Average 9.73	8.28	8.26	Average 8.27	8.64	8.65	Average 8.65	6.68	8.21	Average 7.45
DO Saturation (%)	116	116	Average 116	111	111	Average 111	125	125	Average 125	123	123	Average 123	105	105	Average 105	104	104	Average 104	83	83	Average 83

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
25/10/2010

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 27/10/2010      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1450			1500			1510			1445			1345			1400			1410		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.3			<1			<1			<1		
pH value	8.30			7.67			7.41			7.18			6.85			6.74			6.59		
Temperature (oC)	22.6			23.3			24.1			24.7			20.9			22.7			24.2		
Salinity (ppt)	0.8			3.5			14.2			15.6			0.0			0.0			1.3		
Turbidity (NTU)	0.0	0.0	Average	0.0	0.0	Average	4.3	4.3	Average	2.3	2.3	Average	0.8	0.8	Average	0.8	0.8	Average	3.1	3.1	Average
			0.0			0.0			4.3			2.3			0.8			0.8			3.1
DO (mg/l)	10.16	10.14	Average	9.68	9.64	Average	9.96	9.90	Average	10.44	10.40	Average	9.84	9.86	Average	9.76	9.70	Average	9.47	8.21	Average
			10.15			9.66			9.93			10.42			9.85			9.73			8.84
DO Saturation (%)	119	119	Average	114	114	Average	120	120	Average	126	126	Average	111	111	Average	113	113	Average	113	113	Average
			119			114			120			126			111			113			113

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
27/10/2010

remark or observation: \_\_\_\_\_  
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**Environmental Pioneers & Solutions Limited**  
**Water Quality Monitoring - Summary of On-Site Measurement Results**

Date of Sampling: 29/10/2010      Sunny

Monitoring Location	M1			M2			M3			M4			C1			C2			C3		
Time (hhmm)	1530			1535			1545			1520			1355			1410			1425		
Tide Mode	mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb			mid-ebb		
River Condition	normal			normal			normal			normal			normal			normal			normal		
Water Depth (m)	<1			<1			<1			1.3			<1			<1			<1		
pH value	8.17			8.16			8.15			7.50			7.72			7.21			6.79		
Temperature (oC)	22.6			22.3			24.0			24.0			19.8			21.7			24.4		
Salinity (ppt)	8.2			2.7			18.4			16.7			0.0			0.0			1.8		
Turbidity (NTU)	1.4	1.4	Average 1.4	0.0	0.0	Average 0.0	2.3	2.3	Average 2.3	0.9	0.9	Average 0.9	0.0	0.0	Average 0.0	0.0	0.0	Average 0.0	3.2	3.2	Average 3.2
DO (mg/l)	9.36	9.38	Average 9.37	8.90	8.94	Average 8.92	10.10	10.10	Average 10.10	8.58	8.60	Average 8.59	9.20	9.24	Average 9.22	8.77	8.76	Average 8.77	9.34	8.21	Average 8.78
DO Saturation (%)	108	108	Average 108	102	102	Average 102	120	120	Average 120	102	102	Average 102	101	101	Average 101	100	100	Average 100	112	112	Average 112

Name  
Prepared By: Jimmy Cheng

Signature  


Date  
29/10/2010

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observation: \_\_\_\_\_  
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## **Appendix F2**

### **Water Quality**

### **Monitoring Lab report**



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER**

Report No. : GCC101000127 Date of Issue : 19-10-2010

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Client\* : Environmental Pioneers & Solutions Limited Date Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 04-10-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 05-10-2010

GCE Serial No. : WQM102010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	495	497	-0.4	27.4
Acceptance Criteria			<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	04 Oct 2010 / 11:30		04 Oct 2010 / 11:40		04 Oct 2010 / 11:50			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.5	1.9	<1.0	<1.0	6.0	6.0	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
	Sampling Date/Time	04 Oct 2010 / 10:55		04 Oct 2010 / 11:00		04 Oct 2010 / 11:10		04 Oct 2010 / 10:50		
	LOD	Units								
Suspended Solids (SS)	1	mg/L	2.6	2.2	2.0	2.1	4.3	4.4	3.6	3.5

\* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : --

---- End ----

Tested By : K.L. FONG

Approved Signatory : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER**

Report No. : GCC101000143 Date of Issue : 19-10-2010

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Client\* : Environmental Pioneers & Solutions Limited P.O. Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 06-10-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 07-10-2010

GCE Serial No. : WQM102010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	497	495	0.4	26.1
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ± 5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	06 Oct 2010 / 11:10		06 Oct 2010 / 11:55		06 Oct 2010 / 12:20			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	2.2	2.0	1.2	1.3	8.5	8.4	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	06 Oct 2010 / 10:45		06 Oct 2010 / 10:50		06 Oct 2010 / 10:55		06 Oct 2010 / 10:40	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	3.6	3.6	1.8	2.2	4.9	4.0	3.5

\* : Information provided by client

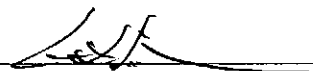
Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : Location M1 & WE3 and Location M3 & WE4 are the same location.

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :   
 Name : GU CHIN  
 Post : Chemist





## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC101000135

Date of Issue : 19-10-2010

Client\* : Environmental Pioneers & Solutions Limited

Date Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon.

Date Started : 08-10-2010

W.O. No.\* : --

Sample Type\* : River Water

Date Completed : 08-10-2010

GCE Serial No. : WQM102010

GCE Reg. No. : GCE 081096

Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results							
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L			
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	497	497	0.0	26.8			
Acceptance Criteria			<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29			
TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate			
	Sampling Date/Time	08 Oct 2010 / 11:30		08 Oct 2010 / 11:40		08 Oct 2010 / 11:50				
	LOD	Units								
Suspended Solids (SS)	1	mg/L	3.7	4.0	<1.0	<1.0	6.6	7.2		
TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
	Sampling Date/Time	08 Oct 2010 / 12:00		08 Oct 2010 / 12:05		08 Oct 2010 / 12:15		08 Oct 2010 / 12:25		
	LOD	Units								
Suspended Solids (SS)	1	mg/L	3.3	3.6	3.2	2.9	4.7	4.8	2.7	3.4

\* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : --

----- End -----

Tested By : K.L. FONG

Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER**

Report No. : GCC101000169 Date of Issue : 19-10-2010

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Client\* : Environmental Pioneers & Solutions Limited Date Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 11-10-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 12-10-2010

GCE Serial No. : WQM102010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	496	498	-0.4	25.4
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	11 Oct 2010 / 15:15		11 Oct 2010 / 15:30		11 Oct 2010 / 15:40			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.5	2.0	2.3	2.7	5.6	6.0	

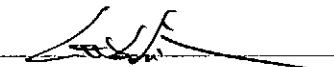
TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
	Sampling Date/Time	11 Oct 2010 / 14:55		11 Oct 2010 / 15:00		11 Oct 2010 / 15:05		11 Oct 2010 / 14:50		
	LOD	Units								
Suspended Solids (SS)	1	mg/L	2.8	2.3	1.5	1.5	4.6	4.3	2.8	3.0

\* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : --

----- End -----

Tested By : K.L. FONG Approved Signatory :   
 Name : GU CHIN  
 Checked By : GU CHIN Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC101000177 Date of Issue : 19-10-2010

Client\* : Environmental Pioneers & Solutions Limited Date Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 12-10-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 13-10-2010

GCE Serial No. : WQM102010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	496	495	0.2	27.7
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	12 Oct 2010 / 16:40		12 Oct 2010 / 16:30		12 Oct 2010 / 16:20			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	2.3	1.9	1.9	1.5	5.4	5.0	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
	Sampling Date/Time	12 Oct 2010 / 15:55		12 Oct 2010 / 16:00		12 Oct 2010 / 16:10		12 Oct 2010 / 15:50		
	LOD	Units								
Suspended Solids (SS)	1	mg/L	1.8	2.4	<1.0	<1.0	1.3	1.1	3.3	2.8

\* : Information provided by client

**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : --

---- End ----

Tested By : K.L. FONG

Approved Signatory :

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Report No. : GCC101000185 Date of Issue : 19-10-2010

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Client\* : Environmental Pioneers & Solutions Limited Date Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 13-10-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 14-10-2010

GCE Serial No. : WQM102010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	498	497	0.2	26.9
Acceptance Criteria			<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate			
		Sampling Date/Time	13 Oct 2010 / 14:00		13 Oct 2010 / 14:00		13 Oct 2010 / 14:00			
		LOD	Units							
Suspended Solids (SS)	1	mg/L	<1.0	<1.0	1.5	1.2	4.8	5.4		

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
		Sampling Date/Time	13 Oct 2010 / 15:15		13 Oct 2010 / 15:20		13 Oct 2010 / 15:25		13 Oct 2010 / 15:05	
		LOD	Units							
Suspended Solids (SS)	1	mg/L	3.0	2.7	1.4	1.6	8.2	8.8	3.7	3.6

\* : Information provided by client

**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : --

---- End ----

Tested By :                     K.L. FONG                    

Approved Signatory :   
 Name :                     GU CHIN                    

Checked By :                     GU CHIN                    

Post :                     Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER**

Report No. : GCC101000737 Date of Issue : 01-11-2010

Client\* : Environmental Pioneers & Solutions Limited Date Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 18-10-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 19-10-2010

GCE Serial No. : WQM102010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	496	495	0.2	26.6
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	18 Oct 2010 / 10:30		18 Oct 2010 / 10:40		18 Oct 2010 / 10:50			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	2.4	2.6	1.6	1.8	13.0	12.6	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	18 Oct 2010 / 10:05		18 Oct 2010 / 10:10		18 Oct 2010 / 10:20		18 Oct 2010 / 10:00	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	2.6	2.1	1.4	1.6	5.3	5.5	2.9

\* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : --

----- End -----

Tested By : K.L. FONG

Approved Signatory : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC101000745 Date of Issue : 01-11-2010

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Client\* : Environmental Pioneers & Solutions Limited Date Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 20-10-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 20-10-2010

GCE Serial No. : WQM102010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	496	496	0.0	26.6
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	20 Oct 2010 / 11:20		20 Oct 2010 / 11:30		20 Oct 2010 / 11:40			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.6	1.4	1.2	1.1	10.3	10.4	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	20 Oct 2010 / 10:50		20 Oct 2010 / 11:00		20 Oct 2010 / 11:10		20 Oct 2010 / 10:40	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	3.0	2.3	2.3	2.0	3.7	3.8	3.8

\* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : --

----- End -----

Tested By : K.L. FONG

Approved Signatory : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER**

Report No. : GCC101000753 Date of Issue : 01-11-2010

Client\* : Environmental Pioneers & Solutions Limited Date Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.

DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 23-10-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 23-10-2010

GCE Serial No. : WQM102010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	496	496	0.0	27.5
Acceptance Criteria			<2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	23 Oct 2010 / 12:35		23 Oct 2010 / 12:25		23 Oct 2010 / 12:15			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	<1.0	<1.0	<1.0	<1.0	4.7	4.4	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	23 Oct 2010 / 12:00		23 Oct 2010 / 12:05		23 Oct 2010 / 12:10		23 Oct 2010 / 11:50	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	5.3	5.7	2.3	2.2	4.1	4.8	10.9 11.1

\* : Information provided by client

**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : --

----- End -----

Tested By : K.L. FONG

Approved Signatory : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist



## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

Page 1 of 1

Report No. : GCC101000761 Date of Issue : 01-11-2010

Client\* : Environmental Pioneers & Solutions Limited Date Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 25-10-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 26-10-2010

GCE Serial No. : WQM102010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	496	495	0.2	27.5
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	25 Oct 2010 / 15:15		25 Oct 2010 / 15:25		25 Oct 2010 / 15:35			
	LOD Units								
Suspended Solids (SS)	1 mg/L	<1.0	<1.0	<1.0	<1.0	8.1	7.9		

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	25 Oct 2010 / 13:50		25 Oct 2010 / 13:55		25 Oct 2010 / 14:05		25 Oct 2010 / 13:40	
	LOD Units								
Suspended Solids (SS)	1 mg/L	3.1	4.5	1.4	1.6	3.5	2.8	9.2	8.5

\* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : --

----- End -----

Tested By : K.L. FONG

Approved Signatory : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist





**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER**

Report No. : GCC101000779 Date of Issue : 01-11-2010

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Client\* : Environmental Pioneers & Solutions Limited Date Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 27-10-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 28-10-2010

GCE Serial No. : WQM102010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	495	492	0.6	25.7
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	27 Oct 2010 / 13:45		27 Oct 2010 / 14:00		27 Oct 2010 / 14:10			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	2.0	2.3	3.0	2.8	6.0	5.6	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate	
	Sampling Date/Time	27 Oct 2010 / 14:50		27 Oct 2010 / 15:00		27 Oct 2010 / 15:10		27 Oct 2010 / 14:45		
	LOD	Units								
Suspended Solids (SS)	1	mg/L	1.2	1.4	<1.0	<1.0	4.8	4.4	5.8	6.4

\* : Information provided by client


**Note :** This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : --

----- End -----

Tested By : K.L. FONG

Checked By : GU CHIN

Approved Signatory :   
 Name : GU CHIN  
 Post : Chemist



**TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER**

Report No. : GCC101000787(A) Date of Issue : 01-11-2010

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Client\* : Environmental Pioneers & Solutions Limited Date Received : 08-09-2008

Client Address\* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.  
 DSD Contract No. DC/2006/11 - Drainage Improvement in Southern Lantau & Construction of

Project\* : Mui Wo Village Sewerage Phase 1

Test Location : G/F, 20 Pak Kung Street, Hung Hom, Kowloon. Date Started : 29-10-2010

W.O. No.\* : -- Sample Type\* : River Water Date Completed : 30-10-2010

GCE Serial No. : WQM102010 GCE Reg. No. : GCE 081096 Test Unit No. : CH 08258

Analysis Description	Test Method	Units	Quality Control Results				
			Method Blank	QC 500 mg/L	QC Duplicate	RPD%	Spike 25 mg/L
Suspended Solids (SS)	APHA 20ed 2540 D	mg/L	< 1.0	495	500	-1.0	26.6
Acceptance Criteria			< 2.5 mg/L	475 ≤ Control Limit ≤ 514		≤ ±5%	21 ≤ R ≤ 29

TEST RESULTS	Sample ID	C1	C1 Duplicate	C2	C2 Duplicate	C3	C3 Duplicate		
	Sampling Date/Time	29 Oct 2010 / 13:55		29 Oct 2010 / 14:10		29 Oct 2010 / 14:25			
	LOD	Units							
Suspended Solids (SS)	1	mg/L	1.1	1.0	<1.0	<1.0	6.9	7.6	

TEST RESULTS	Sample ID	M1	M1 Duplicate	M2	M2 Duplicate	M3	M3 Duplicate	M4	M4 Duplicate
	Sampling Date/Time	29 Oct 2010 / 15:30		29 Oct 2010 / 15:35		29 Oct 2010 / 15:45		29 Oct 2010 / 15:20	
	LOD	Units							
Suspended Solids (SS)	1	mg/L	4.5	4.1	2.2	1.5	7.1	7.5	3.3 2.9

\* : Information provided by client

Note : This laboratory has no responsibility on sampling and all the test results relate only to the sample tested as received.

Remarks : This report is an ammendment of and supplement to report no. GCC101000787

---- End ----

Tested By : K.L. FONG

Approved Signatory : 

Name : GU CHIN

Checked By : GU CHIN

Post : Chemist

Appendix G  
Monitoring Schedule  
for October 2010

## Environmental Pioneers and Solutions Limited

### DC/2006/11 - DRAINAGE IMPROVEMENT IN SOUTHERN LANTAU

#### Master Schedule of EM&A works in October 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
10/3	10/4	10/5	10/6	10/7	10/8	10/9
	WQM at: 9:11  Noise monitoring		WQM, EWQM at: 10:59		WQM at: 12:33	
10/10	10/11	10/12	10/13	10/14	10/15	10/16
	WQM, EWQM at: 14:46  Noise monitoring	WQM at: 15:32	WQM at: 15:57			
10/17	10/18	10/19	10/20	10/21	10/22	10/23
	WQM at: 9:02  Noise monitoring		WQM at: 10:48			WQM at: 11:15
10/24	10/25	10/26	10/27	10/28	10/29	10/30
	WQM at: 13:22  Noise monitoring		WQM at: 14:28		WQM at: 16:19	
10/31					10/1	10/2

Noise Monitoring Locations: Total 4 Locations as N1, N2, N3 and N4

Water Quality Monitoring (WQM) Locations: Total 7 Locations as M1, M2, M3, M4, C1, C2 and C3

Ecological Water Quality Monitoring (EWQM) Locations: Total 6 Locations as WE1, WE2, WE3, WE4, WE5 and WE6

**Appendix H Implementation Status of environmental protection / mitigation measures**

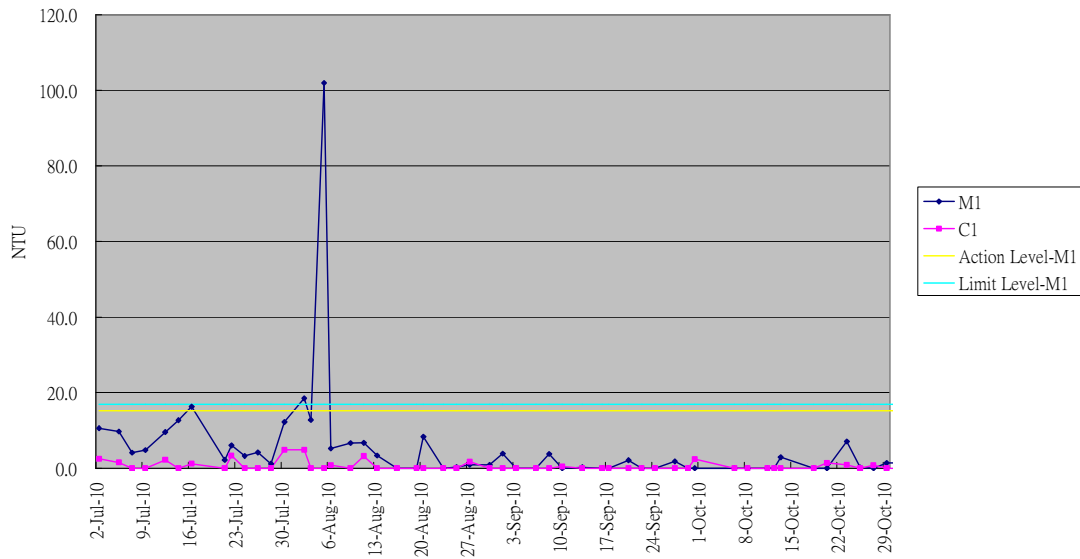
<b>Environmental Aspect</b>	<b>Protection / Mitigation Measures</b>	<b>Implementation status</b>	<b>Follow-up action</b>
<b>Air Quality</b>	Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved road, with complete coverage.	Implemented	-
	Use of frequent watering for particular dusty static construction areas and areas close to ASRs.	Implemented	-
	Tarpaulin covering of all dusty vehicle loads transported to and from and between site location;	Deficiencies found	Outstanding. Improvements were required
	Establishment and use of vehicle wheel and body washing facilities at the exit points of the site.	Implemented	-
	Routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs.	Implemented	-
<b>Noise</b>	Use of quiet powered mechanical equipment (PME)	Implemented	-
	Adoption of movable noise barriers and temporary noise barriers	Implemented	-
	Application of good site practices mentioned in EM&A manual Clause 3.8.1	Implemented	-
<b>Water Quality</b>	Before commencing any site formation works, all sewer and drainage connections should be sealed to prevent debris, soil, sand etc. from entering public sewers/drains.	Deficiencies found	Outstanding. Improvements were required
	Temporary ditches should be provided to facilitate run-off discharge into appropriate watercourses, via a silt retention pond. No site run-off should enter the freshwater marshes at Luk Tei Tong.	Implemented	-
	Sand/ silt removal facilities such as sand traps, silt traps and sediment basins should be provided to remove sand/ silt particles from runoff to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance.	Deficiencies found	Outstanding. Improvements were required
	Water pumped out from foundation excavations should be discharged into silt removal facilities.	Implemented	-
	During rainstorms, exposed slope surface should be covered by a tarpaulin or the means.	Implemented	-
	Exposed soil areas should be minimized to reduce potential for increased siltation and contamination of runoff.	Deficiencies found	Outstanding. Improvements were required
	Exposed soil surfaces should be protected by paving or fill material as soon as possible to reduce potential of soil erosion.	Implemented	-
	Open stockpiles of construction materials or construction wastes on-site of more than 50m <sup>3</sup> should be covered with tarpaulin or similar fabric during rainstorms.	Implemented	-
	Oils and fuels should only be used and stored on designated areas which have pollution prevention facilities.	Implemented	-
	Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site.	Not available	-
	The excavation and widening works for the drainage improvements to the Pak Ngan Heung River, Tai Tei Tong River, Luk Tei Tong River and Luk Tei Tong By-pass Channel should be carried out in sections (approximately 300 –400 m in length) and in dry condition.	Implemented	-

<b>Environmental Aspect</b>	<b>Protection / Mitigation Measures</b>	<b>Implementation status</b>	<b>Follow-up action</b>
	Maintenance desilting of the re-profiled river channels of the Pak Ngan Heung River, Tai Tei Tong River, Luk Tei tong River and Luk Tei Tong By-pass Channel, temporary barrier walls should be used to provide a dry zone for desilting work.	Not applicable at this stage	-
<b>Ecology</b>	Existing natural habitats should be retained as far as practicable	Implemented	-
	Boundary of working areas should be identified to prevent loss of vegetation	Implemented	-
	All existing trees / plant should be well protected within the site or transplanted properly	Implemented	-
	Turf removal from the Luk Tei Tong marsh due to the construction of Luk Tei Tong Bypass Channel shall be minimized	Implemented	-
	Turf from the Luk Tei Tong marsh shall be properly removed, stored, maintained and reused for lining the riverbed of the Luk Tei Tong Bypass Channel	Implemented	-
<b>Chemical and Solid Waste</b>	Chemical wastes should be properly stored in a proper store as per statutory requirements (i.e. on a hard standing, within an enclosed and locked area)	Implemented	-
	Chemical waste stores should be provided with fire precaution facilities (i.e. fire extinguisher, no smoking warning etc).	Implemented	-
	Chemical wastes should be properly stored in corrosion resistant containers placed inside the store and labelled with warning signs in English and Chinese.	Implemented	-
	Chemical wastes should be disposed of by licensed chemical waste collector with supporting delivery records.	Implemented	-
	All containers for fuel, diesel and fluid chemical (in use) and oil filled stationery plants located with proper drip pans.	Implemented	-
	Construction wastes should be managed and disposed to the designated public fill and landfill areas in acceptable manner.	Deficiencies found	Improvements were required
	All waste disposals managed in a proper manner i.e. trip ticket system implementation.	Implemented	-

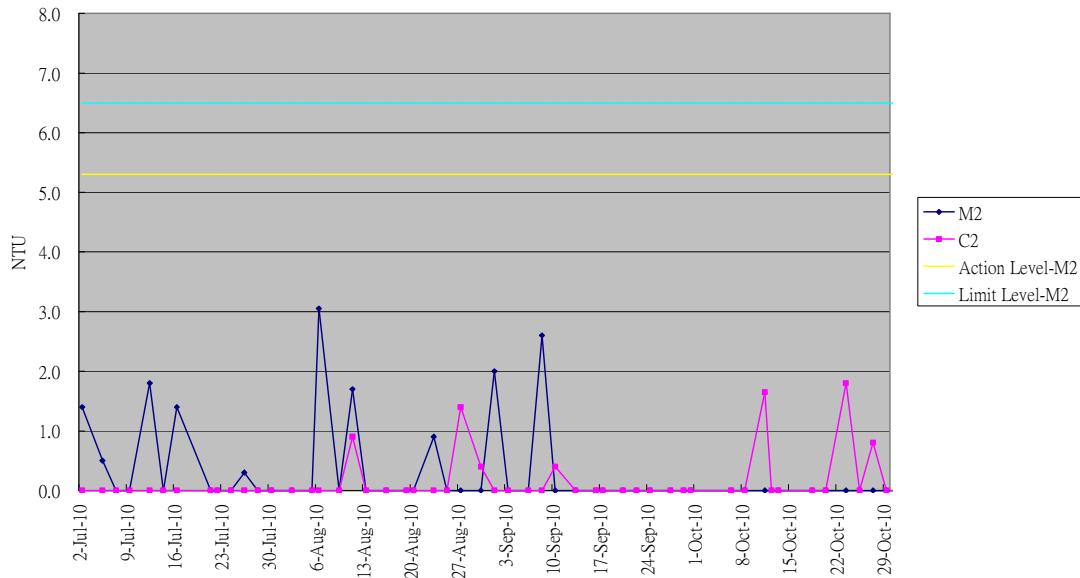
## Appendix I

Graphical plot of water  
quality monitoring  
results (SS, DO,  
turbidity)

**Graphical Plot of Turbidity Trend M1&C1(Jul - Oct 10)**

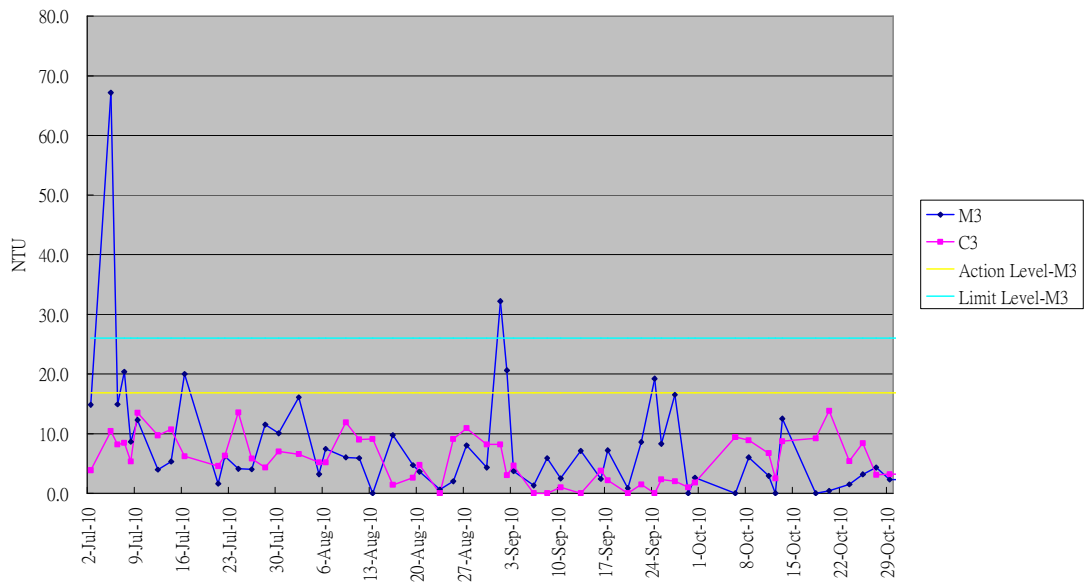


**Graphical Plot of Turbidity Trend M2&C2 (Jul - Oct 10)**

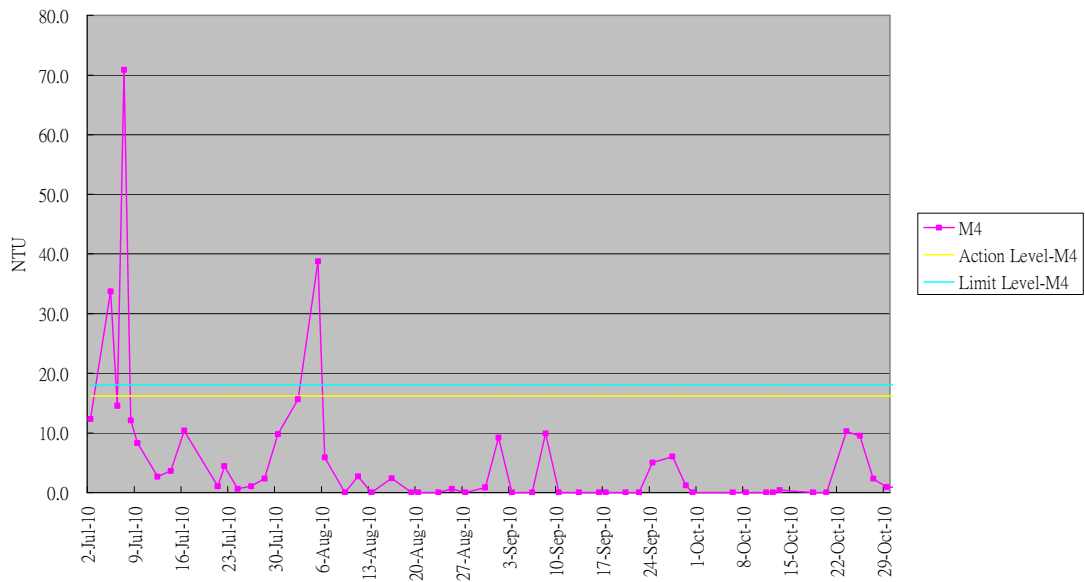




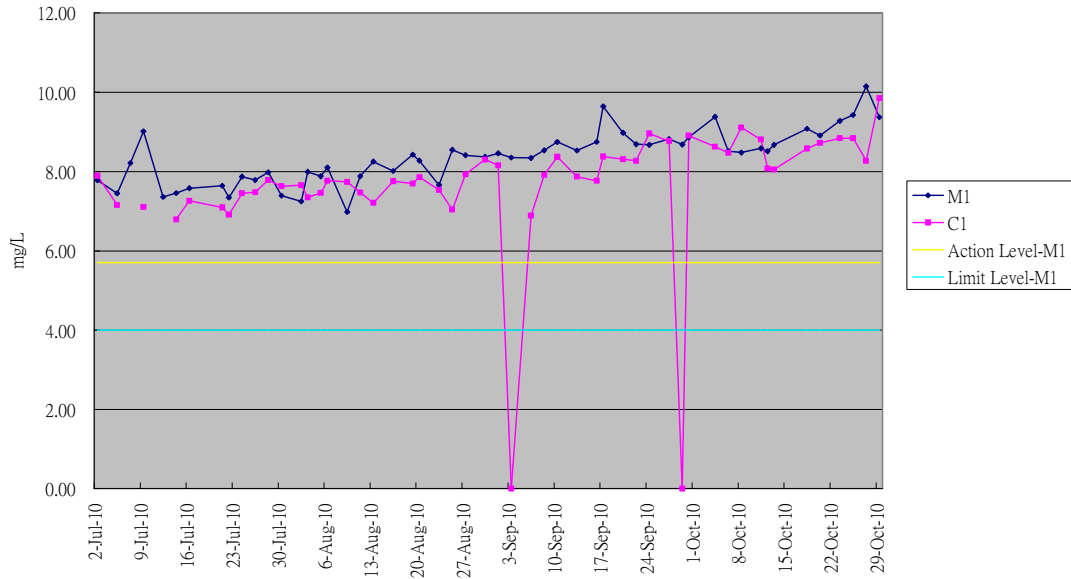
**Graphical Plot of Turbidity Trend M3&C3 (Jul - Oct 10)**



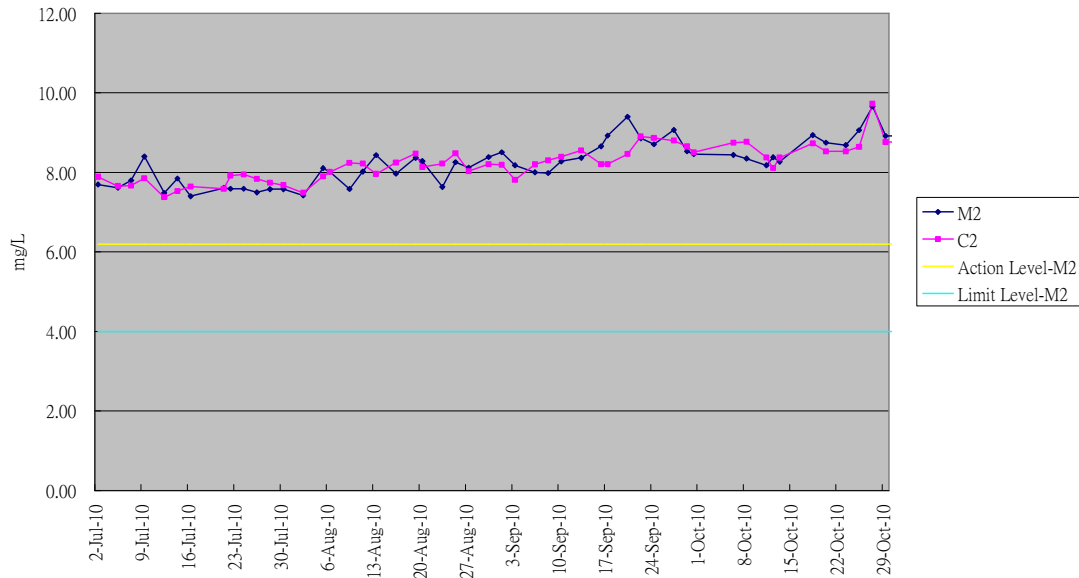
**Graphical Plot of Turbidity Trend M4 (Jul - Oct 10)**



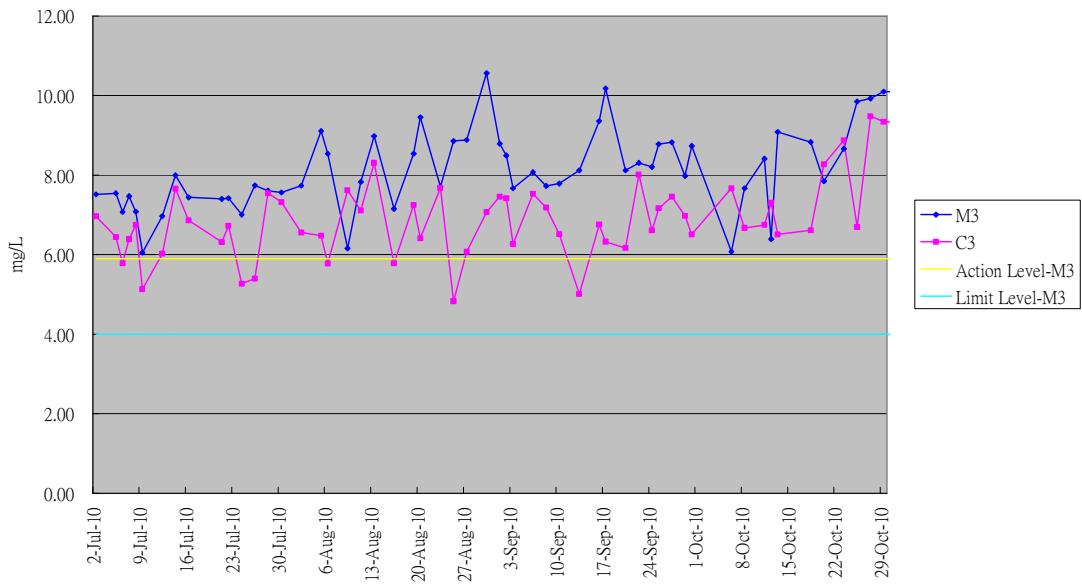
**Graphical Plot of Dissolved Oxygen Trend M1&C1 (Jul - Oct 10)**



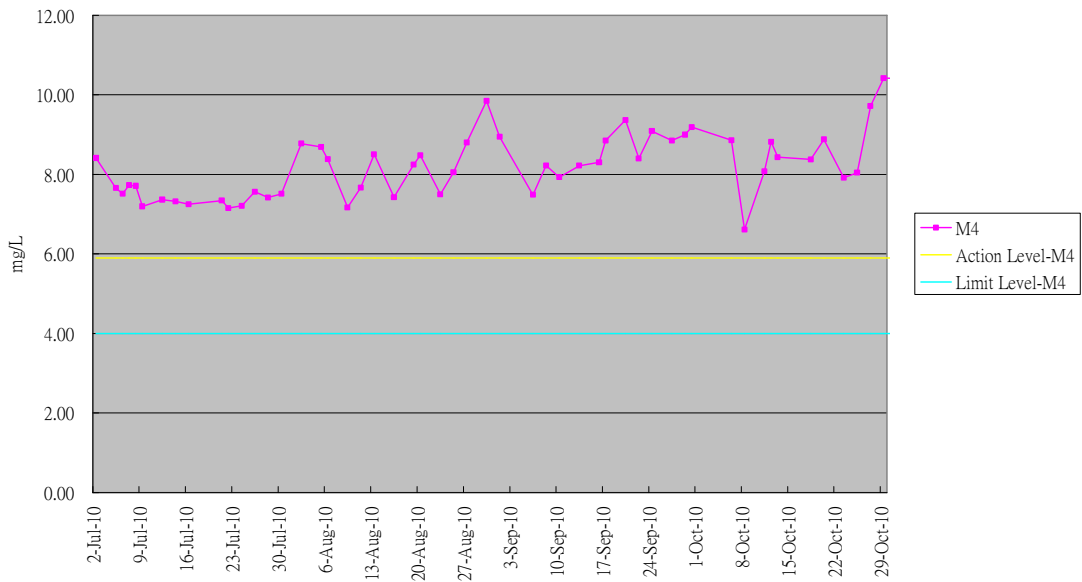
**Graphical Plot of Dissolved Oxygen Trend M2&C2 (Jul - Oct 10)**



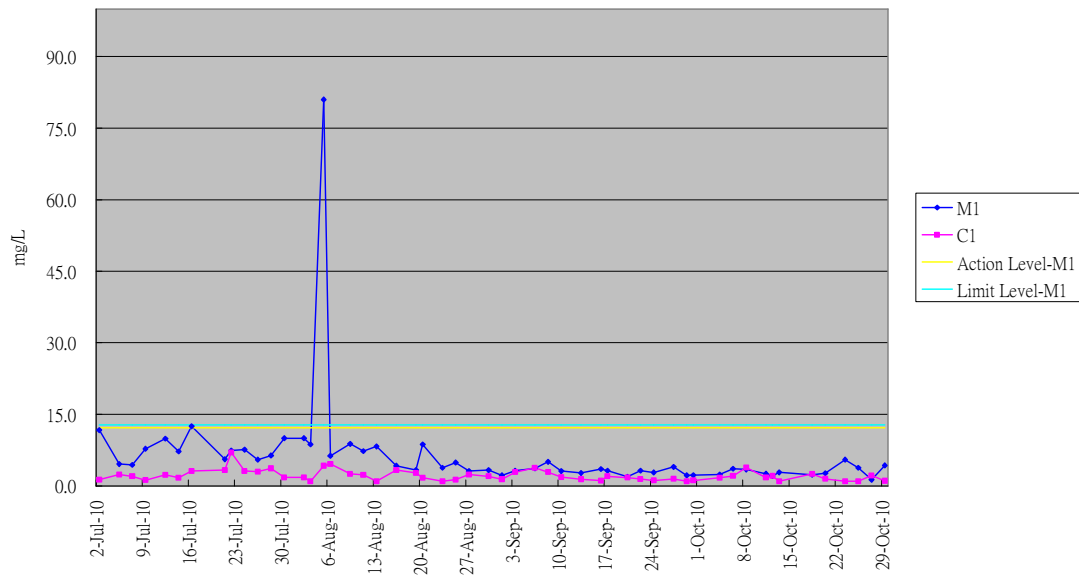
**Graphical Plot of Dissolved Oxygen Trend M3&C3 (Jul - Oct 10)**



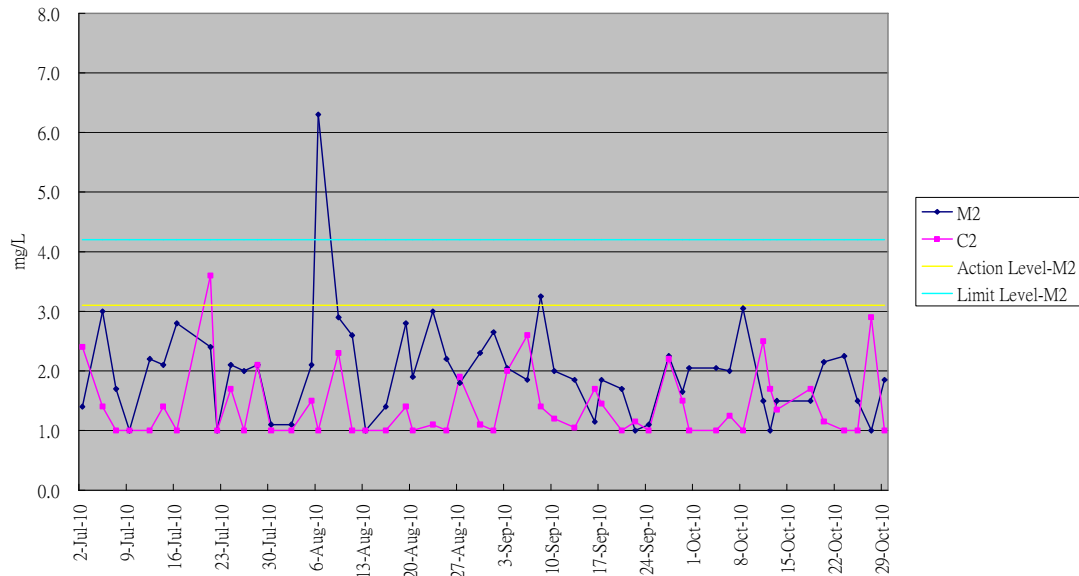
**Graphical Plot of Dissolved Oxygen Trend M4 (Jul - Oct 10)**



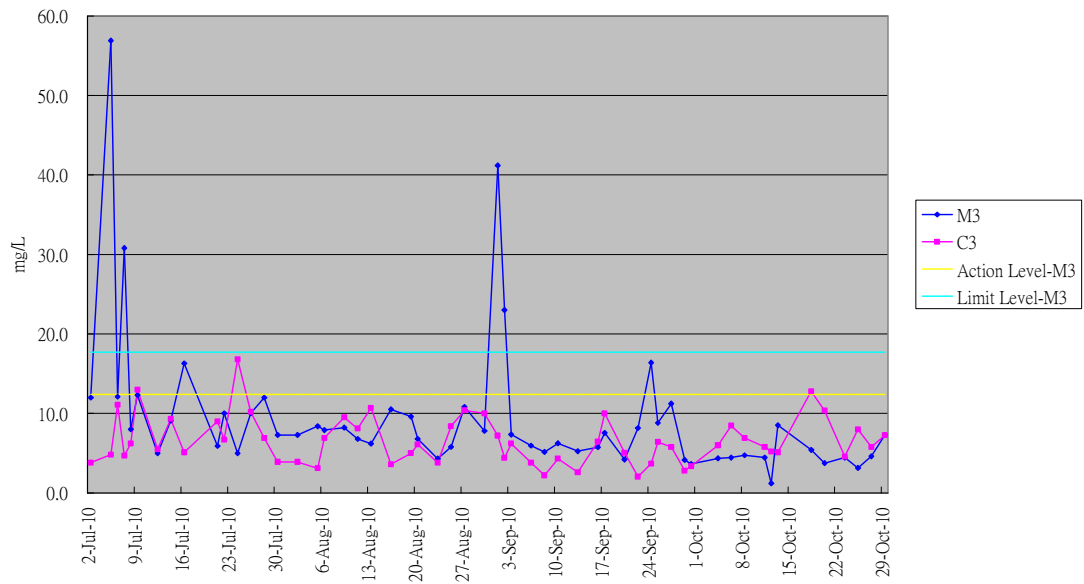
**Graphical Plot of Suspended Solid M1&C1 (Jul - Oct 10)**



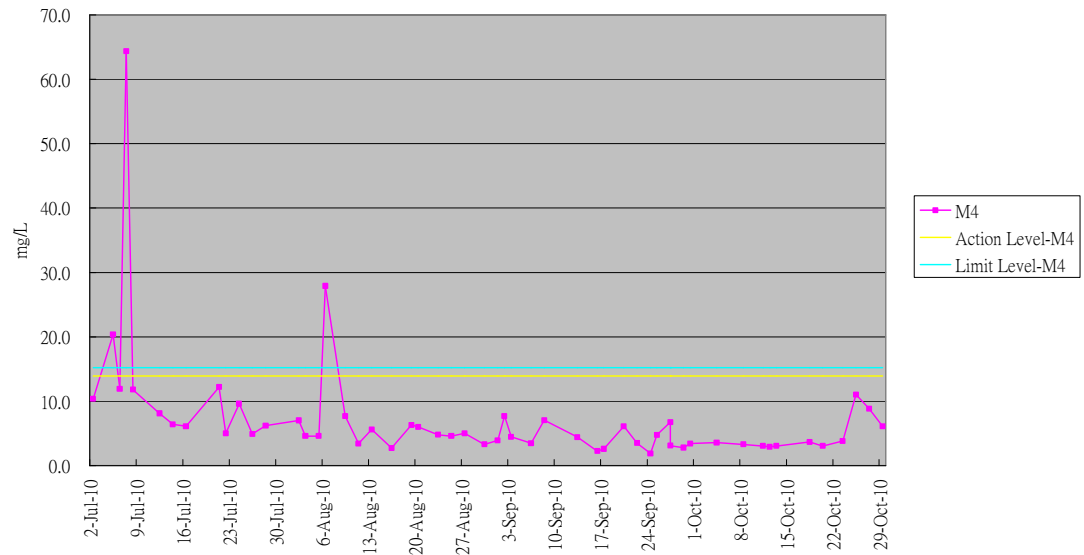
**Graphical Plot of Suspended Solid M2&C2 (Jul - Oct 10)**



**Graphical Plot of Suspended Solid M3&C3 (Jul - Oct 10)**



**Graphical Plot of Suspended Solid M4 (Jul - Oct 10)**



## Appendix J

Graphical plot of noise  
monitoring results

