**Drainage Service Department** 

Monthly Environmental Monitoring & Auditing report for

Contract No.DC/2006/11 Drainage Improvement in Southern Lantau

July 2010

**Environmental Pioneers & Solutions Limited** 

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## **APPENDIXES**

### **EXECUTIVE SUMMARY**

This is the twenty-fourth 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 July 2010 to 31 July 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 53 non-compliance events of water quality criteria were recorded in this reporting period while 8 of them were believed to be mainly attributed to improper site practice and insufficient of water quality mitigation measures on site. As such, contractor was advised to implement necessary corrective actions and mitigation measures as to minimize further deterioration of water quality.

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-fourth 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.

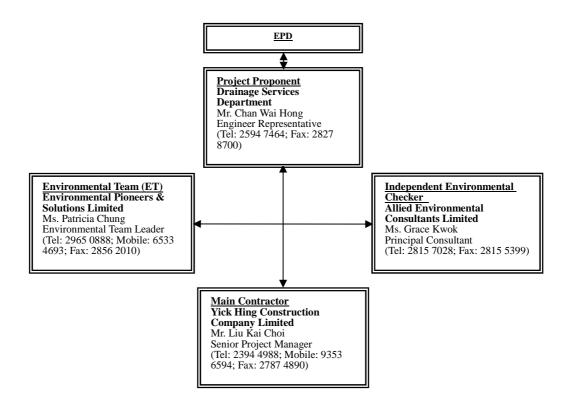


Figure. 2.2.1 Environmental Management structure for the project

### 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.
- 3. Construction of granite facing for concrete structures.

### 3.2 Construction activities for the coming month

Construction activities aforementioned will be continued in the upcoming month.

### 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<sup>-1</sup> or wind with gust exceeding 10ms<sup>-1</sup>. 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

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	B & K, model 4231	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										

Table 4.2.1 Equipment List for Noise Monitoring

### 4.3 Monitoring Locations

According to the Baseline Monitoring Report issued in May 2008 for the captioned project, four locations where are 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.

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)

Table 4.3.1 Noise Monitoring Locations during Construction Phase

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.

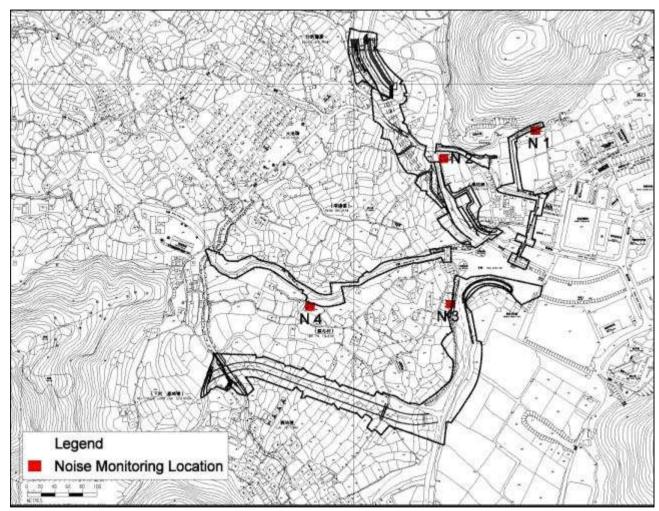


Figure 4.3.1 Impact noise monitoring locations

### 4.4 Monitoring Results and Interpretation

Relevant details of the noise monitoring results are presented in Table 4.4.1. The results, ranged between 47.6 dB(A) and 62.2 dB(A), were within the limit levels and therefore, no exceedance was found.

Monitoring originally scheduled on 21 and 28 July 2010 was postponed to 24 and 30 July 2010 respectively due to rainy weather.

Table 4.4	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 30mins</sub>	7-Jul-10	14:10	51.3	75	Ν	Sunny				
N1	L <sub>eq 30mins</sub>	14-Jul-10	15:55	54.3	75	Ν	Sunny				
N1	L <sub>eq 30mins</sub>	24-Jul-10	11:30	54.2	75	Ν	Sunny				
N1	L <sub>eq 30mins</sub>	30-Jul-10	13:30	60.3	75	Ν	Sunny				
N2	L <sub>eq 30mins</sub>	7-Jul-10	14:50	62.2	75	N	Sunny				
N2	L <sub>eq 30mins</sub>	14-Jul-10	12:05	49.9	75	Ν	Sunny				
N2	L <sub>eq 30mins</sub>	24-Jul-10	12:03	47.8	75	Ν	Sunny				
N2	L <sub>eq 30mins</sub>	30-Jul-10	11:55	47.6	75	Ν	Sunny				
N3*	L <sub>eq 30mins</sub>	7-Jul-10	13:25	59.3	75	N	Sunny				
N3*	L <sub>eq 30mins</sub>	14-Jul-10	11:30	54.3	75	Ν	Sunny				
N3*	L <sub>eq 30mins</sub>	24-Jul-10	10:25	51.6	75	Ν	Sunny				
N3*	L <sub>eq 30mins</sub>	30-Jul-10	11:20	51.6	75	Ν	Sunny				
N4	L <sub>eq 30mins</sub>	7-Jul-10	12:50	55.9	75	N	Sunny				
N4	L <sub>eq 30mins</sub>	14-Jul-10	10:50	48.3	75	Ν	Sunny				
N4	L <sub>eq 30mins</sub>	24-Jul-10	10:58	51.1	75	Ν	Sunny				
N4	L <sub>eq 30mins</sub>	30-Jul-10	10:50	55.6	75	Ν	Sunny				

Table 4.4.1 Noise monitoring results

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 PeriodAction LevelLimit Level								
0700 – 1900 hours on normal weekdays	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.								

EVENT	ACTION												
EVENT	ET	IC(E)	ER	Contractor									
Action Level	<ol> <li>Notify IC(E) and Contractor;</li> <li>Carry out investigation;</li> <li>Report the results of investigation to the IC(E), ER and Contractor;</li> <li>Discuss with the Contractor and formulate remedial measures;</li> <li>Increase monitoring frequency to check mitigation effectiveness.</li> </ol>	<ol> <li>Review the analysed results submitted by the ET;</li> <li>Review the proposed remedial measures by the Contractor and advise ER accordingly;</li> <li>Supervise the implementation of remedial measures.</li> </ol>	<ol> <li>Require Contractor to propose remedial measures for the analysed noise problem;</li> <li>Ensure remedial measures are properly implemented.</li> </ol>	proposals.									
Limit Level	<ol> <li>Identify source;</li> <li>Inform IC(E), ER, EPD and Contractor;</li> <li>Repeat measurements to confirm findings;</li> <li>Increase monitoring frequency;</li> <li>Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>Inform IC(E), ER and EPD the causes and actions taken for the exceedances;</li> <li>Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results</li> <li>If exceedance stops, cease additional monitoring</li> </ol>	<ol> <li>Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;</li> <li>Supervise the implementation of remedial measures.</li> </ol>	<ol> <li>Confirm receipt of notification of failure in writing;</li> <li>Notify Contractor;</li> <li>Require Contractor to propose remedial measures for the analysed noise problem;</li> <li>Ensure remedial measures properly implemented;</li> <li>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>	<ul> <li>for remedial actions to IC(E) within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Resubmit proposals if problem still not under control;</li> <li>Stop the relevant portion of works as determined by the</li> </ul>									

# Table 4.5.2 Event / Action Plan for Construction Noise

### 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.

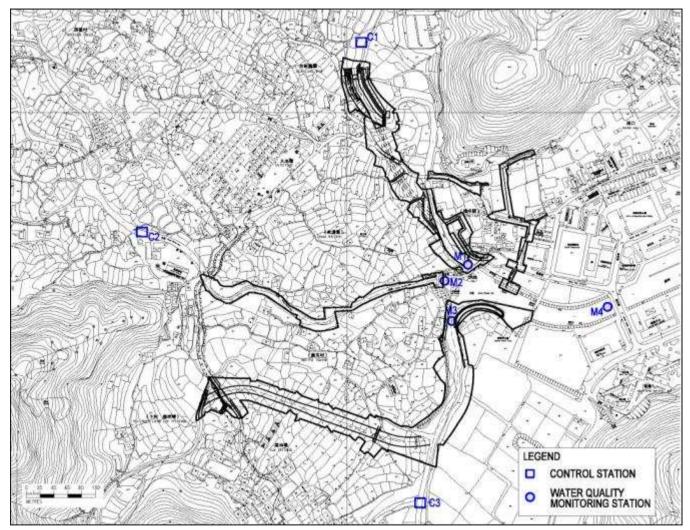


Figure 5.3.1 Water Quality Monitoring Locations

# 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 fourth times during July. 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 53 exceedance events on parameters of turbidity and suspended solids were recorded in this reporting month according to the established level. Findings from the investigations showed most of the exceedance events were mainly caused by natural fluctuation and deficiencies of site practice.

As 8 events were suspected to be related to improper site practices, contractor was seriously reminded to review the site conditions and implement corrective actions as well as mitigation measures as soon as possible to minimize further deterioration of water quality.

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

		M1			M2			M3			M4		
	MIN	MAX	Average	MIN	MAX	Average	MIN	MAX	Average	MIN	MAX	Average	
Turbidity (NTU)	1.2	16.3	6.5	0.0	1.8	0.5	1.6	67.2	13.9	0.6	70.9	12.7	
DO (mg/l)	7.3	9.0	7.8	7.4	8.4	7.7	6.1	8.0	7.3	7.2	8.4	7.5	
Suspended Solid (mg/l)	4.4	12.5	7.5	1.0	3.0	2.0	5.0	56.9	14.7	4.9	64.4	13.2	

Table 5.5.1 Water quality monitoring results in July 2010

		С	1		C	2	C3			
	MIN	MAX	Average	MIN	MAX	IAX Average		MAX	Average	
Turbidity (NTU)	0.0	3.4	0.9	0.0	0.0	0.0	3.9	13.6	7.9	
DO (mg/l)	6.8	7.9	7.4	7.4	8.0	7.7	5.1	7.7	6.4	
Suspended Solid (mg/l)	1.2	7.0	2.8	1.0	3.6	1.5	3.8	16.8	8.1	

\* 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.

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

Table 5.6.1 Water quality criteria for monitoring

Table 5.6.2 Action and Limit Levels established according to baselin	e data
--	--------

			M	o <mark>nitorin</mark>	g locatio	ns		
Parameters	Μ	[1	M2 M3		M2 M3		Μ	[4
r ar ameter s	Action	Limit	Action	Limit	Action	Limit	Action	Limit
	Level	Level	Level	Level	Level	Level	Level	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.

EVENT			ACT	ΓΙΟΝ	
	ET		IC(E)	ER	Contractor
Action Level being exceed by one sampling day	methods;	s for and 2. :t; and data, nt and rorking igation 3. E) and ent on	Discuss with ET and Contractor on the mitigation measures; Review proposals in mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures.	<ul> <li>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> </ul>	<ul> <li>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> </ul>
Action level being exceed by more than two consecutive sampling days	methods; 5. Discuss miti measures with IC(I Contractor;	s for and 2. t; and data, nt and vorking igation are vare to itoring ent on	Discuss with ET and Contractor on the mitigation measures; Review proposals in mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures.	<ul> <li>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> </ul>	<ul> <li>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> </ul>
Limit level being exceeded by one sampling day	methods; 5. Discuss miti measures with IC( Contractor;	s for and 2. it; and data, nt and rorking igation 3. E) and igation are itoring y until	Discuss with ET and Contractor on the mitigation measures; Review proposals in mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures.	<ul> <li>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> </ul>	<ul> <li>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> </ul>

Table 5.6.3 Event and action Plan for Water Quality

### 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 is 2, 5, 6, 9, 11, 13, 16, 19, 20, 23, 25, 27 and 30 August 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.

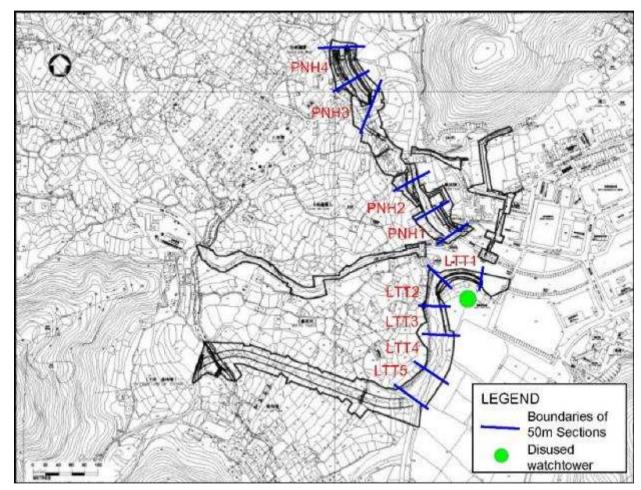


Figure 6.1 Ecological Monitoring Locations

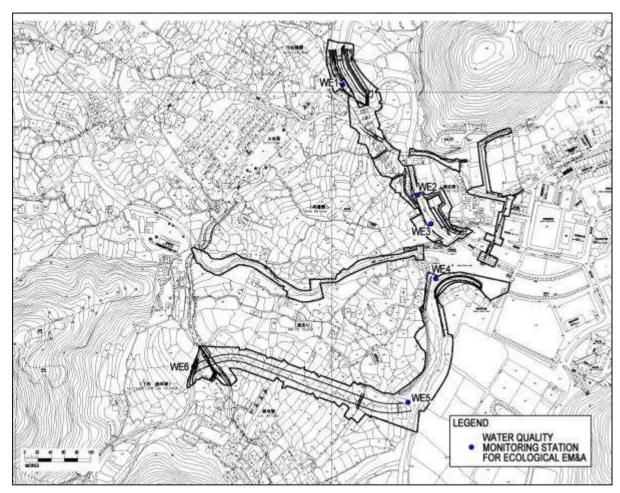


Figure 6.2 Ecological Water Quality monitoring locations

### 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 8 July 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, while the weir is still intact.

The walk through survey recorded a total of 33 species, including 16 trees, 1 shrub, 7 herb and 4 grass species (Appendix D1) on PNH N section. 25 of the species recorded are natives, while 8 were exotics. Remnants of vegetation including native trees (e.g. *Ficus hispida, Macaranga tanarius)* and grasses species (e.g. *Microstegium ciliatum*) were still seen along the weir or retained at 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 ongoing along PNH S section. Vegetation was only found on remnants of the old concrete bank. A total of 6 species recorded, 4 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, Ficus microcarpa*) (Appendix D2). No species of conservation interest was recorded.

### Terrestrial Fauna

Surveys were conducted on 9 July 2010.

No bird was recorded in the proposed work area of the Pak Ngan Heung River (Table 6.5.2).

One species of dragonfly was recorded in the proposed work area of the Pak Ngan Heung River in July 2010. This species is common in Hong Kong.

Table 6.5.2Dragonfly in Pak Ngan Heung

Common names	Latin names	PNH 1	PNH 2	PNH 3	PNH 4	Commonness & distribution
Wandering Glider	Pantala flavescens				2	А

A = abundant Aquatic fauna and fish

Sections of stream within the PNH3 boundary had been diverted to a bypass channel to facilitate the construction of the fish ladder. Therefore the PNH 3 was not covered by the present monitoring. In the remaining three survey section at PNH, 5 species of fish and 1 crustacean were recorded. 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.

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

 Table 6.5.4
 Aquatic Invertebrates and fish in Pak Ngan Heung

+ =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 7 July 2010. During the current survey, site clearance was completed in most sections. New gabion bank at LLT1 was completed, while some renmants of vegetation and mangroves remained at both LLT1 and LLT2 respectively. Some vegetation cleared and trimmed on existing rocky bank of LLT1 in March 2010 for maintenance purpose resprouted or grew back.,

The walk through survey recorded a total of 14 species, including 6 tree, 2 herb and 4 grass species (Appendix D3). 9 species recorded are natives, while 5 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 9 July 2010.

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

Common names	Latin names	LTT	LTT	LTT	LTT	LTT	Commonness
		1	2	3	4	5	& distribution
Little Egret	Egretta garzetta	1					CW
Red-whiskered	Pycnonotus jocosus		2				CW
Bulbul							

Table 6.5.6Avifauna in Luk Tei Tong River

CW = common and widespread

Three species of dragonfly were recorded in the Luk Tei Tong River in June 2010 (Table 6.5.7). All are common in Hong Kong (Wilson 2004).

Common names	Latin names	LTT	LTT	LTT	LTT	LTT	Commonness
		1	2	3	4	5	& distribution
Variegated Flutterer	Rhyothemis variegata					1	С
Saddlebag Glider	Tramea virginia					1	С
Wandering Glider	Pantala flavescens	3					А

Table 6.5.7Dragonfly in Luk Tei Tong River

A = abundant, C = common

### Aquatic invertebrates and fish

4 species of fish, 3 species of crustacean 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.

Common names	Scientific names	LTT1	LTT2	LTT3	LTT4	LTT5
Invertebrates				I	I	I
Mangrove clam	Geloina erosa					
Rock oyster	Saccostrea cuculata		++			
Snail	Melanoides tuberculata				+	++
Snail	Terebralia sp.					
Snail	<i>Nerita</i> sp.		+			
Snail	Littoraria articulata		+++			
Crab	Varuna litterata				+	
Fiddler crab	Uca lactea					
Fiddler crab	Uca arcuata			+		
Fiddler crab	Uca crassipes					
Crab	Perisesarma bidens			++		

Table 6.5.8Aquatic invertebrates and fish in Luk Tei Tong River

Mangrove mud crab	Scylla paramamosain				
Mitten crab	Eriocheir japonica				
Fish					
	Periophthalmus			+	
Common mudskipper	cantonensis				
Tilapia		+	++		
Jarbua terapon	Terapon jarbua				
Mullet	Mugil cephalus	++	+++	+	
Common Silver-biddy	Gerres oyena				
Barcheek Goby	Rhinogobius giurinus				+

+ = 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 9 July 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 July 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 9 July 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 WE6 (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.

Parameters	Limit of detection	WE1	WE2	WE3	WE4	WE5	WE6
Suspended Solid (mg/l)	1	1.00	1.80	7.80	12.25	8.70	84.60
Nitrogen (Ammonia) (mg/l)	0.01	0.03	0.32	0.17	0.34	0.02	0.04
Nitrogen (Nitrate) (mg/l)	0.01	0.15	0.22	0.24	0.29	0.18	0.18
Phosphorous (mg/l)	0.01	0.05	0.08	0.08	0.11	0.05	0.04
BOD₅ (mg/l)	1	1.00	2.00	1.00	2.00	1.00	1.00
DO (mg/l)	0.01	6.80	7.62	9.02	6.06	7.76	7.47
Turbidity (NTU)	0.1	0.00	0.00	4.80	12.30	14.65	155.35
Temperature (oC)	0.1	28.9	28.8	29.7	29.9	29.6	28.9
рН	0.01	6.96	7.54	8.78	7.37	7.22	6.67
Salinity (ppt)	0.1	0.0	0.0	0.3	3.9	0.0	0.0
Conductivity (ms/m)	0.1	4.4	7.7	78.7	0.7	35.1	4.8
Water Flow (m/s)	N/A	0.110	0.090	0.100	0.080	0.080	0.050

Table 6.9 Summarized Ecological water quality monitoring results (9 July 2010)

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
BOD₅ (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
РН	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.

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

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

### 6.7 Ecological monitoring Schedule

The next ecological surveys are scheduled on 6 and 19 August 2010, while ecological water quality monitoring is scheduled on 9 August 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 53 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. Except the reasons of natural fluctuation, 8 events were identified to be substantially attributable to improper site practices. As such, the contractor was strongly recommended to review their sites condition and working method. Necessary as well as effective mitigation measures have to be implemented to minimize water quality impact from project site activities.

The summary of non-compliance events for water quality exceedance is listed in Table 7.1 for reference.

Date	Location	Parameter	Level of	Main cause of exceedance
Date	Location	Farameter	exceedance	
5/7/10	М3	Turbidity, S.S.		M3 & M4 – Disturbance of sediments and soil runoff caused by channel clearance
5/7/10	M4	Turbluity, 5.5.		and removal of earth bund / haul access
7/7/10	M3	Turbidity, S.S.	Limit Level	M3 & M4 - Clearance of riverbed and removal of earth bund / haul access that soil
777710	M4	Turbiaity, 5.5.		runoff and disturbance of sediment

Table 7.1 Summary of Non-compliance for Water Quality

### 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.

	Amount of Construction Waste disposed									
Month	Inert Waste	Non-inert Waste	Chemical Waste							
	(to Public Fill)	(to Landfill)	(to treatment plant)							
1 <sup>st</sup> to 31 <sup>st</sup> July 10	143.40 (ton)	6.10 (ton)	Nil							
Total	27883.76 (ton)	212.93 (ton)	0							

**Table 8.1 Summary of Construction Waste Disposal** 

### 9. Status of Permits and Licenses obtained

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

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

Table 9 .1 Status of Permits and Licenses Obtained

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.

Table 10.1 Summary of Formal Complaints received										
	Noise	Water	Ecology	Cultural	Others					
July 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 8, 15, 22 and 28 July 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 inspec	ction	
Date	Observations	Advice from ET	Action taken	Closing Date
27 May 10	Open stockpiles of earth materials were observed at haul access of PNH retaining wall site	Contractor was advised to provide tarpaulin coverings to the earthy stockpiles to prevent erosion and runoff.	Still outstanding. To be followed in the next reporting period	Ongoing
3 Jun 10	Open stockpile of earth material was observed at LTT site area opposite to Yuen's Compound.	Contractor was recommended to provide tarpaulin coverings to the concerned stockpile to prevent erosion and runoff from causing environmental impact.	Still outstanding. To be followed in the next reporting period.	Ongoing
11 Jun 10	Accumulation of stagnant water was observed at the abandoned site water diversion drainage and soak-away pond	Contractor was advised to backfill the concerned site water treatment system and temporary drainage to prevent accumulation of stagnant water.	Still outstanding. To be followed in the next reporting period.	Ongoing
28 Jun 10	Site materials and equipments were brought to the confluence at downstream from site alone PNHR by the flood water.	Contractor was recommended to remove the concerned materials away from the river channel to minimize deterioration of water quality.	Follow up action was taken as reported by the contractor	8 Jul 10
28 Jun 10	Muddy water was being overflowed into the river channel from the wheel washing bay of PNH fish ladder site	Contractor was recommended to provide proper bund wall at the concerned haul access and removed the muddy water accumulated in the wheel washing bay to minimize generation of runoff from site.	Still Outstanding. To be followed in the next reporting period	Ongoing
28 Jun 10	The alternative mass concrete wall site at PNHR was flooded and caused pollution to the river channel.	Contractor was recommended to implement necessary corrective action to the eroded earth bund to stop further deterioration of water quality as soon as possible.	Further enhancement to the earth bund was taken and no deficiency causing water quality impact was observed at the concerned site area	8 Jul 10
8 Jul 10	Site materials and equipments were stockpiled outside site boundary at the EVA access	Contractor was advised to relocate those equipments and materials to proper storage area as soon as possible	Still Outstanding. To be followed in the next reporting period	15 Jul 10
8 Jul 10	Riverbank and earth bund was exposed without protection at	Contractor was advised to protect the exposed earth surface with		

	Table	11.1 Summary of site inspec	ction	
Date	Observations	Advice from ET	Action taken	Closing Date
	site Box Culvert A of LTT	geo-textile covering as to avoid		
	bypass channel	erosion		
8 Jul 10	Fuel drum and power	Contractor was recommended to	Concerned fuel drums and	15 Jul 10
	generator without secondary	provide proper drip trays to all fuel	containers were removed from	
	containment measures were	containers, chemicals and stationary	the site area prior to the	
	found at site Box Culvert A of	powered equipments to prevent	inspection on 15 Jul	
	LTT bypass channel	chemical spillage		
15 Jul 10	General wastes and wood logs	Contractor was advised to remove	Follow up action was taken as	22 Jul 10
	were clogged within the fish	those wastes for hygiene issues	advised prior to the inspection	
	ladder		on 22 Jul	
15 Jul 10	Sandbags acting as bund	Contractor was advised to replace	Follow up action was taken as	28 Jul 10
	walls for temporary crossing at	those damaged sandbags	advised prior to the inspection	
	LTT River were damaged		on 28 Jul	
22 Jul 10	Site materials were stockpiled	Contractor was advised to remove	Follow up action was taken as	28 Jul 10
	on top of the river wall at LTT	those materials as to prevent those	advised prior to the inspection	
	River	from dropping into the river channel	on 28 Jul	
28 Jul 10	No high jet water sprayer or	Contractor was advised to rectify	To be followed in the next	Ongoing
	wheel washing facility was	such discrepancies as soon as	reporting period	
	provided at site entrance of	possible		
	TTT site bottleneck A			
28 Jul 10	Turbid water was observed at	Contractor was recommended to	To be followed in the next	Ongoing
	the downstream area of TTT	trace the source and implement	reporting period	
	River	necessary corrective if those		
		condition was caused by site		
		activities		

### 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

As construction activities include construction of bypass inlet, gabion wall and provision of granite facing of concrete structures will be continued 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 again 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 haul access formation, construction of retaining walls, gabion wall and box culvert at PNH River and LTT River respectively.

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 July 2010.

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

For water quality monitoring, total 53 non-compliance events of water quality criteria were recorded in this reporting month. Except the natural fluctuation, 8 events were believed to be caused by improper site practices. Hence, the contractor was urged to review the site condition and implement necessary mitigation measures and corrective actions as soon as possible to minimize water quality impact due to site works.

During ecological monitoring survey, no White-shouldered Starling was recorded breeding in the watch tower. 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
0000	DRAINAGE IMPROVEMENT WORK IN S LANTAU	534 *	534 * (	06AUG2009	21JAN2011	0	
0001	Section Commencement	11		07JAN2008 A	17JAN2008 A	100	Section Commencement
0010	Preliminaries	534 *		06AUG2009	21JAN2011	0	Preli
0020	Engineer's Accommodation	80			26MAR2008 A	100	Brginser's Accommodation
0030	Contactor's Accommodation	55 40		07JAN2008 A 07JAN2008 A	01MAR2008 A	100	
0040	Engineer's Accommodation (Secondary) Record Survey & Site Investigation	180			15FEB2008 A 04JUL2008 A	100	Engineer's Accommodation (Secondary)
0060	Recruitment of Environment Team	80			26MAR2008 A	100	Recruitment of Environment Team
0070	Establish Base line monitoring for EP	30			25APR2008 A	100 0060	Establish Base line monitoring for EP
0080	Monitoring for Environmental Permit	1001			21JAN2011	47 0070	
0100	Temporary Traffic Management Schemes	180	0 0	7JAN2008 A	04JUL2008 A	100	And
0110	Construction Proposals and Submissions	80	0 0	7JAN2008 A	26MAR2008 A	100	Construction Proposals and Submissions
0120	Permits Application & Approval	180		The Property of the American Statement of the Ame	04JUL2008 A	100	Participation and the second provide the second sec
0130	Liaison Works with Others (Initial)	220		07JAN2008 A	13AUG2008 A	100	Liaison Works with Others (Initia)
0140	Temporary Noise Barrier (Fabrication)	60			120CT2008 A	100 <b>0130</b>	► Harving Temporary Noise Barrier (Fabrication)
1000	Works at Ling Tsui Tau &TTT River (D2&D3, D4)	510		8JAN2008 A	10JUN2009 A	100 0001	Works at Ling Tsui Tau &TTT River (D2&D3, D4)
1010	Drainage Channel at Ling Tsui Tau (D2&D3)	510		8JAN2008 A	10JUN2009 A	100 0001	Drainage Channel at Ling Tsui Tau (D2&D3)
1020 1030	Sub. & app. from AMO by Archaeologist Covered U-Channel	268		07JAN2008 A	30SEP2008 A	100 1000	Sub. & app. from AMO by Archaeologist
1030	600 & Covered 750 U-Channel (D3)	120			28JAN2009 A	100 <b>1020</b> 100 <b>1030</b>	Covered U-Channel
1032	Covered 300 U-Channel (D2)	30		25FEB2009 A	26MAR2009 A	100 1030	Covered 300 U-Channel (D2)
1040	Concrete Pipe Drainage at Ling Tsui Tau (D3)	0		2APR2009 A		100	Covered Sob C-Chainer (D2)
1040	CP1.3 to MH1.4 (2 x DN600)	14			05MAY2009 A	100 1040	Conceller Pipe Drainage at Ling Tsui rau (D3)
1042	MH1.4 to MH1 (2 x DN 600)	14		6MAY2009 A	19MAY2009 A	100 1041	→ ■ MH1.4 to MH1 (2 x DN 600)
1043	MH1 to MH2 (2 x DN 600)	21	0 2	20MAY2009 A	09JUN2009 A	100 1042	→ ■■■ MH1 to MH2 (2 × DN 600)
1044	MH2 to MH3 (2 x DN 600)	75	18 1	0JUN2009 A	23AUG2009	76 <b>1043</b>	► HH2 to MH3 (2 × DN 600)
1045	MH3 to MH4 (2 x DN 600)	21	21 2	1AUG2009 *	10SEP2009	0 1044	→ ■ MH3 to MH4 (2 × DN 600)
1046	MH4 to MH5 (2 x DN 600)	14		1SEP2009	24SEP2009	0 1045	〒→■MH4 to MH5 (2 x DN 600)
1047	MH5 to MH6 (2 x DN 600)	14		25SEP2009	08OCT2009	0 1046	→ 篇 MH5 to MH6 (2 × DN 600)
1048	MH6 to MH7 (2 x DN 600)	14		90CT2009	22OCT2009	0 1047	<b>→</b> ■MH6 to MH7 (2 × DN 600)
1049	MH7 to MH8 (2 x DN 750)	80		9JUN2009 A	16SEP2009	48	MH7 to MH8 (2 x DN 750)
1050 1100	MH8 to Outlet Structure Gabion Channel at Tai Tei Tong River (D4)	21 510		3OCT2009 8JAN2008 A	12NOV2009 10JUN2009 A	0 <b>1048, 1049</b> 100 <b>0001</b>	uii → manu MH8 to Outlet Structure
1110	Preparation Work for Gabion Channel	409		The second s	01MAR2009 A	100 0001	Fremention Work for Gabion Channel at Tai Tei Tong River (D4)
1120	Bottleneck A widening excavation (LHS)	10		2MAR2009 A	11MAR2009 A	100 1110	Preparation Work for Gabion Chamber ■ Bottleneck A widening excavation (LHS)
1121	Bottleneck A type 6 gabion (LHS)	20		The second s	31MAR2009 A	100 1120	H ■ Bottleneck A type 6 gabion (LHS)
1122	Bottleneck A widening excavation (RHS)	10		1APR2009 A	10APR2009 A	100 1121	Stateried iv type o gabler (cho)
1123	Bottleneck A type 6 gabion (RHS) & river bed	20	0 1	1APR2009 A	30APR2009 A	100 1122	→ ■ Bottleneck A type 6 gabion (RHS) & river bed
1130	Approval of temp access from bottleneck A to B	60	0 3	1MAR2009 A	29MAY2009 A	100	Approval of temp access from bottleneck A to B
1131	Forming of access form bottleneck A to B	12	0 3	0MAY2009 A	10JUN2009 A	100 <b>1130</b>	Forming of access form bottleneck A to B
1132	Bottleneck B widening excavation (North Side)	85	29 1	1JUN2009 A	03SEP2009	66 1131	Patricks Buildenck B widening excavation (North Side)
1133	Bottleneck B type 6 gabion (South Side)	25	25 0	4SEP2009	28SEP2009	0 1132	Bottleneck B type 6 gabion (South Side)
1134	Bottleneck B widening excavation (RHS)	14		9SEP2009	12OCT2009	0 1133	Source B widening excavation (RHS)
1135	Bottleneck B type 6 gabion (RHS) & river bed	14		A REPORT OF A DESCRIPTION	26OCT2009	0 1134	🐂 🛲 Bottleneck B type 6 gabion (RHS) & river bed
1140	Reinforced Concrete Retaining Wall [H]	0		1APR2009 A	070550000	100	Reinforced Concrete Retaining Wall [H]
	R C Retaining Wall H	180 0			27SEP2009	71 <b>1140</b>	A Drainage Works for Changels & Bataining Wall
1150 1151	Drainage Works for Channels & Retaining Wall U-Channel and Catchpit for Widened Bottle Neck A	15		7JAN2008 A 7OCT2009	10NOV2009	0 1123, 1135	w ⊔rainage works for Channels & Retaining Wall,
1152	U-Channel and Catchpit for Widened Bottle Neck A	15			10NOV2009	0 1123, 1135	http://www.u-Channel and Catchpit for Widened Bottle Neck A
1152	U-Channel and Catchpit for Retaining Wall H	20		8SEP2009	170CT2009	0 1135	
	Soft & Hard Landscaping Works	20		80CT2009		0 1123, 1153	U-Channel and Catchpit for Retaining Wall H
1170	Hard Landscaping & Paving Works	50			06DEC2009	0 1153	Hard Landscaping Works
	Soft Landscaping (Planting) Works	50		And the second	06DEC2009	0 1153	Soft Landscaping (Planting) Works
1200	Phase 2 sewerage works at TTT river	60		1SEP2009 *	30OCT2009	0	Phase 2 sewerage works at TTT river
	Submission and approval MS by DSD & EPD	90			29JUL2009 A	100	Submission and approval MS by DSD & EPD
	Excavation 1st half trench at TTT river	20			20SEP2009	0 1210	► → ■ Excavation 1st half trench at TTT river
	Pipe laying and backfilling 1st half trench	5			25SEP2009	0 1220	Pipe laying and backfilling 1st half trench
	Excavation 2nd half trench at TTT river	20	20 2	6SEP2009	15OCT2009	0 1230	Excavation 2nd half trench at TTT river
Start o							Early bar
Finish	-1-1- 0041100000						Drainage Improvement Work in South Lantau Dragress bar
Data o Run d		ction Co	. Ltd.				and Construction of Mui Wo Village Sewerage Phase 1
	number 1A						Master Programme (Rev.9b)
	imavera Systems, Inc.						
							Finish milestone point

Act	Description	Orig	Rem	Early Start	Early Finish	% Predecessors	2008 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
ID 1250	Pipe laying and backfilling 2nd half trench	Dur 5	Dur	160CT2009	200CT2009	0 1240	►§ Pipe laying and backfilling 2nd half trench
1250	Connection to existing manholes	4		210CT2009	240CT2009	0 1250	► Connection to existing manholes
1200	Site clearance and reinstatement of river	5		25OCT2009	29OCT2009	0 1260	⇒ #Site clearance and reinstatement of river
2000	Works at D6, D7 & D8 (HTST, LUT & CShST)	614	48	18JAN2008 A	22SEP2009	92 0001	🗜 🕶
2100	Drainage Works at Pui O - Ham Tin San Tsuen (D6)	614	48	18JAN2008 A	22SEP2009	92 0001	→ Drainage Works at Pui O - Ham Tin San Tsuen (D6)
2110	Preparation works	430		18JAN2008 A	22MAR2009 A	100 <b>0001</b>	Preparation works
2111	Sheet piling for flood protection wall	120		23MAR2009 A	20JUL2009 A	100 <b>2110</b>	→ The second se
2112	Set up cover dam for excavation of FPW	90		23MAR2009 A	20JUN2009 A	100 2110	Set up cover dam for excavation of FPW
2113	excavation and shoring for bay 1 FPW	50 30	survey a service real county was an	21JUN2009 A 10AUG2009	09AUG2009 08SEP2009	92 2112 0 2113	excavation and shoring for bay 1 FPW
2114	Concreting mass concrete wall bay 1 FPW	20		09SEP2009	28SEP2009	0 2113	► • • • • • • • • • • • • • • • • • • •
2115 2116	excavation and shoring for bay 2 FPW Concreting mass concrete wall bay 2 FPW	15		29SEP2009	13OCT2009	0 2115	Concreting mass concrete wall bay 2 FPW
2117	excavation and shoring for bay 3 FPW	20		140CT2009	02NOV2009	0 2116	► 📾 excavation and shoring for bay 3 FPW
2118	Concreting mass concrete wall bay 3 FPW	15	5 15	03NOV2009	17NOV2009	0 2117	🖙 🗰 Concreting mass concrete wall bay 3 FPW
2120	Associated Railing & Paving Works	60	60	29SEP2009 *	27NOV2009	0 2113, 2118	Image: Associated Railing & Paving Works
2130	Associated Granite Paving (vertical)	60	60	29SEP2009	27NOV2009	0 2113, 2118	-► ====================================
2200	Drainage Works at Pui O - Lo Uk Tsuen (D7)	614		18JAN2008 A	22SEP2009	92 0001	Prainage Works at Pui O - Lo Uk Tsuen (D7)
2210	Permit Application and Approval	400		18JAN2008 A	20FEB2009 A	100 0001	Extension of the second s
2211	Mobilization of plant and equipment	5 15		21FEB2009 A 26FEB2009 A	25FEB2009 A 12MAR2009 A	100 <b>2210</b> 100 <b>2211</b>	Mobilization of plant and equipment
2212 2213	Trial holes excavation Reinstatement of trial hole	13		13MAR2009 A	17MAR2009 A	100 2211	► Reinstatement of trial hole
2213	Issuing VO no.8 (Twin DI pipe crossing CP A & B)	1		06APR2009 A	06APR2009 A	100 2212	Issuing VO no.8 (Twin DI pipe crossing CP A & B)
2223	Mobilization of plant and equipment	10		07APR2009 A	16APR2009 A	100 2220	F <b>■</b> Mobilization of plant and equipment
2224	Pipe layer at crossing CP A to MH6	65	5 0	17APR2009 A	20JUN2009 A	100 2223	Pipe layer at crossing CP A to MH6
2225	Reinstatement of carriageway at CP A	7	7 O	21JUN2009 A	27JUN2009 A	100 2224	► Reinstatement of carriageway at CP A
2226	Excavation of crossing at CP B to MH7	70		17APR2009 A	25JUN2009 A	100 2223	Excertising Excertisin of crossing at CP B to MH7
2227	Reinstatement of carriageway at CP B	7		26JUN2009 A	02JUL2009 A	100 2226	
2230	Pre-cast Concrete Pipeline and Manhole	0		03JUL2009 A	450072000	100 2225, 2227	Pre-cast Concrete Pipeline and Manhole
2231 2232	MH6 to MH7 MH7 to MH8	105		03JUL2009 A 16OCT2009	15OCT2009 14DEC2009	32 2230 0 2231	► STANDARD MH7 to MH8
2232	MH8 to MH9	45		15DEC2009	28JAN2010	0 2232	L+ management MH8 to MH9
2234	MH9 to MH10	31		29JAN2010	28FEB2010	0 2233	→ MH9 to MH10
2235	MH10 to Outlet B	21		01MAR2010	21MAR2010	0 2234	
2236	Connection to existing catchpit A & B	7	7 7	17MAR2010	23MAR2010	0 2235	Genection to existing catchpit A & B
2240	Reinstatement of South Lantau Road	170	170	16OCT2009	03APR2010	0 2231, 2236	► Reinstatement of South Lantau Road
2300	Drainage Works at Cheung Sha Sheung Tsuen (D8)	614		18JAN2008 A	22SEP2009	92 0001	► Drainage Works at Cheung Sha Sheung Tsuen (D8)
2310	Permit Application and Approval	353		18JAN2008 A	04JAN2009 A	100 0001	Permit Application and Approval. ▲ Mobilization of plant and equipment
2311	Mobilization of plant and equipment	35		05JAN2009 A 18APR2009 A	09JAN2009 A 22MAY2009 A	100 <b>2310</b> 100 <b>2311</b>	DSD request a quotation for re-lining
2312 2313	DSD request a quotation for re-lining Approval of re-lining	60		23MAY2009 A	21JUL2009 A	100 2312	→ memorane Approval of re-lining
2313	Material ordering	75		22JUL2009 A	04OCT2009	20 2313	Haterial ordering
2315	MHS2 - MHS1	3	3 3	05OCT2009	07OCT2009	0 2314	₩HS2 - MHS1
2316	MHS1 - MHS0	3	3 3	08OCT2009	10OCT2009	0 2315	■ MHS1 - MHS0
2317	MHS0 - Outlet	3		11OCT2009	13OCT2009	0 2316	C+ IMHS0 - Outlet
2340	Site clearance	5		14OCT2009	18OCT2009	0 2317	Site clearance Box Culvert & Gabion Wall at PN
3000	Box Culvert & Gabion Wall at PNH River (D1)	926		18JAN2008 A	31JUL2010 31OCT2008 A	61 0001 100 0001	Preparation of Works & Frogs Capture
3010	Preparation of Works & Frogs Capture	288		18JAN2008 A 18JAN2008 A	28AUG2008 A	100 0001	
3020 3030	EVA application Erection of Control Gate of EVA	224		29AUG2008 A	22SEP2008 A	100 3020	Erection of Control Gate of EVA
3040	Maintenance of EVA	876		29AUG2008 A	21JAN2011	39 3020	
3100	Pak Ngan Heung River Box Culvert	C		29AUG2008 A		100 3020	Pak Ngan Heung River Box Culvert
3110	Construction of Wheel Washing Bays	30			27SEP2008 A	100 <b>3100</b>	L→ and Construction of Wheel Washing Bays
3111	RC Box Culvert (3mx3mx2,25m) Bay 10	35			01NOV2008 A	100 <b>3110</b>	The second RC Box Culvert (3mx3mx2,25m) Bay 10
3112	RC Box Culvert (3mx3mx2,25m) Bay 9	35			24NOV2008 A	100 3111	RC Box Culvert (3mx3mx2,25m) Bay 9
3113	RC Box Culvert (3mx3mx2,25m) Bay 2	35		13NOV2008 A	17DEC2008 A	100 3112	, Teresta RC Box Culvert (SintXintz.2011) Bay 2
3114	RC Box Culvert (3mx3mx2,25m) Bay 3	35		06DEC2008 A	09JAN2009 A	100 3113	La Contract PC Ray Culvert (20x20x2 25m) Ray 11
3115	RC Box Culvert (3mx3mx2,25m) Bay 11	45		29DEC2008 A 31JAN2009 A	11FEB2009 A 16MAR2009 A	100 <b>3114</b> 100 <b>3115</b>	
3116	RC Box Culvert (3mx3mx2,25m) Bay 12	45			30APR2009 A	100 3115	(Approval of tree felling at Mui Wo
3117 Stort	Approval of tree felling at Mui Wo date 07JAN2008		0	00AL N2008 A	A		Early bar
	date 07JAN2008 h date 21JAN2011						Drainage Improvement Work in South Lantau Progress bar
And and a state of the second second second	date 06AUG2009 Yick Hing Constru	ction C	bt Lo:				and Construction of Mui Wo Village Sewerage Phase 1
Run	Tick Thing Consta	00010					—— Summary bar
	e number 2A						Master Programme (Rev.9b)
c F	Primavera Systems, Inc.						Finish milestone point

Act ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish	%	Predecessors	2008 Sors 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 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 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 JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN	2011 JAN FEB
3118	RC Box Culvert (3mx3mx2,25m) Bay 13	55	0	01MAY2009 A	24JUN2009 A	100	3117	Financial RC Box Culvert (3mx3mx2.25m) Bay 13	
3119	Approval of tree tranplant at bay 7 & 8	41	0	01MAY2009 A	10JUN2009 A	100		Approval of tree tranplant at bay 7 & 8	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
3120	RC Box Culvert (3mx3mx2,25m) Bay 8	40	0	11JUN2009 A	20JUL2009 A	100	3119	► ■ ■ ■ ■ ■ RC Box Culvert (3mx3mx2,25m) Bay 8	
3121	RC Box Culvert (3mx3mx2,25m) Bay 7	40	19	16JUL2009 A	24AUG2009	53	3120	RC Box Culvert (3mx3mx2,25m) Bay 7	001003
3122	Awaiting divertion of UU at bay 4, 5 & 6	70	0	01MAY2009 A	09JUL2009 A	100		Awaiting divertion of UU at bay 4, 5 & 6	
3123	RC Box Culvert (3mx3mx2,25m) Bay 4	40	13	10JUL2009 A	18AUG2009	68	3122	RC Box Culvert (3mx3mx2,25m) Bay 4	 
3124	RC Box Culvert (3mx3mx2,25m) Bay 5	40	40	14AUG2009	22SEP2009	0	3123	RC Box Culvert (3mx3mx2.25m) Bay 5	
3125	RC Box Culvert (3mx3mx2,25m) Bay 6	35	35	18SEP2009	22OCT2009	0	3124	RC Box Culvert (3mx3mx2,25m) Bay 6	
3130	Backfill and Reinstatement EVA	20		23OCT2009	11NOV2009		3125	► Backfill and Reinstatement EVA	
3140	Backfilling for RC Box Culvert	385			21NOV2009		3111, 3125		
3150	PNHR Box Culvert Inlet & Outlet Structure	0		01NOV2009 *		0			1 8 1 8 1 8 1 8 1 1 8 1 8 1 8 1 8 1 9 1 8 1 8 1 8 1 8 1 9
3160	RC Box Culvert Outlet Structure (Bay 14)	50		01NOV2009	20DEC2009		3150	RC Box Culvert Outlet Structure (Bay 14)	
3170	RC Box Culvert Inlet Structure (Bay 1-Partly)	50		11NOV2009	30DEC2009	0	3150	★ RC Retaining Walls at PNH River (D1)	на стата По теат
3300	RC Retaining Walls at PNH River (D1)	0		01OCT2009 * 15NOV2009			3510	→ RC Retaining Walls at FMI River (CF)	, , , , , , , , , , , , , , , , , , , ,
3310	RC Retaining Wall A Retaining Wall A - Bay 1	20		15NOV2009	04DEC2009		3310	→ To recalling wan A	1 1 1 1 1 1 1 1 1 1
3311	Retaining Wall A - Bay 3	15		25NOV2009	09DEC2009		3311	Retaining Wall A - Bay 3	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
3312 3313	Retaining Wall A - Bay 2	15		30NOV2009	14DEC2009		3312	→ Retaining Wall A - Bay 2	1 8 1 1 1 8 8 1 1 1 1 1 1 1 1 1 1 1 1 . 1 1 1 1 1 1 1
3313	Retaining Wall A - Bay 2 Retaining Wall A - Bay 4	15		05DEC2009	19DEC2009		3313	Retaining Wall A - Bay 4	
3315	Gabion block at retaining wall A	5		20DEC2009	24DEC2009		3314	← ■Gabion block at retaining wall A	1 1 1 1 1 1 1 1 1 1 1
3320	RC Retaining Wall B	0		31DEC2009			3170, 3315		
3321	Retaining Wall B - Bay 1	20		31DEC2009	19JAN2010		3320	► mining Wall B - Bay 1	
3322	Retaining Wall B - Bay 2	15		10JAN2010	24JAN2010	0	3321	Retaining Wall B - Bay 2	
3323	Retaining Wall B - Bay 3	15	15	15JAN2010	29JAN2010		3322	Retaining Wall B - Bay 3	11111111
3324	Retaining Wall B - Bay 4	15	15	20JAN2010	03FEB2010	0	3323	► 🛲 Retaining Wall B - Bay 4	, , , , , , , , , , , , , , , , , , ,
3325	Retaining Wall B - Bay 5	15	15	25JAN2010	08FEB2010	0	3324	➡■ Retaining Wall B - Bay 5	
3326	Retaining Wall B - Bay 6	15	15	30JAN2010	13FEB2010	0	3325	🕞 🥅 Retaining Wall B - Bay 6	
3327	Gabion block at retaining wall B	5	5	14FEB2010	18FEB2010	0	3326	Sabion block at retaining wall B	
3330	RC Retaining Wall C	0	0	01NOV2009 *		0			2 F F F F F F F F F
3331	Retaining Wall C - Bay 1	30	30	01NOV2009	30NOV2009	0	3330	Retaining Wall C - Bay 1	
3332	Retaining Wall C - Bay 2	30	30	01DEC2009	30DEC2009		3331	S + mini Retaining Wall C - Bay 2	
3333	Retaining Wall C - Bay 3	30		31DEC2009	29JAN2010		3332	Retaining Wall C - Bay 3.	
3334	Gabion block at retaining wall C	7		30JAN2010	05FEB2010		3333	⇒≋Gabion block at retaining wall C	
3340	RC Retaining Wall D	0		01AUG2009 A		100		≪RC Retaining Wall D	
3341	Retaining Wall D - Bay 1	30		01NOV2009 *	30NOV2009		3344		
3342	Retaining Wall D - Bay 2	21		01DEC2009	21DEC2009		3341	► 🗰 Retaining Wall D - Bay 3	
3343	Retaining Wall D - Bay 3	21		01AUG2009 A	21AUG2009 05SEP2009		3340 3343	Retaining Wall D - Bay 4	
3344 3345	Retaining Wall D - Bay 4 Gabion block at retaining wall D	7		22DEC2009	28DEC2009		3342	-→■Gabion block at retaining wall D	
3350	RC Retaining Wall E	0		01NOV2009 *	200202000	0		→ RC Retaining Wall E	
3351	Retaining Wall E - Bay 1	30		01NOV2009	30NOV2009		3350	Retaining Wall E - Bay 1	*******
3352	Retaining Wall E - Bay 2	30		01DEC2009	30DEC2009		3351	Retaining Wall E - Bay 2	
3360	RC Maintanence Ramp	0		06SEP2009			3344		
3361	Ramp bay 1	20	20	06SEP2009	25SEP2009	0	3360	Ramp bay 1	00000
3362	Ramp bay 2	20		26SEP2009	15OCT2009	0	3361	Ramp bay 2	4 4 9 8 1 8 1 8 9 9 8 8 8 8 8 8 8 9 8 9 8 8 8 8 8 8 8
3363	Ramp bay 3	30	30	16OCT2009	14NOV2009	0	3362	En Ramp bay 3	******
3368	Gabion block at maint. ramp	10	10	15NOV2009	24NOV2009	0	3363	► ■ Gabion block at maint. ramp	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
3369	Turning Bay & Maintenance Access	70		26SEP2009	04DEC2009		3361	Turning Bay & Maintenance Access	
3370	Retaining Wall F	0		05DEC2009			3369	Retaining Wall F	
3371	Retaining Wall F - Bay 1	30	4	05DEC2009	03JAN2010		3370	Retaining Wall F - Bay 1	
3372	Retaining Wall F - Bay 2	30		30DEC2009	28JAN2010	CARD AND DESCRIPTION OF TAXABLE	3371	Retaining Wall F - Bay 2	11111111
3373	Retaining Wall F - Bay 3	25		24JAN2010	17FEB2010		3372		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
3374	Gabion block at retaining wall F	7		18FEB2010	24FEB2010		3373		
3380	RC Retaining Wall G	0		27MAR2010			3421		
3381	Retaining Wall G - Bay 1	30		27MAR2010	25APR2010		3380		
3382	Retaining Wall G - Bay 2	30		11APR2010	10MAY2010		3381 3382	Retaining Wall G - Bay 3	
3383	Retaining Wall G - Bay 3	30		26APR2010 11MAY2010	25MAY2010 09JUN2010		3382	Retaining Wall G - Bay 4	
3384	Retaining Wall G - Bay 4	30	30	110/412010	0000112010				and a standard sector to the standard sector to the standard sector of the standard sector of the standard sector se

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 07JAN2008

 Finish date
 21JAN2011

 Data date
 06AUG2009

 Run date
 15AUG2009

 Page number
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 c Primavera Systems, Inc.

Drainage Improvement Work in South Lantau and Construction of Mui Wo Village Sewerage Phase 1 Early bar Progress bar Critical bar Summary bar Start milestone point Finish milestone point

Master Programme (Rev.9b)

Act ID	Description	Orig	Rem	Early	Early	% Predece	2008 2009 2010 2011 Sors 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
3385	Retaining Wall G - Bay 5	Dur	Dur	Start	Finish		THE AND THE AN
		30		26MAY2010	24JUN2010	0 3384	
3386 3400	Gabion block at retaining wall G Alternative Mass Retaining Walls 1& 2	10		25JUN2010	04JUL2010	0 3385	► Cabion block at retaining wall G
3400	RW1	45		22DEC2009 22DEC2009	045500040	0 3342	Alternative Mass Retaining Walls 1& 2
3411	Skin Wall for RW1	45	CONTRACTOR AND A CONTRACT	05FEB2010	04FEB2010 19FEB2010	0 3400	
3412	Gabion block at RW1	7		20FEB2010	26FEB2010	0 3410	> ₩iii Skin Wall for RW1
3420	RW2	35		05FEB2010	11MAR2010	0 3411	► Sabion block at RW1
3421	Skin Wall for RW2	15		12MAR2010	26MAR2010	0 3352, 34	
3422	Gabion block at RW2	7		27MAR2010	02APR2010	0 3420	
3500	Gabion Wall (Type 2, 3, 4 & 5) at PNH River	0		010CT2009 *	02/11/12010	0	⊨⊠Gabion block at RW2
3510	Gabion Wall (opposite to RW-A & B)	45		01OCT2009	14NOV2009	0 3500	Gabion Wall (Type 2, 3, 4 & 5) at PNH River
3530	Fish Ladder and Diversion Dam	50		14FEB2010	04APR2010	0 3326	Gabion Wall (opposite to RW-A & B)
3600	Drainage Works Provision to New PNHR Channel	0		10JUN2010	0.0.0.0	0 3385	Fish Ladder and Diversion Dam
3610	Pre-cast Pipe Drains	50		10JUN2010	29JUL2010	0 3600	Prainage Works Provision to New PNHR
3620	Concrete U-Channels	50		10JUN2010	29JUL2010	0 3600	→ and Pre-cast Pipe Drains
3630	Catchpits	50	50	10JUN2010	29JUL2010	0 3600	► Internet Concrete U-Channels
4000	Luk Tei Tong Bypass Channel and River (D5)	926	360	18JAN2008 A	31JUL2010	61 <b>0001</b>	- Catchpits
4010	Preparation Work	288	0	18JAN2008 A	310CT2008 A	100 0001	Subsection Work
4020	No Excavation Period (1)	214	0*	01APR2008 A	310CT2008 A	100	And the second
4100	Luk Tei Tong By-pass Channel	0	0	01NOV2008 A		100 4020	Luk Tei Tong By-pass Channel
4101	General Site Clearance	20	0	01NOV2008 A	20NOV2008 A	100 4100	Concrat Site Clearance
4102	Mobilization of Plant and Equipment	15	0	21NOV2008 A	05DEC2008 A	100 4101	Mobilization of Plant and Equipment
4103	Preparation Work of Gabion Block Mesh	61	0	01NOV2008 A	31DEC2008 A	100 4100	+ statutes Preparation Work of Gabion Block Mesh
4110	LTT By-pass Channel (CH0+50 to Ch2+60)	0	0	01JAN2009 A		100 4103	└┯♥ LTT By-pass Channel (CH0+50 to Ch2+60)
4111	LTT BPC CH2A 2+60 to CH2A 2+00	30		01JAN2009 A	30JAN2009 A	100 <b>4110</b>	LTT BPC CH2A 2+60 to CH2A 2+00
4112	LTT BPC CH2A 2+00 to CH2A 1+50	30	0	21JAN2009 A	19FEB2009 A	100 4111	The LT BPC CH2A 2+00 to CH2A 1+50
4113	LTT BPC CH2A 1+50 to CH2A 1+00	30	0	10FEB2009 A	11MAR2009 A	100 4112	
4114	LTT BPC CH2A 1+00 to CH2A 0+50	30			31MAR2009 A	100 4113	TT BPC CH2A 1+00 to CH2A 0+50
4200	No Excavation Period (2)	214	87 *	01APR2009 A	31OCT2009	59 4110	No Excavation Period (2)
4210	LTT By-pass Channel (CH2A 2+60 to Ch2A 3+30)	0		01NOV2009		0 4200	LTT By-pass Channel (CH2A 2+60 to Ch2A 3+30)
4211	LTT BPC CH2A 2+60 to CH2A 3+00	30	30	01NOV2009	30NOV2009	0 4210	LTT BPC CH2A 2+60 to CH2A 3+00
4212	LTT BPC CH2A 3+00 to CH2A 3+30	50	50	21NOV2009	09JAN2010	0 4211	► HTT BPC CH2A 3+00 to CH2A 3+30
4220	LTT By-pass Channel (CH2A 0+50 to Ch2A 0+00)	0	0	01NOV2009		0 4200	LTT By-pass Channel (CH2A 0+50 to Ch2A 0+00)
4221	LTT BPC CH2A 0+50 to CH2A 0+00	50	50	01NOV2009	20DEC2009	0 4220	LTT BPC CH2A 0+50 to CH2A 0+00
4230	LTT Rectangular Channel A	90	90	21DEC2009	20MAR2010	0 4221	LTT Rectangular Channel A
4240	Box Culvert - A	75	46	08JUL2009 A	20SEP2009	39	Box Culvert - A
4241	Reprovision of EVA & Footpath at BC-A	10	10	21SEP2009	30SEP2009	0 4240	Reprovision of EVA & Footpath at BC-A
4250	Box Culvert - B	60	0	31JAN2009 A	31MAR2009 A	100 <b>4111</b>	P Box Culver - B
4260	Reprovision of EVA & Footpath at BC-B	180	53	01APR2009 A	27SEP2009	71 <b>4250</b>	Reprovision of EVA & Footpath at BC-B
4300	LTT River Channel & Sea Wall	0	0	01NOV2009		0 4200	LTT River Channel & Sea Wall
4310	LTT RC (CH2B 0+00 to CH2B 1+50) East Side	0	0	01NOV2009		0 4300	► LTT RC (CH28 0+00 to CH28 1+50) East Side
4311	LTT RC (CH2B 0+00 to CH2B 0+50) ES	31		01NOV2009	01DEC2009	0 4310	LTT RC (CH2B 0+00 to CH2B 0+50) ES
4312	LTT RC (CH2B 0+50 to CH2B 1+00) ES	25		22NOV2009	16DEC2009	0 4311	H → LTT RC (CH2B 0+50 to CH2B 1+00) ES
4313	LTT RC (CH2B 1+00 to CH2B 1+50) ES	25		07DEC2009	31DEC2009	0 4312	LTT RC (CH2B 1+00 to CH2B 1+50) ES
4314	LTT RC (CH2B 2+00 to CH2B 0+00) West Side	0		20JAN2010		0 4313, 442	LTT RC (CH2B 2+00 to CH2B 0+00) West Side
4315	LTT RC (CH2B 2+00 to CH2B 1+50) WS	30		20JAN2010	18FEB2010	0 4314	LTL RC (CH22 2+00 to CH22 1+50) WS
4316	LTT RC (CH2B 1+50 to CH2B 1+00) WS	25		19FEB2010	15MAR2010	0 4315	LTT RC (CH2B 1+50 to CH2B 1+50) WS
4317 4318	No works between Apr & Oct 2010	214		01APR2010 *	31OCT2010	0	A second s
ACCOUNT 1000 ACCOUNTS	LTT RC (CH2B 1+00 to CH2B 0+50) WS	30		01NOV2010	30NOV2010	0 4317	LTT RC (CH:
	LTT RC (CH2B 0+50 to CH2B 0+00) WS LTT Sea Wall (CH2B 2+00 to CH2B3+00)	16		01DEC2010	16DEC2010	0 4318	► TT Sog Wall (CLUP 2400 to CLUP2 100)
		75		01NOV2009	141410010	0 4300	
	LTT SW (CH2B 3+00 to CH2B2+50) LTT SW (CH2B 2+00 to CH2B2+50)	75 75		01NOV2009 15JAN2010	14JAN2010 30MAR2010	0 4320	LTTSW (CH2B 3+00 to CH2B2+50)
	Coping Concret Wall	75 50		15JAN2010 31MAR2010		0 4321	L11 SW (CH2B 2+00 to CH2B2+50)
and the second s	Drainage & Railing	88	Contraction of the Contraction of the	24APR2010	19MAY2010	0 4322 0 4323	Coping Concret Wall
	RC Retaining Wall J at LTT River (D5)	88		24APR2010 01JUN2009 A	20JUL2010	100	
·····	Retaining Wall J - Bay 1	30			30JUN2009 A	100 4340	
	Retaining Wall J - Bay 2	21		and the second sec	21JUL2009 A	100 4340	G⊫ sasa Retaining Wall J - Bay 1
		21	•		2.0002003 A	.00 7341	Retaining Wal J - Bay 2

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			Start	Finish		
Retaining Wall J - Bay 3	21		22JUL2009 A	11AUG2009	71 4342	Retaining Wall J - Bay 3
Retaining Wall J - Bay 4	21	21	12AUG2009	01SEP2009	0 4343	Retaining Wall J - Bay 4
Retaining Wall J - Bay 5	21	21	02SEP2009	22SEP2009	0 4344	→ mar Retaining Wall J - Bay 5
Retaining Wall J - Bay 6	25	25	23SEP2009	17OCT2009	0 4345	► mm Retaining Wal J - Bay 6
Retaining Wall J - Bay 7	25	25	18OCT2009	11NOV2009	0 4346	► ■ Retaining Wal J - Bay 7
	149	149	01NOV2009 *	29MAR2010	0	Phase 2 sewer at LTT River (Section A)
	80	80	01NOV2009 *	19JAN2010	0	
	12	12	01NOV2009 *	12NOV2009	0	■ Sewers J139a.1
	12	12	13NOV2009	24NOV2009	0 4421	⊢itti Sewers J140a.1
	12	12	25NOV2009	06DEC2009	0 4422	► 關 Sewers J141a.1
	12	12	07DEC2009	18DEC2009	0 4423	► Sewers J142a.1
	12	12	19DEC2009	30DEC2009	0 4424	F⊨≣Sewers J143a.1
				11JAN2010	0 4425	Fim Sewers J144a.1
	8			19JAN2010	0 4427	Fin Sewers J146a.1
						Section A Sewers (144.1, B135.1 & B136.1)
						► Sewers 144.1
						Fmi Sewers B136.1
						Reinstatement of gabion block
						Mini-bored Pile Wall C at LTT River
				000002000		→ Mini-bored Pile Wall C (RC Retaining Wall);
				4 410 (2000		── MP-C bay 1
		1				► MP-C bay 2
MP-C bay 2						► MP-C bay 3
MP-C bay 3						► MP-C bay 4
MP-C bay 4						₩P-C bay 5
MP-C bay 5						→ Skin Wall for PPW - C
Skin Wall for PPW - C						Remain We
Remain Works within PNH & LTT River (D1&D5)	1010	444	18JAN2008 A	23OCT2010	56 0001	
Approval of use of EVA	0	0	29AUG2008 A		100 3020	Approval of use of EVA
No exca period (1) at Confluence of PNH,TTT&LTT	214	0	01APR2008 A	310CT2008 A	100	No exca period (1) at Confluence of PNH,TTT&LTT
Works within Section 3 (A) at PNH River	151	0	01NOV2008 A	31MAR2009 A	100 4820	The second
Works within Section 3 (B) at LTT River	151	0	01NOV2008 A	31MAR2009 A	100 4820	Works within Section 3 (B) at LTT River
	214	87	01APR2009 A	31OCT2009	59	No exca period (2) at Confluence of PNH,TTT&LTT
	151	151	01NOV2009	31MAR2010	0 4850	Works within Section 3 (B) at LTT River
	214	214	01APR2010	31OCT2010	0 4860	No exca p
	50	50	01JUN2010	20JUL2010	0 3385	Remaining Drainage Works
			01JUN2010	20JUL2010	0 3385	Remaining Drainage Works
					0 4910	Remain Road & Paving
					0 4920	► material Remain Road & Pa
						Remain Soft La
						Works within Portions S1 of the Site (Chung Hau)
				and the second sec		► security construction definite Construction Proposals and Submissions
						── UPVC Sewer (DN160-400) (New works)
						→ proceeding and a second sec
Applocation and Approval of XP				02NOV2008 A		
uPVC Sewer (DN225>400) (On-line Replace)						→■ Preparation works for sewers.
Preparation works for sewers		+				MH EB13 - MH EB18
MH EB13 - MH EB18						MH EB13- MH EB25
MH EB18 - MH EB25						MH EB11 - MH EB13,
MH EB11 - MH EB13				26JAN2010		
MH EB25 - MH EB26	50	50	27JAN2010	17MAR2010	0 5044	
MH EB26 - MH EB31 - EB8	145	5 145	29OCT2009	22MAR2010	0 5042	MIC C2/2 - MIC E03 - C00
	863	3 297	18JAN2008 A	29MAY2010	66 <b>0001</b>	
			18JAN2008 A	27MAY2008 A	100 <b>0001</b>	Prepartion for works (Minor Portion)
			28MAY2008 A	12JAN2009 A	100 6010	
			13JAN2009 A	30AUG2009	89 6020	uPVC Sewer (DN160-400) M/H C45 - M/H C131
				06MAY2010	0 6030	
Sewerage at TWT (S3A & 3B)	638		18JAN2008 A	search and share on a broad state of the second state of the secon	89 0001	► Sewerage at TWT (S3A & 3B)
	Phase 2 sewer at LTT River (Section A) Section A Sewers (J139a.1 - J146a.1) Sewers J139a.1 Sewers J140a.1 Sewers J141a.1 Sewers J142a.1 Sewers B135.1 Sewers B135.1 Sewers B136.1 Reinstatement of gabion block Mini-bored Pile Wall C at LTT River Mini-bored Pile Wall C (RC Retaining Wall) MP-C bay 1 MP-C bay 2 MP-C bay 3 MP-C bay 3 MP-C bay 4 MP-C bay 5 Skin Wall for PPW - C Remain Works within PNH & LTT River (D1&D5) Approval of use of EVA No exca period (1) at Confluence of PNH,TTT&LTT Works within Section 3 (B) at LTT River No exca period (2) at Confluence of PNH,TTT&LTT Works within Section 3 (B) at LTT River No exca period (3) at Confluence of PNH,TTT&LTT Works within Section 3 (B) at LTT River No exca period (3) at Confluence of PNH,TTT&LTT Remaining Drainage Works for (3A) Embankment Remain Road & Paving Works for (3A) Embankment Remain Road & Paving Works for (4) Embankment Remain R	Phase 2 sewer at LT River (Section A)         149           Section A Sewers (J139a.1 - J146a.1)         80           Sewers J140a.1         12           Sewers J140a.1         12           Sewers J141a.1         12           Sewers J142a.1         12           Sewers J144a.1         10           Sewers B135.1         100           Sewers B135.1         100           Sewers B136.1         10           Reinstatement of gabion block         20           Mini-bored Pile Wall C at LTT River         60           Mini-bored Pile Wall C (RC Retaining Wall)         0           MP-C bay 1         14           MP-C bay 3         14           MP-C bay 4         14           MP-C bay 5         14           Skin Wall for PPW - C         24           Remain Works within PNH & LTT River (D18D5)         1010           Approval of use of EVA         0           No exca period (2) at Confluence of PNH,TTT&LTT         214           Works within Section 3 (B) at LTT River         151	Normage Name         149         149           Phase 2 sever at LTT River (Section A)         149         149           Section A Sewers (J139a.1 - J146a.1)         80         80           Severs J130a.1         112         112           Severs J140a.1         12         12           Severs J141a.1         12         12           Severs J142a.1         12         12           Severs J144a.1         12         12           Severs J144a.1         10         10           Section A Sewers (144.1, B135.1 & B136.1)         69         69           Severs B135.1         10         10         10           Sewers B136.1         10         10         10           Reinstatement of gabion block         20         20           Mini-bored Pile Wall C at LTT River         60         60           Mini-bored Pile Wall C (RC Retaining Wall)         0         0           MP-C bay 1         14         14           MP-C bay 2         14         14           MP-C bay 3         14         14           MP-C bay 4         14         14           MP-C bay 5         14         14           Approval of use of EVA         0	Notaming 1rbs of year         149         149         149         01NOV2009 *           Section A Sewers (J139a.1 - J146a.1)         80         80         01NOV2009 *           Sewers J140a.1         12         12         12         01NOV2009 *           Sewers J140a.1         12         12         12         01NOV2009 *           Sewers J141a.1         12         12         12         0NOV2009 *           Sewers J142a.1         12         12         19DEC2009           Sewers J144a.1         12         12         19DEC2009           Sewers J144a.1         8         12,AN2010         Sewers 1444.1         10         10         20JAN2010           Sewers B135.1         10         10         20JAN2010         Sewers B135.1         10         10         30JAN2010           Sewers B135.1         10         10         30JAN2010         Sewers B136.1         10         10         30JAN2010           Reinstatement of gabion block         20         0         OFEE2010         Mini-bored Pile Wall C at LTT River         66         60         1NOV2009 *           MP-C bay 1         14         14         120NO2009         MP-C bay 1         14         14         120NO2009	Nummy Trans Quark         149         149         149         01NOV2009         29MAR2010           Section A Sewers (J139a 1 - J146a.1)         80         80         01NOV2009         13UAV2010           Sewers J140a 1         12         12         10NOV2009         13UAV2009         24NOV2009           Sewers J141a 1         12         12         13NOV2009         24NOV2009         Sewers J142a           Sewers J142a 1         12         12         15DEC2009         30DEC2009         Sewers J144a         12         12         15DEC2009         30DEC2009         Sewers J144a         12         12         13DAV2010         13JAN2010         Sewers J144a         12         14         14DEC2009         30DEC2009         Sewers J144a         16         10         20JAN2010         29JAN2010         Sewers J144a         16         10         10         20JAN2010         29JAN2010         Sewers J135.1         10         10         20JAN2010         29JAN2010         Sewers J140a         14         14         14NOV2009         14NOV2009 <td< td=""><td>Number         Number         Numbr         Numbr</td></td<>	Number         Numbr         Numbr

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Act		Oria	Rem	Early	Early			2008	2009	2010	2011
ID	Description	Dur	Dur	Start	Finish	%	Predecessors	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 Portio	n)		
	Non-working Period at TWT Beach (1)	196	0.*	01APR2008 A	130CT2008 A	100			Period at TWT Beach (1)		
	uPVC Sewer (DN160-400) M/H A16 - M/H A34	465	30	28MAY2008 A	04SEP2009	04	7010		<u> </u>	60-400) M/H A16 - M/H A34	
		50							a na bana na kana kana kana kana kana k	50-400) M/H AT6 - M/H A34	
	uPVC Sewer (DN160-400) M/H A15 - M/H A13			+	02DEC2008 A		7020		C 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		111111111111
7060	uPVC Sewer (DN160-400) M/H A1 - M/H A3	65	0	22JAN2009 A	27MAR2009 A	100	7050		PVC 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			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
8020	uPVC Sewer (DN160-400) M/H ED2 -D28 - D118	320	0	23JUN2008 A	08MAY2009 A	100	8010		Weine Weine UPVC Sewer (DN160-400) M/H ED2 -I	028 - D118	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
8030	uPVC Sewer (DN160-400) M/H D1 - D27	280	191	09MAY2009 A	12FEB2010	32	8020	1360763763763163763763763763763763763763763763		uPVC Sewer (DN160-400) M/H D1 - D27	
9000	Preservation & Protection of Exist Trees	534 *	534 *	06AUG2009	21JAN2011	0	0001				Pres
9010	Preparton for works	100	0	07JAN2008 A	15APR2008 A	100	1	Preparton for works			1 6 1 6 1 6 1 6 1 6 1 6 9 6 1 6 1 6 1 6
9020	Protection & Transplanting Works	1011	534	16APR2008 A	21JAN2011	47	9010				Proti

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

nct Description	Orig Dur	Rem Dur	Early Start	Early Finish	% Predecessors	2008 2009 2010 3 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
00 DRAINAGE IMPROVEMENT WORK IN S LANTAU	534 *			21JAN2011	0	
0 Preliminaries	534 *			21JAN2011	0	
30 Monitoring for Environmental Permit	1001			21JAN2011	47 0070	
4 MH2 to MH3 (2 x DN 600)	75			23AUG2009	76 <b>1043</b>	••••••••••••••••••••••••••••••••••••••
5 MH3 to MH4 (2 x DN 600)	21	21 21	IAUG2009 *	10SEP2009	0 1044	► 🛲 MH3 to MH4 (2 x DN 600)
6 MH4 to MH5 (2 x DN 600)	14	14 11	ISEP2009	24SEP2009	0 1045	► MH4 to MH5 (2 × DN 600)
7 MH5 to MH6 (2 x DN 600)	14		5SEP2009	08OCT2009	0 1046	→ ■■ MH5 to MH6 (2 × DN 600)
3 MH6 to MH7 (2 x DN 600)	14	14 09	OCT2009	22OCT2009	0 1047	H■ MH6 to MH7 (2 × DN 600)
MH7 to MH8 (2 x DN 750)	80		JUN2009 A	16SEP2009	48	MH47 to MH8 (2 x DN 750)
MH8 to Outlet Structure	21	21 23	3OCT2009	12NOV2009	0 1048, 1049	<sup>11</sup> → mmMH8 to Outlet Structure
2 Bottleneck B widening excavation (North Side)	85	29 11	IJUN2009 A	03SEP2009	66 1131	Bottleneck B widening excavation (North Side)
Bottleneck B type 6 gabion (South Side)	25	25 04	SEP2009	28SEP2009	0 1132	₩ ■ Bottleneck B type 6 gabion (South Side)
Bottleneck B widening excavation (RHS)	14	14 29	SEP2009	12OCT2009	0 1133	Bottleneck B widening excavation (RHS)
Bottleneck B type 6 gabion (RHS) & river bed	14	14 13	3OCT2009	26OCT2009	0 1134	■ Bottleneck B type 6 gabion (RHS) & river bed
R C Retaining Wall H	180		APR2009 A	27SEP2009	71 1140	R C Retaining Wall H
U-Channel and Catchpit for Widened Bottle Neck A	15		OCT2009	10NOV2009	0 1123, 1135	
U-Channel and Catchpit for Widened Bottle Neck B	15		OCT2009	10NOV2009	0 1125, 1135	→ → ■ U-Channel and Catchpit for Widened Bottle Neck A
	20			170CT2009		
	20		SEP2009	170012009	0 1141	U-Channel and Catchpit for Retaining Wall H
Soft & Hard Landscaping Works Hard Landscaping & Paving Works			BOCT2009	06050000	0 1123, 1153	Soft & Hard Landscaping Works
	50 50		3OCT2009	06DEC2009	0 1153	Hard Landscaping & Paving Works
			BOCT2009	06DEC2009	0 1153	→ Interest Soft Landscaping (Planting) Works
Phase 2 sewerage works at TTT river	60		SEP2009 *	30OCT2009	0	Phase 2 sewerage works at TTT river
Excavation 1st half trench at TTT river Pipe laying and backfilling 1st half trench	20		SEP2009 *	20SEP2009	0 1210	texes and the second se
Pipe laying and backfilling 1st half trench	5		SEP2009	25SEP2009	0 1220	h⊫⊈ Pipe laying and backfilling 1st half trench
Excavation 2nd half trench at TTT river	20		SEP2009	15OCT2009	0 1230	► ■ Excavation 2nd half trench at TTT river
Pipe laying and backfilling 2nd half trench	5		SOCT2009	20OCT2009	0 1240	► ≋ Pipe laying and backfilling 2nd half trench
Connection to existing manholes	4			24OCT2009	0 1250	Connection to existing manholes
Site clearance and reinstatement of river	5			29OCT2009	0 1260	Site clearance and reinstatement of river
Works at D6, D7 & D8 (HTST, LUT & CShST)	614			22SEP2009	92 0001	Works at D6, D7 & D8 (HTST, LUT & CShST)
Drainage Works at Pui O - Ham Tin San Tsuen (D6)	614			22SEP2009	92 0001	Prinage Works at Pui O - Ham Tin San Tsuen (D6)
excavation and shoring for bay 1 FPW	50			09AUG2009	92 2112	excavation and shoring for bay 1 FPW
Concreting mass concrete wall bay 1 FPW	30			08SEP2009	0 2113	Concreting mass concrete wall bay 1 FPW
excavation and shoring for bay 2 FPW	20			28SEP2009	0 2114	excavation and shoring for bay 2 FPW
Concreting mass concrete wall bay 2 FPW	15		SEP2009	13OCT2009	0 2115	► ME Concreting mass concrete wall bay 2 FPW
excavation and shoring for bay 3 FPW	20			02NOV2009	0 2116	
Associated Railing & Paving Works	60	60 29		27NOV2009	0 2113, 2118	Associated Railing & Paving Works
Associated Granite Paving (vertical)	60	60 29	SEP2009	27NOV2009	0 2113, 2118	Associated Granite Paving (vertical)
Drainage Works at Pui O - Lo Uk Tsuen (D7)	614	48 18	3JAN2008 A	22SEP2009	92 0001	Drainage Works at Pui O - Lo Uk Tsuen (D7)
MH6 to MH7	105	71 03	JUL2009 A	15OCT2009	32 <b>2230</b>	MH6 to MH7
MH7 to MH8	60	60 16	OCT2009	14DEC2009	0 2231	HT to MH8
Reinstatement of South Lantau Road	170	170 16	OCT2009	03APR2010	0 2231, 2236	► Management and Reinstatement of South Lantau Road
Drainage Works at Cheung Sha Sheung Tsuen (D8)	614	48 18	JAN2008 A	22SEP2009	92 0001	Drainage Works at Cheung Sha Sheung Tsuen (D8).
Material ordering	75			04OCT2009	20 2313	Material ordering
MHS2 - MHS1	3			07OCT2009	0 2314	™≓(MHS2- MHS1
MHS2 - MHS1 MHS1 - MHS0	3		OCT2009	10OCT2009	0 2315	-
MHS0 - Outlet	3		OCT2009	13OCT2009	0 2316	S⇒IMHS0 - Outlet
Site clearance	5		OCT2009	18OCT2009	0 2317	
Box Culvert & Gabion Wall at PNH River (D1)	926			31JUL2010	61 <b>0001</b>	Box Culvert & Gabion Wa
Maintenance of EVA	876			21JAN2011	39 3020	
RC Box Culvert (3mx3mx2,25m) Bay 7	40			24AUG2009	53 3120	C Box Culvert (3mx3mx2,25m) Bay 7
RC Box Culvert (3mx3mx2,25m) Bay 4	40			18AUG2009	68 3122	RC Box Culvert (3mx3mx2 25m) Bay 4
RC Box Culvert (3mx3mx2,25m) Bay 5	40			22SEP2009	0 3123	RC Box Culvert (3mx3mx2.25m) Bay 5
RC Box Culvert (3mx3mx2,25m) Bay 6	35			220CT2009	0 3124	Provide the second seco
	20			11NOV2009	0 3124	Backfill and Reinstatement EVA
Backfill and Reinstatement EVA					72 3111, 3125	
Backfilling for RC Box Culvert	385			21NOV2009		
RC Retaining Walls at PNH River (D1)	0		OCT2009 *	04441000000	0	
Retaining Wall D - Bay 3	21	16 01	AUG2009 A		24 3340	
Retaining Wall D - Bay 4	15	1	AUG2009	05SEP2009	0 3343	► 爾 Retaining Wall D - Bay 4

 Start date
 07JAN2008

 Finish date
 21JAN2011

 Data date
 06AUG2009

 Run date
 15AUG2009

 Page number
 1A

 c Primavera Systems, Inc.

G2009 G2009 G2009

Drainage Improvement Work in South Lantau and Construction of Mui Wo Village Sewerage Phase 1 Early bar Progress bar Critical bar Summary bar Start milestone point Finish milestone point

3-Month Rolling Programme (Rev.9b)

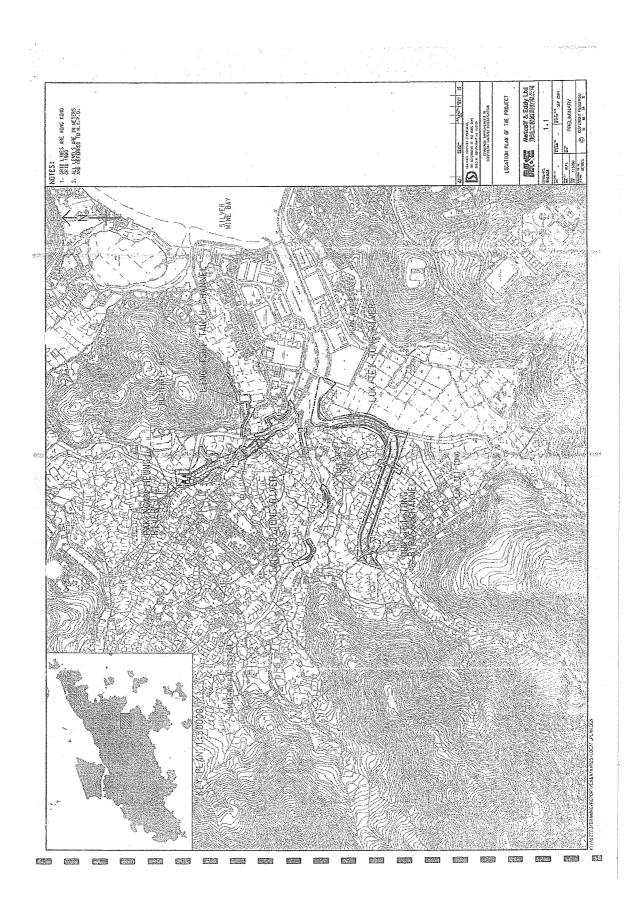
Act		Orig	Rem	Early	Early			2008		2009		2010	2011
ID	Description	Dur	Dur	Start	Finish	% Predecessors	JAN FEB MAR APR MAY	JUN JUL AUG SEP	OCT NOV DEC JAN FEB MAR APR M	MAY JUN JUL /	AUG SEP OCT NOV DE	C JAN FEB MAR APR MAY JUN JUL	AUG SEP OCT NOV DEC JAN FE
3360	RC Maintanence Ramp	0	0	06SEP2009		0 3344		<del> </del>			RC Maintaneno	e Ramp	
3361	Ramp bay 1	20	20	06SEP2009	25SEP2009	0 3360					Ramp bay 1		
3362	Ramp bay 2	20	20	26SEP2009	15OCT2009	0 3361					► 🛲 Ramp bay	2	
3363	Ramp bay 3	30	30	16OCT2009	14NOV2009	0 3362	3 1 1 2 1 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	$\begin{smallmatrix} & 1 & 4 & 3 & 1 & 2 & 3 & 4 & 3 & 4 & 3 & 4 & 3 & 4 & 4 & 4$		1 8 1 4 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Ram	bay 3	
3369	Turning Bay & Maintenance Access	70	70	26SEP2009	04DEC2009	0 3361				1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8	÷	Irning Bay & Maintenance Access	* * * * * * * * * * * * * * * * * * *
3500	Gabion Wall (Type 2, 3, 4 & 5) at PNH River	0	0	01OCT2009 *		0					🕸 Gabion Wa	(Type 2, 3, 4 & 5) at PNH River	1     1
3510	Gabion Wall (opposite to RW-A & B)	45	45	01OCT2009	14NOV2009	0 3500					🕨 🗰 Gabi	on Wall (opposite to RW-A & B)	
4000	Luk Tei Tong Bypass Channel and River (D5)	926	360	18JAN2008 A	31JUL2010	61 <b>0001</b>							Luk Tei Tong Bypass Channel a
4200	No Excavation Period (2)	214	87 *	01APR2009 A	31OCT2009	59 <b>4110</b>				┿┿┿┿┿┿┿┿┿┿	No Exc	avation Period (2)	(1947))))))))))))))))))))))))))))))))))))
4240	Box Culvert - A	75	46	08JUL2009 A	20SEP2009	39					Box Culvert	A	1     1
4241	Reprovision of EVA & Footpath at BC-A	10	10	21SEP2009	30SEP2009	0 4240					Reprovision	of EVA & Footpath at BC-A	
4260	Reprovision of EVA & Footpath at BC-B	180	53	01APR2009 A	27SEP2009	71 <b>4250</b>					Reprovision	of EVA & Footpath at BC-B	
4343	Retaining Wall J - Bay 3	21	6	22JUL2009 A	11AUG2009	71 <b>4342</b>					Retaining Wall J - Ba	y 3 Internet of the test of the test	0100103101010100100101
4344	Retaining Wall J - Bay 4	21	21	12AUG2009	01SEP2009	0 4343					Retaining Wall J	Bay 4	I     I
4345	Retaining Wall J - Bay 5	21	21	02SEP2009	22SEP2009	0 4344					Retaining Wa	I J - Bay 5	
4346	Retaining Wall J - Bay 6	25	25	23SEP2009	17OCT2009	0 4345					► Retaining	Wall J - Bay 6	
4347	Retaining Wall J - Bay 7	25	25	18OCT2009	11NOV2009	0 4346		$\begin{array}{c} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 $		1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 /	🕨 🕨 Retai	ning Wall J - Bay 7	
4800	Remain Works within PNH & LTT River (D1&D5)	1010	444	18JAN2008 A	23OCT2010	56 <b>0001</b>				1 POT POT POT		ιστροτροτροτοστοστροτη	Remain Works wit
4850	No exca period (2) at Confluence of PNH,TTT&LTT	214	87	01APR2009 A	31OCT2009	59					No exc	a period (2) at Confluence of PNH,T	TT&LTT
5000	Works within Portions S1 of the Site (Chung Hau)	748	182	18JAN2008 A	03FEB2010	76 <b>0001</b>		****				Works within Portions S1 of	
5042	MH EB13 - MH EB18	350		13NOV2008 A	28OCT2009	76 <b>5041</b>					MH EB1	3 - MH EB18	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5043	MH EB18 - MH EB25	145	145	29OCT2009	22MAR2010	0 5042						MH EB18 - MH EB2	5
5044	MH EB11 - MH EB13	90		29OCT2009	26JAN2010	0 5042						MH EB11 - MH EB13	
5046	MH EB26 - MH EB31 - EB8	145		29OCT2009	22MAR2010	0 5042	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	111111111111111111111 1111111111111111		************		MH EB26 - MH EB3	1 - EB8
6000	Sewerage Works at TTT (S2A & 2B)	863		18JAN2008 A	29MAY2010	66 <b>0001</b>						Sewerag	e Works at TTT (S2A & 2B)
6030	uPVC Sewer (DN160-400) M/H C85 - M/H C131	230		13JAN2009 A	30AUG2009	89 <b>6020</b>					uPVC Sewer (DN	160-400) M/H C85 - M/H C131	
6040	uPVC Sewer (DN160-400) M/H C1 - M/H C47	249		31AUG2009	06MAY2010	0 6030	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					uPVC Sewer	(DN160-400) M/H C1 - M/H C47
7000	Sewerage at TWT (S3A & 3B)	638		18JAN2008 A	16OCT2009	89 0001					Sewerage	at TWT (S3A & 3B)	
7030	uPVC Sewer (DN160-400) M/H A16 - M/H A34	465		28MAY2008 A	04SEP2009	94 7010				* * * * * * * * * * * * * *	uPVC Sewer (D)	1160-400) M/H A16 - M/H A34	************************
8000	Sewerage works at PNH (S4)	772		18JAN2008 A	27FEB2010	73 <b>0001</b>						Sewerage works at PNH	(S4)
8030	uPVC Sewer (DN160-400) M/H D1 - D27	280		09MAY2009 A	12FEB2010	32 <b>8020</b>				1		uPVC Sewer (DN160-400)	M/H D1 - D27
9000	Preservation & Protection of Exist Trees	534 *		06AUG2009	21JAN2011	0 0001							Pre
9020	Protection & Transplanting Works	1011	534	16APR2008 A	21JAN2011	47 <b>9010</b>							Pro

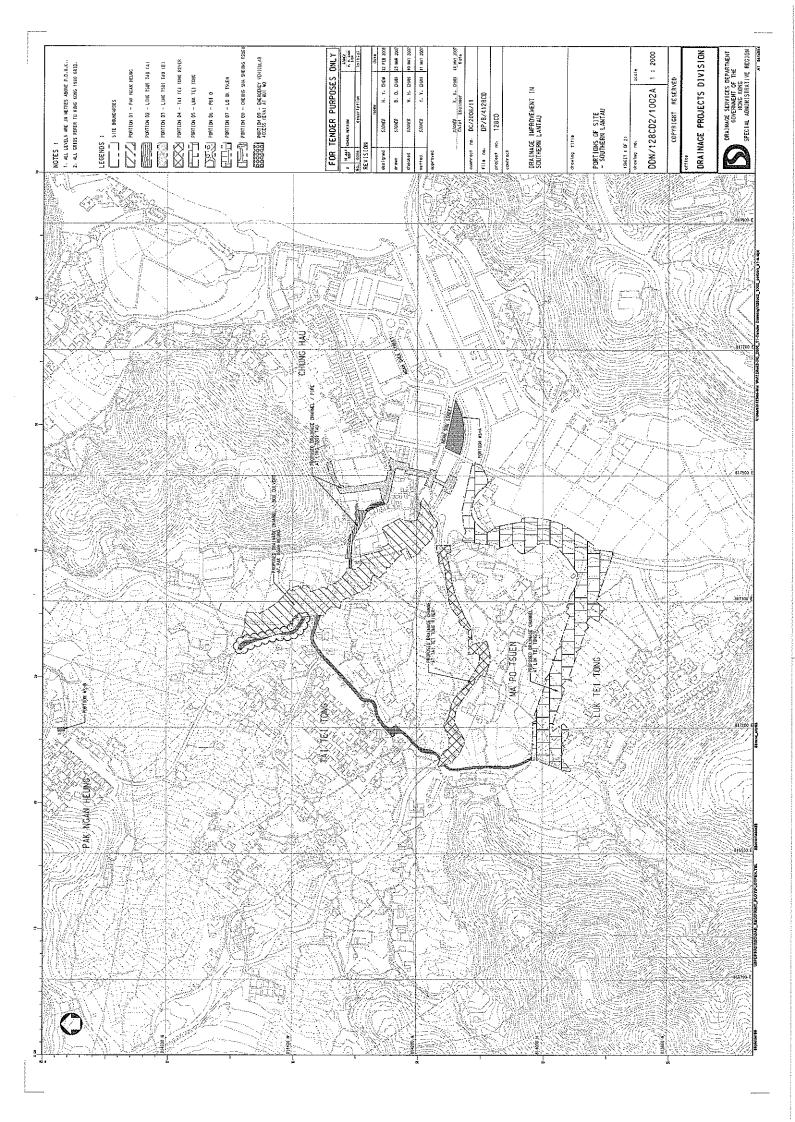
Start date07JAN2008Finish date21JAN2011Data date06AUG2009Run date15AUG2009Page number2Ac Primavera Systems, Inc.

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





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

# Appendix B Key Personal Contact information chart

学南国家计量测试中记。 「东省计量科学研究院 調査MRA SOUTH CHINA NATIONAL CENTER OF METROLOGY

# 检定证书

# **VERIFICATION CERTIFICATE**

证书编号 SSD20093126. 第1页 共 3页 Certificate No: Page of

#### 委托方 Client

委赶方地址 Add.sef.Client

Sound Level Calibrator

## 计量器具名称

Description 型号规格 4231

Model/Type

制造厂 B & K Manufacturer

接收日期 2009年 9 月 21 日 Date of Receipt \_\_\_\_\_ Y \_\_\_ M \_\_\_ D

结论\_\_\_\_\_1级合格(Class 1)\_\_\_\_\_\_ Conclusion、\_\_\_\_\_

检定日期 2009年 97月。22日 Date of Verification Y M

批准人 Approved Signatory\_\_\_\_\_\_\_\_\_\_目面相生

> 技 Inspected by 指出

检定 Verified by 何早甜

本守心地址:中国广州市广园中路松柏东街30号 邮政编码: 510405 电话: (8520) 86594172 传真: (8620) 86590743 E-mail: scm@scm.cm. Add: No.30, Songbaidong Street, Guangyuanzhong Road, Guangzhou, P. R. China Post Code: 510405 Tel: (8620)86594172 Fax: (8620)86590743

证书专用音

## 华南国家计量测试中心 广东省计量科学研究院

DIRECTIONS



CNAS LP730

Hallio

CM SOUTH CHINA NATIONAL CENTER OF METROLOGY CUANGBONG INSTITUTE OF METROLOGY

訪 Ŧ

证书编号 SSD20093126 Certificate No.4 第/2页,共 3页 Page of

- 本中心是国家质量监督检验检疫总高在华南地区设立的国家法定计量检定机构、计量授权证书号是. (国)法计 (2007) 01043号、 (国)法计 (2007) 01032号。 This laboratory is the National Legal Metrological Verification Institution in southern China set up by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ) under authorization certificates No. (2007)01043 & (2007)01032.
- 2. 本中心所出異的数据均可溯源至保存在中国计量科学研究院的国家计量基准和国际单位制(SI)。中国计量科学 研究院于1999年代表中国签署了"国家计量基标准及国家计量研究院出具的技术和测量证书相互承认协议" All flata issued by this laboratory are traceable to mational primary standards manifed in National Institute of Merology (NIM) and International System of Units (SI) NIM is the signatory to the Mutual Recognition Arrangement (MRA) for a national measurement standards and for calibration and measurement certificates issued by mational metrology institutes.

3.本次检定的技术依据。 《Reference documents for the verification

到G176-2005 产校准器检定规程 ·· V.R. of Sound Calibrators....

记号

声01

Serial No

#### 4. 本次检定所使用的主要计量标准器具: 然 Major standards of measurement used in the venification

证书号/有效期。
Certificate No.
Due Date
[1992]国量标零证字
第085号
/2010-01-08

相对湿度

RH ~

计量特性 Metrological Characteristic

声压绩: (0.4~1.0) dB(k=2) 在参考频率上: 0.08 dB(k=2) (圧力场) Sound Level Meters: 0:3 dB(k=2), Sound Calibrator: 0.45 dB(k=2)

(40~80) \$

### 5 检定地点、环境条件。

- Place and environmental conditions of the verification 地点 声学/振动実验室 温度 (23±3) ( Place Acoustics/Vibration Lab 1, Temperature

6. 被检定仪 静限制使用条件

Limiting condition of the instrument verified:

注:1.本证书检定结果只与受检定仪器有关;
 2.未经本中心书面批准;不得部分复制此证书;

Note: 1: The results relate only to the items verified. 2. This certificate shall not be reproduced except in full, without the written approval of our laboratory.



华南国家计量测试电码 广东省计量科学研究院 **Bac** SOUTH CHINA NATIONAL CENTER OF METROLOGY



CNAS L0730

# 检定结果 RESULTS OF VERIFICATION

						2200				
	cation									
				Rec						

1 外观检查: 合格

.... Check on appearance: pass

2 声压级(dB) 见表1

Sound Pressure Level: The value showed in table 1

标称值(dB) 实测值(dB) 抗差(dB) 计结论	起定度(III) 稳定度允差(dB)。 (小结论)
Nominal Value Measured Value Enterance Conclusion	Stabilization Stabilization Tolerance Conclusion
94.06 ±0.40 合格(Pass)	0.020/10 合格(Pass),
114 07 土040 合格(Pass)	0.02
	0.02。。。010 合格(Pais)

「顺平」见表2

- Frequency. The value showed in table 2

表2 Table 2

X	Co 16,50	- Sec. 3 - 3	C <sup>2</sup> 2.5 (2)	ورجا بالانتخاب المردد	A	£1.74	6.° 4 - 6.4 - 6.4											_						_				- · · · ·
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1.	1.1.5		N 18 /	しけた	1. 3 .		1. 2.	5 . E.	飛伯	Date 1	15.33	85 8		S	- A	12	< fr0/	<li>C) 51</li>	1.2.		.3-03		50	结	$\Lambda \sim 1$	1. 1	4	1 K.,
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说明(Note):

17 声压级测量结果扩展不确定度。

Expanded uncertainty of measurement in Sound Pressure Level Calibration:

(依据JJF1059-1999测量不确定度评定与表示)。-----

(According to JJF1059-1999 Evaluation and Expression of Uncertainty in Measurement)

Appendix C

# **Calibration Certificates for Measuring Equipments**



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

|--|

Client : ENVIRONMENTAL	PIONEER AND SO	LUTION LIMITED	
Equipment No. :WQC-24	Location :	Mui Wo Site	
Manufacturer :DKK-TOA	Serial No.:	640274	
Calibration Date : 15 to 17-6-2010	Due Date :	14-09-2010	

### **Criterion: (Repeatabilty, Linearity)**

pH	:	Both within $\pm 0.05 \text{pH}$
Dissolved oxygen	:	Both within $\pm 0.1$ mg/L
Electric conductivity	:	Both within $\pm 1\%$ FS
Turbidity	:	Repeatability : within ±3%FS
Temperature	:	Repeatability ±0.25°C; Linearity ±0.5°C; (Ambient 5~45°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 °C	Indicated value by meter	Linearity (R <sup>2</sup> )
0	0.0 mS/m*	0.0 mS/m	1.0000
0.001	14.7 mS/m	15.2 mS/m	1.0000
0.005	71.8 mS/m	72.3 mS/m	Acceptance Criterion
0.01	0.141 S/m	0.146 S/m	$R^2 > 0.995$
0.05	0.667 S/m	0.670 S/m	Within ± 1% F.S. against
0.1	1.29 S/m	1.30 S/m	calibration standard value 71.8 mS/m, 0.667
0.5	5.87 S/m	5.88 S/m	S/m and 5.87 S/m.
	1 <sup>st</sup> time	0.00 , 5.88 S/m	
Repeatability	2 <sup>nd</sup> time	0.00 , 5.88 S/m	Within $\pm$ 1% F.S.
Repeatability	3 <sup>rd</sup> time	0.00 , 5.88 S/m	against average value
	0.00 , 5.87 S/m	Ave.: 0.00, 5.88	

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

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	
	3.08	3.15	0.9999
	5.57	5.62	Acceptance Criterion
8.33		8.40	$R^2 > 0.995$
10.38		10.32	Within ± 0.1 mg/L
	13.10	13.05	against standard value
D	1 <sup>st</sup> time 0.00, 8.40		
Repeatability 2 <sup>nd</sup> time		0.00, 8.42	Within ± 0.1 mg/L
3 <sup>rd</sup> time		0.00, 8.37	against average
	0.00, 8.33	Ave.: 0.00, 8.40	

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	1.63	1.0000
pH = 6.88	4.00	3.98	Acceptance Criterion
pH = 7.00	6.88	6.84	
pH = 9.22	7.00	6.97	
pH = 10.00	7.43	7.40	$R^2 > 0.995$
	9.22	9.18	Within ± 0.05 pH
	10.00	9.95	against standard value
	12.64	12.60	
	1 <sup>st</sup> time	3.98, 9.95	
Repeatability	2 <sup>nd</sup> time	3.99, 9.96	Within $\pm 0.05 \text{ pH}$
	3 <sup>rd</sup> time	3.98, 9.95	- against average value
	pH 4.00 , 10.00	Ave.: 3.98, 9.95	

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		alue by meter	Linearity
(°C)	(	2C)	(R <sup>2</sup> )
5.0	4	.8	0.9998
15.0	1.	4.6	0.9998
25.0	24	Acceptance Criterion	
35.0	3-	$R^2 > 0.995$	
45.0	4	5.3	Within $\pm 0.5$ °C against
55.0	5.	5.5	standard value
	1 <sup>st</sup> time	14.7,45.3	
Repeatability	2 <sup>nd</sup> time 14.5, 45.4		Within $\pm 0.25$ °C
	3 <sup>rd</sup> time 14.6, 45.2		against average value
	15.0,45.0	Ave.: 14.6, 45.3	

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	Indicated va	lue by meter	Linearity
(NTU)	(N'	TU)	$(\mathbb{R}^2)$
0.0	0	.0	1.0000
20.0	19	9.4	Acceptance Criterion
100.0	98	$R^2 > 0.995$	
400.0	39	6.3	Within $\pm$ 3% F.S. against
800.0	79	5.4	span calibration value
	1 <sup>st</sup> time	0.0,796.0	100.0 and 400.0 NTU
Repeatability	2 <sup>nd</sup> time 0.0, 795.4		
	$3^{\rm rd}$ time 0.0, 794.9		Within ± 3% F.S. against average value
	0.0,800.0	Ave.: 0.0, 795.4	average value

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 Chín Chemist

Checked by : <u>Gu Chin</u> Date

17-6-2010

Page 3 of 3

# 校正証明書 CALIBRATION CERTIFICATE

品名	PRODUCT NAME	:	積分形精密騒音計
			Integrating Precision Sound Level Meter
型式	TYPE	:	6224
器物番号	PRODUCT NUMBER	:	060166
マイク	MICROPHONE	:	34733
製造者	MANUFACTURER	:	株式会社アコー ACO CO., LTD.

#### ※特記事項

[基準器、校正機器のトレーサビリティ証明] 校正に使用した基準器、校正機器は国家基準にトレーサブル であることを証明致します。

**%**Special notes

[Traceability certificate of standard instruments and calibration equipment.] We certify that the standard instruments and calibration equipment are traceable to the national standards.

> 平成21年11月16日 November 16, 2009

東京都世田谷区代訳 2-6-10 株式会社了 代表取締役 寺園信一 2-6-10 Daizawa Setagaya-ku Tokyo Japan President : Shinichi Terazono ACO CO., LTD.

## 1 試験成績 Test Results

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別紙試験成績表添付 Test results are attached as an exhibit.

2	試験条件	Test Requireme	ents			
	試験日	Test date : $\Psi$	成21年11月1	6日		November 16, 2009
	温度	Temperature	:	22	°C	
	湿度	Humidity	:	73	%	
	気圧	Barometric pressu	ire :	980	hPa	

3	使用機器 Used Eq	uipment			
	デジタルマルチメーター	Digital multimeter	VP-2661B	No.	780010E122
	(有効期間	: 平成21年3月から平	4成22年3月 )		
	( Effective life	: from March, 2009	to March, 2010	)	
	アッテネーター	Attenuator	STA-115	No.	11075
	(有効期間	: 平成21年3月から平	「成22年3月 )		
	( Effective life	: from March, 2009	to March, 2010	)	
	周波数カウンター	Frequency counter	VP-4545A	No.	$700008 {\rm E}122$
	(有効期間	: 平成21年3月から平	2成22年3月 )		
	( Effective life	: from March, 2009	to March, 2010	)	
	オーディオアナライザー	Audio Analyzer	VP-7721A	No.	740039 D125
	(有効期間	: 平成21年3月から平	「成22年3月 )		
	( Effective life	: from March, 2009	to March, 2010	)	
	コンデンサマイクロホン	Condenser Microphone	e 4160	No.	1248087
	(有効期間	: 平成21年2月から平	7成23年2月 )		
	( Effective life	: from February, 20	009 to February,	2011	)

# デジタルマルチメーター、アッテネーター 周波数カウンター、オーディオアナライザー トレーサビリティ体系図 Traceability Flow Chart of Digital Multimeters, Attenuators, Frequency Counters, and Audio Analyzers



# 基準静電型マイクロホン トレーサビリティ体系図 Traceability Flow Chart of Standard Electrostatic Microphones



# 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: マイクロホン製造番号 Serial No. of Microphone: Ver:1.6D-06-10

> 年月日: 平成21年11月16日 Date: November 16, 2009

承認		
Approved	Passed	Inspected
J. Yasukuye	T. matumoto	S. Inoue

株式会社 アコー ACO CO., LTD.

## 1. 検査年月日 Inspection Date

平成21年11月16日 November 16, 2009

## 2. 検査条件 Inspection Condition

1)	温度	Temperature	:	$22$ $^{\circ}$	°C
2)	湿度	Humidity	:	73 (	%
3)	気圧	Barometric pressure	:	<b>980</b> (	hPa

## 3. 検査項目及び結果 Inspection Results

 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 va	lue at 70dB	input,	Range 20	-100dB.

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

2) 安定性特性検査 Stability Caracteristic

RANGE: 20-100dB 1分後基準 ±0.5dB以下

Within  $\pm 0.5$ dB 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

入力	規格			quency
Input	Standard	(Hz)		
(dB)	(dB)	31.5	1000	8000
110	±0.7	0.0	0.0	-0.1
<u> </u>	±0.7	-0.1	-0.1	-0.1
100	±0.7	-0.1	-0.1	0.0
95	±0.7	-0.1	-0.1	-0.1
90	±0.7	0.1	0.1	0.0
85	±0.7	0.1	0.1	0.0
80	±0.7	0.0	0.0	0.0
75	±0.7	0.0	0.0	0.0
70	±0.7	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0
60	±0.7	0.0	0.0	0.0
55	±0.7	0.0	0.0	-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	0.0	0.0	0.0
30	±0.7	0.0	0.0	0.0
25	±0.7	0.2	0.2	0.2
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	測定値
	Standard	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)

周波数		A特性			C特性		FLAT(Z)特性	
间叔效	規格	レスポンス	偏差	規格	レスポンス	偏差	レスポンス	許容差
Frequency	Standard	Response	Deviation	Standard	Response	Deviation	Response	Tolerance
(Hz)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	_
20	-50.5	-50.0	0.5	-6.2	-5.8	0.4	-0.9	±3.0
40	-34.6	-34.3	0.3	-2.0	-1.9	0.1	-0.1	$\pm 1.5$
100	-19.1	-18.9	0.2	-0.3	-0.3	0.0	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	1.1	-0.1	-0.2	-0.3	-0.1	0.0	±1.0
4k	1.0	0.8	-0.2	-0.8	-0.9	-0.1	0.2	±1.0
5k	0.5	0.5	0.0	-1.3	1.2	0.1	0.3	$\pm 1.5$
6.3k	-0.1	-0.1	0.0	-2.0	-1.8	0.2	0.3	$+1.5$ $\cdot 2$
8k	-1.1	-1.1	0.0	-3.0	-3.5	-0.5	0.3	+1.5 -3
10k	-2.5	-2.5	0.0	-4.4	-4.2	0.2	-0.1	+2 -4
12.5k	-4.3	-3.5	0.8	-6.2	-5.2	1.0	0.2	
16k							0.1	+3 -6
20k							-0.9	
判定	判定 Passed Pass							

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

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, Ragne 20-100dB.

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

実効値指示誤差	判定
Effective value Error	Passed
(dB)	1 45500
0.3	Pass

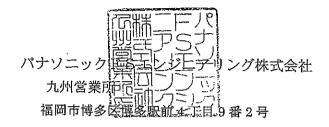
7) 自己雑音特性検査 Self-noise

RANGE : 20-80dB (マイクを含む)

RANGE : 20-80dB (Including Microphone value)

RANGE : 20-80dB		A特性	C特性		
(Including Microph	none value)	A1711	0171II	FLAT(Z)特性	
規格 Standard		18以下	29以下	32以下	
(dB)		Below 18	Below 29	Below 32	
自己雑音 Self-noise		16.6	22.1	25.3	
(dB)		16.6	44.1	40.0	
判定 Passed			Pass		

株式会社 アコー 殿



- 品 名: <u>ディジタルマルチメータ</u>
- 型 番: <u>VP-2661B</u>
- 製造会社: 丛下通信工業株式会社
- 管理番号: <u>EMC-1</u>0004
- 製造番号: <u>780010E122</u>
- 校正日: <u>2009年</u>3月
- 温湿度: \_\_温度 23 ℃ 湿度 42 %

 品名		製造会社	製造番号	管理番号	校正有効月
キャリフ゛ レータ	5700A	フルーク	5440004	KNK1007	2009/06

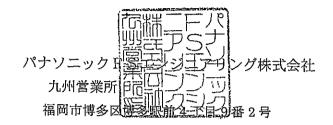
株式会社 アコー 殿



- 品 名: <u>アッテネー</u>タ
- 型 番: <u>STA-115</u>
- 製造会社: 東京光音電波株式会社
- 管理番号: <u>EMC-1 0006</u>
- 製造番号: \_\_\_\_11075
- 校正日: \_\_\_\_\_2009年 3月
- 温 湿 度: <u>温度 23 ℃ 温度 40</u> %

<u>品名</u>	型名	製造会社	製造番号	管理番号	校正有効月
オーデ・ィオアナライザ・ー	VP-7723A	松下通信工業	101417B122	KNK1006	2009/06
			· · · · · · · · · · · · · · · · · · ·		•

株式会社 アコー 殿



- 品 名: <u>周波数カ</u>ウンタ
- 型 番: <u>VP-4545A</u>
- 製造会社: \_\_\_\_松下通信工業株式会社
- 管理番号: <u>EMC-1</u>0005
- 製造番号: <u>700008E122</u>
- 校正日: <u>2009年</u>3月
- 温湿度: <u>温度 23</u> ℃ 湿度 42 %

品名	型名	製造会社	製造番号	管理番号	校正有効月
周波数カウンタ	R5363	アト・ハ・ンテスト	40260090	KNK1016	2010/01
L					

株式会社 アコー 殿



- 品 名: <u>オーディオアナライザー</u>
- 型 番: <u>VP-7721A</u>
- 製造会社: 松下通信工業株式会社
- 管理番号: <u>EMC-1 0007</u>
- 製造番号: <u>740039D125</u>
- 校正日: <u>2009年 3月</u>
- 温湿度: <u>温度 23 ℃ 湿度 40</u> %

品名	型名	製造会社	製造番号	管理番号	校正有効月
キャリプ レータ	5700A	フルーク	5440004	KNK1007	2009/06
周波数カウンタ	R5363	アドバンテスト	40260090	KNK1016	2010/01
オーディオ・アナライザー 	VP-7723A	松下通信工業	101417B122	KNK1006	2009/06

# 基準器検査成績書

09SL第4号

# 騷音基準器

種 類 基準静電型マイクロホン

器物番号 1248087 (BK4160)

## (1) 音圧感度の周波数特性

(音圧感度レベルは1V/Paを0dBとする)

測定周波数	音圧感度レベル	測定周波数	音圧感度レベル
(Hz)	(dB)	(Hz)	(dB)
20	-27.1	3000	-26.9
30	-27.2	4000	-26.7
50	-27.2	5000	-26.6
100	-27.3	6000	-26.7
150	-27.2	7000	-27.0
200	-27.3	8000	-27.9
300	-27.3	9000	-29.1
500	-27.3	10000	-30.6
700	-27.3	11000	-32.3
1000	-27.2	12000	-34.1
1500	-27.2	12500	-34.8
2000	-27.1		

(2) 測定条件 温度 23 ℃、 湿度 27 %、 気圧 1012 hPa、 バイアス電圧 200V
(3) 有効期間 平成21年2月17日から 平成23年2月16日 まで
(4) その他

平成21年2月16日

独立行政法人 產業技術総合研究所調整



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

Calibration Reference No. :	GCE/CAL/2009/MW/WQM/C4
-----------------------------	------------------------

Client : <u> </u>	ENVIRONMENTAL PIONEER AND SOLUTION LIMITED								
Equipment No. :_	WQC-24	Location :	Mui Wo Site						
Manufacturer : _	DKK-TOA	Serial No.:	640274						
Calibration Date:	15 to 17-6-2010	Due Date :	14-09-2010						

## **Criterion:** (Repeatabilty, Linearity)

pH	:	Both within $\pm 0.05 \text{pH}$
Dissolved oxygen	:	Both within $\pm 0.1 \text{ mg/L}$
Electric conductivity	:	Both within $\pm 1\%FS$
Turbidity	:	Repeatability : within ±3%FS
Temperature	:	Repeatability ±0.25°C; Linearity ±0.5°C; (Ambient 5~45°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 °C	Indicated value by meter	Linearity (R <sup>2</sup> )	
0	0.0 mS/m*	0.0 mS/m	1.0000	
0.001	14.7 mS/m	15.2 mS/m	1.0000	
0.005	71.8 mS/m	72.3 mS/m	Acceptance Criterion	
0.01	0.141 S/m	0.146 S/m	$R^2 > 0.995$	
0.05	0.667 S/m	0.670 S/m	Within ± 1% F.S. agains calibration standard value 71.8 mS/m, 0.667	
0.1	1.29 S/m	1.30 S/m		
0.5	5.87 S/m	5.88 S/m	S/m and 5.87 S/m.	
	1 <sup>st</sup> time	0.00 , 5.88 S/m		
Repeatability	2 <sup>nd</sup> time	0.00 , 5.88 S/m	Within $\pm 1\%$ F.S.	
Repeatability	3 <sup>rd</sup> time	0.00 , 5.88 S/m	against average value	
	0.00 , 5.87 S/m	Ave.: 0.00, 5.88	``````````````````````````````````````	

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

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)

	luated by Iodometric hod (mg/L)	Indicated value by meter (mg/L)	Linearity (R <sup>2</sup> )		
	0.00	0.00	0.0000		
	3.08	3.15	0.9999		
	5.57	5.62	Acceptance Criterion		
	8.33	8.40	$R^2 > 0.995$		
-	10.38	10.32	Within $\pm 0.1$ mg/L		
	13.10	13.05	against standard value		
	1 <sup>st</sup> time	0.00, 8.40			
Repeatability	$2^{nd}$ time 0.00, 8.42		Within $\pm 0.1 \text{ mg/L}$		
	3 <sup>rd</sup> time	0.00, 8.37	against average value		
	0.00, 8.33	Ave.: 0.00, 8.40			

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	Input value (pH buffer)	Indicated pH value by meter	Linearity
(20°C)	(20°C)	(20°C)	(R <sup>2</sup> )
pH = 4.00	1.67	1.63	1.0000
pH = 6.88	4.00	3.98	Acceptance Criterion
pH = 7.00	6.88	6.84	
pH = 9.22	7.00	6.97	
pH = 10.00	7.43	7.40	$R^2 > 0.995$
	9.22	9.18	Within $\pm$ 0.05 pH against standard value
	10.00	9.95	against standard value
	12.64	12.60	
	1 <sup>st</sup> time	3.98, 9.95	
Repeatability	2 <sup>nd</sup> time	3.99, 9.96	Within $\pm 0.05 \text{ pH}$
	3 <sup>rd</sup> time	3.98, 9.95	against average value
	pH 4.00 , 10.00	Ave.: 3.98, 9.95	

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	Indicated va	Linearity	
(°C)	(5	<u>(C)</u>	$(R^2)$
5.0	4	8	0.9998
15.0	14	4.6	0.3338
25.0	24	4.7	Acceptance Criterion
. 35.0	34	4.6	$R^2 > 0.995$
45.0	4:	5.3	Within $\pm 0.5$ °C against
55.0	5:	5.5	standard value
	1 <sup>st</sup> time	14.7,45.3	
Repeatability	2 <sup>nd</sup> time	14.5,45.4	Within ± 0.25°C
	3 <sup>rd</sup> time	14.6,45.2	against average value
	15.0,45.0		

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	Indicated va	Linearity			
(NTU)	(N'	TU)	$(\mathbb{R}^2)$		
0.0	0	.0	1.0000		
20.0	19	9.4	Acceptance Criterion		
100.0	98	3.1	$R^2 > 0.995$		
400.0	39	6.3	Within ± 3% F.S. against		
800.0	-	5.4	span calibration value		
	1 <sup>st</sup> time	0.0,796.0	100.0 and 400.0 NTU		
Repeatability	2 <sup>nd</sup> time	0.0,795.4			
	3 <sup>rd</sup> time	0.0,794.9	Within ± 3% F.S. against average value		
	0.0,800.0	Ave.: 0.0, 795.4	average value		

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 Chín Chemist

Checked by : Gu Chin Date

17-6-2010

Page 3 of 3

			Relative	Occurr	ence
Species	Habit	Native	Abundance	PNH3	PNH4
Acacia confusa	tree	no	occasional		+
Achyranthes aspera	herb	yes	scarce		+
Alangium chinensis	tree	yes	scarce		+
Alocasia macrorrhiza	herb	yes	occasional		+
Acorus gramineus	herb	yes	scarce		+
Annoa squamosa	tree	no	scarce		+
Bidens pilosa	herb	no	occasional		+
Bridelia tomentosa	tree	yes	scarce		+
Celtis sinensis	tree	yes	scarce		+
Christella parasitica	fern	yes	occasional		+
Dimocarpus longan	tree	no	occasional		+
Ficus hispida	tree	yes	occasional		+
Ficus microcarpa	tree	yes	scarce		+
Ficus superba	tree	yes	occasional		+
Ficus variegata	tree	yes	scarce		+
Hedychium coronarium	herb	no	occasional		+
Litsea glutinosa	tree	yes	scarce		+
Ludwigia perennis	herb	yes	scarce		+
Macaranga tanarius	tree	yes	occasional		+
Mallotus paniculatus	tree	yes	scarce		+
Microcos paniculata	tree	yes	scarce		+
Microstegium ciliatum	grass	yes	common		+
Mikania micrantha	climber	no	occasional		+
Morus alba	tree	no	scarce		+
Paedaria scandens	climber	yes	scarce		+
Panicum maximum	grass	no	scarce		+
Phyllanthus urinaria	shrub	yes	scarce		+
Pogonatherum crinitum	grass	yes	scarce		+
Pteris vittata	fern	yes	scarce		+
Pueraria phaseoloides	climber	yes	occasional		+
Sida rhombifolia	herb	yes	scarce		+
Sporobolus fertilis	grass	yes	scarce		+
Sterculia lanceolata	tree	yes	scarce		+

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

			Relative	Occur	rrence
Species	Habit	Native	Abundance	PNH1	PNH2
Ficus microcarpa	tree	yes	scarce		+
Ficus superba	tree	yes	occasional		+
Ipomoea cairica	climber	yes	occasional		+
Kandelia obovata	tree	yes	scarce	+	
Lantana camara	shrub	no	scarce		+
Panicum maximum	grass	no	common		+

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

			Relative	Occurrence				
Species	Habit	Native	Abundance	LLT1	LLT2	LLT3	LLT4	LLT5
Achyranthes								
aspera	herb	yes	scarce		+			
Bidens pilosa	herb	no	scarce	+				
Celtis sinensis	tree	yes	scarce	+				
Cyperus								
malaccensis	sedge	yes	scarce		+			
Ficus microcarpa	tree	yes	scarce	+				
Ficus superba	tree	yes	scarce	+				
Hibiscus tiliaceus	tree	yes	scarce	+	+			
Kandelia obovata	tree	yes	scarce		+			
Leucaena								
leucocephala	tree	no	scarce	+				
Mikania								
micrantha	climber	no	scarce	+				
Panicum								
maximum	grass	no	scarce	+	+			
Panicum repens	grass	yes	scarce		+			
Rhynchelytrum								
repens	grass	no	scarce	+				
Saccharum								
arundinaceum	grass	yes	scarce	+				

Appendix D3 Plant species recorded at Luk Tei Tong River

# **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:	9/7/201	0		Wea	ther Co	ndition:	Sunny											
Monitoring Location		WE1			WE2			WE3			WE4			WE5			WE6	
Time (hhmm)		1100			1045			1015			1025			1140			1130	
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		6.96			7.54			8.78			7.37			7.22			6.67	
Temperature (oC)		28.9			28.8			29.7			29.9			29.6			28.9	
Salinity (ppt)		0.0			0.0			0.3			3.9			0.0			0.0	
Conductivity (ms/m)		4.4			7.7			78.7			0.7		35.1			4.8		
Water flow (m/s)		0.110			0.090			0.100 0.080 0.080		0.100 0.080 0.080 0.050		0.050						
Turbidity (NTU)	0.0	0.0	Average 0.00	0.0	0.0	Average	4.8	4.8	Average 4.80	12.3	12.3	Average	14.6	14.7	Average	155.3	155.4	Average
DO (mg/l)	6.79	6.80	Average 6.80	7.48	7.76	Average 7.62	9.01	9.02	Average 9.02	6.05	6.06	Average 6.06	7.75	7.76	Average 7.76	7.47	7.47	Average 7.47
DO Saturation (%)	89	89	Average 89	98	98	Average 98	120	120	Average	81	81	Average 81	102	102	Average	97	97	Average 97
Prepared By:		me Cheng	_	Sister L	ature	-		<b>ate</b> 2010		emark or ervation:								

\_

# **Appendix D5**

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



# TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

							Page 1 of 1
Report No.	:	GCC100700106			Date of Issue	:	12-07-2010
Client *	:	Environmental Pioneers &	Solutions Limited		Date Received	:	08-09-2008
Client Address*	:	8/F, Chaiwan Industrial Ce	entre Building, 20	Lee Chung Street, Chaiwar	, НК.		
		DSD Contract No. DC/200	)6/11 - Drainage li	mprovement in Southern La	intau & Constructi	ion	of
Project*	:	Mui Wo Village Sewerage	Phase 1				
Test Location	:	G/F, 20 Pak Kung Street	, Hung Hom, Kow	loon.	Date Started	:	09-07-2010
W.O. No.*	:	<u></u>	Sample Type*	: River Water	Date Completed	:	09-07-2010
GCE Serial No.	:	WQM072010	GCE Reg. No.	: GCE 081096	Test Unit No.	:	CH 08258

Analysis Description		т	est Metho	thod Units Quality Control Re								lts		
						Method Blank	•	QC 500 m	g/L	ac	Duplicate	RPI	0%	Spike 25 mg/L
Suspended Solid	s (SS)	АРНА	\ 20ed 25	540 D	mg/L	< 1.0		497	97		497	0.0		27.0
			Acce	ptance	Criteria	<2.5 mg	ı/L	475 ≤ C	ontro	ol Lin	nit ≤ 514	≤ ±	5%	21 ≤ R ≤ 29
	Sam	ple ID	WE1	- ·	VE1 blicate	WE2		WE2 Duplicate	W	WE3 WE3 Duplicate		•		
TEST RESULTS	Sampling Date/Time		09 July 2010 / 11:00		09 July 2010 / 10:45		09 July 2010 / 10:15			15				
	LOD	Units												
Suspended Solids (SS)	1	mg/L	<1.0	<	1.0	1.9		1. <b>7</b>	7.	6	8.0			
	Sam	ple ID	WE4		VE4 olicate	WE5	C	WE5 Suplicate	WE6 WE6 Duplicate					
TEST RESULTS	Sampling Date/Time		VILL 60	09 July 2010 / 10:25		09 July 2010 / 11:20		09 July 2010 / 11:30			30			
	LOD	Units												
Suspended Solids (SS)	1	mg/L	12.4	1	2.1	8.5		8.9	8	6	83.2			

\* : 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	:	/sk
			Name	:	GU CHÍN
Checked By	: _	GU CHIN	Post	:	Chemist

Form No. : WQM/R1 (01-09-2008)



Report No.	:	GCC100700148			Date of Issue	:	Page 1 of 1 21-07-2010
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/200	)6/11 - Drainage In	nprovement in Southern La	antau & Constructio	on	of
Project*	:	Mui Wo Village Sewerage Phase 1					
Test Location	:	G/F, 20 Pak Kung Street	, Hung Hom, Kow	loon.	Date Started	:	09-07-2010
W.O. No.*	:	••	Contract No.*	<u></u>	Date Completed	:	16-07-2010
GCE Serial No.	:	WQM072010	Sampling Date*	: 09-07-2010 / 11:00	Sample Type*	:	River Water
GCE Reg. No.	:	GCE 081096	Test Unit No.	: CH 08258	Sample I.D.*	:	WE1
Descripption	:	River Water					

		TEST REFERENCE (In-House Method based on)	TEST RESULT		
Appearance		APHA 20ed 2110			
Odour		APHA 20ed 2150 B	Odour Characteristics :		
		AFNA 2000 2150 6	Threshold Odour Number (TON) :		
pH Value at temperature (	1°C	APHA 20ed 4500-H <sup>+</sup> B			
Colour	тси	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			
		APHA 20ed 4500-NH <sub>3</sub> D	0.03		
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH <sub>3</sub> E			
		APHA 18ed 4500-NH <sub>3</sub> C			
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO3 E	0.14		
Phosphorus	mg/L	APHA 20ed 4500-P D	0.05		
Biochemical Oxygen Demand (BC	DD <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 9 July 2010.

REMARKS : Sample Location WE1.

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



						Page 1 of 1	
Report No.	:	GCC100700156			Date of Issue	: 21-07-2010	
Client*	:	Environmental Pioneers &	& Solutions Limited		Order Received	: 08-09-2008	
Client Address*	dress* : 8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiw			an, HK.			
		DSD Contract No. DC/20	006/11 - Drainage Improvement in S	Southern l	antau & Constructi	on of	
Project*	:	Mui Wo Village Sewerag	e Phase 1				
Test Location	:	G/F, 20 Pak Kung Stre	et, Hung Hom, Kowloon.		Date Started	: 09-07-2010	
W.O. No.*	:	<u></u>	Contract No.* :		Date Completed	: 16-07-2010	
GCE Serial No.	:	WQM072010	Sampling Date* : 09-07-2010 / 11:00		Sample Type*	: River Water	
GCE Reg. No.	:	GCE 081096	Test Unit No. : CH 08258		Sample I.D.*	: WE1 Duplicate	
Descripption	;	River Water					
DESCRIPTION			TEST REFERENCE (In-House Method based on)		TEST RE	SULT	
Appearance			APHA 20ed 2110				
				Odour Cl	haracteristics :		
Odour			APHA 20ed 2150 B	Threshol	nreshold Odour Number (TON) :		
pH Value at ten	npe	erature [ ] °C	APHA 20ed 4500-H <sup>+</sup> B				
Colour		тси	APHA 20ed 2120 B				
Turbidity		NTU	APHA 20ed 2130 B				

Odour		APHA 20ed 2150 B	Odour Characteristics :				
		AFRA ZUEU Z 150 B	Threshold Odour Number (TON) :				
pH Value at temperature [	] °C	APHA 20ed 4500-H <sup>+</sup> B					
Colour	тси	APHA 20ed 2120 B					
Turbidity	NTŲ	APHA 20ed 2130 B					
Conductivity at 25°C	μS/cm	APHA 20ed 2510 B					
Salinity	g/L	APHA 20ed 2520 B					
		APHA 20ed 4500-NH <sub>3</sub> D	0.02				
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH <sub>3</sub> E					
		APHA 18ed 4500-NH <sub>3</sub> C	-				
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO3 <sup>-</sup> E	0.15				
Phosphorus	mg/L	APHA 20ed 4500-P D	0.05				
Biochemical Oxygen Demand (BC	DD <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 9 July 2010.

 REMARKS :
 Sample Location WE1.

 End ---- 

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

 Name
 :
 Gu Chin

 Checked By
 :
 Gu Chin
 Post
 :



							Page 1 of 1		
Report No.	:	GCC100700164			Date of Issue	:	21-07-2010		
							*********		
Client *	:	Environmental Pioneers &		Order Received	:	08-09-2008			
Client Address*	:	8/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.							
		DSD Contract No. DC/200	)6/11 - Drainage In	nprovement in Southern La	antau & Constructio	on	of		
Project*	:	Mui Wo Village Sewerage	Mui Wo Village Sewerage Phase 1						
Test Location	:	G/F, 20 Pak Kung Stree	t, Hung Hom, Kow	loon.	Date Started	:	09-07-2010		
W.O. No.*	:		Contract No.*	:	Date Completed	:	16-07-2010		
GCE Serial No.	:	WQM072010	Sampling Date*	: 09-07-2010 / 10:45	Sample Type*	:	River Water		
GCE Reg. No.	:	GCE 081096	Test Unit No.	: CH 08258	Sample I.D.*	:	WE2		
Descripption	:	River Water							

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	
Odour		APHA 20ed 2150 B	Odour Characteristics :
		AFRA 20ed 2150 B	Threshold Odour Number (TON) :
pH Value at temperature {	1℃	APHA 20ed 4500-H <sup>+</sup> B	
Colour	тси	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	
		APHA 20ed 4500-NH <sub>3</sub> D	0.32
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH <sub>3</sub> E	
		APHA 18ed 4500-NH <sub>3</sub> C	
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO3 E	0.22
Phosphorus	mg/L	APHA 20ed 4500-P D	0.08
Biochemical Oxygen Demand (BOI	D <sub>5</sub> ) mg/L	APHA 20ed 5210 B	2
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 9 July 2010.

 REMARKS :
 Sample Location WE2.

 ---- End ---- 

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

 Name
 :
 Gu Chin
 Ost
 :
 Chemist



							Page 1 of 1
Report No.	:	GCC100700172			Date of Issue	:	21-07-2010
			•••••				
Client*	:	Environmental Pioneers & S	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, Kow	loon.	Date Started	:	09-07-2010
W.O. No.*	:		Contract No.*	:	Date Completed	:	16-07-2010
GCE Serial No.	:	WQM072010	Sampling Date*	: 09-07-2010 / 10:45	Sample Type*	:	River Water
GCE Reg. No.	:	GCE 081096	Test Unit No.	: CH 08258	Sample I.D.*	:	WE2 Duplicate
Descripption	:	River Water					

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT		
Appearance		APHA 20ed 2110			
Odour		APHA 20ed 2150 B	Odour Characteristics :		
		AFNA 2000 2150 B	Threshold Odour Number (TON) :		
pH Value at temperature (	1 °C	APHA 20ed 4500-H <sup>+</sup> B			
Colour	тси	APHA 20ed 2120 B			
Turbidity	ΝΤυ	APHA 20ed 2130 B			
Conductivity at 25°C	μS/cm	APHA 20ed 2510 B			
Salinity	g/L	APHA 20ed 2520 B			
		APHA 20ed 4500-NH <sub>3</sub> D	0.32		
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH <sub>3</sub> E			
	-	APHA 18ed 4500-NH <sub>3</sub> C	-		
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO3 <sup>°</sup> E	0.21		
Phosphorus	mg/L	APHA 20ed 4500-P D	0.07		
Biochemical Oxygen Demand (Bi	OD <sub>5</sub> } mg/L	APHA 20ed 5210 B	2		
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 9 July 2010.

**REMARKS :** Sample Location WE2.

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



							Page 1 of 1
Report No.	:	GCC100700180			Date of Issue	: 21-07-20	10
						••••	
Client*	:	Environmental Pioneers &	Solutions Limited		Order Received	: 08-09-20	0880
Client Address*	:	8/F, Chaiwan Industrial Co	entre Building, 20 I	_ee Chung Street, Chaiwar	n, HK.		
		DSD Contract No. DC/200	)6/11 - Drainage Ir	nprovement in Southern La	antau & Constructi	on of	
Project*	:	Mui Wo Village Sewerage	Phase 1				
Test Location	:	G/F, 20 Pak Kung Stree	t, Hung Hom, Kow	loon.	Date Started	: 09-07-20	10
W.O. No.*	:		Contract No.*	: <u></u>	Date Completed	: 16-07-20	10
GCE Serial No.	:	WQM072010	Sampling Date*	: 09-07-2010 / 10:15	Sample Type*	: River Wat	ter
GCE Reg. No.	:	GCE 081096	Test Unit No.	: CH 08258	Sample I.D.*	: WE3	
Descripption	:	River Water					

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	-
Odour		APHA 20ed 2150 B	Odour Characteristics :
		AFRA ZUEU Z 150 B	Threshold Odour Number (TON) :
pH Value at temperature [	] ⁰C	APHA 20ed 4500-H <sup>+</sup> B	
Colour	тси	APHA 20ed 2120 B	
Turbidity	NTU	APHA 20ed 2130 B	
Conductivity at 25°C	μ <b>S/cm</b>	APHA 20ed 2510 B	
Salinity	g/L	APHA 20ed 2520 B	
		APHA 20ed 4500-NH <sub>3</sub> D	0.16
Nitrogen (Ammonia)	mg/L	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> E	0.24
Phosphorus	mg/L	APHA 20ed 4500-P D	0.08
Biochemical Oxygen Demand	(BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	1
Chemical Oxygen Demand (CC	DD) 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 9 July 2010.

 REMARKS :
 Sample Location WE3.

 ---- End ---- 

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

 Name
 :
 Gu Chin

 Checked By
 :
 Gu Chin
 Post
 :



							Page 1 of 1
Report No.	:	GCC100700198			Date of Issue	: 21-07-20	010
				***************************************			
Client*	:	Environmental Pioneers &	Solutions Limited		Order Received	: 08-09-20	800
Client Address*	:	8/F, Chaiwan Industrial C	entre Building, 20 l	ee Chung Street, Chaiwa	n, HK.		
		DSD Contract No. DC/20	06/11 - Drainage In	nprovement in Southern La	antau & Constructi	on of	
Project*	:	Mui Wo Village Sewerage	Phase 1		· · · · · · · · · · · · · · · · · · ·		v
Test Location	:	G/F, 20 Pak Kung Stree	t, Hung Hom, Kow	loon.	Date Started	: 09-07-20	010
W.O. No.*	:		Contract No.*	:	Date Completed	: 16-07-20	010
GCE Serial No.	:	WQM072010	Sampling Date*	: 09-07-2010 / 10:15	Sample Type*	: River Wa	ter
GCE Reg. No.	:	GCE 081096	Test Unit No.	: CH 08258	Sample I.D.*	: WE3 Dup	olicate
Descripption	:	River Water					

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	
Odour		APHA 20ed 2150 B	Odour Characteristics :
Uddu		AFRA 2000 2150 B	Threshold Odour Number (TON) :
pH Value at temperature [	] °C	APHA 20ed 4500-H <sup>+</sup> B	
Colour	тси	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	
		APHA 20ed 4500-NH <sub>3</sub> D	0.17
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH <sub>3</sub> E	
		APHA 18ed 4500-NH <sub>3</sub> C	
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO3 <sup>-</sup> E	0.23
Phosphorus	mg/L	APHA 20ed 4500-P D	0.07
Biochemical Oxygen Demand	(BOD <sub>5</sub> ) mg/L	APHA 20ed 5210 B	1
Chemical Oxygen Demand (C	OD) 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 9 July 2010.

 REMARKS :
 Sample Location WE3.

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

 Certified By
 :

 Name
 :

 Gu Chin
 Post

 Checked By
 :



							Page 1 of 1
Report No.	:	GCC100700203			Date of Issue	: 2	21-07-2010
Client*	:	Environmental Pioneers & S	Solutions Limited		Order Received	: (	08-09-2008
Client Address*	:	8/F, Chaiwan Industrial Ce	ntre Building, 20 L	ee Chung Street, Chaiwar	л, НК		
		DSD Contract No. DC/200	6/11 - Drainage In	nprovement in Southern La	antau & Constructio	on c	of
Project*	:	Mui Wo Village Sewerage	Phase 1				
Test Location	:	G/F, 20 Pak Kung Street	, Hung Hom, Kow	loon.	Date Started	: (	9-07-2010
W.O. No.*	:		Contract No.*		Date Completed	: _1	16-07-2010
GCE Serial No.	:	WQM072010	Sampling Date*	: 09-07-2010 / 10:25	Sample Type*	: <u>F</u>	River Water
GCE Reg. No.	:	GCE 081096	Test Unit No.	: CH 08258	Sample I.D.*	: 1	NE4
Descripption	:	River Water					

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	
Odour		APHA 20ed 2150 B	Odour Characteristics :
		ATTA 2060 2150 B	Threshold Odour Number (TON) :
pH Value at temperature [	]°C	APHA 20ed 4500-H <sup>+</sup> B	
Colour	тси	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	
		APHA 20ed 4500-NH <sub>3</sub> D	0.33
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH <sub>3</sub> E	
		APHA 18ed 4500-NH <sub>3</sub> C	-
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO3 E	0.29
Phosphorus	mg/L	APHA 20ed 4500-P D	0.11
Biochemical Oxygen Demand (BO	D <sub>5</sub> ) mg/L	APHA 20ed 5210 B	2
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 9 July 2010.

REMARKS :	Sa	mple Location WE4.			
			End		
Tested By	:	T.W. Lam, K.L. Fong		:	Gu Chin
Checked By	:	Gu Chin	Post	:	Chemist



							Page 1 of 1
Report No.	:	GCC100700211			Date of Issue	:	21-07-2010
							******
Client*	:	Environmental Pioneers &	Solutions Limited		Order Received	:	08-09-2008
Client Address*	:	8/F, Chaiwan Industrial Ce	entre Building, 20 l	ee Chung Street, Chaiwa	n, HK.		
		DSD Contract No. DC/200	)6/11 - Drainage Ir	nprovement in Southern La	antau & Constructi	on	of
Project*	:	Mui Wo Village Sewerage	Phase 1				
Test Location	:	G/F, 20 Pak Kung Street	, Hung Hom, Kow	loon.	Date Started	:	09-07-2010
W.O. No.*	:		Contract No.*	:	Date Completed	:	16-07-2010
GCE Serial No.	:	WQM072010	Sampling Date*	: 09-07-2010 / 10:25	Sample Type*	:	River Water
GCE Reg. No.	:	GCE 081096	Test Unit No.	: CH 08258	Sample I.D.*	:	WE4 Duplicate
Descripption	:	River Water					

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	
Odour		APHA 20ed 2150 B	Odour Characteristics :
		AFRA 2080 2150 B	Threshold Odour Number (TON) :
pH Value at temperature (	J °C	APHA 20ed 4500-H <sup>+</sup> B	
Colour	тси	APHA 20ed 2120 B	
Turbidity	NTU	APHA 20ed 2130 B	
Conductivity at 25°C	μ\$/cm	APHA 20ed 2510 B	
Salinity	g/L	APHA 20ed 2520 B	
		APHA 20ed 4500-NH <sub>3</sub> D	0.34
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH <sub>3</sub> E	
		APHA 18ed 4500-NH <sub>3</sub> C	
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO3 <sup>-</sup> E	0.29
Phosphorus	mg/L	APHA 20ed 4500-P D	0.11
Biochemical Oxygen Demand (BC	)D <sub>5</sub> ) mg/L	APHA 20ed 5210 B	2
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 9 July 2010.

REMARKS : Sample Location WE4.

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



							Page 1 of 1	
Report No.	:	GCC100700229			Date of Issue	: :	21-07-2010	
Client*	:	Environmental Pioneers &	Solutions Limited		Order Received	: _	08-09-2008	
Client Address*	:	8/F, Chaiwan Industrial Ce	ntre Building, 20 L	ee Chung Street, Chaiwa	n, HK.			
		DSD Contract No. DC/200	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, Kow	loon.	Date Started	: (	09-07-2010	
W.O. No.*	;		Contract No.*	:	Date Completed	:_	16-07-2010	
GCE Serial No.	:	WQM072010	Sampling Date*	: 09-07-2010 / 11:20	Sample Type*	: [	River Water	
GCE Reg. No.	:	GCE 081096	Test Unit No.	: CH 08258	Sample I.D.*	: 1	WE5	
Descripption	:	River Water						

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	
Odour	APHA 20ed 2150 B	Odour Characteristics :
	AFRA 2000 2150 B	Threshold Odour Number (TON) :
pH Value at temperature [ ] °C	APHA 20ed 4500-H <sup>+</sup> B	
Colour TCI	APHA 20ed 2120 B	
Turbidity NTU	APHA 20ed 2130 B	
Conductivity at 25°C	APHA 20ed 2510 B	
Salinity g/	APHA 20ed 2520 B	
	APHA 20ed 4500-NH <sub>3</sub> D	0.02
Nitrogen (Ammonia) mg/	APHA 20ed 4500-NH <sub>3</sub> E	
	APHA 18ed 4500-NH <sub>3</sub> C	
Nitrogen (Nitrate) mg/	- APHA 20ed 4500-NO <sub>3</sub> <sup>-</sup> E	0.18
Phosphorus mg/	APHA 20ed 4500-P D	0.05
Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/	APHA 20ed 5210 B	1
Chemical Oxygen Demand (COD) mg/	APHA 20ed 5220 D	
Total Suspended Solid mg/	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 9 July 2010.

REMARKS : Sample Location WE5.

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



							Page 1 of 1	
Report No.	:	GCC100700237			Date of Issue	:	21-07-2010	
****								
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/200	6/11 - Drainage In	nprovement in Southern La	intau & Constructi	on	of	
Project*	:	Mui Wo Village Sewerage	Phase 1					
Test Location	:	G/F, 20 Pak Kung Street	, Hung Hom, Kowl	oon.	Date Started	:	09-07-2010	
W.O. No.*	:		Contract No.*	:	Date Completed	:	16-07-2010	
GCE Serial No.	:	WQM072010	Sampling Date*	: 09-07-2010 / 11:20	Sample Type*	:	River Water	
GCE Reg. No.	:	GCE 081096	Test Unit No.	: CH 08258	Sample I.D.*	:	WE5 Duplicate	
Descripption	:	River Water						

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance		APHA 20ed 2110	
Odour		APHA 20ed 2150 B	Odour Characteristics :
		AFRA ZUEU ZIDU B	Threshold Odour Number (TON) :
pH Value at temperature [	] °C	APHA 20ed 4500-H <sup>+</sup> B	
Colour	тси	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	
		APHA 20ed 4500-NH <sub>3</sub> D	0.02
Nitrogen (Ammonia)	mg/L	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	0.17
Phosphorus	mg/L	APHA 20ed 4500-P D	0.05
Biochemical Oxygen Demand (B	OD <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 9 July 2010.

REMARKS :	Sample Lo	cation WE5.			
		Enc			
Tested By	:	T.W. Lam, K.L. Fong	Certified By	:	List
			Name	:	Gu Chin
Checked By	:	Gu Chin	Post	;	Chemist



							Page 1 of 1	
Report No.	:	GCC100700245			Date of Issue	:	21-07-2010	
				•••••				
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/200	6/11 - Drainage In	nprovement in Southern La	intau & Constructi	on	of	
Project*	:	Mui Wo Village Sewerage	Phase 1					
Test Location	:	G/F, 20 Pak Kung Street	, Hung Hom, Kow	oon.	Date Started	:	09-07-2010	
W.O. No.*	:		Contract No.*	:	Date Completed	:	16-07-2010	
GCE Serial No.	:	WQM072010	Sampling Date*	: 09-07-2010 / 11:30	Sample Type*	:	River Water	
GCE Reg. No.	:	GCE 081096	Test Unit No.	: CH 08258	Sample I.D.*	:	WE6	
Descripption	:	River Water						

DESCRIPTION	TEST REFERENCE (In-House Method based on)	TEST RESULT
Appearance	APHA 20ed 2110	
Odour	APHA 20ed 2150 B	Odour Characteristics :
	AFRA 2060 2150 B	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	
	APHA 20ed 4500-NH <sub>3</sub> D	0.03
Nitrogen (Ammonia) mg/L	APHA 20ed 4500-NH <sub>3</sub> E	
-	APHA 18ed 4500-NH <sub>3</sub> C	
Nitrogen (Nitrate) mg/L	APHA 20ed 4500-NO3 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 9 July 2010.

 REMARKS :
 Sample Location WE6.

 End ---- 

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

 Name
 :
 Gu Chin

 Checked By
 :
 Gu Chin
 Post
 :



Report No.	:	GCC100700253			Date of Issue		Page 1 of 1 21-07-2010		
Client*	:	Environmental Pioneers &	Order Received	:	08-09-2008				
Client Address*	:	8/F, Chaiwan Industrial Ce	/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.						
		DSD Contract No. DC/200	6/11 - Drainage In	provement in Southern La	intau & Constructi	ion	of		
Project*	:	Mui Wo Village Sewerage	Phase 1						
Test Location	:	G/F, 20 Pak Kung Street	, Hung Hom, Kow	oon.	Date Started	:	09-07-2010		
W.O. No.*	:		Contract No.*	:	Date Completed	:	16-07-2010		
GCE Serial No.	:	WQM072010	Sampling Date*	: 09-07-2010 / 11:30	Sample Type*	:	River Water		
GCE Reg. No.	:	GCE 081096	Test Unit No.	: CH 08258	Sample I.D.*	:	WE6 Duplicate		
Descripption	:	River Water							

DESCRIPTION		TEST REFERENCE (In-House Method based on)	TEST RESULT		
Appearance		APHA 20ed 2110			
Odour		APHA 20ed 2150 B	Odour Characteristics :		
		AFRA 2000 2100 B	Threshold Odour Number (TON) :		
pH Value at temperature (	] °C	APHA 20ed 4500-H <sup>+</sup> B			
Colour	тси	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			
		APHA 20ed 4500-NH <sub>3</sub> D	0.04		
Nitrogen (Ammonia)	mg/L	APHA 20ed 4500-NH <sub>3</sub> E			
		APHA 18ed 4500-NH <sub>3</sub> C			
Nitrogen (Nitrate)	mg/L	APHA 20ed 4500-NO3 <sup>-</sup> E	0.18		
Phosphorus	mg/L	APHA 20ed 4500-P D	0.04		
Biochemical Oxygen Demand (BOD	)₅) 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 9 July 2010.

REMARKS :	Sample Location WE6.

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

Appendix E

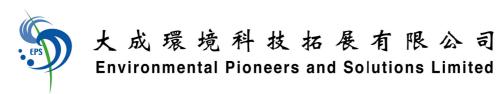


大成環境科技拓展有限公司

Environmental Pioneers and Solutions Limited

Monitoring Location			N1	N2		
Description of Location			Façade	Façade		
Date of Monitoring			7/7/	2010		
Measurement Start Time	е	(hhmm)	14:10	14:50		
Measurement Time Len	gth	(mins.)	30 r	mins		
Noise Meter Model/ Ider	ntificatio	n	ACO Japan,	model 6224		
Calibrator Model/ Identif	ication		Castle Gro	up, GA607		
Wind Speed	(r	n/s)	0.2	0.2		
	L90	(dB(A))	42.7	56.7		
Measurement Results	L10	(dB(A))	54.0	64.4		
	Leq	(dB(A))	51.3	62.2		
Weather condition:			Sunny			
Major Construction Noise Sourse(s) During Monitoring			No construction works are being carried out during measurement.	1. Excavator noise		
Other Noise Source(s) [	During N	<i>f</i> lonitoring	1. Public noise 2. Traffic noise (bicycle)	1. Public noise 2. Traffic noise (bicycle)		
Remarks						

	Name & Designation	<u>Signature</u>	Date:
Duran and dam	liss and Ohean a	1	7/7/0010
Prepared by:	Jimmy Cheng	- X-	7/7/2010



Monitoring Location		N3	N4		
Description of Location		Freefield	Facede		
Date of Monitoring			7/7/	2010	
Measurement Start Time	e	(hhmm)	13:25	12:50	
Measurement Time Len	gth	(mins.)	30 r	mins	
Noise Meter Model/ Ider	ntificatio	n	ACO Japan,	, model 6224	
Calibrator Model/ Identif	ication		Castle Gro	oup, GA607	
Wind Speed	(r	n/s)	0.2	0.2	
	L90	(dB(A))	50.8	47.6	
Measurement Results	L10	(dB(A))	60.7	59.2	
	Leq	(dB(A))	56.3	55.9	
Weather condition:			Sunny		
Major Construction Noise Sourse(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 (bicycle)	1. Public noise	
Remarks					

	Name & Designation	<u>Signature</u>	Date:
Prepared by:	Jimmy Cheng	A	7/7/2010
		1	

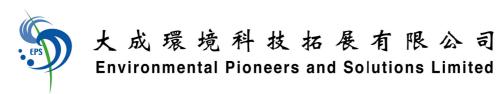


大成環境科技拓展有限公司

Environmental Pioneers and Solutions Limited

Monitoring Location		N1	N2		
Description of Location		Façade	Façade		
Date of Monitoring			14/7/	14/7/2010	
Measurement Start Time	e (	(hhmm)	15:55	12:05	
Measurement Time Len	gth	(mins.)	30 r	30 mins	
Noise Meter Model/ Ider	ntificatio	n	ACO Japan,	model 6224	
Calibrator Model/ Identif	ication		Castle Gro	up, GA607	
Wind Speed	(n	n/s)	0.2	0.2	
	L90	(dB(A))	44.4	45.0	
Measurement Results	L10	(dB(A))	56.7	52.1	
	Leq	(dB(A))	54.3	49.9	
Weather condition:			Sunny		
Major Construction Noise Sourse(s) During Monitoring		1. Construction trucks noise	No construction works are being carried out during measurement.		
Other Noise Source(s) During Monitoring		1. Public noise 2. Traffic noise (bicycle)	1. Public noise 2. Traffic noise (bicycle)		
Remarks					

	Name & Designation	<u>Signature</u>	Date:
Prepared by:	Jimmy Cheng	1	14/7/2010
riepared by.	binning Oneng	-p	14/1/2010
		•	



Monitoring Location		N3	N4		
Description of Location		Freefield	Facede		
Date of Monitoring			14/7/	14/7/2010	
Measurement Start Time	e (	hhmm)	11:30	10:50	
Measurement Time Len	gth	(mins.)	30 1	mins	
Noise Meter Model/ Ider	ntificatio	n	ACO Japan	, model 6224	
Calibrator Model/ Identif	ication		Castle Gro	up, GA607	
Wind Speed	(n	n/s)	0.2	0.2	
	L90	(dB(A))	41.6	42.2	
Measurement Results	L10	(dB(A))	53.9	50.1	
	Leq	(dB(A))	51.3	48.3	
Weather condition:			Sunny		
Major Construction Noise Sourse(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 (bicycle)	1. Public noise		
Remarks					

	Name & Designation	<u>Signature</u>	Date:
Prepared by:	Jimmy Cheng	$\int$	14/7/2010
		0	

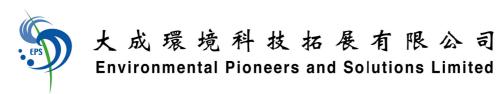


大成環境科技拓展有限公司

Environmental Pioneers and Solutions Limited

Monitoring Location		N1	N2		
Description of Location		Façade	Façade		
Date of Monitoring			24/7/2010		
Measurement Start Time	e (	(hhmm)	11:30	12:03	
Measurement Time Len	gth	(mins.)	30 r	mins	
Noise Meter Model/ Ider	ntificatio	n	ACO Japan,	model 6224	
Calibrator Model/ Identif	ication		Castle Gro	up, GA607	
Wind Speed	(n	n/s)	0.1	0.2	
	L90	(dB(A))	42.4	38.1	
Measurement Results	L10	(dB(A))	54.6	49.6	
	Leq	(dB(A))	54.2	47.8	
Weather condition:			Sunny		
Major Construction Noise Sourse(s) During Monitoring		<ol> <li>Excavator noise</li> <li>Construction truck noise</li> </ol>	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	<u>Signature</u>	Date:
		1	
Prepared by:	Jimmy Cheng	- X-	24/7/2010



Monitoring Location		N3	N4		
Description of Location		Freefield	Facede		
Date of Monitoring			24/7/2010		
Measurement Start Time	e (	(hhmm)	10:25	10:58	
Measurement Time Len	gth	(mins.)	30	30 mins	
Noise Meter Model/ Ider	ntificatio	n	ACO Japan	, model 6224	
Calibrator Model/ Identif	ication		Castle Gro	oup, GA607	
Wind Speed	(n	n/s)	0.3	0.2	
	L90	(dB(A))	40.2	47.9	
Measurement Results	L10	(dB(A))	51.5	52.1	
	Leq	(dB(A))	48.6	51.1	
Weather condition:			Sunny		
Major Construction Noise Sourse(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. Traffic noise		
Remarks					

	Name & Designation	<u>Signature</u>	Date:
Prepared by:	Jimmy Cheng	$\Delta$	24/7/2010



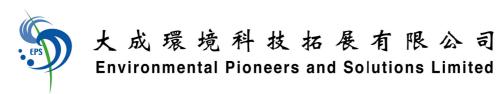
大成環境科技拓展有限公司

Environmental Pioneers and Solutions Limited

## **Construction Noise Monitoring Data Sheet**

Monitoring Location			N1	N2
Description of Location			Façade	Façade
Date of Monitoring			30/7/	/2010
Measurement Start Time	ə (	hhmm)	13:30	11:55
Measurement Time Len	gth	(mins.)	30 1	mins
Noise Meter Model/ Ider	ntificatio	n	ACO Japan	model 6224
Calibrator Model/ Identif	ication		Castle Gro	up, GA607
Wind Speed	(n	n/s)	0.3	0.3
	L90	(dB(A))	45.6	40.4
Measurement Results	L10	(dB(A))	60.8	50.4
	Leq	(dB(A))	60.3	47.6
Weather condition:			Su	nny
Major Construction Nois Monitoring	e Sours	e(s) During	1. Excavator noise	No construction works are being carried out during measurement.
Other Noise Source(s) [	During N	lonitoring	1. Public noise 2. Traffic noise	1. Public noise 2. Traffic noise
Remarks				

	Name & Designation	<u>Signature</u>	Date:
		1	
Prepared by:	Jimmy Cheng	- Yan	30/7/2010



## **Construction Noise Monitoring Data Sheet**

Monitoring Location			N3	N4					
Description of Location			Freefield	Facede					
Date of Monitoring			30/7/	/2010					
Measurement Start Time	ə (	(hhmm)	11:20	10:50					
Measurement Time Len	gth	(mins.)	30	nins					
Noise Meter Model/ Ider	ntificatio	n	ACO Japan, model 6224						
Calibrator Model/ Identif	ication		Castle Gro	up, GA607					
Wind Speed	(n	n/s)	0.2	0.3					
	L90	(dB(A))	39.6	50.2					
Measurement Results	L10	(dB(A))	51.7	56.5					
	Leq	(dB(A))	48.6	55.6					
Weather condition:			Su	nny					
Major Construction Nois Monitoring	e Sours	se(s) During	No construction works are being carried out during measurement.	No construction works are being carried out during measurement.					
Other Noise Source(s) [	During N	fonitoring	1. Public noise 2. Traffic noise	1. Public noise					
Remarks									

Name & Designation	<u>Signature</u>	Date:
limmy Cheng	1_	30/7/2010
Jinning Oneng		
	Name & Designation Jimmy Cheng	

Appendix F1

Water Quality Monitoring Data Sheet

#### Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 02/07/2010 Sunny Monitoring M2 C2 Location M1 М3 Μ4 C1 C3 1450 1500 1505 1445 1340 1350 1400 Time (hhmm) mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb Tide Mode normal normal normal normal normal normal normal River Condition 1.4 <1 < 1 < 1 < 1 < 1 < 1 Water Depth (m) 7.88 7.61 7.00 7.12 7.28 6.93 6.60 pH value 26.0 27.1 28.0 28.3 29.1 28.8 26.5 Temperature (oC) 0.3 0.0 0.2 3.7 0.0 0.0 0.0 Salinity (ppt) Average Average Average Average Average Average Average 12.2 2.5 Turbidity (NTU) 10.6 10.6 1.4 1.4 14.8 14.9 12.4 2.5 0.0 0.0 3.8 3.9 10.6 1.4 14.9 12.3 2.5 0.0 3.9 Average Average Average Average Average Average Average DO (mg/l) 7.77 7.71 7.69 7.52 8.41 8.42 7.89 7.90 7.88 7.90 6.97 7.79 7.51 6.96 7.78 7.70 7.52 8.42 7.90 7.89 6.97 Average Average Average Average Average Average Average DO Saturation (%) 100 100 99 99 98 98 110 110 98 98 98 98 88 88 100 99 98 110 98 98 88

Name

Signature

Date

02/07/2010

remark or observation:

Prepared By: Jimmy Cheng

#### Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 05/07/2010 Sunny Monitoring M2 C2 Location M1 М3 Μ4 C1 C3 1625 1610 1630 1615 1540 1550 1600 Time (hhmm) mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb Tide Mode normal normal Muddy Muddy normal normal normal River Condition < 1 1.3 <1 < 1 < 1 < 1 < 1 Water Depth (m) 6.91 7.00 6.81 7.67 6.66 6.54 6.51 pH value 28.7 30.7 28.6 27.9 27.8 29.0 30.4 Temperature (oC) 0.0 0.0 0.1 9.7 0.0 0.0 0.1 Salinity (ppt) Average Average Average Average Average Average Average 33.8 1.6 0.0 10.4 Turbidity (NTU) 9.7 9.7 0.5 0.5 67.2 67.1 33.7 1.5 0.0 10.4 9.7 0.5 67.2 33.8 1.6 0.0 10.4 Average Average Average Average Average Average Average DO (mg/l) 7.46 7.44 7.62 7.61 7.54 7.55 7.65 7.66 7.16 7.15 7.65 7.66 6.46 6.43 7.45 7.62 7.55 7.66 7.16 7.66 6.45 Average Average Average Average Average Average Average DO Saturation (%) 97 97 99 99 101 101 104 104 93 93 98 98 82 82 97 99 101 104 93 98 82

Name

Signature

M3 & M4 - Clearance of riverbed

Prepared By: Jimmy Cheng

05/07/2010

Date

#### Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 0	6/07/2010	Sunny			-									
Monitoring Location	M1	M2	м	3		M4		C1		C2			C3	
Time (hhmm)			10 <sup>,</sup>	10		1000							1020	
Tide Mode	mid-ebb	mid-ebb	mid-	ebb		mid-ebb	)	mid-ebb		mid-ebb	0		mid-ebb	)
River Condition	normal	normal	norr	nal		normal		normal		normal			normal	
Water Depth (m)	<1	< 1	<	1		1.3		< 1		< 1			< 1	
pH value			7.4	8		7.31							7.48	
Temperature (oC)			29.	0		29.2							29.2	
Salinity (ppt)			0.2	2		5.5							0.3	
Turbidity (NTU)	Average	Average	14.9 14.	9 Average	14.6	14.5	Average	-	Average		Average	8.1	8.2	Average
	#DIV/0	#DIV/0!		14.9			14.6	į	#DIV/0!		#DIV/0!			8.2
DO (mg/l)	Average	Average	7.06 7.0	9 Average	7.52	7.51	Average		Average		Average	5.79	5.78	Average
	#DIV/0	#DIV/0!		7.08			7.52	1	#DIV/0!		#DIV/0!			5.79
DO Saturation (%)	Average	Average	92 92	Average	99	99	Average		Average		Average	76	76	Average
	#DIV/0	#DIV/0!		92			99	;	#DIV/0!		#DIV/0!			76

Name

Signature

re

Prepared By: Jimmy Cheng

-----

Date

06/07/2010

#### Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 07/07/2010 Sunny Monitoring M2 Μ4 C2 Location M1 М3 C1 C3 1025 1035 1020 1010 1100 1050 1045 Time (hhmm) mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb Tide Mode normal normal normal Muddy normal normal normal River Condition 1.3 <1 < 1 < 1 < 1 < 1 < 1 Water Depth (m) 7.94 7.80 7.85 8.07 6.83 6.97 7.09 pH value 27.9 28.2 28.1 27.7 28.5 27.4 27.6 Temperature (oC) 0.0 0.0 0.4 4.5 0.0 0.0 0.0 Salinity (ppt) Average Average Average Average Average Average Average 70.9 0.0 0.0 8.4 Turbidity (NTU) 4.1 4.1 0.0 0.0 20.4 20.3 70.8 0.0 0.0 8.5 4.1 0.0 20.4 70.9 0.0 0.0 8.5 Average Average Average Average Average Average Average DO (mg/l) 8.22 7.79 7.81 7.48 7.46 7.73 7.73 7.11 7.11 7.66 7.67 6.39 8.21 6.39 8.22 7.80 7.47 7.73 7.11 7.67 6.39 Average Average Average Average Average Average Average DO Saturation (%) 104 104 100 100 97 97 98 98 91 91 98 98 83 83 104 100 97 98 91 98 83

Name

Signature

M3 & M4 - Clearance of riverbed

Prepared By: Jimmy Cheng

07/07/2010

Date

#### Water Quality Monitoring - Summary of On-site measurement results

Monitoring Location	M1		M2			M3			M4		C1		C2			C3	
<b>T</b> : (11 )						1000			955							1010	
Time (hhmm)	mid-ebb		mid-ebb			mid-ebb	)		mid-ebb		mid-ebb		mid-ebb	)		mid-ebb	)
Tide Mode	normal		normal			normal			normal		normal		normal			normal	
Water Depth (m)	<1		< 1			< 1			1.3		< 1		< 1			< 1	
pH value						5.93			8.64							7.04	
Temperature (oC)						29.0			28.3							28.8	
Salinity (ppt)						0.5			3.5		-					0.1	-
Turbidity (NTU)	Aver	ge		Average	8.6	8.7	Average	12.2	12.0	Average		Average		Average	5.4	5.3	Average
	#DI\	/0!		#DIV/0!			8.7			12.1		#DIV/0!		#DIV/0!			5.4
DO (mg/l)	Aver	ge		Average	7.08	7.09	Average	7.71	7.71	Average		Average		Average	6.74	6.75	Average
	#DI\	/0!		#DIV/0!			7.09			7.71		#DIV/0!		#DIV/0!			6.75
DO Saturation (%)	Aver	ge		Average	92	92	Average	99	99	Average		Average		Average	88	88	Average
	#DI\	/0!		#DIV/0!			92			99		#DIV/0!		#DIV/0!			88

Name

Signature

Date

08/07/2010

remark or observation:

Prepared By: Jimmy Cheng

#### Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 09/07/2010 Sunny Monitoring M2 Μ4 C2 Location M1 М3 C1 C3 1015 1035 1025 1000 1100 1110 1135 Time (hhmm) mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb Tide Mode normal normal normal normal normal normal normal River Condition 1.3 <1 < 1 < 1 < 1 < 1 < 1 Water Depth (m) 8.78 7.53 7.37 7.54 6.96 6.83 6.76 pH value 29.7 28.9 30.9 29.2 29.9 29.6 29.4 Temperature (oC) 0.3 0.4 3.9 7.8 0.0 0.0 0.5 Salinity (ppt) Average Average Average Average Average Average Average 13.5 Turbidity (NTU) 4.8 4.8 0.0 0.0 12.3 12.3 8.3 8.3 0.0 0.0 0.0 0.0 13.5 4.8 0.0 12.3 8.3 0.0 0.0 13.5 Average Average Average Average Average Average Average DO (mg/l) 9.02 6.06 7.20 6.79 6.80 7.86 5.14 9.01 8.40 8.40 6.05 7.19 7.85 5.12 9.02 8.40 6.06 7.20 6.80 7.86 5.13 Average Average Average Average Average Average Average DO Saturation (%) 120 120 110 110 81 81 95 95 89 89 103 103 69 69 120 110 81 95 89 103 69

Name

Prepared By: Jimmy Cheng

Signature

09/07/2010

Date

#### Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 12/07/2010 Sunny Monitoring M2 Μ4 C2 Location M1 М3 C1 C3 1155 1200 1210 1145 1310 1320 1330 Time (hhmm) mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb Tide Mode normal normal normal normal normal normal normal River Condition 1.4 <1 < 1 < 1 < 1 < 1 < 1 Water Depth (m) 7.95 7.58 7.58 7.82 7.81 7.05 6.74 pH value 28.2 29.5 29.1 30.0 30.3 29.5 28.6 Temperature (oC) 1.4 4.5 12.9 10.2 0.0 0.0 4.2 Salinity (ppt) Average Average Average Average Average Average Average 2.1 Turbidity (NTU) 9.6 9.6 1.8 1.8 3.9 4.0 2.6 2.7 2.3 0.0 0.0 9.7 9.7 9.6 1.8 4.0 2.7 2.2 0.0 9.7 Average Average Average Average Average Average Average DO (mg/l) 7.37 7.49 7.48 6.96 7.35 7.26 7.27 7.36 7.39 6.01 7.35 6.98 7.38 6.04 7.36 7.49 6.97 7.37 7.27 7.38 6.03 Average Average Average Average Average Average Average DO Saturation (%) 96 96 100 100 93 93 97 97 93 93 95 95 79 79 96 100 93 97 93 95 79

Name

Signature

Prepared By: Jimmy Cheng

12/07/2010

Date

#### Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 14/07/2010 Sunny Monitoring M2 C2 Location M1 М3 Μ4 C1 C3 1415 1420 1430 1410 1435 1525 1535 Time (hhmm) mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb Tide Mode normal normal normal normal normal normal normal River Condition 1.4 <1 < 1 < 1 < 1 < 1 < 1 Water Depth (m) 8.10 7.76 7.68 7.90 6.70 6.81 6.88 pH value 29.1 29.8 29.8 30.2 30.9 29.0 29.0 Temperature (oC) 4.5 6.4 15.4 8.6 0.1 0.0 10.1 Salinity (ppt) Average Average Average Average Average Average Average Turbidity (NTU) 12.7 12.7 0.0 0.0 5.3 5.3 3.6 3.6 0.0 0.0 0.0 0.0 10.7 10.7 12.7 0.0 5.3 3.6 0.0 0.0 10.7 Average Average Average Average Average Average Average DO (mg/l) 7.45 7.84 7.86 8.01 7.33 7.08 7.53 7.67 7.46 7.99 7.31 7.11 7.54 7.65 7.46 7.85 8.00 7.32 7.10 7.54 7.66 Average Average Average Average Average Average Average DO Saturation (%) 98 98 105 105 108 108 95 95 93 93 98 98 101 101 98 105 108 95 93 98 101

Name

Signature

Prepared By: Jimmy Cheng

14/07/2010

Date

#### Water Quality Monitoring - Summary of On-site measurement results

Monitoring Location		M1			M2			M3			M4			C1			C2			C3	
Time (hhmm)		1545			1550		1600			1540				1630			1620			1610	
Tide Mode		mid-ebb	)		mid-ebb			mid-ebb	)		mid-ebb	)									
River Condition		Muddy			normal			Muddy			normal			normal			normal			normal	
Water Depth (m)		<1			< 1			< 1			1.3			< 1			< 1			< 1	
pH value		8.31			7.65			7.62			8.07			6.91			7.47			7.43	
Temperature (oC)		27.6			27.6			28.8			28.7			28.4			27.8			28.0	
Salinity (ppt)		0.4			0.6			8.1			13.8			0.0			0.0			0.6	
Turbidity (NTU)	16.3	16.3	Average	1.4	1.4	Average	20.0	20.0	Average	10.3	10.4	Average	1.2	1.2	Average	0.0	0.0	Average	6.2	6.2	Averag
DO (mg/l)	7.57	7.59	Average	7.40	7.40	Average	7.44	7.45	Average	7.25	7.25	Average	6.91	6.92	Average	7.66	7.63	Average	6.86	6.87	Averag
DO Saturation (%)	97	97	7.58 Average	94	94	7.40 Average	97	97	7.45 Average	94	94	7.25 Average	89	89	6.92 Average	98	98	7.65 Average	88	88	6.8 Averag

observation:

Name

Signature

Heavy rainfall causing disturbance of sediment

Prepared By: Jimmy Cheng

Date

remark or

16/07/2010

#### Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 21/07/2010 Sunny Monitoring M2 C2 Location M1 М3 Μ4 C1 C3 1000 1010 1020 950 1030 1040 1050 Time (hhmm) mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb Tide Mode normal normal normal normal normal normal normal River Condition 1.2 <1 < 1 < 1 < 1 < 1 < 1 Water Depth (m) 8.05 7.39 7.08 7.57 7.64 7.10 6.90 pH value 27.4 27.9 27.9 28.0 28.5 28.0 27.8 Temperature (oC) 0.3 0.3 7.4 7.4 0.2 0.0 0.2 Salinity (ppt) Average Average Average Average Average Average Average 4.5 Turbidity (NTU) 2.2 2.2 0.0 0.0 1.6 1.6 1.1 1.0 0.0 0.0 0.0 0.0 4.6 2.2 0.0 1.6 1.1 0.0 0.0 4.6 Average Average Average Average Average Average Average DO (mg/l) 7.64 7.65 7.61 7.60 7.41 7.35 7.44 7.46 7.59 7.59 6.31 7.39 7.34 6.32 7.65 7.61 7.40 7.35 7.45 7.59 6.32 Average Average Average Average Average Average Average DO Saturation (%) 98 98 97 97 96 96 94 94 96 96 97 97 81 81 98 97 96 94 96 97 81

Name

Signature

Date

21/07/2010

remark or observation:

Prepared By: Jimmy Cheng

#### Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 22/07/2010 Rainy Monitoring M2 C2 Location M1 М3 Μ4 C1 C3 1050 1100 1110 1040 1140 1130 1120 Time (hhmm) mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb Tide Mode normal normal normal normal normal normal normal River Condition 1.2 <1 < 1 < 1 < 1 < 1 < 1 Water Depth (m) 7.14 7.92 7.09 7.22 6.97 7.60 7.29 pH value 25.5 26.2 25.6 26.3 26.1 24.3 25.9 Temperature (oC) 5.0 0.4 4.9 4.9 0.0 0.0 0.5 Salinity (ppt) Average Average Average Average Average Average Average 3.3 Turbidity (NTU) 6.1 6.0 0.0 0.0 6.2 6.2 4.4 4.4 3.4 0.0 0.0 6.2 6.4 6.1 0.0 6.2 4.4 3.4 0.0 6.3 Average Average Average Average Average Average Average DO (mg/l) 7.34 7.35 7.58 7.60 7.43 7.16 7.47 7.49 7.93 6.72 7.41 7.14 7.91 6.74 7.35 7.59 7.42 7.15 7.48 7.92 6.73 Average Average Average Average Average Average Average DO Saturation (%) 92 92 95 95 92 92 88 88 91 91 94 94 83 83 92 95 92 88 91 94 83

Name

Prepared By: Jimmy Cheng

Signature

22/07/2010

Date

#### Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 24/07/2010 Sunny Monitoring M2 Μ4 C2 Location M1 М3 C1 C3 1030 1040 1050 1100 1140 1150 1110 Time (hhmm) mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb Tide Mode normal normal normal normal normal normal normal River Condition 1.4 <1 < 1 < 1 < 1 < 1 < 1 Water Depth (m) 7.18 7.04 6.94 7.38 6.97 6.91 7.14 pH value 26.7 27.6 30.2 26.1 27.6 28.2 27.6 Temperature (oC) 1.4 2.2 8.3 5.8 0.0 0.0 3.1 Salinity (ppt) Average Average Average Average Average Average Average Turbidity (NTU) 3.2 3.3 0.0 0.0 4.1 4.1 0.6 0.6 0.0 0.0 0.0 0.0 13.5 13.6 3.3 0.0 4.1 0.6 0.0 0.0 13.6 Average Average Average Average Average Average Average DO (mg/l) 7.88 7.59 7.59 7.01 7.21 7.78 7.79 7.96 5.27 7.86 7.00 7.21 7.95 5.26 7.87 7.59 7.01 7.21 7.79 7.96 5.27 Average Average Average Average Average Average Average DO Saturation (%) 98 98 95 95 90 90 93 93 99 99 101 101 70 70 98 95 90 93 99 101 70

Name

Signature

Date

24/07/2010

remark or observation:

Prepared By: Jimmy Cheng

#### Water Quality Monitoring - Summary of On-site measurement results

Date of Sampling: 26/07/2010 Sunny Monitoring M2 C2 Location M1 М3 Μ4 C1 C3 1155 1205 1210 1150 1050 1100 1110 Time (hhmm) mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb Tide Mode normal normal normal normal normal normal normal River Condition 1.3 <1 < 1 < 1 < 1 < 1 < 1 Water Depth (m) 7.76 7.34 7.51 7.46 7.27 6.96 6.72 pH value 27.2 27.8 28.9 28.8 29.5 28.6 26.1 Temperature (oC) 2.5 14.0 16.8 8.0 0.0 0.0 8.3 Salinity (ppt) Average Average Average Average Average Average Average Turbidity (NTU) 4.2 4.1 0.3 0.3 4.0 4.0 1.1 1.0 0.0 0.0 0.0 0.0 5.8 5.8 4.2 0.3 4.0 1.1 0.0 0.0 5.8 Average Average Average Average Average Average Average DO (mg/l) 7.49 7.51 7.74 7.74 7.55 7.57 7.63 7.63 7.84 5.40 7.78 7.79 7.84 5.40 7.79 7.50 7.74 7.56 7.63 7.84 5.40 Average Average Average Average Average Average Average DO Saturation (%) 102 102 98 98 102 102 98 98 95 95 100 100 69 69 102 98 102 98 95 100 69

Name

Signature

Prepared By: Jimmy Cheng

26/07/2010

Date

#### Water Quality Monitoring - Summary of On-site measurement results

Cloudy Date of Sampling: 28/07/2010 Monitoring M2 Μ4 C2 Location M1 М3 C1 C3 1335 1345 1350 1330 1400 1410 1420 Time (hhmm) mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb mid-ebb Tide Mode normal normal normal normal normal normal normal River Condition 1.3 <1 < 1 < 1 < 1 < 1 < 1 Water Depth (m) 7.74 7.02 7.59 8.19 7.21 6.74 7.14 pH value 27.1 27.1 26.8 26.6 27.4 26.8 26.6 Temperature (oC) 0.4 0.5 10.3 9.8 0.3 0.0 0.2 Salinity (ppt) Average Average Average Average Average Average Average 0.0 4.2 Turbidity (NTU) 1.2 1.2 0.0 0.0 11.5 11.5 2.4 2.3 0.0 0.0 0.0 4.4 1.2 0.0 11.5 2.4 0.0 0.0 4.3 Average Average Average Average Average Average Average DO (mg/l) 7.97 7.99 7.59 7.57 7.61 7.41 7.43 7.65 7.66 7.74 7.56 7.60 7.74 7.54 7.98 7.58 7.61 7.42 7.66 7.74 7.55 Average Average Average Average Average Average Average DO Saturation (%) 100 100 95 95 97 97 93 93 96 96 97 97 96 96 100 95 97 93 96 97 96

Name

Signature

Date

28/07/2010

remark or observation:

Prepared By: Jimmy Cheng

Appendix F2

# Water Quality Monitoring Lab report



							Page 1 of 1
Report No.	:	GCC100700041			Date of Issue	:	08-07-2010
Client*	:	Environmental Pioneers &	Solutions Limited		Date Received	:	08-09-2008
Client Address*	:	8/F, Chaiwan Industrial C	entre Building, 20	Lee Chung Street, Chaiwa	n, HK.		
		DSD Contract No. DC/20	06/11 - Drainage I	mprovement in Southern La	antau & Constructi	ion	of
Project*	:	Mui Wo Village Sewerage	Phase 1				
Test Location	:	G/F, 20 Pak Kung Stree	t, Hung Hom, Kow	/loon.	Date Started	:	02-07-2010
W.O. No.*	:		Sample Type*	: River Water	Date Completed	:	03-07-2010
GCE Serial No.	:	WQM072010	GCE Reg. No.	: GCE 081096	Test Unit No.	:	CH 08258

Analysis Descrip	tion	Т	est Metho	bc	Units				Qualit	y Control Resu	ults		
						Methoo Blank		QC 500 m	ig/L (	DC Duplicate	R	PD%	Spike 25 mg/L
Suspended Solid	s (SS)	APHA	4 20ed 25	540 D	mg/L	< 1.0		495		496	-	0.2	28.1
				eptance	Criteria	<2.5 mg	g/L	475 ≤ C	ontrol	Limit ≤ 514	≤	±5%	21 ≤ R ≤ 29
	Sam	ple ID	C1	C1 D	uplicate	C2	C2	Duplicate	СЗ	C3 Duplic	ate		
TEST RESULTS		pling /Time	02 July	2010	/ 13:40	02 July	201	0 / 13:50	02 J	uly 2010 / 14:	:00		
	LOD	Units											
Suspended Solids (SS)	1	mg/L	1.5	1	.1	2.2	·	2.6	4.0	3.6			
	Sam	ple ID	M1	M1 D	uplicate	M2	M2	2 Duplicate	МЗ	M3 Duplic	ate	M4	M4 Duplicate
TEST RESULTS		ipling /Time	02 July	2010	/ 14:50	02 July :	201	0 / 15:00	02 Ji	י 15: / 2010 אונ	05	02 Jul	y 2010 / 14:45
	LOD	Units											
Suspended Solids (SS)	1	mg/L	11.6	1.	1.8	1.2		1.5	11.9	12.1		10.8	9.9

\* : 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 : GU CHIN Name : Checked By : GU CHIN Post Chemist :

Form No. : WQM/R1 (19-01-2009)



Page 1 of 1

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

Report No.	:	GCC100700059			Date of Issue	:	08-07-2010
Client*	:	Environmental Pioneers &	Solutions Limited		Date Received	:	08-09-2008
Client Address*	:	8/F, Chaiwan Industrial Ce	entre Building, 20	Lee Chung Street, Chaiwar	n, HK.		
		DSD Contract No. DC/200	)6/11 - Drainage li	mprovement in Southern La	antau & Constructi	ion	of
Project*	:	Mui Wo Village Sewerage	Phase 1				
Test Location	:	G/F, 20 Pak Kung Street	, Hung Hom, Kow	loon.	Date Started	:	05-07-2010
W.O. No.*	:		Sample Type*	: River Water	Date Completed	:	06-07-2010
GCE Serial No.	:	WQM072010	GCE Reg. No.	: GCE 081096	Test Unit No.	:	CH 08258

Analysis Descrip	tion	T	Test Method						Quality Control Results								
						Methoo Blank		QC 500 m	g/L C	C Duplicate	R	PD%	Spike 25 mg/L				
Suspended Solid	ended Solids (SS) AP-			540 D	mg/L	< 1.0		497		501	-	0.8	25.3				
	······································		Acce	ptance	Criteria	< 2.5 mg/L 475 $\leq$ Control Limit $\leq$ 514 $\leq$		ntrol Limit ≤ 514 ≤		±5%	21 ≤ R ≤ 29						
	Sam	ple ID	C1	C1 Di	uplicate	C2	C2	Duplicate	СЗ	C3 Duplica	ate						
TEST RESULTS		pling /Time	05 July	2010	/ 15:40	05 July 3	201	0 / 15:50	05 Ju	ly 2010 / 16:	00						
	LOD	Units															
Suspended Solids (SS)	1	mg/L	2.4	2	.4	1.3		1.5	5.0	4.6							
	Sam	ple ID	M1	M1 D	uplicate	M2	М2	Duplicate	МЗ	M3 Duplic	ate	M4	M4 Duplicate				
TEST RESULTS		pling /Time	05 July	2010	/ 16:25	05 July :	201	0 / 16:10	05 Ju	ly 2010 / 16:	30	05 Jul	y 2010 / 16:15				
	LOD	Units															
Suspended Solids (SS)	1	mg/L	4.5	4	.7	2.9		3.1	57.4	56.4		20.8	20.0				

\* : 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
 Post

 Checked By
 :



							Page 1 of 1
Report No	:	GCC100700067			Date of Issue	:	08-07-2010
Client*	:	Environmental Pioneers &	Solutions Limited		Date Received	:	08-09-2008
Client Address*	:	8/F, Chaiwan Industrial C	entre Building, 20	Lee Chung Street, Chaiwa	n, HK.		
		DSD Contract No. DC/20	06/11 - Drainage I	mprovement in Southern L	antau & Construct	ion	of
Project*	:	Mui Wo Village Sewerage	Phase 1				
Test Location	:	G/F, 20 Pak Kung Stree	t, Hung Hom, Kow	vloon.	Date Started	:	06-07-2010
W.O. No.*	:		Sample Type*	: River Water	Date Completed	:	06-07-2010
GCE Serial No.	:	WQM072010	GCE Reg. No.	: GCE 081096	Test Unit No.	:	CH 08258

Analysis Descrip	tion	T	Test Method				Quality Control Results								
						Methoo Blank	ť	QC 500 m	ig/L Q(	C Duplicate	R	PD%	Spike 25 mg/L		
Suspended Solid	s (SS)	АРНА	20ed 28	540 D	mg/L	< 1.0		498		497	(	0.2	25.5		
			Acce	eptance	Criteria	<2.5 mg	g/L 475 ≤ Conti		ontrol Li	$\leq \pm 5\%$		21 ≤ R ≤ 29			
	Sam	ple ID	C1	C1 D	uplicate	C2	C2	2 Duplicate	СЗ	C3 Duplica	ate				
TEST RESULTS		ipling /Tíme							06 Jul	y 2010 / 10:	20				
	LOD	Units	S							-		-			
Suspended Solids (SS)	1	mg/L							11.3	10.9		ngo o ngo ngo ngo ngo ngo ngo ngo ngo ng			
	Sam	ple ID	M1	M1 D	uplicate	M2	M2	2 Duplicate	МЗ	M3 Duplica	ate	M4	M4 Duplicate		
TEST RESULTS		pling /Time		-1					06 Juh	y 2010 / 10:	10	06 Jul	y 2010 / 10:00		
	LOD	Units		1						*********					
Suspended Solids (SS)	1	mg/L							12.2	12.0		11.8	12.0		

\* : 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	:_	Life	
			Name	:	GU CHIN	
Checked By	:	GU CHIN	Post	:	Chemist	

Form No. : WQM/R1 (19-01-2009)

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## TEST REPORT ON ENVIRONMENTAL ANALYSIS OF WATER AND WASTEWATER

							Page 1 of 1
Report No.	:	GCC100700075			Date of Issue	:	08-07-2010
Client*	:	Environmental Pioneers &	Solutions Limited		Date Received	:	08-09-2008
Client Address*	:	8/F, Chaiwan Industrial Ce	entre Building, 20	Lee Chung Street, Chaiwar	, НК.		
		DSD Contract No. DC/200	06/11 - Drainage li	mprovement in Southern La	intau & Constructi	ion	of
Project*	:	Mui Wo Village Sewerage	Phase 1				
Test Location	:	G/F, 20 Pak Kung Street	t, Hung Hom, Kow	loon.	Date Started	:	07-07-2010
W.O. No.*	:		Sample Type*	: River Water	Date Completed	:	08-07-2010
GCE Serial No.	:	WOM072010	GCE Reg. No.	: GCE 081096	Test Unit No.	:	СН 08258

Analysis Description			est Metho	od	Units				Qual	ity (	Control Resu	lts		
						Method Blank		QC 500 m	g/L	00	C Duplicate	R	PD%	Spike 25 mg/L
Suspended Solid	s (SS)	APHA	20ed 25	540 D	D mg/L	< 1.0		496			495	(	0.2	27.7
· · · · · · · · · · · · · · · · · · ·			Acce	ptance	Criteria	<2.5 m	g/L	475 ≤ C	ontro	l Lir	nit ≤ 514	≤	±5%	21 ≤ R ≤ 29
	Sam	pie ID	C1	C1 D	uplicate	C2	C2	Duplicate	C	3	C3 Duplica	ate		
TEST RESULTS		npling /Time	07 July 2010 / 11:00			07 July	201	0 / 10:50	07	July	/ 2010 / 10:	45		
	LOD	Units												
Suspended Solids (SS)	1	mg/L	2.0	2	2.0	<1.0		<1.0	4.8	8	4.6			
	Sam	ple ID	M1	M1 D	uplicate	M2	М2	2 Duplicate	м	3	M3 Duplic	ate	M4	M4 Duplicate
TEST RESULTS		npling e/Time	07 July	2010	/ 10:25	07 July	201	0 / 10:35	07	July	/ 2010 / 10:	20	07 Jul	y 2010 / 10:10
	LOD	Units		- m.,										
Suspended Solids (SS)	1	mg/L	4.3	4	I.4	1.6		1.7	30.	.8	30.8		64.4	64.4

\* : Information provided by client

Remarks :		. · ·			
			End		
Tested By	:	K.L. FONG	Approved Signatory	:_	Lik
			Name	:	GU CHÍN
Checked By	:	GU CHIN	Post	:	Chemist



							Page 1 of 1
Report No.	:	GCC100700083			Date of Issue	:	08-07-2010
Client*	:	Environmental Pioneers &	Solutions Limited		Date Received	:	08-09-2008
Client Address*	:	8/F, Chaiwan Industrial Ce	entre Building, 20	Lee Chung Street, Chaiwar	n, HK.		
		DSD Contract No. DC/200	)6/11 - Drainage Ir	nprovement in Southern La	antau & Constructi	ion	of
Project*	:	Mui Wo Village Sewerage	Phase 1				
Test Location	:	G/F, 20 Pak Kung Street	, Hung Hom, Kow	loon.	Date Started	:	08-07-2010
W.O. No.*	:		Sample Type*	: River Water	Date Completed	:	08-07-2010
GCE Serial No.	:	WQM072010	GCE Reg. No.	: GCE 081096	Test Unit No.	;	CH 08258

Analysis Description			Test Method			Quality Control Results									
						Method Blank	ł	QC 500 m	g/L Q	C Duplicate	R	PD%	Spike 25 mg/L		
Suspended Solids	s (SS)	APHA	20ed 25	540 D	D mg/L	< 1.0		500	501		-	0.2	26.0		
		5	Acce	ptance	Criteria	<2.5 mg	j/L	475 ≤ C	ontrol L	imit ≤ 514	<	±5%	21 ≤ R ≤ 29		
	Sam	ple iD	C1	C1 D	uplicate	C2	C2	Duplicate	СЗ	C3 Duplic	ate				
TEST RESULTS		ipling /Time							08 Ju	ly 2010 / 10:	10				
	LOD	Units													
Suspended Solids (SS)	1	mg/L							6.4	5.9					
	Sam	ple ID	M1	M1 D	uplicate	M2	M2	2 Duplicate	МЗ	M3 Duplic	ate	M4	M4 Duplicate		
TEST RESULTS		ipling /Time							08 Ju	y 2010 / 10:	:00	08 Ju	ly 2010 / 09:55		
	LOD	Units							-						
Suspended Solids (SS)	1	mg/L							7.4	8.6		11.6	12.0		

\* : Information provided by client

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



							Page 1 of 1
Report No.	:	GCC100700091			Date of Issue	:	12-07-2010
Client*	:	Environmental Pioneers &	Solutions Limited		P.O. Received	:	08-09-2008
Client Address*		8/F, Chaiwan Industrial C	entre Building, 20	Lee Chung Street, Chai	wan, HK.		
		DSD Contract No. DC/20	06/11 - Drainage I	mprovement in Souther	n Lantau & Constructi	ion	of
Project*	:	Mui Wo Village Sewerage	Phase 1				
Test Location	:	G/F, 20 Pak Kung Stree	t, Hung Hom, Kov	/loon.	Date Started	:	09-07-2010
W.O. No.*	:		Sample Type*	: River Water	_ Date Completed	:	09-07-2010
GCE Serial No.	:	WQM072010	GCE Reg. No.	: GCE 081096	Test Unit No.	:	CH 08258

Analysis Descript	Analysis Description			bd	Units									
						Method Blank	I	QC 500 m	g/L	QC	C Duplicate	R	PD%	Spike 25 mg/L
Suspended Solid	s (SS)	APHA	A 20ed 2540 D		mg/L	< 1.0		497			497	(	0.0	27.0
			Acce	ptance	Criteria	<2.5 mg	ı/L	475 ≤ C	ontro	l Lir	mit ≤ 514	≤	±5%	21 ≤ R ≤ 29
	Sam	ple ID	C1	C1 Di	uplicate	C2	C2	Duplicate	C	3	C3 Duplica	nte		
TEST RESULTS		npling /Time	09 July 2010 / 11:00			09 July 2010 / 11:10		0 / 11:10	09	July	/ 2010 / 11:	35		4
	LOD	Units												
Suspended Solids (SS)	1	mg/L	1.3	1	.0	<1.0		<1.0	13.	2	12.8			
	Sam	ple ID	M1	M1 D	uplicate	M2	M2	Duplicate	M	3	M3 Duplica	ate	M4	M4 Duplicate
TEST RESULTS		npling /Time	09 July 2010 / 10:15			09 July 2	201	0 / 10:35	09 July 2010 / 10:25			25	09 July	/ 2010 / 10:00
	LOD	Units												
Suspended Solids (SS)	1	mg/L	7.6	8	.0	<1.0		<1.0	12.	4	12.1		8.3	7.9

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

----- End -----

1

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

Form No. : WQM/R1 (01-09-2008)



							Page 1 of 1
Report No.	:	GCC100700261			Date of Issue	;	17-07-2010
Client*	:	Environmental Pioneers &	Solutions Limited		Date Received	:	08-09-2008
Client Address*	:	8/F, Chaiwan Industrial C					
		DSD Contract No. DC/200	06/11 - Drainage li	mprovement in Southern La	antau & Constructi	ion	of
Project*	:	Mui Wo Village Sewerage	Phase 1				
Test Location	:	G/F, 20 Pak Kung Stree	t, Hung Hom, Kow	/loon.	Date Started	:	12-07-2010
W.O. No.*	:		Sample Type*	: River Water	Date Completed	:	13-07-2010
GCE Serial No.	:	WQM072010	GCE Reg. No.	: GCE 081096	Test Unit No.	;	CH 08258

Analysis Descrip	Analysis Description Test Method Units Quality Control Results												
						Methoo Blank		QC 500 m	g/L Q	C Duplicate	R	PD%	Spike 25 mg/L
Suspended Solid	s (SS)	APHA	20ed 25	540 D	mg/L	< 1.0		498		497		).2	26.1
			Acce	ptance	Criteria	<2.5 mỹ	g/L	475 ≤ C	ontrol L	mit ≤ 514	≤	±5%	21 ≤ R ≤ 29
	Sam	ple ID	C1	C1 D	uplicate	C2	C2	2 Duplicate	СЗ	C3 Duplic	ate		
TEST RESULTS		npling e/Time	12 July	2010	/ 13:10	12 July	201	0 / 13:20	12 Ju	y 2010 / 13:	30		
	LOD	Units											
Suspended Solids (SS)	1	mg/L	2.2	2	2.3	<1.0		<1.0	5.6 5.4				
	Sam	iple ID	M1	M1 D	uplicate	M2	M2	2 Duplicate	мз	M3 Duplic	ate	M4	M4 Duplicate
TEST RESULTS		npling e/Time	12 July	2010	/ 11:55	12 July	201	10 / 12:00	12 Ju	iy 2010 / 12:	10	12 Jul	y 2010 / 11:45
	LOD	Units					ĺ						
Suspended Solids (SS)	1	mg/L	10.1	9	9.7	2.3		2.1	4.8	5.2		6.4	6.4

\* : Information provided by client

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



							Page 1 of 1					
Report No.	:	GCC100700279			Date of Issue	:	17-07-2010					
Client*	:	Environmental Pioneers &	Solutions Limited		Date Received	:	08-09-2008					
Client Address*	:	8/F, Chaiwan Industrial Ce	/F, Chaiwan Industrial Centre Building, 20 Lee Chung Street, Chaiwan, HK.									
		DSD Contract No. DC/200	06/11 - Drainage li	mprovement in Southern La	antau & Constructi	ion	of					
Project*	:	Mui Wo Village Sewerage	Phase 1									
Test Location	:	G/F, 20 Pak Kung Stree	t, Hung Hom, Kow	loon.	Date Started	:	14-07-2010					
W.O. No.*	:		Sample Type*	: River Water	Date Completed	:	15-07-2010					
GCE Serial No.	:	WQM072010	GCE Reg. No.	: GCE 081096	Test Unit No.	:	CH 08258					

Analysis Descript	tion	T	est Metho	bd	Units				Quality	Control Resu	lts		
						Method Blank		QC 500 m	g/L Q	C Duplicate	RI	PD%	Spike 25 mg/L
Suspended Solid	s (SS)	APHA	A 20ed 25	540 D	mg/L	< 1.0		500		499	0.2		27.9
			Acce	eptance	Criteria	<2.5 mg	/L	475 ≤ C	ontrol Li	mit ≤ 514	≤	±5%	21 ≤ R ≤ 29
	Sam	ple ID	C1	C1 D	uplicate	C2	C2	Duplicate	СЗ	C3 Duplic	ate		
TEST RESULTS		npling e/Time	14 July	2010	/ 14:35	14 July 2	2010	0 / 15:25	14 Jul	y 2010 / 15:	35		
	LOD	Units											
Suspended Solids (SS)	1	mg/L	1.4	1	.9	1.5		1.3	9.0	9.6			
	Sam	ple ID	M1	M1 D	uplicate	M2	M2	Duplicate	МЗ	M3 Duplic	ate	M4	M4 Duplicate
TEST RESULTS		npling e/Time	14 July	2010	/ 14:15	14 July 2	2010	0 / 14:20	14 Jul	y 2010 / 14:	30	14 Jul	ly 2010 / 14:10
	LOD	Units				(a.)							
Suspended Solids (SS)	1	mg/L	7.0	7	7.4	1.9		2.3	9.1	9.1		6.1	6.0

\* : Information provided by client

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



							Page 1 of 1
Report No.	:	GCC100700287		Date of Issue	:	29-07-2010	
Client*	:	Environmental Pioneers &	Solutions Limited		Date Received	:	08-09-2008
Client Address*	:	8/F, Chaiwan Industrial Ce	entre Building, 20	Lee Chung Street, Chaiwar	л, НК.		
		DSD Contract No. DC/200	)6/11 - Drainage h	mprovement in Southern La	intau & Constructi	ion	of
Project*	:	Mui Wo Village Sewerage	Phase 1				
Test Location	:	G/F, 20 Pak Kung Street	t, Hung Hom, Kow	loon.	Date Started	:	16-07-2010
W.O. No.*	:		Sample Type*	: River Water	Date Completed	:	17-07-2010
GCE Serial No.	:	WQM072010	GCE Reg. No.	: GCE 081096	Test Unit No.	:	CH 08258

Analysis Descript	tion	Т	est Metho	od	Units				Quality	Control Resu	lts		
						Method Blank	- I	QC 500 m	g/L Q	C Duplicate	R	PD%	Spike 25 mg/L
Suspended Solid	s (SS)	АРНА	20ed 25	540 D	mg/L < 1.			499		498		0.2	26.6
			Acce	ptance	Criteria	<2.5 mg	g/L	475 ≤ C	ontrol Li	mit ≤ 514	≤	±5%	21 ≤ R ≤ 29
	Sam	ple ID	C1	C1 D	uplicate	C2	C2	Duplicate	СЗ	C3 Duplic	ate		
TEST RESULTS		npling /Time	16 July	2010	/ 16:30	16 July	201	0 / 16:20	16 Ju	y 2010 / 16:	10	±5% 2	·
	LOD	Units											
Suspended Solids (SS)	1	mg/L	3.1	3	3.0	<1.0		<1.0	5.2 5.0				
	Sam	ple ID	M1	M1 D	uplicate	M2	M2	2 Duplicate	МЗ	M3 Duplic	ate	M4	M4 Duplicate
TEST RESULTS		npling e/Time	16 July	2010	/ 15:45	16 July	201	0 / 15:50	16 Ju	y 2010 / 16	:00	16 Jul	y 2010 / 15:40
	LOD	Units											
Suspended Solids (SS)	1	mg/L	12.0	1	3.0	2.8		2.8	16.0	16.6		12.3	12.1

\* : Information provided by client

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



							Page 1 of 1
Report No.	:	GCC100700863	Date of Issue	:	29-07-2010		
Client*	:	Environmental Pioneers &	Solutions Limited		Date Received	:	08-09-2008
Client Address*	:	8/F, Chaiwan Industrial Co	entre Building, 20	Lee Chung Street, Chaiwa	n, HK.		
		DSD Contract No. DC/200	06/11 - Drainage li	mprovement in Southern L	antau & Constructi	ion	of
Project*	:	Mui Wo Village Sewerage	Phase 1				P
Test Location	:	G/F, 20 Pak Kung Stree	t, Hung Hom, Kow	/loon.	Date Started	:	21-07-2010
W.O. No.*	:		Sample Type*	: River Water	Date Completed	;	22-07-2010
GCE Serial No.	:	WQM072010	GCE Reg. No.	: GCE 081096	Test Unit No.	:	CH 08258

Analysis Descript	ion	Т	est Method Units Quality Control Results											
						Method Blank	ł	QC 500 m	g/L O	C Duplicate	R	PD%	Spike 25 mg/L	
Suspended Solids	s (SS)	APHA	A 20ed 2540 D		mg/L	< 1.0		501		503	-0.4		26.9	
		1	Acce	ptance	Criteria	<2.5 mg	g/L	475 ≤ C	ontrol L	imit ≤ 514	≤	±5%	21 ≤ R ≤ 29	
	Sam	ple ID	C1	C1 D	uplicate	C2	C2	Duplicate	C3	C3 Duplic	ate			
TEST RESULTS		pling /Time	21 July	2010	/ 10:30	21 July	201	0 / 10:40	21 Ju	ly 2010 / 10	:50	±5%		
	LÓD	Units												
Suspended Solids (SS)	1	mg/L	3.0		3.6	3.7		3.4	9.4 8.6					
	Sam	ple ID	M1	M1 D	uplicate	M2	М2	2 Duplicate	MЗ	M3 Duplic	ate	M4	M4 Duplicate	
TEST RESULTS		pling /Time	21 July	2010	/ 10:00	21 July	201	0 / 10:10	21 Ju	ly 2010 / 10	:20	21 Jul	y 2010 / 09:50	
	LOD	Units							a (a a coltra p					
Suspended Solids (SS)	1	mg/L	5.6	Ę	5.6	2.4		2.4	6.0	5.7		5.0	5.0	

\* : Information provided by client

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



Page	1	of	1	
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Report No.	:	GCC100700871			Date of Issue	:	29-07-2010
Client*	:	Environmental Pioneers 8	a Solutions Limited		Date Received	:	08-09-2008
Client Address*	:			Lee Chung Street, Chaiwar		ion	of
Project*	;	Mui Wo Village Sewerage		mprovement in Southern La			
Test Location	:	G/F, 20 Pak Kung Stree	et, Hung Hom, Kow	rloon.	Date Started	;	22-07-2010
W.O. No.*	:		Sample Type*	: River Water	Date Completed	:	22-07-2010
GCE Serial No.	:	WQM072010	GCE Reg. No.	: GCE 081096	Test Unit No.	:	CH 08258

Analysis Descript	Analysis Description T			bd	Units	Quality Control Results									
						Method Blank		QC 500 m	g/L	QC	Duplicate	R	PD%	Spike 25 mg/L	
Suspended Solids (SS)		APHA	20ed 25	540 D	D mg/L	< 1.0		496			495	(	0.2	27.5	
			Acce	ptance	Criteria	<2.5 mg	1/L	475 ≤ C	ontro	l Lin	nit ≤ 514	≤	±5%	21 ≤ R ≤ 29	
	Sam	ple ID	C1	C1 D	uplicate	C2	C2	Duplicate	C	3	C3 Duplica	ate			
TEST RESULTS		pling Time	22 July 2010 / 11:40		22 July 2	201	0 / 11:30	22	July	2010 / 11:	20		, 		
	LOD	Units													
Suspended Solids (SS)	1	mg/L	7.1	e	3.9	<1.0		<1.0	6.4	4	6.9				
	Sam	ple ID	M1	M1 D	uplicate	M2	M2	Duplicate	М	3	M3 Duplic	ate	M4	M4 Duplicate	
TEST RESULTS		npling /Time	22 July	2010	/ 10:50	22 July 2	201	0 / 11:00	22 July 2010 / 11:		10	22 July	/ 2010 / 10:40		
	LOD	Units													
Suspended Solids (SS)	1	mg/L	7.5	7	7.3	<1.0		<1.0	10	.1	9.9		9.6	9.6	

\* : Information provided by client

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



							Page 1 of 1
Report No.	:	GCC100700889			Date of Issue	:	29-07-2010
Client*	:	Environmental Pioneers &	Solutions Limited		Date Received	;	08-09-2008
Client Address*	:	8/F, Chaiwan Industrial C	entre Building, 20	Lee Chung Street, Chaiwa	n, HK.		
		DSD Contract No. DC/20	06/11 - Drainage I	mprovement in Southern La	antau & Constructi	ion	of
Project*	:	Mui Wo Village Sewerage	Phase 1				
Test Location	:	G/F, 20 Pak Kung Stree	t, Hung Hom, Kow	/loon.	Date Started	:	24-07-2010
W.O. No.*	:		Sample Type*	: River Water	Date Completed	:	26-07-2010
GCE Serial No.	:	WQM072010	GCE Reg. No.	: GCE 081096	Test Unit No.	:	CH 08258

Analysis Descript	tion	T	est Metho	at Method Units					Quality Control Results						
						Method Blank	I	QC 500 m	g/L	ac	Duplicate	R	PD%	Spike 25 mg/L	
Suspended Solid	Suspended Solids (SS) APH		A 20ed 2540 D		mg/L	< 1.0		498	497		(	0.2	25.2		
			Acce	eptance	Criteria	<2.5 mg	ı/L	475 ≤ C	ontrol	Lim	ւit ≤ 514	≤	±5%	21 ≤ R ≤ 29	
	Sam	ple ID	C1	C1 D	uplicate	C2	C2	Duplicate	C3		C3 Duplica	ite	_		
TEST RESULTS		npling /Time	24 July	2010	/ 11:40	24 July 2	201	0 / 11:50	1:50 24 July 2010		2010 / 11:	10			
	LOD	Units													
Suspended Solids (SS)	1	mg/L	3.2	3	.0	1.7		1.7	16.8	3	16.8				
	Sam	ple ID	M1	M1 D	uplicate	M2	М2	2 Duplicate	МЗ		M3 Duplica	ate	M4	M4 Duplicate	
TEST RESULTS		npling e/Time	24 July	2010	/ 10:30	24 July 2	201	0 / 10:40	):40 24 July 20		uly 2010 / 10:50		24 Jul	y 2010 / 11:00	
	LOD	Units													
Suspended Solids (SS)	1	mg/L	7.4	7	.8	2.1		2.0	5.3		4.6		4.6	5.2	

\* : 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 :
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 Fested By
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 K.L. FONG

 Approved Signatory
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 Name
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 GU CHIN
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 Checked By
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							Page 1 of 1
Report No.	:	GCC100700897			Date of Issue	:	29-07-2010
Client*	:	Environmental Pioneers &	Solutions Limited		Date Received	:	08-09-2008
Client Address*	:	8/F, Chaiwan Industrial Ce	ntre Building, 20	Lee Chung Street, Chaiwar	n, HK.		
		DSD Contract No. DC/200	6/11 - Drainage I	mprovement in Southern La	antau & Constructi	ion	of
Project*	:	Mui Wo Village Sewerage	Phase 1				
Test Location	:	G/F, 20 Pak Kung Street	, Hung Hom, Kow	/loon	Date Started	:	26-07-2010
W.O. No.*	:		Sample Type*	: River Water	Date Completed	:	26-07-2010
GCE Serial No.	:	WQM072010	GCE Reg. No.	: GCE 081096	Test Unit No.	:	CH 08258

Analysis Descript	tion	Т	est Meth	od	Units	Quality Control Results										
						Methoo Blank		QC 500 m	ig/L	ac	Duplicate	R	PD%	Spike 25 mg/L		
Suspended Solids (SS) APH			\ 20ed 2540 D		mg/L	< 1.0		498		495		0.6		26.7		
			Acce	eptance	Criteria	<2.5 mg	g/L	475 ≤ C	ontrol	l Lir	nit ≤ 514	≤	±5%	21 ≤ R ≤ 29		
	Sam	ple ID	C1	C1 D	uplicate	C2	CZ	Duplicate	СЗ	3	C3 Duplica	ate				
TEST RESULTS		pling /Time	26 July	2010	/ 10:50	26 July :	201	0 / 11:00 26 Jul		26 July 2010 / 11:00		00				
-	LOD	Units					w 1/10	~								
Suspended Solids (SS)	1	mg/L	3.0	3	8.0	<1.0		<1.0	10.:	2	10.2					
	Sam	ple ID	M1	M1 D	uplicate	M2	M2	2 Duplicate	МЗ	3	M3 Duplica	ate	M4	M4 Duplicate		
TEST RESULTS		ipling /Time	26 July	2010	/ 11:55	26 July 2	201	0 / 12:05 26		July	2010 / 12:	10	26 Ju	ly 2010 / 11:50		
	LOD	Units														
Suspended Solids (SS)	1	mg/L	5.3	5	.7	2.0		1.9	9.8		10.2		6.3	6.1		

\* : 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	:	Lit
			Name	:	GU CHIN
Checked By		GU CHIN	Post	:	Chemist

Form No. : WQM/R1 (19-01-2009)



							Page 1 of 1
Report No.	:	GCC100700902			Date of Issue	:	29-07-2010
Client*	:	Environmental Pioneers &	Solutions Limited	1444 and 144	Date Received	:	08-09-2008
Client Address*	:	8/F, Chaiwan Industrial Ce	entre Building, 20	Lee Chung Street, Chaiwa	л, НК.		
		DSD Contract No. DC/200	06/11 - Drainage li	mprovement in Southern La	antau & Constructi	ion	of
Project*	;	Mui Wo Village Sewerage	Phase 1				
Test Location	:	G/F, 20 Pak Kung Stree	t, Hung Hom, Kow	/loon.	Date Started	:	28-07-2010
W.O. No.*	:		Sample Type*	: River Water	Date Completed	:	29-07-2010
GCE Serial No.	:	WQM072010	GCE Reg. No.	: GCE 081096	Test Unit No.	:	CH 08258

Analysis Descrip	tion	T	est Meth	od	Units				Qual	ity	Control Resu	lts		
<u>.</u>						Methoc Blank	-	QC 500 m	ig/L	Q	C Duplicate	R	PD%	Spike 25 mg/L
Suspended Solids (SS) APH			A 20ed 2	540 D mg/L		< 1.0		496			495	0.2		27.5
			Acce	eptance	Criteria	<2.5 mg	g/L	475 ≤ C	ontro	l Lir	nit ≤ 514	≤	±5%	21 ≤ R ≤ 29
	Sam	ple ID	C1	C1 D	uplicate	C2	C2	Duplicate	c	3	C3 Duplica	ate		
TEST RESULTS		npling /Time	28 July	2010	/ 14:00	28 July :	201	0 / 14:10	0 28 July 2010		/ / 2010 / 14:	20		
	LOD	Units												
Suspended Solids (SS)	1	mg/L	3.6	3	.7	2.1		2.1	7.2	2	6.6			
	Sam	ple ID	M1	M1 D	uplicate	M2	MZ	2 Duplicate	M	3	M3 Duplica	ate	M4	M4 Duplicate
TEST RESULTS		npling /Time	28 July	2010 .	( 13:35	28 July 2	28 July 2010 / 13:45		28 -	July	/ 2010 / 13:	50	28 Jul	y 2010 / 13:30
	LOD	Units												
Suspended Solids (SS)	1	mg/L	6.8	5	.9	2.0		2.1	12.	1	11.9		6.7	7.2

\* : 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 :
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 K.L. FONG

 Approved Signatory
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 Name
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 GU CHIN

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 GU CHIN

Appendix G Monitoring Schedule for July 2010

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

Master Schedule of EM&A works in July 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				7/1	7/2	7/3
					WQM at: 15:38	
7/4	7/5	7/6	7/7	7/8	7/9	7/10
	WQM at: 16:45		WQM at: 10:00	WQM at: 14:30	WQM at: 10:25	
			Noise monitoring			
7/11	7/12	7/13	7/14	7/15	7/16	7/17
	WQM at: 12:44		WQM at: 14:19		WQM at: 15:47	
			Noise monitoring			
7/18	7/19	7/20	7/21	7/22	7/23	7/24
			WQM at: 10:05	WQM at: 10:25		WQM at: 10:20
	Noise Monitoring					Noise monitoring
7/25		7/27	7/28	7/29	7/30	
	WQM at: 12:41		WQM at: 13:43			
					Noise monitoring	

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

Environmental	Protection / Mitigation Measures	Implementation	Follow-up
Aspect		status	action
Air Quality	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	-
Noise	Use of quiet powered mechanical equipment (PME)	Implemented	-
110150	Adoption of movable noise barriers and temporary noise barriers	<b>^</b>	
	Application of good site practices mentioned in EM&A manual Clause 3.8.1	-	-
Water Quality	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.		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	Implemented	-
	m in length) and in dry condition.		

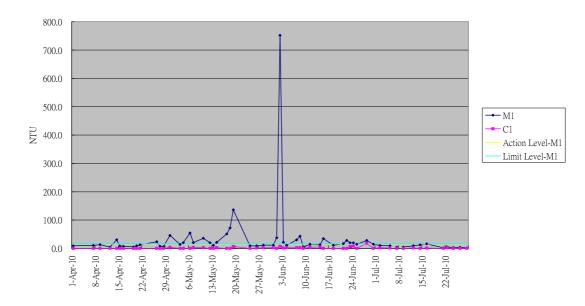
## Appendix H Implementation Status of environmental protection / mitigation measures

Environmental	Protection / Mitigation Measures	Implementation	Follow-up
Aspect		status	action
	Maintenance desiltng 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 desiltng work.	Not applicable at this stage	-
Ecology	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	-
Chemical and	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	-
Solid Waste	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.		Improvements were required
	All waste disposals managed in a proper manner i.e. trip ticket system implementation.	Implemented	-

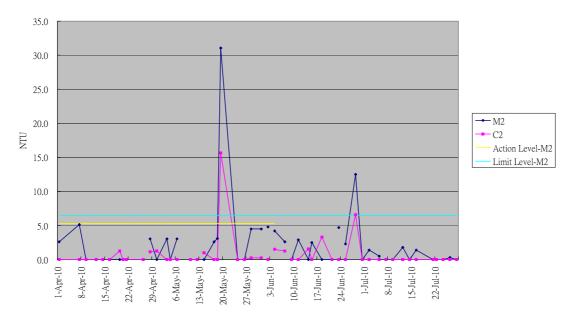
Appendix I

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

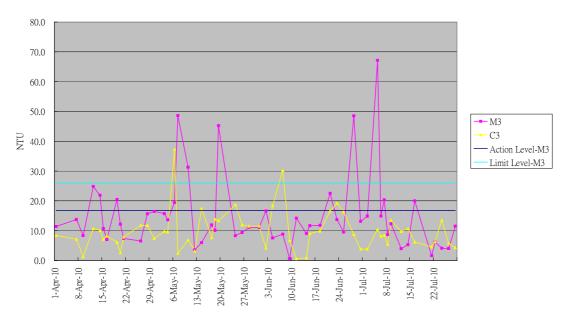
Graphical Plot of Turbidity Trend M1&C1(Apr - Jul 10)



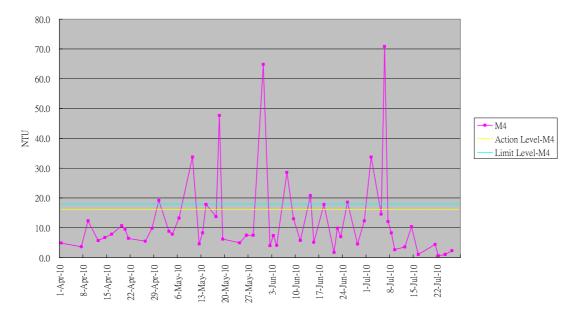
Graphical Plot of Turbidity Trend M2&C2 (Apr - Jul 10)



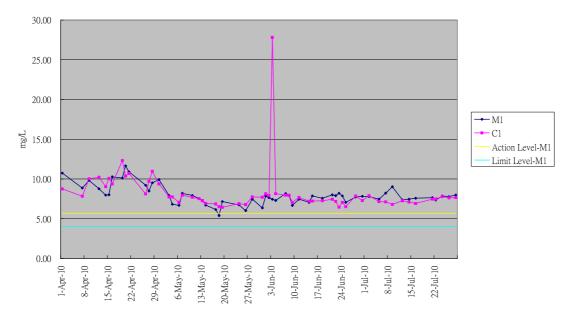
#### Graphical Plot of Turbidity Trend M3&C3 (Apr - Jul 10)



Graphical Plot of Turbidity Trend M4 (Apr - Jul 10)

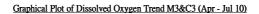


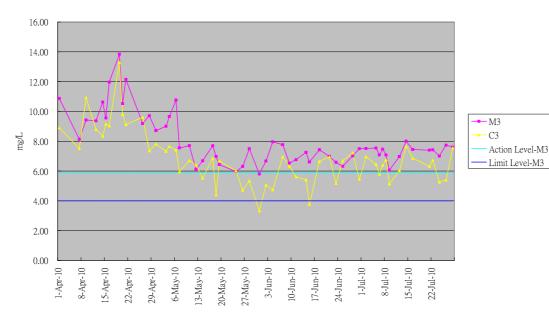
Graphical Plot of Dissolved Oxygen Trend M1&C1 (Apr - Jul 10)



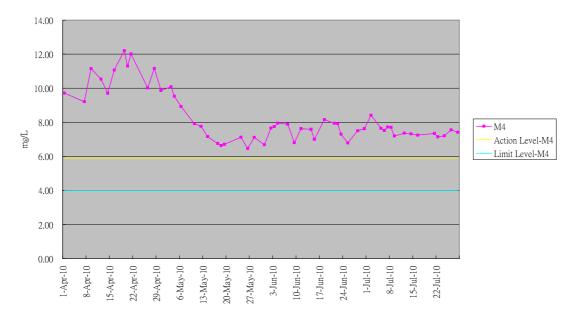
Graphical Plot of Dissolved Oxygen Trend M2&C2 (Apr - Jul 10)



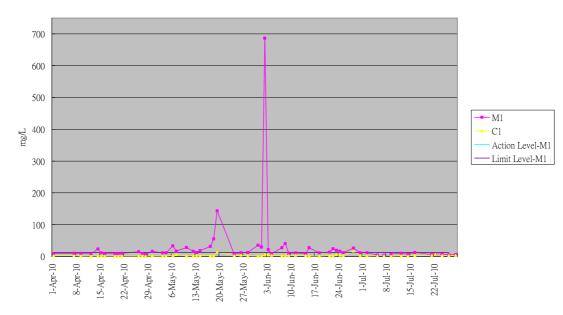




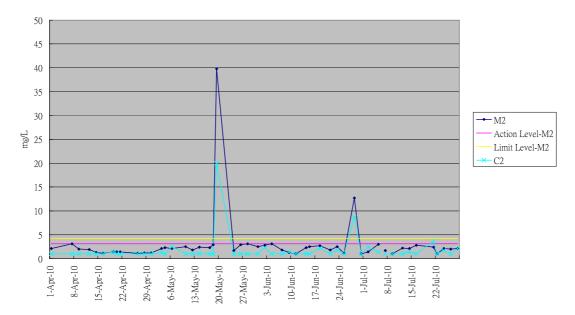
Graphical Plot of Dissolved Oxygen Trend M4 (Apr - Jul 10)



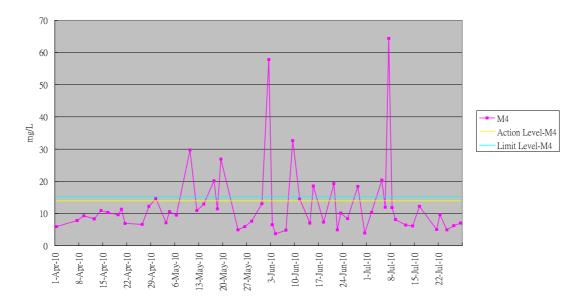
Graphical Plot of Suspended Soild M1&C1 (Apr - Jul 10)



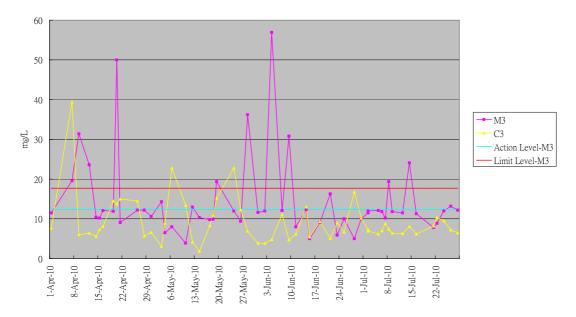
#### Graphical Plot of Suspended Soild M2&C2 (Apr - Jul 10)



#### Graphical Plot of Suspended Soild M4 (Apr - Jul 10)



Graphical Plot of Suspended Soild M3&C3 (Apr - Jul 10)



## Appendix J

Graphical plot of noise monitoring results

