PROJECT NO.: TCS/00553/11

CONTRACT NO. DC/2010/02 –
DRAINAGE IMPROVEMENT IN SHUEN WAN AND SHEK WU WAI

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT REPORT (NO.13) – JULY 2012

PREPARED FOR
KWAN LEE-KULY JOINT VENTURE

Quality Index

Date	Reference No.	Prepared By	Certified by
15 August 2012	TCS00553/11/600/R0168v2	Nicola Hon (Environmental Consultant)	T.W. Tam (Environmental Team Leader)

Ver.	Date	Description
1	9 August 2012	First submission
2	15 August 2012	Amended against IEC's comments on 15 August 2012

This report has been prepared by Action-United Environmental Services & Consulting with all reasonable skill, care and diligence within the terms of the Agreement with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client. We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.

ENVIRON

Ref.: DSDSHUWNEM00_0_0452L.12

15 Aug 2012

Drainage Services Department
Drainage Projects Division
44 & 45/F., Revenue Tower
5 Gloucester Road,
Wan Chai, Hong Kong

By Fax (2827 8700) and Post

Attention: Mr. H.K.Chan and Mr. So Chi Ho

Dear Sirs,

Re: Agreement No. DP 01/2010
Services as Independent Environmental Checker for the Drainage Improvement Works in Sha Tin and Tai Po under Contract No. DC/2010/02
Monthly Environmental Monitoring and Audit Report for Jul 2012

Reference is made to Environment Team's submission of the Monthly Environmental Monitoring and Audit Report for July 2012 by Email on 9 Aug 2012 (entitled "DC/2010/22 - Monthly Impact EM&A Report (Contract 2) No.13 - Jul 2012") and the subsequent revision of the report by Email on 15 Aug 2012.

Please be informed that we have no further comment on the captioned revised report. We write to verify the captioned submission in accordance with Condition 5.4 of EP-303/2008.

Thank you very much for your kind attention and please do not hesitate to contact the undersigned should you have any queries.

Yours sincerely,

Tony Cheng
Independent Environmental Checker

c.c.	AUES	Attn: Mr. T. W. Tam	By Fax: 2959 6079
	Kwan Lee-Kuly JV	Attn: Mr. W. K. Chan	By Fax: 2674 6688

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www.environcorp.com ENVIRON Hong Kong Ltd. 英環香港有限公司
Room 2310, China Resources Building, 26 Harbour Road, Wan Chai, Hong Kong T: 852.3743 0788 F: 852.3548 6988

EXECUTIVE SUMMARY

ES.01. This is the **13th** Monthly Environmental Monitoring and Audit (EM&A) Report for designated works of *DSD Contract No. DC/2010/02 - Drainage Improvement in Shuen Wan and Shek Wu Wai* (hereafter "Contract 2") under Environmental Permit No.EP-303/2008, covering a period from **1 to 31 July 2012** (hereinafter 'the Reporting Period').

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.02. Environmental monitoring activities under the EM&A programme in this Reporting Period are summarized in the following table.

Issues	Environmental Monitoring Parameters / Inspection	Occasions
Construction Noise	Leq (30min) Daytime – M2, M3 & M4	12
	Leq (30min) Daytime – M1 & AL1	8
Water Quality	Local Stream Water Sampling - W1 and W2	13
	Local Stream Water Sampling - W3 and W4	13
	Hydrological characteristics measurement – H1 and H2	4
	Hydrological characteristics measurement – H3 and H4	4
Inspection / Audit	Monthly Environmental Site Inspection and audit by IEC	1
	Regular weekly Environmental inspection by the Contractor, ET and Site Representative Engineer	4
Ecological	Bi- monthly Ecological Monitoring	1
Landscape & Visual	Bi-weekly Inspection by a registered Landscape Architect	2

ES.03. In this Reporting Period, bi-monthly ecological monitoring in Area under Contract 2 was performed on **31 July 2012**.

ES.04. Landscape and visual inspection was carried on **10 and 26 July 2012** and the monthly Landscape & Visual Report (**July 2012**) has been signed by the registered Landscape Architect.

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES.05. No exceedance in construction noise monitoring is recorded in this Reporting Period. For water quality monitoring, a total of 115 Action/ Limit Level exceedances, namely 48 exceedances in dissolved oxygen, 35 exceedances in turbidity and 32 exceedances in suspended solids were recorded in this Reporting Period. NOEs were issued to notify EPD, IEC, the Contractor and RE upon confirmation of the results. The statistics of environmental exceedance, NOE issued and investigation result are summarized in the following table.

Environmental Issues	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	0	N.A.	N.A.
Water Quality	DO	**46**	**2**	**48**	Not related Contract 2	Not required
	Turbidity	**2**	**33**	**35**		
	SS	**6**	**26**	**32**		
Hydrological Characteristics	Water Flow	0	0	0	N.A.	N.A.
	Water Depth	0	0	0	N.A.	N.A.

Note: NOE – Notification of Exceedance

ENVIRONMENTAL COMPLAINT

ES.06. No written or verbal complaint was recorded in this Reporting Period.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.07. No environmental summons or successful prosecutions were recorded in this Reporting Period.

REPORTING CHANGE

ES.08. No report changes were made in this Reporting Period.

SITE INSPECTION BY EXTERNAL PARTIES

ES.09. No site inspection was undertaken by external parties i.e. EPD or AFCD within the Reporting Period.

FUTURE KEY ISSUES

ES.10. During wet season, muddy water and other water quality pollutants via site surface water runoff into the local stream Wah Ha River would be the key issue in the forth-coming month. Mitigation measures for water quality should be fully implemented.

ES.11. As an effective water quality mitigation measure, the rock bund in the de-silting channel should be repaired regularly and ensure the de-silting performance.

ES.12. On the other hand, construction noise should be other key environmental issue during sheet-piling process. The noise mitigation measures should be necessary to implement in accordance with EM&A Manual stipulation. Dust mitigation measures to avoid fugitive dust emissions from loose soil surface or haul road is also reminded.

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1.0 INTRODUCTION

PROJECT BACKGROUND

1.01 ***Kwan Lee-Kuly Joint Venture*** (hereinafter 'KLKJV') has been awarded by Drainage Services Department (hereinafter 'DSD') of the Contract No. DC/2010/02 - Drainage Improvement in Shuen Wan and Shek Wu Wai (hereinafter 'the Project'). The Project is scheduled to commence in May 2011 and complete in March 2014 for about 35 months.

1.02 The works to be executed under the Project are located in Shuen Wan and Shek Wu Wai. The works mainly comprise construction of about 735 metres long single-cell box culvert along Tung Tsz Road in Shuen Wan, Tai Po and construction of about 15 m long three-cell box culvert in Shek Wu Wai, San Tin .

1.03 For the Project, the construction work at Tung Tsz Road Shuen Wan (hereinafter 'the Contract 2') is part of the Drainage Improvement works amongst Shatin and Tai Po and it is defined as a "Designated Project" which controlled under Environmental Permit EP-303/2008. Currently, DSD has another Contract DC/2009/22 (hereinafter 'the Contract 1') ongoing for construction at Shuen Wan working area which under the same Environmental Permit and the updated Environmental Monitoring and Audit Manual (hereinafter 'the Updated EM&A Manual'). Both DSD contract's site boundary at Shuen Wan are shown in ***Appendix A***. On the other hand, Shek Wu Wai San Tin is a non-designated project work and no environmental monitoring and audit is request to carry out.

1.04 In order to effectively implement the environmental protection measures stipulated in the Project Profile (hereinafter 'the PP'), Environmental Impact Assessment Report (hereinafter "the EIAR'), Environmental Permit EP303/2008, a corresponding EM&A Manual have been prepared to outline the environmental monitoring and auditing (hereinafter 'the EM&A') programme undertake for the Contracts 1 and 2.

1.05 KLKJV has commissioned Action-United Environmental Services and Consulting (AUES) as an independent environmental team (hereinafter 'the ET') to implement the EM&A program for the environmental protection of the Project. Due to the construction of Contracts 1 and 2 carry out is just about the time, a Proposal Environmental Monitoring Programme and Methodology (hereinafter the "PEMPM") was prepared and submitted to describe EM&A programme would be undertaken during construction period of the Contract 2.

1.06 The baseline monitoring of EM&A program has been performed by the Contract 1 ET. Although Action and Limit levels of environmental performance criteria have established by the Contract 1 ET, the Action/Limit levels re-establishment to use the Contract 2 was conducted by the Contract 2 ET. The re-established environment performance criteria has accepted by the IEC and also submitted to the EPD seek for endorsement.

1.07 This is the **13th** Monthly EM&A Report for Contract 2 presenting the monitoring results and inspection findings for the reporting period from **1 to 31 July 2012.**

REPORT STRUCTURE

1.08 The Monthly Environmental Monitoring and Audit (EM&A) Report is structured into the following sections:-.

SECTION 1 **INTRODUCTION**
SECTION 2 **PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS AND SUBMISSION**
SECTION 3 **EM&A PROGRAM REQUIREMENT FOR THE PROJECT**
SECTION 4 **IMPACT MONITORING RESULTS**
SECTION 5 **WASTE MANAGEMENT**
SECTION 6 **SITE INSPECTIONS**
SECTION 7 **ENVIRONMENTAL COMPLAINTS AND NON-COMPLIANCE**
SECTION 8 **IMPLEMENTATION STATUES OF MITIGATION MEASURES**
SECTION 9 **IMPACT FORECAST**
SECTION 10 **CONCLUSIONS AND RECOMMENDATION**

2.0 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS AND SUBMISSION

PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

2.01 Organization structure and contact details of relevant parties with respect to on-site environmental management are shown in ***Appendix B***.

CONSTRUCTION PROGRESS

2.02 The master and three month rolling construction programs are enclosed in ***Appendix C*** and the major construction activities undertaken at Tung Tsz Road, Shuen Wan in this report period are listed below:-

- Formwork erection of side walls and top slab of Bay 38
- Fixing of reinforcement of top slab of Bay 38
- Concreting of side walls and top slab of Bay 37, 38, 39
- Removal 1st layer of railing and strut for Bay 35, 36, 37, 38, 39
- Backfilling of Bay 35, 36, 37, 38, 39
- Withdrawal of sheetpile for Bay 35, 36, 37
- Installation of sheetpile for Bay 40, 41, 42, 54, 55
- Excavation of Bay 40, 41

SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.03 Summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this Reporting Period is presented in ***Table 2-1***.

Table 2-1 Status of Environmental Licenses and Permits

Item	Description	License/Permit Status
1	Air Pollution Control (Construction Dust)	Notified EPD on 17 October 2011
2	Chemical Waste Producer Registration (WPN5213-727-K2972-02)	Approved on 28 October 2011
3	Water Pollution Control Ordinance (Discharge License) WT00009528-2011	Valid to 31 July 2016
4	Billing Account for Disposal of Construction Waste (Account No.: 7012838)	Effective

2.04 The "Proposal Environmental Monitoring Programme and Methodology (R0006 Version 2)" was set out in accordance with the Updated Environmental Monitoring and Audit Manual. It was approved by the ER and agreed with the Independent Environmental Checker (IEC) and submitted to the EPD for endorsement.

2.05 For Contract 2 of the Project, no Baseline Monitoring Report was issued by the ETL. However, a new set of the Action/ Limit levels as used to Contract 2 were proposed by ET. It had been accepted by the IEC and also submitted to the EPD seek for endorsement.

3.0 EM&A PROGRAM REQUIREMENT FOR THE CONTRACT 2

3.01 The EM&A requirements set out in the PP, EIAR, Environmental Permit EP303/2008 (hereinafter 'the EP'), and the associated updated EM&A Manual, are presented below sub-section.

MONITORING PARAMETERS

3.02 According to the EIAR and the updated EM&A Manual, The monitoring parameters of each environmental aspect summarized in ***Table 3-1*** will be performed as under the Project.

Table 3-1 Summary of Monitoring Parameters

Environmental Aspect	Parameters	
Construction Noise	• A-weighted equivalent continuous sound pressure level (30min) (hereinafter 'Leq(30min)' during the normal working hours; and • A-weighted equivalent continuous sound pressure level (5min) (hereinafter 'Leq(5min)' for construction work during the restricted hours.	
Water Quality	• In Situ Measurement	Temperature, Dissolved Oxygen, Dissolved Oxygen Saturation, pH and Turbidity
	• Laboratory Analysis	Suspended Solids (hereinafter 'SS')
Hydrological Characteristics	The water flow and depth measurement onsite	
*Ecology	Monitor and audit the proper implementation of mitigation measures stipulated in EIA report and the updated EM&A Manual	
Landscape & Visual	Inspect and audit the implementation and maintenance of landscape and visual mitigation measures	

*Remarks: * the monitoring is carried out by IEC*

MONITORING LOCATIONS

3.03 Monitoring locations have been proposed in the updated EM&A Manual. Graphic plot to show in ***Appendix D*** and summarized in ***Table 3-2***.

Table 3-2 Designated Monitoring Locations of the EM&A Programme

Aspect	Location ID	Address
Construction Noise	M1	14, Shuen Wan Chim Uk
	AL1	Joint Village Office for Villages in Shuen Wan, Tai PO
	M2	150, San Tau Kok
	M3	31, Wai Ha
	M4	Block 15, T rèasure Spot Garden
Water Quality	(#) W1	Between the Shuen Wan Marsh and ECA • Co-ordinates: E839301, N836386 • Existing River Bed Level: +1.75mPD).
	W2	Between Tolo Harbour and Proposed Penstock • Co-ordinates: E839542, N836184 • Exiting River Bed Level: +1.48mPD)
	(*) W3	Upstream of Tung Tze Shan Road • Co-ordinates: E838760, N836714 • Exiting River Bed Level: +5.08mPD)
	W4	Wai Ha Village 29D • Co-ordinates: E838865, N836621 • Exiting River Bed Level: +4.05mPD)
Hydrological	H1	Between the Shuen Wan Marsh and ECA • Coordinates: E839306, N836379)
	H2	Route 10 Sam Kung Temple • Coordinates: E839163, N836433

Aspect	Location ID	Address
	H3	Upstream of Tung Tze Shan Road • Coordinates: E838760, N836714
	H4	Wai Ha Village 29D • Coordinates: E838865, N836621
Ecology	Areas within 100m of the works boundary under Contract 2	
Landscape & Visual	As within and adjacent to the construction sites and works areas under the Contract 2,	

Remarks:
(#) Control Station of Contract 1, however impact station of Contract 2
(*) Control Station of Contract 2

MONITORING FREQUENCY

3.04 The monitoring frequency and duration as specified in the updated EM&A Manual are summarized below.

Construction Noise

Frequency: Once a week during 0700-1900 on normal weekdays for $L_{eq(30min)}$

If the construction work is undertake at restricted hour, the monitoring frequency of construction noise will be conducted in accordance with the related Construction Noise Permit requirement issued by EPD as follow

- 3 consecutive $L_{eq(5min)}$ at restrict hour from 1700 – 2300;
- 3 consecutive $L_{eq(5min)}$ for restrict hour from 2300 – 0700 next day;
- 3 consecutive $L_{eq(5min)}$ for Sunday or public holiday from 0700 – 1900;

Duration: Throughout the construction period when the major construction activities are undertaken

Water Quality

Frequency: Three times a week. The interval between 2 sets monitoring are not less than 36 hours

Duration: During the construction phase of Contract 2 to undertake (in accordance with the Updated EM&A Manual Section 4.27).

Hydrological Characteristics

Frequency: Once per week at mid-flood and mid-ebb tides

Duration: During the construction phase of Contract 2 to undertake; and one year after the construction is complete as operation phase monitoring (in accordance with the Updated EM&A Manual Section 4.32).

Ecology

3.05 In according with Section 6.17 of the Updated EM&A Manual, ecological monitoring should be conducted by the Independent Environmental Checker (hereinafter 'IEC'). Monitoring programme details should be agreed with the Agriculture, Fisheries and Conservation Department (AFCD). Moreover, the IEC should submit reports on the findings of each monitoring trip, and a final report summarizing the monitoring results over the entire monitoring period to AFCD and Environmental Protection Department (EPD). Hence, no monitoring or surveying should be carried out by ET of the Project.

Landscape & Visual

3.06 According to Section 7.4 of the Updated EM&A Manual, site inspection bi-weekly should be performed to check the implementation and maintenance of landscape and visual mitigation measures whether to full realize.

MONITORING EQUIPMENT

Noise Monitoring

3.07 Sound level meter in compliance with the *International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1)* specifications shall be used for noise monitoring. The sound level meter shall be checked with an acoustic calibrator. The wind speed shall be check with a portable wind speed meter, which capable to measure wind speed in m/s.

Water Quality Monitoring

3.08 **Dissolved Oxygen and Temperature Measuring Equipment** – The instrument should be a portable and weatherproof dissolved oxygen (DO) measuring instrument complete with cable and sensor, and use a DC power source. The equipment should be capable of measuring DO level in the range of 0 – 20mg L-1 and 0 – 200% saturation; and temperature of 0 – 45 degree Celsius.

3.09 **pH Meter** – The instrument shall consist of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It shall be readable to 0.1 pH in arrange of 0 to 14.

3.10 **Turbidity (NTU) Measuring Equipment** – The instrument should be a portable and weatherproof turbidity measuring instrument using a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0 - 1000 NTU.

3.11 **Water Sampling Equipment** – A water sampler should comprise a transparent PVC cylinder, with a capacity of not less than 2 litres, which can be effectively sealed with latex cups at both ends. The sampler should have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth.

3.12 **Water Depth Detector** – A portable, battery-operated echo sounder should be used for the determination of water depth at each designated monitoring station. The unit can either be hand held or affixed to the bottom of the work boat.

3.13 **Sample Containers and Storage** – Water samples for SS should be stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen).

3.14 **Suspended Solids Analysis** – Analysis of suspended solids shall be carried out in a HOKLAS or other international accredited laboratory.

Hydrological Characteristics

3.15 **Water Depth Detector** - A portable, battery-operated echo sounder shall be used for the determination of water depth at each designated monitoring station.

3.16 **Stream water flow Equipment** –A portable, battery-operated flow meter should be used for the determination of water flow rate at each designated monitoring location and record in m^3/s.

3.17 The monitoring equipment using for the Project's EM&A program were proposed by the ET and verified by the IEC prior commencement of the monitoring. Details of the equipment used for impact monitoring are listed in ***Table 3-3***.

Table 3-3 Monitoring Equipment Used in EM&A Program

Equipment	Model
Construction Noise	
Integrating Sound Level Meter	B&K Type 2238
Calibrator	B&K Type 4231
Portable Wind Speed Indicator	Testo Anemometer
Water quality	
Water Depth Detector	Eagle Sonar
Water Sampler	A transparent PVC cylinder / bucket

Equipment	Model
Thermometer & DO meter	YSI DO Meter 550A or YSI Sonde 6820 / 650MDS
pH meter	YSI pH10N or YSI Sonde 6820 / 650MDS
Turbidimeter	Hach 2100Q or YSI Sonde 6820 / 650MDS
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-litre plastic cool box
Suspended Solids	HOKLAS-accredited laboratory (ALS Technichem (HK) Pty Ltd)
Hydrological Characteristics	
Water flow meter	GLOBAL WATER model FP211
Water Depth Detector	Eagle Sonar or an appropriate steel ruler or rope with appropriate weight

MONITORING METHODOLOGY

Noise Monitoring

3.18 Noise measurements were taken in terms of the A-weighted equivalent sound pressure level (L_{eq}) measured in decibels (dB). Supplementary statistical results (L_{10} and L_{90}) were also obtained for reference.

3.19 Sound level meter as listed in ***Table 3-3*** are complied with the *International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1)* specifications, as recommended in Technical Memorandum (TM) issued under the *Noise Control Ordinance (NCO)*.

3.20 During the monitoring, all noise measurements were performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (L_{eq}). $Leq_{(30min)}$ in six consecutive $Leq_{(5min)}$ measurements were used as the monitoring parameter for the time period between 0700-1900 hours on weekdays; and also $Leq_{(15min)}$ in three consecutive $Leq_{(5min)}$ measurements is used as monitoring parameter for other time periods (e.g. during restricted hours), if necessary.

3.21 During the course of measurement, the sound level meter is mounted on a tripod with a height of 1.2m above ground and placed at the assessment point and oriented such that the microphone is pointed to the site with the microphone facing perpendicular to the line of sight. The windshield is fitted for all measurements. The assessment point is normally set as free-field situation for the measurement.

3.22 Prior to noise measurement, the accuracy of the sound level meter is checked by an acoustic calibrator which generated a known sound pressure level at a known frequency. The checking was performed before and after the noise measurement.

Water Quality

3.23 Water quality monitoring are conducted at the depth below:-

- Three depths: 1m below water surface, 1m above river bed and at mid-depth when the water depth exceeds 6m, or
- If the water depth is between 3m and 6m, two depths: 1m below water surface and 1m above river bed, and or
- If the water depth is less than 3m, 1 sample at mid-depth is taken

3.24 Water depths are determined prior to measurement and sampling, using a portable battery operated depth detector, brand named 'Eagle Sonar', if the depths exceed 1.5 meter. If the depth between 1.5 meter and 1 meter, plastic tape measurement tied with appropriate weight are used the depth estimation. For the depth well below 1 meter, an appropriate steel ruler or rope with appropriate weight are used for the depth measurement.

3.25 A transparent PVC cylinder, with a capacity of not less than 2 litres, is used for water sampling.

The water sampler is lowered into the water body at a predetermined depth. The trigger system of the sampler is activated with a messenger and opening ends of the sampler are closed accordingly then the sample of water is collected. If the water depth is less than 500mm, a water bucket is be used as a water sampler to minimize the possibility of the latching system disturbing sediment during water sampling

3.26 A portable YSI DO Meter 550A or or YSI Sonde 6820 / 650MDS is used for in-situ DO measurement. The DO meter is capable of measuring DO in the range of 0 - 20 mg/L and 0 - 200 % saturation and checked against water saturated ambient air on each monitoring day prior to monitoring. Although the DO Meter automatically compensates ambient water temperature to a standard temperature of 20^0C for ease of comparison of the data under the changing reality, the temperature readings of the DO Meter are be recorded in the field data sheets. The equipment calibration is performed on quarterly basis.

3.27 A portable YSI pH10N Meter or or YSI Sonde 6820 / 650MDS is used for in-situ pH measurement. The pH meter is capable of measuring pH in the range of 0 – 14 and readable to 0.1. Standard buffer solutions of pH 7 and pH 10 are used for calibration of the instrument before and after measurement. The equipment calibration is performed on quarterly basis.

3.28 A portable Hach 2100Q Turbidity Meter or or YSI Sonde 6820 / 650MDS is be used for in-situ turbidity measurement. The turbidity meter is capable of measuring turbidity in the range of 0 – 1000 NTU. The equipment calibration is performed on quarterly basis.

3.29 Water samples are contained in screw-cap PE (Poly-Ethylene) bottles, which are provided and pretreated and 'PE' (Poly-Ethylene) sampling bottles provided and pre-treated according to corresponding analytical requirements. Where appropriate, the sampling bottles are rinsed with the water to be contained. Water sample is then transferred from the sampler to the sample bottles.

3.30 One liter or 500 mL water sample are collected from each depth for SS determination. The collected samples are stored in a cool box maintained at 4^0C and delivered to laboratory upon completion of the sampling by end of each sampling day.

3.31 All water samples are analyzed with Suspended Solids (SS) as specified in the updated *EM&A Manual* by a local HOKLAS-accredited testing laboratory (ALS Technichem (HK) Pty Ltd HOKLAS registration no. 66). SS are determined by the laboratory upon receipt of the water samples using HOKLAS accredited analytical method. The detection limits and testing method are shown below in ***Table 3-4***. The certificate of ALS Technichem (HK) Pty Ltd is provided in ***Appendix E***.

Table 3-4 Testing Method and Detection limit of Suspended Solids

Determinant	Testing Method	Detection Limit
Suspended solid	Determination use HOKLAS accredited analytical methods namely ALS Method EA-025 (based on APHA 2540 D)	2mg/L

Hydrological Characteristics

3.32 A portable, water flow meter, brand named "*GLOBAL WATER model FP211*" are used to determine the water current flow at the designated monitoring stations. A water flow velocity is measured at mid depth of current water body or 0.5m below water level.

3.33 Water depths are determined prior to measurement, using a portable battery operated depth detector, brand named 'Eagle Sonar', if the depths exceed 1.5 meter. If the depth between 1.5 meter and 1 meter, plastic tape measurement tied with appropriate weight are used the depth estimation. For the depths well below 1 meter, an appropriate steel ruler or rope with appropriate weight are used for the depth measurement.

DATA MANAGEMENT AND DATA QA/QC CONTROL

3.34 The impact monitoring data are handled by the ET's systematic data recording and management, which complies with in-house Quality Management System. Standard Field Data Sheets (FDS) are used in the impact monitoring program.

3.35 The monitoring data recorded in the equipment e.g. noise meter and Multi-parameter Water Quality Monitoring System are downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data are input into a computerized database properly maintained by the ET. The laboratory results are input directly into the computerized database and QA/QC checked by personnel other than those who input the data. For monitoring activities require laboratory analysis, the local laboratory follows the QA/QC requirements as set out under the HOKLAS scheme for all laboratory testing.

OTHERS MONITORING IMPLEMENTATION FOR THE CONTRACT

Ecology

3.36 Ecological monitoring and reporting should be performed by IEC. No equipment and procedure are presented in the EM&A Monthly Report.

Landscape and Visual

3.37 A registered Landscape Architect as member of the ET is employed by the Contractor to undertake site inspection. Site inspection will undertake at least once every two weeks throughout the construction period to ensure compliance with the intended aims of the mitigation measures are proposed in the EIA and the updated EM&A Manual, implemented by the Contractor.

DETERMINATION OF ACTION/LIMIT (A/L) LEVELS

3.38 The re-established performance criteria for construction noise, water quality and hydrological, namely Action and Limit levels is used for Contract 2 are listed in ***Tables 3-5, 3-6,*** and ***3-7***.

Table 3-5 Action and Limit Levels for Construction Noise

Location	Time Period	Action Level in dB(A)	Limit Level in dB(A)
M1, AL1, M2, M3, M4	Daytime 0700 – 1900 hrs on normal weekdays	When one documented complaint is received	75* dB(A)
	1900 – 2300 on all days and 0700 – 2300 on general holidays (including Sundays		60/65/70 dB(A)**
	2300 – 0700 on all days		45/50/55 dB(A)**

Note: * *Reduces to 70dB(A) for schools and 65dB(A) during the school examination periods.*
** *To be selected based on the Area Sensitivity Rating of A/B/C, and the conditions of the applicable CNP(s) must be followed*

Table 3-6 Action and Limit Levels for Water Quality

Parameter	Performance Criteria	Impact Station		
		W1	W2	W4
DO Concentration (mg/L)	Action Level	7.27	7.26	9.27
	Limit Level	4.00	4.00	4.00
pH	Action Level	NA	NA	NA
	Limit Level	6 - 9	6 - 9	6 - 9
Turbidity (NTU)	Action Level	4.77	2.46	3.32
	Limit Level	5.26	3.42	4.52
Suspended Solids (mg/L)	Action Level	9.73	8.89	6.98
	Limit Level	10.77	9.75	7.66

Notes:

- *The proposed Action/Limit Levels of DO are established to be used 5%-ile/1%-ile of all the baseline data;*
- *The proposed Action/Limit Levels of Turbidity and SS are established to be used 95%-ile/99%-ile of all the baseline data;*
- *For DO, non-compliance of the water quality limits occur is when monitoring result lower than the action/limit levels;*
- *For turbidity and SS, non-compliance of the water quality limits occurs is when monitoring result higher than the limits; and*
- *For pH, non-compliance of the quality limit occur is when monitoring result lower than 6 and higher than 9; and*
- *All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered necessary*

Table 3-7 Action and Limit Levels for Hydrological Characteristics

Parameter	Acceptance Criteria	Monitoring Station	
		H1	H2
Water Depth (m)	Action Level	0.08 (80% of baseline water depth)	0.40 (80% of baseline water depth)
	Limit Level	0.06 (60% of baseline water depth)	0.30 (60% of baseline water depth)
Volumetric Flow Rate (Q), m^3/s	Action Level	120% of control station's water flow rate on the same day of measurement	120% of control station's water flow rate on the same day of measurement
	Limit Level	140% of control station's water flow rate on the same day of measurement	140% of control station's water flow rate on the same day of measurement

3.39 The locations H3 and H4 are a reference measurement point in order to monitor any changes in the hydrological characteristics of Wai Ha River arising from the work Contract 2 to affect the Shuen Wan Marsh.

3.40 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan enclosed in ***Appendix F***.

EQUIPMENT CALIBRATION

3.41 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme in yearly basis.

3.42 All the water quality monitoring equipment such as the DO, pH and Turbidity meters are calibrated by HOKLAS accredited laboratory of three month intervals.

3.43 A portable, water flow meter, brand named "*GLOBAL WATER model FP211*" is calibrated in yearly basis.

3.44 All updated calibration certificates of the monitoring equipment used for the impact monitoring program in this Reporting Period are attached in ***Appendix E***.

METEOROLOGICAL INFORMATION

3.45 The meteorological information during the construction phase is obtained from Tai Po and Shatin Stations of the Hong Kong Observatory (HKO). The meteorological data during the impact monitoring days are summarized in ***Appendix H***

4.0 IMPACT MONITORING RESULTS

4.01 The monitoring schedule had been issued to relevant parties before each Reporting Period which presented in ***Appendix G***. The works undertaken during the Reporting Period are illustrated in ***Appendix C.*** The monitoring results are presented in the following sub-sections.

MONITORING RESULTS SHARING

4.02 Environmental Permit EP-203/2008 was issued on 25 February 2008 by EPD which adopted for both Contracts 1 and 2 of DSD construction at Shuen Wan. Also, the EM&A programme of both contracts are undertaken in accordance with the same updated EM&A Manual which has to be carried out during construction period. According to the updated EM&A manual, designated monitoring Locations M1 and AL1 for noise monitoring stations, Locations W1 and W2 for water quality monitoring stations, and Locations H1 and H2 for hydrological measurement are requested to perform at both Contracts 1 and 2. Since Contract 1 has already commenced in January 2011, those results measured by Contract 1 would be shared for the Contract 2. This recommendation has been accepted by IEC and submitted to EPD.

RESULTS OF CONSTRUCTION NOISE MONITORING

4.03 In this Reporting Period, the noise monitoring results at the designated locations M1, AL1, M2, M3 and M4 are summarized in ***Table 4-1***. The detail monitoring data are presented in ***Appendix I***. The graphical plot is shown in ***Appendix J***.

Table 4-1 Summary of Construction Noise Monitoring Results, dB(A)

Date	$L_{eq(30min)}$ (dB(A))				
	M1(#)	AL1(#)	M2(*)	M3(*)	M4(*)
5-Jul-12	62.3	62.6	-	-	-
7-Jul-12	-	-	63.8	68.2	57.4
11-Jul-12	60.7	64.2	-	-	-
13-Jul-12	-	-	67.8	67.8	60.4
16-Jul-12	-	-	66.0	66.1	59.3
18-Jul-12	64.4	67.2	-	-	-
25-Jul-12	62.1	68.2	64.2	71.7	63.4
Limit Level	**>75 dB(A)**				

Remarks:

(#) *The monitoring is undertaken under façade situation. No façade correction is added according to acoustical principles and EPD guidelines.*

(*) *The monitoring is undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines*

4.04 The sound meter was set in a free field situation at the designated monitoring locations M2, M3 and M4, therefore, a façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines. For Location A1 and AN1, the monitoring is undertaken under façade situation. No façade correction is added according to acoustical principles and EPD guidelines.

4.05 No noise complaint (which is an Action Level exceedance) was received in this Reporting Period. As shown in ***Table 4-1,*** all the noise monitoring result are well below 75dB(A) and no Action or Limit Level exceedance was triggered during this Reporting Period . The graphical plot is shown in ***Appendix J***.

RESULTS OF LOCAL STREAM WATER QUALITY MONITORING

4.06 In this Reporting Period, **13** sampling days were performed at designated measurement Points W1 W2, W3 & W4 for local stream water quality monitoring. The monitoring results including in-situ measurements and laboratory testing results are provided in ***Appendix I***. The graphical plots are shown in ***Appendix J***.

4.07 Monitoring results of 3 key parameters: dissolved oxygen (DO), turbidity and suspended solids in

this Reporting Period, are summarized in ***Table 4-2***.

Table 4-2 Water Quality Results Summary in Reporting Period

Sampling date	DO (mg/L)			Turbidity (NTU)			SS (mg/L)		
	W1 (ebb)	W1 (flood)	W2	W1 (ebb)	W1 (flood)	W2	W1 (ebb)	W1 (flood)	W2
3-Jul-12	***4.23***	***4.11***	***7.02***	3.1	**8.1**	**6.7**	6.00	**18.00**	**13.00**
5-Jul-12	***4.56***	***4.52***	***6.94***	**28.6**	**42.2**	**12.7**	**35.00**	**38.00**	**13.00**
7-Jul-12	***4.58***	***4.70***	***6.78***	4.3	1.6	**5.5**	7.00	4.00	8.20
9-Jul-12	***4.54***	***4.13***	**6.43**	**19.2**	4.3	**6.9**	**33.00**	6.00	**9.40**
11-Jul-12	***4.48***	***4.58***	***6.5***	**8.4**	**7.3**	**10.1**	6.00	8.00	7.60
13-Jul-12	***4.46***	***4.19***	***7.17***	3.6	**6.4**	**11.3**	***10.00***	***10.00***	5.00
16-Jul-12	***4.56***	**3.98**	***7.24***	**5.5**	**35.5**	**7.2**	4.00	**37.00**	***9.40***
18-Jul-12	***4.16***	***4.22***	***7.2***	**9.2**	**10.6**	**6.1**	**14.00**	**16.00**	**13.00**
20-Jul-12	***6.12***	***5.08***	***7.14***	**12.1**	**13.1**	**5.7**	**12.00**	**13.00**	6.80
23-Jul-12	***5.68***	***4.94***	7.52	**12.5**	**9.7**	1	**20.00**	**16.00**	4.20
25-Jul-12	***4.87***	***5.10***	8.09	**8.5**	**9.6**	**450.1**	***10.00***	**15.00**	**320.00**
27-Jul-12	***7.10***	***6.54***	7.81	3.4	4.6	**27**	**12.00**	**16.00**	**10.00**
30-Jul-12	***4.17***	***4.31***	7.35	2.3	3.5	**4.4**	**14.00**	**16.00**	**13.00**

- *Bold and Italic is indicated exceeded Action Level*; *Bold with underline is indicated exceeded Limit Level*

Table 4-2 Water Quality Results Summary in Reporting Period

Sampling date	DO (mg/L)		Turbidity (NTU)		SS (mg/L)	
	W3	W4	W3	W4	W3	W4
3-Jul-12	4.28	***4.38***	2.09	1.94	4.00	4.00
5-Jul-12	4.79	***5.69***	11.55	**21.55**	10.00	**11.00**
7-Jul-12	4.62	***4.59***	2.18	1.25	4.00	2.00
9-Jul-12	4.82	***4.76***	8.41	2.95	4.00	3.00
11-Jul-12	4.40	***4.61***	1.67	1.71	2.00	2.00
13-Jul-12	4.57	***4.65***	3.14	2.48	5.00	2.00
16-Jul-12	4.22	***5.69***	12.05	***4.24***	3.00	2.00
18-Jul-12	4.62	***5.70***	22.81	**5.40**	58.00	***7.00***
20-Jul-12	6.04	***5.52***	3.57	3.17	5.00	2.00
23-Jul-12	5.51	***5.70***	7.94	**11.65**	12.00	**22.00**
25-Jul-12	5.28	***5.48***	12.67	**8.55**	26.00	**11.00**
27-Jul-12	5.43	***5.65***	4.63	***4.20***	13.00	**31.00**
30-Jul-12	4.88	***4.95***	3.29	3.09	6.00	4.00

- *Bold and Italic is indicated exceeded Action Level*; *Bold with underline is indicated exceeded Limit Level*

4.08 During the Reporting Period, field measurements showed that stream water temperatures were within 23.7℃ to 34.9℃ and pH values within 6.30 to 8.85.

4.09 A statistics of exceedances for the three parameters: dissolved oxygen (DO), turbidity and suspended solids are shown in ***Table 4-3***.

Table 4-3 Statistics Water Quality Exceedance in the Reporting Period

Station	DO		Turbidity		SS		Total Exceedance	
	Action	Limit	Action	Limit	Action	Limit	Action	Limit
W1	**25**	**1**	0	**17**	**3**	**16**	**28**	**34**
W2	**8**	**1**	0	**12**	**2**	**6**	**10**	**19**
W4	**13**	0	**2**	**4**	**1**	**4**	**16**	**8**
No. of Exceedance	**46**	**2**	**2**	**33**	**6**	**26**	**54**	**61**

4.10 As shown in ***Table 4-3***, a total of 115 Action/ Limit Level exceedances, namely 48 exceedances in dissolved oxygen, 35 exceedances in turbidity and 32 exceedances in suspended solids were recorded in this Reporting Period. NOEs were issued to notify EPD, IEC, the Contractor and RE upon confirmation of the results.

4.11 According to site information provided by the Contractor, the site activities undertaken on site included formwork erection of side walls and top slab of Bay 38; fixing of reinforcement of top slab of Bay 38; concreting of side walls and top slab of Bay 37, 38, 39; removal 1st layer of railing and strut for Bay 35, 36, 37, 38, 39; backfilling of Bay 35, 36, 37, 38, 39; withdrawal of sheetpile for Bay 35, 36, 37; installation of sheetpile for Bay 40, 41, 42, 54, 55 and excavation of Bay 40, 41.

4.12 The construction activities may lead to increase of turbidity or suspended solids levels to the nearby stream by washed out from stockpiles of dusty materials, excavated surface or dusty haul roads. To minimize the impact to the existing stream, precautionary measures such as sedimentation pit and temporary artificial precipitation stream to remove the suspended solids from wastewater to maintain the water quality of downstream. During regular site inspection with the RE and Contractor, the implemented water quality mitigation measures such as the sedimentation pit and temporary artificial precipitation stream are effective. The precautionary measures have been modified and improved base on the actual situation and advice by RE and ET. Investigation reports for the exceedances had conducted and it was concluded that all the exceedances in water quality monitoring are not related to the works under the Project. The investigation results for the exceedances are summarized as follows:

- For the DO exceedances, it is noted that the construction activities comprised none of DO depleting characteristics. Therefore, it is considered that all the DO exceedances were due to natural variation of the stream and not related to the works under the Project.
- The recent major construction works of the Project are located at downstream of Locations W3 and W4. Therefore, the water quality exceedances (turbidity and SS) at Locations W4 affected by the Project were unlikely.
- Washing out of soil in Shuen Wan Marsh and muddy water were noted after heavy rainstorm on 5, 13, 14, 16, 18, 20, 23, 24, 25, 26, 27 and 31 July 2012 which affected the water quality in Wai Ha River. Since the marsh is located between the active work area and W1, exceedances of turbidity and SS exceedances in W1 were not likely due to the works under the project.
- It is concluded that the exceedances were highly possibly due to the muddy water after rainstorm.

4.13 During wet season, KLKJV is reminded to fully implement the required water quality mitigation measures in accordance with the updated EM&A Manual stipulation during construction under the Project. In particular when excavation and the associated box culvert construction works are undertaken near Wai Ha River, all construction wastewater or runoff generated from work area should be treated and drained to the designated discharge point. Moreover, as an effective water quality mitigation measure, the rock bund in the de-silting channel should be repaired regularly and ensure the de-silting performance.

RESULTS OF HYDROLOGICAL CHARACTERISTICS MONITORING

4.14 In this Reporting Period, hydrological characteristics measurement at were carried out on **7, 13, 20 and 27 July 2012**. The monitoring data of H1 and H2 provided by DC/2009/22 is showed ***Appendix I***. The detailed H3 and H4 measurement results in this Reporting Period are presented in ***Tables 4-4***.

Table 4-4 Detailed monitoring results of hydrological characteristics at H3 and H4

Date	Measurement Time	Tide Condition	River Width (m)	Water Depth (m)	Cut Section (m^2)	Velocity Flow Rate (m/s)	Average Volumetric Flow Rate (Q), m^3/s
Measurement Point: H3							
7-Ju1-12	11:14	Flood	7.45	0.3	2.2350	0.5	1.118
	13:50	Ebb	7.45	0.3	2.2350	0.5	1.118
13-Ju1-12	13:06	Flood	7.45	0.4	2.9800	0.4	1.192
	9:59	Ebb	7.45	0.3	2.2350	0.4	0.894

Date	Measurement Time	Tide Condition	River Width (m)	Water Depth (m)	Cut Section (m^2)	Velocity Flow Rate (m/s)	Average Volumetric Flow Rate (Q), m^3/s
20-Ju1-12	9:14	Flood	7.45	0.3	2.2350	0.3	0.671
	11:07	Ebb	7.45	0.3	2.2350	0.3	0.671
27-Ju1-12	13:14	Flood	7.45	0.4	2.9800	0.5	1.490
	17:33	Ebb	7.45	0.5	3.7250	0.6	2.235
Measurement Point: H4							
7-Ju1-12	11:24	Flood	2.74	0.4	1.0960	0.3	0.329
	13:58	Ebb	2.74	0.4	1.0960	0.3	0.329
13-Ju1-12	13:12	Flood	2.74	0.4	1.0960	0.3	0.329
	10:14	Ebb	2.74	0.4	1.0960	0.2	0.219
20-Ju1-12	9:29	Flood	2.74	0.4	1.0960	0.2	0.219
	11:07	Ebb	2.74	0.4	1.0960	0.3	0.329
27-Ju1-12	13:29	Flood	2.74	0.5	1.3700	0.4	0.548
	17:40	Ebb	2.74	0.6	1.6440	0.5	0.822

Remarks: Tide information extract from Tai Po Kau Station

Date	Time	Height(m)	Time	Height(m)	Time	Height(m)	Time	Height(m)
7-Jul-12	0037	1.5	0517	1.0	1227	2.3	1823	0.4
13-Jul-12	0551	1.8	1246	1.0	1857	1.2	2116	1.1
20-Jul-12	0249	1.0	1045	2.2	1658	0.4	2332	1.5
27-Jul-12	0409	2.0	0939	1.0	1705	1.4	2126	1.0

4.15 Hydrological characteristics results of the all measurement points are summarized in ***Tables 4-5*** and ***4-6***.

Table 4-5 Summarized Hydrological Characteristics of Water Depth, m

Date	Mid-Flood				Mid-Ebb			
	H1	H2	H3	H4	H1	H2	H3	H4
7-Jul-12	0.12	0.12	0.30	0.30	0.12	0.12	0.30	0.30
13-Jul-12	0.12	0.12	0.40	0.30	0.12	0.12	0.30	0.20
20-Jul-12	#	#	0.30	0.20	0.18	0.18	0.30	0.30
27-Jul-12	0.12	0.18	0.40	0.40	#	#	0.50	0.50

 # No data was provided by ET of Contract 1.

Table 4-6 Summarized Hydrological Characteristics of Average Volumetric flow rate (Q), m^3/s

Date	Mid-Flood				Mid-Ebb			
	H1	H2	H3	H4	H1	H2	H3	H4
7-Jul-12	0.225	1.13	1.12	0.33	0.15	0.225	1.12	0.33
13-Jul-12	0.225	0.754	1.19	0.33	0.15	0.377	0.89	0.22
20-Jul-12	#	#	0.67	0.22	0.225	1.507	0.67	0.33
27-Jul-12	0.15	0.754	1.49	0.55	#	#	2.24	0.82

 # No data was provided by ET of Contract 1.

4.16 To compare the monitoring data between the Reporting Period (rainy season) and baseline monitoring period, the currently water depth and volumetric flow rate has insignificant changed. Furthermore, water depth and water flow rate were found no exceedance in this Reporting Period.

RESULTS OF ECOLOGICAL MONITORING

4.17 According to updated EM&A Manual Section 6.17, bi-monthly ecological monitoring is conducted by the IEC – ENVIRON Hong Kong Limited. In brief, the monitoring tasks include regular check on the retained and transplanted trees and shrubs, monitoring on fauna groups and aquatic fauna within the works area and any ecologically sensitive area within 100 m of the works boundary.

4.18 In this Reporting Period, the ecological monitoring in Area under Contract 2 is performed on **31 July 2012**. The details monitoring report is presented in ***Appendix N***.

5.0 WASTE MANAGEMENT

5.01 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time.

RECORDS OF WASTE QUANTITIES

5.02 All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil.

5.03 The quantities of waste for disposal in this Reporting Period are summarized in ***Table 5-1*** and ***5-2*** and the Monthly Summary Waste Flow Table is shown in ***Appendix K***. Whenever possible, materials were reused on-site as far as practicable.

Table 5-1 Summary of Quantities of Inert C&D Materials

Type of Waste	Quantity	Disposal Location
C&D Materials (Inert) (m^3)	0	-
Reused in this Contract (Inert) (m^3)	0	-
Reused in other Projects (Inert) (m^3)	0	-
Disposal as Public Fill (Inert) (m^3)	5	Tuen Mum Area 38

Table 5-2 Summary of Quantities of C&D Wastes

Type of Waste	Quantity	Disposal Location
Recycled Metal (kg)	0	-
Recycled Paper / Cardboard Packing (kg)	0	-
Recycled Plastic (kg)	0	-
Chemical Wastes (kg)	0	-
General Refuses (m^3)	5	Local refuse station

5.04 To control over the site performance on waste management, the Contractor shall ensure that all solid and liquid waste management works are in full compliance with the relevant license/permit requirements, such as the effluent discharge license and the chemical waste producer registration. The Contractor is also reminded to implement the recommended environmental mitigation measures according to the EM&A Manual based on actual site conditions.

6.0 SITE INSPECTION

REGULAR SITE INSPECTION AND MONTHLY AUDIT

6.01 According to the Updated Environmental Monitoring and Audit Manual, regular site inspection to evaluate the project environmental performance should be carried out during construction phase. Weekly environmental site inspections had been carried out by the Contractor, ET and RE on **4, 11, 18 and 25 July 2012.** Also, joint site inspection with the IEC was carried out on **11 July 2012**. In this Reporting period, **3** observations were recorded but no non-compliance was noted.

6.02 Observations for the site inspection and monthly audit within this Reporting Period are summarized in ***Table 6-1*** and weekly inspection checklists are attached in ***Appendix L***.

Table 6-1 Site Inspection of Observations – Findings and Deficiencies

Date	Findings / Deficiencies	Follow-Up Status
4 July 12	• As a reminder, water spraying should be applied to the haul road and stock pile to minimize dust generation.	Rectified on 11 July 2012.
11 July 12	• No adverse environmental impact was observed during site inspection.	N.A.
18 July 12	• The rock bund in the de-silting channel was broken by rainstorm; the Contractor was reminded to repair it regularly to ensure the desilting channel function properly.	Rectified on 1 August 2012.
25 July 12	• The rock bund in the de-silting channel was broken by rainstorm; the Contractor was reminded to repair it regularly to ensure the desilting channel function properly.	Rectified on 1 August 2012.

LANDSCAPE AND VISUAL INSPECTION

6.03 In this Reporting Period, landscape and visual inspection was carried on **10 and 26 July 2012**.

6.04 The stand-alone of monthly Landscape & Visual Report signed by the registered Landscape Architect. Mitigation measures implemented in this Reporting Period are presented in the monthly Landscape & Visual Report (**July 2012**) which enclosed in ***Appendix M***.

6.05 The next bi-weekly Landscape & Visual Monitoring in **August 2012** is scheduled to be conducted in the week of **6 and 20 August 2012**.

7.0 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

7.01 No environmental complaint, summons and prosecution was received in this Reporting Period. The statistical summary table of environmental complaint is presented in ***Tables 7-1, 7-2*** and ***7-3***.

Table 7-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
July 2011 – June 2012	0	0	NA
July 2012	0	0	NA

Table 7-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
July 2011 – June 2012	0	0	NA
July 2012	0	0	NA

Table 7-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
July 2011 – June 2012	0	0	NA
July 2012	0	0	NA

8.0 IMPLEMENTATION STATUS OF MITIGATION MEASURES

8.01 The environmental mitigation measures that recommended in the Updated Environmental Monitoring and Audit Manual covered the issues of dust, noise and waste and they are summarized as follows:

Noise Mitigation Measure

(a) Only well-maintained plant should be operated on-site and plant shall be serviced regularly during the construction program;
(b) Silencers or mufflers on construction equipment should be utilized and shall be properly maintained during the construction program;
(c) Mobile plant, if any, should be sited as far from NSRs as possible;
(d) 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;
(e) Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs;
(f) Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities;
(g) Use of quieter plants to carry out the construction tasks proposed for the Project;
(h) Use about 3.5m high of temporary noise barriers as screened the noisy PMEs to carry out construction of box culvert and site clearance.
(i) Low Impact Method, such as using PMEs smaller in size and to be enclosed by noise enclosure, should be adopted for the construction of box culvert and pipe laying in Wai Ha; and
(j) Use of noise enclosure during the works area for pipe laying in Wai Ha.

Dust Mitigation Measure

8.02 Implementation of mitigation measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices including but not limited to the following:

(a) Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved road, with complete coverage, particularly during dry weather;
(b) Use of frequent watering for particularly dusty static construction areas and areas close to ASRs;
(c) Tarpaulin covering of all dusty vehicle loads transported to, from and between site location;
(d) Establishment and use of vehicle wheel and body washing facilities at the exit points of the site;
(e) Routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs;
(f) Stockpiled excavated materials should be covered with tarpaulin and should be removed offsite within 24 hours to avoid any odour nuisance arising.

Local Stream Water Quality Mitigation Measure

(a) Before commencing any site formation work, all sewer and drainage connections shall be sealed to prevent debris, soil, sand etc. from entering public sewers/drains;
(b) Temporary ditches shall be provided to facilitate run-off discharge into appropriate watercourses, via a silt retention pond. No site run-off shall enter the fishponds at Shuen Wan;
(c) Sand/silt removal facilities such as sand traps, silt traps and sediment basins shall be provided to remove sand/silt particles from runoff to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance. The design of silt removal facilities shall be based on the guidelines provided in ProPECC PN 1/94. All drainage facilities and erosion and sediment control structures shall be inspected monthly and maintained to ensure proper and efficient operation al all times and particularly during rainstorms
(d) Water pumped out from excavated pits shall be discharged into sill removal facilities;

(e) During rainstorms, exposed slope/soil surfaces shall be covered by a tarpaulin or other means. Other measures that need to be implemented before, during, and after rainstorms as summarized in ProPECC PN 1/94 shall be followed

(f) Exposed soil areas shall be minimized to reduce potential for increased siltation and contamination of runoff

(g) Earthwork final surfaces shall be well compacted and subsequent permanent work or surface protection shall be immediately performed to reduce the potential of soil erosion;

(h) Open stockpiles of construction materials or construction wastes on-site shall be covered with tarpaulin or similar fabric during rainstorms;

(i) For the construction of the box culvert next to the existing channel of the Wai Ha River, sand bags should be deployed around the boundary of the works trench to prevent muddy water ingress into the adjacent CA or Wai Ha River. Sand bags should also be used to surround the excavated trench. Generally, the sand bags will be placed up to a height 01 300mm to provide adequate allowance for the built-up water level during rainstorm event. With sand bags in place surface runoff will be intercepted and flow to Wai Ha River or collected by the existing drainage system as usual;

(j) For the construction of the box culvert in the extreme northeast corner of Shuen Wan Marsh Conservation Area sand bags should be deployed along the limit of the works area to prevent muddy water ingress into the CA. Sand bags should be placed to a height 0.1 at least 300mm from ground level and +2.5 mPD (whichever is greater) to provide adequate allowance for the built-up water level during rainstorm events Unpolluted surface runoff within the works area should then be collected and directed into the existing drainage system;

(k) Sheet-piles, which would be installed around the works trench near the Conservation Area, would be extended above ground level for about 2m to serve as hoardings to isolate the works site;

(l) Tarpaulin sheets would be used to cover the excavation areas during heavy rainstorms. This would prevent the ingress of rainwater into the trench minimizing the risk of muddy water getting into Wai Ha River and the adjacent Conservation Area;

(m) Any concrete washing water would be contained inside the works site surrounded by the extended sheet piles. A pump sump at the bottom 0f the trench would be provided to pump any excess water during concrete washing;

(n) Stockpiling the excavated materials adjacent to the Conservation Area would not be allowed. The excavated materials would be either removed off site immediately after excavation, or stockpile at location(s) away from the Conservation Area. The stockpile locations shall be approved by the site engineer;

(o) Debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering the Wai Ha River and fish ponds at Shuen Wan. Stockpiles of cement and other construction materials should be kept covered when not being used.

(p) Oils and fuels should only be used and stored in designated areas which have pollution prevention facilities to prevent spillage of fuels and solvents to nearby water bodies, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity 01 the largest tank The bund should be drained of rainwater after a rain event

(q) Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site. A licensed contractor would be responsible for appropriate disposal and maintenance of these facilities;

(r) The excavation works within the upstream end of the existing river channel of the Wai Ha River for the construction of the proposed box culvert should be carried out in dry condition. Containment measures such as bunds and barriers shall be used within the affected length of the river channel and the excavation works restricted to within an enclosed dry section of the channel. The excavation works within Wai Ha River shall be restricted to the period from October to April

Waste Mitigation Measures

(a) The Contractor shall observe and comply with the Waste Disposal Ordinance (WDO) and its subsidiary regulations.

(b) The Contractor shall submit to the Engineer for approval a Waste Management Plan with appropriate mitigation measures including the allocation of an area for waste segregation and shall ensure that the day-to-day site operations comply with the approved waste management plan.

(c) The Contractor shall minimize the generation of waste from his work. Avoidance and minimization of waste generation can be achieved through changing or improving design and practices, careful planning and good site management.

(d) The reuse and recycling of waste shall be practised as far as possible. The recycling materials shall include paper/cardboard, timber and metal etc.

(e) The Contractor shall ensure that Construction and Demolition (C&D) materials are sorted into public fill (inert portion) and C&D waste (non-inert portion). The public fill which comprises soil, rock, concrete, brick, cement plaster/mortar, inert building debris, aggregates and asphalt shall be reused in earth filling, reclamation or site formation works. The C&D waste which comprises metal, timber, paper, glass, junk and general garbage shall be reused or recycled where possible and, as the last resort, disposal of at landfills.

(f) The Contractor shall record the amount of wastes generated, recycled and disposed of (including the disposal sites). The Contractor shall use a trip ticket system for the disposal of C&D materials to any designated public filling facility and/or landfill.

(g) In order to avoid dust or odour impacts, any vehicles leaving a works area carrying construction waste or public fill shall have their load covered.

(h) To avoid the excessive use of wood, reusable steel shutters shall be used as a preferred alternative to formwork and falsework where possible.

(i) The Contractor shall observe and comply with the Waste Disposal (Chemical Waste) (General) Regulation. The Contractor shall apply for registration as chemical waste producer under the Waste Disposal (Chemical Waste) (General) Regulation when chemical waste is produced. All chemical waste shall be properly stored, labeled, packaged and collected in accordance with the Regulation.

8.03 KLKJV had been implementing the required environmental mitigation measures according to the Updated Environmental Monitoring and Audit Manual subject to the site condition. Environmental mitigation measures generally implemented by KLKJV in this Reporting Period are summarized in ***Table 8-1***.

Table 8-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	• Wastewater were appropriately treated by treatment facilities; • Drainage channels were provided to convey run-off into the treatment facilities; and • Drainage systems were regularly and adequately maintained.
Air Quality	• Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather; • Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers; • Cover all excavated or stockpile of dusty material by impervious sheeting or sprayed with water to maintain the entire surface wet; • Public roads around the site entrance/exit had been kept clean and free from dust; and • Tarpaulin covering of any dusty materials on a vehicle leaving the site.
Noise	• Good site practices to limit noise emissions at the sources; • Use of quite plant and working methods; • Use of site hoarding or other mass materials as noise barrier to screen noise at ground level of NSRs; • Use of shrouds/temporary noise barriers to screen noise from relatively static PMEs; • Scheduling of construction works nearly Tung Tsz Road; and • Alternative use of plant items within one worksite, where practicable.

Issues	Environmental Mitigation Measures
Waste and Chemical Management	• Excavated material should be reused on site as far as possible to minimize off-site disposal. Scrap metals or abandoned equipment should be recycled if possible; • Waste arising should be kept to a minimum and be handled, transported and disposed of in a suitable manner; • The Contractor should adopt a trip ticket system for the disposal of C&D materials to any designed public filling facility and/or landfill; and • Chemical waste shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.
General	• The site was generally kept tidy and clean.

9.0 IMPACT FORCAST

CONSTRUCTION ACTIVITIES FOR THE FORTH-COMING MONTH

9.01 Construction activities planned to be carried out next month at Shuen Wan is listed as below:-

- Construction of box culvert
- Installation of Sheet Piling
- Trench Excavation
- Formwork erection

9.02 Three months Rolling Construction Program is attached in ***Appendix C***

KEY ISSUES FOR THE COMING MONTH

9.03 According to construction activities carry out in coming months, key issues to be considered include:

- Implementation of dust suppression measures at all times;
- Ensure dust suppression measures are implemented properly;
- Disposal of empty engine oil containers within site area;
- Sediment catch-pits and silt removal facilities should be regularly maintained;
- Management of chemical wastes;
- Discharge of site effluent to the nearby local stream or storm drainage, stockpiling or disposal of materials, and any dredging or construction area at this area are prohibited;
- Follow-up of improvement on general waste management issues; and
- Implementation of construction noise preventative control measures.

10.0 CONCLUSIONS AND RECOMMENTATIONS

CONCLUSIONS

10.01 This is the **13th** monthly EM&A report for Contract 2 presenting the monitoring results and inspection findings for the Reporting Period from **1 to 31 July 2012**.

10.02 No noise complaint (which is an Action Level exceedance) was received and no construction noise measurement results that exceeded the Limit Level were recorded in this Reporting Period. No NOE or the associated corrective actions were therefore issued.

10.03 For water quality monitoring, a total of 115 Action/ Limit Level exceedances, namely 48 exceedances in dissolved oxygen, 35 exceedances in turbidity and 32 exceedances in suspended solids were recorded in this Reporting Period. NOEs were issued to notify EPD, IEC, the Contractor and RE. It is concluded that the exceedances were not related to the works under the Project.

10.04 Furthermore, the hydrological characteristics of water depth and water flow rate were found no exceedance in this Reporting Period.

10.05 In this Reporting Period, the ecological monitoring in Area under Contract 2 is performed on **31 July 2012**.

10.06 No documented complaint, notification of summons or successful prosecution was received.

10.07 Weekly environmental site inspections had been carried out by the Contractor, ET and the RE on **4, 11, 18 and 25 July 2012**. Furthermore, joint site inspection with the IEC was carried out on **3 July 2012**. **3** observations were recorded but no non-compliance was noted during the site inspection. Generally, the Contractor is reminded to improve the de-silting capacity especially in wet season.

10.08 In this Reporting Period, landscape and visual inspection was carried on **10 and 26 July 2012** and the monthly Landscape & Visual Report (**July 2012**) has been signed by the registered Landscape Architect.

10.09 No site visit was undertaken by any external party in this Reporting Period.

RECOMMENDATIONS

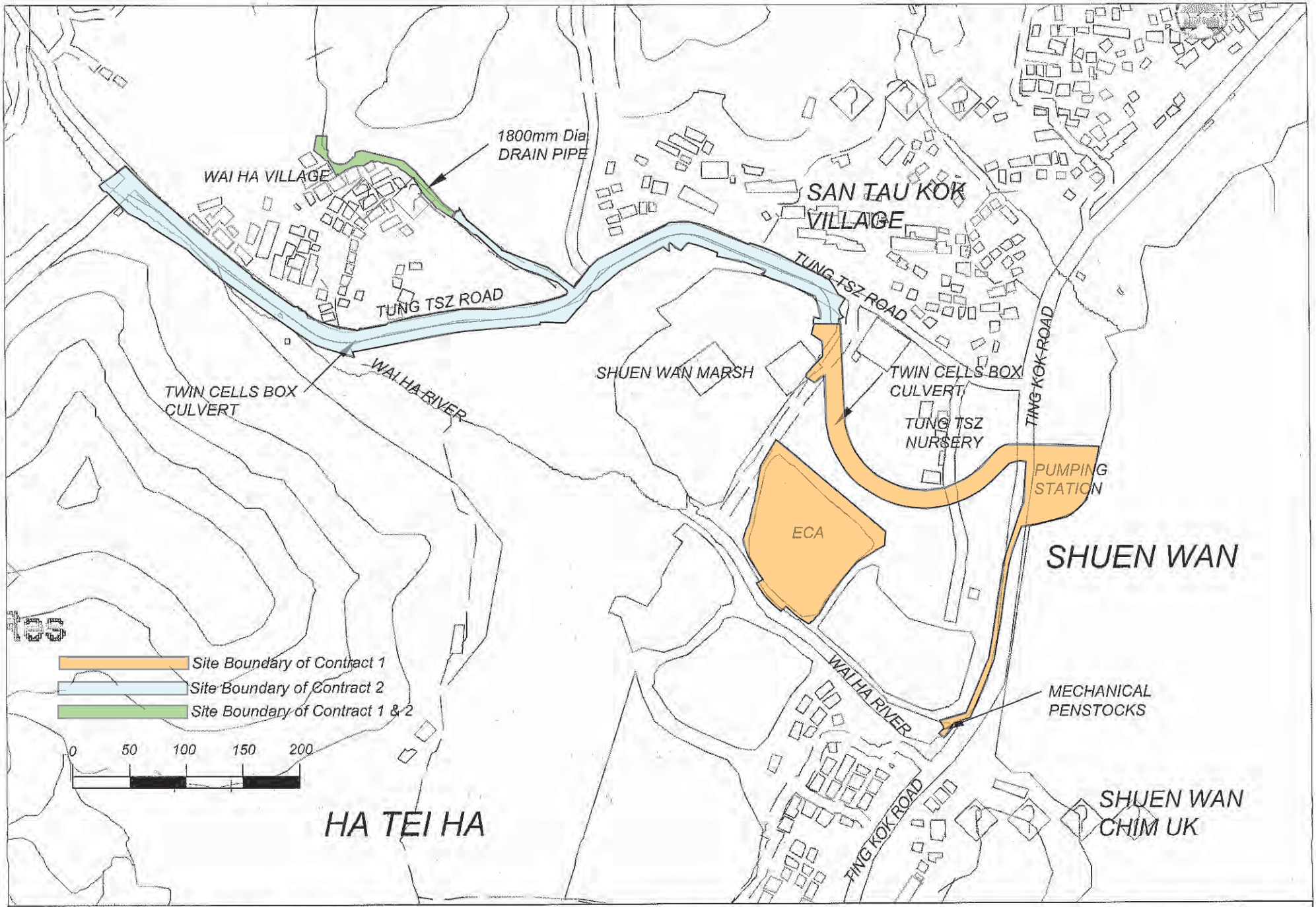
10.10 As excavation works of construction box culvert or a trench, surface runoff or water discharge to local stream course should be key environment aspect issue. The Contractor is reminded that mitigation measures for water quality and ecology should be fully implemented. As an effective water quality mitigation measure, the rock bund in the de-silting channel should be repaired regularly and ensure the de-silting performance.

10.11 During wet season, muddy water and other water quality pollutants via site surface water runoff into the local stream Wah Ha River would be the key issue in the forth-coming month. On the other hand, construction noise should be other key environmental issue during sheet-piling process. The noise mitigation measures should be necessary to implement in accordance with EM&A Manual stipulation. Dust mitigation measures to avoid fugitive dust emissions from loose soil surface or haul road is also reminded.

10.12 To control the site performance on waste management, the KLKJV shall ensure that all solid and liquid waste management works are fully in compliance with the relevant license/permit requirements, such as the effluent discharge licence and the chemical waste producer registration. KLKJV is also reminded to implement the recommended environmental mitigation measures according to the Updated Environmental Monitoring and Audit Manual.

Appendix A

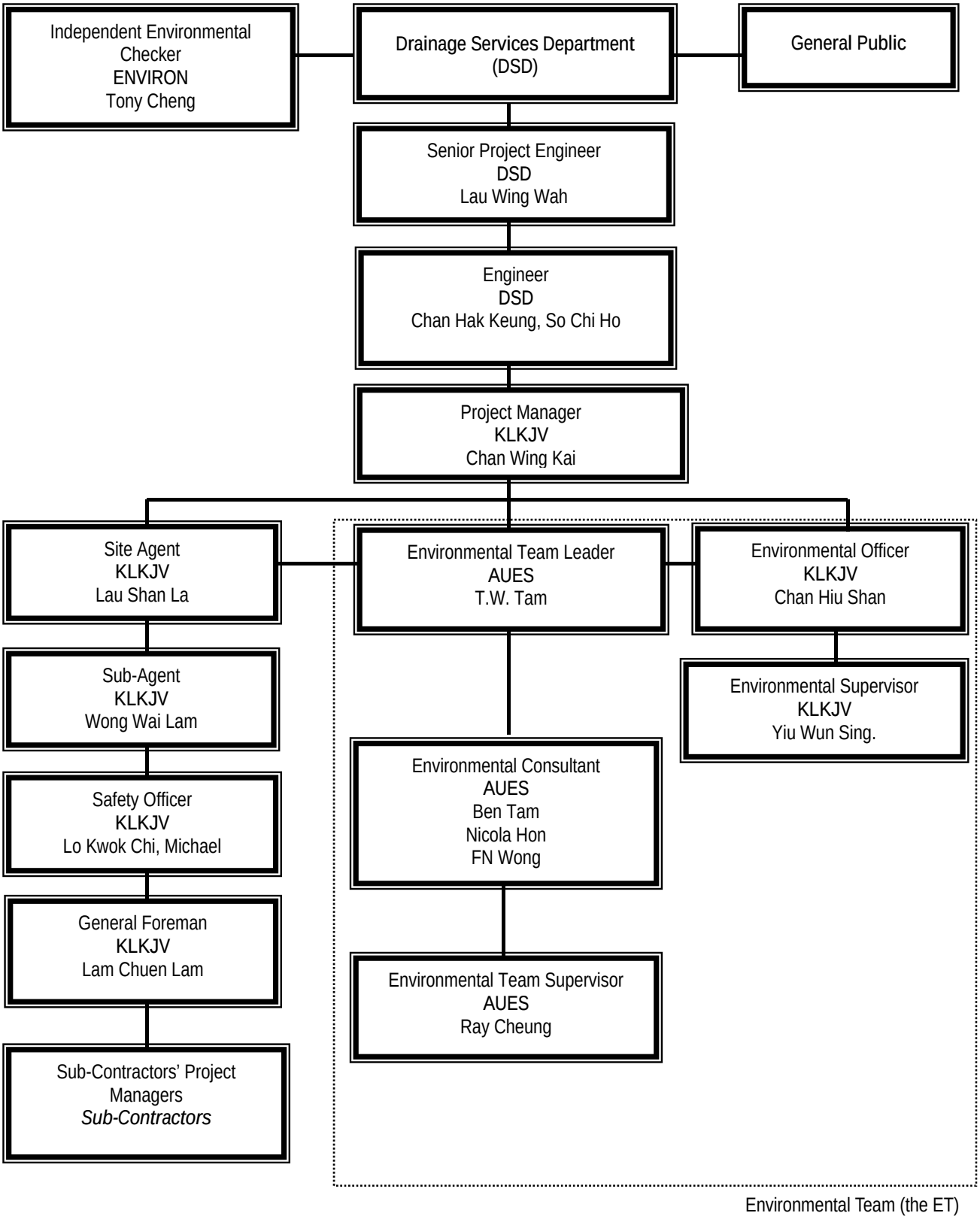
Site Location Plan
(DSD Contract 1 and Contract 2 at Shuen Wan)



Site Location Plan of DSD Contract 1 and Contract at Shuen Wan

Appendix B

Organization Chart and the Key Contact Person



Environmental Management Organization

Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
DSD	Employer	Mr. Luk Wai Hung	2594 7400	2827 8700
DSD	Senior Engineer	Mr. Lau Wing Wah	2594 7402	2827 8700
DSD	Engineer	Mr. Chan Hak Keung	2594 7596	2827 8700
DSD	Engineer	Mr. So Chi Ho	2594 7356	2827 8700
DSD	Senior Inspector	Mr. Tso Si On	6778 2708	2827 8700
ENVIRON	Independent Environmental Checker	Mr. Tong Cheng	3743-0788	3548-6988
KLKJV	Project Director	Mr. Poon Chi Yeung Francis	2674 3888	2674 9988
KLKJV	Project Manager	Mr. Chan Wing Kai	2674 3888	2674 9988
KLKJV	Site Agent	Mr. Lau Shan La	2674 3888	2674 9988
KLKJV	Sub- Agent	Mr. Wong Wai Lam,	2674 3888	2674 9988
KLKJV	Technical Manager	Mr. Yeung Tai Yung	9674 9712	2674 9988
KLKJV	Site Forman	Mr. Lam Chuen Lam	2674 3888	2674 9988
KLKJV	Environmental Officer	Miss. Chan Hiu Shan	2674 3888	2674 9988
KLKJV	Environmental Supervisor	Mr. Yiu Wun Sing	2674 3888	2674 9988
AUES	Environmental Team Leader	Mr. T.W. Tam	2959-6059	2959-6079
AUES	Senior Environmental Consultant	Mr. Wong Fu Nam	2959-6059	2959-6079
AUES	Environmental Consultant	Miss. Nicola Hon	2959-6059	2959-6079
AUES	Environmental Consultant	Mr. Ben Tam	2959-6059	2959-6079
AUES	Environmental Team Supervisor	Mr. Ray Cheung	2959-6059	2959-6079

Legends:

DSD *(Employer) – Drainage Services Department*

DSD *(Engineer) – Drainage Services Department*

KLKJV *(Main Contractor) – Kwan Lee-Kuly Joint Venture*

ENVIRON *(IEC) – ENVIRON Hong Kong Limited*

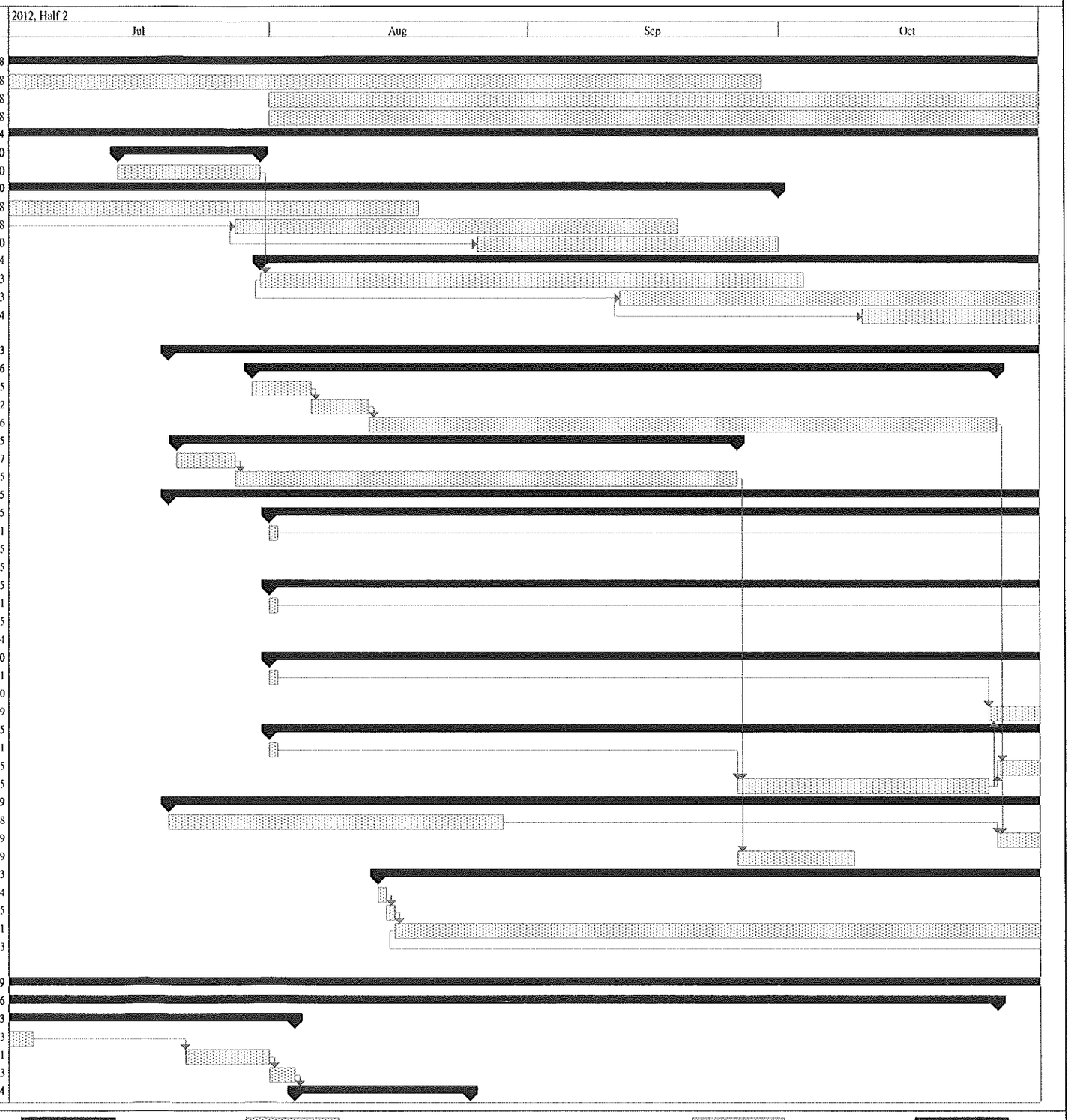
AUES *(ET) – Action-United Environmental Services & Consulting*

Appendix C

Master and Three Months Rolling Construction Programs

Contract No.: DC/2010/02
Contract Title: Drainage Improvement Works in Shuen Wan and Shek Wu Wai
Rolling Programme (Aug 2012 to Oct 2012)

ID	Task Name	Duration	Start	Finish
1				
2	**Section I (Construction Works in Shuen Wan)**	**197 days**	**2012 June 15**	**2012 December 28**
3	CLP's overhead pole diversion (Bay 1 to Bay 15)	90 days	2012 July 1	2012 September 28
4	Relocation/ diversion of light post (near Bay 13)	150 days	2012 August 1	2012 December 28
5	Relocation/ diversion of light post (near Bay 32)	150 days	2012 August 1	2012 December 28
6	**Construction of Single Cell (approx. 724m)**	**153 days**	**2012 June 15**	**2012 November 14**
7	**from CH480 to CH541 (Bay 35,36,37,38,39) in progress**	**17 days**	**2012 July 14**	**2012 July 30**
8	Backfill	17 days	2012 July 14	2012 July 30
9	**from CH541 to CH589 (Bay 40,41,42,43)**	**108 days**	**2012 June 15**	**2012 September 30**
10	Excavation, sheetpile, lateral support, geotextile, rockfill & blinding	65 days	2012 June 15	2012 August 18
11	Box culvert	53 days	2012 July 28	2012 September 18
12	Backfill	36 days	2012 August 26	2012 September 30
13	**from CH674 to CH732 (Bay 52,53,54,55)**	**107 days**	**2012 July 31**	**2012 November 14**
14	Excavation, sheetpile, lateral support, geotextile, rockfill & blinding	65 days	2012 July 31	2012 October 3
15	Box culvert	53 days	2012 September 12	2012 November 3
16	Backfill	35 days	2012 October 11	2012 November 14
17				
18	**Section II (Construction Works in Shek Wu Wai)**	**219 days**	**2012 July 20**	**2013 February 23**
19	**Construction of RW1 wing wall portion**	**89 days**	**2012 July 30**	**2012 October 26**
20	CLP (overhead pole) - cable laying	7 days	2012 July 30	2012 August 5
21	CLP (overhead pole) - changing over & removal of overhead pole	7 days	2012 August 6	2012 August 12
22	Retaining wall RW1 - wing wall portion	75 days	2012 August 13	2012 October 26
23	**Construction of RW2 (wing wall)**	**67 days**	**2012 July 21**	**2012 September 25**
24	PCCW - demolition of existing joint box/ cable drawpit	7 days	2012 July 21	2012 July 27
25	Retaining wall RW2 (wing wall)	60 days	2012 July 28	2012 September 25
26	**Utilities Diversion by UU**	**180 days**	**2012 July 20**	**2013 January 15**
27	**CLP (2no. 11kV cables)**	**168 days**	**2012 August 1**	**2013 January 15**
28	CLP (2 no. 11kV cables) - XP application	1 day	2012 August 1	2012 August 1
29	CLP (2 no. 11kV cables) - ducting & cable works (near RW1)	21 days	2012 December 26	2013 January 15
30	CLP (2 no. 11kV cables) - ducting & cable works (near RW2)	21 days	2012 November 25	2012 December 15
31	**NWT**	**147 days**	**2012 August 1**	**2012 December 25**
32	NWT - XP application	1 day	2012 August 1	2012 August 1
33	NWT - manholes & ducting construction works (near RW1)	15 days	2012 December 11	2012 December 25
34	NWT - manholes & ducting construction works (near RW2)	15 days	2012 November 10	2012 November 24
35	**HGC**	**132 days**	**2012 August 1**	**2012 December 10**
36	HGC - XP application	1 day	2012 August 1	2012 August 1
37	HGC - manholes & ducting construction works (near RW1)	15 days	2012 November 26	2012 December 10
38	HGC - manholes & ducting construction works (near RW2)	15 days	2012 October 26	2012 November 9
39	**PCCW**	**117 days**	**2012 August 1**	**2012 November 25**
40	PCCW - XP application	1 day	2012 August 1	2012 August 1
41	PCCW - manholes & ducting construction works (near RW1)	30 days	2012 October 27	2012 November 25
42	PCCW - manholes & ducting construction works (near RW2)	30 days	2012 September 26	2012 October 25
43	**WSD**	**113 days**	**2012 July 20**	**2012 November 9**
44	WSD - material delivery	40 days	2012 July 20	2012 August 28
45	WSD - pipes frabrication, installation & laying (near RW1)	14 days	2012 October 27	2012 November 9
46	WSD - pipes frabrication, installation & laying (near RW2)	14 days	2012 September 26	2012 October 9
47	**Retaining Wall RW1 & Access Ramp**	**194 days**	**2012 August 14**	**2013 February 23**
48	Coordination with RMO & TD to finalize the implementation date of TTA at S	1 day	2012 August 14	2012 August 14
49	Implementation of TTA at San Tin Tsuen Road	1 day	2012 August 15	2012 August 15
50	Construction of RW1	180 days	2012 August 16	2013 February 11
51	Construction of access ramp	102 days	2012 November 14	2013 February 23
52				
53	**Section III (Construction Works in Wai Ha Village)**	**162 days**	**2012 June 1**	**2012 November 9**
54	**Construction of Box Culvert (approx. 200m) Bay 1 to Bay 16**	**148 days**	**2012 June 1**	**2012 October 26**
55	**Bay 13**	**64 days**	**2012 June 1**	**2012 August 3**
56	Excavation, sheetpile, lateral support, geotextile, rockfill & blinding	33 days	2012 June 1	2012 July 3
57	Box culvert	10 days	2012 July 22	2012 July 31
58	Backfill	3 days	2012 August 1	2012 August 3
59	**Bay 12**	**21 days**	**2012 August 4**	**2012 August 24**

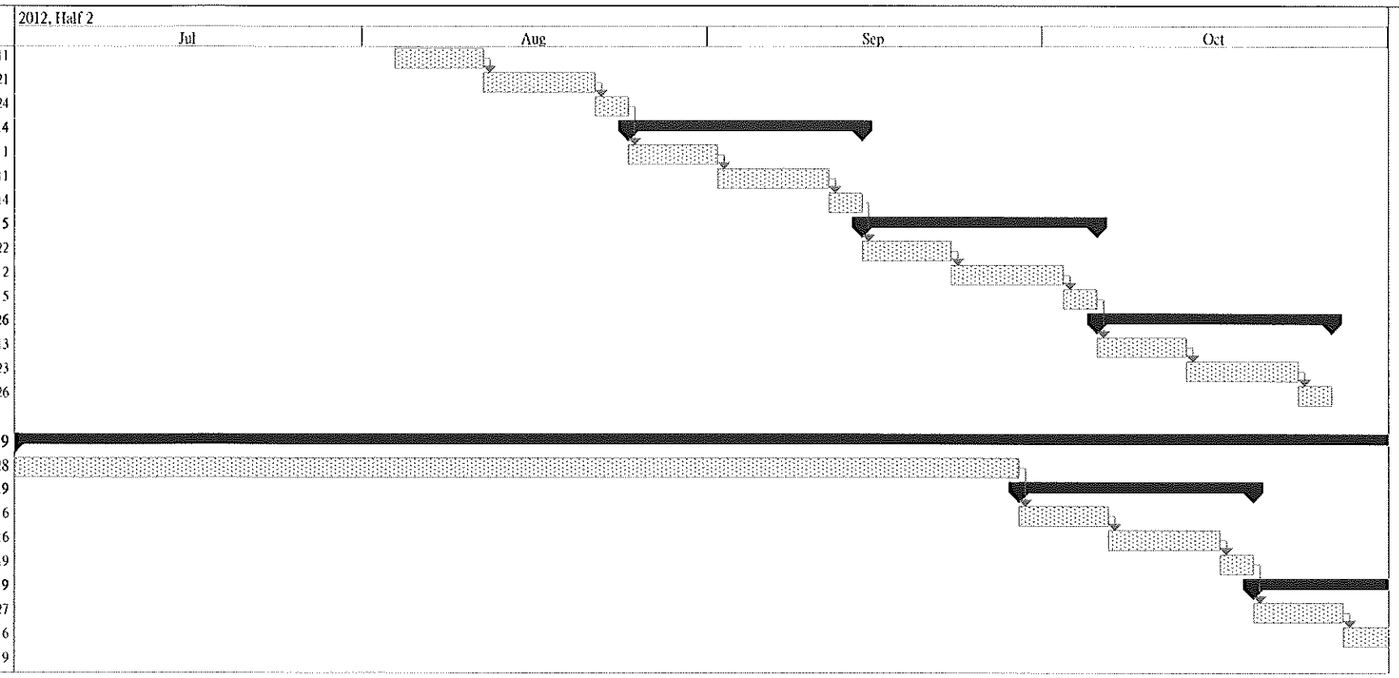


Data Date: 25 July 2012
Printed on : 25 July 2012

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

Contract No.: DC/2010/02
Contract Title: Drainage Improvement Works in Shuen Wan and Shek Wu Wai
Rolling Programme (Aug 2012 to Oct 2012)

ID	Task Name	Duration	Start	Finish
60	Excavation, sheetpile, lateral support, geotextile, rockfill & blinding	8 days	2012 August 4	2012 August 11
61	Box culvert	10 days	2012 August 12	2012 August 21
62	Backfill	3 days	2012 August 22	2012 August 24
63	**Bay 11**	**21 days**	**2012 August 25**	**2012 September 14**
64	Excavation, sheetpile, lateral support, geotextile, rockfill & blinding	8 days	2012 August 25	2012 September 1
65	Box culvert	10 days	2012 September 2	2012 September 11
66	Backfill	3 days	2012 September 12	2012 September 14
67	**Bay 10**	**21 days**	**2012 September 15**	**2012 October 5**
68	Excavation, sheetpile, lateral support, geotextile, rockfill & blinding	8 days	2012 September 15	2012 September 22
69	Box culvert	10 days	2012 September 23	2012 October 2
70	Backfill	3 days	2012 October 3	2012 October 5
71	**Bay 9**	**21 days**	**2012 October 6**	**2012 October 26**
72	Excavation, sheetpile, lateral support, geotextile, rockfill & blinding	8 days	2012 October 6	2012 October 13
73	Box culvert	10 days	2012 October 14	2012 October 23
74	Backfill	3 days	2012 October 24	2012 October 26
75				
76	**Construction of box culvert (1m x 1m) Bay 1 to Bay 8 (approx. 95m)**	**132 days**	**2012 July 1**	**2012 November 9**
77	Notification to villagers regarding traffic arrangement for construction of 1m x	90 days	2012 July 1	2012 September 28
78	**Bay 1**	**21 days**	**2012 September 29**	**2012 October 19**
79	Excavation, sheetpile, lateral support, geotxtile, rockfill & blinding	8 days	2012 September 29	2012 October 6
80	Box culvert	10 days	2012 October 7	2012 October 16
81	Backfill	3 days	2012 October 17	2012 October 19
82	**Bay 2**	**21 days**	**2012 October 20**	**2012 November 9**
83	Excavation, sheetpile, lateral support, geotxtile, rockfill & blinding	8 days	2012 October 20	2012 October 27
84	Box culvert	10 days	2012 October 28	2012 November 6
85	Backfill	3 days	2012 November 7	2012 November 9



Data Date: 25 July 2012
Printed on : 25 July 2012

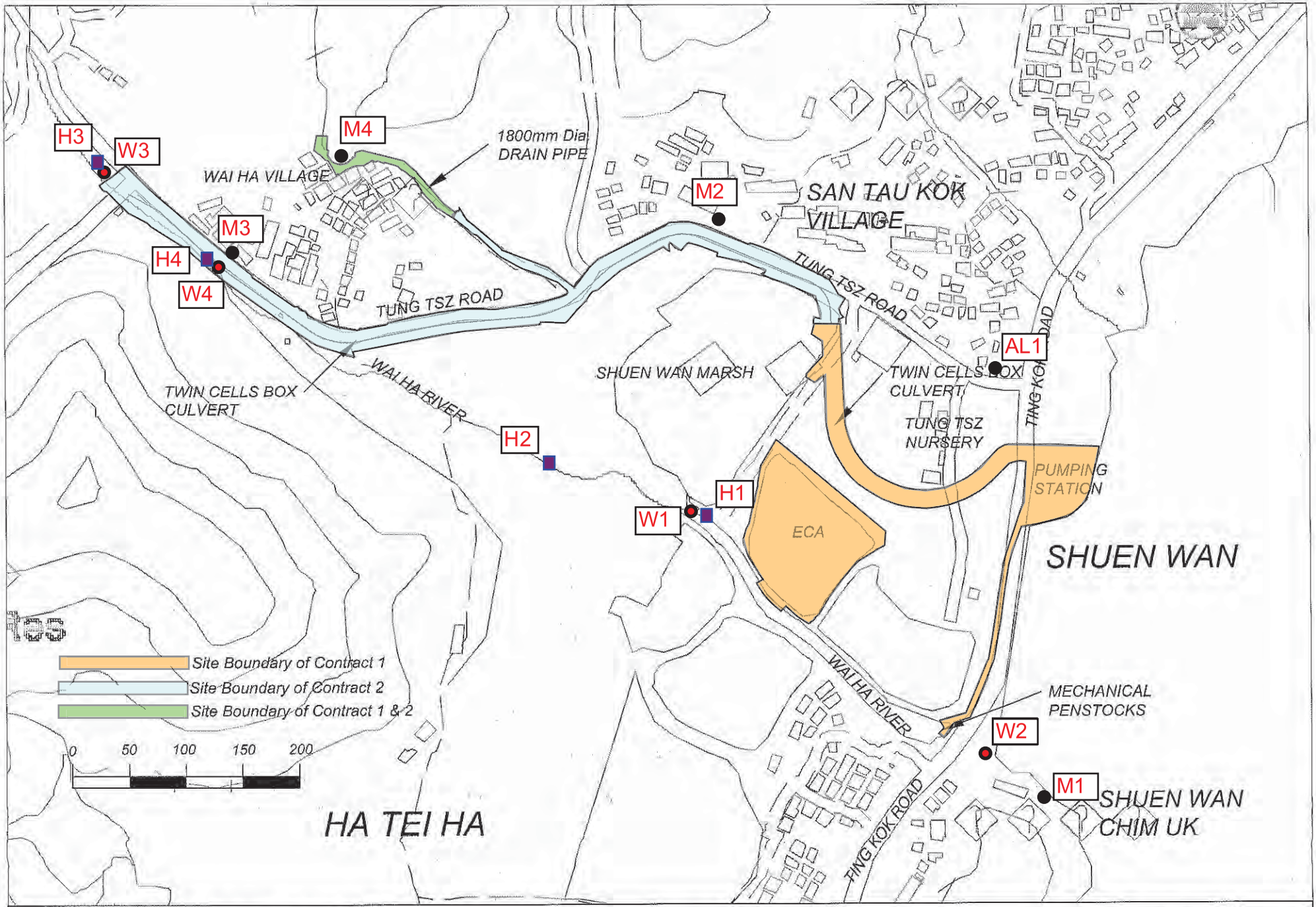
Task | Progress | Summary | Rolled Up Critical Task | Rolled Up Progress | External Tasks | Group By Summary
Critical Task | Milestone | Rolled Up Task | Rolled Up Milestone | Split | Project Summary | Deadline

Construction of Box Culvert

Scale 1:1500

Appendix D

Environmental Monitoring Locations



All Environmental Monitoring Locations

Appendix E

Calibration certificates of the monitoring equipment and Certificate of ALS Technichem (HK) Pty Ltd

Equipment Calibration List

Items	Aspect	Description of Equipment	Date of Calibration	Date of Next Calibration
1	Noise	Bruel & Kjaer Integrating Sound Level Meter (Serial No. 2285721)	20 Apr 12	20 Apr 13
2		Bruel & Kjaer Acoustical Calibrator (Serial No. 2713428)	20 Apr 12	20 Apr 13
3	Water	YSI Sonde (Serial No. 02J0912/ 02K0788 AA)	27 Apr 12	27 Jul 12
4*		YSI 550A DO meter (Serial No. 05F2063AZ)	23 July 12	23 Oct 12
5*		HACH Turbidmeter 2100Q (Serial No. 11030C008499)	13 Jul 12	13 Oct 12
6*		YSI pH10N (Serial No.JC002589)	14 Jun 12	14 Sep 12

Note: *Calibration certificates will only be provided when monitoring equipment is re-calibrated or new.

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR RAY CHEUNG	**WORK ORDER:**	HK1219057
CLIENT:	ACTION UNITED ENVIRO SERVICES	**LABORATORY:**	HONG KONG
ADDRESS:	RM A 20/F., GOLDEN KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG.	**DATE RECEIVED:**	18/07/2012
		DATE OF ISSUE:	25/07/2012
PROJECT:	--		

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	Dissolved Oxygen & Temperature
Description:	DO Meter
Brand Name:	YSI
Model No.:	550A
Serial No.:	05F2063AZ
Equipment No.:	--
Date of Calibration:	23 July, 2012

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: HONG KONG

Address

ALS Technichem (HK) Pty Ltd

11/F Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung
HONG KONG

Phone: 852-2610 1044
Fax: 852-2610 2021
Email: hongkong@alsglobal.com

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1219057
Date of Issue: 25/07/2012
Client: ACTION UNITED ENVIRO SERVICES

Description: DO Meter
Brand Name: YSI
Model No.: 550A
Serial No.: 05F2063AZ
Equipment No.: --
Date of Calibration: 23 July, 2012 Date of next Calibration: 23 October, 2012

Parameters:

Dissolved Oxygen **Method Ref: APHA (21st edition), 4500O: G**

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
2.71	2.56	-0.15
6.02	5.87	-0.15
7.50	7.34	-0.16
	Tolerance Limit (±mg/L)	0.20

Temperature **Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.**

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)
11.0	9.7	-1.3
21.0	19.6	-1.4
42.0	40.8	-1.2
	Tolerance Limit (°C)	2.0

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR RAY CHEUNG	**WORK ORDER:**	HK1218502
CLIENT:	ACTION UNITED ENVIRO SERVICES	**LABORATORY:**	HONG KONG
ADDRESS:	RM A 20/F., GOLDEN KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG.	**DATE RECEIVED:**	12/07/2012
		DATE OF ISSUE:	17/07/2012
PROJECT:	--		

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	Turbidity
Description:	Turbidimeter
Brand Name:	HACH
Model No.:	2100Q
Serial No.:	11030C008499
Equipment No.:	--
Date of Calibration:	13 July, 2012

NOTES

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Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: HONG KONG

Address

ALS Technichem (HK) Pty Ltd

11/F Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung
HONG KONG

Phone: 852-2610 1044
Fax: 852-2610 2021
Email: hongkong@alsglobal.com

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1218502
Date of Issue: 17/07/2012
Client: ACTION UNITED ENVIRO SERVICES

Description: Turbidimeter
Brand Name: HACH
Model No.: 2100Q
Serial No.: 11030C008499
Equipment No.: --
Date of Calibration: 13 July, 2012 Date of next Calibration: 13 October, 2012

Parameters:

Turbidity

Method Ref: ALPHA 21st Ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.23	--
4	4.36	9.00
40	37.9	-5.25
80	75.3	-5.88
400	386	-3.50
800	790	-1.25
	Tolerance Limit (±%)	10.0

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR RAY CHEUNG	**WORK ORDER:**	HK1215228
CLIENT:	ACTION UNITED ENVIRO SERVICES	**LABORATORY:**	HONG KONG
ADDRESS:	RM A 20/F., GOLDEN KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG.	**DATE RECEIVED:**	11/06/2012
		DATE OF ISSUE:	22/06/2012
PROJECT:	--		

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	pH
Description:	pH Meter
Brand Name:	YSI
Model No.:	pH10N
Serial No.:	JC002589
Equipment No.:	--
Date of Calibration:	14 June, 2012

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: HONG KONG

Address

ALS Technichem (HK) Pty Ltd

11/F Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung
HONG KONG

Phone: 852-2610 1044
Fax: 852-2610 2021
Email: hongkong@alsglobal.com

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1215228
Date of Issue: 22/06/2012
Client: ACTION UNITED ENVIRO SERVICES

Description: pH Meter
Brand Name: YSI
Model No.: pH10N
Serial No.: JC002589
Equipment No.: --
Date of Calibration: 14 June, 2012 Date of next Calibration: 14 September, 2012

Parameters:

pH Value

Method Ref: APHA (21st edition), 4500H:B

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.07	0.07
7.0	7.01	0.01
10.0	10.06	0.06
	Tolerance Limit (±unit)	0.20

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

Appendix F

Event and Action Plan

Event Action Plan for Construction Noise

EVENT	ACTION			
	ET Leader	IEC	ER	Contractor
Action Level	1. Notify IEC and Contractor 2. Carry out investigation. 3. Report the results of investigation to the IEC, ER and Contractor. 4. Discuss with the Contractor and formulate remedial measures 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analyzed results submitted by the ET. 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly 3. Supervise the implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose 'remedial measures for the analyzed noise problem 4. Check remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC 2. Implement noise mitigation proposals
Limit Level	1. Notify IEC, ER, EPD and Contractor 2. Identify source. 3. Repeat measurements to confirm findings 4. Increase monitoring frequency. 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions 2. Review Contractor's' remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly 3. Supervise the implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analyzed noise problem 4. Check remedial measures properly implemented. 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to IEC within 3 working days of notification 3. Implement the agreed proposals 4. Resubmit proposals if problem still not under control 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Event and action Plan for Water Quality

Event	ET Leader	IEC	ER	Contractor
ACTION LEVEL				
Action level being exceeded by one sampling day	1. Repeat in-situ measurements to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform IEC, Contractor and Engineer; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, Engineer and Contractor; 6. Ensure mitigation measures are implemented. 7. Repeat measurement on next day of exceedance.	1. Discuss mitigation measures with ET, Engineer and Contractor; 2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; 3. Assess effectiveness of implemented mitigation measures.	1. Discuss proposed mitigation measures with IEC, ET and Contractor; 2. Make agreement on mitigation measures to be implemented; 3. Assess effectiveness of implemented mitigation measures.	1. Inform Engineer and confirm in writing notification of the non-compliance; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes in working methods; 5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days; 6. Implement agreed mitigation measures.
Action level being exceeded by more than two consecutive sampling days	1. Repeat in-situ measurements to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform IEC, Contractor and Engineer; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, Engineer and Contractor; 6. Ensure mitigation measures are implemented. 7. Prepare to increase the monitoring frequency to daily; 8. Repeat measurement on next day of exeedance.	1. Discuss mitigation measures with ET, Engineer and Contractor; 2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; 3. Assess effectiveness of implemented mitigation measures.	1. Discuss proposed mitigation measures with IEC, ET and Contractor; 2. Make agreement on mitigation measures to be implemented; 3. Assess effectiveness of implemented mitigation measures.	1. Inform Engineer and confirm in writing notification of the non-compliance; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes in working methods; 5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days; 6. Implement agreed mitigation measures
LIMIT LEVEL				
Limit level being exceeded by one sampling day	1. Repeat in-situ measurements to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform EPD, IEC, Contractor and Engineer; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, Engineer and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level.	1. Discuss mitigation measures with ET, Engineer and Contractor; 2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; 3. Assess effectiveness of implemented mitigation measures.	1. Discuss proposed mitigation measures with IEC, ET and Contractor; 2. Request Contractor to critically review the working methods; 3. Make agreement on mitigation measures to be implemented; 4. Assess effectiveness of implemented mitigation measures.	1. Inform Engineer and confirm in writing notification of the non-compliance; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes in working methods; 5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days; 6. Implement agreed mitigation measures.
Limit level being exceeded by more than two consecutive sampling days	1. Repeat in-situ measurements to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform EPD, IEC, Contractor and Engineer; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, Engineer and Contractor; 6. Ensure mitigation measures are implemented. 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	1. Discuss mitigation measures with ET, Engineer and Contractor; 2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; 3. Assess effectiveness of implemented mitigation measures.	1. Discuss proposed mitigation measures with IEC, ET and Contractor; 2. Request Contractor to critically review the working methods; 3. Make agreement on mitigation measures to be implemented; 4. Assess effectiveness of implemented mitigation measures; 5. Consider and if necessary instruct Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit Level.	1. Inform Engineer and confirm in writing notification of the non-compliance; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes in working methods; 5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days; 6. Implement agreed mitigation measures; 7. As directed by the Engineer, slow down or stop all or part of the construction activities until no exceedance of Limit level.

Event and action Plan for Hydrological Characteristics

Event	ET Leader	IEC	ER	Contractor
ACTION LEVEL				
Action level being exceeded by one sampling day	1. Repeat in-situ measurements to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform IEC, Contractor and Engineer; 4. Check monitoring data, Contractor's working methods and any excavation works or dewatering processes; 5. Discuss mitigation measures with IEC, Engineer and Contractor; 6. Ensure mitigation measures are implemented. 7. Repeat measurement on next day of exceedance.	1. Discuss mitigation measures with ET, Engineer and Contractor; 2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; 3. Assess effectiveness of implemented mitigation measures.	1. Discuss proposed mitigation measures with IEC, ET and Contractor; 2. Make agreement on mitigation measures to be implemented; 3. Assess effectiveness of implemented mitigation measures.	1. Inform Engineer and confirm in writing notification of the non-compliance; 2. Rectify unacceptable practice; 3. Check working methods and any excavation works or dewatering processes; 4. Consider changes in working methods and plans; 5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days; 6. Implement agreed mitigation measures.
Action level being exceeded by more than two consecutive sampling days	1. Repeat in-situ measurements to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform IEC, Contractor and Engineer; 4. Check monitoring data, Contractor's working methods and any excavation works or dewatering processes; 5. Discuss mitigation measures with IEC, Engineer and Contractor; 6. Ensure mitigation measures are implemented. 7. Prepare to increase the monitoring frequency to daily; 8. Repeat measurement on next day of exeedance.	1. Discuss mitigation measures with ET, Engineer and Contractor; 2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; 3. Assess effectiveness of implemented mitigation measures.	1. Discuss proposed mitigation measures with IEC, ET and Contractor; 2. Make agreement on mitigation measures to be implemented; 3. Assess effectiveness of implemented mitigation measures.	1. Inform Engineer and confirm in writing notification of the non-compliance; 2. Rectify unacceptable practice; 3. Check working methods and any excavation works or dewatering processes; 4. Consider changes in working methods and plans; 5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days; 6. Implement agreed mitigation measures
LIMIT LEVEL				
Limit level being exceeded by one sampling day	1. Repeat in-situ measurements to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform AFCD, IEC, Contractor and Engineer; 4. Check monitoring data, and Contractor's working methods and any excavation works or dewatering processes; 5. Discuss mitigation measures with IEC, Engineer and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level.	1. Discuss mitigation measures with ET, Engineer and Contractor; 2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; 3. Assess effectiveness of implemented mitigation measures.	1. Discuss proposed mitigation measures with IEC, ET and Contractor; 2. Request Contractor to critically review the working methods; 3. Make agreement on mitigation measures to be implemented; 4. Assess effectiveness of implemented mitigation measures.	1. Inform Engineer and confirm in writing notification of the non-compliance; 2. Rectify unacceptable practice; 3. Check working methods and any excavation works or dewatering processes; 4. Consider changes in working methods and plans; 5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days; 6. Implement agreed mitigation measures.
Limit level being exceeded by more than two consecutive sampling days	1. Repeat in-situ measurements to confirm findings; 2. Identify reasons for non-compliance and source(s) of impact; 3. Inform AFCD, IEC, Contractor and Engineer; 4. Check monitoring data and Contractor's working methods and any excavation works or dewatering processes; 5. Discuss mitigation measures with IEC, Engineer and Contractor; 6. Ensure mitigation measures are implemented. 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	1. Discuss mitigation measures with ET, Engineer and Contractor; 2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; 3. Assess effectiveness of implemented mitigation measures.	1. Discuss proposed mitigation measures with IEC, ET and Contractor; 2. Request Contractor to critically review the working methods; 3. Make agreement on mitigation measures to be implemented; 4. Assess effectiveness of implemented mitigation measures; 5. Consider and if necessary instruct Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit Level.	1. Inform Engineer and confirm in writing notification of the non-compliance; 2. Rectify unacceptable practice; 3. Check working methods and any excavation works or dewatering processes; 4. Consider changes in working methods and plans; 5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days; 6. Implement agreed mitigation measures; 7. As directed by the Engineer, slow down or stop all or part of the construction activities until no exceedance of Limit level.

Appendix G

Monitoring Schedule in Reporting Period and the Coming Month

Monitoring Schedule in this Reporting Period – July 2012

Date		Stream Monitoring		Noise Monitoring
		Water Sampling	Flow Monitoring	
Sun	1-July-12			
Mon	2-July-12			
Tue	3-July-12	**W1, W2, W3, W4**		
Wed	4-July-12			
Thu	5-July-12	**W1, W2, W3, W4**		**M1, AL1**
Fri	6-July-12			
Sat	7-July-12	**W1, W2, W3, W4**	**H1, H2, H3, H4**	**M2, M3, M4**
Sun	8-July-12			
Mon	9-July-12	**W1, W2, W3, W4**		
Tue	10-July-12			
Wed	11-July-12	**W1, W2, W3, W4**		**M1, AL1**
Thu	12-July-12			
Fri	13-July-12	**W1, W2, W3, W4**	**H1, H2, H3, H4**	**M2, M3, M4**
Sat	14-July-12			
Sun	15-July-12			
Mon	16-July-12	**W1, W2, W3, W4**		**M2, M3, M4**
Tue	17-July-12			
Wed	18-July-12	**W1, W2, W3, W4**		**M1, AL1**
Thu	19-July-12			
Fri	20-July-12	**W1, W2, W3, W4**	**H1, H2, H3, H4**	
Sat	21-July-12			
Sun	22-July-12			
Mon	23-July-12	**W1, W2, W3, W4**		
Tue	24-July-12			
Wed	25-July-12	**W1, W2, W3, W4**		**M1, AL1,M2, M3, M4**
Thu	26-July-12			
Fri	27-July-12	**W1, W2, W3, W4**	**H1, H2, H3, H4**	
Sat	28-July-12			
Sun	29-July-12			
Mon	30-July-12	**W1, W2, W3, W4**		
Tue	31-July-12			

	Monitoring Day
	Sunday or Public Holiday

Monitoring Schedule for next Reporting Period – August 2012

Date		Stream Monitoring		Noise Monitoring
		Water Sampling	Flow Monitoring	
Wed	1-Aug-12	W1, W2, W3, W4		
Thu	2-Aug-12			
Fri	3-Aug-12	W1, W2, W3, W4	H1, H2, H3, H4	M1, AL1,M2, M3, M4
Sat	4-Aug-12			
Sun	5-Aug-12			
Mon	6-Aug-12	W1, W2, W3, W4		M1, AL1,M2, M3, M4
Tue	7-Aug-12			
Wed	8-Aug-12	W1, W2, W3, W4		
Thu	9-Aug-12			
Fri	10-Aug-12	W1, W2, W3, W4	H1, H2, H3, H4	
Sat	11-Aug-12			
Sun	12-Aug-12			
Mon	13-Aug-12	W1, W2, W3, W4		M1, AL1,M2, M3, M4
Tue	14-Aug-12			
Wed	15-Aug-12	W1, W2, W3, W4		
Thu	16-Aug-12			
Fri	17-Aug-12	W1, W2, W3, W4	H1, H2, H3, H4	
Sat	18-Aug-12			
Sun	19-Aug-12			
Mon	20-Aug-12	W1, W2, W3, W4		
Tue	21-Aug-12			
Wed	22-Aug-12	W1, W2, W3, W4		
Thu	23-Aug-12			
Fri	24-Aug-12	W1, W2, W3, W4	H1, H2, H3, H4	M1, AL1,M2, M3, M4
Sat	25-Aug-12			
Sun	26-Aug-12			
Mon	27-Aug-12	W1, W2, W3, W4		M1, AL1,M2, M3, M4
Tue	28-Aug-12			
Wed	29-Aug-12	W1, W2, W3, W4		
Thu	30-Aug-12			
Fri	31-Aug-12	W1, W2, W3, W4	H1, H2, H3, H4	

	Monitoring Day
	Sunday or Public Holiday

Appendix H

Meteorological Data of Reporting Period

Meteorological Data in Reporting Period

Date		Weather	Total Rainfall (mm)	Tai Po Station		Shatin Station	
				Mean Air Temp. (°C)	Mean Relative Humidity (%)	Wind Speed (km/h)	Wind Direction
1-Jul-12	Sun	HOLIDAY					
2-Jul-12	Mon	HOLIDAY					
3-Jul-12	Tue	Moderate southwesterly winds.	0	29	75.5	7.7	E/SE
4-Jul-12	Wed	Mainly fine.	0	28.8	76.7	8.4	E/SE
5-Jul-12	Thu	Very hot in the afternoon.	22	27.2	85	7.6	E/SE
6-Jul-12	Fri	Moderate south to southwesterly winds.	0.8	28	83	9.1	E/SE
7-Jul-12	Sat	Very hot during the day	2.7	28.6	81.7	11	S/SE
8-Jul-12	Sun	Mainly fine.	0.4	28.7	80.5	12.1	S/SE
9-Jul-12	Mon	Mainly fine and very hot	Trace	29.8	72	9	SW
10-Jul-12	Tue	Fine and very hot apart from one or two isolated showers at first.	Trace	30	73.7	10.5	S/SW
11-Jul-12	Wed	Very hot in the afternoon.	Trace	29.8	75	16.1	S/SW
12-Jul-12	Thu	Mainly cloudy with a few showers.	1.3	29.7	72.5	13.9	S/SW
13-Jul-12	Fri	Hot with sunny intervals	9	28.7	82.2	12.2	S/SW
14-Jul-12	Sat	Moderate southwesterly winds, fresh offshore.	7	28.9	80	15	S/SW
15-Jul-12	Sun	Mainly fine and very hot.	2.1	30.7	70.5	17.6	SW
16-Jul-12	Mon	Mainly fine and very hot.	18.1	29.8	76.7	15.1	S/SW
17-Jul-12	Tue	Moderate south to southwesterly winds.	1	29.3	80.5	13.2	SW
18-Jul-12	Wed	Sunny periods in the afternoon.	34.3	27.9	85.7	10.3	SW
19-Jul-12	Thu	Mainly cloudy with a few showers.	Trace	29.4	80.5	8.2	S/SW
20-Jul-12	Fri	Mainly fine and very hot.	4.2	29.7	76	7.2	S/SW
21-Jul-12	Sat	The Strong Wind Signal, No. 1	2.2	30.2	85.2	8.4	N/NE
22-Jul-12	Sun	The Strong Wind Signal, No. 1	1	28.1	82.2	13.1	N/NE
23-Jul-12	Mon	The Strong Wind Signal, No. 3	112	26.6	85	20.5	N/NE
24-Jul-12	Tue	The Strong Wind Signal, No. 3	99.5	26.2	91.7	29.7	SE
25-Jul-12	Wed	Moderate east to southeasterly winds.	82.3	25.3	92	15	S/SE
26-Jul-12	Thu	Cloudy with scattered showers and a few squally thunderstorms.	28.1	24.6	96.5	6.4	N/NE
27-Jul-12	Fri	Light winds.	25.7	25.4	95	7.2	N/NE
28-Jul-12	Sat	Light winds.	Trace	26.7	85.7	8	N/NE
29-Jul-12	Sun	Isolated showers in the afternoon	0	27.9	76.5	10.9	S/SW
30-Jul-12	Mon	fine and very hot.	0	29.4	69	8.2	S/SW
31-Jul-12	Tue	Amber Rainstorm Warning Signal	9.5	28.9	72.5	11.9	S/SW

** The record was downloaded from The Hong Kong Observatory Weather Stations*

Appendix I

Data Base of Monitoring Results

Construction Noise Measurement Data

Designated Monitoring Station – M1 (14, Shuen Wan Chim Uk)

Date	Start Time	1st Leq_{5min}	2nd Leq_{5min}	3rd Leq_{5min}	4th Leq_{5min}	5th Leq_{5min}	6th Leq_{5min}	Leq_{30min*}
5-Jul-12	13:10	-	-	-	-	-	-	62.3
11-Jul-12	10:45	-	-	-	-	-	-	60.7
18-Jul-12	11:00							64.4
25-Jul-12	11:45	-	-	-	-	-	-	62.1
Limit Level		-						**> 75 dB(A)**

(*)The monitoring is undertaken under façade situation. No façade correction is added according to acoustical principles and EPD guidelines.

Designated Monitoring Station – AL1 (Joint Village Office for Villages in Shuen Wan, Tai PO)

Date	Start Time	1st Leq5min	2nd Leq5min	3rd Leq5min	4th Leq5min	5th Leq5min	6th Leq5min	Leq30min*
5-Jul-12	13:50	-	-	-	-	-	-	62.6
11-Jul-12	11:25							64.2
18-Jul-12	11:35	-	-	-	-	-	-	67.2
25-Jul-12	13:10	-	-	-	-	-	-	68.2
Limit Level		-						**> 75 dB(A)**

(*)The monitoring is undertaken under façade situation. No façade correction is added according to acoustical principles and EPD guidelines.

Designated Monitoring Station - M2 (150, San Tau Kok)

Date	Start Time	1st Leq_{5min}	2nd Leq_{5min}	3rd Leq_{5min}	4th Leq_{5min}	5th Leq_{5min}	6th Leq_{5min}	Leq_{30min}	Corrected* Leq_{30min}
7-Jul-12	13:25	59.9	59.8	63.2	59.7	61.5	59.6	60.8	63.8
13-Jul-12	10:33	63.7	66.5	65.4	62.5	64.9	65.0	64.8	67.8
16-Jul-12	11:30	64.3	62.7	62.8	56.2	65.7	61.1	63.0	66.0
25-Jul-12	9:50	64.3	63.6	56.5	59.1	61.1	56.4	61.2	64.2
Limit Level		-						**> 75 dB(A)**	

(*) A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines.

Designated Monitoring Station – M3 (31,Wai Ha)

Date	Start Time	1st Leq_{5min}	2nd Leq_{5min}	3rd Leq_{5min}	4th Leq_{5min}	5th Leq_{5min}	6th Leq_{5min}	Leq_{30min}	Corrected* Leq_{30min}
7-Jul-12	11:20	58.5	71.4	50.6	53.3	55.1	66.9	65.2	68.2
13-Jul-12	10:35	66.9	66.7	60.8	61.9	65.4	63.4	64.8	67.8
16-Jul-12	10:54	63.0	60.4	61.8	62.9	65.1	64.0	63.1	66.1
25-Jul-12	9:54	64.2	75.2	65.7	63.7	62.8	60.8	68.7	71.7
Limit Level		-						**> 75 dB(A)**	

(*) A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines.

Designated Monitoring Station – M4 (Block 15, Treasure Spot Garden)

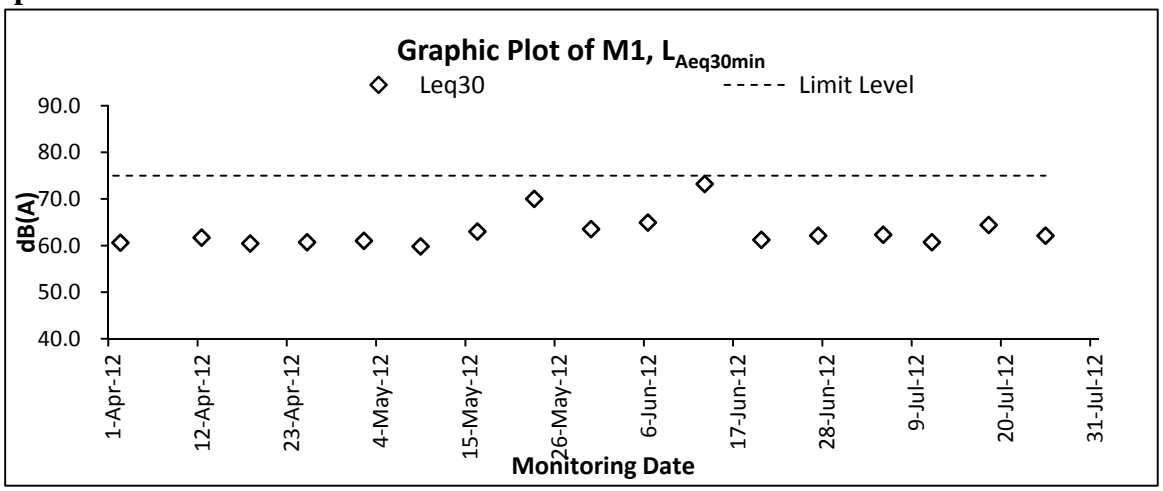
Date	Start Time	1st Leq_{5min}	2nd Leq_{5min}	3rd Leq_{5min}	4th Leq_{5min}	5th Leq_{5min}	6th Leq_{5min}	Leq_{30min}	Corrected* Leq_{30min}
7-Jul-12	13:00	55.5	54.3	53.6	53.8	54.9	53.8	54.4	57.4
13-Jul-12	10:35	57.2	56.1	60.9	55.9	56.2	54.8	57.4	60.4
16-Jul-12	11:30	55.9	53.4	53.0	51.5	54.7	61.1	56.3	59.3
25-Jul-12	10:20	57.4	59.0	62.0	59.6	59.8	62.4	60.4	63.4
Limit Level		-						**> 75 dB(A)**	

(*) A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines.

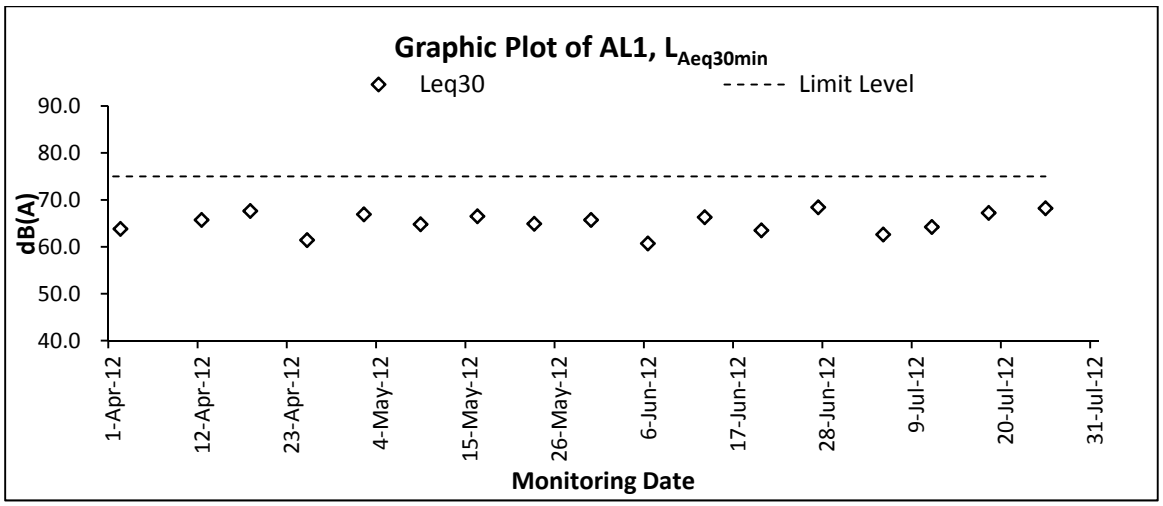
Appendix J

Graphical Plots of Impact Monitoring – Noise, Water Quality and Hydrological Characteristics

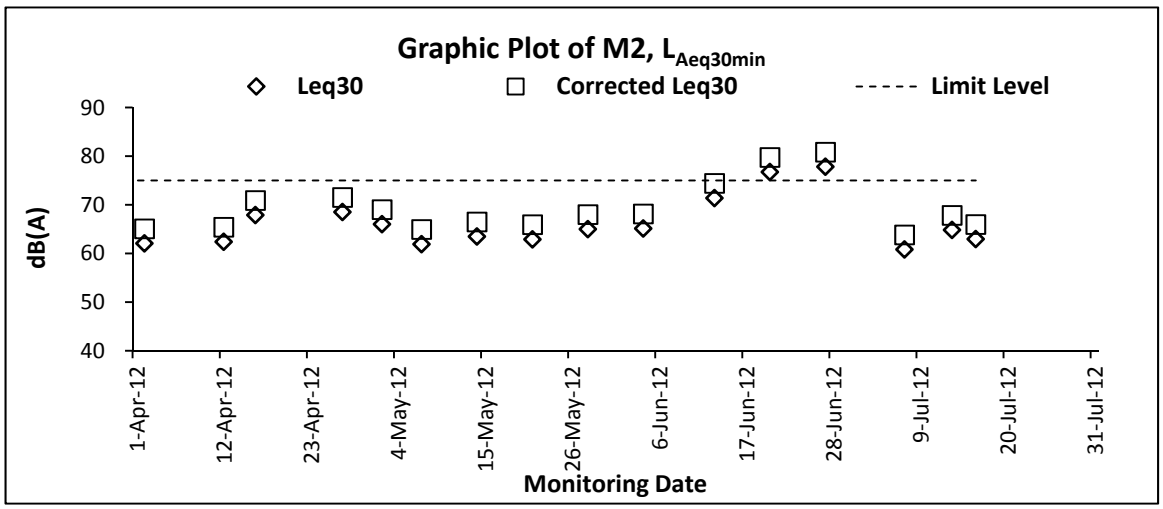
Graphic Plot – Construction Noise



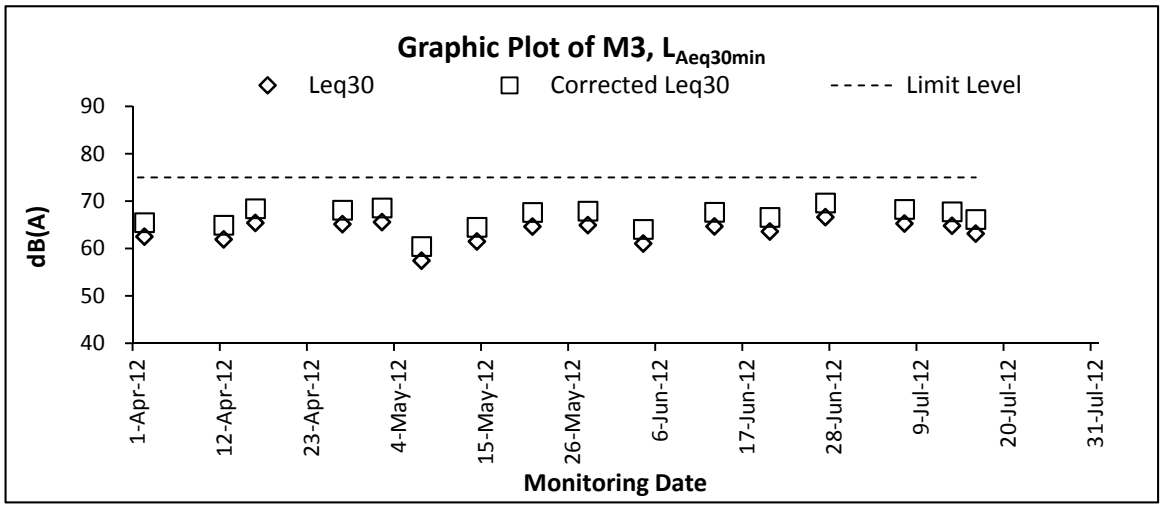
Remark: The monitoring is undertaken under façade situation. No façade correction is added according to acoustical principles and EPD guidelines.



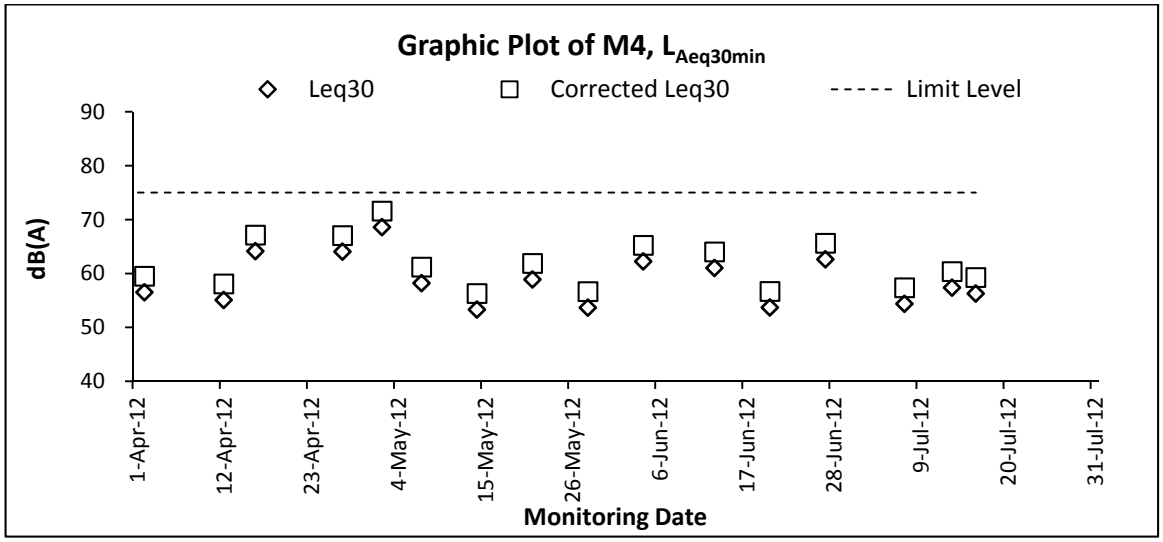
Remark: The monitoring is undertaken under façade situation. No façade correction is added according to acoustical principles and EPD guidelines.



Remark: The monitoring is undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines.

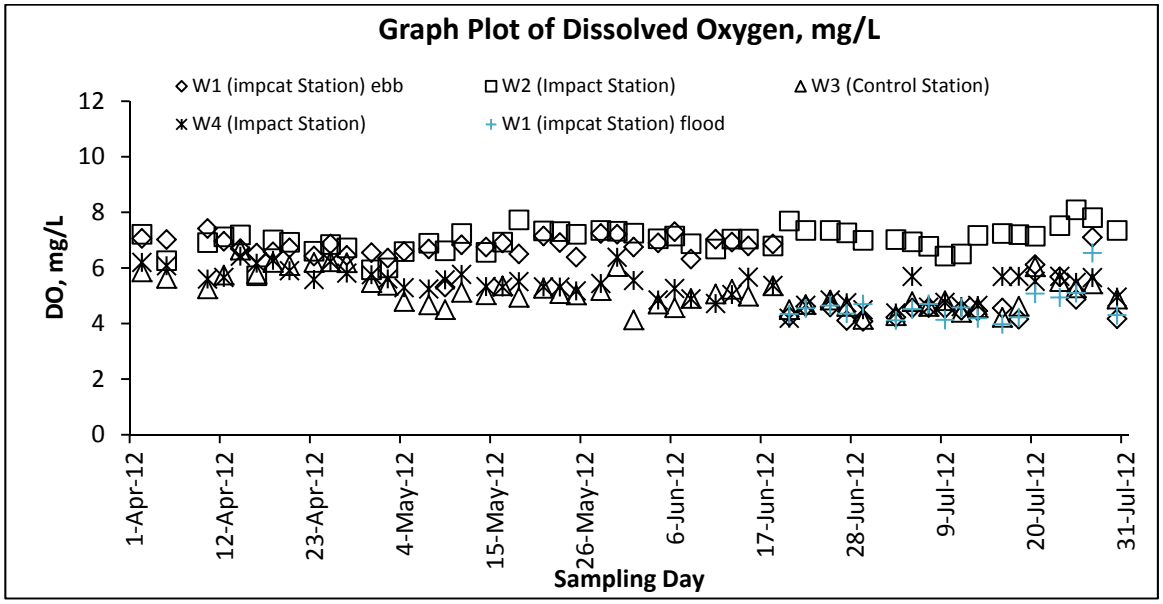


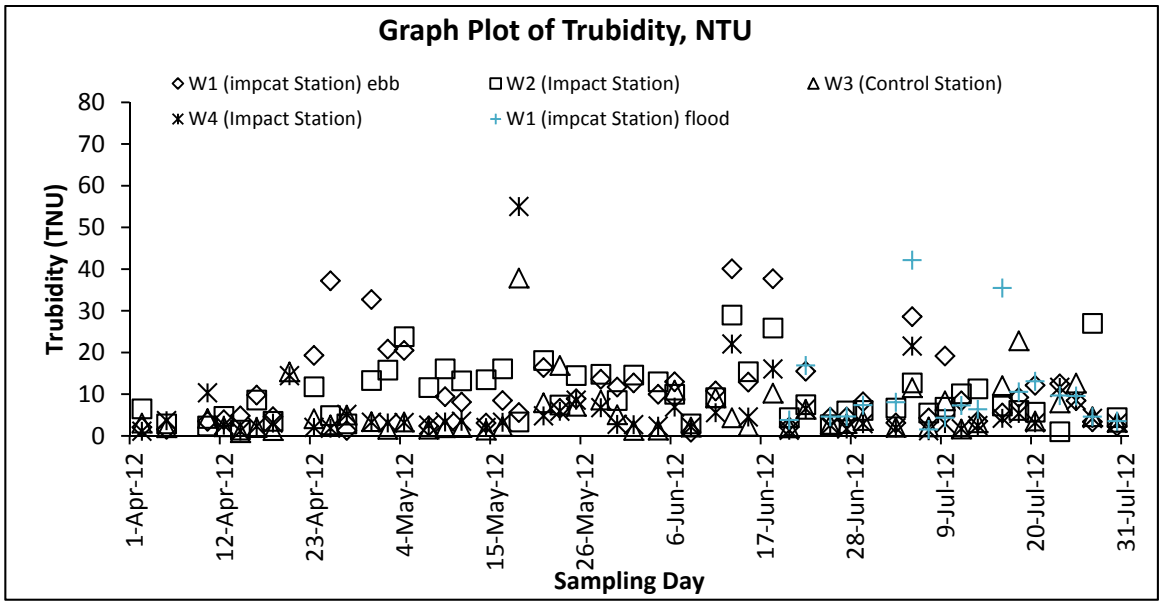
Remark: The monitoring is undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines

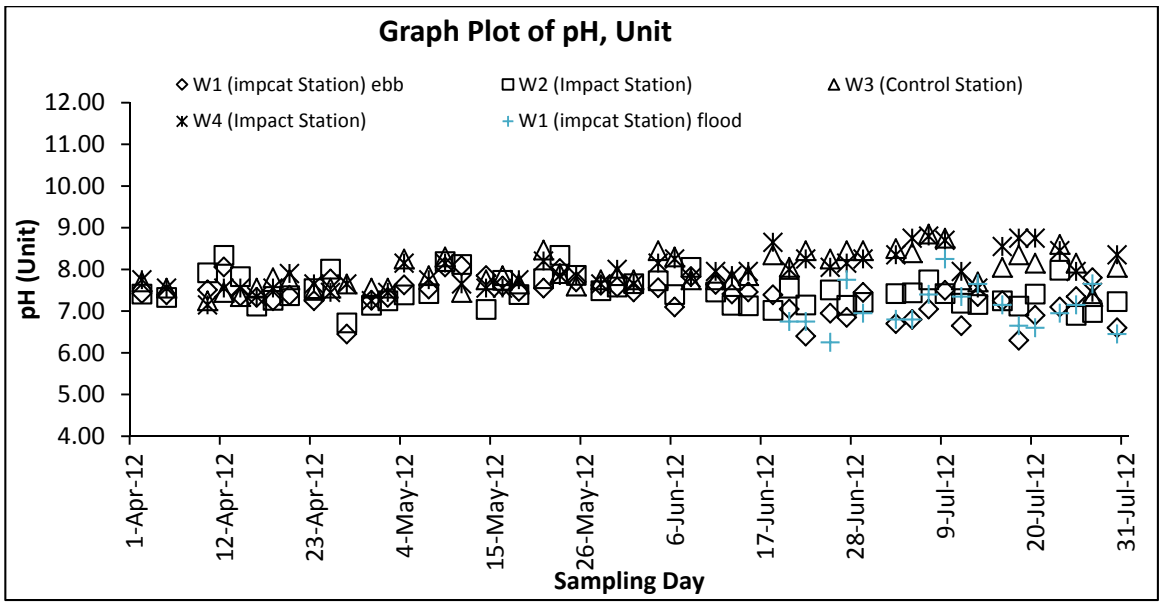


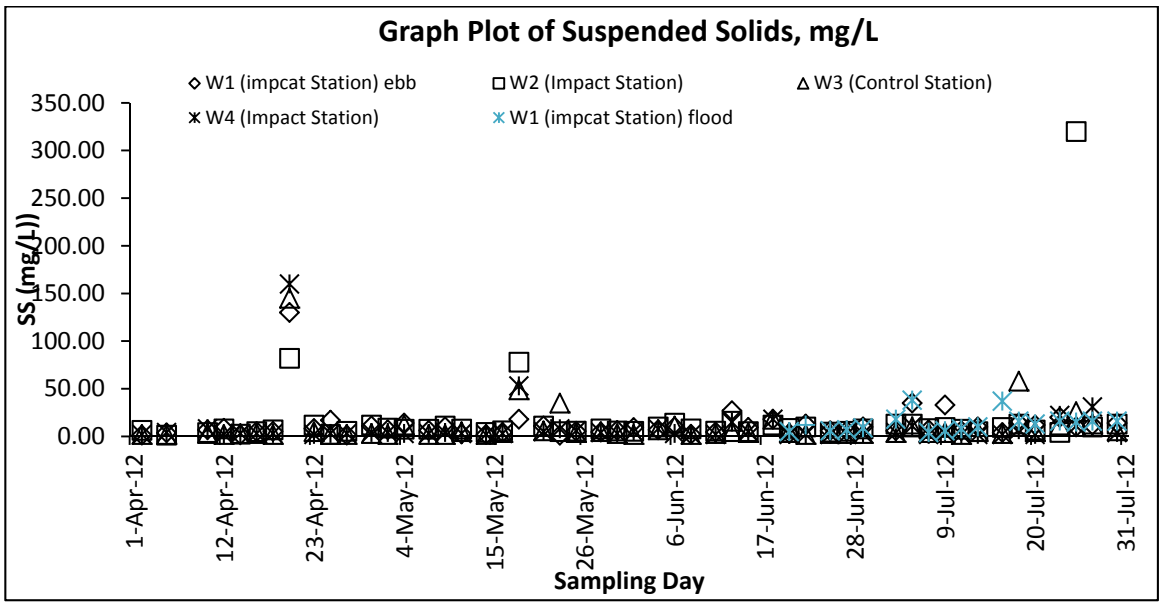
Remark: The monitoring is undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines

Graphic Plot – Water Quality

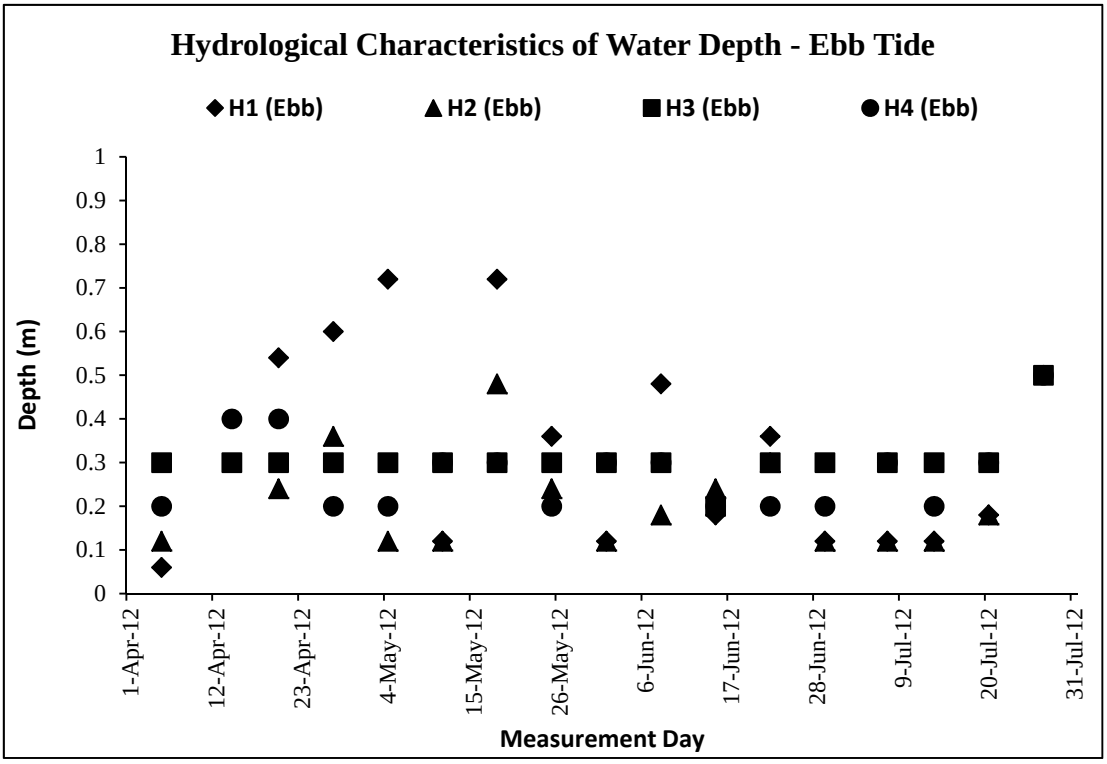


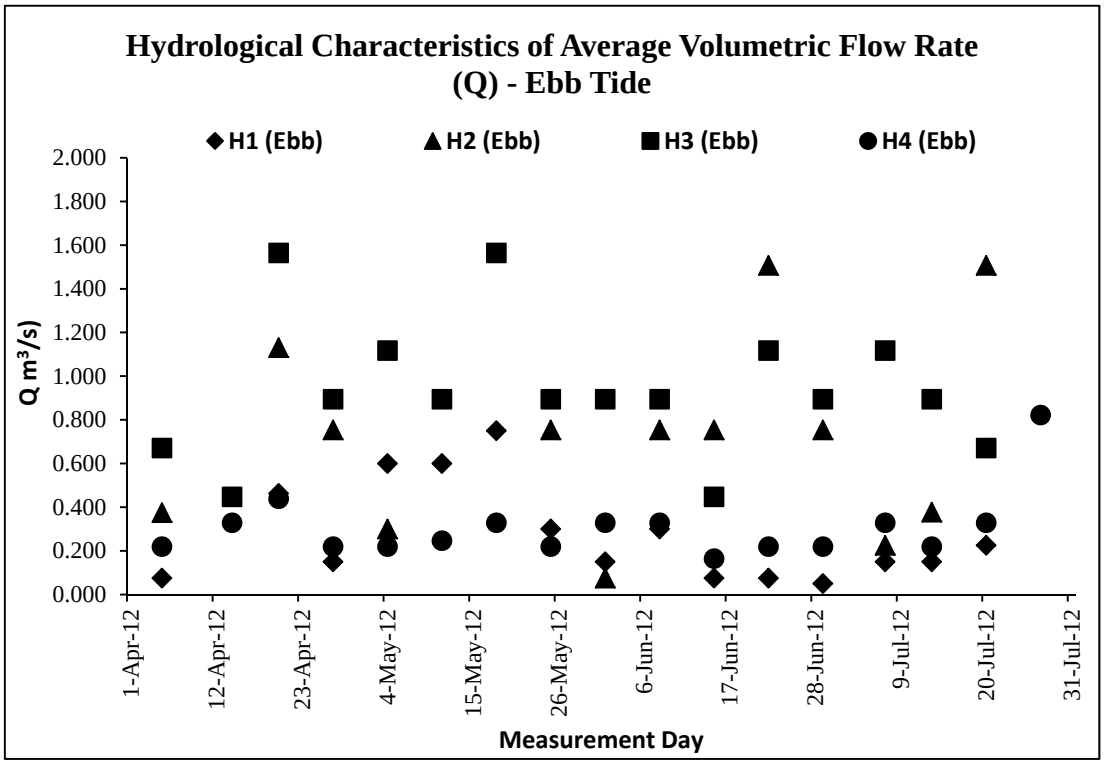




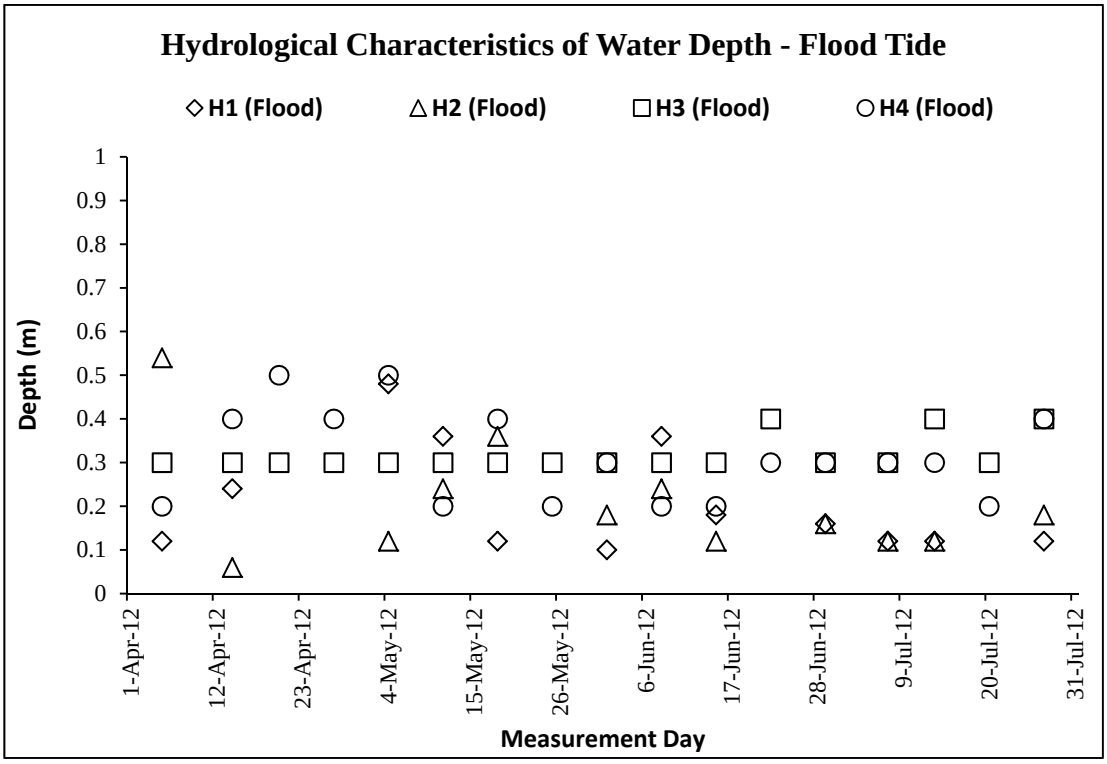

Graph Plot of Suspended Solids, mg/L
W1 (impcat Station) ebb
W2 (Impact Station)
W3 (Control Station)
W4 (Impact Station)
W1 (impcat Station) flood
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
SS (mg/L))
1-Apr-12
12-Apr-12
23-Apr-12
4-May-12
15-May-12
26-May-12
6-Jun-12
17-Jun-12
28-Jun-12
9-Jul-12
20-Jul-12
31-Jul-12
Sampling Day

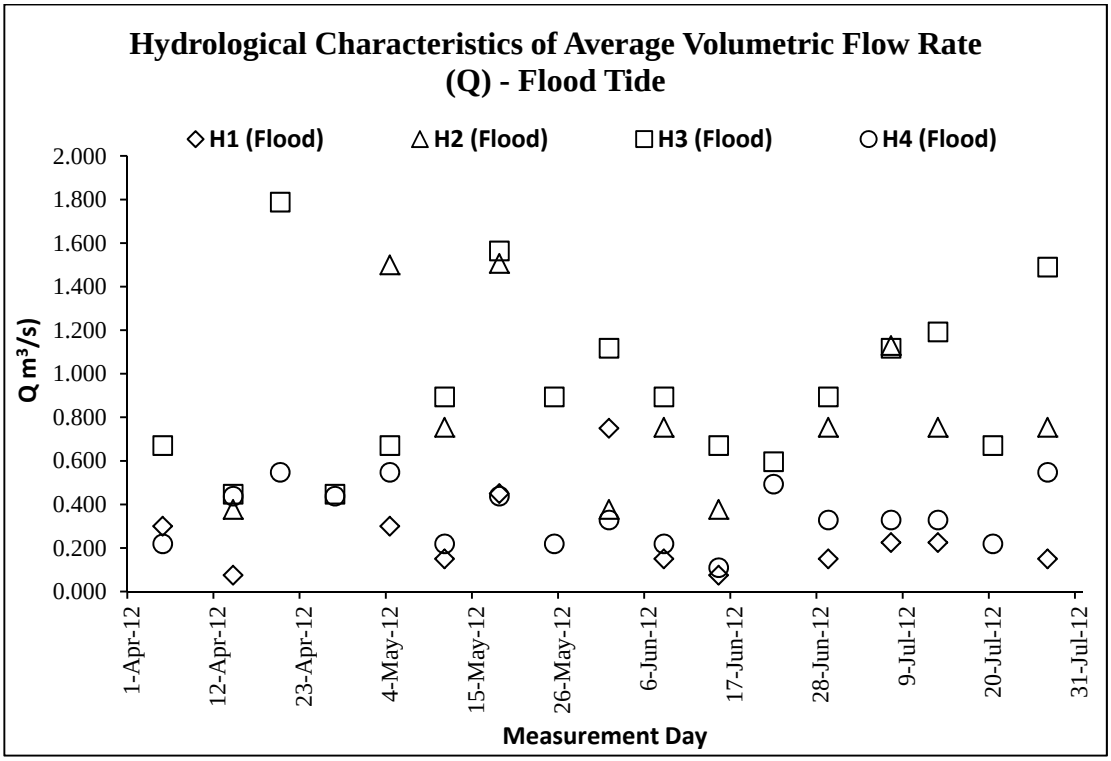
Graphic Plot – Hydrological Characteristics (Water Depth)





Graphic Plot – Hydrological Characteristics (Water Flow Rate)





Appendix K

Monthly Summary Waste Flow Table

Name of Department: DSD Contract No.: DC/2010/02

Monthly Summary Waste Flow Table for 2011 to 2012 (Year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Apr 2011	Nil	0	0	0	0	0	0	0	0	0	0
May 2011	Nil	0	0	0	0	0	0	0	0	0	0
June 2011	Nil	0	0	0	0	0	0	0	0	0	0
July 2011	Nil	0	0	0	0	0	0	0	0	0	0
Aug 2011	0.7855	0	0	0.7855	0	0	0	0	0	0	0
Sept 2011	Nil	0	0	0	0	0	0	0	0	0	0
Oct 2011	Nil	0	0	0	0	0	0	0	0	0	0.02
Nov 2011	Nil	0	0	0	0	0	0	0	0	0	0.045
Dec 2011	0.08	0	0	0	0.08	0	0	0	0	0	0
Jan 2012	Nil	0	0	0	0	0	0	0	0	0	0.01
Feb 2012	0.01	0	0	0	0.01	0	0	0	0	0	0.03
Mar 2012	0.405	0	0	0	0.405	0	0	0	0	0	0
Apr 2012	0.005	0	0	0	0.005	0	0	0	0	0	0
May 2012	0.165	0	0	0	0.165	0	0	0	0	0	0
June 2012	0.145	0	0	0	0.145	0	0	0	0	0	0.035
July 2012	0.005	0	0	0	0.005	0	0	0	0	0	0.005
Aug 2012											
Sept 2012											
Oct 2012											
Nov 2012											
Dec 2012											
Total	**1.6005**	**0**	**0**	**0.7855**	**0.815**	**0**	**0**	**0**	**0**	**0**	**0.145**

Forecast of Total Quantities of C&D Materials to be Generated from the Contract*										
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
23	1	10	0	10	2	5	2	1	1	3

Notes:

(1) The performance targets are given in ETWB Technical Circular PS Clause 6(14).
(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material
(4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m3. (ETWB Technical Circular PS Clause 5(4)(b) refers). [Delete Note (4) and the table above on the forecast, where inapplicable].

Summary Table for Work Processes or Activities Requiring Timber for Temporary Works

Contract No. : DC/2010/02

Contract Title : Drainage Improvement Works in Shuen Wan and Shek Wu Wai

Item No.	Description of Works Process or Activity [see note (a) below]	Justifications for Using Timber in Temporary Construction Works	Est. Quantities of Timber Used (m3)	Actual Quantities used (m3)	Remarks
1.	Formwork for concreting	Easy handle by manpower	1.1	1.13	
2.					
3.					
4.					
5.					
6.					
7.					
8.					
		Total Estimated Quantity of Timber Used	1.1		

Notes:

a. The Contractor shall list out all the work items requiring timber for use in temporary construction works. Several minor work items may be grouped into one for ease of updating.

b. The summary table shall be submitted to the *Architect/Engineer's Representative monthly together with the Waste Flow Table for review and monitoring in accordance with the ETWB Technical Circular 19/2005 PS sub-clause 5(5) in Appendix C.

Appendix L

Inspection and Auditing Checklist

Environmental Site Inspection Checklist

Project:	***DSD Contract No. DC/2010/02***	**Inspected by**	**Checklist No.** DC1002-04072012
	Drainage Improvement in Shuen Wan and Shek Wu Wai	**IEC/IEC's Representative:**	Max Lee
		RE/RE's Representative:	Lau Siu Chuen
Inspection:	**Tung Tsz Road, Shuen Wan**	**ETL/ ET's Representative:**	Ben Tam
Date:	4 July 2012	**EO/EO's Representative:**	Chan Hiu Shan
Time:	10:15	**Contractor's Representative:**	Chan Hiu Shan

PART A: **GENERAL INFORMATION** **Environmental Permit No.**

Weather: ☑ Sunny ☐ Fine ☐ Cloudy ☐ Rainy ☐ Calm ☑ **EP-303/2008**

Temperature: 29.6 ^{0}C

Humidity: ☐ High ☑ Moderate ☐ Low ☐ N/A

Wind: ☐ Strong ☐ Breeze ☑ Light

Area Inspected

1. Bay 35 - 39
2.
3.

PART B: **SITE AUDIT**

Note: **Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-Up actions **N/A**: Not Applicable		**Not Obs.**	**Yes**	**No**	**Follow Up**	**N/A**	**Photo/ Remarks**
Section 1: Water Quality							
1.01	Is an effluent discharge license obtained for the Project?	☐	☑	☐	☐	☐	
1.02	Is the effluent discharged in accordance with the discharge licence?	☐	☑	☐	☐	☐	
1.03	Is the discharge of turbid water avoided?	☐	☑	☐	☐	☐	
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	☐	☑	☐	☐	☐	
1.05	Are there channels, sandbags or bunds to direct surface run-off to sedimentation tanks?	☑	☐	☐	☐	☐	
1.06	Are there any perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	☐	☑	☐	☐	☐	
1.07	Is drainage system well maintained?	☐	☑	☐	☐	☐	
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	☑	☐	☐	☐	☐	
1.09	Are temporary exposed slopes properly covered?	☐	☑	☐	☐	☐	
1.10	Are earthworks final surfaces well compacted or protected?	☐	☐	☐	☐	☑	
1.11	Are manholes adequately covered or temporarily sealed?	☐	☑	☐	☐	☐	
1.12	Are there any procedures and equipment for rainstorm protection?	☑	☐	☐	☐	☐	
1.13	Are wheel washing facilities well maintained?	☑	☐	☐	☐	☐	
1.14	Is runoff from wheel washing facilities avoided?	☑	☐	☐	☐	☐	
1.15	Are there toilets provided on site?	☐	☑	☐	☐	☐	
1.16	Are toilets properly maintained?	☑	☐	☐	☐	☐	
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	☑	☐	☐	☐	☐	
1.18	Is the oil leakage or spillage avoided?	☑	☐	☐	☐	☐	
1.19	Are there any measures to prevent leaked oil from entering the drainage system?	☑	☐	☐	☐	☐	
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	☑	☐	☐	☐	☐	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	☐	☐	☐	☐	☑	
1.22	Are the oil interceptors/grease traps maintained properly?	☐	☐	☐	☐	☑	

Environmental Site Inspection Checklist

Note:	**Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-Up actions **N/A**: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	☑	☐	☐	☐	☐	
1.24	Designated settlement area for runoff/wheel wash waste is provide and located at the streambed with 1-2m deep, 12m long and around 50m3 capacities for sedimentation.	☐	☐	☐	☐	☑	
1.25	No excavation is undertaken in the settlement area.	☑	☐	☐	☐	☐	
1.26	Concreting wastes water should be neutralized below the pH Action Levels before discharge.	☑	☐	☐	☐	☐	
1.27	Mobile toilets should provide on site and located away the Wai Ha River course.	☐	☑	☐	☐	☐	
1.25	License collector should be employed for handling the sewage of mobile toilet.	☐	☑	☐	☐	☐	
Section 2: Air Quality							
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	☑	☐	☐	☐	☐	
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?	☐	☑	☐	☐	☐	
2.03	Are the excavated materials sprayed with water during handling?	☑	☐	☐	☐	☐	
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?	☐	☐	☐	☑	☐	Remark 1
2.05	Is the exposed earth properly treated within six months after the last construction activities?	☑	☐	☐	☐	☐	
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved?	☐	☐	☐	☑	☐	Remark 1
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?	☐	☐	☐	☐	☑	
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?	☐	☑	☐	☐	☐	
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	☐	☑	☐	☐	☐	
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?	☐	☑	☐	☐	☐	
2.11	Is dark smoke emission from plant/equipment avoided?	☑	☐	☐	☐	☐	
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement?	☐	☐	☐	☐	☑	
2.13	Are site vehicles travelling within the speed limit not more than 15km/hour?	☐	☑	☐	☐	☐	
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?	☐	☑	☐	☐	☐	
2.15	Is open burning avoided?	☑	☐	☐	☐	☐	
2.16	Excavated materials from the stream must remove form site on the same day. The materials shall be stored in covered impermeable skips awaiting removal from site.	☐	☐	☐	☐	☑	
Section 3: Noise							
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?	☐	☑	☐	☐	☐	
3.02	Is silenced equipment adopted?	☐	☑	☐	☐	☐	
3.03	Is idle equipment turned off or throttled down?	☐	☑	☐	☐	☐	
3.04	Are all plant and equipment well maintained and in good condition?	☐	☑	☐	☐	☐	
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	☑	☐	☐	☐	☐	
3.06	Are hand held breakers fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.07	Are air compressors fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.08	Are flaps and panels of mechanical equipment closed during operation?	☑	☐	☐	☐	☐	
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	☐	☐	☐	☐	☑	

Environmental Site Inspection Checklist

Note:	**Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-Up actions **N/A**: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	☐	☐	☐	☐	☑	
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	☑	☐	☐	☐	☐	
3.12	Use of quiet plant had been used on site to minimise the construction noise impact to the surrounding residences/dwellings (Level 1 mitigation measures).	☐	☑	☐	☐	☐	
3.13	Temporary/Moveable noise barrier or site hoarding are provide or erect at the site boundary to minimise the noise impact of the closest NSRs or stationary equipments shield by the noise barrier which cannot visible from NSRs (Level 2 mitigation measure)	☑	☐	☐	☐	☐	
3.14	Temporary/Moveable noise barrier equal to or more than 3m height with 10kg/m2 are provide for noise mitigation measures (Level 2 mitigation measures).	☑	☐	☐	☐	☐	
Section 4: Waste/Chemical Management							
4.01	Waste Management Plan had been submit to Engineer for approval.	☐	☑	☐	☐	☐	
4.02	Are receptacles available for general refuse collection?	☐	☑	☐	☐	☐	
4.03	Is general refuse sorting or recycling implemented?	☑	☐	☐	☐	☐	
4.04	Is general refuse disposed of properly and regularly?	☐	☑	☐	☐	☐	
4.05	Is the Contractor registered as a chemical waste producer?	☐	☑	☐	☐	☐	
4.06	Are the chemical waste containers properly labelled?	☐	☑	☐	☐	☐	
4.07	Are the chemical wastes stored in proper storage areas?	☐	☑	☐	☐	☐	
4.08	Is the chemical waste storage area properly labelled?	☐	☑	☐	☐	☐	
4.09	Is the chemical waste storage area used for storage of chemical waste only?	☐	☑	☐	☐	☐	
4.10	Are incompatible chemical wastes stored in different areas?	☐	☑	☐	☐	☐	
4.11	Are the chemical wastes disposed of by licensed collectors?	☐	☑	☐	☐	☐	
4.12	Are trip tickets for chemical wastes disposal available for inspection?	☐	☑	☐	☐	☐	
4.13	Are chemical/fuel storage areas bunded?	☐	☑	☐	☐	☐	
4.14	Are designated areas identified for storage and sorting of construction wastes?	☑	☐	☐	☐	☐	
4.15	Are construction wastes sorted (inert and non-inert) on site?	☑	☐	☐	☐	☐	
4.16	Are construction wastes reused?	☑	☐	☐	☐	☐	
4.17	Are construction wastes disposed of properly?	☐	☑	☐	☐	☐	
4.18	Are site hoardings and signboards made of durable materials instead of timber?	☐	☑	☐	☐	☐	
4.19	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?	☐	☑	☐	☐	☐	
4.20	Are appropriate procedures followed if contaminated material exists?	☐	☐	☐	☐	☑	
4.21	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	☐	☐	
4.22	Site cleanliness and appropriate waste management training had provided for the site workers.	☐	☑	☐	☐	☐	
4.23	Contaminated sediments will managed according to WBTC No.12/2000 and EWTB TC(W) No. 34/2002.	☐	☐	☐	☐	☑	
Section 5: Landscape & Visual							
5.01	Are retained and transplanted trees in health condition?	☑	☐	☐	☐	☐	
5.02	Are retained and transplanted trees properly protected?	☐	☑	☐	☐	☐	

Environmental Site Inspection Checklist

Note:	**Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-Up actions **N/A**: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
5.03	Are surgery works carried out for the damaged trees?	☑	☐	☐	☐	☐	
5.04	Is damage to trees outside site boundary due to construction activities avoided?	☑	☐	☐	☐	☐	
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	☐	☑	☐	☐	☐	
Section 6: Ecology							
6.01	Gabion banks and base had been provide for channel linings and banks for typical sections of work area?	☐	☐	☐	☐	☑	
6.02	Prevent site effluent/runoff discharge to the seasonal wetlands at Wai Ha River?	☐	☑	☐	☐	☐	
6.03	Stockpiling or disposal of materials, and any dredging or construction activities at the seasonal wetlands at Wai Ha River are prohibited?	☐	☑	☐	☐	☐	
Section 7: Others							
7.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	☐	☑	☐	☐	☐	

Remarks

Follow up of last Site Inspection (27-6-2012):

Nil

Observations recorded in this Site Inspection (4-7-2012):

As a reminder, water spraying should be applied to the haul road and stock pile to minimize dust generation.

IEC's representative	*RE's representative*	*ET's representative*	*EO's representative*	*Contractor's representative*
( )	( )	(Ben Tam)	( )	( )

Environmental Site Inspection Checklist

Project:	***DSD Contract No. DC/2010/02***	**Inspected by**	**Checklist No.** **DC1002-11072012**
	Drainage Improvement in Shuen Wan and Shek Wu Wai	**IEC/IEC's Representative:**	-
		RE/RE's Representative:	Lau Siu Chuen
Inspection:	**Tung Tsz Road, Shuen Wan**	**ETL/ ET's Representative:**	Tony Wong
Date:	11 July 2012	**EO/EO's Representative:**	Chan Hiu Shan
Time:	11:00	**Contractor's Representative:**	Chan Hiu Shan

PART A: **GENERAL INFORMATION** **Environmental Permit No.**

Weather: ☑ Sunny ☐ Fine ☐ Cloudy ☐ Rainy ☐ Calm ☑ **EP-303/2008**

Temperature: 32.6 ^{0}C

Humidity: ☐ High ☑ Moderate ☐ Low ☐ N/A

Wind: ☐ Strong ☐ Breeze ☑ Light

Area Inspected

1. Bay 35 - 41
2.
3.

PART B: **SITE AUDIT**

Note: **Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-Up actions **N/A**: Not Applicable		**Not Obs.**	**Yes**	**No**	**Follow Up**	**N/A**	**Photo/ Remarks**
Section 1: Water Quality							
1.01	Is an effluent discharge license obtained for the Project?	☐	☑	☐	☐	☐	
1.02	Is the effluent discharged in accordance with the discharge licence?	☐	☑	☐	☐	☐	
1.03	Is the discharge of turbid water avoided?	☐	☑	☐	☐	☐	
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	☐	☑	☐	☐	☐	
1.05	Are there channels, sandbags or bunds to direct surface run-off to sedimentation tanks?	☑	☐	☐	☐	☐	
1.06	Are there any perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	☐	☑	☐	☐	☐	
1.07	Is drainage system well maintained?	☐	☑	☐	☐	☐	
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	☑	☐	☐	☐	☐	
1.09	Are temporary exposed slopes properly covered?	☐	☑	☐	☐	☐	
1.10	Are earthworks final surfaces well compacted or protected?	☐	☐	☐	☐	☑	
1.11	Are manholes adequately covered or temporarily sealed?	☐	☑	☐	☐	☐	
1.12	Are there any procedures and equipment for rainstorm protection?	☑	☐	☐	☐	☐	
1.13	Are wheel washing facilities well maintained?	☑	☐	☐	☐	☐	
1.14	Is runoff from wheel washing facilities avoided?	☑	☐	☐	☐	☐	
1.15	Are there toilets provided on site?	☐	☑	☐	☐	☐	
1.16	Are toilets properly maintained?	☑	☐	☐	☐	☐	
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	☑	☐	☐	☐	☐	
1.18	Is the oil leakage or spillage avoided?	☑	☐	☐	☐	☐	
1.19	Are there any measures to prevent leaked oil from entering the drainage system?	☑	☐	☐	☐	☐	
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	☑	☐	☐	☐	☐	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	☐	☐	☐	☐	☑	
1.22	Are the oil interceptors/grease traps maintained properly?	☐	☐	☐	☐	☑	

Environmental Site Inspection Checklist

Note:	**Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-Up actions **N/A**: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	☑	☐	☐	☐	☐	
1.24	Designated settlement area for runoff/wheel wash waste is provide and located at the streambed with 1-2m deep, 12m long and around 50m3 capacities for sedimentation.	☐	☐	☐	☐	☑	
1.25	No excavation is undertaken in the settlement area.	☑	☐	☐	☐	☐	
1.26	Concreting wastes water should be neutralized below the pH Action Levels before discharge.	☑	☐	☐	☐	☐	
1.27	Mobile toilets should provide on site and located away the Wai Ha River course.	☐	☑	☐	☐	☐	
1.25	License collector should be employed for handling the sewage of mobile toilet.	☐	☑	☐	☐	☐	
Section 2: Air Quality							
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	☑	☐	☐	☐	☐	
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?	☐	☑	☐	☐	☐	
2.03	Are the excavated materials sprayed with water during handling?	☑	☐	☐	☐	☐	
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?	☐	☑	☐	☐	☐	
2.05	Is the exposed earth properly treated within six months after the last construction activities?	☑	☐	☐	☐	☐	
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved?	☐	☑	☐	☐	☐	
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?	☐	☐	☐	☐	☑	
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?	☐	☑	☐	☐	☐	
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	☐	☑	☐	☐	☐	
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?	☐	☑	☐	☐	☐	
2.11	Is dark smoke emission from plant/equipment avoided?	☑	☐	☐	☐	☐	
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement?	☐	☐	☐	☐	☑	
2.13	Are site vehicles travelling within the speed limit not more than 15km/hour?	☐	☑	☐	☐	☐	
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?	☐	☑	☐	☐	☐	
2.15	Is open burning avoided?	☑	☐	☐	☐	☐	
2.16	Excavated materials from the stream must remove form site on the same day. The materials shall be stored in covered impermeable skips awaiting removal from site.	☐	☐	☐	☐	☑	
Section 3: Noise							
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?	☐	☑	☐	☐	☐	
3.02	Is silenced equipment adopted?	☐	☑	☐	☐	☐	
3.03	Is idle equipment turned off or throttled down?	☐	☑	☐	☐	☐	
3.04	Are all plant and equipment well maintained and in good condition?	☐	☑	☐	☐	☐	
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	☑	☐	☐	☐	☐	
3.06	Are hand held breakers fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.07	Are air compressors fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.08	Are flaps and panels of mechanical equipment closed during operation?	☑	☐	☐	☐	☐	
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	☐	☐	☐	☐	☑	

Environmental Site Inspection Checklist

Note:	**Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-Up actions **N/A**: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	☐	☐	☐	☐	☑	
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	☑	☐	☐	☐	☐	
3.12	Use of quiet plant had been used on site to minimise the construction noise impact to the surrounding residences/dwellings (Level 1 mitigation measures).	☐	☑	☐	☐	☐	
3.13	Temporary/Moveable noise barrier or site hoarding are provide or erect at the site boundary to minimise the noise impact of the closest NSRs or stationary equipments shield by the noise barrier which cannot visible from NSRs (Level 2 mitigation measure)	☑	☐	☐	☐	☐	
3.14	Temporary/Moveable noise barrier equal to or more than 3m height with 10kg/m2 are provide for noise mitigation measures (Level 2 mitigation measures).	☑	☐	☐	☐	☐	
Section 4: Waste/Chemical Management							
4.01	Waste Management Plan had been submit to Engineer for approval.	☐	☑	☐	☐	☐	
4.02	Are receptacles available for general refuse collection?	☐	☑	☐	☐	☐	
4.03	Is general refuse sorting or recycling implemented?	☑	☐	☐	☐	☐	
4.04	Is general refuse disposed of properly and regularly?	☐	☑	☐	☐	☐	
4.05	Is the Contractor registered as a chemical waste producer?	☐	☑	☐	☐	☐	
4.06	Are the chemical waste containers properly labelled?	☐	☑	☐	☐	☐	
4.07	Are the chemical wastes stored in proper storage areas?	☐	☑	☐	☐	☐	
4.08	Is the chemical waste storage area properly labelled?	☐	☑	☐	☐	☐	
4.09	Is the chemical waste storage area used for storage of chemical waste only?	☐	☑	☐	☐	☐	
4.10	Are incompatible chemical wastes stored in different areas?	☐	☑	☐	☐	☐	
4.11	Are the chemical wastes disposed of by licensed collectors?	☐	☑	☐	☐	☐	
4.12	Are trip tickets for chemical wastes disposal available for inspection?	☐	☑	☐	☐	☐	
4.13	Are chemical/fuel storage areas bunded?	☐	☑	☐	☐	☐	
4.14	Are designated areas identified for storage and sorting of construction wastes?	☑	☐	☐	☐	☐	
4.15	Are construction wastes sorted (inert and non-inert) on site?	☑	☐	☐	☐	☐	
4.16	Are construction wastes reused?	☑	☐	☐	☐	☐	
4.17	Are construction wastes disposed of properly?	☐	☑	☐	☐	☐	
4.18	Are site hoardings and signboards made of durable materials instead of timber?	☐	☑	☐	☐	☐	
4.19	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?	☐	☑	☐	☐	☐	
4.20	Are appropriate procedures followed if contaminated material exists?	☐	☐	☐	☐	☑	
4.21	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	☐	☐	
4.22	Site cleanliness and appropriate waste management training had provided for the site workers.	☐	☑	☐	☐	☐	
4.23	Contaminated sediments will managed according to WBTC No.12/2000 and EWTB TC(W) No. 34/2002.	☐	☐	☐	☐	☑	
Section 5: Landscape & Visual							
5.01	Are retained and transplanted trees in health condition?	☑	☐	☐	☐	☐	
5.02	Are retained and transplanted trees properly protected?	☐	☑	☐	☐	☐	

Environmental Site Inspection Checklist

Note:	**Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-Up actions **N/A**: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
5.03	Are surgery works carried out for the damaged trees?	☑	☐	☐	☐	☐	
5.04	Is damage to trees outside site boundary due to construction activities avoided?	☑	☐	☐	☐	☐	
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	☐	☑	☐	☐	☐	
Section 6: Ecology							
6.01	Gabion banks and base had been provide for channel linings and banks for typical sections of work area?	☐	☐	☐	☐	☑	
6.02	Prevent site effluent/runoff discharge to the seasonal wetlands at Wai Ha River?	☐	☑	☐	☐	☐	
6.03	Stockpiling or disposal of materials, and any dredging or construction activities at the seasonal wetlands at Wai Ha River are prohibited?	☐	☑	☐	☐	☐	
Section 7: Others							
7.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	☐	☑	☐	☐	☐	

Remarks

Follow up of last Site Inspection (4-7-2012):

Water spraying at haul road was observed.

Observations recorded in this Site Inspection (11-7-2012):

No adverse environmental issue was observed during site inspection.

IEC's representative	*RE's representative*	*ET's representative*	*EO's representative*	*Contractor's representative*
( )	( )	(Tony Wong)	( )	( )

Environmental Site Inspection Checklist

Project:	***DSD Contract No. DC/2010/02***	**Inspected by**	**Checklist No.** **DC1002-18072012**
	Drainage Improvement in Shuen Wan and Shek Wu Wai	**IEC/IEC's Representative:**	-
		RE/RE's Representative:	Lau Siu Chuen
Inspection:	**Tung Tsz Road, Shuen Wan**	**ETL/ ET's Representative:**	Tony Wong
Date:	18 July 2012	**EO/EO's Representative:**	Chan Hiu Shan
Time:	11:00	**Contractor's Representative:**	Chan Hiu Shan

PART A: **GENERAL INFORMATION** **Environmental Permit No.**

Weather:	☐ Sunny	☐ Fine	☐ Cloudy	☑ Rainy	☐ Calm	☑ **EP-303/2008**
Temperature:	29.1 ^{0}C					
Humidity:	☑ High	☐ Moderate	☐ Low			☐ N/A
Wind:	☐ Strong	☑ Breeze	☐ Light			

Area Inspected
1. Bay 35 - 41
2.
3.

PART B: **SITE AUDIT**

Note: **Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-Up actions **N/A**: Not Applicable		**Not Obs.**	**Yes**	**No**	**Follow Up**	**N/A**	**Photo/ Remarks**
Section 1: Water Quality							
1.01	Is an effluent discharge license obtained for the Project?	☐	☑	☐	☐	☐	
1.02	Is the effluent discharged in accordance with the discharge licence?	☐	☑	☐	☐	☐	
1.03	Is the discharge of turbid water avoided?	☐	☑	☐	☐	☐	
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	☐	☐	☐	☑	☐	Remark 1
1.05	Are there channels, sandbags or bunds to direct surface run-off to sedimentation tanks?	☑	☐	☐	☐	☐	
1.06	Are there any perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	☐	☑	☐	☐	☐	
1.07	Is drainage system well maintained?	☐	☑	☐	☐	☐	
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	☑	☐	☐	☐	☐	
1.09	Are temporary exposed slopes properly covered?	☐	☑	☐	☐	☐	
1.10	Are earthworks final surfaces well compacted or protected?	☐	☐	☐	☐	☑	
1.11	Are manholes adequately covered or temporarily sealed?	☐	☑	☐	☐	☐	
1.12	Are there any procedures and equipment for rainstorm protection?	☑	☐	☐	☐	☐	
1.13	Are wheel washing facilities well maintained?	☑	☐	☐	☐	☐	
1.14	Is runoff from wheel washing facilities avoided?	☑	☐	☐	☐	☐	
1.15	Are there toilets provided on site?	☐	☑	☐	☐	☐	
1.16	Are toilets properly maintained?	☑	☐	☐	☐	☐	
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	☑	☐	☐	☐	☐	
1.18	Is the oil leakage or spillage avoided?	☑	☐	☐	☐	☐	
1.19	Are there any measures to prevent leaked oil from entering the drainage system?	☑	☐	☐	☐	☐	
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	☑	☐	☐	☐	☐	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	☐	☐	☐	☐	☑	
1.22	Are the oil interceptors/grease traps maintained properly?	☐	☐	☐	☐	☑	

Environmental Site Inspection Checklist

Note:	**Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-Up actions **N/A**: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	☑	☐	☐	☐	☐	
1.24	Designated settlement area for runoff/wheel wash waste is provide and located at the streambed with 1-2m deep, 12m long and around 50m3 capacities for sedimentation.	☐	☐	☐	☐	☑	
1.25	No excavation is undertaken in the settlement area.	☑	☐	☐	☐	☐	
1.26	Concreting wastes water should be neutralized below the pH Action Levels before discharge.	☑	☐	☐	☐	☐	
1.27	Mobile toilets should provide on site and located away the Wai Ha River course.	☐	☑	☐	☐	☐	
1.25	License collector should be employed for handling the sewage of mobile toilet.	☐	☑	☐	☐	☐	
Section 2: Air Quality							
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	☑	☐	☐	☐	☐	
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?	☐	☑	☐	☐	☐	
2.03	Are the excavated materials sprayed with water during handling?	☑	☐	☐	☐	☐	
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?	☐	☑	☐	☐	☐	
2.05	Is the exposed earth properly treated within six months after the last construction activities?	☑	☐	☐	☐	☐	
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved?	☐	☑	☐	☐	☐	
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?	☐	☐	☐	☐	☑	
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?	☐	☑	☐	☐	☐	
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	☐	☑	☐	☐	☐	
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?	☐	☑	☐	☐	☐	
2.11	Is dark smoke emission from plant/equipment avoided?	☑	☐	☐	☐	☐	
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement?	☐	☐	☐	☐	☑	
2.13	Are site vehicles travelling within the speed limit not more than 15km/hour?	☐	☑	☐	☐	☐	
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?	☐	☑	☐	☐	☐	
2.15	Is open burning avoided?	☑	☐	☐	☐	☐	
2.16	Excavated materials from the stream must remove form site on the same day. The materials shall be stored in covered impermeable skips awaiting removal from site.	☐	☐	☐	☐	☑	
Section 3: Noise							
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?	☐	☑	☐	☐	☐	
3.02	Is silenced equipment adopted?	☐	☑	☐	☐	☐	
3.03	Is idle equipment turned off or throttled down?	☐	☑	☐	☐	☐	
3.04	Are all plant and equipment well maintained and in good condition?	☐	☑	☐	☐	☐	
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	☑	☐	☐	☐	☐	
3.06	Are hand held breakers fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.07	Are air compressors fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.08	Are flaps and panels of mechanical equipment closed during operation?	☑	☐	☐	☐	☐	
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	☐	☐	☐	☐	☑	

Environmental Site Inspection Checklist

Note:	**Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-Up actions **N/A**: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	☐	☐	☐	☐	☑	
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	☑	☐	☐	☐	☐	
3.12	Use of quiet plant had been used on site to minimise the construction noise impact to the surrounding residences/dwellings (Level 1 mitigation measures).	☐	☑	☐	☐	☐	
3.13	Temporary/Moveable noise barrier or site hoarding are provide or erect at the site boundary to minimise the noise impact of the closest NSRs or stationary equipments shield by the noise barrier which cannot visible from NSRs (Level 2 mitigation measure)	☑	☐	☐	☐	☐	
3.14	Temporary/Moveable noise barrier equal to or more than 3m height with 10kg/m2 are provide for noise mitigation measures (Level 2 mitigation measures).	☑	☐	☐	☐	☐	
Section 4: Waste/Chemical Management							
4.01	Waste Management Plan had been submit to Engineer for approval.	☐	☑	☐	☐	☐	
4.02	Are receptacles available for general refuse collection?	☐	☑	☐	☐	☐	
4.03	Is general refuse sorting or recycling implemented?	☑	☐	☐	☐	☐	
4.04	Is general refuse disposed of properly and regularly?	☐	☑	☐	☐	☐	
4.05	Is the Contractor registered as a chemical waste producer?	☐	☑	☐	☐	☐	
4.06	Are the chemical waste containers properly labelled?	☐	☑	☐	☐	☐	
4.07	Are the chemical wastes stored in proper storage areas?	☐	☑	☐	☐	☐	
4.08	Is the chemical waste storage area properly labelled?	☐	☑	☐	☐	☐	
4.09	Is the chemical waste storage area used for storage of chemical waste only?	☐	☑	☐	☐	☐	
4.10	Are incompatible chemical wastes stored in different areas?	☐	☑	☐	☐	☐	
4.11	Are the chemical wastes disposed of by licensed collectors?	☐	☑	☐	☐	☐	
4.12	Are trip tickets for chemical wastes disposal available for inspection?	☐	☑	☐	☐	☐	
4.13	Are chemical/fuel storage areas bunded?	☐	☑	☐	☐	☐	
4.14	Are designated areas identified for storage and sorting of construction wastes?	☑	☐	☐	☐	☐	
4.15	Are construction wastes sorted (inert and non-inert) on site?	☑	☐	☐	☐	☐	
4.16	Are construction wastes reused?	☑	☐	☐	☐	☐	
4.17	Are construction wastes disposed of properly?	☐	☑	☐	☐	☐	
4.18	Are site hoardings and signboards made of durable materials instead of timber?	☐	☑	☐	☐	☐	
4.19	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?	☐	☑	☐	☐	☐	
4.20	Are appropriate procedures followed if contaminated material exists?	☐	☐	☐	☐	☑	
4.21	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	☐	☐	
4.22	Site cleanliness and appropriate waste management training had provided for the site workers.	☐	☑	☐	☐	☐	
4.23	Contaminated sediments will managed according to WBTC No.12/2000 and EWTB TC(W) No. 34/2002.	☐	☐	☐	☐	☑	
Section 5: Landscape & Visual							
5.01	Are retained and transplanted trees in health condition?	☑	☐	☐	☐	☐	
5.02	Are retained and transplanted trees properly protected?	☐	☑	☐	☐	☐	

Environmental Site Inspection Checklist

Note:	**Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-Up actions **N/A**: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
5.03	Are surgery works carried out for the damaged trees?	☑	☐	☐	☐	☐	
5.04	Is damage to trees outside site boundary due to construction activities avoided?	☑	☐	☐	☐	☐	
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	☐	☑	☐	☐	☐	
Section 6: Ecology							
6.01	Gabion banks and base had been provide for channel linings and banks for typical sections of work area?	☐	☐	☐	☐	☑	
6.02	Prevent site effluent/runoff discharge to the seasonal wetlands at Wai Ha River?	☐	☑	☐	☐	☐	
6.03	Stockpiling or disposal of materials, and any dredging or construction activities at the seasonal wetlands at Wai Ha River are prohibited?	☐	☑	☐	☐	☐	
Section 7: Others							
7.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	☐	☑	☐	☐	☐	

Remarks

Follow up of last Site Inspection (11-7-2012):

Nil.

Observations recorded in this Site Inspection (18-7-2012):

1. The rock bund in the de-silting channel was broken by rainstorm; the Contractor was reminded to repair it regularly to ensure the desilting channel function properly.

IEC's representative	*RE's representative*	*ET's representative*	*EO's representative*	*Contractor's representative*
( )	( )	(Tony Wong)	( )	( )

Environmental Site Inspection Checklist

Project:	***DSD Contract No. DC/2010/02***	**Inspected by**	**Checklist No.** **DC1002-25072012**
	Drainage Improvement in Shuen Wan and Shek Wu Wai	**IEC/IEC's Representative:**	-
		RE/RE's Representative:	Lau Siu Chuen
Inspection:	**Tung Tsz Road, Shuen Wan**	**ETL/ ET's Representative:**	Tony Wong
Date:	25 July 2012	**EO/EO's Representative:**	Chan Hiu Shan
Time:	11:00	**Contractor's Representative:**	Chan Hiu Shan

PART A: **GENERAL INFORMATION** **Environmental Permit No.**

Weather: ☐ Sunny ☐ Fine ☐ Cloudy ☑ Rainy ☐ Calm ☑ **EP-303/2008**

Temperature: 25.7 °C

Humidity: ☑ High ☐ Moderate ☐ Low ☐ N/A

Wind: ☐ Strong ☑ Breeze ☐ Light

Area Inspected

1. Bay 35 - 41
2.
3.

PART B: **SITE AUDIT**

Note: **Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-Up actions **N/A**: Not Applicable		**Not Obs.**	**Yes**	**No**	**Follow Up**	**N/A**	**Photo/ Remarks**
Section 1: Water Quality							
1.01	Is an effluent discharge license obtained for the Project?	☐	☑	☐	☐	☐	
1.02	Is the effluent discharged in accordance with the discharge licence?	☐	☑	☐	☐	☐	
1.03	Is the discharge of turbid water avoided?	☐	☑	☐	☐	☐	
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	☐	☐	☐	☑	☐	Remark 1
1.05	Are there channels, sandbags or bunds to direct surface run-off to sedimentation tanks?	☑	☐	☐	☐	☐	
1.06	Are there any perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	☐	☑	☐	☐	☐	
1.07	Is drainage system well maintained?	☐	☑	☐	☐	☐	
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	☑	☐	☐	☐	☐	
1.09	Are temporary exposed slopes properly covered?	☐	☑	☐	☐	☐	
1.10	Are earthworks final surfaces well compacted or protected?	☐	☐	☐	☐	☑	
1.11	Are manholes adequately covered or temporarily sealed?	☐	☑	☐	☐	☐	
1.12	Are there any procedures and equipment for rainstorm protection?	☑	☐	☐	☐	☐	
1.13	Are wheel washing facilities well maintained?	☑	☐	☐	☐	☐	
1.14	Is runoff from wheel washing facilities avoided?	☑	☐	☐	☐	☐	
1.15	Are there toilets provided on site?	☐	☑	☐	☐	☐	
1.16	Are toilets properly maintained?	☑	☐	☐	☐	☐	
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	☑	☐	☐	☐	☐	
1.18	Is the oil leakage or spillage avoided?	☑	☐	☐	☐	☐	
1.19	Are there any measures to prevent leaked oil from entering the drainage system?	☑	☐	☐	☐	☐	
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	☑	☐	☐	☐	☐	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	☐	☐	☐	☐	☑	
1.22	Are the oil interceptors/grease traps maintained properly?	☐	☐	☐	☐	☑	

Environmental Site Inspection Checklist

Note:	**Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-Up actions **N/A**: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	☑	☐	☐	☐	☐	
1.24	Designated settlement area for runoff/wheel wash waste is provide and located at the streambed with 1-2m deep, 12m long and around 50m3 capacities for sedimentation.	☐	☐	☐	☐	☑	
1.25	No excavation is undertaken in the settlement area.	☑	☐	☐	☐	☐	
1.26	Concreting wastes water should be neutralized below the pH Action Levels before discharge.	☑	☐	☐	☐	☐	
1.27	Mobile toilets should provide on site and located away the Wai Ha River course.	☐	☑	☐	☐	☐	
1.25	License collector should be employed for handling the sewage of mobile toilet.	☐	☑	☐	☐	☐	
Section 2: Air Quality							
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	☑	☐	☐	☐	☐	
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?	☐	☑	☐	☐	☐	
2.03	Are the excavated materials sprayed with water during handling?	☑	☐	☐	☐	☐	
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?	☐	☑	☐	☐	☐	
2.05	Is the exposed earth properly treated within six months after the last construction activities?	☑	☐	☐	☐	☐	
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved?	☐	☑	☐	☐	☐	
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?	☐	☐	☐	☐	☑	
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?	☐	☑	☐	☐	☐	
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	☐	☑	☐	☐	☐	
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?	☐	☑	☐	☐	☐	
2.11	Is dark smoke emission from plant/equipment avoided?	☑	☐	☐	☐	☐	
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement?	☐	☐	☐	☐	☑	
2.13	Are site vehicles travelling within the speed limit not more than 15km/hour?	☐	☑	☐	☐	☐	
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?	☐	☑	☐	☐	☐	
2.15	Is open burning avoided?	☑	☐	☐	☐	☐	
2.16	Excavated materials from the stream must remove form site on the same day. The materials shall be stored in covered impermeable skips awaiting removal from site.	☐	☐	☐	☐	☑	
Section 3: Noise							
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?	☐	☑	☐	☐	☐	
3.02	Is silenced equipment adopted?	☐	☑	☐	☐	☐	
3.03	Is idle equipment turned off or throttled down?	☐	☑	☐	☐	☐	
3.04	Are all plant and equipment well maintained and in good condition?	☐	☑	☐	☐	☐	
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	☑	☐	☐	☐	☐	
3.06	Are hand held breakers fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.07	Are air compressors fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.08	Are flaps and panels of mechanical equipment closed during operation?	☑	☐	☐	☐	☐	
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	☐	☐	☐	☐	☑	

Environmental Site Inspection Checklist

Note:	**Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-Up actions **N/A**: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	☐	☐	☐	☐	☑	
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	☑	☐	☐	☐	☐	
3.12	Use of quiet plant had been used on site to minimise the construction noise impact to the surrounding residences/dwellings (Level 1 mitigation measures).	☐	☑	☐	☐	☐	
3.13	Temporary/Moveable noise barrier or site hoarding are provide or erect at the site boundary to minimise the noise impact of the closest NSRs or stationary equipments shield by the noise barrier which cannot visible from NSRs (Level 2 mitigation measure)	☑	☐	☐	☐	☐	
3.14	Temporary/Moveable noise barrier equal to or more than 3m height with 10kg/m2 are provide for noise mitigation measures (Level 2 mitigation measures).	☑	☐	☐	☐	☐	
Section 4: Waste/Chemical Management							
4.01	Waste Management Plan had been submit to Engineer for approval.	☐	☑	☐	☐	☐	
4.02	Are receptacles available for general refuse collection?	☐	☑	☐	☐	☐	
4.03	Is general refuse sorting or recycling implemented?	☑	☐	☐	☐	☐	
4.04	Is general refuse disposed of properly and regularly?	☐	☑	☐	☐	☐	
4.05	Is the Contractor registered as a chemical waste producer?	☐	☑	☐	☐	☐	
4.06	Are the chemical waste containers properly labelled?	☐	☑	☐	☐	☐	
4.07	Are the chemical wastes stored in proper storage areas?	☐	☑	☐	☐	☐	
4.08	Is the chemical waste storage area properly labelled?	☐	☑	☐	☐	☐	
4.09	Is the chemical waste storage area used for storage of chemical waste only?	☐	☑	☐	☐	☐	
4.10	Are incompatible chemical wastes stored in different areas?	☐	☑	☐	☐	☐	
4.11	Are the chemical wastes disposed of by licensed collectors?	☐	☑	☐	☐	☐	
4.12	Are trip tickets for chemical wastes disposal available for inspection?	☐	☑	☐	☐	☐	
4.13	Are chemical/fuel storage areas bunded?	☐	☑	☐	☐	☐	
4.14	Are designated areas identified for storage and sorting of construction wastes?	☑	☐	☐	☐	☐	
4.15	Are construction wastes sorted (inert and non-inert) on site?	☑	☐	☐	☐	☐	
4.16	Are construction wastes reused?	☑	☐	☐	☐	☐	
4.17	Are construction wastes disposed of properly?	☐	☑	☐	☐	☐	
4.18	Are site hoardings and signboards made of durable materials instead of timber?	☐	☑	☐	☐	☐	
4.19	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?	☐	☑	☐	☐	☐	
4.20	Are appropriate procedures followed if contaminated material exists?	☐	☐	☐	☐	☑	
4.21	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	☐	☐	
4.22	Site cleanliness and appropriate waste management training had provided for the site workers.	☐	☑	☐	☐	☐	
4.23	Contaminated sediments will managed according to WBTC No.12/2000 and EWTB TC(W) No. 34/2002.	☐	☐	☐	☐	☑	
Section 5: Landscape & Visual							
5.01	Are retained and transplanted trees in health condition?	☑	☐	☐	☐	☐	
5.02	Are retained and transplanted trees properly protected?	☐	☑	☐	☐	☐	

Environmental Site Inspection Checklist

Note:	**Not Obs.**: Not Observed; **Yes**: Compliance; **No**: Non-Compliance; **Follow Up**: Observations requiring follow-Up actions **N/A**: Not Applicable	Not Obs.	Yes	No	Follow Up	N/A	Photo/ Remarks
5.03	Are surgery works carried out for the damaged trees?	☑	☐	☐	☐	☐	
5.04	Is damage to trees outside site boundary due to construction activities avoided?	☑	☐	☐	☐	☐	
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	☐	☑	☐	☐	☐	
Section 6: Ecology							
6.01	Gabion banks and base had been provide for channel linings and banks for typical sections of work area?	☐	☐	☐	☐	☑	
6.02	Prevent site effluent/runoff discharge to the seasonal wetlands at Wai Ha River?	☐	☑	☐	☐	☐	
6.03	Stockpiling or disposal of materials, and any dredging or construction activities at the seasonal wetlands at Wai Ha River are prohibited?	☐	☑	☐	☐	☐	
Section 7: Others							
7.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	☐	☑	☐	☐	☐	

Remarks

Follow up of last Site Inspection (18-7-2012):

Repair of the de-silting channel is on-going.

Observations recorded in this Site Inspection (25-7-2012):

1. The rock bund in the de-silting channel was broken by rainstorm; the Contractor was reminded to repair it regularly to ensure the desilting channel function properly.

IEC's representative	*RE's representative*	*ET's representative*	*EO's representative*	*Contractor's representative*
( )	( )	(Tony Wong)	( )	( )

Appendix M

Monthly Landscape & Visual Inspection Report

Contract No. DC/2010/02
Drainage Improvement Works in Shuen Wan and Shek Wu Wai
Bi-weekly Landscape & Visual Monitoring

EM&A (Landscape & Visual) Report (July 2012)
(Issue 1)

Job Ref.: 09/317/161D KLKJV-SW
Date: August 2012

Contract No. DC/2010/02
Drainage Improvement Works in Shuen Wan and Shek Wu Wai
Bi-weekly Landscape & Visual Monitoring

EM&A (Landscape & Visual) Report (July 2012)

(Issue 1)

August 2012

	Name	Signature
Prepared by:	**Sean FONG**	
Reviewed by:	**Ida YU**	
Date:	**3rd August 2012**	

127 Commercial Centre, Palm Springs, Yuen Long, New Territories, Hong Kong
Tel: +852 2486 2885 Email: aec@aechk.hk

CONTENTS

LIST OF APPENDICES

1 INTRODUCTION

1.1.1 The Landscape and Visual Monitoring of the Project is conducted to fulfill Clauses 5.2 and 5.4 of EP-303/2008 and the monitoring requirements in accordance with Section 7 of the approved updated EM&A Manual (approved by EPD on 7th November 2011) of the Project. A Baseline Review on updating the landscape and visual condition, and the mitigation measures of the Project (including Contracts 1 and 2 of the Project) was undertaken before the commencement of the Project. The review findings were updated in the Baseline Environmental Monitoring Report submitted to the EPD on 14th February 2011.

1.1.2 This monthly monitoring report will detail the scope of landscape and visual monitoring work, monitoring findings and observations, and any recommendation and advice on proper implementation of the landscape mitigation measures in the works areas under Contract 2 of the Project.

2 SCOPE OF MONITORING

2.1 Monitoring objectives

2.1.1 Landscape and Visual Monitoring of the Project should be conducted in a bi-weekly basis for checking the design, implementation and maintenance of the landscape and visual mitigation measures throughout the construction phase and in a quarterly basis during operational phase of the Project. Observations of any potential conflicts between the proposed mitigation measures and the project works carried out by the Contractors should be recorded. Recommendation and advice on proper implementation of the landscape mitigation measures should be provided to the Contractor for minimizing any potential impacts on the landscape and visual elements.

2.2 Monitoring during Construction Phase

2.2.1 The following landscape and visual mitigation measure should be implemented during the construction phase of the project to minimize the potential impacts:

- *Visual Screen* – Use of hoardings as visual screens for the construction in the works areas;
- *Contaminant/ Sediment Control* – Use of temporary barriers, covers and drainage provision around the construction works as contaminant/ sediment control to prevent the contaminants and sediments from entering the sensitive water-based habitats;
- *Pollution Control* – Implementation of pollution control measures to minimize any adverse environmental impacts to the surrounding habitats;
- *Liaison with Nursery* (Not relevant to Contract 2 of the Project) – Liaison with the nursery operator as necessary to minimize any adverse impact to the daily operation and plant holding capacity of the nursery;
- Existing Trees within Works Area – Maintenance and protection of the existing trees, especially their crowns, trunks and roots, within work sites; and
- Construction Light – Provision of construction light should be controlled at night to avoid excessive glare to the surrounding villages and to Plover Cove.

2.3 Monitoring during Operational Phase

2.3.1 The following landscape and visual mitigation measure should be implemented during the operational phase of the project to minimize the potential impacts:

- Viewing area formation by planting with shrubs, grasses and benches along the area;
- Architectural design of the pump house will help it fit into the existing suburban, natural to semi-natural surroundings (Not relevant to Contract 2 of the Project);
- Landscape design of pump house by providing sufficient planting around its boundary fence (Not relevant to Contract 2 of the Project);
- Enhancement planting along Tung Tsz Road with shrubs/ trees of suitable species to help protect the stream and marshes;
- Construction of box culvert should be with at least 1.0m soil depth for enhancement planting;
- Transplanting of existing affected trees to adjacent locations should be carried out;
- Preparation for transplanting is needed to allow sufficient time for root pruning and rootball preparation prior to transplanting; and
- Reinstatement of affected area should be carried out to check that the works areas are properly reinstated.

3 LANDSCAPE & VISUAL MONITORING RESULTS

3.1 Monitoring Date(s)

3.1.1 This monthly Landscape and Visual Monitoring (July 2011) was conducted to cover only areas of Contract 2 of the Project (i.e. the construction of a twin-cell box culvert close to Shuen Wan Conservation Area and Wai Ha River along Tung Tsz Road, and a drainage pipe near Wai Ha Village). The bi-weekly monitoring was conducted on 10th and 26th July 2012.

3.1.2 All photos stated in this section are recorded in **Appendix A**.

3.2 Visual Screen

3.2.1 No follow-up action by the Contractor is required as from the *Monthly EM&A Report for June 2012*.

Observation

3.2.2 Construction area for Contract 2 has been extended along Tung Tsz Road. Temporary hoardings, in the form of construction barriers, have been erected from west to east parts along Tung Tsz Road and opposite to San Tau Kwok.

3.2.3 No hoardings have been erected along the rest of the proposed works area since neither construction works nor any associated preparation works have been commenced. **Photos 1-2** show the views of the erected hoardings along the active works area under Contract 2.

3.2.4 Temporary fences were found erected outside Wai Ha Tsuen during the monitoring on 10th July 2012 (**Photo 3**). They were found removed during the monitoring on 26th July 2012 as the works in the area was finished (**Photo 4**).

3.2.5 Dumping of soil was noted next to the path towards Treasure Spot Garden II outside the construction area during the inspection on 10th July 2012 (**Photo 5**). The dumped soil was not related to the works related to the current Contract No. DC/2010/02.

3.2.6 To the southeast of Jade View Villa and adjacent to the current active works area, a demarcated wetland rehabilitation area has been maintained by parties other than the Project Proponent, the Project's Contractor and Sub-contractors since January 2012 (**Photo 6**). The extended wetland rehabilitation area since April 2012 has been surrounded by red strings as observed in July 2012 (**Photo 7**). No vegetation clearance or any other works were observed within this wetland rehabilitation area.

Recommendations

3.2.7 No specific recommendation is required.

3.3 Contaminant/ Sediment Control

3.3.1 A few sections of sedimentation beds with gravel were built along the boundary of the active works area to the south of Wai Ha in accordance with the recommendation stated in the *Monthly EM&A Report for June 2012*.

Observation

3.3.2 The major works to the south of Tung Tsz Road was almost finished, and no discharge of underground water from the built twin-cell box culvert was observed. The sedimentation beds located from north to south near the retained tree T196 (*Macaranga tanarius* var. *tomentosa*) and another beds aligned from western to eastern parts along Tung Tsz Road and opposite to San Tau Kwok have been maintained appropriately since March 2012. As massive rainfall was brought by the severe Typhoon 'Vincente' (hoisted from 21st to 24th July), the runoff increased and overflowed the sedimentation beds (**Photos 8-9**).

Recommendations

3.3.3 Regular monitoring should be conducted to ensure no direct discharge or leakage of contaminants or any polluted fluid into the adjacent Wai Ha River. The Contractor should maintain appropriate sedimentation beds and/or tanks throughout the construction phase.

3.4 Pollution Control

3.4.1 No follow-up action by the Contractor is required as from the *Monthly EM&A Report for June 2012*.

Observation

3.4.2 As abovementioned, the works to the south of Tung Tsz Road was almost finished; and no discharge of underground water from the built twin-cell box culvert was observed. The sedimentation beds located from north to south near the retained tree T196 (*Macaranga tanarius* var. *tomentosa*) and another aligned from western to eastern parts along Tung Tsz Road and opposite to San Tau Kwok have been maintained appropriately since March 2012. As massive rainfall was brought by the Typhoon 'Vincente' (hoisted from 21st to 24th July), the runoff increased and overflowed the sedimentation beds during the inspection on 26th July 2012 (**Photos 8-9**).

3.4.3 No direct water discharge into the upper stream of Wai Ha River was observed since no active construction work from the Project has commenced adjacent to the River. However, as shown in **Photo 10**, muddy water caused by the soil runoff from the upper stream of Wai Ha River was observed. This was due to the massive rainfall during the typhoon.

Recommendations

3.4.4 The Contractor should prevent any contaminants and sediments from entering the sensitive water-based habitats and implement pollution control measures to minimize any adverse environmental impacts to the water body. The Contractor should maintain appropriate sedimentation beds and/or tanks throughout the construction phase.

3.5 Liaison with Nursery

3.5.1 The construction undertaken within Tung Tsz Nursery is restricted under Contract 1 of the Project. This monitoring item is not applicable to Contract 2 of the Project.

3.6 Existing Trees within Works Areas

3.6.1 Individual trees retained within the active works area have been protected within Tree Protection Zones (TPZs). The protection measures generally follow the recommendations stated in the *Monthly EM&A Report for June 2012*. Particular observations are highlighted in the following paragraphs.

Observation

3.6.2 Some trees were found fallen within the Project Area of Contract 2. These included trees to be felled/removed (T022, T085, T086 and T107) and trees to be retained (T082, T083, T084 and T088) (the tree recommendation status are in accordance with the latest approved Tree Felling Application) (**Photos 11-15**). They may be impacted by the severe Typhoon 'Vicente' during 21st to 24th July 2012. Other existing trees were observed having broken scaffold branches.

3.6.3 Most trees proposed to be retained within the Project Area were recorded generally in fair health conditions. As reported since January 2012, a retained tree T180, which has been extensively covered by climbers, has been dead due to natural dieback (**Photo 16**).

3.6.4 The leaning, retained tree T190 (*Ficus hispida*) was still remained leaning and protected within a demarcated zone (**Photo 17**). However, the wooden stand for anchorage was found fallen during the monitoring on 26th July 2012 (**Photo 18**). The TPZ has been established around T190 to protect the tree and restrict access close to the tree. No further deterioration in tree health condition and stability was observed.

3.6.5 No significant signs of damage on other existing tree crowns, trunks and roots resulting from the construction works were observed in this monthly monitoring.

3.6.6 The three transplanted specimens (Tree No.: PH01, PH02 and PH03) of the protected shrub species of conservation interest *Pavetta hongkongensis* have remained in fair health condition in Area C under Contract 1 of the Project (**Photos 19-20**). Newly regenerated leaves were observed on all three shrubs. Weeding of unwanted herbs and climbers were observed around these transplanted shrubs. The dead specimen (Tree No.: PH04, due to natural dieback) was still remained at its original location and extensively covered by climbing herbs.

Recommendations

3.6.7 Within the active works area, maintenance of TPZs for the retained trees and the trees to be transplanted should be continued. Trunk base of all retained trees and trees to be transplanted should be kept clear, with no stockpiled soil, construction equipments and rubbish allowed around the trunk bases and within the TPZs. If necessary, these retained trees or trees to be transplanted shall be watered regularly to maintain their health. All fallen trees or tree parts of the existing trees maintained within the works area of Contract No. DC/2010/02 should be removed if they pose imminent hazards to the people/property or cause obstruction to the traffic. Any broken tree parts still attached to the trees could be pruned appropriately to prevent their potential hazard to the public and property.

3.6.8 Disturbance is prohibited in all TPZs. In any practical circumstances, the contractor should follow Section 8 of Annex 4 of the approved Landscape Plan for protecting the existing trees from any potential damages resulting from the construction works. In addition, the Contractor and the Project Proponent should have routine inspection on any tree remedial works conducted by other party on the trees within the Project Area, and close monitoring of the tree stability of the leaning tree T190 (*Ficus hispida*) located to the south of Wai Ha. The broken wooden stand that provides the support to T190 should be replaced with a new one. If necessary, the Contractor and the Project Proponent have to restrict any access within the tree falling zone of this leaning tree.

3.7 Construction Light

3.7.1 No follow-up action on maintenance of construction light is required as from the *Monthly EM&A Report for June 2012*.

Observation

3.7.2 No construction light impact to the surrounding villages and to Plover Cove as all construction activities and construction sites are halted at 1800. No construction light at night is provided by the Contractor.

Recommendation

3.7.3 No specific recommendation is required.

4 AUDIT SCHEDULE

4.1.1 The next bi-weekly Landscape & Visual Monitoring in August 2012 is scheduled to be conducted in the weeks of 6th and 20th August 2012.

Appendix A

Photographs

	
Photo 1 – Temporary hoardings have been erected around the active works area.	**Photo 2** – Temporary hoardings have been erected around the active works area.
	
Photo 3 – Temporary fences was erected outside Wai Ha Tsuen during the monitoring on 10th July 2012.	**Photo 4** – Temporary fences were removed during the monitoring on 26th July 2012 as the works in the area was finished.
	
Photo 5 – Dumping of soil next to the path towards Treasure Spot Garden II was noted.	**Photo 6** – The wetland rehabilitation area was observed adjacent to the active works area.

	
Photo 7 – The wetland rehabilitation area was extended to the west of the works area (i.e. to the south of Wai Ha) and surrounded by red strings.	**Photo 8** – The sedimentation beds and PVC liner were aligned from north to south near the retained tree T196 (*Macaranga tanarius* var. *tomentosa*).
	
Photo 9 – The sedimentation beds and PVC liner were aligned from western to eastern parts along Tung Tsz Road and opposite to San Tau Kwok. The beds were overflowed by the rain.	**Photo 10** – No direct water discharge into the upper stream of Wai Ha River was noted since no active construction work from the Project has commenced adjacent to the River. Muddy water in Wai Ha River was caused by the soil runoff from the upstream of Wai Ha River.
	
Photo 11 – Tree to be felled (T22) was found fallen after the severe Typhoon 'Vicente'.	**Photo 12** – Trees to be retained (T082-T084) were found fallen after the severe Typhoon 'Vicente'.

Photo 13 – Trees to be felled (T085-T086) were found fallen after the severe Typhoon 'Vicente'.

Photo 14 – Tree to be retained (T088) was found fallen after the severe Typhoon 'Vicente'.

Photo 15 – Tree T107 was found fallen after the severe Typhoon 'Vicente'.

Photo 16 – Retained tree T180 was suspected to be a dead specimen due to natural dieback and found being covered by weedy climbers extensively.

Photo 17 – The leaning, retained tree T190 (*Ficus hispida*) was protected within a TPZ.

Photo 18 – The wooden stand for anchorage for T190 was found fallen during the monitoring on 26th July 2012.

	
Photo 19 – The transplanted shrubs of *Pavetta hongkongensis* (PH01 and PH02) showed fair health condition in Area C under Contract 1.	**Photo 20** – The protected shrub of *Pavetta hongkongensis* (PH03) showed fair health condition in Area C under Contract 1.

Appendix N

Ecological Monitoring Report in Area under Contract 2

Agreement No. DP/01/2010
Drainage Improvement Works in Shatin and Tai Po: Ecological Monitoring in area under Contract 1 (Report 9b for July 2012)

Prepared for:

Drainage Services Department

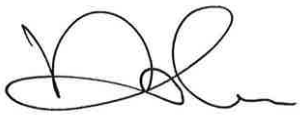
Prepared by:
ENVIRON Hong Kong Limited

Date:
Jun 2011

Reference Number:
R2668_V1.0

Agreement No. DP/01/2010
Drainage Improvement Works in Shatin and Tai Po:
Ecological Monitoring in area under Contract 1
(Report 9b for July 2012)

Prepared by:



Max Lee
Assistant Environmental Consultant

Approved by:

Tony Cheng
Project Manager

ENVIRON Hong Kong Limited
Room 2310, China Resources Building
26 Harbour Road, Wan Chai, Hong Kong
Tel: (852) 3743 0788
Fax: (852) 3548 6988
Email: hkinfo@environcorp.com

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1. Introduction

1.1 Project description

The Drainage Improvement Works in Shuen Wan was undertaken to minimize the potential flooding impacts in Sha Tin and Tai Po area. Although the Ecological Impact Assessment in the EIA Report identified that ecological impacts resulting from the proposed drainage improvement works at Shuen Wan were anticipated to be very minor in scale, ecological mitigation and ecological monitoring were recommended in the EM&A Manual (http://env-shuenwan.com/pdf/review_note_em&a_rev.3.pdf) as stipulated under Environment Permit No. EP-303/2008.

1.1. Scope of ecological impact monitoring was described in the Particular Specifications and EM & A Manual of the projects. In brief, the monitoring tasks include regular check on the retained and transplanted trees and shrubs, monitoring on fauna groups and aquatic fauna within the works area and any ecologically sensitive area within 100 m of the works boundary.

1.2. China-Hong Kong Ecology Consultants Co. was commissioned by ENVIRON Hong Kong Limited to perform the ecological impact monitoring survey for the projects under Contract 2 since July 2011.

1.3. The outline of this ecological monitoring report was as follow:

- Highlights of this report
- Summary of construction activities for the month
- Monitoring methodology
- Monitoring data
- Remedial measures adopted to the adverse condition
- Record of complains and remedial measures
- Review of monitoring results
- Forecast of works programme and monitoring requirements
- Comments and brief summary

1.4. This is the report No. 9b ecological monitoring conducted on 31th July 2012 within the works boundary under Contract 2 and area within 100 m from the works boundary.

2. Highlights of this report

- Field survey was conducted on 31th July 2012
- Construction activities of Contract 2 was initiated since June 2011
- Lower number of species was observed within the works area under Contract 2, but habitats in the 100 m buffer area retain its natural condition.

3. Summary of construction activities for the month

Major construction activities carried out in Contract 2 at Wai Ha Village and Tung Tsz Road by the contractor during the present monitoring period (July 2012) includes:

1) Fixing of reinforcement at Bay 36, 38, 39.
2) Erection of formwork at Bay 36, 37, 39
3) Concreting at Bay 36, 37
4) Cutting bottom layer shoring at Bay 39
5) Driving sheetpiles for Bay 40, 41, 42
6) Excavation, Installation of shoring and Laying of rockfill at Bay 13 (Wai Ha Road)

4. Monitoring Methodology

Ecological monitoring methods were generally followed those described in the baseline ecological surveys (DC/2009/22). However, sampling area maybe reduced because of habitat change, for instance, deforestation and channel modification due to drainage works, where sampling was not applicable. Survey data and evaluation are detailed in the following sections.

4.1 Vegetation survey

Vegetation survey was performed along the designated transects (**Figure 1**) for ecological monitoring as described in the project specifications to monitor the vegetation health which could be adversely influenced by any bad site practice. Qualitative data of plants within the works boundary and wetland vegetation in the 100 m buffer area of Contract 2 adjacent to construction site and wetland was recorded. Riparian vegetation including aquatic and emergent at 4 stream ecological monitoring points (hereinafter referred to as "SEMP") under Contract 2 (i.e. SEMP 3 & 4; **Figure 2 & 3**) along the affected stream channel and riparian habitat was recorded in terms of species, relative abundance and average heights. Any signs of damages and adverse health problems directly caused the works were recorded and reported. Nomenclature and protection status of the species followed those documented in the AFCD website (www.hkbiodiversity.net) and Hong Kong Herbarium (2004).

4.2 Avifauna

Bird survey was conducted by following the proposed transects which cover the major ecologically sensitive areas of the Project (**Figure 1**). All bird species were recorded with special attention paid on the species of conservation importance and wetland-dependent species. List of bird species recorded and the relative abundance was provided.

4.3 Herpetofauna

Hepetofauna survey was conducted via direct observation and active searching along the survey transects with a focus in the work areas (**Figure 1**). All reptiles and amphibians encountered or heard were recorded. Nomenclature and conservation status of herpetofauna species follows AFCD website (www.hkbiodiversity.net).

4.4 Butterflies and Odonata

Odonates and butterfly survey of different habitats within the Study Area was conducted along the proposed transect (**Figure 1**). All butterflies and odonata were identified and relative abundance was recorded. Nomenclauture and status of conservation of butterflies follows Lo & Hui (2005) while that of odonata follows AFCD websites (www.hkbiodiversity.net).

4.5 Mammals

As the monitoring site was situated near traffics, plant nursery and residential buildings, mammals were unlikely inhabited at the site except rodents, domestic dogs and cats. Detailed mammal monitoring was not conducted. However, any sighting, tracks and signs of mammals encountered during survey of other faunal groups was recorded. Bat was surveyed by search for potential colony habitat, such as palm trees, which are often used by fruit bats as nesting sites.

4.6 Aquatic fauna

Monitoring of aquatic fauna was carried out mainly by bank-side observation, sometimes with the aid of binoculars, at two stream ecological monitoring points under Contract 2 (i.e. SEMP 3 & 4). These points are selected for covering representative sections of Wai Ha River and are shown in **Figure 1**. Netting and fish traps were also deployed at these points to collect supplementary data. Aquatic fauna seen/collected was identified *in situ* to the lowest possible taxon and relative abundance was presented.

5. Monitoring data

5.1 Vegetation survey

The habitats identified in area under Contract 2 are river course, wooded area, mangrove, marsh and developed area (including village). Vegetation were found in wooded area, mangrove, marsh, develop area and river bank. The riparian vegetation which were dominated by *Leucaena leucocephala*, *Bidens alba*, and *Rhaphiolepis salicifolias* with average coverage ranged from 15% to 30% (**Table 1**). A list of plant species recorded from different habitats within the assessment area under Contract 2 is presented on **Table 2**. A total of 180 species were recorded within the assessment boundary in which 175 species were recorded within the buffer area, while 120 species recorded within the work areas under Contract 2. About 20% of common vegetation species in the edge of marsh under Contract 2 were removed due to direct conflict with the construction activities. Most of the vegetation species were distributed in the secondary woodland area. Among them, species protected under Hong Kong ordinance were found in buffer area under Contract 2, namely *Aquilaria sinensis* (Cap. 586)*, Cibotium barometz* (Cap. 586). Three individuals of protected species *Pavetta*

hongkongensis located within works area of Contract 2 were transplanted to ECA on 20th Dec 2011.

5.2 Avifauna

A total of 12 bird species were recorded in the current survey (**Table 3**). In the work area under Contract 2, four bird species were recorded in which none are considered to be of conservation concern. A total of 12 bird species were recorded in the 100m buffer area in which one wetland dependent species *Ardeola bacchus* is recognized as being regional conservation concern, though it is common in suitable habitats in Hong Kong (Viney et al., 2005).

5.3 Herpetofauna

No reptile was recorded within the assessment area Mating call of Gunter's Frog, Asiatic Painted and Paddy Frog were heard from the water of pools, ditches and river bank within the 100m buffer zone. Eggs of Brown Tree Frog were seen in the buffer zone of the site. Common Toad were found on both work area and buffer zone of the site. The species recorded belongs to common species in Hong Kong. (**Table 4**)

5.4 Butterflies

A total of 19 butterfly species were recorded during surveys (**Table 5**). However, none of the species are of the conservation concern..

5.5 Odonata

A total of 7 odonata species were recorded during the surveys (**Table 6**). Only Common Red Skimmer (*Orthetrum pruinosum neglectum*), Crimson Dropwing (*Trithemis aurora) &* Indigo Dropwing *(Trithemis festiva)* were found within the work boundaries under Contract 2. Most of the observed odonata species were largely inhabiting along the river bank in the 100m buffer area.

5.6 Mammal

No other mammals or trace of mammals was observed within the assessment area.

5.7 Aquatic fauna

Under Contract 2 (i.e. SEMP 3 & 4), a total of 10 fish species, 1 crustacean, 1 gastropod and 1 arthropod were recorded and most of them were freshwater species (**Table 7**). *Carassius auratus* was commonly observed at SEMP 3 because of the

traditional Buddhist practice from the nearby temple in which captured organisms were released back to nature. In addition, river section at SEMP 3 is relatively natural and the presence of *Parazacco spilurus* may imply that good water quality at this section is maintained. Overall, no protected or rare species were recorded.

6. Remedial measures adopted to the adverse condition

There was no non-compliance event recorded within this reporting month.

7. Record of complains and remedial measures

There was no complaint in relation to environmental issue recorded in this reporting month.

8. Review of the monitoring results

During the present survey period, construction activities were carried out at works area under Contract 2, while 100 m buffer area remains natural. Much of the construction activities are carried out along Tung Tsz Road under Contact 2. In general, lower numbers of species were recorded within the works area under Contract 2 than that of 100 m buffer area because of the associated constructions and urbanized in nature. Water quality in river section of Contract 2 (i.e. SEMP 3 & 4) was maintained at good condition as indicated by the presence of *Parazacco spilurus*. In addition, most of the construction activities are restricted in the developed area with low ecological significance. As mitigation measures recommended in the EM&A Manual were properly implemented during the current survey, and hence the residual environmental impacts would be minimized.

9. Forecast of works programme and monitoring requirements

The tentative construction activities undertaken by the contractor at Wai Ha Village and Tung Tsz Road in the coming month are as follows:

- Bay 43:
  - Backfill to kicker
  - Remove shoring
  - Erection of exterior formwork of Wall & top slab
  - Backfill and removal of sheetpile

- Bay 44:
  - Excavatiion, shoring and sheetpile
  - Geotextile and rockfill
  - Laying of blinding
  - Erection of formwork for base slab
  - Conrete casting of base slab

- Backfill to kicker
- Remove shoring
- Erection of exterior formwork of Wall & top slab
- Backfill and removal of sheetpile

The monitoring programme described in EM&A will strictly follow to verify compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

10. Comments and summary

The bi-monthly ecological impact monitoring under Contracts 2 was conducted in May 2012 and relevant flora and fauna data were collected according to project specification and EM & A Manual. As indicated by the low abundance and diversity of species within the work areas, habitats within the work boundary under Contracts 2 offer few ecological opportunities for colonization of fauna and flora. Given that the construction activities are restricted in the developed area with proper mitigation measures being implemented, disturbances associated with the current construction activities are largely affecting area with low ecological significance. On the other hand, the natural habitats in the 100 m buffer area are retained at acceptable condition, and hence the 100 m buffer area has not been significantly affected by the construction works.

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Figure

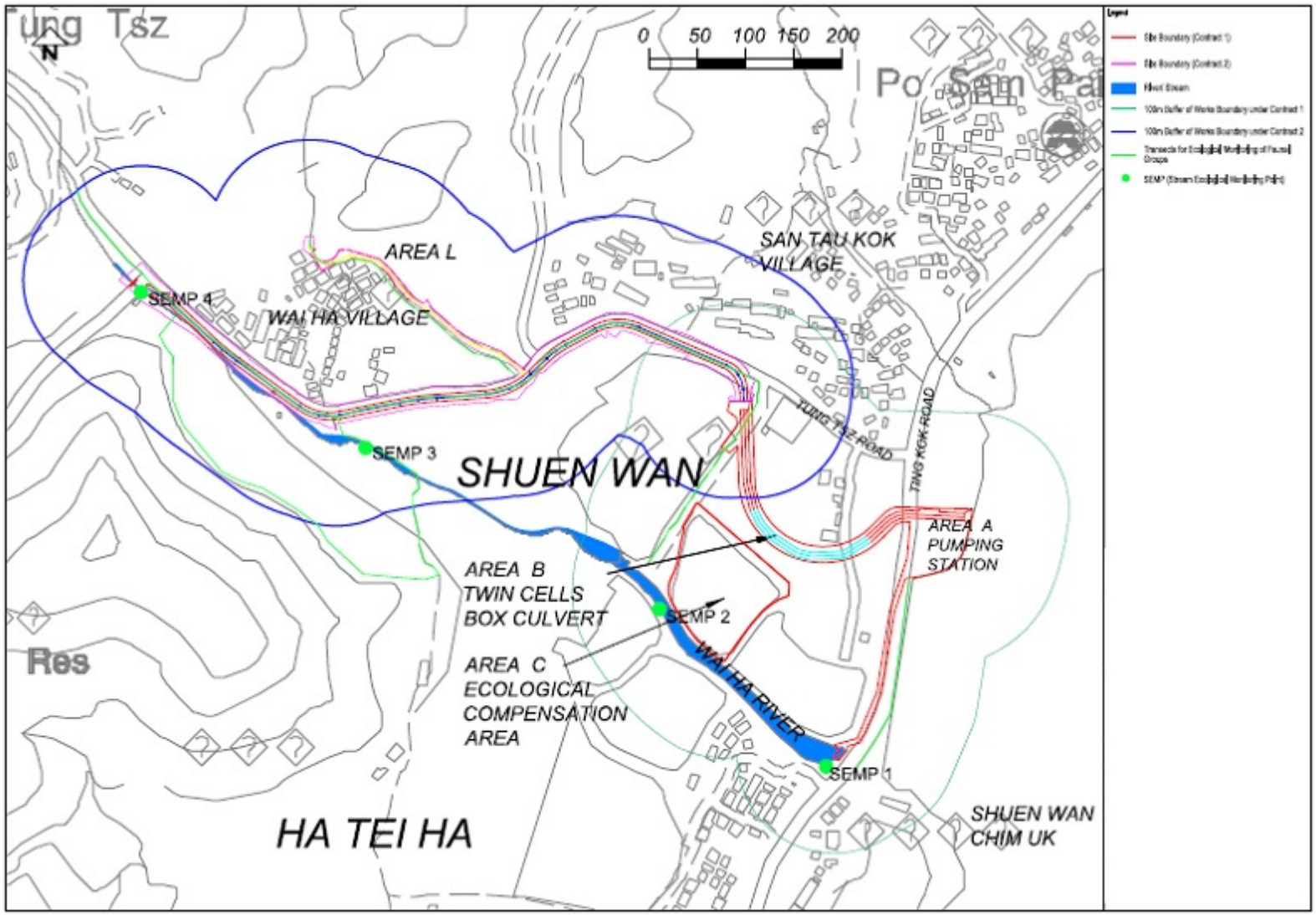

Figure: 1	ENVIRON
Title: Map showing the ecological monitoring transect and the boundary of assessment area.	Drawn by: IT
	Checked by: ML
Project: Agreement No. DP/01/2010 Drainage Improvement Works in Shatin and Tai Po: Ecological Monitoring in area under Contract 2 (July 2012, Report 9b)	Rev.: 1.0
	Date: July 2012

Figure: 2	ENVIRON
Title: SEMP 3, the third sampling point of Wai Ha River under Contract 2.	Drawn by: IT Checked by: ML
Project: Agreement No. DP/01/2010 Drainage Improvement Works in Shatin and Tai Po: Ecological Monitoring in area under Contract 2 (July 2012, Report 9b)	Rev.: 1.0 Date: July 2012

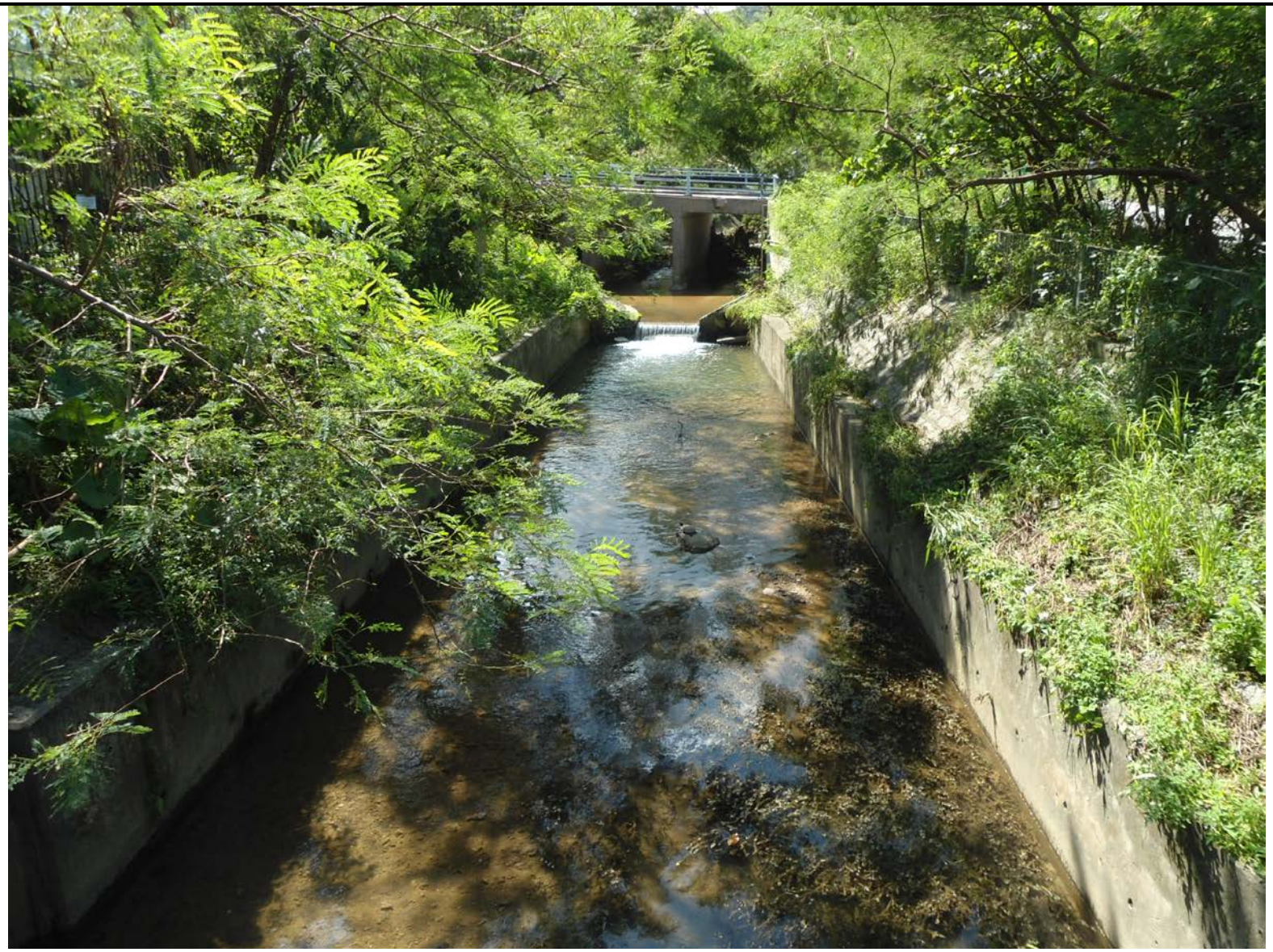

Figure: 3	ENVIRON
Title: SEMP 4, the second sampling point along Wai Ha River under Contract 2.	Drawn by: IT
	Checked by: ML
Project: Agreement No. DP/01/2010 Drainage Improvement Works in Shatin and Tai Po: Ecological Monitoring in area under Contract 2 (July 2012, Report 9b)	Rev.: 1.0
	Date: July 2012

Table

Table 1. List of riparian vegetation and coverage (%) recorded from two stream sampling points under Contract 2 (i.e. SEMP 3 & 4).

			Sampling point	**SEMP 3**		**SEMP 4**	
Species	**Family**	**Growth form**	**Status in Hong Kong**	**Height (cm)**	**%**	**Height (cm)**	**%**
Bidens alba	ASTERACEAE	Herb	E			0.8	20
Leucaena leucocephala	MIMOSACEAE	Small Tree	E			4	30
Microstegium ciliatum	POACEAE	Perennial Procumbent Herb	N	1.2	10		
Pistia stratiotes	ARACEAE	Floating Aquatic Herb	N	0.1	10		
Polygonum chinensis	POLYGONACEAE	Herb	N	0.8	5		
Polygonum lapathifolium	POLYGONACEAE	Herb	N	0.8	10		
Rhaphiolepis salicifolia	ROSACEAE	Shrub or Small Tree	N	1.2	15		
Spirodela polyrrhiza	LEMNACEAE	Floating Small Herb	N			n/a	5
Wedelia chinensis	ASTERACEAE	Perennial Herb	N	n/a	10		
Bare	n/a	n/a	n/a	n/a	40	n/a	45

*Key:
E = Exotic
N = Native
n/a = not available

Table 2. List of vegetation recorded from works area under Contracts 2 and 100 m buffer area in the impact monitoring survey conducted in July 2012. Vegetation species presents in the identified location was indicated by "V".

Habitat	Species name	Family	Growth form	*Status in Hong Kong	Work Area of Contract 2	100 m buffer area under Contract 2
Stream	*Chrysalidocarpus lutescens*	ARECACEAE	Shrub Palm	E	V	V
	Melia azedarach	MELIACEAE	Tree	E	V	V
	Murraya paniculata	RUTACEAE	Small Tree	E	V	V
	Lantana camara	VERBENACEAE	Shrub	E	V	V
	Ficus hispida	MORACEAE	Tree	N	V	V
	Ficus virens	MORACEAE	Tree	N	V	V
	Chrysopogon aciculatus	POACEAE	Perennial Herb	N	V	V
	Microstegium ciliatum	POACEAE	Perennial Procumbent Herb	N	V	V
	Mucuna birdwoodiana	FABACEAE (PAPILIONACEAE)	Climber: Vine	N	V	V
	Pistia stratiotes	ARACEAE	Floating Aquatic Herb	N	V	V
	Cyperus flabelliformis	CYPERACEAE	Herb	E	V	V
	Acanthopanax gracilistylus	ARALIACEAE	Shrub	E	V	V
	Ficus triangularis	MORACEAE	Tree	E	V	V
	Spirodela polyrrhiza	LEMNACEAE	Floating Small Herb	N	V	V
	Glochidion zeylanicum	EUPHORBIACEAE	Shrub or Small Tree	N	V	V
	Sterculia lanceolata	STERCULIACEAE	Semi-deciduous	N	V	V

Habitat	Species name	Family	Growth form	*Status in Hong Kong	Work Area of Contract 2	100 m buffer area under Contract 2
			Tree			
	Albizia lebbeck	MIMOSACEAE	Tree	E		V
	Arundinella nepalensis	POACEAE	Perennial Herb	N		V
	Bidens alba	ASTERACEAE	Herb	E		V
	Clerodendrum inerme	VERBENACEAE	Shrub	N		V
	Coculus orbiculatus	MENISPERMACEAE	Climber: Vine	N		V
	Hibiscus tiliaceus	MALVACEAE	Tree or Shrub	N		V
	Leucaena leucocephala	MIMOSACEAE	Small Tree	E		V
	Manilkara zapota	SAPOTACEAE	Tree	E		V
	Sapium discolor	EUPHORBIACEAE	Tree	N		V
Developed area	*Pericampylus glaucus*	MENISPERMACEAE	Woody Vine	N	V	V
	Ficus variegata var. chlorocarpa	MORACEAE	Tree or Shrub	N	V	V
	Citrus reticulata Blanco	RUTACEAE	Small Tree	E	V	V
	Salvia japonica	LAMIACEAE (LABIATAE)	Herb	N	V	V
	Morus alba	MORACEAE	Tree or Shrub	N	V	V
	Emilia sonchifolia	ASTERACEAE	Herb	N	V	V
	Clausena lansium	RUTACEAE	Small Tree	E	V	V
	Pyrostegia venusta	BIGNONIACEAE	Climber: Vine	E	V	V
	Psidium guajava	MYRTACEAE	Tree	E	V	V
	Catharanthus roseus	APOCYNACEAE	Subshrub	N	V	V
	Archontophoenix alexandrae	ARECACEAE	Tree Palm	E	V	V
	Desmodium	FABACEAE	Shrub	N	V	V

Habitat	Species name	Family	Growth form	*Status in Hong Kong	Work Area of Contract 2	100 m buffer area under Contract 2
	heterocarpon	(PAPILIONACEAE)				
	Rhinacanthus nasutus	ACANTHACEAE	Herb	E	V	V
	Acacia confusa	MIMOSACEAE	Tree	E		V
	Artocarpus macrocarpon	MORACEAE	Tree	E		V
	Averrhoa carambola	OXALIDACEAE	Small Tree	E		V
	Bauhinia blakeana	CAESALPINIACEAE	Tree or Shrub	N		V
	Bauhinia variegata	CAESALPINIACEAE	Tree	E		V
	Bridelia tomentosa	EUPHORBIACEAE	Shrub or Small Tree	N		V
	Calliandra haematocephala	MIMOSACEAE	Shrub	E		V
	Caryota ochlandra	ARECACEAE	Tree palm	E		V
	Cassia spectabilis	CAESALPINIACEAE	Small Tree	E		V
	Casuarina equisetifolia	CASUARINACEAE	Tree	E		V
	Citrus grandis	CASUARINACEAE	Tree	E		V
	Cordyline fruticosa	AGAVACEAE	Shrub	E		V
	Cynodon dactylon	POACEAE	Perennial Herb	N		V
	Dracaena draco	AGAVACEAE	Tree	E		V
	Elaeocapus haminanensis	ELAEOCARPACEAE	Small Tree	E		V
	Eleusine indica	POACEAE	Herb	N		V
	Eriobotrya japonica	ROSACEAE	Small Tree	E		V
	Ficus benjamina	MORACEAE	Tree	E		V
	Ficus elastica	MORACEAE	Tree	E		V
	Ficus simplicissima	MORACEAE	Shrub	N		V
	Hibiscus rosa-sinensis	MALVACEAE	Shrub	E		V

Habitat	Species name	Family	Growth form	*Status in Hong Kong	Work Area of Contract 2	100 m buffer area under Contract 2
	Lantana camara	VERBENACEAE	Shrub	E		V
	Litchi chinensis	SAPINDACEAE	Tree	E		V
	Lumnitzera racemosa	COMBRETACEAE	Shrub or Small Tree	N		V
	Lygodium japonicum	LYGODIACEAE	Climbing Herb	N		V
	Melaleuca quinquenervia	MYRTACEAE	Tree	E		V
	Oxalis corniculata	OXALIDACEAE	Perennial Herb	N		V
	Phoenix roebelenii	ARECACEAE	Small Tree Palm	E		V
	Polygonum hydropiper	POLYGONACEAE	Herb	N		V
	Psychotria serpens	RUBIACEAE	Climber: Vine	N		
	Pterocypsela indica	ASTERACEAE	Herb	N		V
	Rhapis excelsa	ARECACEAE	Shrub Palm	N		V
	Sansevieria trifasciata	AGAVACEAE	Perennial Herb	E		V
	Schefflera actinophylla	ARALIACEAE	Climbing Shrub	E		V
	Schefflera heptaphylla	ARALIACEAE	Tree	N		V
	Sesbania cannabina	FABACEAE	Herb	E		V
	Terminalia catappa	COMBRETACEAE	Large Tree	E		V
	Thuja orientalis	CUPRESSACEAE	Tree	E		V
	Tradescantia spathacea	COMMELINACEAE	Herb	E		V
	Youngia japonica	ASTERACEAE	Herb	N		V
	Phragmites karka	POACEAE	Perennial Herb	N	V	
	Coix lacryma-jobi	POACEAE	Herb	N	V	
	Apluda mutica	POACEAE	Perennial Herb	N	V	
	Glochidion puberum	EUPHORBIACEAE	Shrub	N	V	
	Acanthus ilicifolius	ACANTHACEAE	Shrub	N	V	V

Habitat	Species name	Family	Growth form	*Status in Hong Kong	Work Area of Contract 2	100 m buffer area under Contract 2
	Acrostichum aureum	ACROSTICHACEAE	Herb	N	V	V
	Aegiceras corniculatum	MYRSINACEAE	Shrub	N	V	V
	Alocasia odora	ARACEAE	Perennial Herb	N	V	V
	Avicennia marina	VERBENACEAE	Shrub	N	V	V
	Digitaria ciliaris	POACEAE	Herb	N	V	V
	Panicum repens L.	POACEAE	Perennial Herb	N	V	V
	Pennisetum alopecuroides	POACEAE	Perennial Herb	N	V	V
	Phragmites anstralis	POACEAE	Perennial Herb	N	V	V
	Plantago major	PLANTAGINACEAE	Perennial herb	N	V	V
	Solanum nigrum	SOLANACEAE	Herb	N	V	V
Plantation	*Bischofia javanica*	EUPHORBIACEAE	Tree	N	V	V
	Scolopia chinensis	FLACOURTIACEAE	Tree or Large Shrub	N	V	V
	Piper hancei	PIPERACEAE	Climber: Vine	N	V	V
	Dimocarpus longan	SAPINDACEAE	Tree	E	V	V
	Paederia scandens	RUBIACEAE	Climber: Vine	N	V	V
	Cleistocalyx operculatus	MYRTACEAE	Tree	N	V	V
	Antidesma bunius	EUPHORBIACEAE	Tree	N	V	V
	Litsea monopetala	LAURACEAE	Small Tree	N	V	V
	Microcos paniculata	TILIACEAE	Shrub or Small Tree	N	V	V
	Maesa perlarius	MYRSINACEAE	Shrub	N	V	V
	Boehmeria nivea (L.) Gaudich.	URTICACEAE	Subshrub or shrub	E	V	V

Habitat	Species name	Family	Growth form	*Status in Hong Kong	Work Area of Contract 2	100 m buffer area under Contract 2
	Mallotus apelta	EUPHORBIACEAE	Shrub or Small Tree	N	V	V
	Sapindus saponaria	SAPINDACEAE	Tree	N	V	V
	Aporusa dioica	EUPHORBIACEAE	Tree	N	V	V
	Wedelia chinensis	ASTERACEAE	Perennial Herb	N	V	V
	Carica papaya	CARICACEAE	Tree	E	V	V
	Rubus reflexus	ROSACEAE	Climbing Shrub	N	V	V
	Brassica rapa	BRASSICACEAE (CRUCIFERAE)	Biennial Herb	E	V	V
	Mucuna championii Benth.	FABACEAE	Climbing Vine	N		V
	Pinus massoniana	PINACEAE	Tree	N	V	V
Cultivated land	*Coriandrum sativum*	APIACEAE (UMBELLIFERAE)	Herb	E	V	V
	Allium fistulosum	LILIACEAE	Herb	E	V	V
	Lactuca sativa	ASTERACEAE	Herb	E	V	V
	Musa x paradisiaca L.	MUSACEAE	Perennial Herb	E	V	V
	Lycopersicon esculentum	SOLANACEAE	Herb	E	V	V
	Chrysanthemum coronarium	ASTERACEAE	Herb	E	V	V
	Myosoton aquaticum	CARYOPHYLLACEAE	Herb	N	V	V
	Drymaria diandra	CARYOPHYLLACEAE	Herb	N	V	V
	Eupatorium odoratum	ASTERACEAE	Perennial Herb	E	V	V
	Conyza canadensis	ASTERACEAE	Herb	E	V	V
	Polygonum chinensis	POLYGONACEAE	Herb	N	V	V
	Pueraria lobata	FABACEAE	Climber: Vine	N	V	V

Habitat	Species name	Family	Growth form	*Status in Hong Kong	Work Area of Contract 2	100 m buffer area under Contract 2
	Panicum maximum	POACEAE	Perennial Herb	E	V	V
	Pteridium aquilinum	PTERIDIACEAE	Herb	N	V	V
	Polygonum lapathifolium	POLYGONACEAE	Herb	N	V	V
	Colocasia esculenta	ARACEAE	Herb	N	V	V
	Cuscuta chinensis	CUSCUTACEAE	Parasitic Herb	N	V	V
	Panicum trypheron	POACEAE	Perennial Herb	E	V	V
Secondary woodland	*Mallotus paniculatus*	EUPHORBIACEAE	Tree or Shrub	N	V	V
	Litsea glutinosa	LAURACEAE	Tree	N	V	V
	Trifolium repens	FABACEAE (PAPILIONACEAE)	Herb	E	V	V
	Hedyotis hedyotidea	RUBIACEAE	Scandent Shrub	N	V	V
	Solanum torvum	SOLANACEAE	Shrub	E	V	V
	Uvaria macrophylla	ANNONACEAE	Climbing Shrub	N	V	V
	Psychotria asiatica	RUBIACEAE	Tree or Shrub	N	V	V
	Glochidion eriocarpum	EUPHORBIACEAE	Shrub	N	V	V
	Ardisia quinquegona	MYRSINACEAE	Shrub	N	V	V
	Pteris semipinnata	PTERIDACEAE	Herb	N	V	V
	Melastoma sanguineum	MELASTOMATACEAE	Shrub	N	V	V
	Lasianthus chinensis	RUBIACEAE	Shrub	N	V	V
	Cinnamomum camphora	LAURACEAE	Large Tree	N	V	V
	Rhus hypoleuca	ANACARDIACEAE	Shrub or Small Tree	N	V	V
	Syzygium jambos (L.) Alston	MYRTACEAE	Tree	E	V	V

Habitat	Species name	Family	Growth form	*Status in Hong Kong	Work Area of Contract 2	100 m buffer area under Contract 2
	Canthium dicoccum	RUBIACEAE	Tree or Shrub	N	V	V
	Stephania longa	MENISPERMACEAE	Climber: Vine	N	V	V
	Aquilaria sinensis	THYMELAEACEAE	Tree	N (Cap. 586)		V
	Bridelia insulana	EUPHORBIACEAE	Shrub	N	V	V
	Disporum cantoniense	LILIACEAE	Herb	E	V	V
	Litsea cubeba	LAURACEAE	Shrub to Small Tree	N	V	V
	Cibotium barometz	DICKSONIACEAE	Large Herb	N (Cap. 586)		V
	Sapium discolor	EUPHORBIACEAE	Tree	N	V	V
	Melastoma candidum	MELASTOMATACEAE	Shrub	N	V	V
	Dicranopteris pedata	GLEICHENIACEAE	Herb	N	V	V
	Cratoxylum cochinchinense	CLUSIACEAE	Tree or Shrub	N	V	V
	Desmos chinensis	ANNONACEAE	Shrub	N	V	V
	Acronychia pedunculata	RUTACEAE	Tree	N	V	V
	Selaginella uncinata	SELAGINELLACEAE	Herb	N	V	V
	Rhus succedanea	ANACARDIACEAE	Shrub or Small Tree	N	V	V
	Millettia reticulata	FABACEAE (PAPILIONACEAE)	Climber: Vine	N	V	V
	Embelia ribes	MYRSINACEAE	Climber: Vine	N	V	V
	Pavetta hongkongensis	RUBIACEAE	Tree or Shrub	N (Cap. 96)		V
	Mangifera indica	ANACARDIACEAE	Tree	E	V	V
	Cinnamomum burmannii	LAURACEAE	Tree or Large Shrub	N	V	V

Habitat	Species name	Family	Growth form	*Status in Hong Kong	Work Area of Contract 2	100 m buffer area under Contract 2
	Ficus microcarpa	MORACEAE	Tree	N	V	V
	Byttneria aspera	STERCULIACEAE	Woody Vine	N	V	V
	Equisetum debile	EQUISETACEAE	Herb	N	V	V
	Bambusa sp.	POACEAE	Clumped Tree Bamboo	/	V	V
	Rourea microphylla	CONNARACEAE	Climbing Shrub	N	V	V
	Pennisetum alopecuroides	POACEAE	Perennial Herb	N	V	V
	Ipomea cairica	CONVOLVULACEAE	Climber: Twining Herb	E	V	V
	Mikania micrantha	ASTERACEAE	Climbing Herb	E	V	V
Wooded area	*Celtis sinensis*	ULMACEAE	Tree	N		V
	Ligustrum sinensis	OLEACEAE	Tree or Shrub	N		V
	Macaranga tanarius	EUPHORBIACEAE	Tree	N		V
	Pandanus tectorius	PANDANACEAE	Shrub or Small Tree	N		V
	Excoecaria agallocha	EUPHORBIACEAE	Tree	N		V
	Kandelia obovata	RHIZOPHORACEAE	Shrub or Small Tree	N		V
	Thespesia populnea	MALVACEAE	Tree or Shrub	N		V
	Zoysia sinica	POACEAE	Perennial Herb	N		V
Marsh	*Acanthus ilicifolius*	ACANTHACEAE	Shrub	N		V
	Acrostichum aureum	ACROSTICHACEAE	Herb	N		V
	Aegiceras corniculatum	MYRSINACEAE	Shrub	N		V
	Alocasia odora	ARACEAE	Perennial Herb	N		V
	Avicennia marina	VERBENACEAE	Shrub	N		V

Habitat	Species name	Family	Growth form	*Status in Hong Kong	Work Area of Contract 2	100 m buffer area under Contract 2
	Digitaria ciliaris	POACEAE	Herb	N		V
	Ficus hispida	MORACEAE	Tree	N		V
	Hibiscus tiliaceus	MALVACEAE	Tree or Shrub	N		V
	Ipomea cairica	CONVOLVULACEAE	Climber: Twining Herb	E		V
	Kandelia obovata	RHIZOPHORACEAE	Shrub or Small Tree	N		V
	Macaranga tanarius	EUPHORBIACEAE	Tree	N		V
	Mikania micrantha	ASTERACEAE	Climbing Herb	E		V
	Panicum repens L.	POACEAE	Perennial Herb	N		V
	Pennisetum alopecuroides	POACEAE	Perennial Herb	N		V
	Phragmites anstralis	POACEAE	Perennial Herb	N		V
	Plantago major	PLANTAGINACEAE	Perennial herb	N		V
	Polygonum lapathifolium	POLYGONACEAE	Herb	N		V
	Pueraria lobata	FABACEAE	Climber: Vine	N		V
	Schefflera heptaphylla	ARALIACEAE	Tree	N		V
	Solanum nigrum	SOLANACEAE	Herb	N		V
	Solanum torvum	SOLANACEAE	Shrub	E		V

***Key:**
E = Exotic
N = Native

Table 3. List of avifauna species and maximum counts recorded from the impact monitoring survey in July 2012 at work area under Contracts 2 and 100 m buffer area.

Species	**Common name**	**Habitat**	**Conservation status in Hong Kong**	**Work area: Contract 2**	**100m buffer area**
Acridotheres cristatellus	Crested Myna			2	2
Amaurornis phoenicurus	White-breasted Water hen	W			1
Ardeola bacchus	Chinese Pond Heron	W	RC		2
Copsychus saularis	Oriental Magpie Robin			1	1
Egretta garzetta	Little Egret	W		1	1
Garrulax perspicillatus	Masked Laughing thrush				2
Motacilla alba	White Wagtail				1
Orthotomus sutorius	Common Tailorbird				1
Passer montanus	Eurasian Tree Sparrow			3	6
Pycnonotus jocosus	Red-whiskered Bulbul				3
Pycnonotus sinensis	Chinese Bulbul				2
Streptopelia chinensis	Spotted Dove				1
Total number of species:				**4**	**12**

*** Key:**

W = Wetland dependent spices ; RC = Regional Concern

Table 4. List of herpetofauna and maximum counts recorded from the impact monitoring survey in July 2012 at work area under Contracts 2 and 100 m buffer area..

Species	**Common name**	**Conservation status in Hong Kong**	**Work area: Contract 2**	**100m Buffer area of Contract 2**
Rana guentheri	Gunther's Frog	Common		1@
Kaloula pulchra pulchra	Asiatic Painted Frog	Common		1@
Fejervarya limnocharis	Paddy Frog	Common		1@
Polypedates megacephalus	Brown Tree Frog	Common		2*
Bufo melanostictus	Common Toad	Common	1	2

Key:
@-Calling heard,
*-Egg founded

Table 5. Relative abundance of butterfly species recorded under Contracts 2 in impact monitoring survey during July 2012.

Species	**Common name**	**Conservation status in Hong Kong**	**Work area: Contract 2**	**100m Buffer area of Contract 1**
Abisara echerius	Plum judy	Very Common		+
Athyma selenophora	Staff Sergeant	Common		+
Borbo cinnara	Formosan Swift	Common		+
Catopsilia pyranthe	Mottled Emigrant	Very Common		++
Cupha erymanthis	Rustic	Very Common		+
Eurema hecabe	Common Grass Yellow	Very Common	+	++
Hestina assimilis	Red Ring Shirt	Common		+
Lethe confusa	Banded Treebrown	Common		+
Mycalesis mineus	Dark-brand Bush Brown	Very Common	+	++
Neptis hylas	Common Sailer	Very Common	+	+
Papilio bianor	Chinese Peacock	Common		+
Papilio helenus	Red Helen	Very Common		+
Papilio memnon agenor	Great Mormon	Very Common		++
Papilio polytes	Common mormon	Very Common		+
Papilio protenor	Spangle	Very Common		+
Parantica aglea	Glassy Tiger	Common		+
Pieris canidia	Indian Cabbage White	Very Common		++
Ypthima baldus	Common Five-ring	Very Common		++
Zizeeria maha	Pale Grass Blue	Very Common		+

Key:

+ : Species exists in the survey area

++ : Species common in the survey area

+++ : Species abundant in the survey area

Table 6. Relative abundance of odonata species recorded under Contracts 2 in impact monitoring survey during July 2012.

Species	**Common name**	**Conservation status in Hong Kong**	**Work area: Contract 2**	**100m Buffer area of Contract 1**
Coeliccia cyanomelas	Blue Forest Damsel	Common		+
Orthetrum pruinosum neglectum	Common Red Skimmer	Common	+	+
Pantala flavescens	Wandering Glider	Common		+
Prodasineura autumnalis	Black Threadtail	Common		+
Pseudagrion rubriceps rubriceps	Orange-faced Sprite	Common		+
Trithemis aurora	Crimson Dropwing	Common	+	+
Trithemis festiva	Indigo Dropwing	Common	+	+

Key:

+ : Species exists in the survey area
++ : Species common in the survey area
+++ : Species abundant in the survey area

Table 7. Relative abundance of aquatic species recorded in Wai Ha River within the 100 m buffer of works boundary under Contracts 2 in the impact monitoring survey during July 2012.

Species	**Common name**	**[1]Life-cycle characteristics**	**[2]Origin**	**SEMP 3**	**SEMP 4**
Carassius auratus	Goldfish	F	I	+++	+
Cyprinus carpio	Common Carp	F	I	+	
Gambusia affinis	Mosquito Fish	F	I	++	++
Oreochromis niloticus	Nile Tilapa	F	I	+	+
Parazacco spilurus	Predaceaous Chub	F	N	+	+
Poecilia reticulata	Guppy	F	I	++	++
Puntius semifasciolatus	Chinese Barb	F	N	++	
Rhinogobius duospilus	Goby	F	N	+	++
Rhinogobius giurinus	Barcheek Goby	D	N	+	
Xiphophorus hellerii	Swordtail	F	I	++	++
Uca arcuata	Fiddler Crab	M	N	+	
Pomacea lineata	Apple snail	F	I	+	
Gerris sp.	Water Strider	F	/	+	
Total number of species:	**13**			**13**	**7**

Key:

Relative abundance:
+ : Species exists in the survey area
++ : Species common in the survey area
+++ : Species abundant in the survey area

[1] Life-cycle characteristics:
M = Marine vagrant
F = Freshwater species

[2]Origin:
N = Native
I = Introduced; / = not available