



PROJECT No.: TCS/00553/11

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

**QUARTERLY ENVIRONMENTAL MONITORING AND**  
**AUDIT (EM&A) SUMMARY REPORT (NO.14) –**  
**OCTOBER TO DECEMBER 2014**

PREPARED FOR  
**KWAN LEE-KULY JOINT VENTURE**

Quality Index

Date	Reference No.	Prepared By	Certified by
10 March 2015	TCS00553/11/600/R0415v2	 Ben Tam (Environmental Consultant)	 T.W. Tam Environmental Team Leader

Ver.	Date	Description
1	07 March 2015	First submission
2	10 March 2015	Amended against the IEC's comment on 10 Mar 2015

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Ref.: DSDSHUWNEM00\_0\_0688L.15

10 March 2015

Drainage Services Department  
Projects and Development Branch  
Drainage Projects Division  
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5 Gloucester Road,  
Wan Chai, Hong Kong

By Post and Fax (2827 8700)

Attention : Mr. H.K. Chan & Mr. Ronald Siu

Dear Sir,

**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  
Quarterly Environmental Monitoring and Audit Report for October to December  
2014**

Reference is made to Environment Team's submission of the Quarterly Environmental Monitoring and Audit Report for October to December 2014 by Email on 10<sup>th</sup> March 2015 (entitled "DC/2010/02 - Quarterly EM&A Summary Report (No.14) – October to December 2014").

Please be informed that we have no further comment on the captioned revised report. We write to verify the captioned submission in accordance with Section 9.9 of EM&A Manual under 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  
Kwan Lee-Kuly JV

Attn: Mr. T. W. Tam  
Attn: Mr. W. K. Chan

By Fax: 2959 6079  
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**EXECUTIVE SUMMARY**

ES.01. This is the 14<sup>th</sup> Quarterly EM&A Summary Report under Environmental Permit No.EP-303/2008 (hereinafter “the EP”) for the Contract No. DC/2010/02 - Drainage Improvement in Shuen Wan and Shek Wu Wai (hereinafter “the Project”), covering the period from **1 October to 31 December 2014** (hereinafter “Reporting Quarter”).

ES.02. In November 2014, *Contract No. DC/2010/02* (hereinafter the “Contract 2”) has taken over all relevant EM&A programmes due to *DSD Contract No. DC/2009/22* (hereafter “Contract 1”) *Drainage Improvement in Shuen Wan*, completed in **end-October 2014**.

ES.03. Environmental monitoring activities under the EM&A programme in the Reporting Quarter are summarized in the following table:

Aspects	Monitoring Parameters	Monitoring Location	Perform by	Day / Occasions
Construction Noise	L <sub>eq(30min)</sub> Daytime	M2, M3 and M4	Contract 2	<b>9 days</b>
		M1 & AL1	Contract 2	<b>4 days</b>
		M1 & AL1	Contract 1	<b>4 days</b>
Water Quality	Local Stream Water Sampling	W1, W3 and W4	Contract 2	<b>25 days</b>
		W2	Contract 2	<b>12 days</b>
		W2	Contract 1	<b>13 days</b>
	Hydrological characteristics measurement	H3 and H4	Contract 2	<b>13 days</b>
		H1 and H2	Contract 2	<b>8 days</b>
		H1 and H2	Contract 1	<b>4 days</b>
Inspection / Audit	Regular weekly Environmental inspection by the Contractor, ET and Site Representative Engineer			<b>7 occasions</b>
	Regular weekly Environmental inspection only by the Contractor and Site Representative Engineer			<b>4 occasions</b>
	Monthly Environmental Site Inspection / audit by IEC			<b>3 occasions</b>
Ecological	Bi- monthly Ecological Monitoring by IEC			<b>1 occasions</b>
Landscape & Visual	Bi-weekly Inspection by a registered Landscape Architect			<b>7 occasions</b>

ES.04. No noise complaint (which is an Action Level exceedance) and exceedance was received in this Reporting Quarter. For water quality monitoring, a total of 223 Action/Limit Levels exceedances, namely 105 dissolved oxygen, 100 turbidity and 18 suspended solids were recorded in this Reporting Quarter. Investigation reports concluded that all registered exceedances were not related to the Project.

Environmental Issues	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
<b>Construction Noise</b>	L <sub>eq30min</sub> Daytime	0	0	0	N.A	N.A
<b>Water Quality</b>	Dissolved Oxygen	<b>76</b>	0	<b>76</b>	Exceedances not due to project	Enhance the water quality mitigation measures
	Turbidity	<b>8</b>	<b>34</b>	<b>42</b>		
	Suspended Solids	<b>3</b>	<b>3</b>	<b>6</b>		
<b>Hydrological Characteristics</b>	Water Flow	0	0	0	N.A	N.A
	Water Depth	0	0	0	N.A	N.A

ES.05. No documented notification of environmental complaints, summons and successful prosecution was received during the Reporting Quarter.

ES.06. No major environmental impacts were observed during the weekly site inspection which indicated

that the implemented mitigation measures for construction noise and water quality were effective. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered as satisfactory.

- ES.07. During dry season, special attention should be paid on the potential construction dust impact since a lot of villages are adjacent the Project site. The Contractor should fully implement Dust mitigation measures to avoid dust emission from loose soil surface of haul road.
- ES.08. On the other hand, construction noise should be other key environmental issue during construction work process. The noise mitigation measures should be necessary to implement in accordance with EM&A Manual stipulation.

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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. 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 This Project (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 Sha Tin is a non-designated project work and no environmental monitoring and audit is requested 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 programme for the environmental protection of the Project. Since the construction of Contracts 1 and 2 is carry out at same period, a Proposal Environmental Monitoring Programme and Methodology (hereinafter the “PEMPM”) was prepared to address the EM&A programme for Contract 2. It had been accepted by the IEC and also submitted to the EPD for endorsement.
- 1.06 The baseline monitoring of EM&A programme has been performed by the Contract 1 ET. The Action and Limit Levels environmental performance criteria have also been established by the Contract 1. Therefore, no baseline monitoring was performed for the Contract 2 of Project.
- 1.07 This is the 14<sup>th</sup> Quarterly EM&A Summary Report under Environmental Permit No.EP-303/2008 for the Contract No. DC/2010/02 - Drainage Improvement in Shuen Wan and Shek Wu Wai, covering the period from **1 October to 31 December 2014**.

### 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 PROGRAMME 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 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 programme are enclosed in *Appendix C* and the major construction activities undertaken in this report period are listed below:-

Reporting Month	Construction activities
October 2014	<ul style="list-style-type: none"> <li>Rectification of minor defects of all Box Culverts</li> </ul>
November 2014	<ul style="list-style-type: none"> <li>Pathway reinstatement at Wai Ha Tsuen</li> <li>Minor defects rectify of Box Culverts</li> </ul>
December 2014	<ul style="list-style-type: none"> <li>Pathway reinstatement at Wai Ha Tsuen</li> <li>Minor defects rectify of Box Culverts</li> </ul>

**SUMMARY OF ENVIRONMENTAL SUBMISSIONS**

2.03 Summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this Reporting Quarter 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 PROGRAMME REQUIREMENT FOR THE PROJECT

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	<ul style="list-style-type: none"> <li>A-weighted equivalent continuous sound pressure level (30min) (hereinafter ‘Leq(30min)’ during the normal working hours; and</li> <li>A-weighted equivalent continuous sound pressure level (5min) (hereinafter ‘Leq(5min)’ for construction work during the restricted hours.</li> </ul>	
Water Quality	In Situ Measurement	Temperature, Dissolved Oxygen, Dissolved Oxygen Saturation, pH and Turbidity
	Laboratory Analysis	Suspended Solids (hereinafter ‘SS’)
Hydrological	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 and the location map is shown 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 reasure Spot Garden
Water Quality	(#) W1	Between the Shuen Wan Marsh and ECA (Co-ordinates: 839301E, 836386N; and Existing River Bed Level: +1.75mPD).
	W2	Between Tolo Harbour and Proposed Penstock (Co-ordinates: 839542E, 836184N; and Existing River Bed Level: +1.48mPD)
	(*) W3	Upstream of Tung Tze Shan Road (Co-ordinates: 838760E, 836714N; and Existing River Bed Level: +5.08mPD)
	W4	Wai Ha Village 29D (Co-ordinates: 838865E, 836621N; and Existing River Bed Level: +4.05mPD)
Hydrological	H1	Between the Shuen Wan Marsh and ECA (Coordinates: 839306E, 836379N)
	H2	Route 10 Sam Kung Temple (Coordinates: 839163E, 836433N)
	H3	Upstream of Tung Tze Shan Road (Coordinates: 838760E, 836714N)
	H4	Wai Ha Village 29D (Coordinates: 838865E, 836621N)
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 Leq30min

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 Leq5min at restrict hour from 1700 – 2300;
- 3 consecutive Leq5min for restrict hour from 2300 – 0700 next day;
- 3 consecutive Leq5min 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 checked with 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<sup>-1</sup> 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<sup>3</sup>/s.
- 3.17 The monitoring equipment using for the Project’s EM&A programme 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 Programme**

Equipment	Model
<b><i>Construction Noise</i></b>	
Integrating Sound Level Meter	B&K Type 2238
Calibrator	B&K Type 4231
Portable Wind Speed Indicator	Testo Anemometer
<b><i>Water quality</i></b>	
Water Depth Detector	Eagle Sonar
Water Sampler	A transparent PVC cylinder / bucket
Thermometer & DO meter	YSI Pro 20/ YSI 550A
pH meter	AZ8685
Turbidimeter	Hach 2100Q
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)
<b><i>Hydrological Characteristics</i></b>	

Equipment	Model
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 ( $L_{eq}$ ).  $L_{eq(30min)}$  in six consecutive  $L_{eq(5min)}$  measurements were used as the monitoring parameter for the time period between 0700-1900 hours on weekdays; and also  $L_{eq(15min)}$  in three consecutive  $L_{eq(5min)}$  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 YSI Professional Plus 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°C 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 Professional Plus 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 YSI Sonde 6820 / 650MDS is 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°C 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 the relevant Monthly EM&A Reports.

**Table 3-4 Testing Method and Detection limit of SS to be provided by the Laboratory**

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*” is 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 Prior to measurement, water depths is determined 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 programme.
- 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 According to the Updated Environmental Monitoring and Audit Manual, the performance criteria for construction noise, water quality and hydrological, namely Action and Limit levels were established by Contract DC/2009/22. The Action/Limit Levels proposed by DC/2009/22 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	7.05	6.44	7.98
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	H3	H4
Water Depth (m)	Action Level	0.08 (80% of baseline water depth)	0.40 (80% of baseline water depth)	0.40 (80% of baseline water depth)	0.24 (80% of baseline water depth)
	Limit Level	0.06 (60% of baseline water depth)	0.30 (60% of baseline water depth)	0.30 (60% of baseline water depth)	0.18 (60% of baseline water depth)
Water Flow Rate (m <sup>3</sup> /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	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	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 programme in this Reporting Quarter are attached in the relevant Monthly EM&A Reports.

**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 the relevant Monthly EM&A Reports.

#### 4.0 IMPACT MONITORING RESULTS

- 4.01 In November 2014, Contract 2 has taken over all relevant EM&A programmes due to Contract 1 completed in *end-October 2014*. Since the Main Contractor and Resident Engineer confirmed that the Contracts 1 and 2 were to be completed in end-October 2014, as agreed by IEC, the EM&A programme was changed to Operation Phase according to the Updated EM&A Manual.
- 4.02 Joint site inspection by the EPD, DSD, IEC, the Contractor and ET was carried out on **4 December 2014** to inspect the progress of work and environmental impact. EPD only accepted that the EM&A programmes of Contract 1 changed to operation phase. So Contract 2 construction phase impact monitoring was resumed in December 2014.

#### RESULTS OF CONSTRUCTION NOISE MONITORING

- 4.03 In this Reporting Quarter, a total **43** events construction noise measurement was conducted at the identified locations. A summary of the construction noise monitoring results and the breaches of A/L Level at the identified locations during the Reporting Quarter are respectively summarized in Tables 4-1 and 4-2. Addition, graphical plots showed in *Appendix E*.

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

Station	Leq <sub>30min</sub> (dB(A))				
	M1	AL1	M2	M3	M4
Minimum	55.6 <sup>(*)</sup>	60.5 <sup>(*)</sup>	50.6 <sup>(*)</sup>	53.0 <sup>(*)</sup>	48.4 <sup>(*)</sup>
Date of record	19-Dec-14	19-Dec-14	10-Oct-14	17-Oct-14	17-Oct-14
Maximum	63.6 <sup>(#)</sup>	67.6 <sup>(*)</sup>	67.1 <sup>(*)</sup>	67.1 <sup>(*)</sup>	66.0 <sup>(*)</sup>
Date of record	8-Oct-14	5-Dec-14	20-Oct-14	20-Oct-14	3-Oct-14

Remarks:

- <sup>(#)</sup> The monitoring locations AL1 and M1 were undertaken under façade situation in October 2014. No façade correction is added according to acoustical principles and EPD guidelines.
- <sup>(\*)</sup> The monitoring locations AL1 and M1 were undertaken under free field situation in December 2014. Moreover, the monitoring locations M2, M3 and M4 were undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines.

**Table 4-2 Summaries of Breaches of Construction Noise A/L Levels**

Station	Exceedance of Environmental Quality Criteria	
	Action Level	Limit Level
M1	0	0
AL1	0	0
M2	0	0
M3	0	0
M4	0	0

- 4.04 No noise complaint (which is an Action Level exceedance) was received in this Reporting Period. All the noise monitoring result are well below 75dB(A) and no Action or Limit Level exceedance was triggered during this Reporting Period.

#### RESULTS OF LOCAL STREAM WATER QUALITY MONITORING

- 4.05 In this Reporting Quarter, total **25** sampling days were conducted for local stream water quality monitoring at all designated locations W1, W2, W3 and W4. At below, *Table 4-3* is summarized the Breaches of water quality A/L Levels and *Table 4-4* is a statistics of the compliance status during the Reporting Quarter. Moreover, graphical plots showed in *Appendix E*.
- 4.06 During the Reporting Quarter, field measurements showed that stream water temperatures were within 16.4°C to 31.3°C and pH values within 5.45 to 8.9.



**Table 4-3 Summaries of Breaches of the Existing Water Quality A/L Levels**

Location	Dissolved Oxygen		Turbidity		Suspended Solids		Total Exceedance	
	Action	Limit	Action	Limit	Action	Limit	Action	Limit
<b>October 2014</b>								
W1	21	0	0	5	1	2	22	7
W2	4	0	0	13	0	1	4	14
W4	12	0	1	1	1	0	14	1
<b>November 2014</b>								
W1	NA		NA		NA		NA	
W2	NA		NA		NA		NA	
W4	NA		NA		NA		NA	
<b>December 2014</b>								
W1	18	0	4	3	0	0	22	3
W2	10	0	1	11	1	0	12	11
W4	11	0	2	1	0	0	13	1
<b>Exceedance in Quarter Period</b>	<b>76</b>	<b>0</b>	<b>8</b>	<b>34</b>	<b>3</b>	<b>3</b>	<b>87</b>	<b>37</b>

**Table 4-4 Statistics Water Quality Exceedance in the Reporting Quarter**

Parameter	Statistics		
	Number of Monitoring Event (W1, W2 & W4)	No. of Exceedances	Compliance %
Dissolve Oxygen	100	76	24.0
Turbidity	100	42	58.0
Suspended Solids	100	6	94.0

**Exceedances in October 2014**

4.07 In October 2014, a total of 62 Action/ Limit Level exceedances, namely 37 exceedances in dissolved oxygen, 20 exceedances in turbidity and 5 exceedances in SS, were recorded. According to site activity and precautionary measures taken by KLKJV, the investigation report concluded that all exceedances were not related to works under the Project.

**Exceedances in November 2014**

4.08 The water quality monitoring was ceased in end- October 2014 and resumed in December 2014. No in-situ water quality measurement and sampling was therefore performed in November 2014.

**Exceedances in December 2014**

4.09 In December 2014, a total of 62 Action/ Limit Level exceedances, namely 39 exceedances in dissolved oxygen, 22 exceedances in turbidity and 1 exceedance in SS, were recorded. According to site activity and precautionary measures taken by KLKVJ, the investigation report concluded that all exceedances were not related to works under the Project.

**RESULTS OF HYDROLOGICAL CHARACTERISTICS MONITORING**

4.10 In this Reporting Quarter, a total 12 days of hydrological characteristics measurement was carried out at designated measurement points H1 and H2 (4 days measurement at the each month). Moreover, a total 13 days of hydrological characteristics measurement was carried out at designated measurement points H3 and H4 (5 days of October 2014 and 4 days of the months November and December 2014).

4.11 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
3-Oct-14	-	-	0.29	0.18	-	-	0.24	0.13
8-Oct-14	0.48	0.36	-	-	0.12	0.12	-	-
10-Oct-14	-	-	0.38	0.33	-	-	0.36	0.30
15-Oct-14	0.42	0.36	-	-	-	-	-	-
17-Oct-14	-	-	0.33	0.25	-	-	0.32	0.23
22-Oct-14	0.3	0.3	-	-	0.3	0.3	-	-
24-Oct-14	-	-	0.33	0.24	-	-	0.31	0.23
29-Oct-14	0.36	0.36	-	-	0.12	0.12	-	-
31-Oct-14	-	-	0.36	0.33	-	-	0.35	0.31
8-Nov-14	0.52	0.43	0.31	0.38	0.46	0.4	0.28	0.36
14-Nov-14	0.6	0.4	0.3	0.4	0.54	0.32	0.37	0.37
22-Nov-14	0.51	0.31	0.4	0.33	0.59	0.34	0.42	0.34
28-Nov-14	0.69	0.35	0.34	0.22	0.61	0.35	0.31	0.21
5-Dec-14	0.53	0.38	0.38	0.29	0.5	0.36	0.37	0.26
11-Dec-14	0.4	0.34	0.37	0.28	0.39	0.34	0.36	0.28
19-Dec-14	0.48	0.35	0.4	0.32	0.45	0.34	0.39	0.3
22-Dec-14	0.51	0.31	0.38	0.26	0.44	0.29	0.36	0.25

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

Date	Mid-Flood				Mid-Ebb			
	H1	H2	H3	H4	H1	H2	H3	H4
3-Oct-14	-	-	0.65	0.20	-	-	0.54	0.07
8-Oct-14	0.3	1.13	-	-	0.15	0.754	-	-
10-Oct-14	-	-	2.26	0.54	-	-	1.07	0.33
15-Oct-14	0.15	0.754	-	-	-	-	-	-
17-Oct-14	-	-	1.72	0.62	-	-	1.43	0.44
22-Oct-14	0.15	1.13	-	-	0.15	0.754	-	-
24-Oct-14	-	-	1.72	0.46	-	-	1.15	0.38
29-Oct-14	0.225	1.507	-	-	0.225	1.13	-	-
31-Oct-14	-	-	1.34	0.54	-	-	0.52	0.17
8-Nov-14	2.574	0.404	1.155	0.625	2.024	0.188	0.834	0.395
14-Nov-14	2.970	0.188	0.894	0.548	2.376	0.301	0.827	0.406
22-Nov-14	1.964	0.146	1.788	0.723	2.272	0.100	1.565	0.559
28-Nov-14	2.657	0.165	1.013	0.301	2.013	0.100	1.155	0.345
5-Dec-14	2.332	0.179	0.849	0.238	1.925	0.100	0.551	0.142
11-Dec-14	1.100	0.160	1.103	0.230	0.858	0.160	0.268	0.153
19-Dec-14	1.584	0.165	1.490	0.263	0.990	0.160	0.872	0.164
22-Dec-14	0.842	0.146	1.132	0.285	0.484	0.100	0.805	0.206

4.12 Comparing the monitoring data between the Reporting Quarter and baseline monitoring period, the current water depth and volumetric flow rate has insignificant change. Furthermore, no exceedance in water depth and water flow rate were found in this Reporting Quarter.

**RESULTS OF ECOLOGICAL MONITORING**

4.13 According to updated EM&A Manual Section 6.17, 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.

4.14 In this Reporting Quarter, bi-monthly ecological monitoring is conducted by the IEC –

ENVIRON Hong Kong Limited on **28 November 2014**. The detailed reports are presented in the Monthly EM&A Report (**November 2014**).

**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 Quarter are summarized in *Table 5-1* and *5-2* and the Monthly Summary Waste Flow Table is shown in *Appendix G*. 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
	Oct 14	Nov 14	Dec 14	
C&D Materials (Inert) (m <sup>3</sup> )	0	0	0	-
Reused in this Contract (Inert) (m <sup>3</sup> )	0	0	0	-
Reused in other Projects (Inert) (m <sup>3</sup> )	0	0	0	-
Disposal as Public Fill (Inert) (m <sup>3</sup> )	680	0	0	Tuen Mum Area 38

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

Type of Waste	Quantity			Disposal Location
	Oct 14	Nov 14	Dec 14	
Recycled Metal (kg)	0	0	0	-
Recycled Paper / Cardboard Packing (kg)	0	0	0	-
Recycled Plastic (kg)	0	0	0	-
Chemical Wastes (kg)	0	0	0	-
General Refuses (m <sup>3</sup> )	0	0	15	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 licence 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

- 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.
- 6.02 In this reporting period, weekly joint site inspection by the RE, the Contractor and ET, was carried out on **3, 10, 17, 23 & 31 October 2014** and monthly joint inspection was carried out on **20 November 2014** and **4 December 2014**. Furthermore, weekly Environmental inspection in December 2014 only carried out by the RE and Contractor was on **10, 17, 24** and **30 December 2014**. Moreover, IEC joint site inspection was carried out on **23 October 2014, 20 November 2014** and **4 December 2014**.
- 6.03 In this Reporting Quarter, no non-compliance and deficiencies was noted but work area cleanness and tidiness maintain was reminded.
- 6.04 Observations for the site inspection and monthly audit within this Reporting Quarter are summarized in *Table 6-1*.

**Table 6-1 Site Observations during this Reporting Quarter**

Month	Findings / Deficiencies	Follow-Up Status
October 2014	NA	NA
November 2014	NA	NA
December 2014	NA	NA

## LANDSCAPE AND VISUAL INSPECTION

- 6.05 In this Reporting Quarter, **7** events landscape and visual inspection dated **3, 17 & 31 October 2014, 14 & 25 November 2014** and **11 & 23 December 2014**, was carried out by the landscape sub-contractor. The detailed inspection reports have provided at the relevant Monthly EM&A Reports (**October 2014, November 2014** and **December 2014**).

**7.0 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE**

**ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION**

7.01 No environmental complaints, summons and prosecution was received in this Reporting Quarter. 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 – December 2011	0	0	NA
January – December 2012	0	0	NA
January – December 2013	0	0	NA
January – September 2014	1 (in Feb 2014)	1	Air Quality (1)
October 2014	0	1	Air Quality (1)
November 2014	0	1	Air Quality (1)
December 2014	0	1	Air Quality (1)

**Table 7-2 Statistical Summary of Environmental Summons**

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
July – December 2011	0	0	NA
January – December 2012	0	0	NA
January – December 2013	0	0	NA
January – September 2014	0	0	NA
October 2014	0	0	NA
November 2014	0	0	NA
December 2014	0	0	NA

**Table 7-3 Statistical Summary of Environmental Prosecution**

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
July – December 2011	0	0	NA
January – December 2012	0	0	NA
January – December 2013	0	0	NA
January – September 2014	0	0	NA
October 2014	0	0	NA
November 2014	0	0	NA
December 2014	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 programme;
- (b) Silencers or mufflers on construction equipment should be utilized and shall be properly maintained during the construction programme;
- (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 at all times and particularly during rainstorms
- (d) Water pumped out from excavated pits shall be discharged into silt 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 0.1 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 of 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 of 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 minimise the generation of waste from his work. Avoidance and minimisation 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 practiced as far as possible. The recycled 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 Quarter are summarized in **Table 8-1**.

**Table 8-1 Environmental Mitigation Measures**

Issues	Environmental Mitigation Measures
Water Quality	<ul style="list-style-type: none"> <li>• Wastewater were appropriately treated by treatment facilities;</li> <li>• Drainage channels were provided to convey run-off into the treatment facilities; and</li> <li>• Drainage systems were regularly and adequately maintained.</li> </ul>
Air Quality	<ul style="list-style-type: none"> <li>• Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather;</li> <li>• Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers;</li> <li>• Cover all excavated or stockpile of dusty material by impervious sheeting or sprayed with water to maintain the entire surface wet;</li> <li>• Public roads around the site entrance/exit had been kept clean and free from dust; and</li> <li>• Tarpaulin covering of any dusty materials on a vehicle leaving the site.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>• Good site practices to limit noise emissions at the sources;</li> <li>• Use of quiet plant and working methods;</li> <li>• Use of site hoarding or other mass materials as noise barrier to screen noise at ground level of NSRs;</li> <li>• Use of shrouds/temporary noise barriers to screen noise from relatively static PMEs;</li> <li>• Scheduling of construction works nearby Tung Tsz Road; and</li> <li>• Alternative use of plant items within one worksite, where practicable.</li> </ul>

Issues	Environmental Mitigation Measures
Waste and Chemical Management	<ul style="list-style-type: none"><li>• 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;</li><li>• Waste arising should be kept to a minimum and be handled, transported and disposed of in a suitable manner;</li><li>• The Contractor should adopt a trip ticket system for the disposal of C&amp;D materials to any designed public filling facility and/or landfill; and</li><li>• Chemical waste shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.</li></ul>
General	<ul style="list-style-type: none"><li>• The site was generally kept tidy and clean.</li></ul>

## 9.0 CONCLUSIONS AND RECOMMENTATIONS

### CONCLUSIONS

- 9.01 This is the **14<sup>th</sup>** Quarterly EM&A Summary Report under Environmental Permit No.EP-303/2008 for the Contract No. DC/2010/02 - Drainage Improvement in Shuen Wan and Shek Wu Wai, covering the period from **1 October 2014** to **31 December 2014**.
- 9.02 In November 2014, Contract 2 has taken over all relevant EM&A programmes due to Contract 1 completed in *end-October 2014*. Since the Main Contractor and Resident Engineer confirmed that the Contracts 1 and 2 were to be completed in end-October 2014, as agreed by IEC, the EM&A programme was changed to Operation Phase according to the Updated EM&A Manual. However site inspection by the EPD, DSD, IEC, the Contractor and ET on **4 December 2014**, EPD only accepted that the EM&A programmes of Contract 1 changed to operation phase. So Contract 2 construction phase impact monitoring including water in-situ measurement & sampling and construction noise were resumed in December 2014.
- 9.03 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.
- 9.04 For water quality monitoring, a total of **124** Action/Limit Levels exceedances, namely **76** dissolved oxygen, **42** turbidity and **6** suspended solids were recorded in this Reporting Quarter. Investigation reports concluded that all registered exceedances were not related to the Project.
- 9.05 The hydrological characteristics of water depth and water flow rate were found no exceedance in this Reporting Period.
- 9.06 In the Reporting Quarter, there were no environmental complaints, notification of summons or successful prosecution received.
- 9.07 In this reporting period, weekly joint site inspection by the RE, the Contractor and ET, was carried out on **3, 10, 17, 23 & 31 October 2014** and monthly joint inspection was carried out on **20 November 2014** and **4 December 2014**. Furthermore, weekly Environmental inspection in December 2014 only carried out by the RE and Contractor was on **10, 17, 24** and **30 December 2014**. Moreover, IEC joint site inspection was carried out on **23 October 2014, 20 November 2014** and **4 December 2014**. In this Reporting Quarter, no non-compliance and deficiencies was noted but work area cleanness and tidiness maintain was reminded. The environmental performance of Contract 2 of the Project was therefore considered satisfactory.

### RECOMMENDATIONS

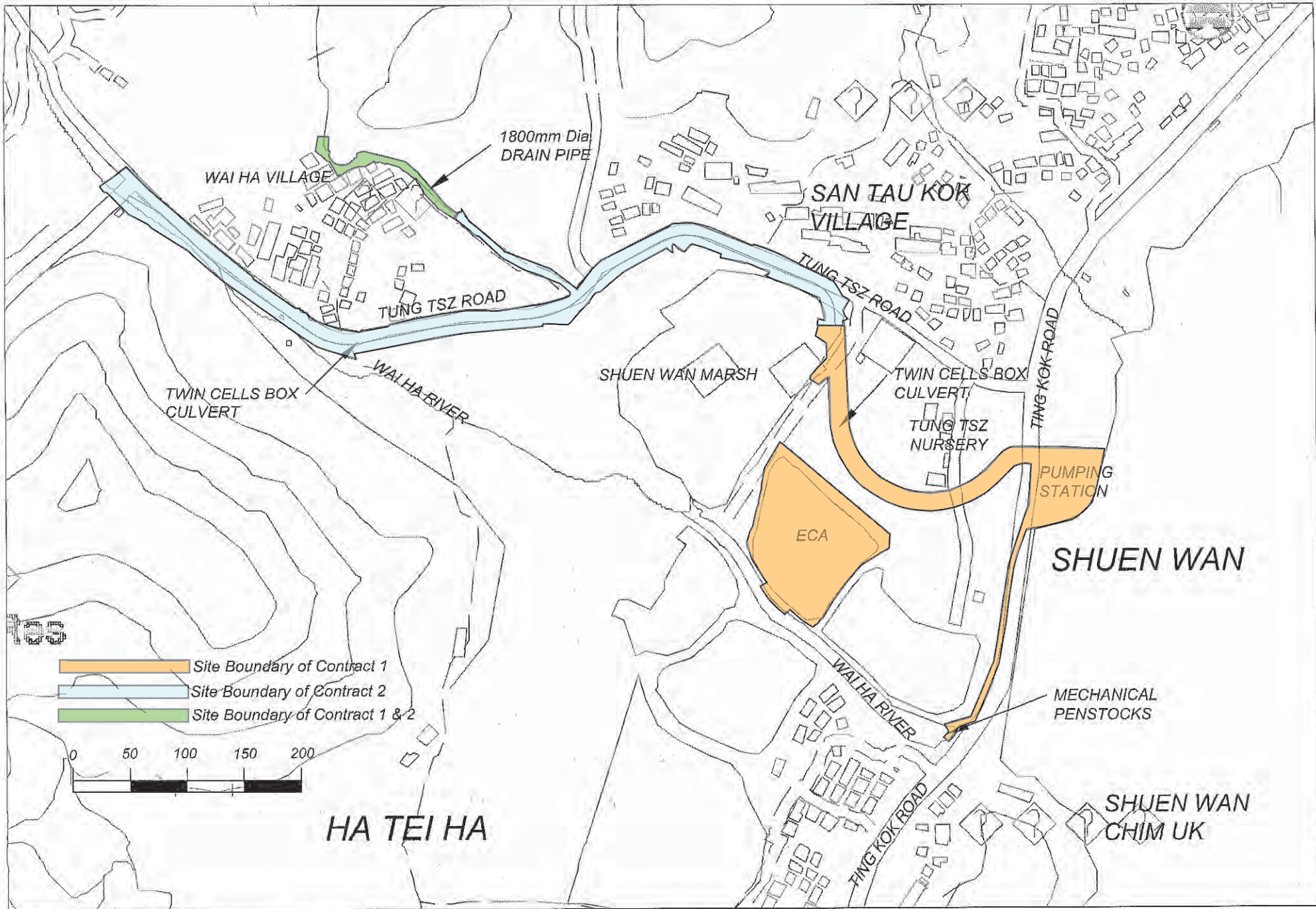
- 9.08 During dry season, special attention should be paid on the potential construction dust impact since a lot of villages are adjacent the Project site. The Contractor reminded that Dust mitigation measures should fully implement to avoid dust emission from loose soil surface of haul road.
- 9.09 On the other hand, construction noise should be other key environmental issue during construction work process. The noise mitigation measures should be necessary to implement in accordance with EM&A Manual stipulation.
- 9.10 Although breaches of water quality criteria frequently were record and concluded not related to works under the Project, mitigation measures as recommended in the EM&A Manual shall effectively implement to minimize the environmental impact arise from the works on the Project.
- 9.11 Moreover, work area cleanness and tidiness maintain was reminded. 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.

- END OF TEXT -

## **Appendix A**

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

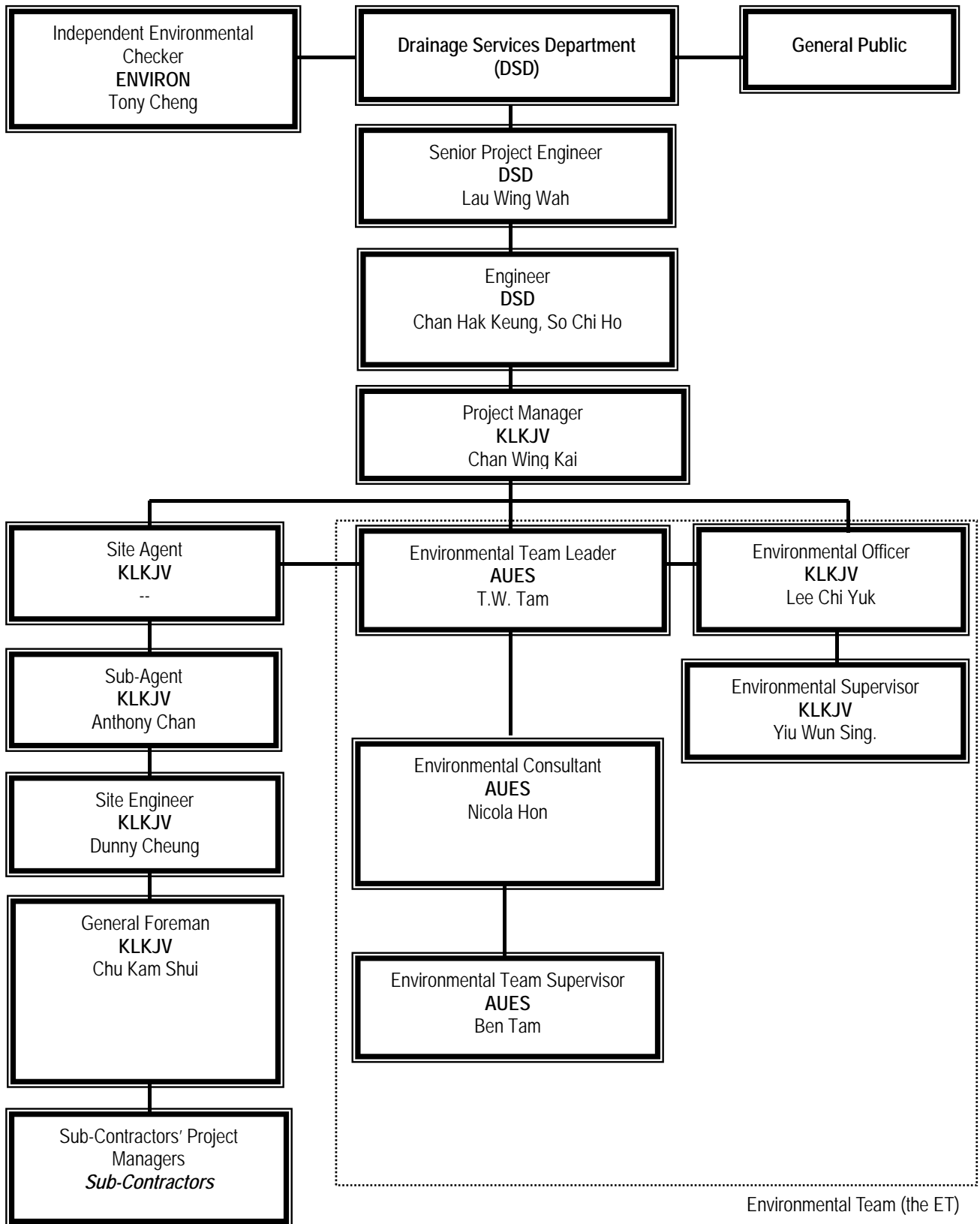




**Site Location Plan of DSD Contract 1 and Contract at Shuen Wan**

## **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	3465-2888	3465-2899
KLKJV	Project Director	Mr. Poon Chi Yeung Francis	2674 3888	2674 9988
KLKJV	Project Manager	Mr. Jeff Chan	2674 3888	2674 9988
KLKJV	Sub- Agent	Mr. Anthony Chan	2674 3888	2674 9988
KLKJV	Site Forman	Mr. Chu Kam Shui	2674 3888	2674 9988
KLKJV	Environmental Officer	Mr. Ronald Wong	2674 3888	2674 9988
AUES	Environmental Team Leader	Mr. T.W. Tam	2959-6059	2959-6079
AUES	Environmental Consultant	Miss. Nicola Hon	2959-6059	2959-6079
AUES	Environmental Supervisor	Mr. Ben Tam	2959-6059	2959-6079
DSD	Employer	Mr. Luk Wai Hung	2594 7400	2827 8700

**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*

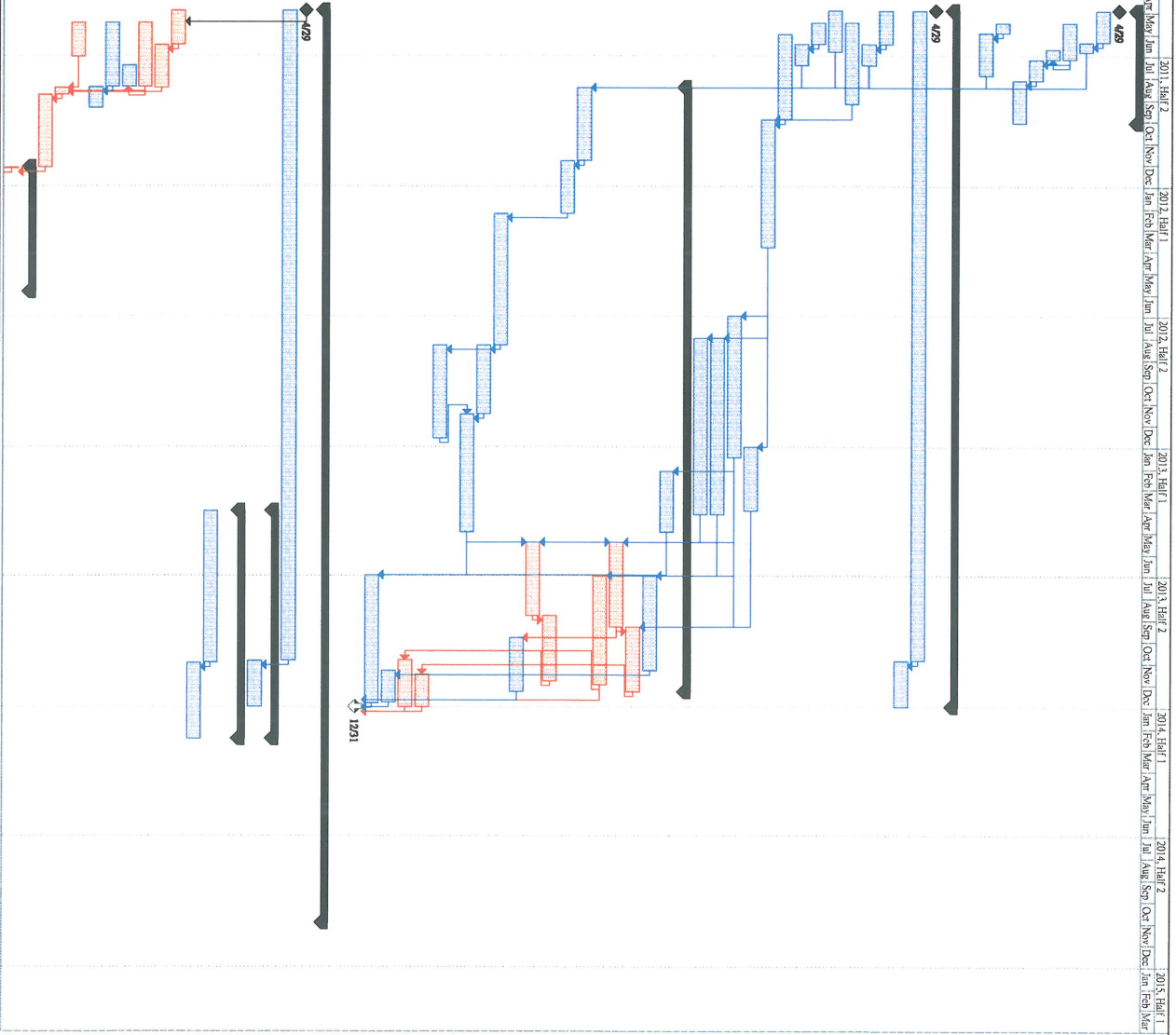
*AUES (ET) – Action-United Environmental Services & Consulting*



## **Appendix C**

### **Master and Three Months Rolling Construction Programme**

ID	Task Name	Duration	Start	Finish	Predecessors
1	<b>Primary Works</b>	<b>158 days</b>	<b>Fri 11 Apr 29</b>	<b>Mon 11 Oct 3</b>	
2	Commencement of Works	0 days	Fri 11 Apr 29	Fri 11 Apr 29	
3	Site Clearance	44 days	Fri 11 Apr 29	Sat 11 Jun 11	
4	Record Survey	14 days	Sat 11 Jun 12	Sat 11 Jun 25	
5	Design & Construction of Hoarding	51 days	Mon 11 May 16	Tue 11 Jul 5	
6	Sitebound (Type B)	14 days	Wed 11 Jun 22	Tue 11 Jul 5	5FF
7	Design & Approval of Engineer's Site Office	30 days	Wed 11 Jun 6	Thu 11 Aug 4	
8	Construction of Engineer's Site Office	60 days	Fri 11 Aug 5	Mon 11 Oct 3	
9	Pre-construction Condition Survey	14 days	Mon 11 May 16	Sat 11 May 29	
10	Reduction of Existing Shires (2 Nos)	60 days	Mon 11 May 30	Tue 11 Jul 26	
11					
12	<b>Section I (Construction Works in Shuen Wan)</b>	<b>978 days</b>	<b>Fri 11 Apr 29</b>	<b>Tue 13 Dec 31</b>	
13	Commencement of Works	0 days	Fri 11 Apr 29	Fri 11 Apr 29	
14	<b>Original Contract Period</b>	<b>913 days</b>	<b>Fri 11 Apr 29</b>	<b>Sun 13 Oct 27</b>	
15	<b>Extension of Time - due to Judgment Waiver</b>	<b>65 days</b>	<b>Mon 13 Oct 28</b>	<b>Tue 13 Dec 31</b>	
16	Design of TTA	47 days	Fri 11 Apr 29	Tue 11 Jun 14	
17	Submission of TTA to TM/CG (for Approval)	30 days	Fri 11 Apr 29	Tue 11 Jul 16	
18	Excavation Permit	115 days	Mon 11 May 16	Wed 11 Sep 7	
19	Submission & approval of calculation & MS for BC (including trench ELS/Scope)	58 days	Fri 11 Apr 29	Sat 11 Jun 25	
20	Notify EPD on commencement (one month advance notice)	30 days	Mon 11 May 16	Tue 11 Jun 14	
21	Tree Felling	30 days	Wed 11 Jun 15	Tue 11 Jul 14	
22	Utility detection and diversion programme	120 days	Wed 11 Jun 15	Wed 11 Sep 28	
23	Utilities coordination	180 days	Thu 11 Sep 29	Mon 12 Nov 26	18,22
24	Temporary disconnection of the hydrant (Bay 7)	90 days	Tue 11 Jun 1	Sun 13 Mar 21	23
25	CI#2's overhead pole diversion (Bay 1 to Bay 15)	199 days	Mon 12 Jul 1	Tue 13 Jan 15	23
26	Relocation/diversion of light post (near Bay 13)	248 days	Wed 12 Aug 1	Fri 13 Apr 5	23
27	Relocation/diversion of light post (near Bay 32)	248 days	Wed 12 Aug 1	Fri 13 Apr 5	23
28	<b>Construction of Single Cell (approx. 72m)</b>	<b>869 days</b>	<b>Mon 11 Aug 15</b>	<b>Tue 13 Dec 10</b>	
29	Inhale Box Culvert - in progress	86 days	Mon 11 Aug 15	Tue 13 Apr 25	
30	from CI#67 to CI#27 (Bay 12,3,4,5)	133 days	Mon 11 Jul 1	Sat 13 Nov 10	25
31	from CI#27 to CI#15 (Bay 6,7)	91 days	Wed 13 Sep 11	Tue 13 Dec 10	22,24,25
32	from CI#15 to CI#20 (Bay 8,9,10,11)	159 days	Wed 13 Sep 15	Tue 13 Sep 10	4,25
33	from CI#20 to CI#297 (Bay 12,13,14,15,16,17,18,19)	179 days	Mon 13 Jul 1	Tue 13 Nov 20	26,25
34	from CI#297 to CI#34 (Bay 20,21,22) <b>completed</b>	<b>104 days</b>	<b>Mon 11 Aug 15</b>	<b>Fri 11 Nov 5</b>	<b>17,19,21,110,4</b>
35	from CI#34 to CI#395 (Bay 23,24,25,26,27) <b>completed</b>	<b>74 days</b>	<b>Sat 11 Nov 26</b>	<b>Tue 12 Feb 7</b>	<b>34</b>
36	from CI#395 to CI#49 (Bay 28,29)	92 days	Mon 13 Aug 28	Mon 13 Nov 25	37
37	from CI#49 to CI#435 (Bay 30,31,32)	101 days	Wed 13 Sep 26	Sun 13 Aug 25	41,27
38	from CI#435 to CI#480 (Bay 33,34)	76 days	Thu 13 Sep 26	Mon 13 May 15	41,27
39	from CI#480 to CI#541 (Bay 35,36,37,38,39) <b>completed</b>	<b>185 days</b>	<b>Wed 12 Aug 1</b>	<b>Fri 12 Aug 10</b>	
40	from CI#541 to CI#577 (Bay 40,41,42) <b>completed</b>	<b>97 days</b>	<b>Sat 12 Aug 11</b>	<b>Tue 12 Nov 15</b>	
41	from CI#577 to CI#674 (Bay 43,44,45,46,47,48,49,50) in progress	166 days	Fri 12 Nov 16	Tue 13 Apr 30	40,29,35,44 days
42	RCP above Bay 6)	171 days	Sat 12 Aug 11	Wed 12 Dec 19	39
43	CCTV inspection	46 days	Sat 13 Nov 16	Tue 13 Dec 11	31,35,25 days
44	Installation of Type 2 Railing at Upstream (CI#7 to CI#40)	66 days	Sat 13 Oct 27	Tue 13 Dec 31	36,35,30 days,33FF,35,4
45	Landscape Schematic	45 days	Mon 13 Nov 11	Wed 13 Dec 25	30
46	Completion of Section 1	180 days	Sun 13 Jan 30	Tue 13 Dec 26	29,4,13,5,6,48 days
47		0 days	Tue 13 Dec 31	Tue 13 Dec 31	46,45,43,44,33,38
48					
49	<b>Section II (Construction Works in Shek Wu Wai)</b>	<b>1281 days</b>	<b>Fri 11 Apr 29</b>	<b>Thu 14 Oct 30</b>	
50	Commencement of Works	0 days	Fri 11 Apr 29	Fri 11 Apr 29	
51	Original Contract Period	913 days	Fri 11 Apr 29	Sun 13 Oct 27	
52	<b>Extension of Time</b>	<b>320 days</b>	<b>Mon 13 Apr 1</b>	<b>Fri 14 Feb 14</b>	
53	EOT due to inclement weather	65 days	Mon 13 Oct 28	Tue 13 Dec 31	51
54	<b>Utilities in conflict with Construction of Box Culvert at downstream</b>	<b>320 days</b>	<b>Mon 13 Apr 1</b>	<b>Fri 14 Feb 14</b>	
55	utilites diversions	213 days	Mon 13 Apr 1	Wed 13 Oct 30	
56	construction of remaining works	107 days	Thu 13 Oct 31	Fri 14 Feb 14	55
57	Design of TTA	48 days	Fri 11 Apr 29	Wed 11 Jun 15	50
58	Submission of TTA to TM/CG for approval	60 days	Thu 11 Jun 16	Sun 11 Aug 14	57
59	Excavation Permit	90 days	Mon 11 May 16	Sat 11 Aug 13	59FF
60	Temp Work Design	30 days	Fri 11 Jul 15	Sat 11 Aug 13	59FF
61	Site Investigation for Utilities	90 days	Mon 11 May 16	Sat 11 Aug 13	59FF
62	Submit Program for Utilities Diversion	30 days	Sun 11 Aug 14	Mon 11 Sep 12	61
63	Site Clearance and Tree Felling	48 days	Sat 11 May 16	Sat 11 Jul 2	
64	Implement Stage 1 of TTA	10 days	Mon 11 Aug 15	Wed 11 Aug 24	58,59,63
65	Temp, Steel Decking and temporary carriageway	102 days	Mon 11 Aug 25	Sat 11 Dec 4	64
66	<b>Box Culvert Construction</b>	<b>175 days</b>	<b>Mon 11 Dec 5</b>	<b>Sun 12 Mar 27</b>	
67	Implement Stage 2 of TTA	189 days	Mon 11 Dec 5	Mon 11 Dec 5	65



Data Date: 09 Jun 2015  
 Printed on: 30 Mar 2015

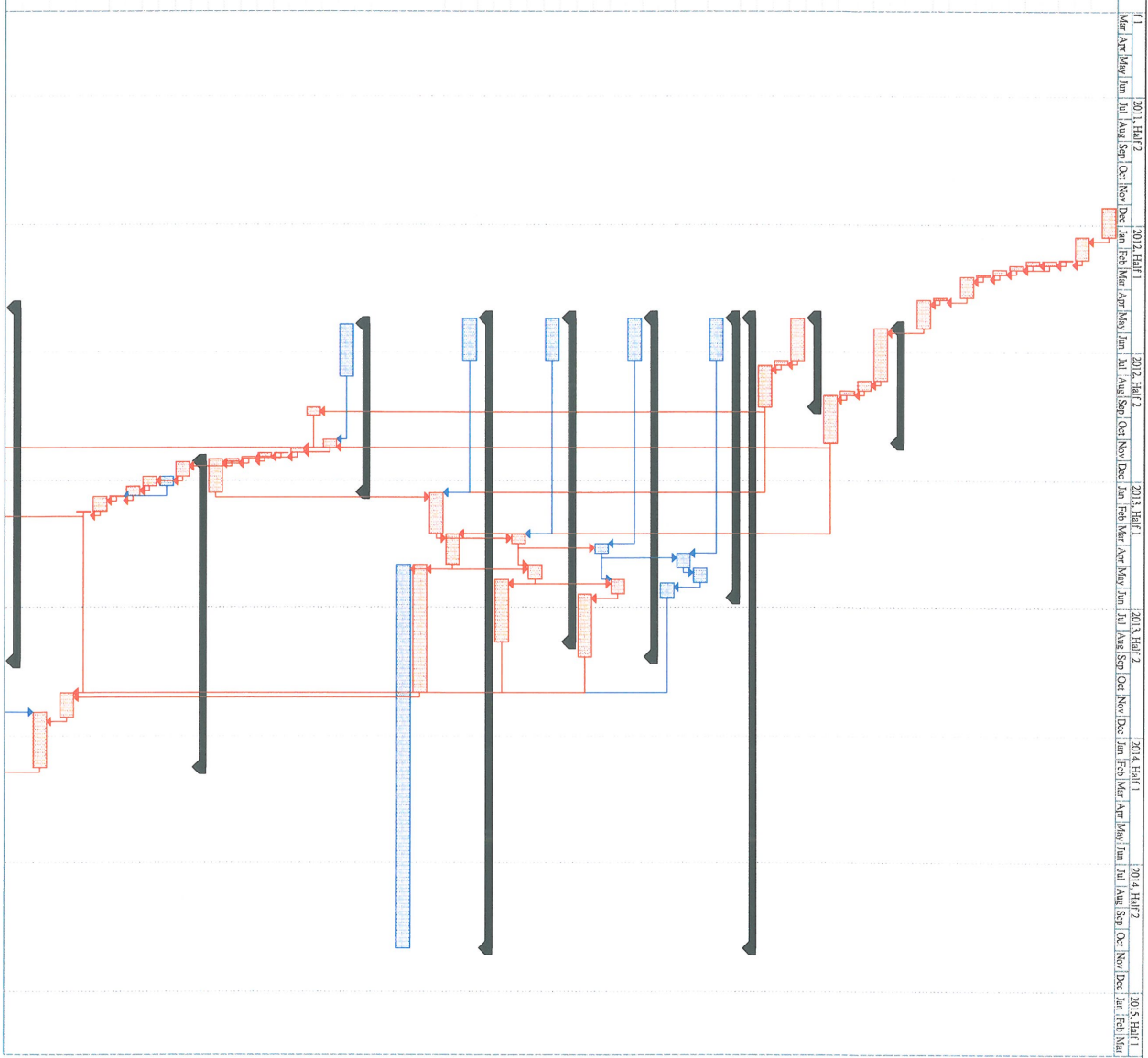
Task Critical Task Milestone Summary

Roll Up Task Roll Up Critical Task Roll Up Milestone Roll Up Progress

Shift External Tasks Project Summary Group By Summary Inactive Task Progress Deadline

Page 1

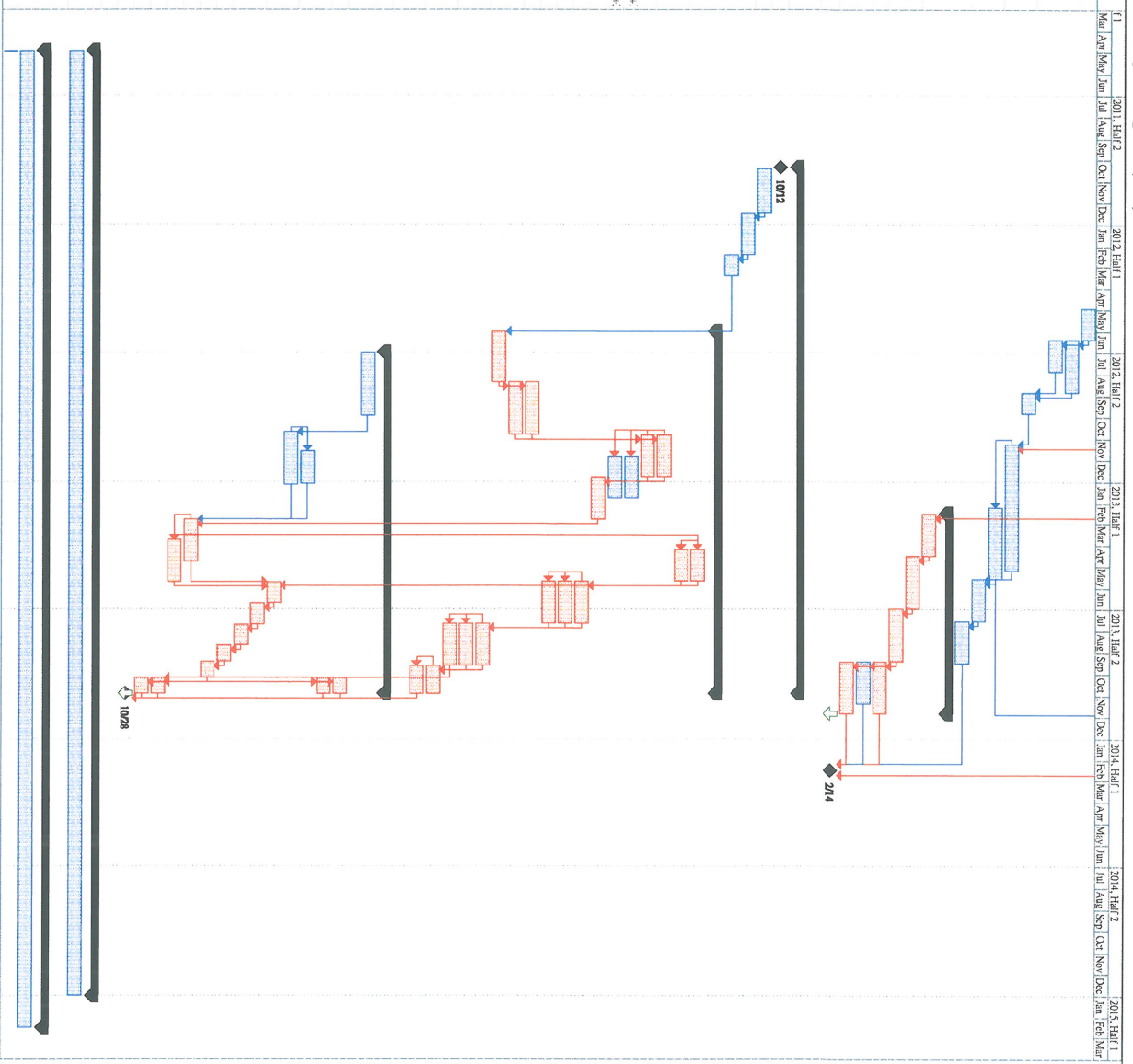
ID	Task Name	Duration	Start	Finish	Processors
68	Construction of Box Culvert along Castle Peak Road (West Bound) including demolition of B/C	41 days	Tue 11 Dec 6	Tue 12 Jun 17	67
69	Temporary accessways for stage 3 TTA	33 days	Wed 12 Jan 18	Sun 12 Feb 09	68
70	Implement Stage 3 of TTA	1 day	Mon 12 Feb 20	Mon 12 Feb 20	69
71	Trail pit for utilities	7 days	Tue 12 Feb 20	Mon 12 Feb 27	70
72	Construction of steel footbridge	7 days	Tue 12 Feb 20	Mon 12 Feb 27	70
73	Installation of steel sheet piles	6 days	Tue 12 Feb 28	Sun 12 Mar 4	72,71
74	Temporary support for utilities	7 days	Mon 12 Mar 5	Sun 12 Mar 11	73
75	Demolish Existing Box Culvert (East Bound)	3 days	Mon 12 Mar 5	Wed 12 Mar 14	74
76	Construction of Base Slabs & Wall of Box Culvert along Castle Peak Road (East Bound)	30 days	Tue 12 Mar 15	Fri 12 Apr 13	75
77	Remove Temporary flow diversion	3 days	Sat 12 Apr 16	Sun 12 Apr 16	76
78	Construction of 3.5m wide top slab of box culvert along Castle Peak Road (East Bound)	41 days	Tue 12 Apr 14	Sun 12 May 27	77
79	<b>Construction of RW1 wing wall section</b>	<b>164 days</b>	<b>Mon 12 May 28</b>	<b>Wed 12 Nov 7</b>	
80	C/P (overhead pole) - electric layne	75 days	Mon 12 May 28	Fri 12 Aug 28	78
81	C/P (overhead pole) - electric over	14 days	Sat 12 Aug 11	Fri 12 Aug 24	80
82	C/P (overhead pole) - removal of overhead pole	7 days	Sat 12 Aug 25	Fri 12 Aug 31	81
83	Reclaiming wall RW1 - wing wall portion	68 days	Sat 12 Sep 1	Wed 12 Sep 17	82
84	<b>Construction of RW2 (wing wall)</b>	<b>127 days</b>	<b>Mon 12 Sep 14</b>	<b>Mon 12 Sep 17</b>	
85	PCCW - XP application	60 days	Mon 12 Sep 14	Tue 12 Jul 12	83
86	PCCW - demolition of existing joint box cable droopt	7 days	Fri 12 Jul 13	Mon 12 Sep 14	84
87	Reclaiming wall RW2 (wing wall)	60 days	Fri 12 Jul 20	Mon 12 Sep 17	85
88	Reclaiming wall RW2	60 days	Fri 12 Jul 20	Mon 12 Sep 17	86
89	<b>Utilities Diversion by RW2</b>	<b>900 days</b>	<b>Mon 12 Sep 14</b>	<b>Thu 14 Oct 30</b>	
90	C/P (2 no. 11kV cables) - XP application	60 days	Mon 12 Sep 14	Sun 13 Jan 16	87
91	C/P (2 no. 11kV cables) - ducting & cable works (near RW1)	21 days	Mon 13 May 14	Sun 13 May 26	92
92	C/P (2 no. 11kV cables) - ducting & cable works (near RW2)	21 days	Mon 13 Apr 15	Sun 13 May 5	90,97
93	C/P (2 no. 11kV cables) - changing over	21 days	Mon 13 May 27	Sun 13 Jun 16	91
94	<b>NWT</b>	<b>484 days</b>	<b>Mon 12 May 14</b>	<b>Mon 13 Sep 9</b>	
95	NWT - XP application	60 days	Mon 12 May 14	Tue 12 Jul 12	93
96	NWT - manholes & ducting construction works (near RW1)	21 days	Wed 13 May 22	Tue 13 Jun 11	97,101
97	NWT - manholes & ducting construction works (near RW2)	14 days	Mon 13 Apr 1	Sun 13 Apr 14	95,102
98	NWT - diversion & changing over	90 days	Wed 13 Sep 12	Mon 13 Sep 9	96
99	<b>HQC</b>	<b>463 days</b>	<b>Mon 12 May 14</b>	<b>Mon 13 Aug 19</b>	
100	HQC - XP application	60 days	Mon 12 May 14	Tue 12 Jul 12	94
101	HQC - manholes & ducting construction works (near RW1)	21 days	Wed 13 May 2	Tue 13 May 12	98
102	HQC - manholes & ducting construction works (near RW2)	14 days	Wed 13 May 18	Sun 13 May 31	100,107
103	HQC - diversion & changing over	90 days	Wed 13 Aug 22	Mon 13 Aug 19	101
104	<b>PCCW</b>	<b>900 days</b>	<b>Mon 12 May 14</b>	<b>Thu 14 Oct 30</b>	
105	PCCW - XP application	60 days	Mon 12 May 14	Tue 12 Jul 12	95
106	PCCW - manholes & ducting construction works (near RW1)	44 days	Mon 13 May 18	Tue 13 Apr 20	83,107
107	PCCW - manholes & ducting construction works (near RW2)	59 days	Fri 13 Jan 18	Sun 13 Feb 17	87,105,119
108	PCCW - diversion & changing over (oversea cables)	184 days	Wed 13 May 1	Wed 13 Oct 30	106
109	PCCW - diversion & changing over (oversea cables - about 4 nos) - to be handed up for construction of remaining Box Culvert	548 days	Wed 13 May 1	Tue 14 Oct 30	106
110	<b>WSD</b>	<b>261 days</b>	<b>Tue 12 May 22</b>	<b>Thu 13 Jun 17</b>	
111	WSD - material delivery	75 days	Tue 12 May 22	Sat 12 Aug 4	
112	WSD - pipes fabrication, installation & laying (near RW1)	12 days	Sat 12 Nov 3	Wed 12 Nov 14	83,85,5 days,11
113	WSD - pipes fabrication, installation & laying (near RW2)	12 days	Tue 12 Sep 18	Sat 12 Sep 29	87
114	WSD - occupation of connection points	7 days	Thu 12 Nov 15	Wed 12 Nov 21	112,113
115	WSD - occupation of connection points with WSD	1 day	Thu 12 Nov 22	Thu 12 Nov 22	114
116	WSD - inspection of connection points with WSD	6 days	Tue 12 Nov 22	Tue 12 Nov 29	114
117	WSD - swabbing / flushing / sterilization	3 days	Wed 12 Nov 28	Fri 12 Nov 30	116,115
118	WSD - shutdown & commissioning by WSD	4 days	Sat 12 Dec 1	Fri 12 Dec 4	117
119	WSD - removal of disused pipes/reinforcement	48 days	Sat 12 Jan 17	Thu 13 Jan 17	117
120	<b>Remaining box culvert</b>	<b>437 days</b>	<b>Wed 12 Dec 5</b>	<b>Fri 14 Feb 14</b>	
121	Construction of top slab of box culvert for East Bound	21 days	Wed 12 Dec 5	Tue 12 Dec 25	118
122	Construction of temp. forebay at downstream	14 days	Wed 12 Dec 26	Tue 13 Jan 8	121
123	Backfilling and removal of temporary works	14 days	Wed 12 Dec 26	Tue 13 Jan 8	121
124	Temporary road surface for East Bound	14 days	Wed 12 Dec 26	Tue 13 Jan 8	121
125	Resume the east bound traffic	1 day	Wed 13 Jan 9	Wed 13 Jan 9	122
126	Temporary road surface for West Bound	21 days	Wed 13 Jan 23	Wed 13 Jan 23	124
127	Resume Castle Peak Road traffic for both direction	1 day	Thu 13 Feb 14	Thu 13 Feb 14	126
128	Construction of remaining top slab of box culvert and footpath at downstream	35 days	Thu 13 Oct 31	Wed 13 Dec 4	127,108,93,98,103
129	Implementation of TTA, Permanent road surface & paving block for footpath and associated works	79 days	Thu 13 Nov 28	Fri 14 Feb 14	128,5 days,16
130	<b>Reclaiming Wall RW1 &amp; Access Ramp</b>	<b>505 days</b>	<b>Sun 12 Apr 29</b>	<b>Sun 13 Sep 15</b>	





**Contract Title: Drainage Improvement Works in Shuen Wan and Shek Wu Wai**  
**Updated Programme (No. 6)**

ID	Task Name	Duration	Start	Finish	Predecessors
131	Design & submission of TTA (San Tin Tsuen Road) for construction RW1	45 days	Sun 12 Apr 20	Tue 12 Jun 12	
132	Reduction of free surface	75 days	Wed 12 Jun 13	Sun 12 Aug 26	131
133	Construction with RKO & TD to finalize the implementation date of TTA at San Tin	45 days	Wed 12 Jun 13	Fri 12 Jul 21	
134	Site Road	30 days	Mon 12 Aug 27	Tue 13 Sep 25	132, 133
135	Implementation of TTA at San Tin Tsuen Road	180 days	Tue 12 Nov 6	Mon 13 May 6	134
136	Construction of access ramp	102 days	Wed 13 Feb 6	Sun 13 May 19	135
137	Construction of concrete parapet	60 days	Thu 13 Jul 18	Wed 13 Jul 17	136
138	Installation of railing and vehicular gate	60 days	Sun 13 Sep 15	Sun 13 Sep 15	137
139	<b>Rehabilitate Wadi RW3 &amp; RW4</b>	<b>264 days</b>	<b>Fri 13 Feb 15</b>	<b>Mon 13 Apr 15</b>	<b>137</b>
140	Removal of steel road bridge at upstream	60 days	Fri 13 Feb 15	Mon 13 Apr 15	139
141	Construction of RW4	75 days	Tue 13 Apr 16	Sun 13 Jun 29	140
142	Construction of RW3	75 days	Sun 13 Jun 29	Thu 13 Sep 12	141
143	UU detector permanent works	74 days	Fri 13 Sep 13	Mon 13 Nov 11	142
144	Installation of Type 2 falling and construction of flood wall	60 days	Fri 13 Sep 13	Mon 13 Nov 11	143
145	Rehabilitation of footpath and planter areas	74 days	Fri 13 Sep 13	Mon 13 Nov 11	144
146	<b>Completion of Section II</b>	<b>0 days</b>	<b>Fri 14 Feb 14</b>	<b>Fri 14 Feb 14</b>	<b>145, 144, 143, 142, 141, 140, 139</b>
147					
148	<b>Section III (Construction Works in Wai Ha Village)</b>	<b>748 days</b>	<b>Wed 11 Oct 12</b>	<b>Mon 13 Oct 28</b>	
149	Commence of Works	0 days	Wed 11 Oct 12	Wed 11 Oct 12	
150	Design of 2.4m x 0.9m Box Culvert	65 days	Thu 11 Oct 13	Wed 11 Dec 14	
151	Submission of design & works proposal for Approval	60 days	Thu 11 Oct 13	Sun 12 Feb 12	150
152	Site Clearance & trial pits	30 days	Mon 12 Feb 13	Tue 12 Mar 13	151
153	<b>Construction of Box Culvert (approx. 200m) Bay 1 to Bay 16</b>	<b>515 days</b>	<b>Fri 12 Jan 1</b>	<b>Mon 13 Oct 28</b>	<b>152</b>
154	Bay 1	45 days	Sun 13 Mar 7	Thu 13 Mar 21	153
155	Bay 2	45 days	Sun 13 Apr 7	Mon 13 Apr 21	154
156	Bay 3	45 days	Fri 12 Oct 26	Mon 12 Dec 24	155
157	Bay 4	45 days	Fri 12 Oct 26	Mon 12 Dec 24	156
158	Bay 5	45 days	Fri 12 Oct 26	Mon 12 Dec 24	157
159	Bay 6	45 days	Sun 12 Nov 25	Wed 13 Jan 23	158
160	Bay 7	45 days	Tue 12 Dec 25	Fri 13 Feb 22	159
161	Bay 8	45 days	Wed 13 Mar 22	Sat 13 Jul 20	160
162	Bay 9	45 days	Wed 13 Mar 22	Sat 13 Jul 20	161
163	Bay 10	45 days	Wed 13 Mar 22	Sat 13 Jul 20	162
164	Bay 11	75 days	Sun 12 Aug 12	Thu 12 Oct 25	163
165	Bay 12	72 days	Sun 12 Aug 12	Thu 12 Oct 25	164
166	Bay 13	72 days	Fri 12 Aug 11	Wed 13 Sep 18	165
167	Bay 14	60 days	Sat 13 Jul 21	Wed 13 Sep 18	166
168	Bay 15	60 days	Sat 13 Jul 21	Wed 13 Sep 18	167
169	Bay 16	40 days	Thu 13 Sep 19	Mon 13 Oct 28	168
170	Bay 17	40 days	Thu 13 Sep 19	Mon 13 Oct 28	169
171	Bay 18 and Outfall	40 days	Thu 13 Sep 19	Mon 13 Oct 28	170
172					
173	<b>Construction of box culvert (1m x 1m) Bay 1 to Bay 8 (approx. 50m)</b>	<b>485 days</b>	<b>Sun 12 Jul 1</b>	<b>Mon 13 Oct 28</b>	
174	Notification to villagers regarding traffic arrangement for construction of 1 m x 1 m box culvert	90 days	Sun 12 Jul 1	Fri 12 Sep 28	
175	Intake headwall	23 days	Sun 13 Oct 6	Mon 13 Oct 28	174
176	Bay 1	23 days	Sun 13 Oct 6	Mon 13 Oct 28	175
177	Bay 2	47 days	Sun 12 Nov 18	Thu 13 Jan 3	176
178	Bay 3	75 days	Mon 12 Oct 22	Fri 13 Jan 4	177
179	Bay 4	30 days	Thu 13 Mar 22	Sun 13 Jul 21	178
180	Bay 5	30 days	Sun 13 Jun 22	Sun 13 Jul 21	179
181	Bay 6	30 days	Mon 13 Jul 22	Thu 13 Aug 20	180
182	Bay 7	23 days	Wed 13 Aug 21	Thu 13 Sep 12	181
183	Bay 8	23 days	Fri 13 Sep 13	Sat 13 Oct 5	182
184	Bay 9	60 days	Tue 13 Apr 23	Wed 13 Mar 22	183
185	Bay 10	60 days	Sat 13 Apr 24	Wed 13 Mar 22	184
186	CCTV inspection of box culvert	23 days	Sun 13 Oct 6	Mon 13 Oct 28	185
187	Grouting of existing 900mm storm drain	23 days	Sun 13 Oct 6	Mon 13 Oct 28	186
188	<b>Completion of Section III</b>	<b>0 days</b>	<b>Mon 13 Oct 28</b>	<b>Mon 13 Oct 28</b>	<b>187, 186, 185, 184, 183, 182, 181, 180, 179, 178, 177, 176, 175, 174, 173</b>
189					
190	<b>Section IV (Gradient A1 and A2, Shuen Wan)</b>	<b>1345 days</b>	<b>Fri 11 Apr 29</b>	<b>Wed 14 Dec 31</b>	
191	Landscape Establishment Works and preservation & protection of trees	1345 days	Fri 11 Apr 29	Wed 14 Dec 31	
192					
193	<b>Section V (Gradient B, Shek Wu Wai)</b>	<b>1388 days</b>	<b>Fri 11 Apr 29</b>	<b>Sat 15 Feb 14</b>	
194	Landscape Establishment Works and preservation & protection of trees	1388 days	Fri 11 Apr 29	Sat 15 Feb 14	
195					



Data Date: 09 Jun 2015  
 Printed on : 30 Mar 2015

Task: Critical Task

Milestone: Summary

Legend:

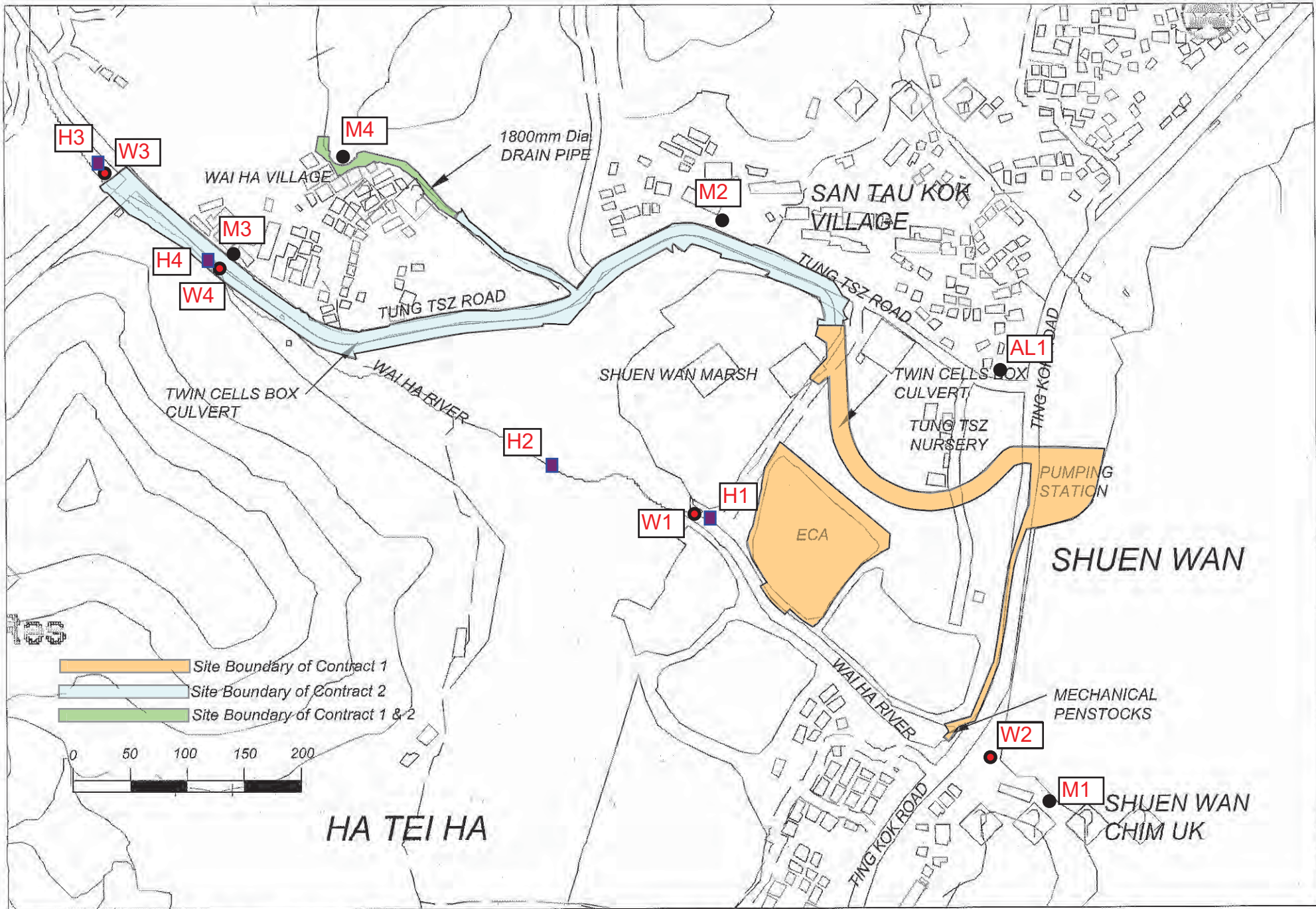
- Roll Up Task
- Roll Up Critical Task
- Roll Up Milestone
- Roll Up Progress
- Split
- External Tasks
- Project Summary
- Group By Summary
- Inactive Task
- Progress
- Deadline

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## **Appendix D**

### **Environmental Monitoring Locations**





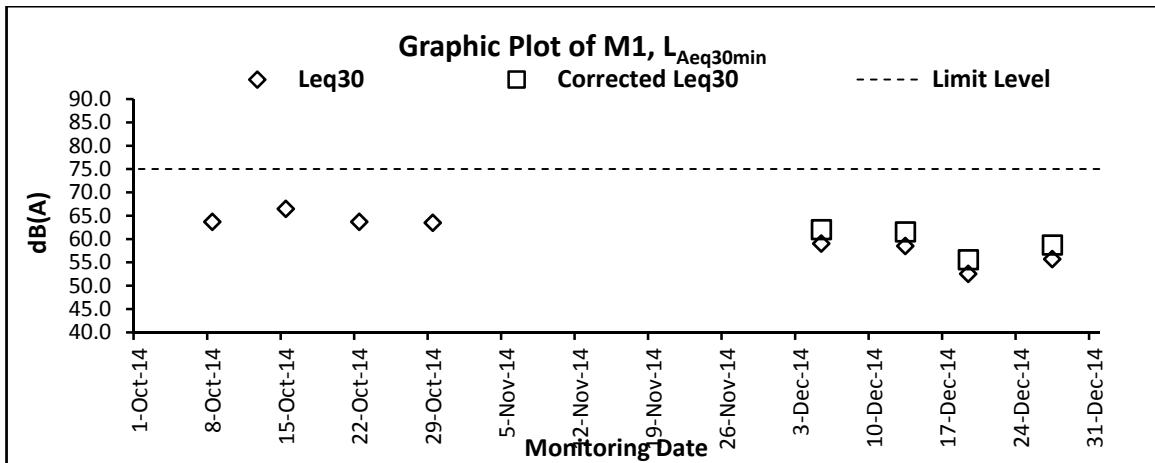
**All Environmental Monitoring Locations**

## **Appendix E**

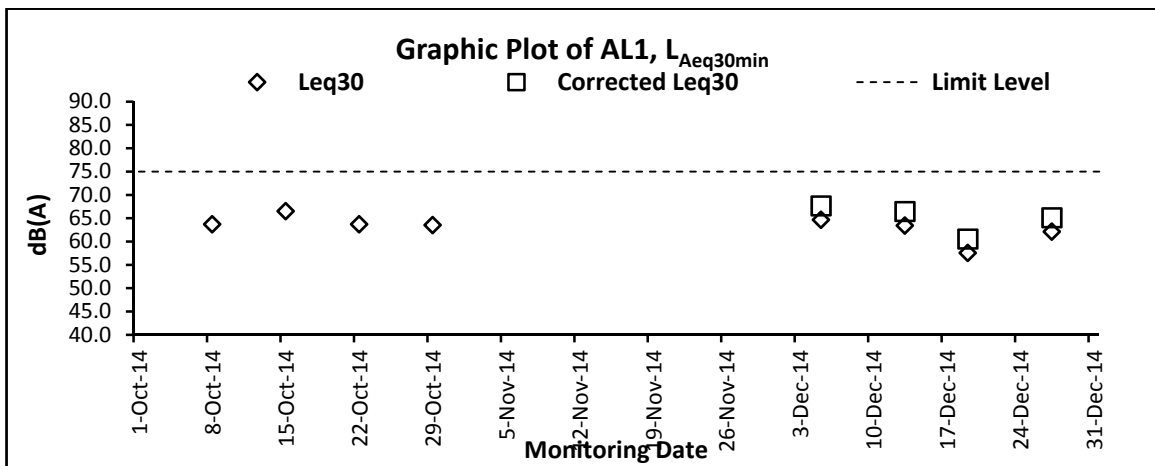
### **Graphical Plots of Impact Monitoring –**

- (a) Noise**
- (b) Water Quality**
- (c) Hydrological Characteristics**

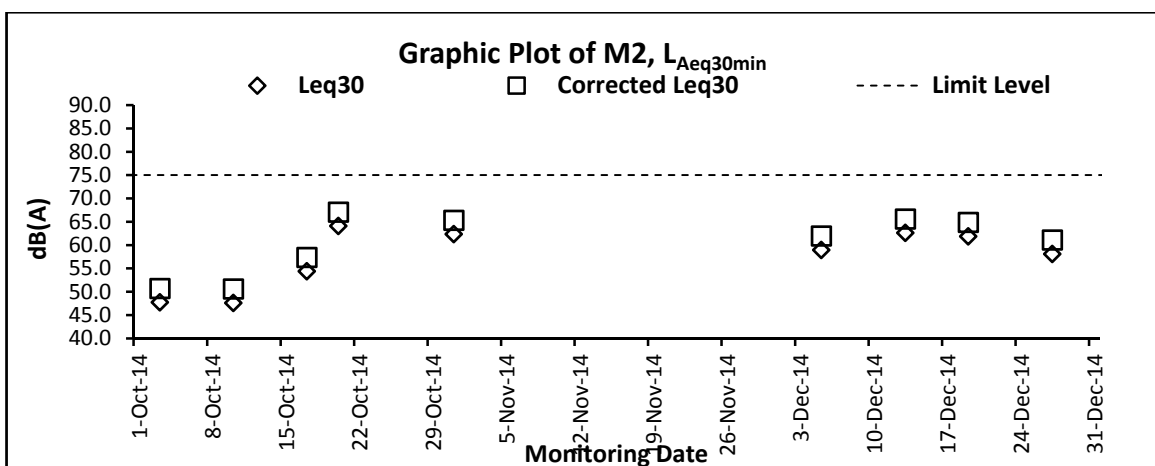
**Graphic Plot – Construction Noise**



Remark: The monitoring was undertaken under façade situation in October 2014. No façade correction is added according to acoustical principles and EPD guidelines.

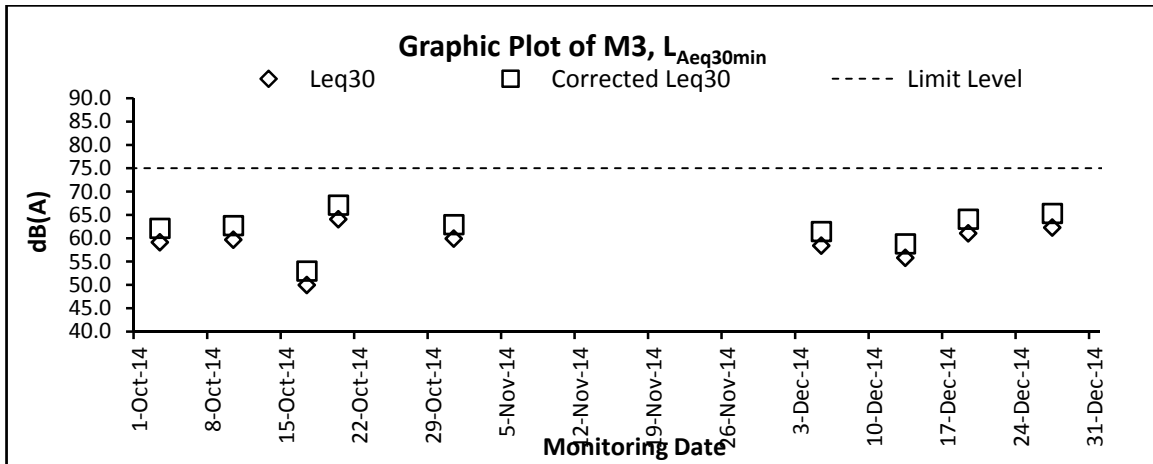


Remark: The monitoring was undertaken under façade situation in October 2014. No façade correction is added according to acoustical principles and EPD guidelines.

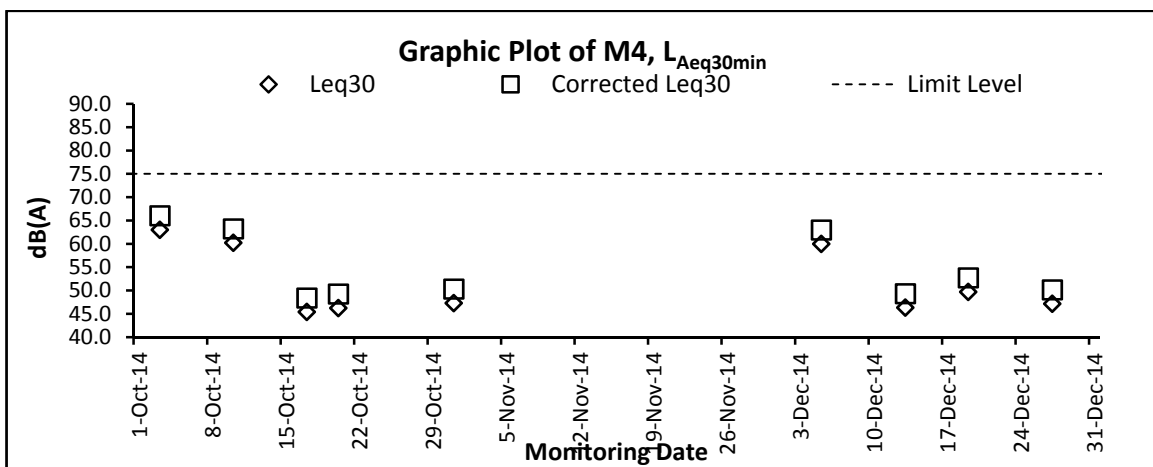


Remark: The monitoring is undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines



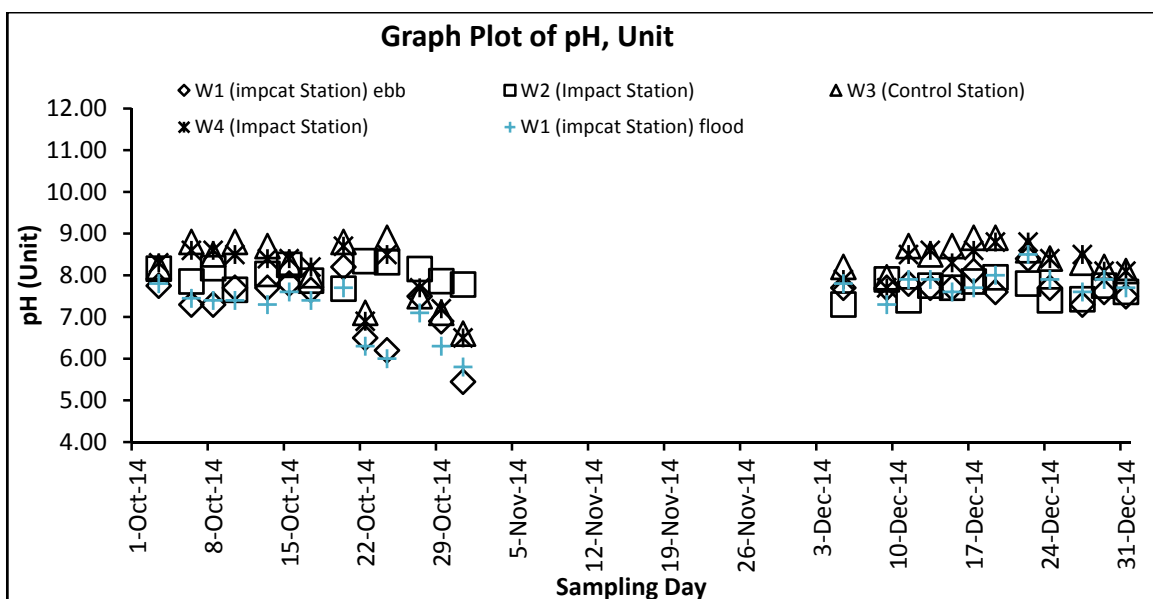
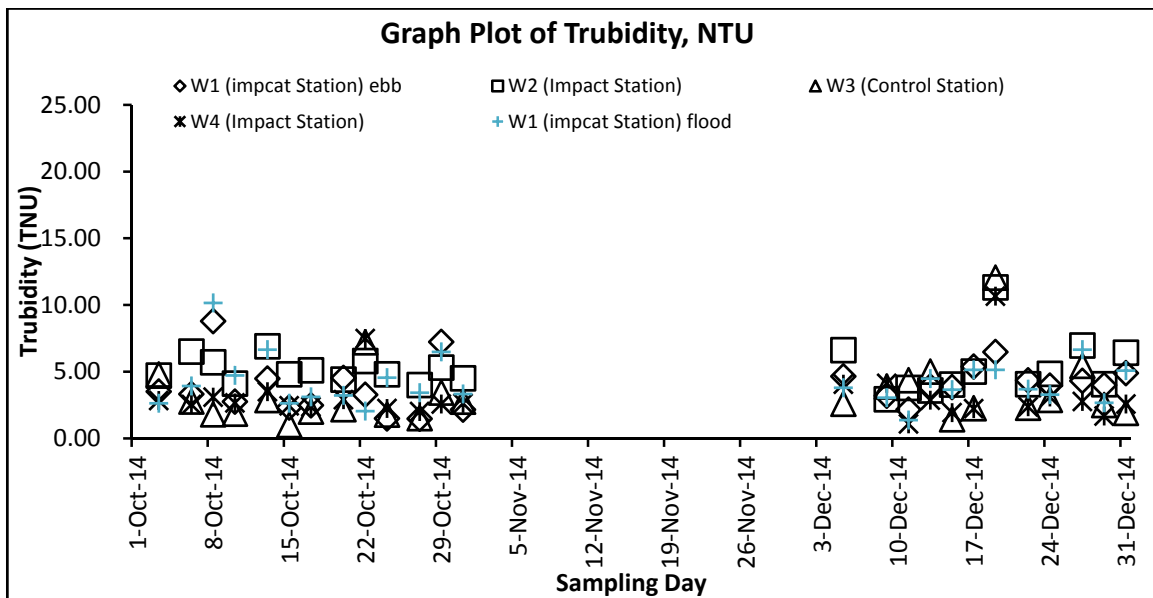
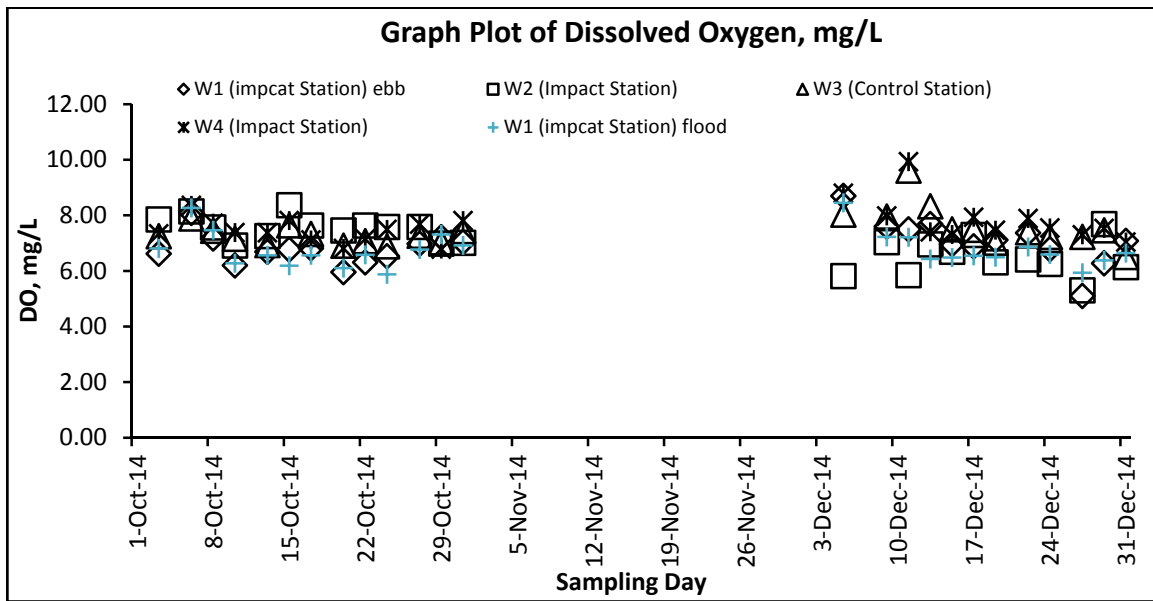


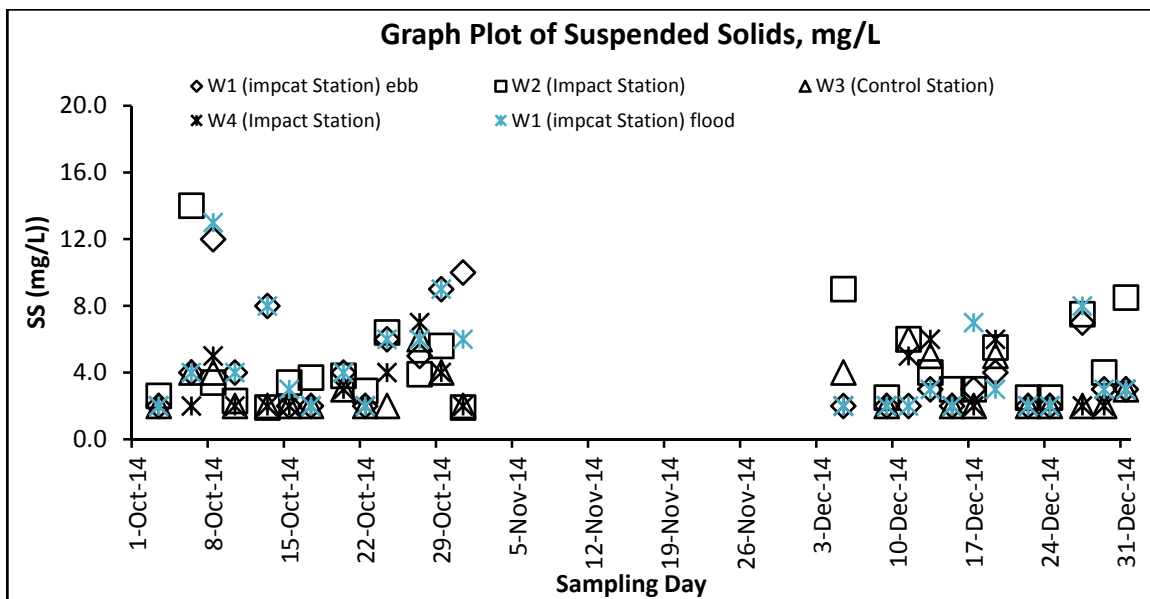
Remark: The monitoring is undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines



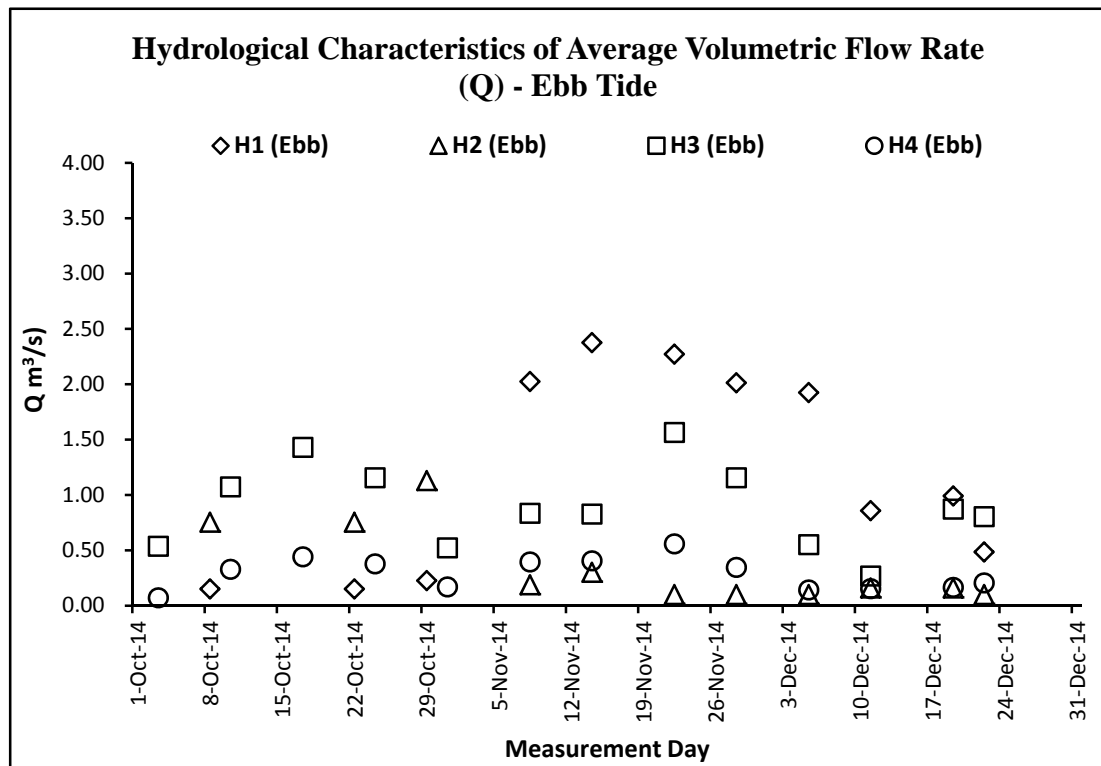
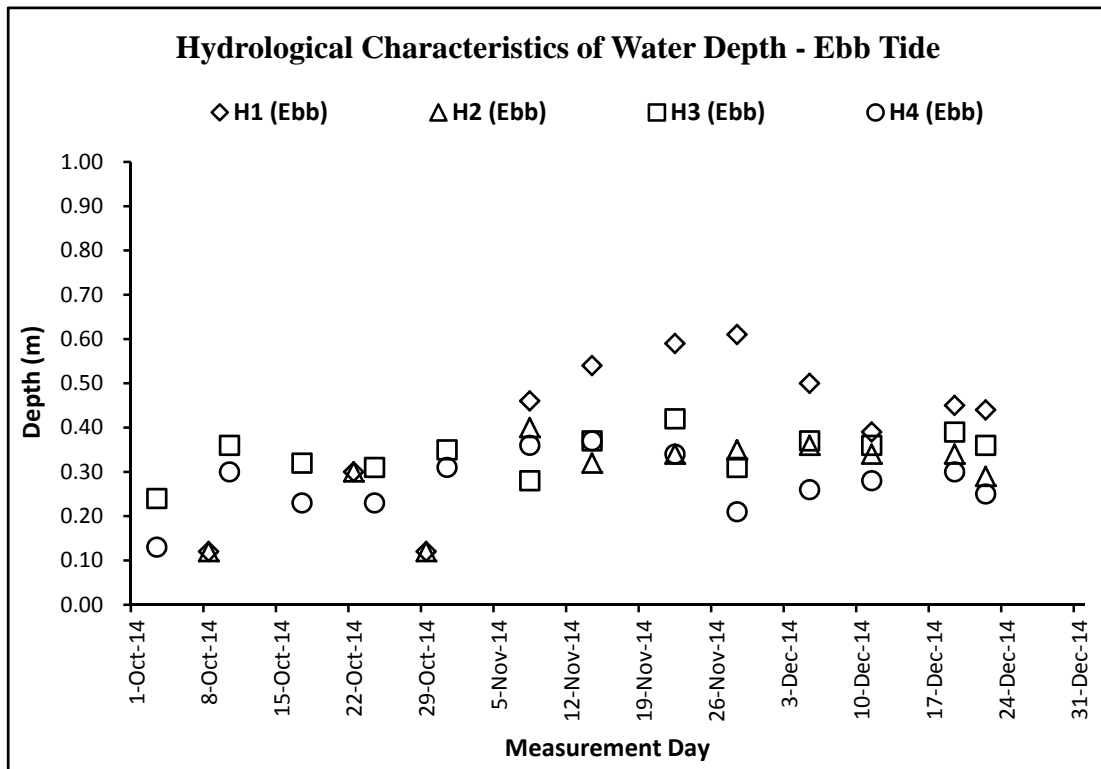
Remark: The monitoring is undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines

Graphic Plot – Water Quality

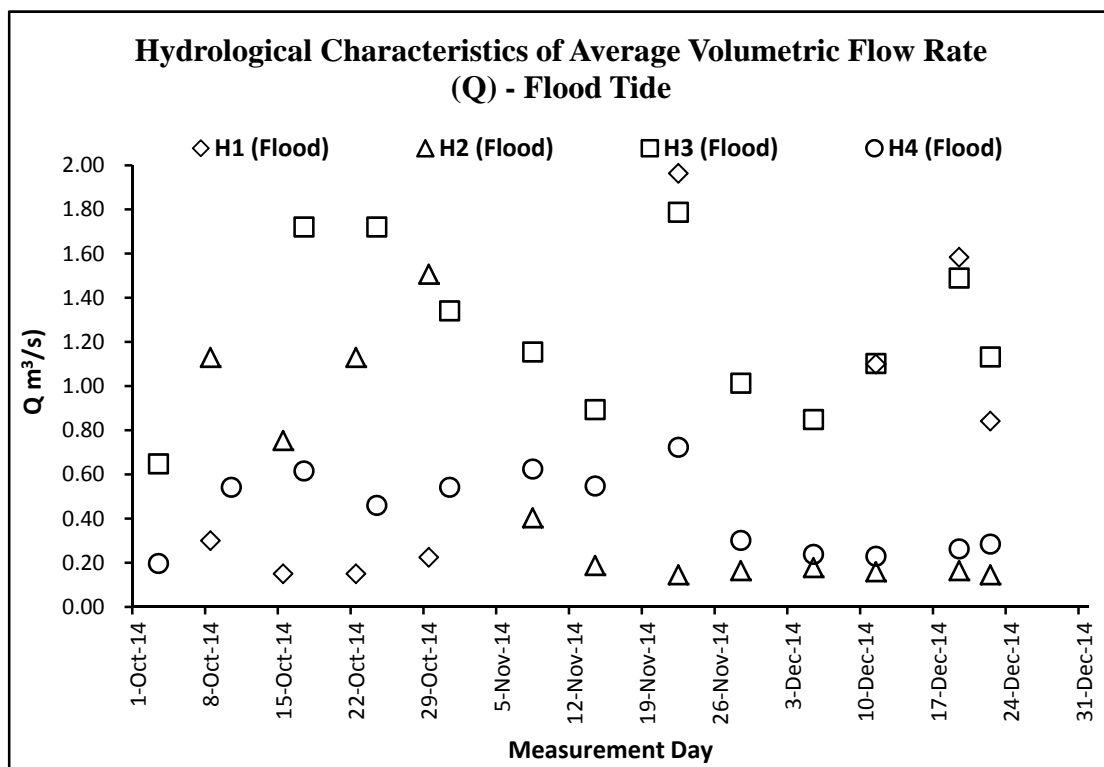
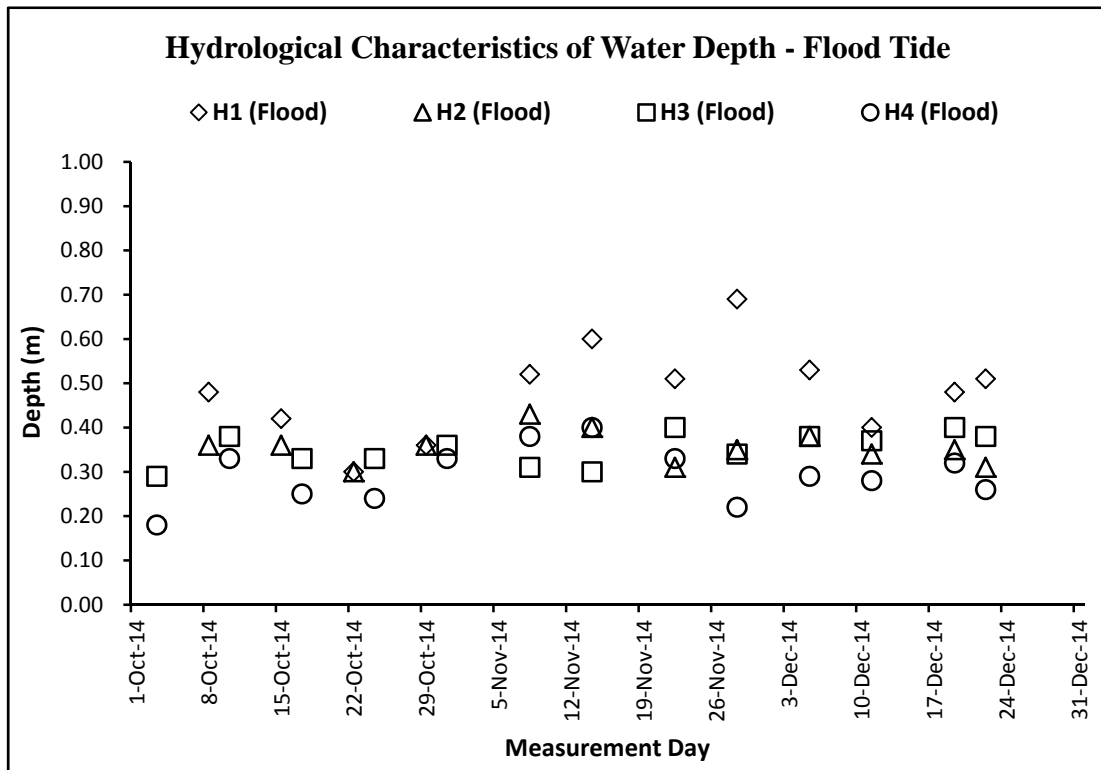




Graphic Plot – Hydrological Characteristics (Water Depth)



Graphic Plot – Hydrological Characteristics (Water Flow Rate)



## **Appendix F**

### **Event and Action Plan**

**Event Action Plan for Construction Noise**

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



### Event and action Plan for Water Quality

Event	ET Leader	IEC	ER	Contractor
<b>ACTION LEVEL</b>				
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented.</li> <li>7. Repeat measurement on next day of exceedance.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Make agreement on mitigation measures to be implemented;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes in working methods;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures.</li> </ol>
Action level being exceeded by more than two consecutive sampling days	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented.</li> <li>7. Prepare to increase the monitoring frequency to daily;</li> <li>8. Repeat measurement on next day of exceedance.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Make agreement on mitigation measures to be implemented;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes in working methods;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures</li> </ol>
<b>LIMIT LEVEL</b>				
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform EPD, IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented;</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit Level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Request Contractor to critically review the working methods;</li> <li>3. Make agreement on mitigation measures to be implemented;</li> <li>4. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes in working methods;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures.</li> </ol>
Limit level being exceeded by more than two consecutive sampling days	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform EPD, IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented.</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Request Contractor to critically review the working methods;</li> <li>3. Make agreement on mitigation measures to be implemented;</li> <li>4. Assess effectiveness of implemented mitigation measures;</li> <li>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.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes in working methods;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures;</li> <li>7. As directed by the Engineer, slow down or stop all or part of the construction activities until no exceedance of Limit level.</li> </ol>

### Event and action Plan for Hydrological Characteristics

Event	ET Leader	IEC	ER	Contractor
<b>ACTION LEVEL</b>				
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, Contractor's working methods and any excavation works or dewatering processes;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented.</li> <li>7. Repeat measurement on next day of exceedance.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Make agreement on mitigation measures to be implemented;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check working methods and any excavation works or dewatering processes;</li> <li>4. Consider changes in working methods and plans;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures.</li> </ol>
Action level being exceeded by more than two consecutive sampling days	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, Contractor's working methods and any excavation works or dewatering processes;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented.</li> <li>7. Prepare to increase the monitoring frequency to daily;</li> <li>8. Repeat measurement on next day of exceedance.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Make agreement on mitigation measures to be implemented;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check working methods and any excavation works or dewatering processes;</li> <li>4. Consider changes in working methods and plans;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures</li> </ol>
<b>LIMIT LEVEL</b>				
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform AFCD, IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, and Contractor's working methods and any excavation works or dewatering processes;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented;</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Request Contractor to critically review the working methods;</li> <li>3. Make agreement on mitigation measures to be implemented;</li> <li>4. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check working methods and any excavation works or dewatering processes;</li> <li>4. Consider changes in working methods and plans;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures.</li> </ol>
Limit level being exceeded by more than two consecutive sampling days	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform AFCD, IEC, Contractor and Engineer;</li> <li>4. Check monitoring data and Contractor's working methods and any excavation works or dewatering processes;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented.</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Request Contractor to critically review the working methods;</li> <li>3. Make agreement on mitigation measures to be implemented;</li> <li>4. Assess effectiveness of implemented mitigation measures;</li> <li>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.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check working methods and any excavation works or dewatering processes;</li> <li>4. Consider changes in working methods and plans;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures;</li> <li>7. As directed by the Engineer, slow down or stop all or part of the construction activities until no exceedance of Limit level.</li> </ol>

## **Appendix G**

### **Monthly Summary Waste Flow Table**

Monthly Summary Waste Flow Table

Month	Actual Quantities of Inert C & D Materials Generated Monthly						Actual Quantities of C & D Wastes Generated Monthly					
	Total Quantity Generated (in'000m <sup>3</sup> )	Hard Rock and Large Broken Concrete (in'000m <sup>3</sup> )	Reused in the Contract (in'000m <sup>3</sup> )	Reused in other Projects (in'000m <sup>3</sup> )	Disposed as Public Fill (in'000m <sup>3</sup> )	Imported Fill (in'000m <sup>3</sup> )	Metals (in'000kg)	Paper/cardboard packaging (in'000kg)	Plastics (see note 3) (in'000kg)	Chemical Waste (in'000kg)	Others, e.g. general refuse (in'000m <sup>3</sup> )	
Jan-14	0.435	-	-	-	0.435	-	-	-	-	0.015		
Feb-14	0.215	-	-	-	0.215	-	-	-	-	0		
Mar-14	0.036	-	-	-	0.036	-	-	-	-	0		
Apr-14	0.333	-	-	-	0.333	-	-	-	-	0		
May-14	0.333	-	-	-	0.333	-	-	-	-	0		
Jun-14	1.776	-	-	-	1.776	-	-	-	-	0		
Jul-14	0.461	-	-	-	0.461	-	-	-	-	0		
Aug-14	2.187	-	-	-	2.187	-	-	-	-	0		
Sep-14	0.000	-	-	-	0.000	-	-	-	-	0		
Oct-14	0.680	-	-	-	0.680	-	-	-	-	0		
Nov-14										0.09		
Dec-14										0.015		
<b>Total</b>	<b>6.456</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>6.456</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.12</b>		
Forecast of Total Quantities of C & D Materials to be Generated from the Contract												
	Total Quantity Generated (in'000m <sup>3</sup> )	Hand Rock and Large Broken Concrete (in'000m <sup>3</sup> )	Reused in the Contract (in'000m <sup>3</sup> )	Reused in other Projects (in'000m <sup>3</sup> )	Disposed as Public Fill (in'000m <sup>3</sup> )	Imported Fill (in'000m <sup>3</sup> )	Metals (in'000kg)	Paper/cardboard packaging (in'000kg)	Plastics (see note 3) (in'000kg)	Chemical Waste (in'000kg)	Others, e.g. general refuse (in'000m <sup>3</sup> )	
	23	1	10	0	10	2	5	2	1	1	3	

- Notes:
- (1) The performance targets are given in PS Clause 26.23(14).
  - (2) The waste flow table shall also include C & D materials that are specified in the Contract to be imported for used at the Sites.
  - (3) Plastics refer to plastics bottles/containers, plastic sheets/foam from packaging materials.
  - (4) The summary table shall be submitted to the Engineer's Representative monthly together with the Waste Flow Table for review and monitoring in accordance with the PS Clause 25.20A(4)

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 (m <sup>3</sup> )	Actual Quantities used (m <sup>3</sup> )	Remarks
1	Formwork for concreting	Easy handle by manpower	2	1.1	
2					
3					
4					
5					
6					
7					
<b>Total estimated Quantity of timber Used</b>			<b>2</b>		

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 Engineer's Representative monthly together with the Waste Flow Table for review and monitoring in accordance with the PS Clause 25.20A(5)