JOB NO.: TCS00491/09

DSD CONTRACT NO.: DC/2009/08

CONSTRUCTION OF YUEN LONG SOUTH BRANCH SEWERS AND EXPANSION OF HA TSUEN SEWAGE PUMPING STATION

1ST ENVIRONMENTAL MONITORING & AUDIT MONTHLY REPORT – FEBRUARY 2010

PREPARED FOR

CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) COMPANY LIMITED

Quality Index

Date	Reference No.	Prepared By	Certified By
26 May 2011	TCS00491/09/600/R0099v5	Dennis Ho (Environmental Consultant)	T.W. Tam (Environmental Team Leader)

Version	Date	Description
1	6 August 10	First submission
2	11 August 2010	Amended against IEC's comments on 10 August 2010
3	19 August 2010	Amended against IEC's comments on 12 August 2010
4	23 May 2011	Amended against IEC's comment on 20 May 2011
5	26 May 2011	Amended against IEC's comment on 25 May 2011

安誠工程顧問有限公司
香港灣仔
皇后大道東183號
合和中心47樓
電話：(852) 2911 2233
傳真：(852) 2805 5028

Hyder Consulting Limited
Company Number 126012
47th Floor, Hopewell Centre
183 Queen's Road East
Wan Chai, Hong Kong
Tel: (852) 2911 2233
Fax: (852) 2805 5028
hyder.hk@hyderconsulting.com
www.hyderconsulting.com

30 May 2011

By Post

Action-United Environmental Services & Consulting
Unit A, 20/F, Gold King Industrial Building,
35-41 Tai Lin Pai Road,
Kwai Chung,
New Territories,
Hong Kong.

Your Ref:

Our Ref: EB000586-F/E11-091449

For attention of: Mr. T. W. Tam

Dear Mr. Tam,

Contract No.: DC/2009/08
Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen Sewage Pumping Station
Monthly EM&A Report for Designated Project, February 2010 – IEC Verification

With reference to ET's captioned report (ET's ref.: TCS00491/09/600/R0099v5 dated 26 May 2011) received on 27 May 2011, we have no comment and hereby verify the captioned report excluding the Landscape and Visual Impact section of the report.

We request the ET to submit the separate submission of Landscape and Visual Impact section of the report as soon as possible, for the completion of the captioned report.

Should there be any queries, please feel free to contact our William Law on 2911 2511.

Yours sincerely

F.C. TSANG
Independent Environmental Checker
HYDER CONSULTING LIMITED

FCT/WL/my

EXECUTIVE SUMMARY

ES01. The China State Construction Engineering (Hong Kong) Limited (hereinafter "The Contractor") has been awarded by the Drainage Services Department (DSD) the Contract **DC/2009/08** *Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen Sewage Pumping Station* (the Project) in October 2009.

ES02. For ease of reporting, it has been agreed among the Engineer's Representatives (ER, AECOM), Independent Environmental Checker (IEC, Hyder Consulting Limited), The Contractor (The China State Construction Engineering (Hong Kong) Limited), Environmental Team (Action-United Environmental Services and Consulting, ET) and Environmental Protection Department (EPD) that the EM&A report under the Project is split to the following two stand-alone parts:

- Expansion of the existing Ha Tsuen Sewage Pumping Station (under Environmental Permit No.EP-327/2009)
- Construction of a sewage pumping station near Shui Tsui San Tsuen Road in Yuen Long South; and construction of about 9km of sewers and rising mains with diameter ranging from 200-1500mm in Yuen Long South and Ha Tsuen areas (without Environmental Permit).

ES03. As part of the project EM&A program, baseline monitoring was conducted between ***22 December 2009*** and ***18 January 2010*** to determine the ambient environmental conditions before the project commence any major construction works. Finally, the baseline monitoring report (*Ref: TCS00491/09/600/R0023v6*) had been verified by IEC on 16 July 2010 and endorsed by EPD on 21 July 2010.

ES04. This is the **1st** monthly EM&A Report – *Expansion of Ha Tsuen Sewage Pumping Station* (hereinafter 'this Report') for designated works under Environmental Permit No.EP327/2009 (hereinafter 'the EP'), covering a period from **8 February 2010 to 28 February 2010** (hereinafter 'the Reporting Period') during the designated works commencement on 8 February 2010.

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES05. Environmental monitoring activities under the EM&A program in this reporting month are summarized in the following table.

Aspects	Environmental Monitoring Parameters / Inspection	Occasions
Air Quality	1-hour TSP	18
	24-hour TSP	6
Construction Noise	Leq (30min) Daytime	6
Water Quality	Total Suspended Solids (TSP)	7
Inspection / Audit	ET Weekly Environmental Site Inspection	1

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES06. Breach of the air quality, construction noise and water quality in this reporting period is summarized in the following table.

Environmental Aspects	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0	--	--
	24-hour TSP	0	0	0	--	--
Construction Noise	Leq (30min) Daytime	0	0	0	--	--
Water Quality	Dissolved Oxygen	**1**	**1**	**2**	ongoing	NA
	Turbidity	0	0	0	--	--
	Suspended Solids	0	0	0	--	--

Note: NOE – Notification of Exceedance

ES07. A total of 4 Action/Limit Level exceedances were recorded in water quality monitoring, namely one Limit Level exceedance in Turbidity, one Limit Level exceedance in Suspended Solids and two Action/ Limit Level exceedances in Dissolved Oxygen. The preliminary investigation considered that the exceedances are not due to the Project and the corresponding investigation report is ongoing.

ENVIRONMENTAL COMPLAINT

ES08. No environmental complaint was recorded / received in this reporting month. The statistics of environmental complaint are summarized in the following table.

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
8 Feb – 28 Feb 2010	0	0	NA

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES09. No environmental summons and successful prosecutions were recorded in this reporting month. The statistics of environmental complaint are summarized in the following tables.

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
8 Feb – 28 Feb 2010	0	0	NA

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
8 Feb – 28 Feb 2010	0	0	NA

REPORTING CHANGE

ES10. There are no reporting changes in the first reporting month.

SITE INSPECTION BY EXTERNAL PARTIES

ES11. No site inspection was undertaken by external parties in this reporting month.

FUTURE KEY ISSUES

ES12. During dry season current, special attention should be paid to provide dust mitigation measures to avoid emission nearby ASR from the construction site Ha Tsuen Sewage Pumping Station. Moreover, mitigation measures for ingress of surface runoff into nearby water bodies should be properly maintained as necessary.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ANNEXES

1 INTRODUCTION

BACKGROUND

1.01 The China State Construction Engineering (Hong Kong) Limited (hereinafter "The Contractior") has been awarded by the Drainage Services Department (DSD) the Contract D**C/2009/08** *Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen Sewage Pumping Station* (the Project) in October 2009.

1.02 The Project involves construction of about 9km of sewers and rising mains with diameter ranging from 200-1500mm in Yuen Long South and Ha Tsuen areas, a sewage pumping station near Shui Tsui San Tsuen Road in Yuen Long South, expansion of existing Ha Tsuen Sewage Pumping Station. The site layout plan is shown in ***Appendix A***.

1.03 The construction of expansion Ha Tsuen Sewage Pumping Station is under a statutory EIA (Register No. AEIAR-072/2003) study for "*Upgrading and expansion of San Wai Sewage Treatment Works and expansion of Ha Tsuen Pumping Station*" commissioned by the DSD. An Environmental Permit (No.EP-327/2009) for upgrading and expansion of Sewage Treatment Works at San Wai (excluded for the Project) and Ha Tsuen Sewage Pumping Station has been obtained by DSD in January 2009 for the relevant works.

1.04 According to the Section 25 of the Particular Specification (PS) and the Environmental Permit No. EP-327/2009, the scope of monitoring includes air quality, construction noise, water quality and environmental site audit. It should be undertaken in accordance with the Environmental Monitoring and Audit Manual as part of EIA report [AEIAR-072/2003] (hereafter "the EM&A Manual") by an independent Environmental Team (ET). Also, monitoring and audit works for landscaping and visual will be undertaken as part of the EM&A programme.

1.05 As the works of the Project will be commenced in different period of time, the environmental monitoring and audit report for the Project will be split to two separate parts as follows:

(a) Expansion Ha Tsuen Sewage Pumping Station (under Environmental Permit No.EP-327/2009);

(b) Construction of sewers and rising mains with diameter ranging from 200-1500mm in Yuen Long South and Ha Tsuen areas and a sewage pumping station near Shui Tsiu San Tsuen Road in Yuen Long South (the works without Environmental Permit)

1.06 Action-United Environmental Services and Consulting (AUES) has been commissioned by the Contractor as the ET to implement the relevant EM&A program. As part of the project EM&A program, baseline monitoring was conducted between ***22 December 2009*** and ***18 January 2010*** to determine the ambient environmental conditions before the project commence any major construction works at Ha Tsuen Sewage Pumping Station. Finally, the baseline monitoring report (*Ref: TCS00491/09/600/R0023v6*) had been verified by IEC on 16 July 2010 and endorsed by EPD on 21 July 2010.

1.07 Further to the Contractor's instructions, the EM&A program of construction phase was commencement on 8 February 2010. This is the **1st** monthly EM&A Report – *Expansion of Ha Tsuen Sewage Pumping Station* (hereinafter 'this Report') for designated works under Environmental Permit No.EP-327/2009 (hereinafter 'the EP'), covering a period from **8 February to 28 February 2010** (hereinafter 'the Reporting Period') during the designated works commencement on 8 February 2010 as notified by the Contractor.

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

SECTION 3 SUMMARY OF IMPACT MONITORING REQUIREMENTS

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

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

CONSTRUCTION PROGRESS

2.02 The construction programs include the master tentative and a three month rolling are enclosed in ***Appendix C.*** Also, the major construction activities undertaken in this reporting month are listed below:

- Noise barrier erection in accordance with EP requirement;
- Ground investigation work; and
- Site clearance and preparation work.

SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.03 Summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this reporting month 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)	In progress
2	Chemical waste Producer Registration Registration No. 5213-511-C3570-01	Issued on 13 Nov 2009
3	Water Pollution Control Ordinance (Discharge License) License No. WT00005671-2009	Issued on 12 Jan 2010 Expiry date: 31 Jan 2015
4	Billing Account for Disposal of Construction Waste (Account Number: 700947)	Issued on 7 October 2009

2.04 The baseline monitoring report - *Expansion of Ha Tsuen Sewage Pumping Station* (*Ref: TCS00491/09/600/R0023v6*) had been verified by IEC and endorsed by EPD.

3 SUMMARY OF IMPACT MONITORING REQUIREMENTS

3.01 The Environmental Monitoring and Audit requirements are set out in the EM&A Manual. Environmental issues such as air quality, construction noise and water quality were identified as the key issues during the construction phase of expansion of Ha Tsuen Pumping Station. Also, monitoring and audit works for landscaping and visual shall be undertaken as part of the EM&A programme. Besides, baseline monitoring was undertaken in between 22 December 2009 and 18 January 2010 before the work commencement. The related Action/Limit Level including air construction noise and water quality were established in accordance with the EM&A Manual requirement.

MONITORING PARAMETERS

3.02 According to the *EM&A Manual*, the environmental aspects implemented by ET, including air quality, construction noise and water quality, while the landscape and visual impact should be monitored by a competent landscape architect. The monitoring parameters are summarized in ***Table 3-1***.

Table 3-1 Summary of Monitoring Parameters

Environmental Aspect	Parameters
Air Quality	• 1-hour Total Suspended Particulate (hereinafter '1-hr TSP'); and • 24-hour Total Suspended Particulate (hereinafter '24-hr TSP').
Construction Noise	• A-weighted equivalent continuous sound pressure level (30min) (hereinafter 'Leq(30min)' during the normal working hours; and • A-weighted equivalent continuous sound pressure level (5min) (hereinafter 'Leq(5min)' for construction work during the restricted hours.
Water Quality – Local Stream Course	• In Situ Measurement - Dissolved Oxygen (DO) and Turbidity • Laboratory Analysis - Suspended Solids (SS)
Water Quality – Effluent Discharge	• In Situ Measurement - pH value • Laboratory Analysis - SS and Chemical oxygen demand (COD)
Landscape and Visual Resources	• Vegetation survey undertaken on an "area" basis to identify representative types and species composition; • Assessment of landscape character; and • Tree survey report. • The inspection findings will be submitted separately.

MONITORING LOCATIONS

Monitoring Location Stipulation in the EM&A Manual

3.03 According to *EM&A Manual* ***Sections 2.2.1.18, 3.4.1.1*** & ***4.4.1.4***, and Figures ***2.1***, ***2.2***, ***3.1***, ***3.2*** and ***4.2***, there are four air and noise monitoring stations and one water quality monitoring station identified as sensitivity receiver during construction phase of the Project. For the four designated air and noise monitoring locations, two are located within the San Wai STW and other two are within the existing Ha Tsuen Pumping Station. Also, a local stream course of water quality monitoring station is identified in Tin Shui Wai Nullah. Also, the area of landscape and visual monitoring is recommended the entire selected route and within compounds in accordance with *the EM&A Manual* ***Section 6.3.1.1***

Air Quality

3.04 Although four (4) air sensitive receivers are proposed to be carried out in the EM&A programme as stipulated in the *EM&A Manual*, to study the location of air monitoring stations to be related the Project, two designated ASRs should be therefore performed and are listed in ***Table 3-2*** and illustrated in ***Appendix D***.

Table 3-2 Air Quality Monitoring Station under the Project Proposed in the EM&A Manual

No.	Name of ASR
1	Tin Shing Court
2	Home for Aged at Sha Chau Lei Road)

Construction Noise

3.05 Similarly to the air monitoring, two (2) designated NSRs should be performed and are listed in ***Table 3-3*** and illustrated in ***Appendix D***.

Table 3-3 Construction Noise Monitoring Station under the Project Proposed in the EM&A Manual

No.	Name of NSR
1	Tin Shing Court
2	Home for Aged at Sha Chau Lei Road

Water Quality

3.06 One designated location of a local stream course, Tin Shui Wai Nullah, is recommended to carry out water quality monitoring in accordance with the EM&A Manual under the project and illustrated in ***Appendix D***.

3.07 According to the EM&A Manual Section 4.3.1.5, the effluent water quality monitoring are proposed to be carried out at representative discharge point(s) where effluent from the construction sites is discharged into the local water course after being treated in a wastewater treatment system.

Landscape and Visual

3.08 The selected route and area, frequency and requirements of landscape & visual monitoring is proposed by a competent landscape architect.

Monitoring Locations during the Construction Period for Impact Monitoring

Air Quality and Construction Noise

3.09 In order to identify and seek for the access for the air and noise monitoring locations designated in the EM&A Manual, site inspection and the premises request about the monitoring locations have been carried out by the Contractor and ET. A designated monitoring location Yeung Chun Pui Care & Attention Home located at Sha Chau Lei Road has been identified and this premise was also granted by CEDD existing project CV/2008/03 for air and dust monitoring.

3.10 However, installation of sampler at another designated monitoring location Tin Shing Court was rejected by Incorporated Owners of Yuen Long Tin Shing Court. In this case, Ho Tak Sum Primary School was proposed to be the replacement to undertake air quality and construction noise monitoring during the expansion works of Ha Tsuen Sewage Pumping Station. The proposed alternative location is based on the EM&A Manual Clauses 2.2.1.20 and 3.4.1.3 as below:-

- The proposed location is one of air and noise sensitive receiver as mentioned in the "*EIA Study for the Upgrading and Expansion of San Wai STW and the Expansion of Ha Tsuen PS"* (Register No. AEIAR-072/2003);
- Which is built within Tin Shing Court and adjacent the denied monitoring stations;
- The distance between the construction site Ha Tsuen Sewage Pumping Station and Ho Tak Sum Primary School is shorter than other three education sensitive receivers such as Ho Ming Primary School, Pui Shing Catholic Secondary School and Tang Siu Tong Secondary School at Tin Shui Wai direction; and
- According to EIA study, the construction noise prediction is shown that Ho Tak Sum Primary School is high potential impacted by the construction noise under the project.

Water Quality

3.11 According to the Project EM&A Manual, the water sampling point for local stream course (hereinafter as R1) is designated at Tin Shui Wai Nullah. As R1 is located at the midpoint between two pedestrian flyovers athwart Tin Shui Wai Nullah, which are 320 meters apart, there is technical difficulty and safety is concerned when conducting the sampling. Therefore, proposal of relocation of sampling point to about 160 meters downstream of R1 (hereinafter as R1a) was recommended by ET during the joint site visit. The proposal was agreed by the IEC and ER and the baseline monitoring for water quality was conducted at R1a during the period from 22 December 2009 to 18 January 2010 as instructed by the Contractor.

3.12 However, EPD pointed out that there are several storm outfalls near R1a, it is considered that R1a may not be sensitive enough to allow early detection of water quality on the nullah. A new sampling point located at approximately 160m upstream of the R1 (hereinafter as R1b) was therefore proposed for the impact monitoring. A proposal (submission ref.: TCS00491/09/300/L0080) regards to the proposed Action/Limit Levels for water quality monitoring and impact monitoring point was submitted and it has been verified by IEC and no further comments by EPD.

3.13 The proposed monitoring stations undertaken for EM&A programme (to be agreed by IEC and endorsed by EPD) are detailed to list in ***Table 3-4*** and show in ***Appendix D***.

Table 3-4 Air, Noise and water Quality Monitoring Stations under the Project

Env. Aspect	Monitoring Location ID	Identified Address	Remarks
Air	AM1	Ho Tak Sum Primary School	Replace the Designated Monitoring Station Tin Shing Court
	AM2	Yeung Chun Pui Care & Attention Home	Designated in the EM&A Manual
Noise	NM1	Ho Tak Sum Primary School	Replace the Designated Monitoring Station Tin Shing Court
	NM2	Yeung Chun Pui Care & Attention Home	Designated in the EM&A Manual
Water	R1b	The crossing Tin Shui Wai Nullah pedestrian flyover	About 160 meters upstream from the designated location as stipulated in the EM&A Manual. Also, closer the existing Ha Tsuen Pumping Station

MONITORING FREQUENCY

3.14 According to the *EM&A Manual* Sections 2.2.1.27, 3.6 and 4.4.1.8, impact monitoring is covered air quality, noise and water quality of local stream course.

Air Quality Monitoring

Parameters: 1-hour TSP and 24-hour TSP.

Frequency: Once every six days for 24-hour TSP and three times every six days for 1-hour TSP.

Duration: Throughout the construction period.

Noise Monitoring

Parameters: One set of Leq(30min) as 6 consecutive Leq(5min) between 0700-1900 hours on normal weekdays.

Leq (5min), L10 and L90 during the construction undertaken during Restricted Hours (19:00 to 07:00 hours next of normal working day and full day of public holiday and Sunday)

Frequency: Once every six days during 0700-1900 hours on normal weekdays. Restricted Hour monitoring should depend on conditions stipulated in Construction Noise Permit.

Duration: Throughout the construction period.

Water Quality Monitoring of Local Stream Course

Parameters: DO, Turbidity and SS.
Frequency: 3 days per week.
Depths: mid-depth
Duration: Throughout the construction period and the interval between 2 sets of monitoring is not less than 36 hours

Water Quality Monitoring of Effluent Discharge

Parameters: pH, COD and SS.
Frequency: Depend on conditions stipulated in discharge license under **Section 20** of the ***Water Pollution Control Ordinance***.
Duration: Throughout the construction period

3.15 Post Project Monitoring will be performed at water quality monitoring local stream course. The requirements are same as baseline monitoring are presented below:

Parameters: DO, Turbidity and SS.
Frequency: 3 days per week.
Depths: mid-depth
Duration: 4 weeks and the interval between 2 sets of monitoring is not less than 36 hours upon completion pf the construction activities

MONITORING METHODOLOGY AND EQUIPMENTS

Air Quality

3.16 The air quality monitoring equipments for 1-hour and 24-hour TSP are listed in ***Table 3-5*** and the specification of equipments was submitted before the EM&A programme commencement.

Table 3-5 Air Quality Monitoring Equipments

Equipments	Description
1-hour TSP	
Portable dust meter	TSI DustTrak Model 8520 / Sibata LD-3 Laser Dust Meter
24-hour TSP	
High Volume Air Sampler	Grasby Anderson GMWS 2310 HVS
Calibration Kit	TISCH Model TE-5025A

1-hour TSP

3.17 The 1-hour TSP monitor is either a TSI Dust Track Aerosol Monitor Model 8520 or a Sibata LD-3 Laser Dust Meter which is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90^{o} light scattering. The 1-hour TSP monitor consists of the following:

(a.) A pump to draw sample aerosol through the optic chamber where TSP is measured;

(b.) A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and

(c.) A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

3.18 The 1-hour TSP meter is used within the valid period as follow manufacturer's Operation and Service Manual.

24-hour TSP

3.19 The equipment used for 24-hour TSP measurement is Thermo Andersen Model GS2310 TSP high volume air sampling system, which complied with EPA Code of Federal Regulation, Appendix B to Part 50. The High Volume Air Sampler (HVS) consists of the following:

(a.) An anodized aluminum shelter;

(b.) A 8"x10" stainless steel filter holder;

(c.) A blower motor assembly;

(d.) A continuous flow/pressure recorder;

(e.) A motor speed-voltage control/elapsed time indicator;

(f.) A 7-day mechanical timer; and

(g.) A power supply of 220v/50 Hz

3.20 The HVS was operated and calibrated on a regular basis in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5025A). One point checking would carry out in two month interval while full point checking in every 6 month.

3.21 24-hour TSP was collected by the ET on filters of HVS and quantified by a local HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd (ALS), upon receipt of the samples. The ET kept all the sampled 24-hour TSP filters in normal air conditioned room conditions, i.e. 70% RH (Relative Humidity) and 25^{o}C, for six months prior to disposal.

Noise

3.22 The equipments for noise monitoring are summaries in ***Table 3-6*** and the specification was submitted before the EM&A programme commencement**.**

Table 3-6 Noise Monitoring Equipments

Equipments	Description
Integrating Sound Level Meter	B&K Type 2238 or 2236
Calibrator	B&K Type 4231
Portable Wind Speed Indicator	Testo Anemometer

3.23 Sound level meters listed above comply 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).

3.24 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.

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

3.26 No noise extension cable was used to link the microphone with sound level meter for the measurement. The microphone was set about 1.2m height above ground and oriented such that it was pointed to the site with the microphone facing perpendicular to the line of sight. The windshield was fitted for all measurements. The monitoring locations AM1 and AM2 were normally set in a free field situation.

3.27 In prior of impact noise measurement, the accuracy of the sound level meter was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. The checking was performed before and after the noise measurement. Also, the wind speed was checked with a portable wind speed meter. No fog and rain were encountered during the noise measurement , and the wind speed and gusts were also below 5m/s or 10m/s respectively.

Water quality of Local Stream Course

3.28 The equipments for water monitoring are summaries in ***Table 3-7*** and the specifications were submitted before the EM&A programme commencement**.**

Table 3-7 Water Quality Monitoring Equipments

Equipment	Model / Description
Water Sampler	Teflon bailer / bucket
Thermometer & DO meter	YSI DO Meter 55
Turbidimeter	Hach 2100p
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-litter plastic cool box

3.29 Water quality monitoring was conducted below water column surface 0.5m.

Dissolved Oxygen (DO)

3.30 A portable YSI 550A DO Meter was used for in-situ DO measurement, which automates the measurements of temperature, dissolved oxygen and dissolved oxygen saturation simultaneously. The DO meter is capable of measuring DO in the range of 0 - 20 mg/L and 0 - 200 % saturation. Before each round of monitoring, the dissolved oxygen probe is calibrated by the wet bulb method with distilled water. Calibration of the equipment are performed by ALS on quarterly basis.

Turbidity

3.31 A portable Hach 2100p turbidity Meter was used for in-situ turbidity measurement. The turbidity meter is capable of measuring turbidity in the range of 0 – 1000 NTU. Calibration of the equipment is performed by ALS on quarterly basis.

Suspended Solids (SS)

3.32 SS will be determined by ALS upon receipt of the water samples using HOKLAS accredited analytical methods namely ALS Method EA-025.

Water Sampler

3.33 The water samples were collected by the ET using a plastic sampler, which has a volume of not less than 2 litres and can be sealed at both ends with cups to prevent metal contamination. The sampler was rinsed before collection with the sample to be taken. The water samples were collected at mid-depth level at the selected monitoring location for SS determination.

Sample Container

3.34 Water sample was contained in screw-cap PE (Poly-Ethylene) sampling bottle (1,000ml) to be provided by HOKLAS accredited laboratory ALS. Where appropriate, the sampling bottle was rinsed with the water to be contained in prior. Water sample was then transferred from the sampler to the sample bottles to 95% bottle capacity to allow possible volume expansion during delivery and storage.

Sample Storage

3.35 A 'Willow' 33-litter plastic cool box packed with ice was used to preserve the collected water samples prior to arrival at the laboratory. The water temperature of the cool box was maintained at a temperature as close to 4℃ as possible without being frozen. Samples were delivered to laboratory within 24 hours and analyzed within 2 days of delivery or within the holding time as advised by the laboratory.

EQUIPMENT CALIBRATION

3.36 Calibration of the HVS was performed upon installation in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5025A). The calibration data are properly documented and the records are maintained by ET for future reference.

3.37 The 1-hour TSP meter was calibrated by the supplier prior to purchase. Zero response of the equipment was checked before and after each monitoring event. In-house calibration with the High Volume Sampler (HVS) in same condition was undertaken in yearly basis.

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

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

METEOROLOGICAL INFORMATION

3.40 The meteorological information in this reporting month was downloaded from Lau Fau Shan Station of the Hong Kong Observatory (HKO) and presented in ***Appendix F***.

DATA MANAGEMENT AND DATA QA/QC CONTROL

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

3.42 The monitoring data recorded in the equipment e.g. 1-hour TSP meters and noise meters 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 or water quality in-situ measurement records are input directly into the computerized database and QA/QC checked by personnel other than those who input the data.

3.43 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.

DETERMINATION OF ACTION/LIMIT (A/L) LEVELS

3.44 According to the EM&A Manual, the air quality, construction noise and water quality criteria were set up, namely Action and Limit levels are listed in ***Tables 3-8, 3-9*** and ***3-10*** as below:-

Table 3-8 Action and Limit Levels for Air Quality Monitoring

Monitoring Location	Action Level (μg /m^3)		Limit Level (μg /m^3)	
	1-hour	24-hour	1-hour	24-hour
AM1	305	162	> 500	> 260
AM2	310	190	> 500	> 260

Table 3-9 Action and Limit Levels for Construction Noise

Monitoring Location	Action Level	Limit Level in dB(A)
	0700-1900 hrs on normal weekdays	
NM1	When one or more documented complaints are received	70 dB(A) of Leq(30min) during normal hours from 0700 to 1900 hours on normal weekdays, reduced to 65 dB(A) during school examination periods
NM2		70 dB(A) of Leq(30min) during normal hours from 0700 to 1900 hours on normal weekdays

*Note: * Reduces to 65 dB(A) during the school examination periods.*

Table 3-10 Action and Limit Levels for a Local Stream Water Quality Monitoring (R1b)

Parameter	Action Level	Limit Level
DO (mg/L)	4.6	4 mg/L or 40% saturation at 15^{o}C
Turbidity (NTU)	15.6	16.2
SS (mg/L)	31.5	31.9

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

4 IMPACT MONITORING RESULTS

4.01 Further to the Contractor's instructions, the EM&A program commenced on 8 February 2010. The monitoring schedule was issued to relevant parties in prior impact monitoring. The monitoring activities undertaken in this reporting month is listed in ***Appendix H***. The monitoring results are presented in the following sub-sections.

RESULTS OF AIR QUALITY MONITORING

4.02 In this reporting period, a total 4 events of 24-hour TSP monitoring and 9 events of 1-hour TSP monitoring were undertaken. The results air quality monitoring are summarized in ***Tables 4-1 and 4-2***. The 24-hour TSP data are shown in ***Appendix I***. Also, the graphical plots of 24-hour and 1-hour TSP are shown in ***Appendix J***.

Table 4-1 Summary of 24-hour and 1-hour TSP Monitoring Results – AM1

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st hour measured	2nd hour measured	3rd hour measured
10-Feb-10	23	11-Feb-10	14:00	97	108	106
18-Feb-10	24	17-Feb-10	08:20	71	78	75
22-Feb-10	53	23-Feb-10	08:35	92	104	101
27-Feb-10	33					
Average (Range)	**33 (23 – 53)**	Average (Range)		**92 (71 – 108)**		

Table 4-2 Summary of 24-hour and 1-hour TSP Monitoring Results – AM2

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st hour measured	2nd hour measured	3rd hour measured
10-Feb-10	32	11-Feb-10	13:30	109	121	118
18-Feb-10	129	17-Feb-10	09:05	79	87	86
22-Feb-10	66	23-Feb-10	09:05	102	111	109
27-Feb-10	69					
Average (Range)	**74 (32 – 129)**	Average (Range)		**102 (79 – 121)**		

4.03 As shown in ***Tables 4-1*** and ***4-2***, 24-hour and 1-hour TSP results fluctuated well below the Action Level during the Reporting Period. No Notification of Exceedance (NOE) of 24-hour and 1-hour TSP air quality criteria or corrective action was therefore required.

4.04 The meteorological data during the impact monitoring days are summarized in ***Appendix F***.

RESULTS OF CONSTRUCTION NOISE MONITORING

4.05 The noise monitoring results at the designated location (N1) are summarized in ***Tables 4-3*** and ***4-4***. The sound level were set in a free field situation, and therefore, a façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines.

Table 4-3 Summary of Construction Noise Monitoring Results – NM1

Date	Start Time	1st Leq_{5min}	2nd Leq_{5min}	3rd Leq_{5min}	4th Leq_{5min}	5th Leq_{5min}	6th Leq_{5min}	Leq_{30min}	Corrected* Leq_{30min}
11-Feb-10	14:40	56.6	55.7	57.1	59.4	57.7	56.9	57.4	60.4
17-Feb-10	08:25	53.2	52.7	53.3	54.1	52.4	52.2	53.0	56.0
23-Feb-10	08:35	58.8	60.2	60.7	59.4	62.3	58.7	60.2	63.2
Limit Level		-						**> 75 dB(A)**	

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

Table 4-4 Summary of Construction Noise Monitoring Results – NM2

Date	Start Time	1st Leq_{5min}	2nd Leq_{5min}	3rd Leq_{5min}	4th Leq_{5min}	5th Leq_{5min}	6th Leq_{5min}	Leq_{30min}	Corrected* Leq_{30min}
11-Feb-10	14:00	52.9	54.2	52.3	55.2	54.3	52.2	53.7	56.7
17-Feb-10	09:05	56.2	58.3	55.9	56.4	57.7	55.6	56.8	59.8
23-Feb-10	14:20	57.2	56.9	56.6	57.7	57.8	56.5	57.1	60.1
Limit Level		-						**> 75 dB(A)**	

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

4.06 It was noted that no noise complaint (which is an Action Level exceedance) was received. In view of the results shown in ***Tables 4-3*** and ***4-4*** which were all below 75dB(A), no Action or Limit Level exceedance was triggered during this month. The graphical plot is shown in ***Appendix J***.

RESULTS OF WATER QUALITY MONITORING – LOCAL STREAM COURSE

4.07 In this Reporting Month, a total of 8 sampling days were performed for water quality monitoring at R1b of the local stream course, Tin Shui Wai Nullah. The monitoring results including in-situ measurements and laboratory testing results are provided in ***Appendix I***. The graphical plots are shown in ***Appendix J***.

4.08 Monitoring results of 3 key parameters: dissolved oxygen (DO), turbidity and suspended solids (SS) in this Reporting Month, are summarized in ***Table 4-5***.

Table 4-5 Summaries of Water Quality Results – R1b

Sampling date	DO conc. (mg/L)	Turbidity (NTU)	SS (mg/L)
8 February 2010	***4.0***	15.5	15
10 February 2010	4.7	7.6	10
12 February 2010	**3.0**	11.5	16
17 February 2010	5.2	5.6	2
19 February 2010	6.4	6.9	11
22 February 2010	6.1	6.9	17
24 February 2010	8.4	13.8	23
26 February 2010	8.1	**16.5**	**42.0**

Remarks: Bold indicated Action Level exceedance
Bold and Italic indicated Limit Level exceedance

4.09 During this Reporting Period, a total of 4 Action/Limit Level exceedances were recorded in water quality monitoring, namely one Limit Level exceedance in Turbidity, one Limit Level exceedance in SS and two Action/ Limit Level exceedances in DO. NOE were issued to notify the relevant parties and the investigations for the cause of exceedances are ongoing. Based on site information obtained, construction of the site hoarding, noise barriers erection, ground investigation and site clearance were undertaken in this reporting period. Those construction activities would not generate any wastewater or runoff from to be discharged from the site to natural streams and Tin Shui Wai Nullah. Therefore, the preliminary investigation would consider that the exceedances are not due to the Project and the corresponding investigation report is ongoing.

4.10 During the Reporting Period, field measurements showed that water temperature and pH value of the local stream are within 11.9℃ to 24.4℃, and 7.6 to 9.5 respectively.

RESULTS OF LANDSCAPE AND VISUAL IMPACT

4.11 The landscape and visual impacts monitoring will be submitted separately as a stand-alone document.

5 WASTE MANAGEMENT

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

RECORDS OF WASTE QUANTITIES

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

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

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

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

Type of Waste	Quantity	Disposal Location
C&D Materials (Inert) (m^3)	0	-
Reused in this Contract (Inert) (m^3)	0	-
Reused in other Projects (Inert) (m^3)	0	-
Disposal as Public Fill (Inert) (m^3)	36	Tuen Mun Area 38

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

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

5.04 There was no site effluent or surface runoff discharged in this monthly period.

5.05 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 SITE INSPECTIONS

6.01 According to the Environmental Monitoring and Audit Manual, the environmental site inspection should be formulated by ET Leader. Regular environmental site inspections had been carried out by ET joined with the Contractor and ER to confirm the environmental performance. During this Reporting Period, the joint site inspection was undertaken on **23 February 2010** to evaluate the site environmental performance. No non-compliance was noted.

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

Table 6-1 Site Observations in the Reporting Month

Date	Findings / Deficiencies	Follow-Up Status
23 Feb 2010	The wheel washing facility is reminded to maintain regular.	Reminder

7 ENVIRONMENTAL COMPLAINTS AND NON-COMPLIANCE

ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

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

Table 7-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
8 Feb– 25 Feb 2010	0	0	NA

Table 7-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
8 Feb– 25 Feb 2010	0	0	NA

Table 7-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
8 Feb– 25 Feb 2010	0	0	NA

8 IMPLEMENTATION STATUS OF MITIGATION MEASURES

8.01 The environmental mitigation measures that recommended in the Environmental Monitoring and Audit Manual covered the issues of dust, noise, water quality, waste, landscape and visual and they are summarized as following:

Dust Mitigation Measure

(a) The contractor shall frequently clean and water the site to minimize fugitive dust emissions.

(b) Effective water sprays shall be used during the delivery ad handling of aggregate, and other similar materials, when dust is likely to be created and to dampen all sited material during dry and windy weather.

(c) Watering of exposed surfaces shall be exercised as often as possible depending on the circumstance.

(d) Areas within the site where there is regular movement of vehicles must be regularly watered as often as necessary for effective suppression of dust or as often as directed by the Engineer.

(e) Where dusty materials are being discharged to vehicle from a conveying system at a fixed transfer point, a three-sided roofed enclosure with a flexible curtain across the entry shall be provided. Exhausted fans shall be provided for this enclosure and vented to a suitable fabric filer system.

(f) The Contractor shall restrict all motorized vehicles within the site, excluding those on public roads, to a maximum speed of 5km per hour and confine haulage and delivery vehicles to designated roadways inside the site.

(g) Wheel washing facilities shall be installed and used by all vehicles leaving the site. No earth, mud, debris, dust and the like shall be deposited on public roads, water in wheel cleaning facility shall be changed at frequent intervals and sediments shall be removed regularly. The Contractor shall submit detailed proposals for the wheel cleaning facilities to the Engineer prior to construction of the facility. Such wheel washing facilities shall be usable prior to any earthworks excavating activity in the site.

(h) Any material dropped in the roads will need to be cleaned up immediately to prevent dust nuisance.

Noise Mitigation Measure

(a) During construction of the Project, temporary noise barriers should be used in order to reduce the noise impacts emanating from the construction sites on nearby Noise Sensitive Receivers (NSRs). The location of the temporary noise barriers should be along the site boundary of the expanded portion of Ha Tsuen Pumping Station.

(b) Noisy equipment and activities should be sited by the Contractor as far from close-proximity sensitive receivers as practical. Prolonged operation of noisy equipment close to dwellings and schools should be avoided.

(c) The Contractor should minimize construction noise exposure to the schools. Especially during examination periods, the Contractor should not carry out any construction activities. Activities shall be restricted to transit movements by construction vehicles during this period.

(d) Noisy plant or processes should be replaced by quieter alternatives where possible. Silenced diesel and gasoline generators and power units, as well as silenced and super-silenced air compressors should be used.

(e) Noisy activities should be scheduled to minimize exposure of nearby sensitive receivers to high levels of construction noise. For example, noisy activities can be scheduled for midday, or at times coinciding with periods of high background noise (such as during peak traffic hours).

(f) Idle equipment should be turned off or throttled down. Noisy equipment should be properly maintained and used no more often than is necessary.

(g) The power units of non-electric stationary plant and earth-moving plant should be quietened by vibration isolation and partial or full acoustic enclosures for individual noise-generating components.

(h) Construction activities should be planned so that parallel operation of several sets of equipment close to a given receiver is avoided, thus reducing the cumulative impacts between operations. The numbers of operating items of powered mechanical equipment should be minimized.

(i) Construction plant should be properly maintained (well-greased, damage and worn parts promptly replaced) and operated. Construction equipment often has silencing measures built in or added on, e.g. bulldozer silencers, compressor panels, and mufflers. Silencing measures should be properly maintained and utilized. Where possible, rubber or damping materials should be introduced between metal panels to avoid rattle and reverberation of noise.

(j) Equipment known to emit sound strongly in one direction, should where possible, be oriented so that the noise is directed away from nearby NSRs.

(k) Material stockpiles and other structures (such as site offices) should be effectively utilized, where practicable, to screen noise from on-site construction activities.

(l) The Contractor should devise, arrange methods of working and carry out the works in such manner as to minimize noise impacts on the surrounding environment, and should provide experienced personnel with suitable training to ensure that these measures are implemented properly.

Water Quality Mitigation Measures

(a) Exposed stockpiles should be covered with tarpaulin or impervious sheets before a rainstorm occurs;

(b) The exposed soil surfaces should also be properly protected to minimise dust emission;

(c) The stockpiles of materials should be placed in the locations away from the drainage channel so as to avoid releasing materials into the channel;

(d) Wheel washing facilities should be provided at site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles;

(e) Provision of site drainage systems and treatment facilities would be required to minimize the water pollution;

(f) A discharge licence needs to be applied from EPD for discharging effluent from the construction site;

(g) The treated effluent quality is required to meet the requirements specified in the discharge licence;

(h) Provision of chemical toilets is required to collect sewage from workforce. The chemical toilets should be cleaned on a regular basis;

(i) Wastewater generated from kitchens should be discharged to public foul sewers or collected in a temporary storage tank if connection to public foul sewers is not feasible;

(j) A licensed waste collector should be employed to clean the chemical toilets and temporary storage tank on a regular basis;

(k) Illegal disposal of chemicals should be strictly prohibited;

(l) Registration as a chemical waste producer is required if chemical wastes are generated and need to be disposed of. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes;

(m) Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance should be used as a guideline for handing chemical wastes; and

(n) The impact from accidental spillage of chemicals can be effectively controlled through good

management practices.

Waste Mitigation Measures

(a) Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;

(b) To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce;

(c) Any unused chemicals or those with remaining functional capacity should be recycled;

(d) Prior to disposal of C&D waste, it is recommended that wood, steel and other metals be separated for re-use and/or recycling and inert waste utilised as fill material to minimise the quantity of waste to be disposed of to landfill;

(e) Proper storage and site practices to minimise the potential for damage or contamination of construction materials; and

(f) Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.

Landscape and Visual Mitigation Measures

(a) Prior to construction work the detailed tree survey should have been completed and, if appropriate, trees to be transplanted moved to their final positions.

(b) The transplants and existing trees to be retained should be properly protected from damage by stout hoarding positioned as directed by a qualified Landscape Architect.

(c) Hoarding will help screen the construction work from the view of passers by.

(d) Typically a minimum of 4 months should be allowed prior to construction to prepare trees for transplanting.

(e) During construction regular inspections of the retained and transplanted trees should be made to ensure the effectiveness of the hoarding.

(f) Any topsoil excavated in the course of the works shall be stored and protected on site for reuse for restoration and screen planting works.

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

Table 8-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	• Wastewater were appropriately treated by treatment facilities; • Drainage channels were provided to convey run-off into the treatment facilities; • Drainage systems were regularly and adequately maintained. • De-silting facility was provided to treat the discharged water; also the treated water is reused for spraying the road surface; • Exposed stockpiles and exposed soil surfaces were covered with tarpaulin or impervious sheets to minimise dust emission; • The stockpiles of materials were placed in the locations away from the drainage channel so as to avoid releasing materials into the channel; • Wheel washing facilities should has been provided at site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles; • Provision of site drainage systems and treatment facilities would be required to minimize the water pollution; • A discharge licence was applied from EPD for discharging effluent from the construction site; • A licensed waste collector have been applied from EPD; • Illegal disposal of chemicals should be strictly prohibited; and • Registration as a chemical waste producer have been applied from EPD
Air Quality	• Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather; • Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers; • Cover all excavated or stockpile of dusty material by impervious sheeting or sprayed with water to maintain the entire surface wet; • Public roads around the site entrance/exit had been kept clean and free from dust; • Tarpaulin covering of any dusty materials on a vehicle leaving the site; • Spanker of water spray system is provided at haul road to reduce dust emissions during the vehicles passing through the haul road' • The vehicle speed within the site is limited to 5km/hr; • Wheel washing facilities have been provided at the site exit
Noise	• Good site practices to limit noise emissions at the sources; • Use of quite plant and working methods according to EP-329/2009; • Use of site hoarding with noise barriers to screen noise at ground level of NSRs; • Use of shrouds/temporary noise barriers to screen noise from relatively static PMEs according to EP-329/2009 • Use of temporary noise barrier with surface density 7kg/m2 to be assumed that the noise reduction is 10 dB(A) for stable plants and 5dB(A) for movable plant in accordance with approved EIA Report Appendix 4A Table 4A3.2; • Idle equipment are turned off or throttled down; • No construction works shall be undertaken during school examination period in the Ha Tsuen Pumping Station according to EP-329/2009; and • Alternative use of plant items within one worksite, where practicable.

Issues	Environmental Mitigation Measures
Waste and Chemical Management	• Excavated material should be reused on site as far as possible to minimize off-site disposal. Scrap metals or abandoned equipment should be recycled if possible; • Waste arising should be kept to a minimum and be handled, transported and disposed of in a suitable manner; • The Contractor should adopt a trip ticket system for the disposal of C&D materials to any designed public filling facility and/or landfill; and • Chemical waste shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes. • Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; • To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce; • Any unused chemicals or those with remaining functional capacity should be recycled; • Prior to disposal of C&D waste, it is recommended that wood, steel and other metals be separated for re-use and/or recycling and inert waste utilised as fill material to minimise the quantity of waste to be disposed of to landfill; • Proper storage and site practices to minimise the potential for damage or contamination of construction materials; and • Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.
Landscape and Visual	The landscape and visual impacts monitoring was undertaken by the landscape sub-contractor. The implemented mitigation measures will be presented in the stand-alone document.
General	• The site was generally kept tidy and clean.

9 IMPACT FORECAST

KEY ISSUES FOR THE COMING MONTH

9.01 Key issues to be considered in the coming month include:

- Implementation of dust suppression measures at all times;
- Potential wastewater quality impact due to surface runoff;
- Potential fugitive dust quality impact due from the dry/loose/exposure soil surface/dusty material;
- Disposal of empty engine oil containers within site area;
- Ensure dust suppression measures are implemented properly;
- Sediment catch-pits and silt removal facilities should be regularly maintained;
- Management of chemical wastes;
- Discharge of site effluent to the nearby nullah or storm drainage, stockpiling or disposal of materials, and any dredging or construction area at this area are prohibited;
- Follow-up of improvement on general waste management issues; and
- Implementation of construction noise preventative control measures.

10 CONCLUSIONS AND RECOMMENTATIONS

CONCLUSIONS

10.01 This is the **1st** monthly EM&A report, covering the construction period from **8 February** to **28 February 2010** (the Reporting Period) during the construction commencement on 8 February 2010.

10.02 No 1-hour TSP and 24-hour monitoring results that triggered the Action or Limit Level was recorded in this Reporting Period.

10.03 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 NOEs or the associated corrective actions were therefore issued.

10.04 During this Reporting Period, a total of 4 Action/Limit Level exceedances were recorded in water quality monitoring, namely one Limit Level exceedance in Turbidity, one Limit Level exceedance in Suspended Solids and two Action/ Limit Level exceedances in Dissolved Oxygen. NOE were issued to notify the relevant parties and the investigations for the cause of exceedances are ongoing. Based on site information obtained, construction of the site hoarding, noise barriers erection, ground investigation and site clearance were undertaken in this reporting period. Those construction activities would not generate any wastewater or runoff from to be discharged from the site to natural streams and Tin Shui Wai Nullah. Therefore, the preliminary investigation would consider that the exceedances are not due to the Project and the corresponding investigation report is ongoing.

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

10.06 The ET had carried out a site inspection on **23 February 2010**. No non-compliance was observed during the inspections. In general, it was reminded that good house keeping practice and wheel washing facility should be maintained; and the dust mitigation measures should be improve to prevent the dust emission during dry season. The environmental performance of the Project was therefore considered satisfactory.

10.07 No site inspection was undertaken by any other external parties such as EPD, the Agriculture, Fisheries and Conservation Department (AFCD) and Leisure and Cultural Services Department (LCSD) in this Reporting Period.

10.08 The landscape and visual impacts monitoring findings will be submitted separately as a stand-alone document.

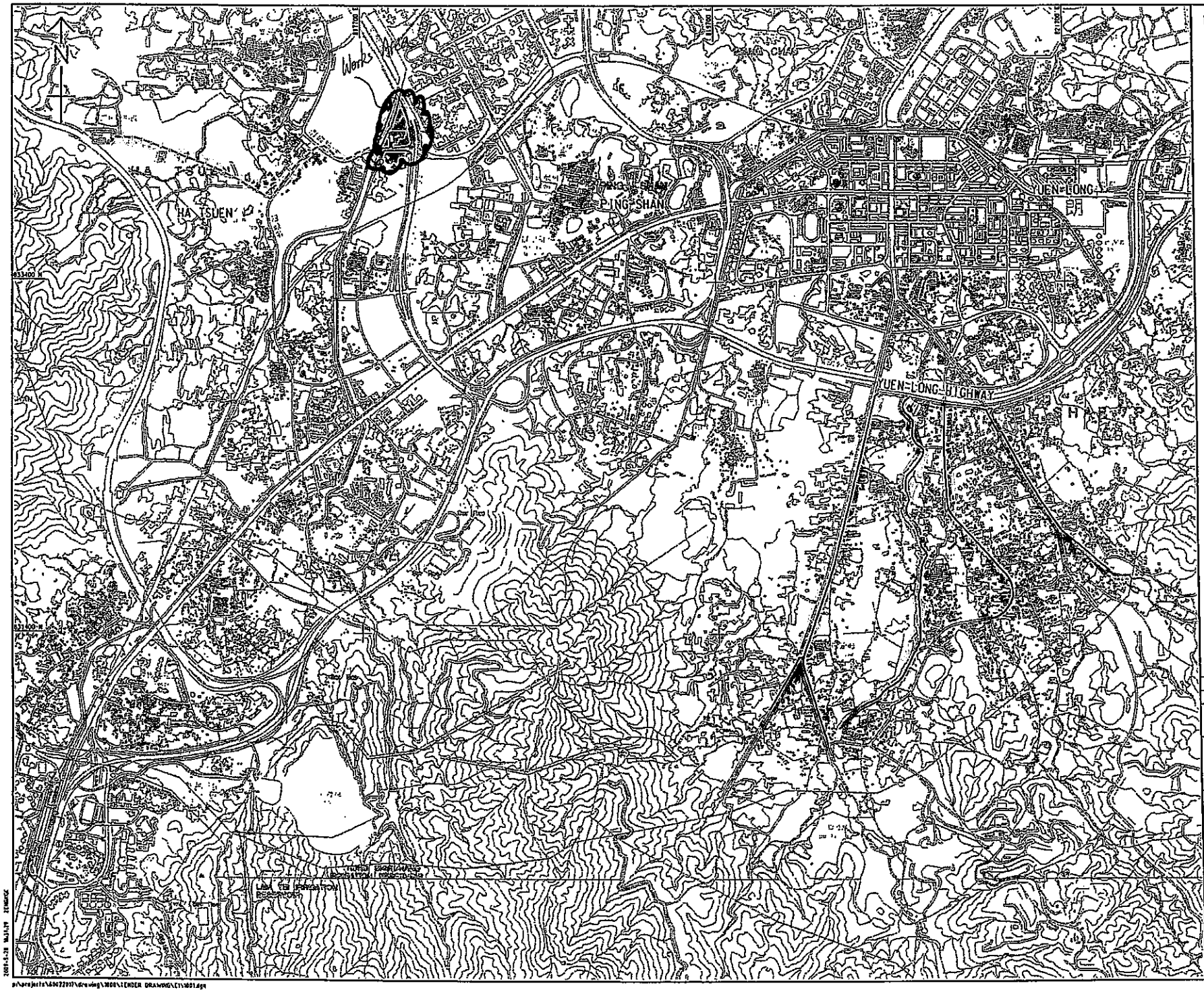
RECOMMENDATIONS

10.09 During dry season, special attention should be paid to provide air quality mitigation measures including wheel wash facilities, watering of haul roads and covering of dusty materials with tarpaulin sheet, etc. Moreover, mitigation measures to avoid ingress of surface runoff into nearby water bodies from the construction site should be properly maintained.

10.10 To control the site performance on waste management, the Contractor 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 license and the chemical waste producer registration. The Contractor is also reminded to implement the recommended environmental mitigation measures according to the Environmental Monitoring and Audit Manual.

Appendix A

Site Layout Plan



-	TENDER DRAWING	DSD/ACTS	05.09

DRAINAGE SERVICES DEPARTMENT,
THE GOVERNMENT OF THE HONG KONG
SPECIAL ADMINISTRATIVE REGION

YUEN LONG AND KAM TIN SEWERAGE AND SEWAGE DISPOSAL - CONSTRUCTION OF YUEN LONG SOUTH BRANCH SEWERS AND EXPANSION OF HA TSUEN SEWAGE PUMPING STATION

LOCATION PLAN

AECOM

DRG NO. 60022017/C1/1001

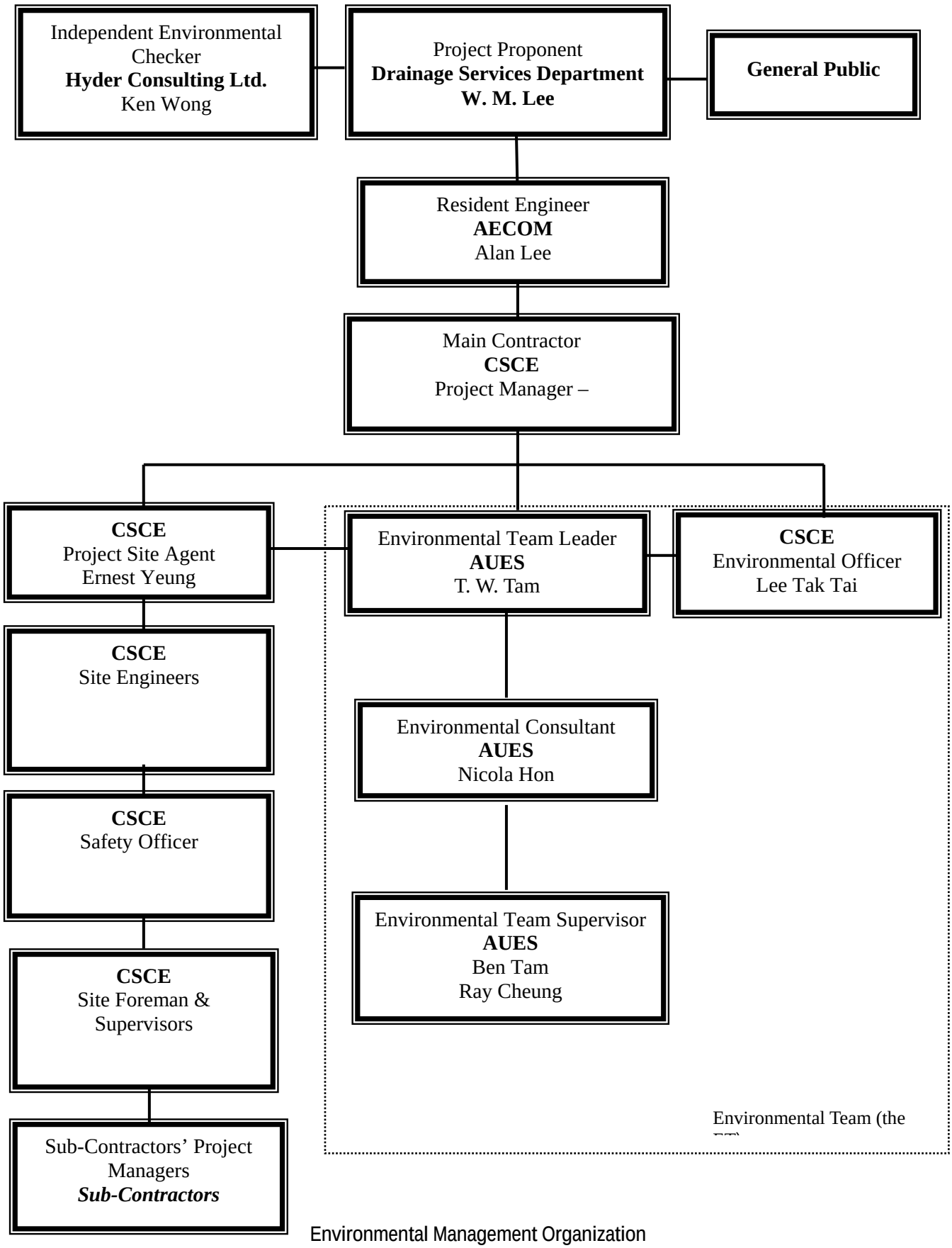
CONTRACT NO. DC/2009/08

SCALE AT A1 1 : 10000

METRES

Appendix B

On-site environmental management



Environmental Management Organization

Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
DSD	Employer	Mr. W. M. Lee	--	2827-8700
AECOM	Engineer's Representative	Mr. Alan Lee	9706 9568	2472 0132
Hyder	Independent Environmental Checker	Mr. Ken Wong	2911 2730	2805 5028
CSCE	Project Manager	Mr. Lu Xingmin	2472 0113	2472-0229
CSCE	Site Agent	Mr. Ernest Yeung	2472 0113	2472-0229
CSCE	Site Engineer	Mr. Poon Kwong Keung	2472 0113	2472-0229
CSCE	Environmental Officer	Mr. Lee Tak Tai	2472 0113	2472-0229
CSCE	Safety Officer	Mr. Ng Ka Po	2472 0113	2472-0229
AUES	Environmental Team Leader	Mr. T. W. Tam	2959-6059	2959-6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959-6059	2959-6079
AUES	Assistance Environmental Consultant	Mr. Ray Cheung	2959-6059	2959-6079
AUES	Team Supervisor	Mr. Ben Tam	2959-6059	2959-6079

Legend:

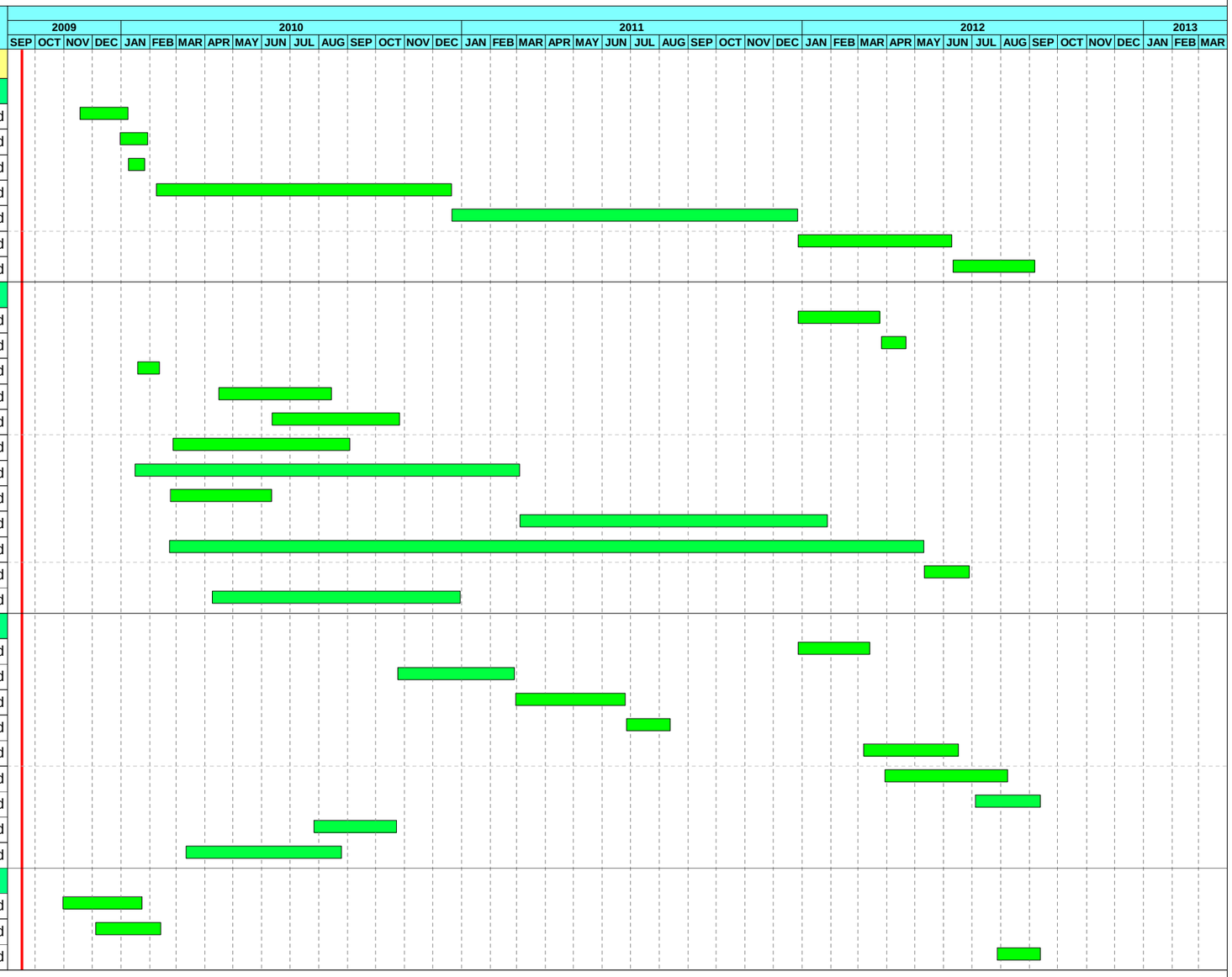
DSD (Employer) – Drainage Services Department
AECOM (Engineer) – AECOM
CSCE (Main Contractor) – China State Construction Engineering (Hong Kong) Ltd
Hyder (IEC) – Hyder Consulting Limited
AUES (ET) – Action-United Environmental Services & Consulting

Appendix C

Master tentative construction program

Contract No. DC/2009/08
Construction of Yuen Long South Branch Sewers and Expansion of HTS Pumping Station

Activity ID	Description	Original Duration	Early Start	Early Finish	Total Float
Ha Tsuen Area					
Pumping Station					
H/200020	Site investigation and report	42	18NOV09	08JAN10	67d
H/200030	Install acoustic screen	25	31DEC09	29JAN10	154d
H/200040	Installation of monitoring point	15	09JAN10	26JAN10	157d
H/200050	Prebored H-piles	210	08FEB10	21DEC10	147d
H/200070	Substructure	252 *	22DEC10	27DEC11	147d
H/201800	Superstructure	84	28DEC11	09JUN12	158d
H/202100	Finishes	75	11JUN12	06SEP12	158d
Rising Main					
H/300010	Gang B: RM from station to extg valve chamber	70	28DEC11	24MAR12	192d
H/300020	Testing of RM bet station and extg valve chamber	20	26MAR12	21APR12	192d
H/300200	Trial pit to locate existing sleeve at nullah	21	19JAN10	11FEB10	116d
H/300210	Rising Main under existing nullah	100	16APR10	14AUG10	133d
H/300400	Rising Main bet ch274 to ch298 & washout chamber	112	12JUN10	26OCT10	4d
H/300500	Rising Main between ch0 to ch89	155	26FEB10	03SEP10	116d
H/300600	Pipe jacking between ch385 to ch815	330 *	16JAN10	04MAR11	96d
H/300665	Pipe jacking between ch298 to ch385	88	23FEB10	11JUN10	4d
H/300800	Gang A : RM between ch815 to ch1002	264 *	05MAR11	28JAN12	96d
H/300900	Gang A : RM between ch1002 to ch1585	651 *	22FEB10	10MAY12	13d
H/301430	Testing of RM bet ch1787 to extg valve chamber	40	11MAY12	28JUN12	13d
H/302000	Pipe jacking between ch 1585 to ch1787.2	219 *	09APR10	30DEC10	359d
Road and Drain					
H/400020	Concrete pipe between extension to FM17	60	28DEC11	13MAR12	153d
H/400030	Sewage between FM17 to FM15 and manholes	100 *	25OCT10	26FEB11	169d
H/400050	Concrete pipe between M1 to FM16	50	28FEB11	25JUN11	169d
H/400090	Manhole M1 and sewage connection	40	27JUN11	12AUG11	169d
H/400100	Storm water drain	36	07MAR12	16JUN12	153d
H/400110	Power supply to pumping station	60	30MAR12	08AUG12	153d
H/400115	Roadworks	60 *	05JUL12	12SEP12	153d
H/400135	Pipe jacking between FM16 to existing FM7	74 *	27JUL10	23OCT10	169d
H/410010	Pipe jacking between FM16 to FM15	89 *	12MAR10	25AUG10	169d
Landscaping					
H/600110	Tree transplant at HTSPS Extension	70	31OCT09	23JAN10	7d
H/600120	Tree transplant at Ping Ha Road	70	05DEC09	12FEB10	158d
H/600130	Landscaping finishes at HTSPS	40	28JUL12	12SEP12	153d



Start date	17SEP09
Finish date	02JUL15
Run date	05FEB10
Project name	WP11
Page number	1A
c Primavera Systems, Inc.	

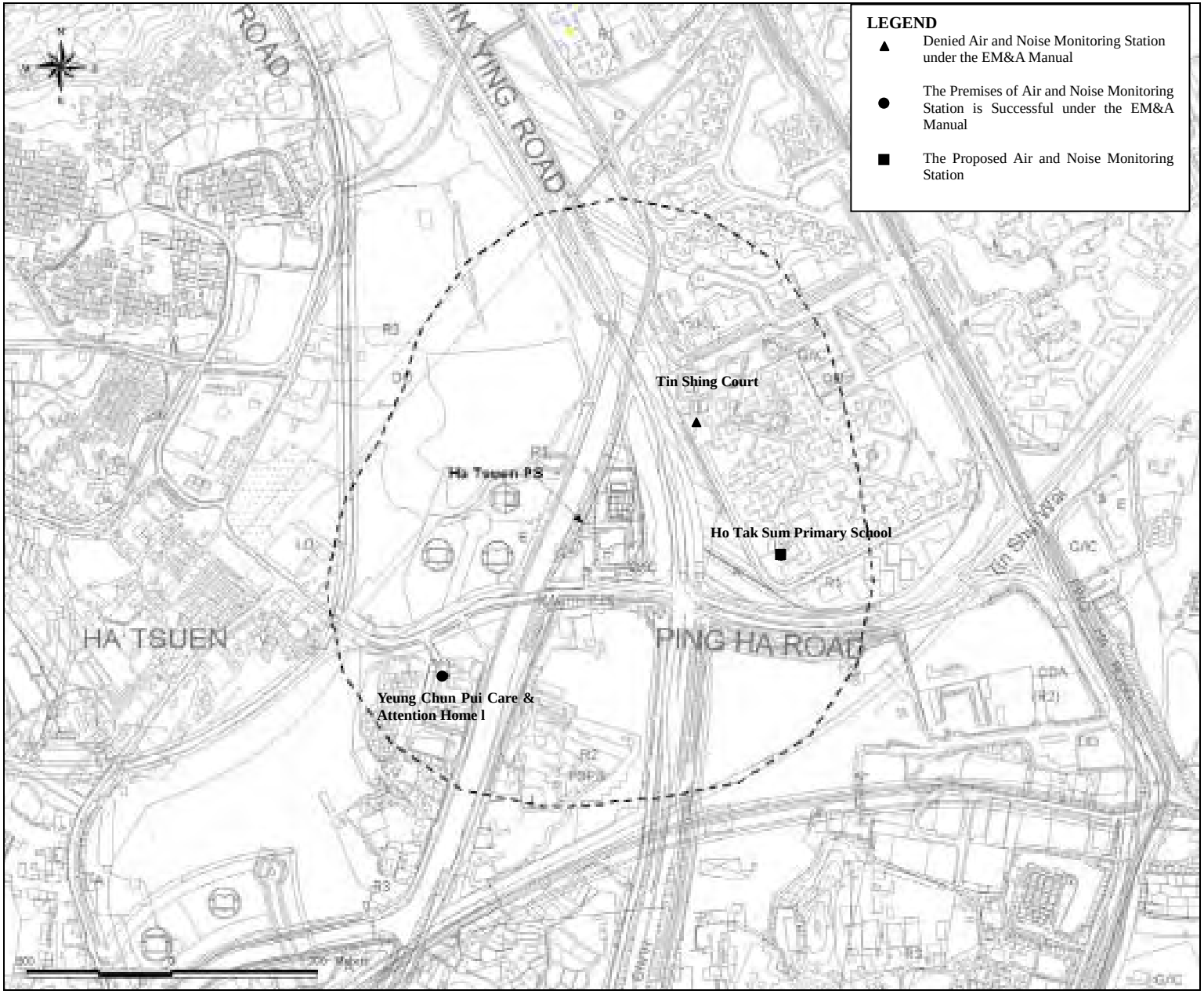
Early bar
Critical bar
Summary bar
Start milestone point
Finish milestone point

Initial Works Programme - Rev 02 (Ha Tsuen Area)

中國建築 CHINA STATE CONSTRUCTION

Appendix D

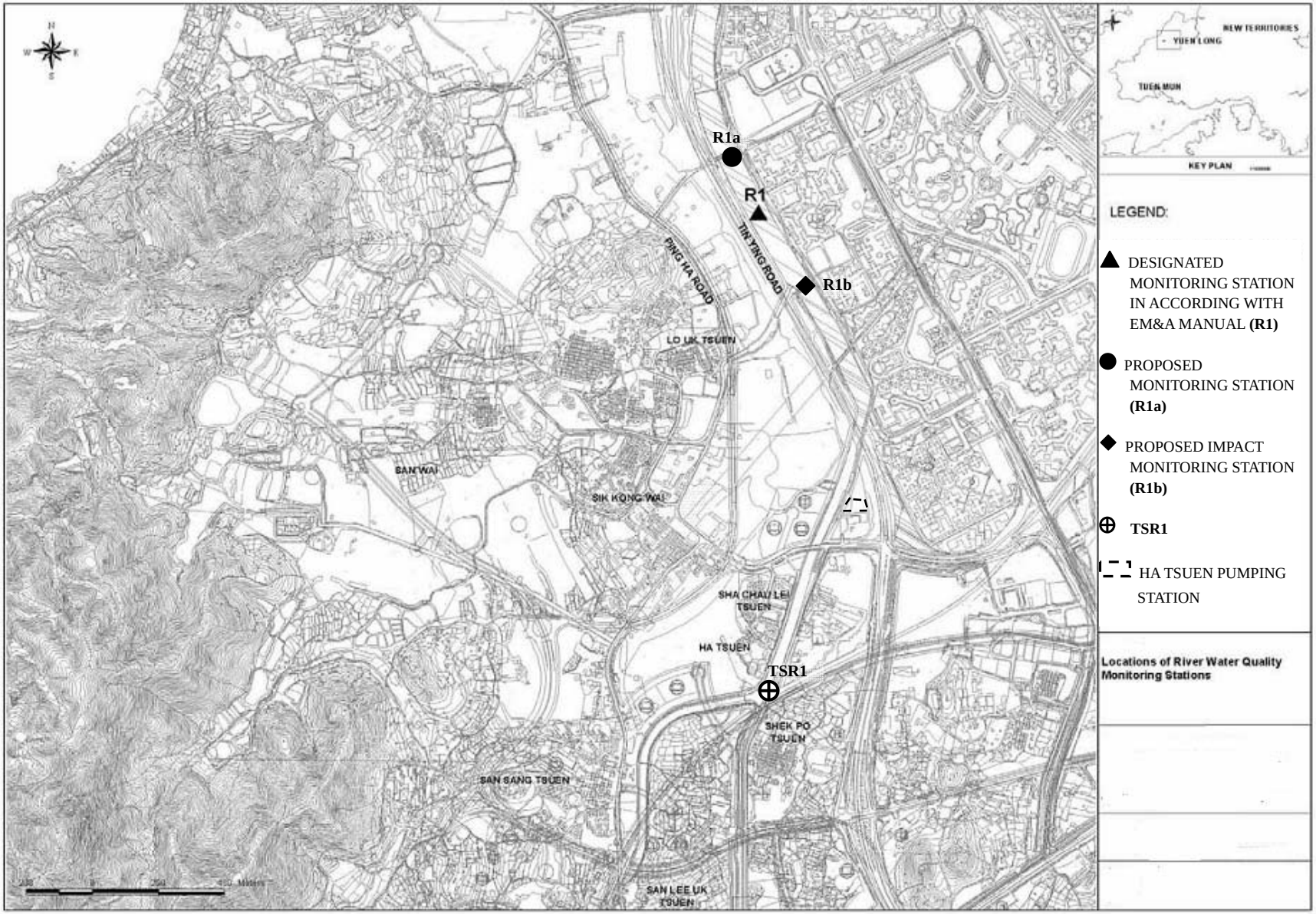
Monitoring Location of EM&A Programme


LEGEND
Denied Air and Noise Monitoring Station under the EM&A Manual
The Premises of Air and Noise Monitoring Station is Successful under the EM&A Manual
The Proposed Air and Noise Monitoring Station
Tin Shing Court
Ha Tsuen PS
Ho Tak Sum Primary School
Yeung Chun Pui Care & Attention Home l
HA TSUEN
PING HA ROAD
IN YING ROAD

DSD Contract No. DC/2009/08 – Construction of Yuen Long South Branch Sewers And Extension of Ha Tsuen Sewage Pumping Station

Proposed Water Quality Monitoring Location

AUES



Appendix E

Calibration certificates

Equipment Calibration Certificates List

Items	Aspect	Description of Equipment	Date of Calibration	Date of Next Calibration
1	Air	Thermo Andersen Model GS2310 TSP high volume air sampling system (AM1 - Yeung Chun Pui Care & Attention Home)	02 Feb 10	02 Apr 10
2		Thermo Andersen Model GS2310 TSP high volume air sampling system (AM2 - Ho Tak Sum Primary School)	02 Feb 10	02 Apr 10
3		Calibration Kit TISCH Model TE-5025A –Orifcs ID 1612 and Rootsmeter S/N 9833620	02 Jun 09	02 Jun 10
4		TSI DustTrak Model 8520 (Serial Number 21060)	12 Dec 09	12 Dec 10
5		TSI DustTrak Model 8520 (Serial Number 23080)	12 Dec 09	12 Dec 10
6	Noise	Bruel & Kjaer 4231 Acoustical Calibrator (Serial Number 2292168)	27 Apr 09	27 Apr 10
7		Bruel & Kjaer 2238 Integrating Sound Level Meter (Serial Number 2285722)	28 Apr 09	28 Apr 10
8	Water	YSI DO Meter 55 (Serial Number 97F0937AM)	27 Jan10	27 Apr 10
9		HACH Trubidmeter (Serial Number: 95090008735)	27 Jan 10	27 Apr 10
10		ExTech EC500 pH meter (Serial Number: NA)	20 Jan 10	20 Apr 10

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

TISCH ENVIROMENTAL, INC.
145 SOUTH MIAMI AVE.
VILLAGE OF CLEVES, OH 45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX
WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Jun 02, 2010 Rootsmeter S/N 9833620 Ta (K) - 297
Operator Tisch Orifice I.D. - 1483 Pa (mm) - 746.76

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3990	3.2	2.00
2	NA	NA	1.00	0.9820	6.4	4.00
3	NA	NA	1.00	0.8770	7.9	5.00
4	NA	NA	1.00	0.8350	8.8	5.50
5	NA	NA	1.00	0.6910	12.8	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9816	0.7017	1.4042		0.9957	0.7117	0.8919
0.9775	0.9954	1.9858		0.9914	1.0096	1.2613
0.9754	1.1122	2.2202		0.9893	1.1281	1.4102
0.9742	1.1668	2.3286		0.9882	1.1835	1.4790
0.9689	1.4023	2.8084		0.9828	1.4223	1.7837
Qstd slope (m) =		2.00279		Qa slope (m) =		1.25411
intercept (b) =		-0.00494		intercept (b) =		-0.00314
coefficient (r) =		0.99994		coefficient (r) =		0.99994
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

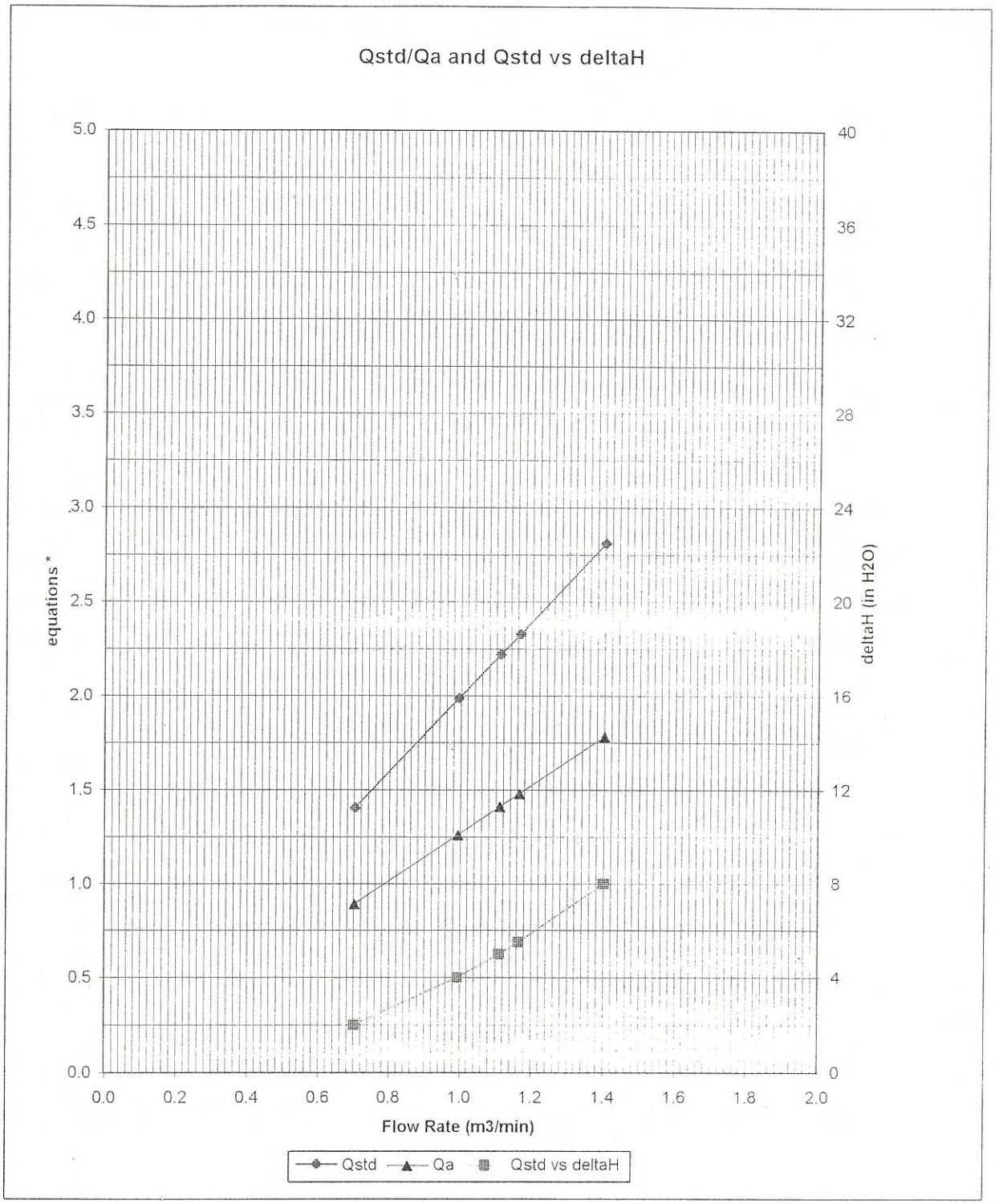
Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

TISCH ENVIROMENTAL, INC.
145 SOUTH MIAMI AVE.
VILLAGE OF CLEVES, OH 45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX
WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT



* y-axis equations:

Qstd series: $\sqrt{\Delta H \left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$

Qa series: $\sqrt{(\Delta H\ (Ta\ /\ Pa))}$

#1483

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Yeung Chun Pui Care & Attention Home
Location ID : AM1

Date of Calibration: 2-Feb-10
Next Calibration Date: 2-Apr-10
Technician: Mr. Ben Tam

CONDITIONS

Sea Level Pressure (hPa)	1015.5	Corrected Pressure (mm Hg)	761.625
Temperature (ºC)	15.0	Temperature (K)	288

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.01546
Model->	TE-5025A	Qstd Intercept ->	-0.02851
Calibration Date->	2-Jun-09	Expiry Date->	2-Jun-10

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4.4	4.4	8.8	1.513	52	53.86	Slope = 39.6868
13	3.1	3.1	6.2	1.272	44	45.58	Intercept = -5.7401
10	2.1	2.1	4.2	1.050	34	35.22	Corr. coeff. = 0.9985
7	1.3	1.3	2.6	0.829	27	27.97	
5	0.8	0.8	1.6	0.653	19	19.68	

Calculations :

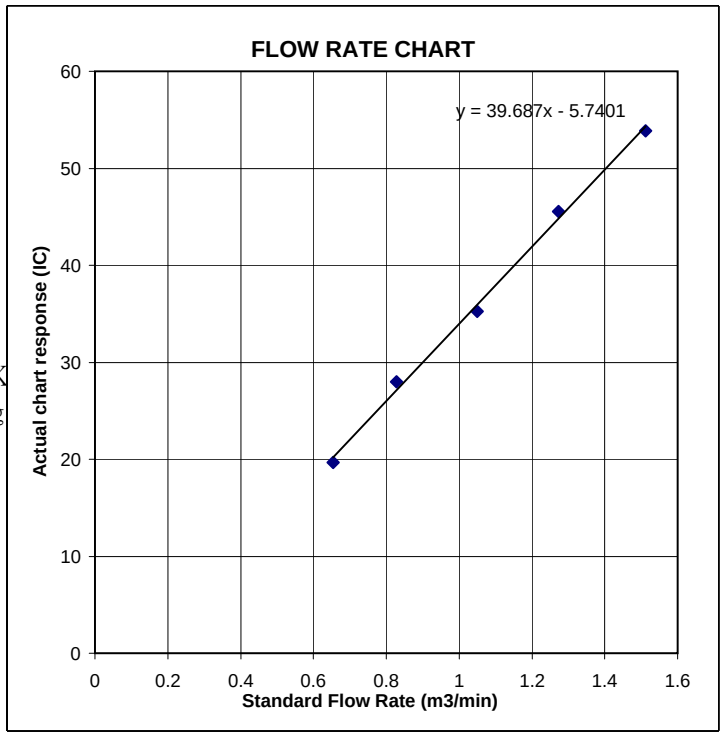
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K
Pstd = actual pressure during calibration (mm Hg

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Lions Clubs International Ho Tak Sum Primary School
Location ID : AM2

Date of Calibration: 2-Feb-10
Next Calibration Date: 2-Apr-10
Technician: Ben Tam

CONDITIONS

Sea Level Pressure (hPa)	1015.5	Corrected Pressure (mm Hg)	761.625
Temperature (°C)	15.0	Temperature (K)	288

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.01546
Model->	TE-5025A	Qstd Intercept ->	-0.02851
Calibration Date->	2-Jun-09	Expiry Date->	2-Jun-10

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4.4	4.4	8.8	1.513	48	49.72	Slope = 43.0988
13	3.2	3.2	6.4	1.292	40	41.43	Intercept = -15.1966
10	2.4	2.4	4.8	1.121	31	32.11	Corr. coeff. = 0.9985
7	1.6	1.6	3.2	0.918	24	24.86	
5	0.9	0.9	1.8	0.692	14	14.50	

Calculations :

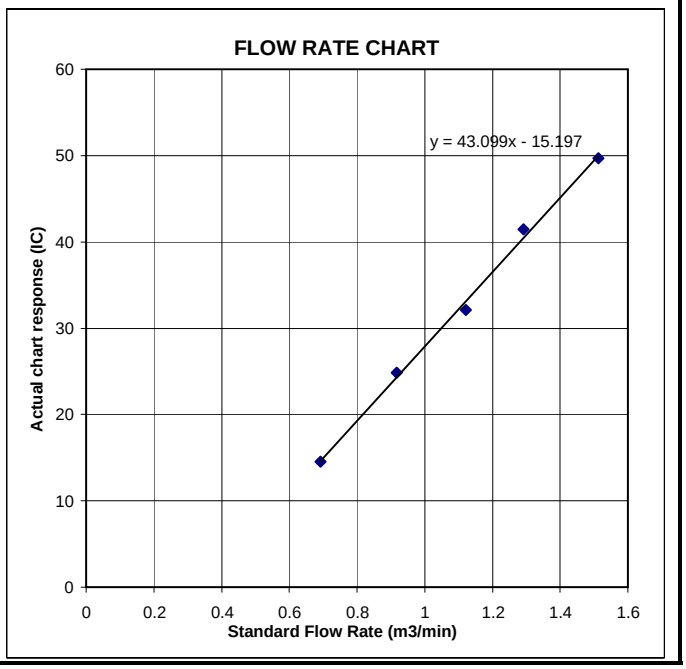
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



AUES

Equipment Calibration Record

Equipment Calibrated:

Type:	Dust Trak Model 8520
Manufacturer:	TSI
Serial No.	21060
Equipment Ref:	EQ021

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	Block A of Government Dockyard Offices
Equipment Ref:	AM8
Last Calibration Date:	2-Dec-09

Equipment Calibration Results:

Calibration Date: 12-Dec-09

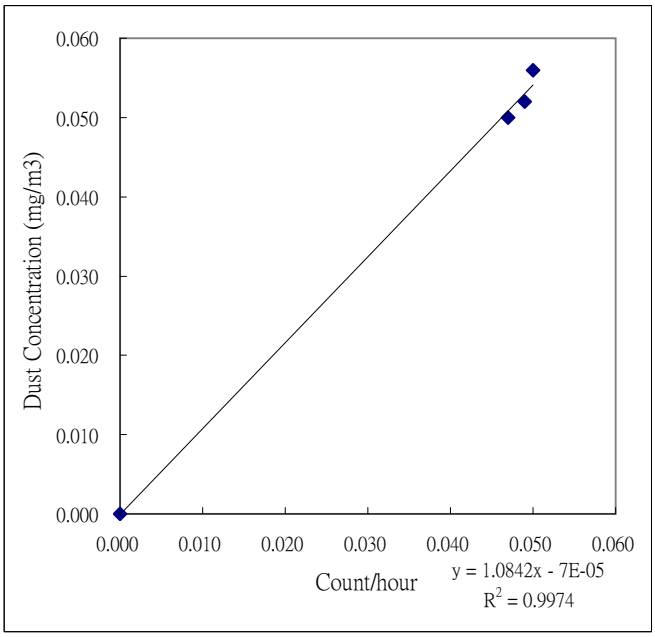
Hour	Time	Temp °C	RH %	Dust Concentration in mg/m^3	
				(Standard Equipment)	(Calibrated Equipment)
1	9:00 ~ 10:00	20.2	87	0.050	0.056
1	10:05 ~ 11:05	20.5	83	0.049	0.052
1	11:10 ~ 12:10	20.7	82	0.047	0.050

Sensitivity Adjustment Zero Calibration (Before Calibration) 0 (mg/m^3)

Sensitivity Adjustment Zero Calibration (After Calibration) 0 (mg/m^3)

Linear Regression of Y or X

Slope:	**1.0842**
Correlation Coefficient	**0.9974**
Validity of Calibration Record	**12-Dec-10**



Operator : Billy Ng Signature : Date : 2009/12/20

QC Reviewer Ben Tam Signature : Date : 2009/12/20

AUES

Equipment Calibration Record

Equipment Calibrated:

Type:	Dust Trak Model 8520
Manufacturer:	TSI
Serial No.	23080
Equipment Ref:	EQ063

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	Block A of Government Dockyard Offices
Equipment Ref:	AM8
Last Calibration Date:	2-Dec-09

Equipment Calibration Results:

Calibration Date: 12-Dec-09

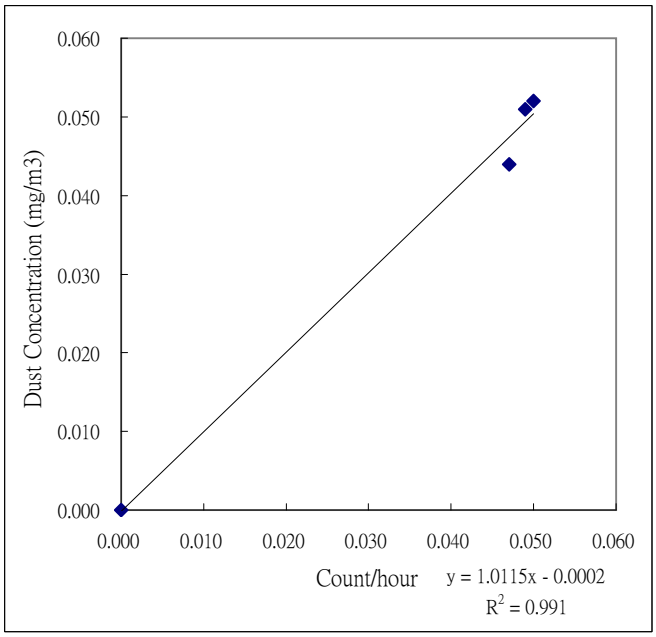
Hour	Time	Temp °C	RH %	Dust Concentration in mg/m^3	
				(Standard Equipment)	(Calibrated Equipment)
1	9:00 ~ 10:00	20.2	87	0.050	0.052
1	10:05 ~ 11:05	20.5	83	0.049	0.051
1	11:10 ~ 12:10	20.7	82	0.047	0.044

Sensitivity Adjustment Zero Calibration (Before Calibration) 0 (mg/m^3)

Sensitivity Adjustment Zero Calibration (After Calibration) 0 (mg/m^3)

Linear Regression of Y or X

Slope:	**1.0115**
Correlation Coefficient	**0.9910**
Validity of Calibration Record	**12-Dec-10**



Operator : Billy Ng Signature : Date : 2009/12/20

QC Reviewer Ben Tam Signature : Date : 2009/12/20

輝創工程有限公司
Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C092064

Certificate of Calibration

This is to certify that the equipment

Description : Acoustical Calibrator (EQ017)

Manufacturer : Bruel & Kjaer

Model No. : 4231

Serial No. : 2292168

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C092064.

The equipment is supplied by

Co. Name : Action-United Environmental Services and Consulting

Address : Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

Date of Issue : 28 April 2009

Certified by : K C Lee

The test equipment used for calibration are traceable to the National Standards as specified in this report.

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C092064

Calibration Report

ITEM TESTED

DESCRIPTION : Acoustical Calibrator (EQ017)
MANUFACTURER : Bruel & Kjaer
MODEL NO. : 4231
SERIAL NO. : 2292168

TEST CONDITIONS

AMBIENT TEMPERATURE : (23 ± 2)°C RELATIVE HUMIDITY : (55 ± 20)%
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration

DATE OF TEST : 27 April 2009 ***JOB NO.*** : IC09-0962

TEST RESULTS

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested by : *H C Chan* *Date : 28 April 2009*

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

Report No. : C092064

Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C083083
CL281	Multifunction Acoustic Calibrator	DC090052
TST150A	Measuring Amplifier	C080751

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Measurement

UUT Nominal Value	Measured Value (dB)		Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
	Before Adjustment	After Adjustment		
94 dB, 1 kHz	93.8	94.0	± 0.2	± 0.2
114 dB, 1 kHz	113.9	114.1		

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)		Mfr's Spec.	Uncertainty of Measured Value (Hz)
	Before Adjustment	After Adjustment		
1	1.000 0	1.000 0	1 kHz ± 0.1 %	± 0.1

Remark : - The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Calibration Report only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

輝創工程有限公司
Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C092085

Certificate of Calibration

This is to certify that the equipment

Description : Integrating Sound Level Meter (EQ006)

Manufacturer : Bruel & Kjaer

Model No. : 2238

Serial No. : 2285762

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C092085.

The equipment is supplied by

Co. Name : Action-United Environmental Services and Consulting

Address : Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

Date of Issue : 30 April 2009

Certified by : K C Lee

The test equipment used for calibration are traceable to the National Standards as specified in this report.

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C092085

Calibration Report

ITEM TESTED

DESCRIPTION : Integrating Sound Level Meter (EQ006)
MANUFACTURER : Bruel & Kjaer
MODEL NO. : 2238
SERIAL NO. : 2285762

TEST CONDITIONS

AMBIENT TEMPERATURE : (23 ± 2)°C RELATIVE HUMIDITY : (55 ± 20)%
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 28 April 2009 ***JOB NO.*** : IC09-0962

TEST RESULTS

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

Tested by : *H C Chan* *Date* : *30 April 2009*

Report No. : C092085

Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration using the B&K acoustic calibrator 4231, S/N 2326408 was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C090024
CL281	Multifunction Acoustic Calibrator	DC090052

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Parameter	Freq. Weight	Time Weight	Level (dB)	Freq. (kHz)		
20 - 100	L_{AFP}	A	F	94.00	1	94.1	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Freq. Weight	Time Weight	Level (dB)	Freq. (kHz)	
40 - 120	L_{AFP}	A	F	94.00	1	94.1 (Ref.)
				104.00		104.1
				114.00		114.1

IEC 651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Parameter	Freq. Weight	Time Weight	Level (dB)	Freq. (kHz)		
20 - 100	L_{AFP}	A	F	94.00	1	94.1	Ref.
	L_{ASP}		S			94.1	± 0.1
	L_{AIP}		I			94.1	± 0.1

Report No. : C092085

Calibration Report

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Parameter	Freq. Weight	Time Weight	Level (dB)	Burst Duration		
30 - 110	L_{AFP}	A	F	106.00	Continuous	106.0	Ref.
	L_{AFMax}				200 ms	105.0	-1.0 ± 1.0
	L_{ASP}		S		Continuous	106.0	Ref.
	L_{ASMax}				500 ms	102.0	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Parameter	Freq. Weight	Time Weight	Level (dB)	Freq.		
20 - 100	L_{AFP}	A	F	94.00	31.5 Hz	54.8	-39.4 ± 1.5
					63 Hz	67.8	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					500 Hz	90.7	-3.2 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.1	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	88.5	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Parameter	Freq. Weight	Time Weight	Level (dB)	Freq.		
20 - 100	L_{CFP}	C	F	94.00	31.5 Hz	91.2	-3.0 ± 1.5
					63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.7	-0.2 ± 1.0
					500 Hz	93.9	0.0 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	93.3	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	86.6	-6.2 (+3.0 ; -6.0)

Report No. : C092085

Calibration Report

6.4 Time Averaging

UUT Setting				Applied Value					UUT	IEC 60804
Range (dB)	Mode	Freq. Weight	Integrating Time	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)	Reading (dB)	Type 1 Spec. (dB)
30 - 110	Leq	A	10 sec.	4	1	1/10	110.0	100	99.9	± 0.5
						$1/10^2$		90	89.7	± 0.5
			60 sec.			$1/10^3$		80	79.3	± 1.0
			5 min.			$1/10^4$		70	69.2	± 1.0

Remarks : - Mfr's Spec. : IEC 651 & IEC 60804 Type 1

- Uncertainties of Applied Value :

94 dB :	31.5 Hz - 125 Hz	: ± 0.40 dB
	500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz	: ± 0.40 dB
	4 kHz	: ± 0.50 dB
	8 kHz	: ± 0.70 dB
	12.5 kHz	: ± 1.20 dB
104 dB :	1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB :	1 kHz	: ± 0.10 dB (Ref. 94 dB)
Burst equivalent level		: ± 0.2 dB (Ref. 110 dB continuous sound level)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Calibration Report only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

CERTIFICATE OF ANALYSIS

Batch: HK1001507
Date of Issue: 03/02/2010
Client: ACTION UNITED ENVIRO SERVICES
Client Reference:

Calibration

Item : YSI DO Meter 55 Model No.: YSI 52/12FT
ALS Lab ID: HK1001507 -001 Equipment No.: N/A
Date of Calibration: 27/01/2010 Serial No.: 97F0837AM

Testing Results :

Dissolved Oxygen

Expected Reading	Recording Reading
4.74 mg/L	4.84 mg/L
6.71 mg/L	6.83 mg/L
8.58 mg/L	8.72 mg/L
Allowing Deviation	±0.2 mg/L

Testing Method:

APHA (20th edition), 4500-O C & G

Temperature

Reference Temperature (^{0}C)	Recorded Temperature (^{0}C)
20.5 ^{0}C	20.6 ^{0}C
45.0 ^{0}C	44.8 ^{0}C
Allowing Deviation	±2.0^{0}C

Testing Method:

In House

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

ALS Technichem (HK) Pty Ltd
ALS Environmental

CERTIFICATE OF ANALYSIS

Batch: HK1001911
Date of Issue: 01/02/2010
Client: ACTION UNITED ENVIRO SERVICES
Client Reference:

Calibration

Item : HACH Turbidimeter
ALS Lab ID: HK1001911 -001
Date of Calibration: 27/01/2010

Model No.: HACH 2100P
Equipment No.: EQ091
Serial No.: 950900008735

Testing Results :

Turbidity

Expected Reading	Recording Reading
0.0 NTU	0.2 NTU
4.0 NTU	3.9 NTU
16.0 NTU	15.7 NTU
40.0 NTU	36.9 NTU
80.0 NTU	76.5 NTU
160 NTU	144 NTU
Allowing Deviation	±10%

Testing Method:

APHA (20th edition), 2130B

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

ALS Technichem (HK) Pty Ltd
ALS Environmental

CERTIFICATE OF ANALYSIS

Batch: HK1001303
Date of Issue: 28/01/2010
Client: ACTION UNITED ENVIRO SERVICES
Client Reference:

Calibration

Item : pH Meter
ALS Lab ID: HK1001303 -001
Date of Calibration: 20/01/2010

Model No.: EXTECH EC500
Equipment No.: N/A
Serial No.: N/A

Testing Results :

Turbidity

Expected Reading	Recording Reading
4.00	3.81
7.00	6.98
10.0	10.0
Allowing Deviation	± 0.2

Testing Method:

APHA (20th edition), 4500-H+B

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

ALS Technichem (HK) Pty Ltd
ALS Environmental

Hong Kong Accreditation Service
香港認可處

Certificate of Accreditation
認可證書

This is to certify that
特此證明

ALS TECHNICHEM (HK) PTY LIMITED

11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, New Territories, Hong Kong
香港新界葵涌永業街1-3號忠信針織中心11樓

has been accepted by the HKAS Executive, on the recommendation of the Accreditation Advisory Board, as a
為香港認可處執行機關根據認可諮詢委員會建議而接受的

HOKLAS Accredited Laboratory
「香港實驗所認可計劃」認可實驗所

This laboratory meets the requirements of ISO / IEC 17025 : 2005 – General requirements for the competence of testing and calibration laboratories and it has been accredited for performing specific tests or calibrations as listed in the HOKLAS Directory of Accredited Laboratories within the test category of
此實驗所符合ISO / IEC 17025 : 2005 –《測試及校正實驗所能力的通用規定》所訂的要求，獲認可進行載於香港實驗所認可計劃《認可實驗所名冊》內下述測試類別中的指定測試或校正工作

Environmental Testing
環境測試

This laboratory is accredited in accordance with the recognised International Standard ISO / IEC 17025 : 2005.
本實驗所乃根據公認的國際標準 ISO / IEC 17025 : 2005 獲得認可。
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (see joint IAF-ILAC-ISO Communiqué).
這項認可資格演示在指定範疇所需的技術能力及實驗所質量管理體系的運作（見國際認可論壇、國際實驗所認可合作組織及國際標準化組織的聯合公報）。

The common seal of the Hong Kong Accreditation Service is affixed hereto by the authority of the HKAS Executive
香港認可處根據認可處執行機關的權限在此蓋上通用印章

CHAN Sing Sing, Terence, Executive Administrator
執行幹事 陳成城
Issue Date : 5 May 2009
簽發日期：二零零九年五月五日

Registration Number : HOKLAS 066
註冊號碼：

Date of First Registration : 15 September 1995
首次註冊日期：一九九五年九月十五日

This certificate is issued subject to the terms and conditions laid down by HKAS
本證書按照香港認可處訂立的條款及條件發出

L 000552

Equipment Calibration Certificates List

Items	Aspect	Description of Equipment	Date of Calibration	Date of Next Calibration
1	Air	Thermo Andersen Model GS2310 TSP high volume air sampling system (AM1 - Yeung Chun Pui Care & Attention Home)	02 Feb 10	02 Apr 10
2		Thermo Andersen Model GS2310 TSP high volume air sampling system (AM2 - Ho Tak Sum Primary School)	02 Feb 10	02 Apr 10
3		Calibration Kit TISCH Model TE-5025A –Orifcs ID 1612 and Rootsmeter S/N 9833620	02 Jun 09	02 Jun 10
4		TSI DustTrak Model 8520 (Serial Number 21060)	12 Dec 09	12 Dec 10
5		TSI DustTrak Model 8520 (Serial Number 23080)	12 Dec 09	12 Dec 10
6	Noise	Bruel & Kjaer 4231 Acoustical Calibrator (Serial Number 2292168)	27 Apr 09	27 Apr 10
7		Bruel & Kjaer 2238 Integrating Sound Level Meter (Serial Number 2285722)	28 Apr 09	28 Apr 10
8	Water	YSI DO Meter 55 (Serial Number 97F0937AM)	27 Jan10	27 Apr 10
9		HACH Trubidmeter (Serial Number: 95090008735)	27 Jan 10	27 Apr 10
10		ExTech EC500 pH meter (Serial Number: NA)	20 Jan 10	20 Apr 10

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

Appendix F

Meteorological information

Meteorological Data Extracted from HKO during the Reporting Period

Date		Weather		Lau Fau Shan Weather Station			
			Total Rainfall (mm)	Mean Air Temperature (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
Tue	9-Feb-10	Foggy with a few light rain patches at first.	0	23.8	18.5	80.5	S/SE
Wed	10-Feb-10	Moderate to fresh easterly winds.	Trace	25.2	16.7	7	S/SE
Thu	11-Feb-10	Mainly cloudy with light rain.	Trace	25.6	19	76	S/SW
Fri	12-Feb-10	Cloudy to overcast with a few rain patches.	Trace	17	24	74	NE
Sat	13-Feb-10	Holiday					
Sun	14-Feb-10	Holiday					
Mon	15-Feb-10	Holiday					
Tue	16-Feb-10	Holiday					
Wed	17-Feb-10	Moderate to fresh northerly winds.	1	7.9	18.2	83.5	N/NE
Thu	18-Feb-10	It will be cold and cloudy with a few light rain patches.	0.8	8.1	17.7	69.5	NE
Fri	19-Feb-10	Mainly cloudy with a few rain patches at first.	3.7	7.7	13.5	88	N/NE
Sat	20-Feb-10	Cloudy with mist. A few showers at first.	Trace	11.9	8.8	72.5	N/NE
Sun	21-Feb-10	Moderate east to northeasterly winds.	Trace	16.2	9	73.5	E/NE
Mon	22-Feb-10	Cloudy/ sunny periods during the day.	0.1	18.6	8.2	82.2	N/NW
Tue	23-Feb-10	Cloudy with mist patches. Sunny intervals during the day.	0	20.3	11.5	79.5	E/SE
Wed	24-Feb-10	Mainly cloudy with a few showers.	Trace	23.2	22.2	78.5	S/SE
Thu	25-Feb-10	Misty tomorrow morning. Sunny periods during the day.	0.4	24.8	13.5	82	S/SE
Fri	26-Feb-10	Sunny intervals with one or two showers.	0.3	25.2	13.5	84	S/SE
Sat	27-Feb-10	Mainly cloudy with fog patches.	Trace	25.7	13.2	81.2	S/SE
Sun	28-Feb-10	Light to moderate southerly winds.	Trace	26	19.5	75.5	S/SE

Appendix G

Event and Action Plan

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level being exceeded for one sample	1. Identify source; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action Level being exceeded for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. Discuss with IEC and Contractor on remedial actions required; 6. If exceedance continues, arrange meeting with IEC and ER; 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures are properly implemented.	1. Submit proposals for remedial actions to IEC within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
Limit Level being exceeded for one sample	1. Identify source; 2. Inform IEC, ER and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions; 6. Keep EPD and ER informed of the results.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with Contractor on the possible mitigation measures; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Check monitoring data and Contractor's working methods; 4. Discuss with IEC and Contractor on potential remedial actions; 5. Ensure remedial actions properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit Level being exceeded for two or more consecutive samples	1. Identify source; 2. Inform IEC, ER and EPD the causes & actions taken for the exceedances; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Investigate the causes of exceedance; 6. Arrange meeting with EPD and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with Contractor on the possible mitigation measures; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Supervise the implementation of mitigation measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 4. Discuss with IEC and the Contractor on potential remedial actions; 5. Review Contractor's remedial actions whenever necessary to assure their effectiveness; 6. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not resolved; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

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

Appendix H

Monitoring Schedule in Reporting Month (Feb 2010) and Coming Month (Mar 2010)

Monitoring Schedule for Reporting Period

Date		Dust Monitoring		Noise Monitoring	Water Quality
		1-hour TSP	24-hour TSP		
Mon	8-Feb-10				
Tue	9-Feb-10				
Wed	10-Feb-10				
Thu	11-Feb-10				
Fri	12-Feb-10				
Sat	13-Feb-10				
Sun	14-Feb-10				
Mon	15-Feb-10				
Tue	16-Feb-10				
Wed	17-Feb-10				
Thu	18-Feb-10				
Fri	19-Feb-10				
Sat	20-Feb-10				
Sun	21-Feb-10				
Mon	22-Feb-10				
Tue	23-Feb-10				
Wed	24-Feb-10				
Thu	25-Feb-10				
Fri	26-Feb-10				
Sat	27-Feb-10				
Sun	28-Feb-10				

	Monitoring Day
	Sunday or Public Holiday

Monitoring Schedule for Coming Month (March 2010)

Date		Dust Monitoring		Noise Monitoring	Water Quality
		1-hour TSP	24-hour TSP		
Mon	1-Mar-10	■		■	■
Tue	2-Mar-10				
Wed	3-Mar-10				■
Thu	4-Mar-10				
Fri	5-Mar-10		■		■
Sat	6-Mar-10	■		■	
Sun	7-Mar-10				
Mon	8-Mar-10				■
Tue	9-Mar-10				
Wed	10-Mar-10				■
Thu	11-Mar-10		■		
Fri	12-Mar-10	■		■	■
Sat	13-Mar-10				
Sun	14-Mar-10				
Mon	15-Mar-10				■
Tue	16-Mar-10				
Wed	17-Mar-10		■		■
Thu	18-Mar-10	■		■	
Fri	19-Mar-10				■
Sat	20-Mar-10				
Sun	21-Mar-10				
Mon	22-Mar-10				■
Tue	23-Mar-10		■		
Wed	24-Mar-10	■		■	■
Thu	25-Mar-10				
Fri	26-Mar-10				■
Sat	27-Mar-10				
Sun	28-Mar-10				
Mon	29-Mar-10		■		■
Tue	30-Mar-10	■		■	
Wed	31-Mar-10				■

■	Monitoring Day
	Sunday or Public Holiday

Appendix I

Results Data

Impact 24-Hour TSP Monitoring Results - AM1 (Lions Clubs International Ho Tak Sum Primary School

DATE									STANDARD			BLANK	BLANK	BLANK	BLANK	INITIAL	FINAL	WEIGHT	Dusk
	SAMPLE	ELAPSED	ELAPSED	ELAPSED	MIN	MAX	AVG	AVG	AVG	FLOW	AIR	SAMPLE	INTIAL	FINAL	DIFF	FILTER	FILTER	DUST	24-hr TSP
	NUMBER	TIME	TIME	TIME	CHART	CHART	CHART	TEMP	PRESS	RATE	VOLUME	NUMBER	WEIGHT	WEIGHT	WEIGHT	WEIGHT	WEIGHT	COLLECTED	in air
		INITIAL	FINAL	(min)	READING	READING	READING	(oC)	(hPa)	(m^3/min)	(std m^3)		(g)	(g)	(g)	(g)	(g)	(g)	($\mu g/m^3$)
10-Feb-10	21474	7767.54	7791.34	1428.00	36	38	37.0	24.1	1013.2	1.21	1731	NA	2.8721	2.8719	-0.0002	2.8354	2.8749	0.0395	23
18-Feb-10	21157	7791.34	7814.98	1418.40	36	38	37.0	9.1	1024.1	1.24	1758	NA	2.8726	2.8726	0.0000	2.8796	2.9210	0.0414	24
22-Feb-10	21566	7814.98	7838.13	1389.00	36	38	37.0	17.7	1015.6	1.22	1698	NA	2.8726	2.8722	-0.0004	2.8285	2.9188	0.0903	53
27-Feb-10	21542	7838.13	7862.15	1441.20	36	38	37.0	24.7	1011.7	1.21	1745	NA	2.8723	2.8720	-0.0003	2.8336	2.8912	0.0576	33

Impact 24-Hour TSP Monitoring Results - AM2 (Yeung Chun Pui Care & Attention Home

DATE									STANDARD			BLANK	BLANK	BLANK	BLANK	INITIAL	FINAL	WEIGHT	Dust
	SAMPLE	ELAPSED	ELAPSED	ELAPSED	MIN	MAX	AVG	AVG	AVG	FLOW	AIR	SAMPLE	INTIAL	FINAL	DIFF	FILTER	FILTER	DUST	24-hr TSP
	NUMBER	TIME	TIME	TIME	CHART	CHART	CHART	TEMP	PRESS	RATE	VOLUME	NUMBER	WEIGHT	WEIGHT	WEIGHT	WEIGHT	WEIGHT	COLLECTED	in air
		INITIAL	FINAL	(min)	READING	READING	READING	(oC)	(hPa)	(m^3/min)	(std m^3)		(g)	(g)	(g)	(g)	(g)	(g)	($\mu g/m^3$)
10-Feb-10	21475	9378.62	9402.65	1441.80	36	38	37.0	24.1	1013.2	1.08	1555	NA	2.8721	2.8719	-0.0002	2.8398	2.8891	0.0493	32
18-Feb-10	21162	9402.65	9427.75	1506.00	36	38	37.0	9.1	1024.1	1.11	1669	NA	2.8726	2.8726	0.0000	2.8561	3.0713	0.2152	129
22-Feb-10	21567	9427.75	9450.64	1373.40	36	38	37.0	17.7	1015.6	1.09	1496	NA	2.8726	2.8722	-0.0004	2.8619	2.9596	0.0977	66
27-Feb-10	21541	9450.64	9474.52	1432.80	36	38	37.0	24.7	1011.7	1.08	1543	NA	2.8723	2.8720	-0.0003	2.8608	2.9664	0.1056	69

DSD Contract No DC/2009/08

Construction of Yuen Long South Branch Sewers and Extension of Ha Tsuen Sewage Pumping Station

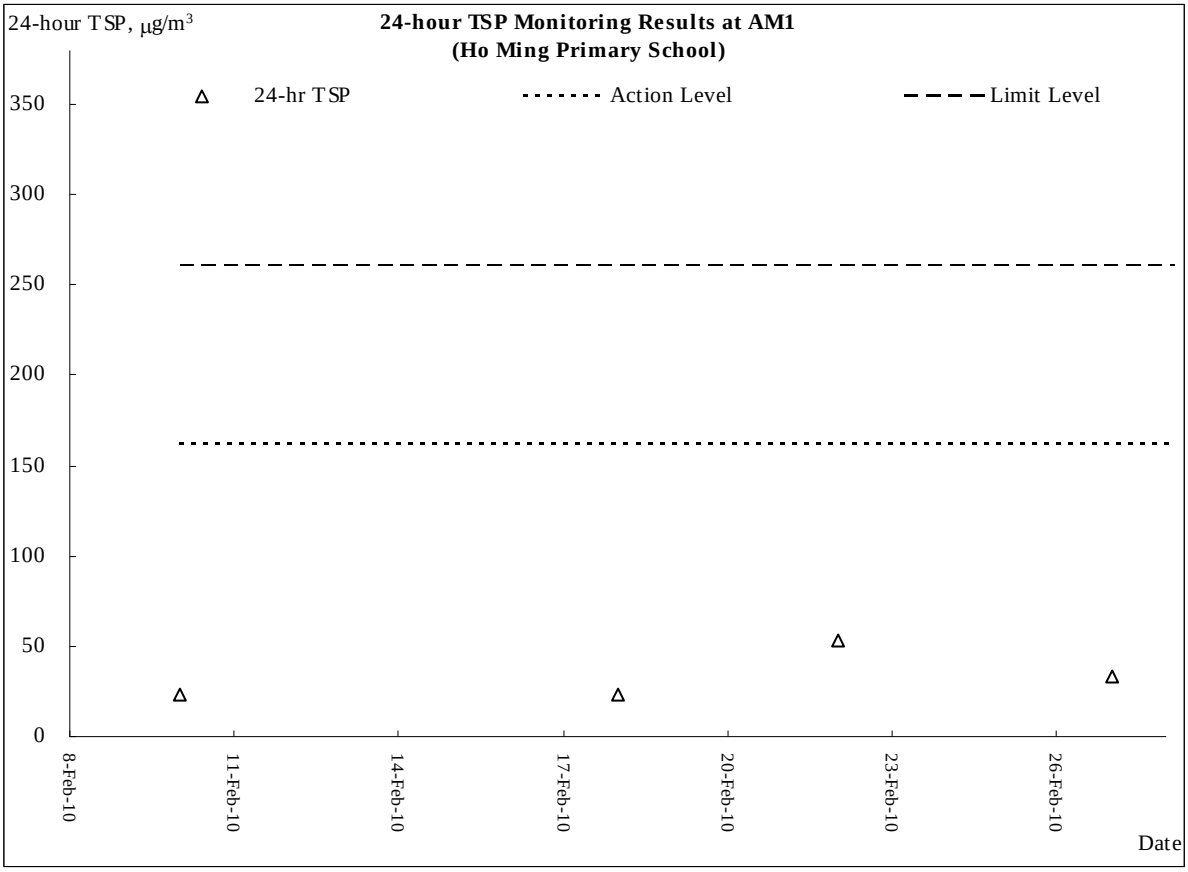
Summary of Water Quality Monitoring Results - R1b

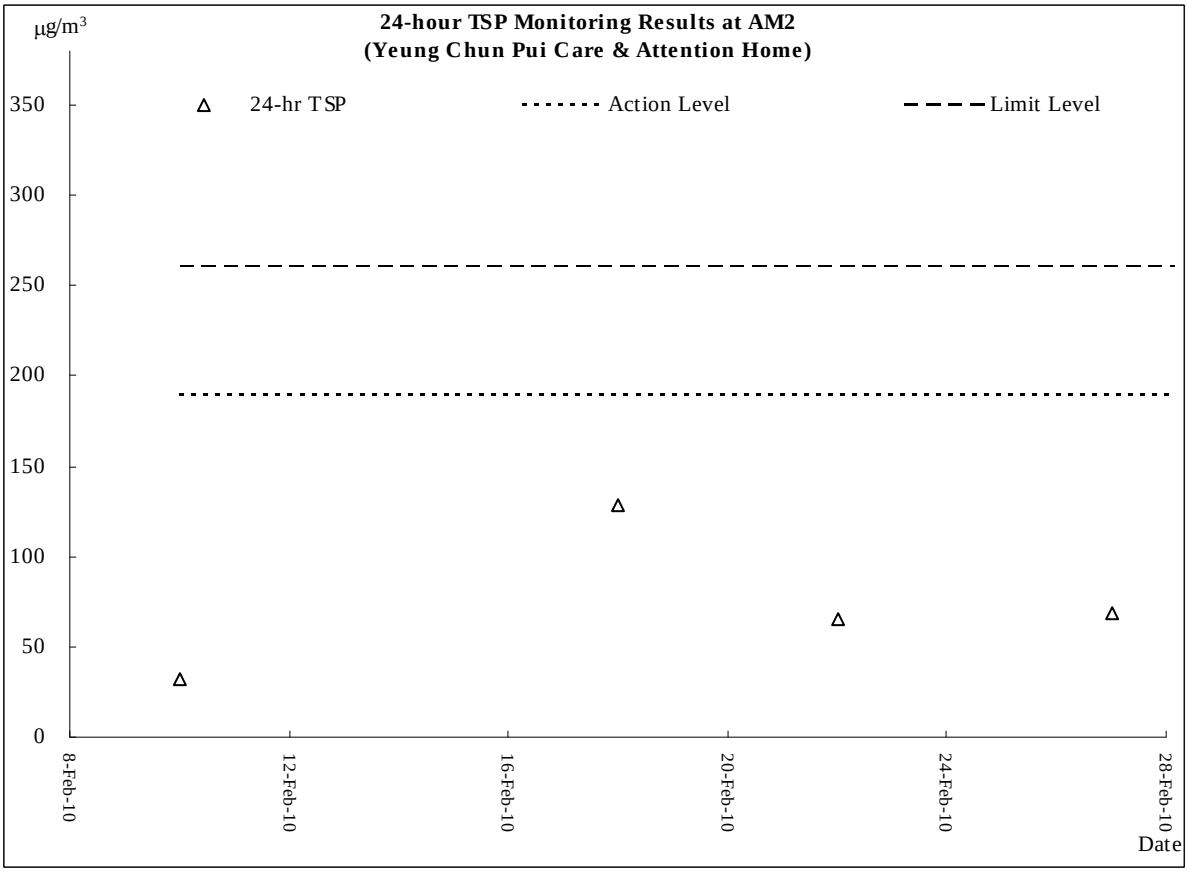
Date	ACTION/ LIMIT				DO (mg/L)		DOS (%)		Turbidity (NTU)		pH		SS	
Location					ACT	4.6			ACT	15.6	ACT		ACT	31.5
R1b					LIM	4			LIM	16.2	LIM		LIM	31.9
Date	**8-Feb-10**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS**	
R1b	16:15	0.42	20.7	20.7	4.04	**4.0**	45.0	44.9	15.5	15.5	7.54	7.5	15	15.0
			20.7		4.02		44.8		15.4		7.54		15	
Date	**10-Feb-10**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS**	
R1b	17:15	0.40	24.4	24.4	4.71	4.7	56.2	56.0	7.7	7.6	7.59	7.6	10	10.0
			24.4		4.76		55.8		7.5		7.59		10	
Date	**12-Feb-10**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS**	
R1b	15:00	0.30	19.5	19.5	3.1	**3.0**	34.5	31.6	11.6	11.5	7.59	7.6	16	16.0
			19.5		2.85		28.6		11.4		7.59		16	
Date	**17-Feb-10**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS**	
R1b	09:08	0.40	15.4	15.4	5.27	5.2	68.2	67.7	5.6	5.6	7.69	7.7	<2	2.0
			15.4		5.19		67.1		5.6		7.69		<2	
Date	**19-Feb-10**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS**	
R1b	16:05	0.40	11.9	11.9	6.62	6.4	62.7	60.1	7.0	6.9	7.65	7.7	11	11.0
			11.9		6.24		57.4		6.7		7.65		11	
Date	**22-Feb-10**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS**	
R1b	16:00	0.30	19.4	19.4	6.1	6.1	131.3	130.4	7.5	6.9	8.76	8.8	17	17.0
			19.4		6.1		129.5		6.4		8.76		17	
Date	**24-Feb-10**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS**	
R1b	16:10	0.40	22.5	22.5	8.2	8.4	190.0	189.5	13.5	13.8	9.5	9.5	23	23.0
			22.5		8.5		188.9		14.0		9.5		23	
Date	**26-Feb-10**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DOS (%)**		**Turbidity (NTU)**		**pH**		**SS**	
R1b	16:00	0.40	26.2	26.2	8	8.1	195.0	185.6	16.0	**16.5**	8.43	8.4	42	**42.0**
			26.2		8.2		176.3		17.0		8.43		42	

Appendix J

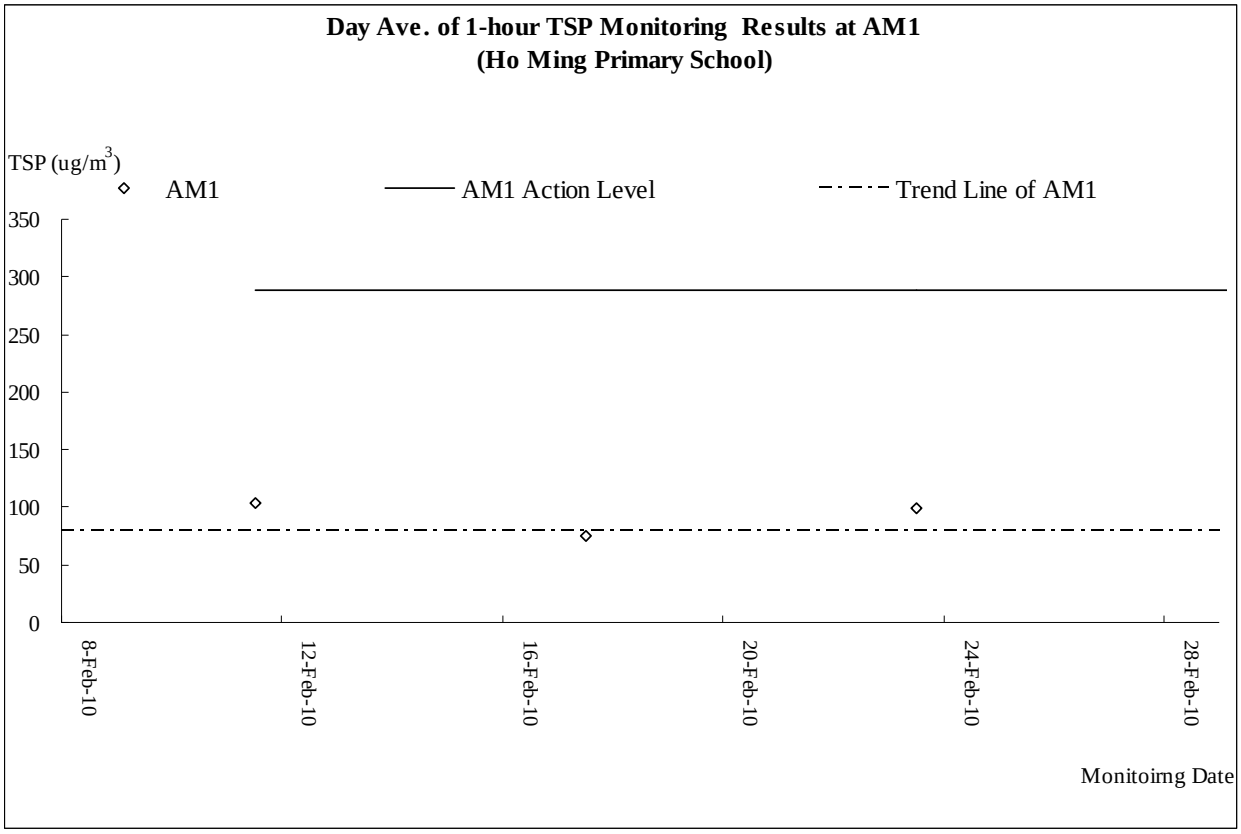
Graphical plots

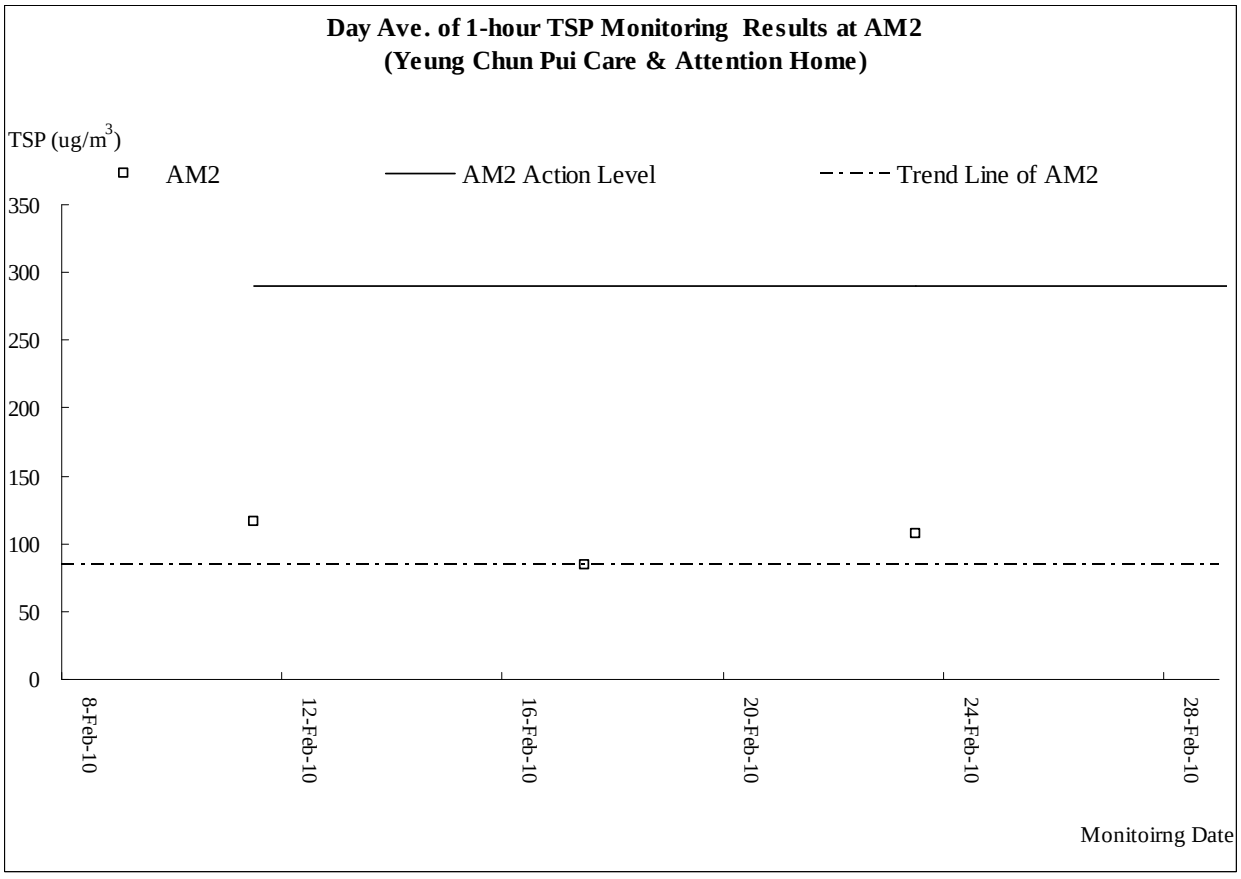
Air Quality – 24-Hr TSP



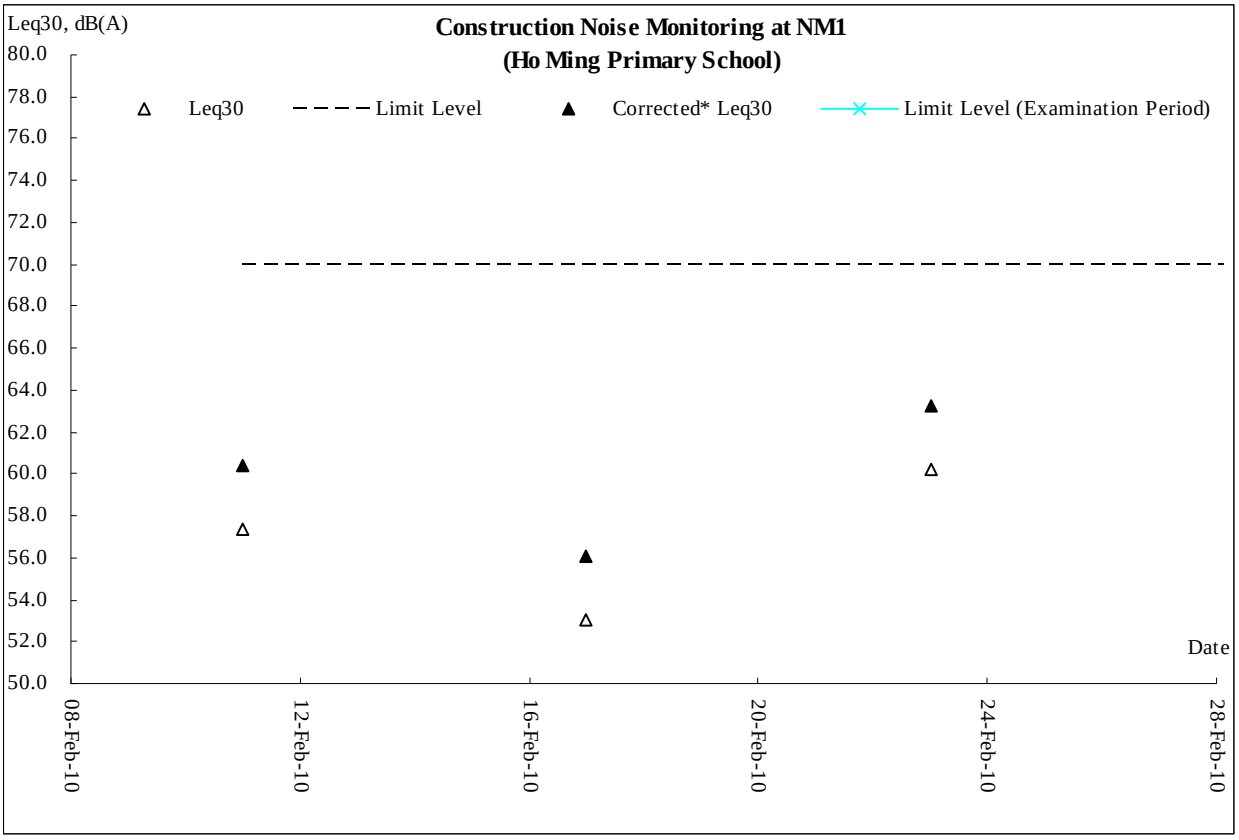


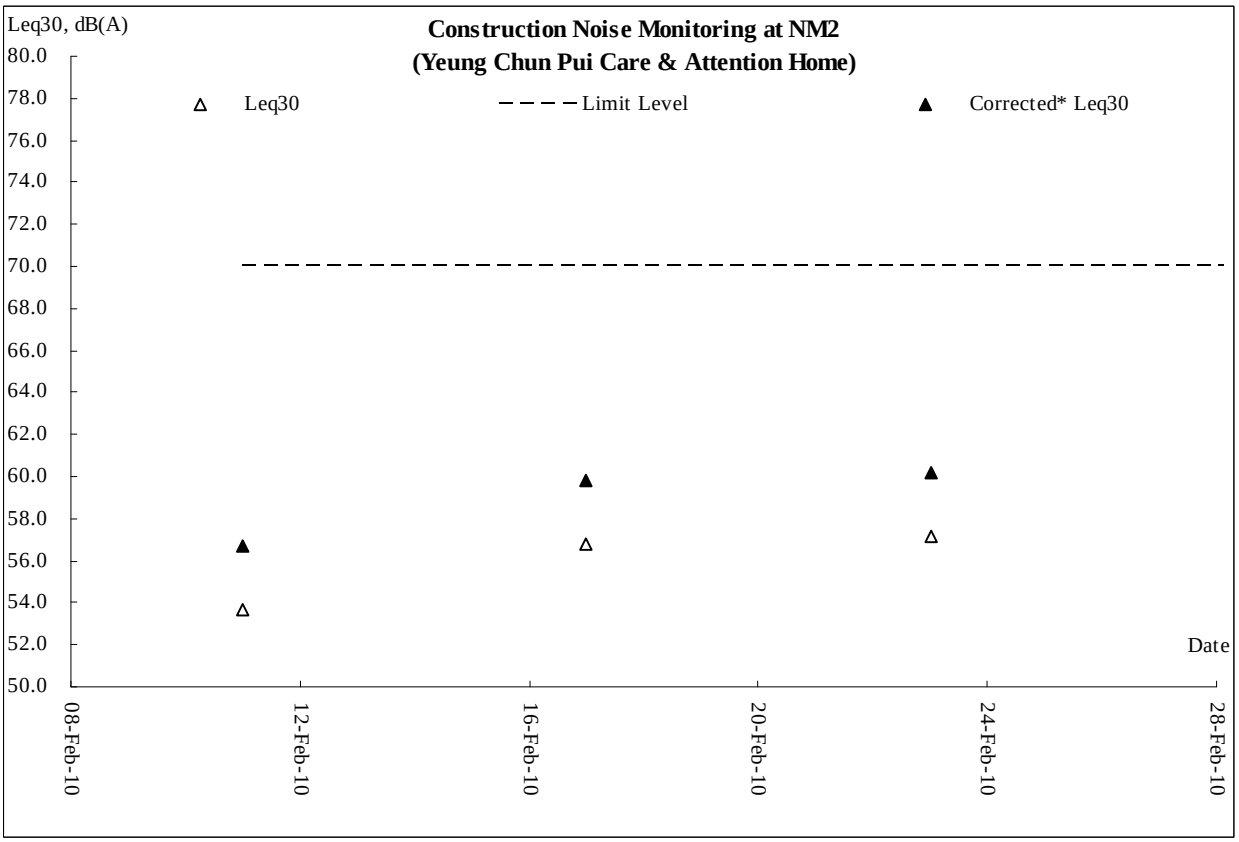
Air Quality – 1 Hour TSP



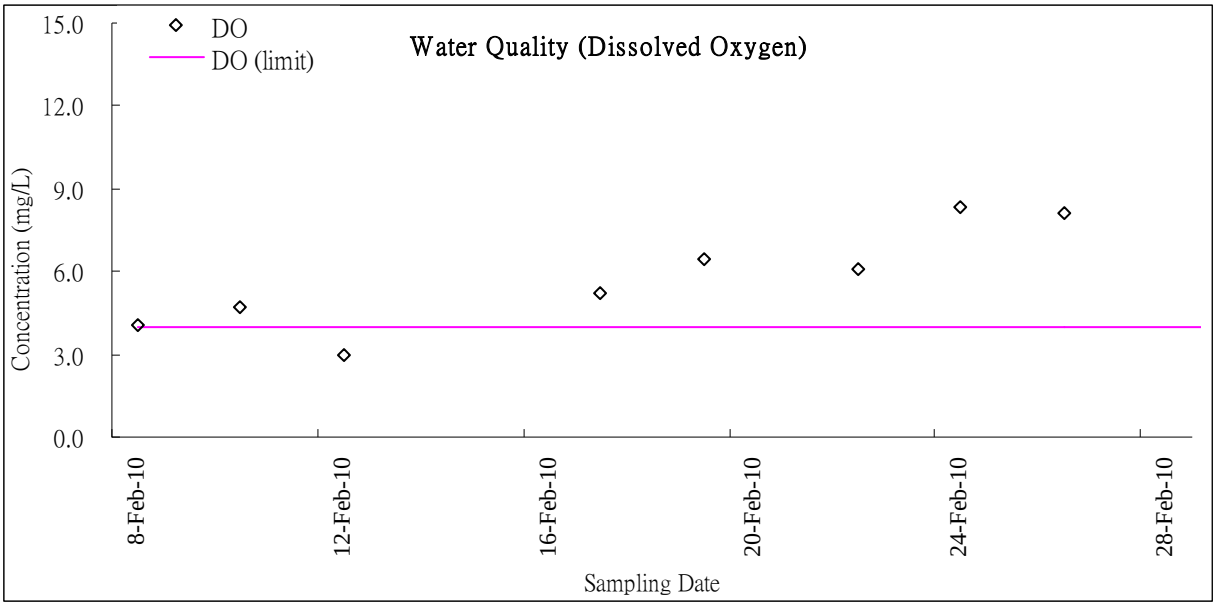


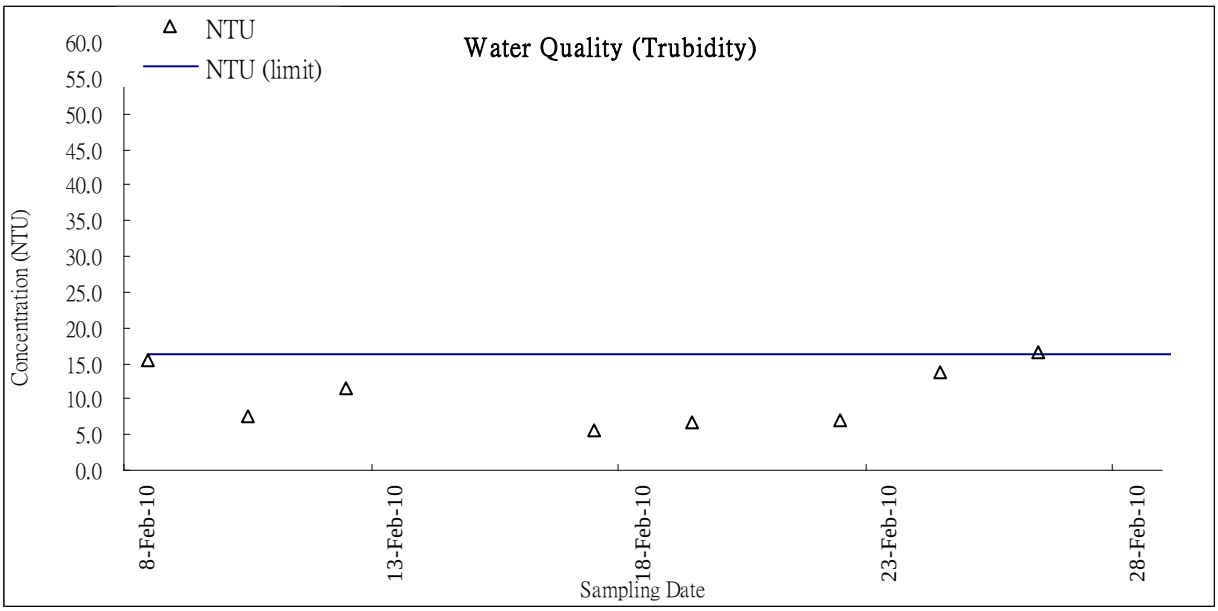
Construction Noise

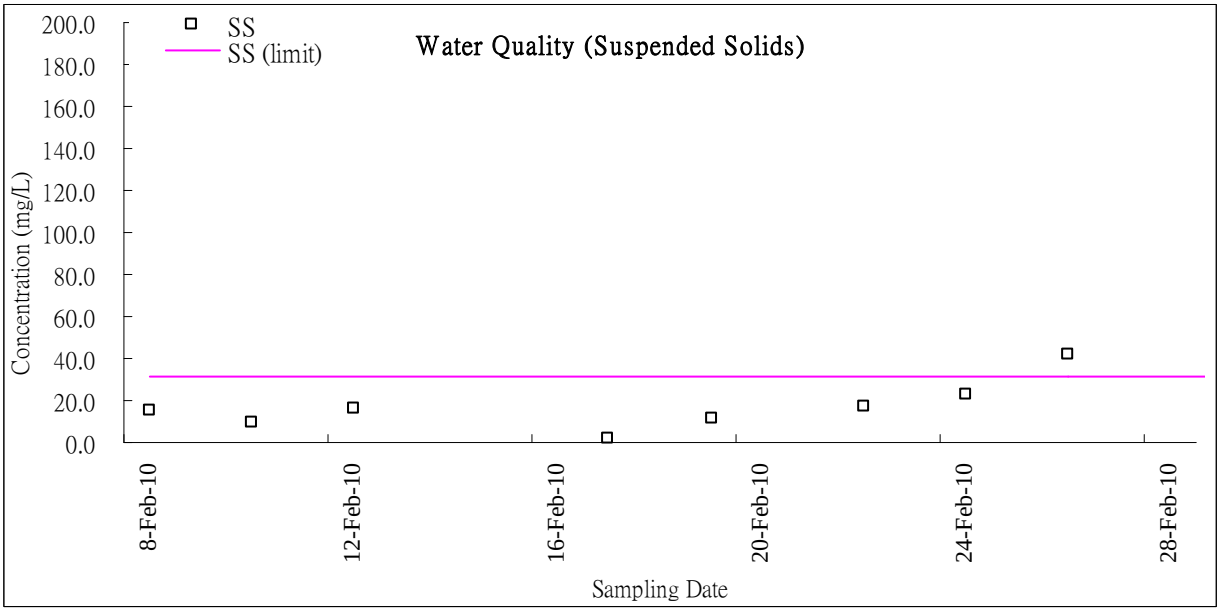




Water Quality – Local Stream Course (R1b)







Appendix K

Monthly Summary Waste Flow Table

Water Supplies Department
Monthly Summary Waste Flow Table
for Contract with Waste Management Plan under ETWB TCW No. 15/2003
Reporting Year: 2010

Contract No. *DC/2009/08*

(To be submitted to C&D MM Coordinator of Respective Division/Region via Engineer's Representative before 15th of the following month)

Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m^3)						Actual Quantities of Other C&D Materials / Wastes Generated				
	Total Quantities Generated [a+b+c+d]	Broken Concrete (including rock for recycling into aggregates) (a)	Reused in the Contract (b)	Reused in Other Projects (c)	Disposed as Public Fill (d)	Imported C&D Material	Metal (in '000kg)	Paper/ Cardboard Packaging (in '000kg)	Plastic (bottles/containers, plastic sheets/ foams from package material) (in '000kg)	Chemical Waste (in '000kg)	Others (e.g. General Refuse etc.) (in '000m^3)
January	0	0	0	0	0	0	0	0	0	0	0.011
February	0.036	0	0	0	0.036	0	0	0	0	0	0.003
March	0										
April	0										
May	0										
June	0										
Half-year total	0.036	0	0	0	0.036	0	0	0	0	0	0.014
July	0										
August	0										
September	0										
October	0										
November	0										
December	0										
Yearly Total	0.036	0	0	0	0.036	0	0	0	0	0	0.014

Appendix L

Inspection Checklist

Environmental Site Inspection Checklist

AUES

Project:	**DC/2009/08 Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen PS**	**Inspected by**	
		RE's representative:	
Inspection		**IEC's representative:**	
Date:	23 February 2010	**ET's representative:**	*T.W. Tam*
Time:	10:00	**Contractor's representative:**	*T.T. Lee*
		Checklist No.	DC200908-230210

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

Weather:	☐ Sunny	☑ Fine	☐ Cloudy	☐ Rainy
Temperature:	20.3 ^{0}C			
Humidity:	☐ High	☑ Moderate	☐ Low	
Wind:	☐ Strong	☑ Breeze	☐ Light	☐ Calm

PART B: SITE AUDIT

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

		Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
1.23	Is used bentonite recycled where appropriate?	☐	☐	☐	☐	☑	
1.24	Is the sediment laden runoff from the unpaved surface to avoid discharge into the nearby aquatic environments, mash lands and moat ponds?	☐	☑	☐	☐	☐	
Section 2: Air Quality							
2.01	Are there wheel washing facilities with high pressure jets provided at every vehicle exit point?	☐	☐	☐	☐	☑	
2.02	Are vehicles washed to remove any dusty materials from their bodies and wheels before leaving construction sites?	☐	☑	☐	☐	☐	
2.03	Are the excavated materials or exposure soil surface sprayed with water during handling?	☐	☑	☐	☐	☐	
2.04	Are stockpiles of dusty materials sprayed with water, covered or placed in sheltered areas?	☑	☐	☐	☐	☐	
2.05	Is the exposed earth properly treated within six months after the last construction activities?	☐	☑	☐	☐	☐	
2.06	Are the access roads sprayed with water to maintain the entire road surface wet or paved and speed control (<15km/hr)?	☐	☑	☐	☐	☐	
2.07	Is the surface where any drilling, cutting, polishing or breaking operation continuously sprayed with water?	☐	☑	☐	☐	☐	
2.08	Is the load on vehicles covered entirely by clean impervious sheeting?	☐	☑	☐	☐	☐	
2.09	Is the loading of materials to a level higher than the side and tail boards during transportation by vehicles avoided?	☐	☑	☐	☐	☐	
2.10	Is the road leading to the construction site within 30m of the vehicle entrance kept clear of dusty materials?	☐	☑	☐	☐	☐	
2.11	Is dark smoke emission from plant/equipment avoided?	☐	☑	☐	☐	☐	
2.12	Are de-bagging, batching and mixing processes carried out in sheltered areas (3-sided roofed enclosure) during the use of bagged cement?	☐	☑	☐	☐	☐	
2.13	Are site vehicles travelling within the speed limit (<15km/hour)?	☐	☑	☐	☐	☐	
2.14	Are hoardings of not less than 2.4m high provided along the site boundary, which adjoins areas accessible to the public?	☐	☑	☐	☐	☐	
2.15	Is open burning avoided?	☐	☑	☐	☐	☐	
2.16	Are any materials dropped on the roads (Outside the site boundaries) had clean up immediately?	☑	☐	☐	☐	☐	
Section 3: Noise							
3.01	Are noisy equipment and activities positioned as far as practicable from the sensitive receivers?	☐	☑	☐	☐	☐	
3.02	Is silenced equipment adopted?	☐	☑	☐	☐	☐	
3.03	Is idle equipment turned off or throttled down?	☐	☑	☐	☐	☐	
3.04	Are all plant and equipment well maintained and in good condition?	☐	☑	☐	☐	☐	
3.05	Are noise barriers or enclosures provided at areas where construction activities cause noise impact on sensitive receivers?	☐	☑	☐	☐	☐	
3.06	Are hand held breakers fitted with valid noise emission labels during operation?	☑	☐	☐	☐	☐	
3.07	Are air compressors fitted with valid noise emission labels during operation?	☐	☑	☐	☐	☐	
3.08	Are flaps and panels of mechanical equipment closed during operation?	☐	☑	☐	☐	☐	
3.09	Are Construction Noise Permit(s) applied for percussive piling works?	☐	☐	☐	☐	☑	
3.10	Are Construction Noise Permit(s) applied for general construction works during restricted hours?	☐	☐	☐	☐	☑	
3.11	Are valid Construction Noise Permit(s) posted at site entrances?	☐	☑	☐	☐	☐	
Section 4: Waste/Chemical Management							
4.01	Are receptacles available for general refuse collection?	☐	☑	☐	☐	☐	

		Not Obs.	Yes	No	Follow up	N/A	Photo/ Remarks
4.02	Is general refuse sorting or recycling implemented?	☐	☑	☐	☐	☐	
4.03	Is general refuse disposed of properly and regularly?	☐	☑	☐	☐	☐	
4.04	Is the Contractor registered as a chemical waste producer?	☐	☑	☐	☐	☐	
4.05	Are the chemical waste containers properly labelled?	☐	☑	☐	☐	☐	
4.06	Are the chemical wastes stored in proper storage areas?	☐	☑	☐	☐	☐	
4.07	Is the chemical waste storage area properly labelled?	☐	☑	☐	☐	☐	
4.08	Is the chemical waste storage area used for storage of chemical waste only?	☐	☑	☐	☐	☐	
4.09	Are incompatible chemical wastes stored in different areas?	☑	☐	☐	☐	☐	
4.10	Are the chemical wastes disposed of by licensed collectors?	☑	☐	☐	☐	☐	
4.11	Are trip tickets for chemical wastes disposal available for inspection?	☐	☑	☐	☐	☐	
4.12	Are chemical/fuel storage areas bunded?	☐	☑	☐	☐	☐	
4.13	Are designated areas identified for storage and sorting of construction wastes?	☐	☑	☐	☐	☐	
4.14	Are construction wastes sorted on site?	☐	☑	☐	☐	☐	
4.15	Are construction wastes reused?	☑	☐	☐	☐	☐	
4.16	Are construction wastes disposed of properly?	☐	☑	☐	☐	☐	
4.17	Are site hoardings and signboards made of durable materials instead of timber?	☐	☑	☐	☐	☐	
4.18	Is trip ticket system implemented for the disposal of construction wastes and records available for inspection?	☐	☑	☐	☐	☐	
4.19	Are appropriate procedures followed if contaminated material exists?	☐	☑	☐	☐	☐	
4.20	Is relevant license/ permit for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	☐	☐	
Section 5: Landscape & Visual							
5.01	Are retained and transplanted trees in health condition?	☐	☑	☐	☐	☐	
5.02	Are retained and transplanted trees properly protected?	☐	☑	☐	☐	☐	
5.03	Are surgery works carried out for the damaged trees?	☑	☐	☐	☐	☐	
5.04	Is damage to trees outside site boundary due to construction activities avoided?	☐	☑	☐	☐	☐	
5.05	Is the night-time lighting controlled to minimize glare to sensitive receivers?	☐	☑	☐	☐	☐	
Section 6: Others							
6.01	Are relevant Environmental Permits posted at all vehicle site entrances/exits?	☐	☑	☐	☐	☐	

Remarks

Observations recorded in this Site Inspection: (23-02-2010)

As a reminder, the wheel washing facility should be regularly cleaned up to avoid overflow of muddy water.

RE's representative	***IEC's representative***	***ET's representative***	***Contractor's representative***
( )	( )	(T.W. Tam)	( )