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

12th QUARTERLY ENVIRONMENTAL MONITORING & AUDIT SUMMARY REPORT – (November 2012 to January 2013)

PREPARED FOR

CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) COMPANY LIMITED

Quality Index

Date	Reference No.	Prepared By	Certified By
25 March 2013	TCS00491/09/600/R0445v2		
		Nicola Hon (Environmental Consultant)	T.W. Tam (Environmental Team Leader)

Version	Date	Description
1	28 February 2013	First submission
2	25 March 2013	Amended against IEC's comments on 21 March 2013

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3 April 2013

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Your Ref:

Our Ref: EB000586-F/THW13-11194

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
Quarterly EM&A Summary Report for Designated Project (November 2012 to January 2013) – IEC Verification

With reference to ET's captioned report (ET's ref.: TCS00491/09/600/R0445v2, dated 25 March 2013), we have no comment and hereby verify the captioned report.

Should there be any queries, please feel free to contact the undersigned on 2911 2744.

Yours sincerely,

F.C. TSANG
Independent Environmental Checker
HYDER CONSULTING LIMITED

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EXECUTIVE SUMMARY

ES.01. This is the **12th** Quarterly EM&A Summary Report for the *Expansion of Ha Tsuen Sewage Pumping Station* under Environmental Permit No.EP-327/2009/A (hereinafter ''the EP''), covering the period from **1 November 2012 to 31 January 2013** (hereinafter "Reporting Period").

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

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

Aspects	Environmental Monitoring Parameters / Inspection	Occasions
Air Quality	1-hour TSP	**96**
	24-hour TSP	**31**
Construction Noise	$L_{eq(30min)}$ Daytime	**32**
Water Quality	Dissolved Oxygen	**40**
	Turbidity	**40**
	Suspended Solids (SS)	**40**
Inspection / Audit	ET Weekly Environmental Site Inspection	**13**

BREACHES OF ACTION/LIMIT LEVELS

ES.03. In this reporting period, no exceedance was recorded in air quality and water quality monitoring. One (1) Limit Level exceedance for noise monitoring was recorded at NM1 on 16 February 2013. Notification of Exceedance (NOE) was issued to relevant parties and investigation for the cause of exceedance concluded that the exceedance was not related to the works under the Project. The summary of breach of environmental performance is shown below.

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	$L_{eq(30min)}$ Daytime	0	1	1	Not Project related	--
Water Quality	Dissolved Oxygen	0	0	0	--	--
	Turbidity	0	0	0	--	--
	Suspended Solids	0	0	0	--	--

ENVIRONMENTAL COMPLAINT, NOTIFICATIONS OF SUMMONS AND PROSECUTIONS

ES.04. No documented complaint, notifications of summons and successful prosecutions were received during the Reporting Period. No associated mitigation action is needed.

REPORTING CHANGES

ES.05. There are no reporting changes in this reporting month.

FUTURE KEY ISSUES

ES.06. During dry season, special attention should be paid to the dust mitigation measures to avoid fugitive dust emissions from loose soil surface or haul road. Nevertheless, mitigation measures implemented to control the surface runoff including wheel wash facilities, covering of the loose soil surface or stockpile with tarpaulin sheet, etc., should be properly maintained to prevent any muddy or sandy runoff from the loose soil surface overflow on the site boundary.

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1 INTRODUCTION

BACKGROUND

1.01 The China State Construction Engineering (Hong Kong) Limited (hereinafter "CSCE") 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.

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 Tsiu 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 expansion of 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. The Variation Environmental Permit No. EP-327/2009A for upgrading and expansion of Sewage Treatment Works at San Wai (excluded for the Project) and Ha Tsuen Sewage Pumping Station was again obtained by DSD in June 2010 for the relevant works.

1.04 According to Section 25 of the Particular Specification (PS) and the Variation Environmental Permit No. EP-327/2009A, 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).

1.05 This is the **12th** Quarterly EM&A Summary Report which is part of the EM&A programme under Environmental Permit No. EP-327/2009/A for the Expansion of Ha Tsuen Sewage Pumping Station, covering the period from **1 November 2012 to 31 January 2013**.

REPORT STRUCTURE

1.06 This Report is structured as follows:

Section 1 Introduction
Section 2 Project Organization and Construction Progress
Section 3 Summary of Impact Monitoring Requirements
Section 4 Monitoring Results and Breaches of Environmental Quality Criteria
Section 5 Waste Management
Section 6 Site Inspections
Section 7 Non-compliance, Complaints, Notifications of Summons and Successful Prosecutions
Section 8 Implementation Status of Mitigation Measures
Section 9 Conclusions and Recommendations

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***.

WORKS UNDERTAKEN DURING THE REPORTING PERIOD

2.02 The tentative master construction program is enclosed in ***Appendix C.*** Also, the major construction activities undertaken in this reporting period are listed below:

November 2012	• Construction of pumping station
December 2012	• Construction of pumping station
January 2013	• Construction of pumping station

SUMMARY OF ENVIRONMENTAL SUBMISSIONS

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

Table 2-1 Status of Environmental Licenses and Permits

Item	Description	License/Permit Status
1	Environmental Permit (EP-329/2009/A)	Update on 1 June 2010
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

MONITORING PARAMETERS

3.01 According to the *EM&A Manual*, the environmental aspect implemented by ET, including air quality, construction noise and water quality, also the landscape and visual impact to 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 Particulates (hereinafter '1-hr TSP'); and • 24-hour Total Suspended Particulates (hereinafter '24-hr TSP').
Construction Noise	• A-weighted equivalent continuous sound pressure level (30min) (hereinafter '$L_{eq(30min)}$' during the normal working hours; and • A-weighted equivalent continuous sound pressure level (5min) (hereinafter '$L_{eq(5min)}$' 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

Air Quality

3.02 The designated monitoring location Yeung Chun Pui Care & Attention Home has been identified. As High Volume Sampler (HVS) installation at another designated air monitoring station Tin Shing Court was refused by the incorporated owners, the alternative location Ho Tak Sum Primary School as sensitive receiver mentioned in the EIA Report (Register No. AEIAR-072/2003) is proposed to be the replacement to undertake air quality monitoring in accordance with the EM&A Manual Clauses 2.2.1.20. The proposal and recommendation is agreed by IEC and as endorsed by EPD. Details of monitoring stations are presented in ***Table 3-2*** and illustrated in ***Appendix D***.

3.03 As requested by the occupants of Yeung Chun Pui Care & Attention Home (AM2) due to safety reasons, the High Volume Air Sampler (HVS) for AM2 was relocated to a nearby location on 27 October 2011. Details of the relocation were given in the October 2011 Monthly EM&A Report.

3.04 As reported to the RE and IEC on 16 October 2012, the power supply for the HVS at AM2 was disconnected since the site office that provides the electric support has been dismantled. Therefore, the monitoring was suspended on 20 October until new location confirmed on 7 November. The proposal of new location at AM2(a) has been formally submitted to EPD subsequent to the agreement with the RE and IEC. No further comments were received from EPD regards on the proposal.

Table 3-2 Air Quality Monitoring Stations

Monitoring Location ID	Identified Address	Remarks
AM1	Ho Tak Sum Primary School	Replace the Designated Monitoring Station Tin Shing Court
AM2(a)	RE Site Office which opposite to	Replace the Designated Monitoring

Monitoring Location ID	Identified Address	Remarks
	the original location Yeung Chun Pui Care & Attention Home	Station Yeung Chun Pui Care & Attention Home

Construction Noise

3.05 Similar to the air quality monitoring, the construction noise monitoring stations undertaken for EM&A programme was agreed by IEC and endorsed by EPD. Details of the monitoring stations are presented in ***Table 3-3*** and shown in ***Appendix D***.

Table 3-3 Construction Noise Monitoring Stations

Monitoring Location ID	Identified Address	Remarks
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 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. The designated sampling location R1 is located at the midpoint between two pedestrian flyovers athwart Tin Shui Wai Nullah, which are 320 meters apart. There are technical difficulty and safety issue to sample at R1. So, a new sampling point located at approximately 160m upstream of the R1 (hereinafter as R1b) was therefore proposed for the local stream water quality impact monitoring and was verified by IEC, without comment from EPD.

3.07 Details of the monitoring station are presented in ***Table 3-4*** and shown in ***Appendix D***.

Table 3-4 Local Stream Water Quality Monitoring Station

Monitoring Location ID	Identified Address	Remarks
R1b	The athwart Tin Shui Wai Nullah pedestrian flyover	About 160 meters upstream from the designated location as stipulated in the EM&A Manual. Also, it is closer to the existing Ha Tsuen Sewage Pumping Station

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 FREQUENCY

3.09 The impact monitoring frequency and duration for air quality, construction noise, water quality of local stream course, and landscape & visual are summarized below.

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 $L_{eq(30min)}$ as 6 consecutive $L_{eq(5min)}$ between 0700 and 1900 hours on normal weekdays.
$L_{eq(5min)}$, L_{10} and L_{90} during the construction undertaken during Restricted Hours

(from 1900 to 0700 hours of the following day and full day of public holiday and Sunday)

Frequency: Once every six days during 0700 to 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.

Depth: mid-depth

Duration: Throughout the construction period and the interval between 2 sets of monitoring is not less than 36 hours

Landscape and Visual Monitoring

Parameters: Site inspection with broad scope of audit as listed in the EM&A Manual

Frequency: Once every 2 weeks

Duration: Throughout the construction period

Site inspection and Audit

Frequency: Once per week.

Duration: Throughout the construction period.

ENVIRONMENTAL QUALITY CRITERIA

3.10 The environmental quality criteria i.e. Action and Limit levels (herein after 'A/L levels') are listed in Table 3-5, 3-6 and 3-7 below.

Table 3-5 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 3-6 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 $L_{eq(30min)}$ 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 $L_{eq(30min)}$ during normal hours from 0700 to 1900 hours on normal weekdays

Table 3-7 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

ENVIRONMENTAL MITIGATION MEASURES

3.11 Environmental Mitigation Implementation Schedule (EMIS) such as the construction dust, noise, wastewater and waste management shall be performed in accordance with the project EM&A Manual Appendix A requirements.

4 MONITORING RESULTS AND BREACHES OF ENVIRONMENTAL QUALITY CRITERIA

AIR QUALITY MONITORING

4.01 Monitoring results and breaches of air quality A/L levels during the Reporting Period are tabulated in ***Tables 4-1*** and ***4-2*** and the relevant graphical plots are presented in ***Appendix E***.

Table 4-1 Summary of Air Quality Monitoring Results, (μg/m³)

Date	24-hour TSP		Date	1-hour TSP					
	AM1	AM2(a)		AM1			AM2(a)		
				1st hour	2nd hour	3rd hour	1st hour	2nd hour	3rd hour
1-Nov-12	58	#	1-Nov-12	153	186	184	164	192	143
7-Nov-12	60	124	7-Nov-12	201	189	154	187	213	177
13-Nov-12	98	99	13-Nov-12	186	224	175	182	165	184
19-Nov-12	76	111	19-Nov-12	123	109	111	107	124	116
24-Nov-12	45	52	24-Nov-12	108	95	81	94	112	97
30-Nov-12	32	42	30-Nov-12	94	88	91	109	87	121
5-Dec-12	79	82	6-Dec-12	136	112	109	126	145	98
11-Dec-12	40	59	12-Dec-12	78	81	93	89	102	106
17-Dec-12	30	76	18-Dec-12	108	94	86	83	111	102
22-Dec-12	79	105	24-Dec-12	84	96	94	111	96	101
28-Dec-12	27	37	29-Dec-12	145	106	98	87	91	100
3-Jan-13	87	121	4-Jan-13	108	94	126	126	118	90
9-Jan-13	42	147	10-Jan-13	88	151	96	116	82	71
15-Jan-13	71	140	16-Jan-13	132	128	116	145	128	152
21-Jan-13	120	131	22-Jan-13	95	84	101	128	111	82
26-Jan-13	71	95	28-Jan-13	108	121	135	152	118	106
Average (Range)	**63 (27 – 120)**	**95 (37– 147)**	**Average (Range)**	**120 (78 – 224)**			**122 (71 – 213)**		

 # Power failure of HVS and no data was obtained.

Table 4-2 Summaries of Breaches of Air Quality A/L Levels

Location	Exceedance	1-hour TSP	24- hour TSP	Total
AM1	Action Level	0	0	0
	Limit Level	0	0	0
AM2(a)	Action Level	0	0	0
	Limit Level	0	0	0

4.02 As shown in ***Table 4-1***, all 1-hour TSP and 24-hour TSP monitoring results were fluctuated below the Action Level in this Reporting Period.

CONSTRUCTION NOISE MONITORING

4.03 Monitoring results and breaches of construction noise A/L levels during the Reporting Period are tabulated in ***Tables 4-3*** and ***4-4*** and the relevant graphical plots are presented in ***Appendix E***.

Table 4-3 Summary of Construction Noise Monitoring Results ($L_{eq(30min)}$, dB(A))

Date	(*) NM1	(*) NM2
1-Nov-12	65.1	65.6
7-Nov-12	66.1	63.2
13-Nov-12	69.5	61.4
19-Nov-12	68.1	61.5
24-Nov-12	64.1	64.4
30-Nov-12	63.9	62.1
6-Dec-12	66.5	63.4
12-Dec-12	65.9	63.4
18-Dec-12	65.3	61.5
24-Dec-12	60.2	62.5

Date	(*) NM1	(*) NM2
29-Dec-12	69.3	64.6
4-Jan-13	68.1	64.0
10-Jan-13	66.6	69.9
16-Jan-13	**68.3 #**	62.6
22-Jan-13	66.1	61.9
28-Jan-13	61.1	64.3

(*) A façade correction of +3dB(A) has been added according to acoustical principles and EPD guidelines.
(#) The noise limit level was reduced to 65dB(A) during the school exam period 15 and 18 January 2013.

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

Station	Limit Level	Action Level	Received Date
NM1	**1**	Noise complaint	NA
NM2	0		

4.04 In this Reporting Period, one (1) Limit Level exceedance was recorded at NM1 on 16 February 2013. Notification of Exceedance (NOE) was issued to relevant parties and investigation for the cause of exceedance has been undertaken by the Contractor and ET.

4.05 According to the site diary and records provided by the Contractor, laying of floor screeding at staircase ST-4, installation of chequer plate at transformer room and laying of 5-legs tile at roof of transformer were in progress at Ha Tsuen Sewage Pumping Station. The abovementioned activities did not involve noisy plants operation and create noise nuisance as the majority of works were indoor activities.

4.06 According to the field data sheet recorded by the ET, no noisy construction activities were observed in Ha Tsuen Sewage Pumping Station. However, school bell ringing at NM1 was recorded as other noise source during the course of monitoring. Since the monitoring was carried out at the roof top of NM1, the noise from school bell would affect the monitoring result. It is concluded that the exceedance was not related to the works under the Project.

WATER QUALITY MONITORING – LOCAL STREAM COURSE

4.07 In this Reporting Period, a total of **40** events of local stream course monitoring were undertaken. Statistical analyses for the monitoring results are summarized in ***Table 4-5*** and the relevant graphical plots are presented in ***Appendix E***.

Table 4-5 Statistics of the Monitoring Results

Statistics	DO (mg/L)	Turbidity (NTU)	SS (mg/L)
Min	4.7	1.8	2.0
Average	7.1	10.4	15.5
Max	10.6	15.3	30.0

4.08 Breaches of water quality A/L levels and statistical analysis of compliance for the water quality monitoring results are summarized in ***Table 4-6***.

Table 4-6 Summaries of Breaches of the Existing Water Quality A/L Levels

Construction Month	No. of sample analysis in each Parameter	Exceedance	DO	Turbidity	SS
November 2012	14	Action Level	0	0	0
		Limit Level	0	0	0
		Sub-Total	0	0	0
December 2012	13	Action Level	0	0	0
		Limit Level	0	0	0
		Sub-Total	0	0	0
January 2013	13	Action Level	0	0	0

Construction Month	No. of sample analysis in each Parameter	Exceedance	DO	Turbidity	SS
		Limit Level	0	0	0
		Sub-Total	0	0	0
Total	40	**Action Level**	0	0	0
		Limit Level	0	0	0
Percentage of compliance			**100%**	**100%**	**100%**
Total % of compliance for water quality			**100%**		

4.09 In Reporting Period, no exceedance of water quality monitoring recorded at water samples collected from location "R1b". No NOE was therefore issued and no corrective measures recommended.

RESULTS OF LANDSCAPE AND VISUAL IMPACT

4.10 The monitoring and audit works for landscaping and visual was undertaken by the Landscape Architect of the Contractor and the monitoring findings were submitted to ET for reporting.

4.11 In this Reporting Period, 6 events of site inspection were undertaken in November 2012, December 2012 and January 2013 and the result findings were summarized in the relevant L&V site inspection checklist in the stand-alone monthly L&V Impact Monitoring Report.

4.12 In general, standard hoarding was erected and well maintained around the works area in Ha Tsuen Sewage Pumping Station (HTSPS). The construction had no complication to protected trees. There were 73 nos. of transplanted trees in HTSPS due to construction works under the contract and all trees have been handover back to DSD. However, 24 transplanted trees were reported dead. They were removed by the Contractor in late October 2012. These trees would be replaced by *Melaleuca quinquenervia* and *Bauhinia variegate* after the completion of the construction works. In this Reporting Period, all retained trees were fenced off and protected properly within the works area of the site. DSD was carrying out the preservation and protection.

4.13 In conclusion, the overall conditions were normal in the transplanting and visual impact at HTSPS. The conditions of hoarding were satisfactory. The trees at HTSPS have been returned to DSD for management and monitoring since January 2011.

RESULTS OF EFFLUENT MONITORING

4.14 Monitoring of effluent quality should follow the requirements specified in Section 4.3 of the approved EM&A Manual. A discharge license under Water Pollution Control Ordinance has been obtained by the Contractor upon commencement of the Project. The licensee shall perform self-monitoring as and when required by the Authority.

4.15 No effluent quality monitoring was carried out by the Contractor in this Reporting Period.

5 WASTE MANAGEMENT

5.01 Waste management was performed by an on-site Environmental Officer or an Environmental Supervisor from time to time. A Billing Account (The account number 700947) under the ***Waste Disposal (Charges for Disposal of Construction Waste) Regulation*** has already been assigned on 7 October 2009. A discharge license No. WT00005671-2009 under Section 20 of the ***Water Pollution Control Ordinance*** has been issued. CSCE has also registered as a Chemical Waste Producer with EPD under the Waste Disposal (Chemical Waste) (General) Regulation and the Waste Producer Number assigned is WPN: 5213-511-C3570-01 dated 13 November 2009.

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 Whenever possible, materials were reused on-site as far as practicable. The quantities of waste for disposal in the Reporting Period are summarized in ***Tables 5-1*** and ***5-2***. The Monthly Summary Waste Flow Table provided by the Contractor can be found at the relevant EM&A monthly report.

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

Type of Waste	Quantity			Disposal Location
	Nov 12	Dec 12	Jan 13	
C&D Materials (Inert) (m^3)	0	0	0	-
Reused in this Contract (Inert) (m^3)	0	0	0	-
Reused in other Projects (Inert) (m^3)	0	0	0	-
Disposal as Public Fill (Inert) (m^3)	1,012	1,241	1,765	Tuen Mun Area 38

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

Type of Waste	Quantity			Disposal Location
	Nov 12	Dec 12	Jan 13	
Recycled Metal (kg)	0	0	0	-
Recycled Paper/Cardboard Packing (kg)	0	0	0	-
Recycled Plastic (kg)	0	0	0	-
Chemical Wastes (kg)	0	0	0	-
General Refuses (m^3)	1	1	1	NENT Landfill

5.04 The Monthly Summary Waste Flow Table provided by the Contractor can found from the relevant EM&A monthly report.

6 SITE INSPECTIONS

6.01 According to the Environmental Monitoring and Audit Manual, regular environmental site inspections had been carried out by ET joined with the Contractor and ER to confirm the environmental performance. During the Reporting Period, ***13*** events of the joint site inspections were undertaken to evaluate the site environmental performance. No non-compliance was noted but ***9*** observations were recorded during the site inspections within the Reporting Period.

6.02 The summaries of the findings are presented in ***Table 6-1*** and the site inspection checklists can be found in relevant EM&A monthly report.

Table 6-1 Site Reminders/Observations Found in the Reporting Period

Date	Findings / Deficiencies	Follow-Up Status
6 November 2012	No environmental issue was observed during site inspection.	N.A.
13 November 2012	- Scattered of C&D waste was observed Ha Tsuen Sewage Pumping Station, housekeeping should be improved.	Housekeeping in Ha Tsuen Sewage Pumping Station has been improved on 21 November 2012
21 November 2012	No environmental issue was observed during site inspection. As a reminder, water spraying within the site area should be applied more frequently during dry season.	N.A.
27 November 2012	No environmental issue was observed during site inspection.	N.A.
4 December 2012	- Heap of C&D waste was scattered in the working area of Ha Tsuen Sewage Pumping Station, housekeeping should be improved.	- Housekeeping has been improved in in the working area of Ha Tsuen Sewage Pumping Station on 11 December 2012.
11 December 2012	- Mud trails was observed in Ha Tsuen Sewage Pumping Station., the Contractor should clean the mud regularly and ensure the access road kept clear of dusty materials.	- The mud trails in Ha Tsuen Sewage Pumping Station was cleared on 11 December 2012.
19 December 2012	No environmental issue was observed during site inspection.	- N.A.
24 December 2012	- Stagnant water was observed in Ha Tsuen Sewage Pumping Station, the Contractor should clear the excessive water regularly to avoid mosquito breeding. - Stockpile of general refuse was observed in Ha Tsuen Sewage Pumping Station, the Contractor was reminded to improve the housekeeping of the site.	- Stagnant water was cleared on 2 January 2013. - Stockpile of general refuse was cleared on 2 January 2013.
2 January 2013	- Scattered of general refuse was observed in Ha Tsuen Sewage Pumping Station, the Contractor was required to improve the housekeeping of the site.	- Housekeeping has been improved in the working area of Ha Tsuen Sewage Pumping Station on 8 January 2013.
8 January 2013	- Dusty and dry haul road was observed in Ha Tsuen Sewage Pumping Station, the Contractor should apply water spraying more frequently especially during dry	- Water spraying was provided in Ha Tsuen Sewage Pumping Station on 18 January 2013.

	season.	
18 January 2013	- No environmental issue was observed during site inspection.	- N.A.
22 January 2013	- Direct discharge of site water to sewerage system was observed within the site at Ha Tsuen Sewage Pumping Station. Pretreatment of the site water is required prior to discharge.	- Pretreatment of site water was made by the Contractor on 1 February 2013.
29 January 2013	- Direct discharge of site water to sewerage system was observed within the site at Ha Tsuen Sewage Pumping Station. Pretreatment of the site water is required prior to discharge.	- Pretreatment of site water was made by the Contractor on 1 February 2013.

6.03 In general, it is reminded that air quality mitigation measures should be enhanced and watering at the site exit should be applied more frequently to clean the mud trail during dry season. Overall, the environmental performance of the Project was considered satisfactory.

7 NON-COMPLIANCE, COMPLAINTS, NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS

NON-COMPLIANCE

7.01 No non-compliance or deficiency was identified during regular site inspection and environmental audit. No associated remedial actions were recommended.

ENVIRONMENTAL COMPLAINT

7.02 No documented noise, air quality or water quality complaint was received by the Contractor, ER or EPD. The statistical summary table of environmental complaint is presented in ***Table 7-1***.

Table 7-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
February 2010 - October 2012	3	3	Air (2)/ Noise (1)
November 2012	0	3	NA
December 2012	0	3	NA
January 2013	0	3	NA

NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS

7.03 No notifications of summons and successful prosecutions were recorded during the Reporting Period. No associated remedial actions were recommended. The statistical summary table of environmental summons and successful prosecution are presented in ***Tables 7-2 and 7-3***.

Table 7-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
February 2010 - October 2012	0	0	NA
November 2012	0	0	NA
December 2012	0	0	NA
January 2013	0	0	NA

Table 7-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
February 2010 - October 2012	0	0	NA
November 2012	0	0	NA
December 2012	0	0	NA
January 2013	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 management, and landscaping and visual.

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 during the Reporting Period are summarized in ***Table 8-1***.

Table 8-1 Environmental Mitigation Measures Implementation in the Reporting Period

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 was 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 has been provided at site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles; • A discharge licence was issued by EPD for discharging effluent from the construction site; • A licensed waste collector have been applied from EPD; and • Illegal disposal of chemicals should be strictly prohibited.
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; • Water sprinkler system was 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; and • Wheel washing facilities have been provided at the site exit.
Noise	• Good site practices to limit noise emissions at the sources; • Use of quiet plant and working methods according to EP-327/2009/A; • 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-327/2009/A; • Use of temporary noise barrier with surface density 7kg/m^2 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 Sewage Pumping Station according to EP-327/2009/A; and • Alternative use of quiet plant within one worksite, where practicable.

Issues	Environmental Mitigation Measures
Waste and Chemical Management	• Excavated material was reused on site as far as possible to minimize off-site disposal. Scrap metals or abandoned equipment was recycled if possible; • Waste arising was kept to a minimum and be handled, transported and disposed of in a suitable manner; • The Contractor adopted a trip ticket system for the disposal of C&D materials to any designated public filling facility and/ or landfill; • Chemical waste was 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 were provided to segregate this waste from other general refuse generated by the workforce; • Any unused chemicals or those with remaining functional capacity were recycled; • Prior to disposal of C&D waste, wood, steel and other metals were separated for re-use and 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	• Hoarding was erected around site boundary properly; • The transplanted tree and landscaping plants were kept in regular inspection; • All preserved trees were protected and fenced off properly; • No construction activities were carried out in the protection zone of the preserved trees.
General	• The site was generally kept tidy and clean.

9 CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

9.01 This is the **12th** quarterly EM&A summary report under Environmental Permit No.EP-327/2009/A for the *Expansion of Ha Tsuen Sewage Pumping Station*, covering the period from **1 November 2012 to 31 January 2013.**

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

9.03 No noise complaint (which is an Action Level exceedance) was received. One (1) Limit Level exceedance for noise monitoring was recorded at NM1 on 16 February 2013. Notification of Exceedance (NOE) was issued to relevant parties and investigation for the cause of exceedance concluded that the exceedance was not related to the works under the Project.

9.04 No Action/Limit Level exceedance was recorded for the water quality monitoring during Reporting Period.

9.05 No effluent quality monitoring was carried out by the Contractor in this Reporting Period.

9.06 The monitoring and audit works for landscaping and visual was undertaken by a Landscape Architect of the Contractor and the monitoring findings were submitted as a stand-alone document separately. During the regular weekly site inspection, it was observed that all the retained and transplanted trees were well protected by site hoarding and fence erection, and were in good condition. Details of the inspections and observations were reported in stand-alone monthly documents "Results of Landscape and Visual Impact Monitoring" of the Reporting Period

9.07 A total of **13** occasions of joint site inspections were undertaken to evaluate the site environmental performance. No non-compliance was noted but **9** observations were recorded during the site inspections within the Reporting Period.

9.08 No documented complaint, notifications of summons and successful prosecutions were received during the Reporting Period. No adverse environmental impacts were observed during the weekly site inspection and environmental audit of the Reporting Period, indicating the implemented mitigation measures for air quality, construction noise and water quality were effective. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.

9.09 No site inspection was undertaken by EPD, the Agriculture, Fisheries and Conservation Department (AFCD) and Leisure and Cultural Services Department (LCSD) in this Reporting Period.

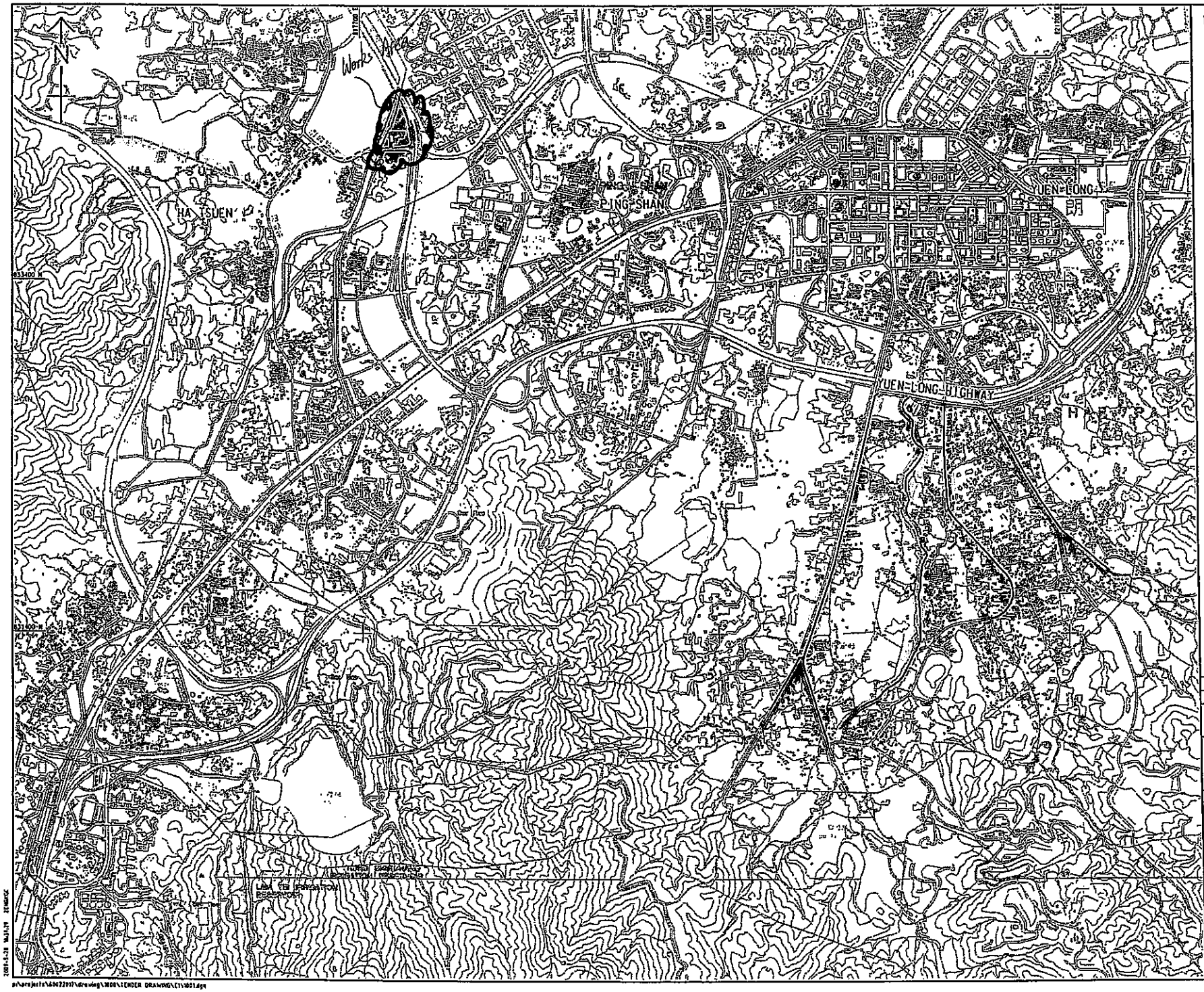
RECOMMENDATIONS

9.10 During dry season, special attention should be paid to the dust mitigation measures to avoid fugitive dust emissions from loose soil surface or haul road. Nevertheless, mitigation measures implemented to control the surface runoff including wheel wash facilities, covering of the loose soil surface or stockpile with tarpaulin sheet, etc., should be properly maintained to prevent any muddy or sandy runoff from the loose soil surface overflow on the site boundary.

9.11 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

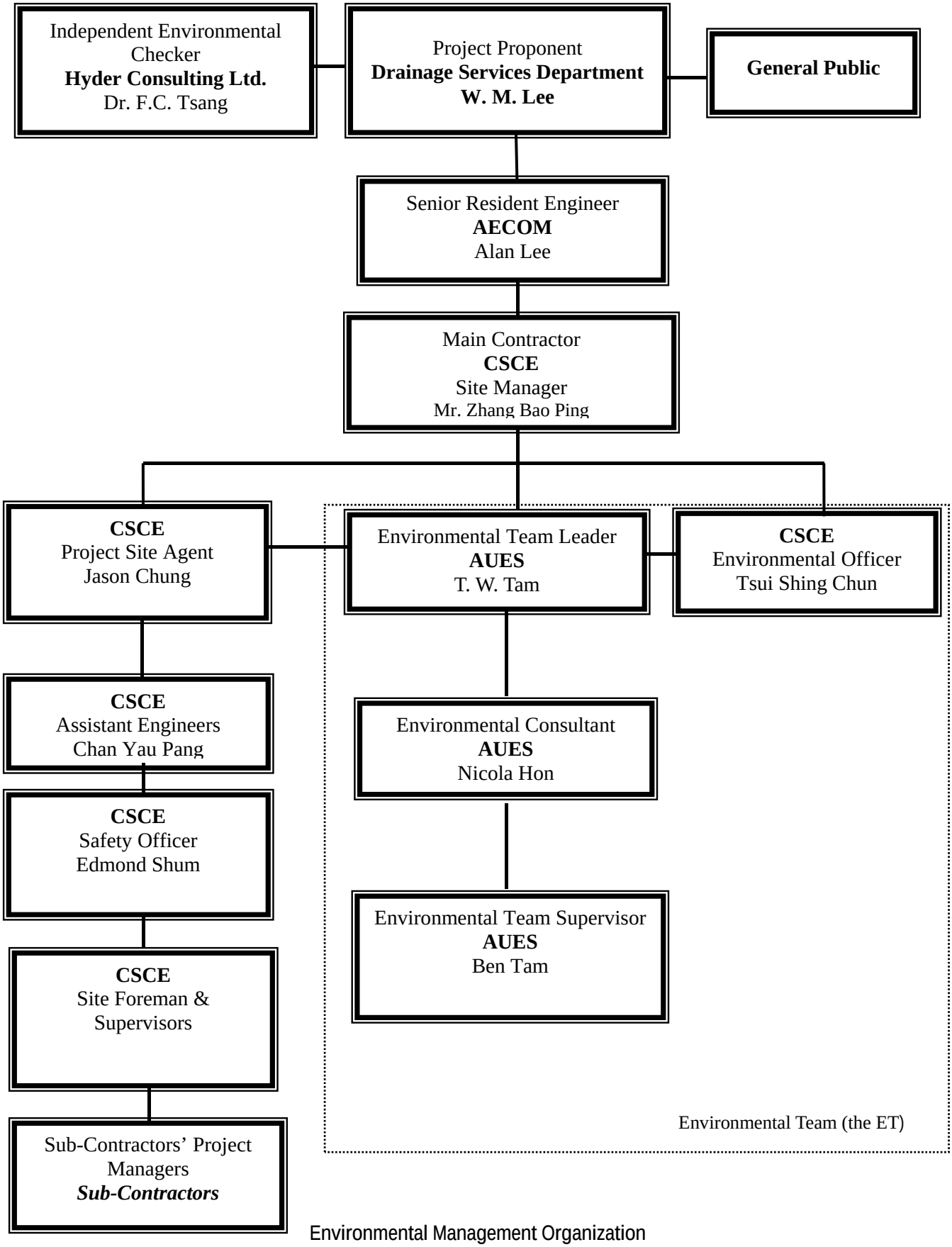
CONTRACT NO. DC/2009/08

SCALE AT A1 1 : 10000

METRES

Appendix B

Environmental Management Organization Chart



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	Senior Resident Engineer	Mr. Alan Lee	9706 9568	2472 0132
Hyder	Independent Environmental Checker	Dr. F C Tsang	2911 2744	2805 5028
CSCE	Project Manager	Mr. Zhang Bao Ping	2472 0113	2472-0229
CSCE	Site Agent	Mr. Jason Chung	2472 0113	2472-0229
CSCE	Assistant Engineer	Mr. Chan Yau Pang	2472 0113	2472-0229
CSCE	Environmental Officer	Mr. Tsui Shing Chun	2472 0113	2472-0229
CSCE	Safety Officer	Mr. Edmond Shum	2472 0113	2472-0229
AUES	Environmental Team Leader	Mr. T. W. Tam	2959-6059	2959-6079
AUES	Senior Environmental Consultant	Mr. F.N. Wong	2959-6059	2959-6079
AUES	Environmental Consultant	Ms. Nicola Hon	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

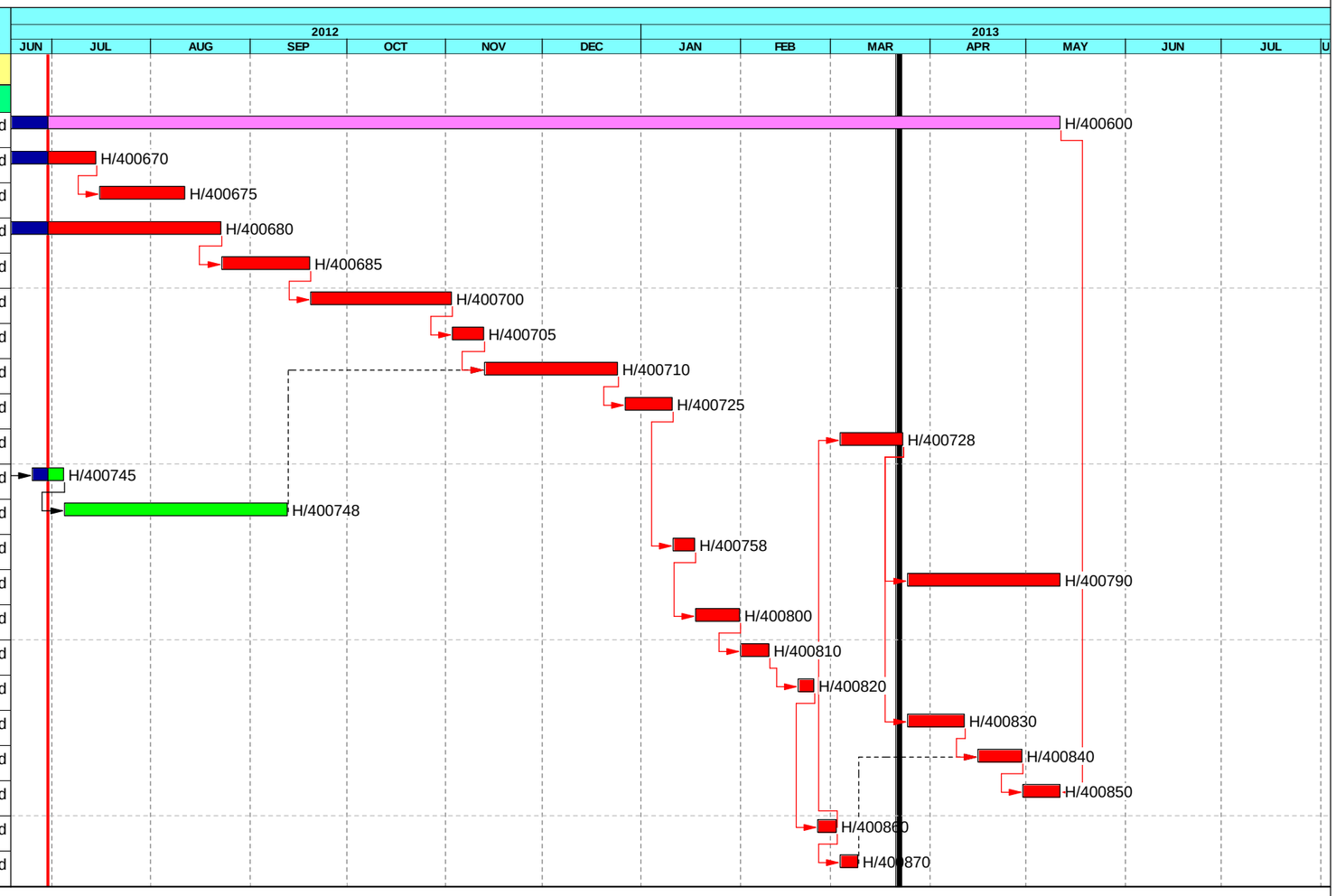
AUES (ET) – Action-United Environmental Services & Consulting

Appendix C

Master Construction Program

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

Activity ID	Description	Orig Dur	Early Start	Early Finish	Total Float
Ha Tsuen Area					
Road and Drain					
H/400600	Sewerage Works at Ha Tsuen Pumping Station	520 *	04AUG11 A	11MAY13	-39d
H/400670	Construct Remaining Manhole FM17	36	23MAY12 A	14JUL12	-45d
H/400675	Backfill and Remove Sheet Pile at FM17	24	16JUL12	11AUG12	-45d
H/400680	Construct Manhole FM14	75	14MAY12 A	22AUG12	-39d
H/400685	Sheet Piling between FM14 to FM16	24	23AUG12	19SEP12	-39d
H/400700	Excavate Trench bet FM14 to M1	36	20SEP12	02NOV12	-39d
H/400705	Pipe Line between FM14 to M1	8	03NOV12	12NOV12	-39d
H/400710	Construct Manhole FM16	36	13NOV12	24DEC12	-39d
H/400725	Backfill between FM16 to FM14 stage 1	12	27DEC12	10JAN13	-39d
H/400728	Install Stop Log & Penstock at FM16 (by Others)	18	04MAR13	23MAR13	-39d
H/400745	Sheet Piling between M1 and FM6 (2)	15	25JUN12 A	04JUL12	11d
H/400748	Exc and Construct Manhole M1	60	05JUL12	12SEP12	11d
H/400758	Sheet Piling between FM16 to FM6	6	11JAN13	17JAN13	-39d
H/400790	Drainage Connection at M1	37	25MAR13	11MAY13	-39d
H/400800	Excavate Trench between FM16 to FM6	12	18JAN13	31JAN13	-39d
H/400810	Break opening and lay pipe between FM16 to FM6	8	01FEB13	09FEB13	-39d
H/400820	Make Good FM6	5	19FEB13	23FEB13	-39d
H/400830	Backfill Pipe Trenches	15	25MAR13	11APR13	-39d
H/400840	Remove Sheet Pile	12	16APR13	29APR13	-39d
H/400850	Reinstatement of Area	10	30APR13	11MAY13	-39d
H/400860	Install Cat Ladder at FM16	6	25FEB13	02MAR13	-39d
H/400870	CCTV of Sewerage bet PS to M1	6	04MAR13	09MAR13	-12d



Start date	17SEP09
Finish date	13JUN19
Run date	16JUL12
Project name	WP8A
Page number	1A
c Primavera Systems, Inc.	

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

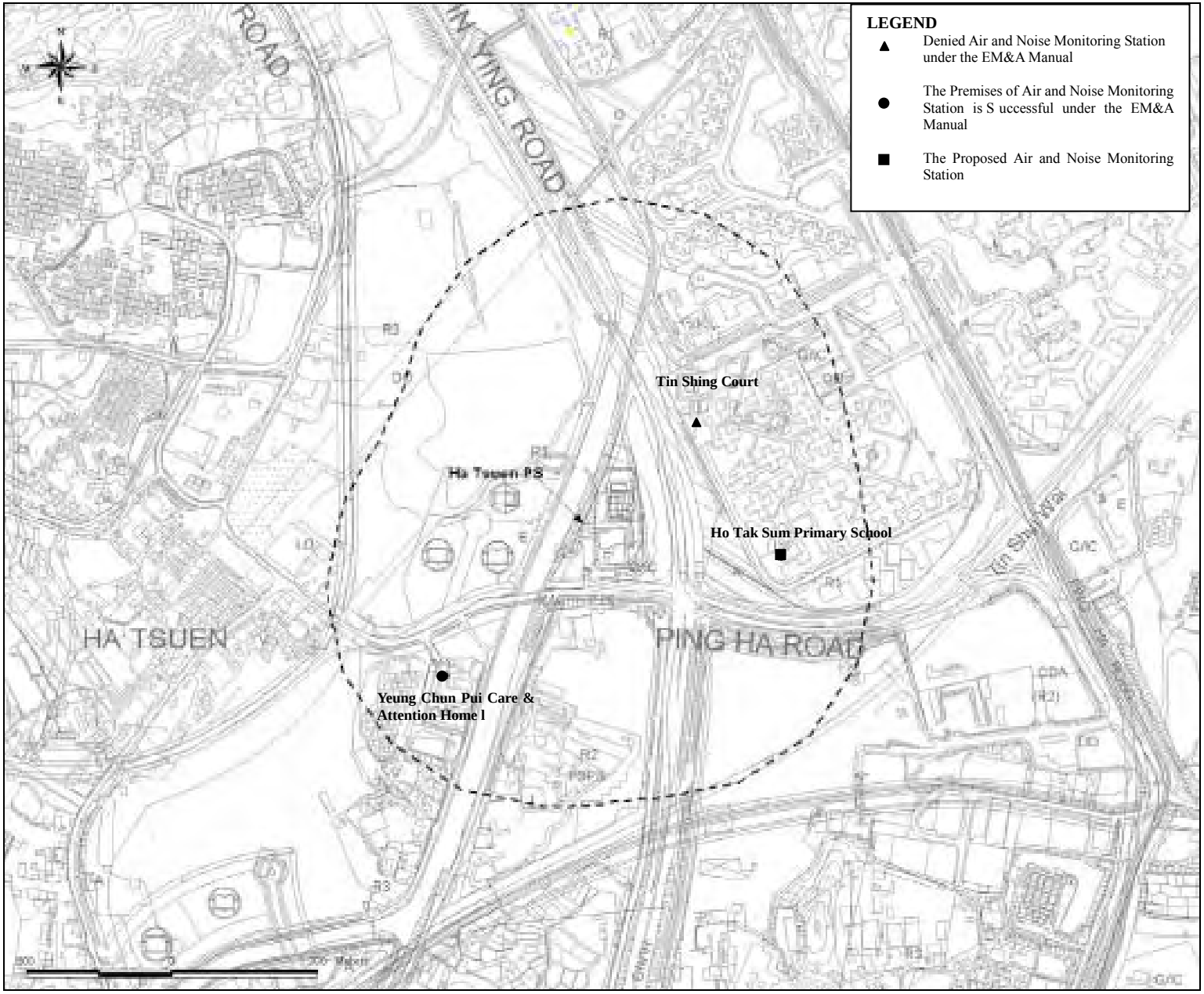
Works Programme Revision 08 - Sewerage at Ha Tsuen Pumping Station

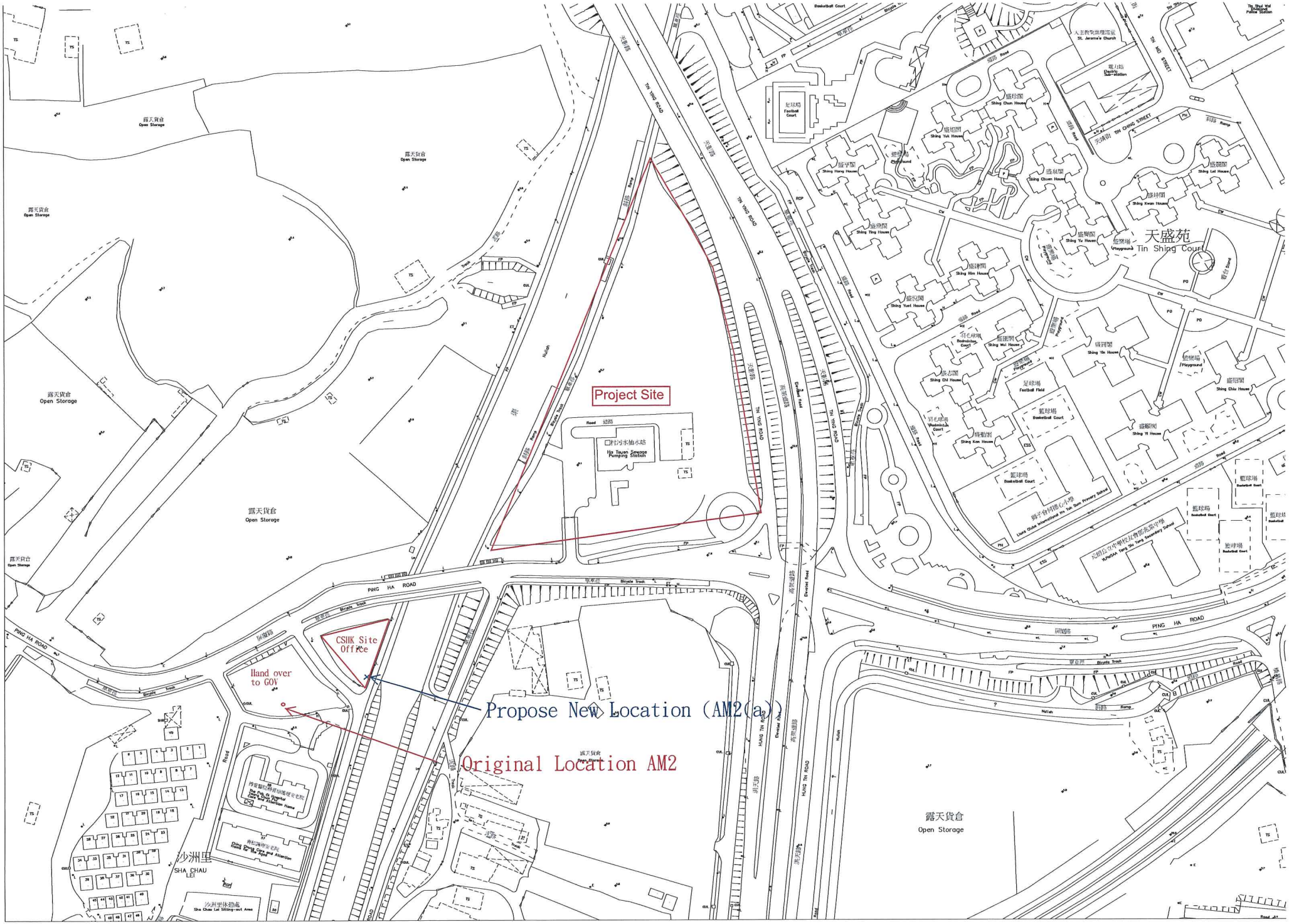
中國建築 CHINA STATE CONSTRUCTION

Appendix D

Monitoring Location of EM&A Programme

Proposed Air and Noise Monitoring Station

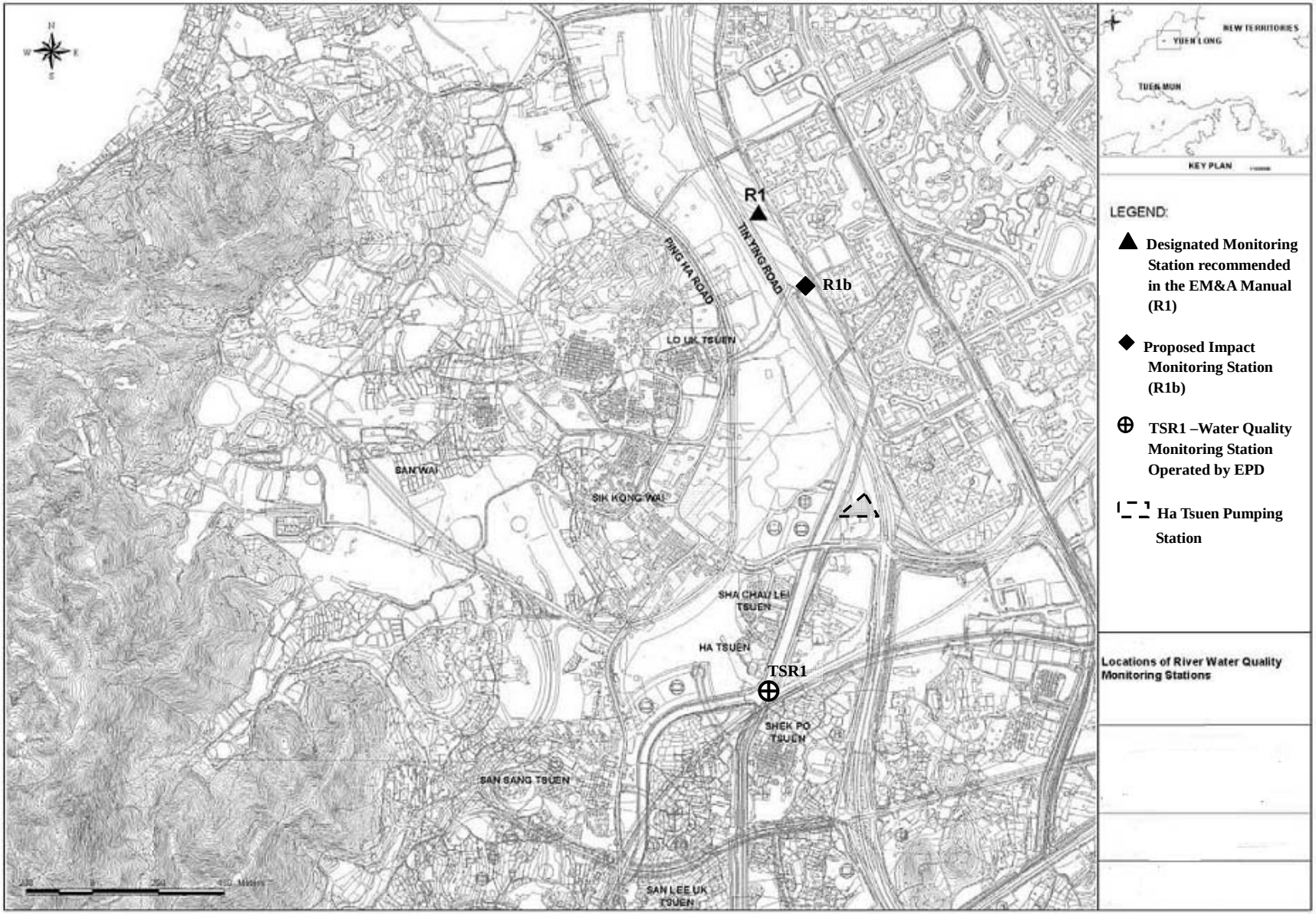



Project Site
CSHK Site Office
Hand over to GOV
Propose New Location (AM2(a))
Original Location AM2
天盛苑
Tin Shing Court
PING HA ROAD
TIN YING ROAD
HUNG TIN ROAD
露天貨倉
Open Storage
沙洲里
SHA CHAU LEI

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

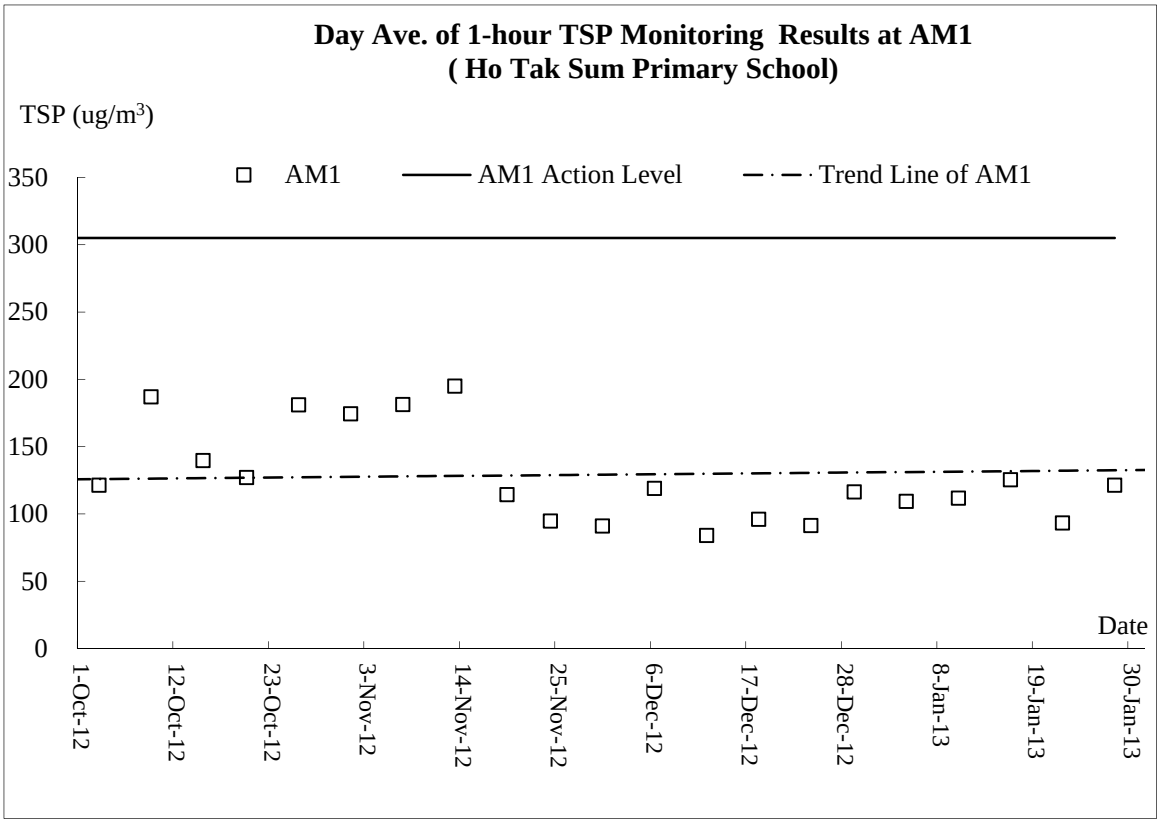


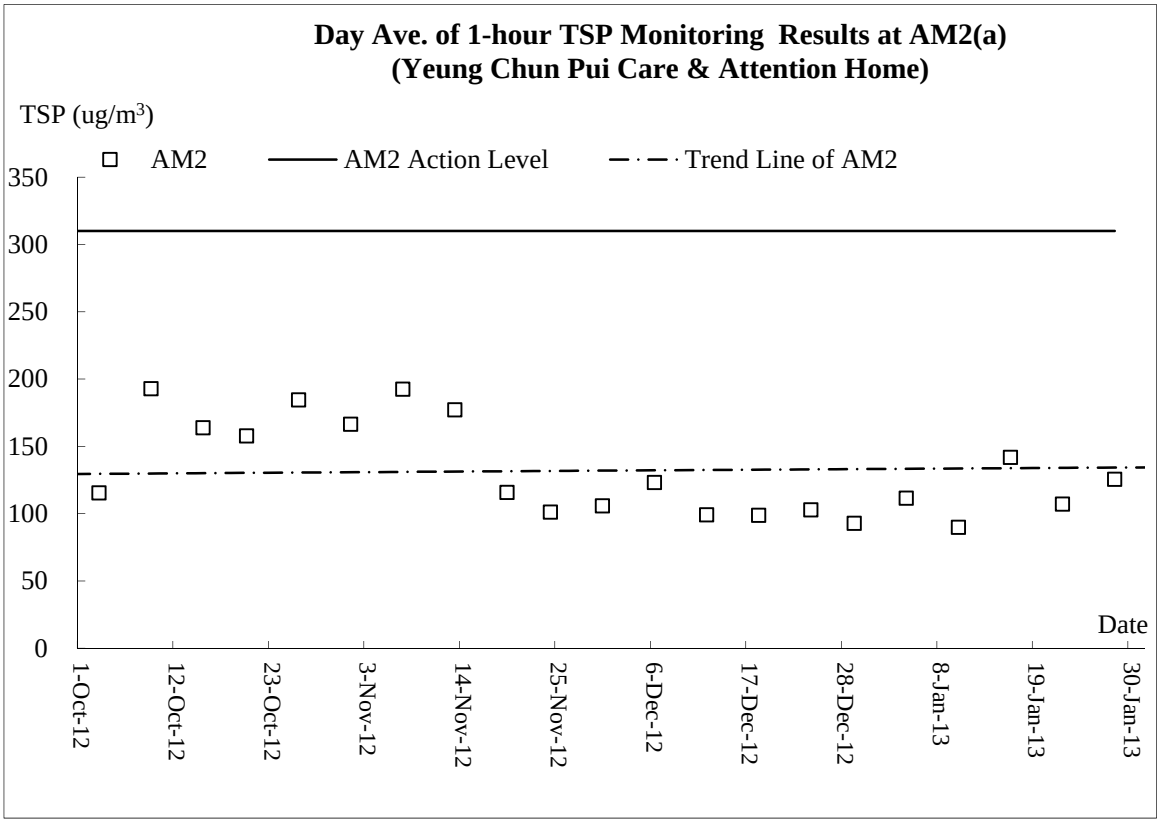
Appendix E

Graphic Plot of

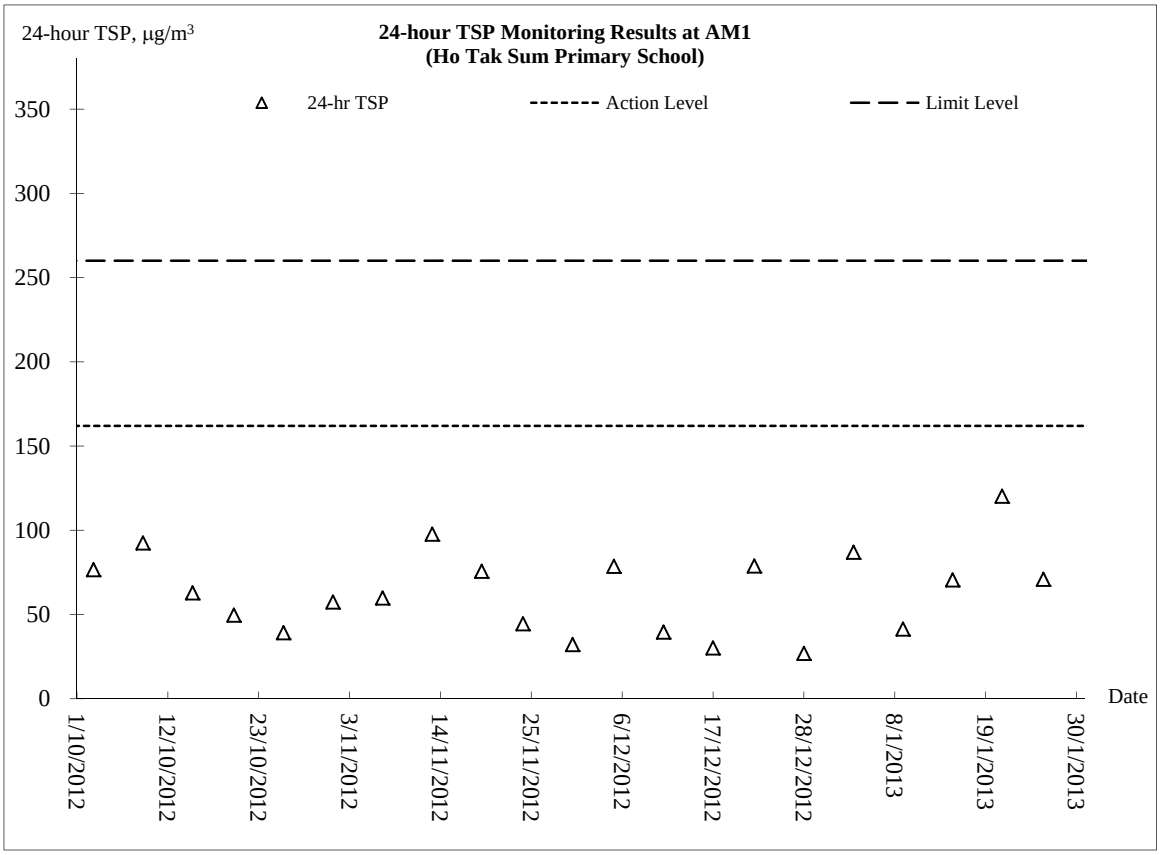
- **Air Quality**
- **Construction Noise**
- **Water Quality**

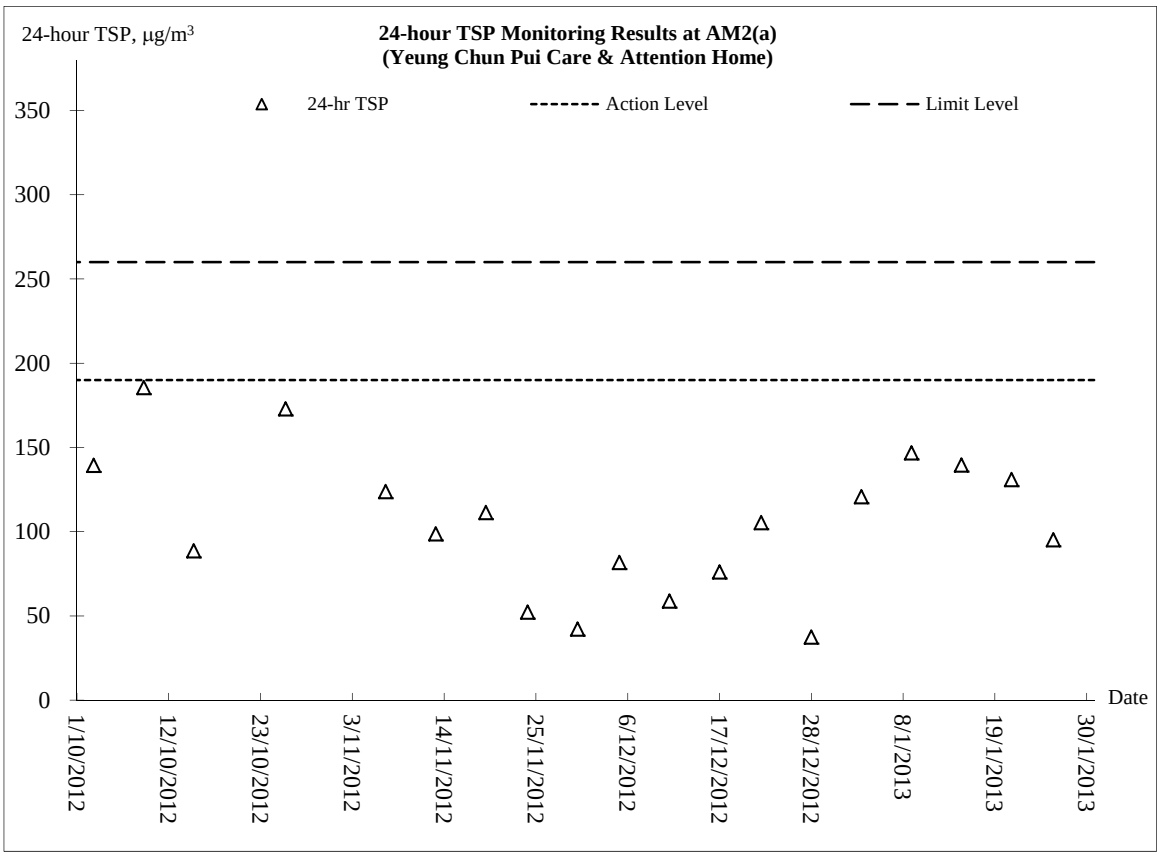
Air Quality – 1-hour TSP





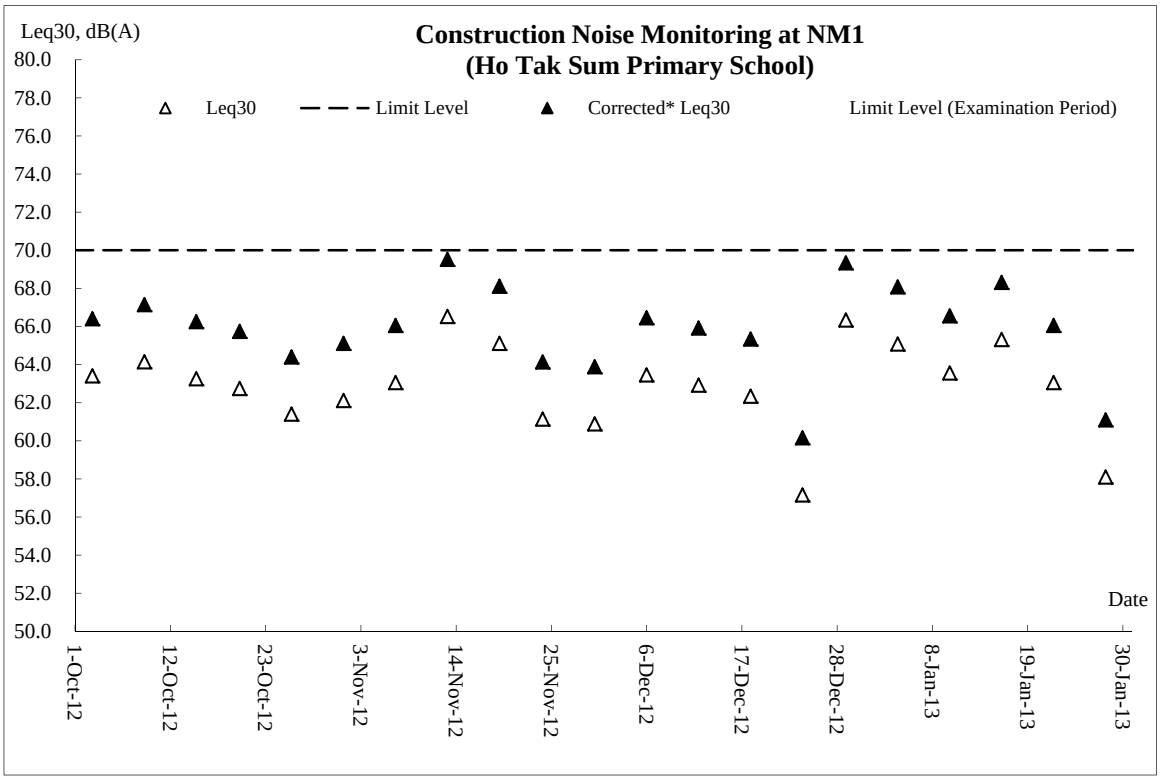
Air Quality – 24-hour TSP



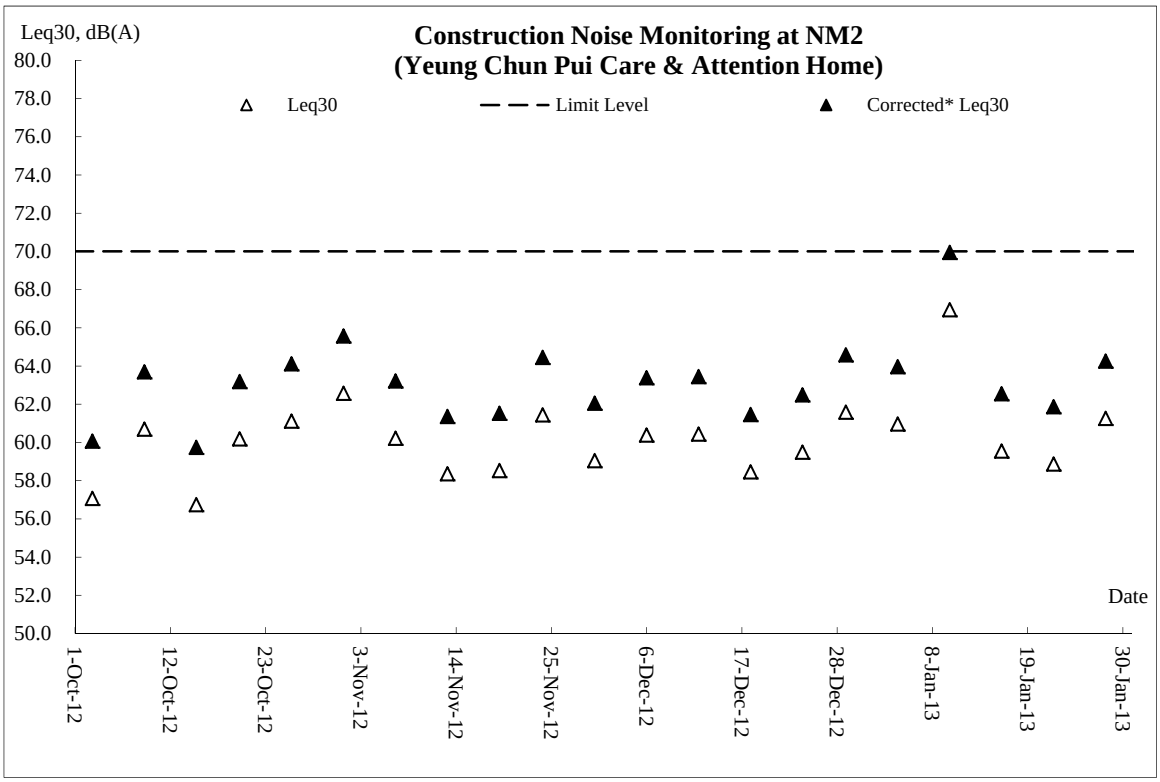


Remark: newly location AM2(a) replaced the original AM2 since 7 November 2012.

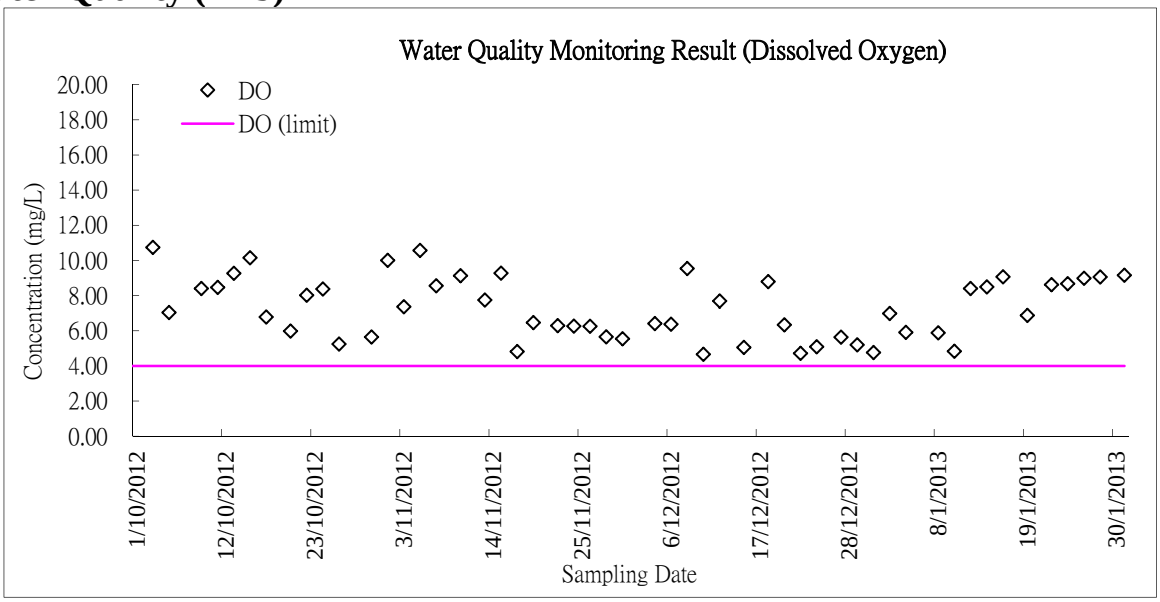
Construction Noise

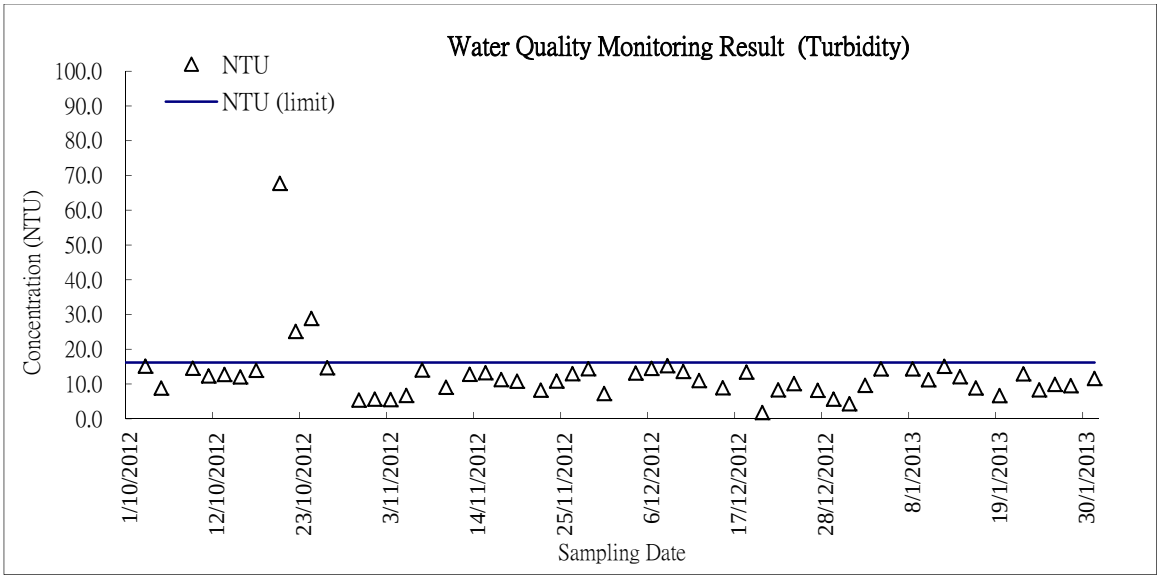


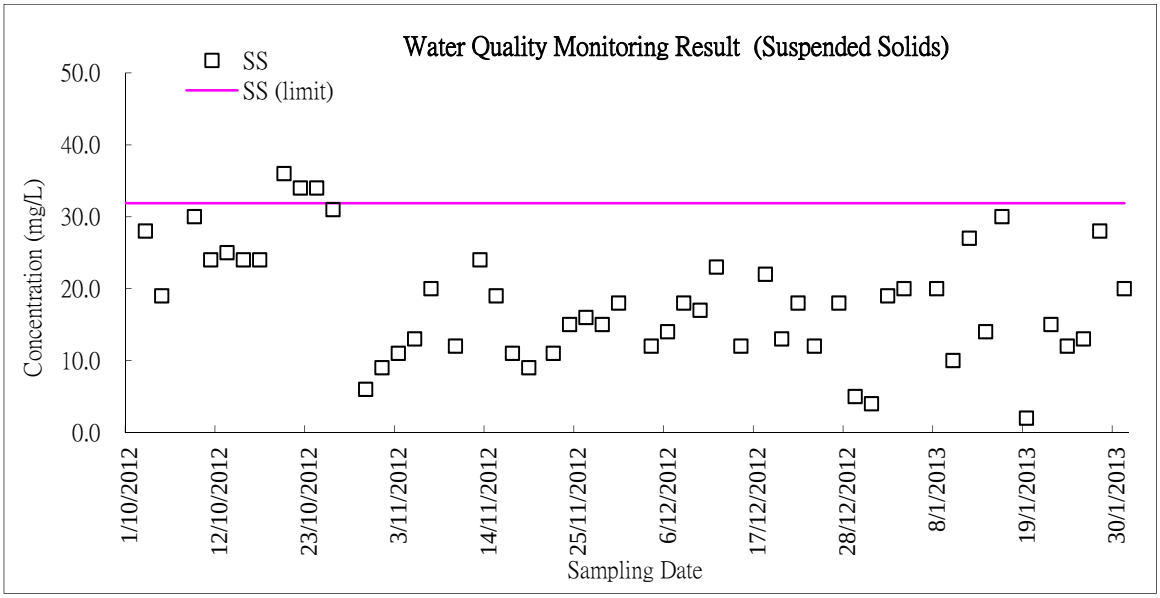
Remark: Limit Level was reduced to 65dB(A) during examination period between 15 and 18 January 2013.



Water Quality (R1b)







Appendix F

Meteorological information

Meteorological Data Extracted from HKO – November 2012

Date		Weather		Lau Fau Shan Weather Station			
			Total Rainfall (mm)	Mean Air Temperature (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Nov-12	Thu	Cloudy, sunny periods, dry, moderate northeasterly winds.	0.0	20.2	12.0	58	40
2-Nov-12	Fri	Sunny periods, cloudy, moderate to fresh easterly winds.	0.0	21.6	9.2	70	70
3-Nov-12	Sat	Cloudy, rain, sunny intervals, moderate easterly winds, fresh offshore at first.	0.0	23.8	13.0	73	70
4-Nov-12	Sun	Cloudy, sunny intervals, moderate north to northeasterly winds	0.0	23.5	14.0	64	30
5-Nov-12	Mon	Cloudy, sunny periods, dry, moderate northeasterly winds.	0.0	23.3	11.6	64	70
6-Nov-12	Tue	Fine, dry, cloudy, moderate east to northeasterly winds.	0.0	23.4	11.8	65	70
7-Nov-12	Wed	Sunny periods, cloudy, moderate to fresh easterly winds.	0.0	23.5	14.1	71	80
8-Nov-12	Thu	Cloudy, rain, sunny intervals, moderate easterly winds, fresh offshore at first.	0.0	24.8	13.0	76	70
9-Nov-12	Fri	Fine, dry, cloudy, moderate east to northeasterly winds.	0.0	26	10.8	77	60
10-Nov-12	Sat	Cloudy, sunny intervals, moderate north to northeasterly winds	0.0	26	7.2	81	130
11-Nov-12	Sun	Cloudy, sunny intervals, moderate north to northeasterly winds	4.0	20.6	19.5	73	40
12-Nov-12	Mon	Fine, cloudy, moderate east to northeasterly winds	0.0	20.7#	10.1#	70#	040#
13-Nov-12	Tue	Cloudy, sunny periods, dry, moderate northeasterly winds.	0.0	22	10.4	78	70
14-Nov-12	Wed	Cloudy, sunny periods, dry, moderate northeasterly winds.	0.0	22.8	10.5	78	70
15-Nov-12	Thu	Cloudy, sunny intervals, moderate north to northeasterly winds	0.0	23.2	18.1	77	80
16-Nov-12	Fri	Sunny periods, cloudy, moderate to fresh easterly winds.	1.5	23.5	18.3	79	80
17-Nov-12	Sat	Cloudy, sunny periods, dry, moderate northeasterly winds.	8.0	19.3	14.5	83	30
18-Nov-12	Sun	Cloudy, rain, moderate to fresh easterly winds	2.5	18	9.5	91	70
19-Nov-12	Mon	Cloudy, rain, moderate to fresh easterly winds	0.0	21.7	8.5	81	70
20-Nov-12	Tue	Cloudy, rain, moderate to fresh easterly winds	0.5	21.5	12.9#	84#	070#
21-Nov-12	Wed	Cloudy, rain, foggy, light to moderate southerly winds	2.0	22.5	12.7	94	70
22-Nov-12	Thu	Cloudy, rain, foggy, moderate to fresh northerly winds	0.0	24.6	10.3	91	140
23-Nov-12	Fri	Cloudy, rain, moderate east to northeasterly winds, occasionally fresh at first.	32.5	21.2	18.2	85	40
24-Nov-12	Sat	Cloudy, rain, moderate to fresh easterly winds	0.5	17.4	12.3	89	40
25-Nov-12	Sun	Cloudy, rain, foggy, moderate to fresh northerly winds	12.0	20.8	11.8	98	70
26-Nov-12	Mon	Cloudy, rain, foggy, moderate to fresh northerly winds	22.0	16.8	15.9	98	50
27-Nov-12	Tue	Cloudy, rain, moderate east to northeasterly winds, occasionally fresh at first.	10.5	13.5	10.3	99	40
28-Nov-12	Wed	Cloudy, overcast, mist, Moderate east to northeasterly winds.	0.5	17.3	8.0	97	330
29-Nov-12	Thu	Cloudy, overcast ,rain ,mist ,moderate northeasterly winds.	4.5	18.3	7.9	98	70
30-Nov-12	Fri	Cloudy, rain, cool, moderate north to northeasterly winds	4.5	19.7	10.1	99	70

 # missing (less than 24 hourly observations a day)
Rainfall measured in increment of 0.5 mm. Amount of < 0.5 mm cannot be detected

Meteorological Data Extracted from HKO – December 2012

Date		Weather		Lau Fau Shan Weather Station			
			Total Rainfall (mm)	Mean Air Temperature (°C)	Mean Relative Humidity (%)	Wind Direction	Wind Speed (km/h)
1-Dec-12	Sat	Cool, fine, moderate to fresh east to northeasterly winds	0.5	20.6	94	70	10.1
2-Dec-12	Sun	Cloudy, rain, moderate to fresh east to northeasterly winds	9.0	16	95	50	13.0
3-Dec-12	Mon	Cloudy ,rain , moderate north to northeasterly winds	15.5	15	91	40	12.1
4-Dec-12	Tue	Cloudy, rain, moderate to fresh east to northeasterly winds	4.0	14.6	91	50	10.6
5-Dec-12	Wed	Cloudy, rain, moderate to fresh northerly winds	7.5	14.7	89	40	15.4
6-Dec-12	Thu	Cool, fine, moderate to fresh east to northeasterly winds	0.0	15.4	74	60	12.0
7-Dec-12	Fri	Sunny intervals, cloudy, moderate northeasterly winds.	0.0	17.7	78	70	8.3
8-Dec-12	Sat	Sunny periods, cloudy, fresh easterly winds	0.0	18.7	79	70	10.7
9-Dec-12	Sun	Cloudy, rain, sunny intervals, moderate northeasterly winds	0.0	18.2	78	80	10.3
10-Dec-12	Mon	Sunny periods, cloudy, fresh easterly winds	0.0	17.8	77	70	14.4
11-Dec-12	Tue	Cloudy, rain, sunny intervals, moderate northeasterly winds	0.0	17.3	77	60	12.5
12-Dec-12	Wed	Cloudy, sunny periods, moderate to fresh easterly winds	0.0	16.5	77	70	14.4
13-Dec-12	Thu	Cloudy, sunny periods, moderate to fresh easterly winds	0.0	18.6	77	70	14.6
14-Dec-12	Fri	Cloudy, rain, sunny intervals, moderate northeasterly winds	0.0	20.2	87	70	9.6
15-Dec-12	Sat	Cloudy, rain, sunny intervals, moderate northeasterly winds	0.0	21.4	92	70	7.5
16-Dec-12	Sun	Cloudy, rain, sunny intervals, moderate northeasterly winds	0.0	22.2	92	80	8.2
17-Dec-12	Mon	Sunny intervals, cloudy, moderate northeasterly winds.	0.0	21.5	88	80	12.7
18-Dec-12	Tue	Cloudy, rain, fresh northerly winds	2.5	15.4	86	40	18.0
19-Dec-12	Wed	Sunny periods, cloudy, fresh easterly winds	0.0	13.1	80	50	17.3
20-Dec-12	Thu	Cloudy, rain, moderate to fresh east to northeasterly winds	0.0	18.4	84	80	16.6
21-Dec-12	Fri	Cloudy, sunny periods, moderate to fresh easterly winds	0.0	21.1	89	70	10.1
22-Dec-12	Sat	Cloudy, rain, fresh northerly winds	0.0	16.2	79	350	22.0
23-Dec-12	Sun	Fine, dry, cloudy, moderate northeasterly winds, fresh offshore.	0.0	11.5	61	360	28.4
24-Dec-12	Mon	Fine, dry, cloudy, moderate northeasterly winds, fresh offshore.	0.0	11.1	70	40	13.0
25-Dec-12	Tue	Cloudy, rain, fresh northerly winds	0.0	15.2	74	70	9.1
26-Dec-12	Wed	Fine, dry, cloudy, moderate northeasterly winds, fresh offshore.	0.0	17.6	79	70	11.5
27-Dec-12	Thu	Fine, dry, cloudy, moderate northeasterly winds, fresh offshore.	0.0	16.9	84	50	12.9
28-Dec-12	Fri	Sunny periods, cloudy, fresh easterly winds	0.0	18.6	78	70	8.5
29-Dec-12	Sat	Sunny periods, cloudy, fresh easterly winds	15.0	17.5	85	70	20.6
30-Dec-12	Sun	Fine, dry, cloudy, moderate northeasterly winds, fresh offshore.	0.0	9.4	55	360	34.3
31-Dec-12	Mon	Fine, dry, cloudy, moderate northeasterly winds, fresh offshore.	0.0	8.6	47	20	13.6

Rainfall measured in increment of 0.5 mm. Amount of < 0.5 mm cannot be detected

Meteorological Data Extracted from HKO – January 2013

Date		Weather		Lau Fau Shan Weather Station			
			Total Rainfall (mm)	Mean Air Temperature (°C)	Mean Relative Humidity (%)	Wind Direction	Wind Speed (km/h)
1-Jan-13	Tue	Sunny periods, cloudy, moderate to fresh north to northeasterly winds	0.0	12	56	70	9.3
2-Jan-13	Wed	Sunny periods, cloudy, moderate east to northeasterly winds.	0.0	15.4	66	70	7.4
3-Jan-13	Thu	Sunny periods, cloudy, moderate to fresh north to northeasterly winds	0.0	15.5	70	50	14.5
4-Jan-13	Fri	Sunny periods, cloudy, moderate east to northeasterly winds.	0.0	10.3	75	50	13.0
5-Jan-13	Sat	Sunny intervals, dry, haze, moderate north to northeasterly winds	0.0	11.7	73	320	12.0
6-Jan-13	Sun	Sunny periods, cloudy, moderate to fresh north to northeasterly winds	0.0	12.6	75	330	14.2
7-Jan-13	Mon	Sunny intervals, dry, haze, moderate north to northeasterly winds	0.0	13.7	74	290	11.1
8-Jan-13	Tue	Sunny intervals, dry, haze, moderate north to northeasterly winds	0.0	15.9	70	330	8.7
9-Jan-13	Wed	Sunny periods, cloudy, moderate east to northeasterly winds.	0.0	14.8	65	350	15.8
10-Jan-13	Thu	Sunny periods, cloudy, moderate east to northeasterly winds.	0.0	13	64	40	12.8
11-Jan-13	Fri	Dry, sunny periods, cloudy, moderate to fresh easterly winds.	0.0	15.5	69	330	12.0
12-Jan-13	Sat	Sunny periods, cloudy, moderate east to northeasterly winds.	0.0	15.3	71	330	10.5
13-Jan-13	Sun	Sunny intervals, dry, haze, moderate north to northeasterly winds	0.0	15.7	73	300	14.8
14-Jan-13	Mon	Sunny periods, cloudy, moderate east to northeasterly winds.	0.0	13.6	71	50	12.4
15-Jan-13	Tue	Dry, sunny periods, cloudy, moderate to fresh easterly winds.	0.0	14.6	80	70	11.0
16-Jan-13	Wed	Sunny periods, cloudy, moderate east to northeasterly winds.	0.0	16	78	120	7.3
17-Jan-13	Thu	Cloudy, haze, moderate to fresh easterly winds.	0.0	16.2	67	50	14.5
18-Jan-13	Fri	Cloudy, haze, moderate to fresh easterly winds.	0.0	13.9	68	80	12.1
19-Jan-13	Sat	Sunny periods, cloudy, moderate east to northeasterly winds.	0.0	13.8	75	70	10.5
20-Jan-13	Sun	Dry, sunny periods, cloudy, moderate to fresh easterly winds.	0.0	17.4	81	80	10.6
21-Jan-13	Mon	Dry, sunny periods, cloudy, moderate to fresh easterly winds.	0.0	19.9	83	70	9.2
22-Jan-13	Tue	Cloudy, haze, moderate to fresh easterly winds.	0.0	20.3	84	80	8.3
23-Jan-13	Wed	Sunny periods, cloudy, moderate east to northeasterly winds.	0.0	18.3	87	70	11.4
24-Jan-13	Thu	Mainly fine, dry, moderate east to northeasterly winds.	0.0	18.4	83	70	7.6
25-Jan-13	Fri	Dry, sunny periods, cloudy, moderate to fresh easterly winds.	0.0	17.6	73	70	13.6
26-Jan-13	Sat	Sunny periods, cloudy, moderate east to northeasterly winds.	5.0	17.3	85	70	11.3
27-Jan-13	Sun	Sunny periods, cloudy, moderate east to northeasterly winds.	0.5	15.5	86	60	8.8
28-Jan-13	Mon	Sunny periods, cloudy, moderate east to northeasterly winds.	0.0	15.9	71	70	11.4
29-Jan-13	Tue	Mainly fine, dry, moderate east to northeasterly winds.	0.0	17.1	74	70	10.3
30-Jan-13	Wed	Fine, light to moderate easterly winds.	0.0	18	71	80	12.2
31-Jan-13	Thu	Cloudy, sunny periods, moderate to fresh easterly winds	0.0	19.2	69	70	10.5

Rainfall measured in increment of 0.5 mm. Amount of < 0.5 mm cannot be detected