

**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**

**13<sup>th</sup> QUARTERLY ENVIRONMENTAL MONITORING &  
AUDIT SUMMARY REPORT –  
(February to April 2013)**

**PREPARED FOR**

**CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG)  
COMPANY LIMITED**

**Quality Index**

Date	Reference No.	Prepared By	Certified By
16 July 2013	TCS00491/09/600/R0469v2	 Nicola Hon (Environmental Consultant)	 T.W. Tam (Environmental Team Leader)

Version	Date	Description
1	28 May 2013	First submission
2	16 July 2013	Amended against IEC's comments on 9 July 2013

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17 July 2013

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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 (February to April 2013) – IEC Verification**

With reference to ET's captioned report (ET's ref.: TCS00491/09/600/R0469v2, dated 16 July 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  
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FCT/my

## EXECUTIVE SUMMARY

ES.01. This is the 13<sup>th</sup> 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 February to 30 April 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	90
	24-hour TSP	32
Construction Noise	L <sub>eq(30min)</sub> Daytime	30
Water Quality	Dissolved Oxygen	34
	Turbidity	34
	Suspended Solids (SS)	34
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, noise and water quality monitoring. 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 <sub>eq(30min)</sub> Daytime	0	0	0	--	--
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 wet season, muddy water or other water pollutants from site surface runoff into the local stream will be key environment issue. Therefore, water mitigation measures to prevent surface runoff into nearby water bodies should be paid on special attention. Moreover, mitigation measures should be properly maintained to avoid fugitive dust emissions from loose soil surface or haul road.

## **TABLE OF CONTENTS**

<b>1</b>	<b>INTRODUCTION</b>	<b>1</b>
	BACKGROUND	1
	REPORT STRUCTURE	1
<b>2</b>	<b>PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS</b>	<b>2</b>
	PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE	2
	WORKS UNDERTAKEN DURING THE REPORTING PERIOD	2
	SUMMARY OF ENVIRONMENTAL SUBMISSIONS	2
<b>3</b>	<b>SUMMARY OF IMPACT MONITORING REQUIREMENTS</b>	<b>3</b>
	MONITORING PARAMETERS	3
	MONITORING LOCATIONS	3
	MONITORING FREQUENCY	4
	ENVIRONMENTAL QUALITY CRITERIA	5
	ENVIRONMENTAL MITIGATION MEASURES	5
<b>4</b>	<b>MONITORING RESULTS AND BREACHES OF ENVIRONMENTAL QUALITY CRITERIA</b>	<b>6</b>
	AIR QUALITY MONITORING	6
	CONSTRUCTION NOISE MONITORING	6
	WATER QUALITY MONITORING – LOCAL STREAM COURSE	7
	RESULTS OF LANDSCAPE AND VISUAL IMPACT	7
	RESULTS OF EFFLUENT MONITORING	8
<b>5</b>	<b>WASTE MANAGEMENT</b>	<b>9</b>
	RECORDS OF WASTE QUANTITIES	9
<b>6</b>	<b>SITE INSPECTIONS</b>	<b>10</b>
<b>7</b>	<b>NON-COMPLIANCE, COMPLAINTS, NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS</b>	<b>12</b>
	NON-COMPLIANCE	12
	ENVIRONMENTAL COMPLAINT	12
	NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS	12
<b>8</b>	<b>IMPLEMENTATION STATUS OF MITIGATION MEASURES</b>	<b>13</b>
<b>9</b>	<b>CONCLUSIONS AND RECOMMENDATIONS</b>	<b>15</b>
	CONCLUSIONS	15
	RECOMMENDATIONS	15

## **LIST OF TABLES**

TABLE 2-1	STATUS OF ENVIRONMENTAL LICENSES AND PERMITS
TABLE 3-1	SUMMARY OF MONITORING PARAMETERS
TABLE 3-2	AIR QUALITY MONITORING STATIONS
TABLE 3-3	CONSTRUCTION NOISE MONITORING STATIONS
TABLE 3-4	LOCAL STREAM WATER QUALITY MONITORING STATION
TABLE 3-5	ACTION AND LIMIT LEVELS FOR AIR QUALITY MONITORING
TABLE 3-6	ACTION AND LIMIT LEVELS FOR CONSTRUCTION NOISE
TABLE 3-7	ACTION AND LIMIT LEVELS FOR A LOCAL STREAM WATER QUALITY MONITORING (R1b)
TABLE 4-1	SUMMARY OF AIR QUALITY MONITORING RESULTS, ( $\mu\text{g}/\text{m}^3$ )
TABLE 4-2	SUMMARIES OF BREACHES OF AIR QUALITY A/L LEVELS
TABLE 4-3	SUMMARY OF CONSTRUCTION NOISE MONITORING RESULTS ( $L_{\text{eq}(30\text{min})}$ , dB(A))
TABLE 4-4	SUMMARIES OF BREACHES OF CONSTRUCTION NOISE A/L LEVELS
TABLE 4-5	STATISTICS OF THE MONITORING RESULTS
TABLE 4-6	SUMMARIES OF BREACHES OF THE EXISTING WATER QUALITY A/L LEVELS
TABLE 5-1	SUMMARY OF QUANTITIES OF INERT C&D MATERIALS
TABLE 5-2	SUMMARY OF QUANTITIES OF C&D WASTES
TABLE 6-1	SITE REMINDERS/OBSERVATIONS FOUND IN THE REPORTING PERIOD
TABLE 7-1	STATISTICAL SUMMARY OF ENVIRONMENTAL COMPLAINTS
TABLE 7-2	STATISTICAL SUMMARY OF ENVIRONMENTAL SUMMONS
TABLE 7-3	STATISTICAL SUMMARY OF ENVIRONMENTAL PROSECUTION
TABLE 8-1	ENVIRONMENTAL MITIGATION MEASURES IMPLEMENTATION IN THE REPORTING PERIOD

## **LIST OF ANNEXES**

APPENDIX A	SITE LAYOUT PLAN
APPENDIX B	ENVIRONMENTAL MANAGEMENT ORGANIZATION CHART
APPENDIX C	MASTER CONSTRUCTION PROGRAM
APPENDIX D	MONITORING LOCATION OF EM&A PROGRAMME
APPENDIX E	GRAPHIC PLOT OF AIR QUALITY, CONSTRUCTION NOISE AND WATER QUALITY
APPENDIX F	METEOROLOGICAL INFORMATION

## 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 13<sup>th</sup> 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 February to 30 April 2013**.

### REPORT STRUCTURE

- 1.06 This Report is structured as follows:
- |                  |  |
|------------------|--|
| <b>Section 1</b> | Introduction   |
| <b>Section 2</b> | Project Organization and Construction Progress                                   |
| <b>Section 3</b> | Summary of Impact Monitoring Requirements  |
| <b>Section 4</b> | Monitoring Results and Breaches of Environmental Quality Criteria                |
| <b>Section 5</b> | Waste Management   |
| <b>Section 6</b> | Site Inspections   |
| <b>Section 7</b> | Non-compliance, Complaints, Notifications of Summons and Successful Prosecutions |
| <b>Section 8</b> | Implementation Status of Mitigation Measures                                     |
| <b>Section 9</b> | 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:
- Construction of sewage pumping station: Finishing, façade, water proofing, R/F handrailing and internal sewerage works.

### 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	<ul style="list-style-type: none"> <li>1-hour Total Suspended Particulates (hereinafter '1-hr TSP'); and</li> <li>24-hour Total Suspended Particulates (hereinafter '24-hr TSP').</li> </ul>
Construction Noise	<ul style="list-style-type: none"> <li>A-weighted equivalent continuous sound pressure level (30min) (hereinafter '<math>L_{eq(30min)}</math>') during the normal working hours; and</li> <li>A-weighted equivalent continuous sound pressure level (5min) (hereinafter '<math>L_{eq(5min)}</math>') for construction work during the restricted hours.</li> </ul>
Water Quality – Local Stream Course	<ul style="list-style-type: none"> <li>In Situ Measurement - Dissolved Oxygen (DO) and Turbidity</li> <li>Laboratory Analysis - Suspended Solids (SS)</li> </ul>
Water Quality – Effluent Discharge	<ul style="list-style-type: none"> <li>In Situ Measurement - pH value</li> <li>Laboratory Analysis - SS and Chemical oxygen demand (COD)</li> </ul>
Landscape and Visual Resources	<ul style="list-style-type: none"> <li>Vegetation survey undertaken on an "area" basis to identify representative types and species composition;</li> <li>Assessment of landscape character; and</li> <li>Tree survey report</li> </ul>

#### 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 the original location Yeung Chun	Replace the Designated Monitoring Station Yeung Chun Pui Care & Attention



Monitoring Location ID	Identified Address	Remarks
	Pui Care & Attention Home	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 ( $\mu\text{g}/\text{m}^3$ )		Limit Level ( $\mu\text{g}/\text{m}^3$ )	
	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°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, ( $\mu\text{g}/\text{m}^3$ )**

Date	24-hour TSP		Date	1-hour TSP					
	AM1	AM2(a)		AM1			AM2(a)		
				1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour
1-Feb-13	69	90	2-Feb-13	127	144	119	133	117	130
7-Feb-13	75	74	8-Feb-13	124	152	168	142	128	150
14-Feb-13	65	68	15-Feb-13	141	102	113	96	123	115
20-Feb-13	73	94	20-Feb-13	81	96	88	95	81	100
26-Feb-13	155	70	26-Feb-13	139	87	90	123	96	111
4-Mar-13	105	134	4-Mar-13	152	118	97	186	143	214
9-Mar-13	102	96	9-Mar-13	186	142	153	121	108	142
15-Mar-13	67	35	15-Mar-13	111	109	85	130	160	146
21-Mar-13	31	65	21-Mar-13	89	102	111	103	104	94
27-Mar-13	41	37	27-Mar-13	55	61	91	57	56	80
2-Apr-13	21	27	3-Apr-13	118	115	93	119	160	194
8-Apr-13	25	30	9-Apr-13	51	100	90	49	89	84
13-Apr-13	107	90	15-Apr-13	127	112	120	110	89	101
19-Apr-13	15	51	20-Apr-13	181	154	132	120	118	158
25-Apr-13	30	59	26-Apr-13	130	113	107	80	69	61
30-Apr-13	27	46							
Average (Range)	63 (15 – 155)	67 (27– 134)	Average (Range)	115 (51 – 186)			115 (49 – 214)		

**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
2-Feb-13	66.0	63.1
8-Feb-13	64.2	62.9
15-Feb-13	63.6	63.9
20-Feb-13	59.5	55.2
26-Feb-13	68.0	62.4
4-Mar-13	64.0	61.9
9-Mar-13	65.9	67.9
15-Mar-13	69.4	65.5
21-Mar-13	67.3	64.8
27-Mar-13	66.6	65.9

Date	(*) NM1	(*) NM2
3-Apr-13	61.5	59.5
9-Apr-13	63.1	64.0
15-Apr-13	64.0	61.8
20-Apr-13	66.1	66.6
26-Apr-13	66.3	65.6

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

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

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

- 4.04 In this Reporting Period, neither Limit Level exceedance nor noise complaint (which is an Action Level exceedance) was received.

#### WATER QUALITY MONITORING – LOCAL STREAM COURSE

- 4.05 In this Reporting Period, a total of **34** 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	4.6	5.2	6.0
Average	6.6	10.9	16.1
Max	9.2	14.3	30.0

- 4.06 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
February 2013	10	Action Level	0	0	0
		Limit Level	0	0	0
		Sub-Total	0	0	0
March 2013	12	Action Level	0	0	0
		Limit Level	0	0	0
		Sub-Total	0	0	0
April 2013	12	Action Level	0	0	0
		Limit Level	0	0	0
		Sub-Total	0	0	0
Total	34	Action Level	0	0	0
		Limit Level	0	0	0
Percentage of compliance			100%	100%	100%
Total % of compliance for water quality			100%		

- 4.07 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

- 4.08 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.

- 4.09 In this Reporting Period, 6 events of site inspection were undertaken in February 2013, March 2013 and April 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.
- 4.10 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 variegata* 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.
- 4.11 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**

- 4.12 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.
- 4.13 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
	Feb 13	Mar 13	Apr 13	
C&D Materials (Inert) (m <sup>3</sup> )	0	0	0	-
Reused in this Contract (Inert) (m <sup>3</sup> )	0	0	0	-
Reused in other Projects (Inert) (m <sup>3</sup> )	0	0	0	-
Disposal as Public Fill (Inert) (m <sup>3</sup> )	82	1,925	1,025	Tuen Mun Area 38

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

Type of Waste	Quantity			Disposal Location
	Feb 13	Mar 13	Apr 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 <sup>3</sup> )	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 **7** 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
5 February 2013	- Uncovered sand stockpile was observed in Ha Tsuen Sewage Pumping Station, the Contractor should cover the stockpile with tarpaulin sheet to prevent fugitive dust.	Sand stockpile has been removed on 14 February 2013.
14 February 2013	No environmental issue was observed during site inspection.	N.A.
20 February 2013	- Construction wastes was found underneath the retained tree in Ha Tsuen Sewage Pumping Station, the Contractor should remove the wastes promptly and provide proper fencing for the retained tree.	Tree protection has been provided for the retained trees in Ha Tsuen Sewage Pumping Station on 26 February 2013.
26 February 2013	- Debris and mud tails were observed in Ha Tsuen Sewage Pumping Station, the Contractor should remove debris and clean the haul road regularly.	Debris and mud tails were removed on 5 March 2013.
5 March 2013	- Dusty stockpile was observed in Ha Tsuen Sewage Pumping Station, the Contractor should cover it with impervious sheet or remove it off site properly.	The sand stockpile in Ha Tsuen Sewage Pumping Station has been removed on 12 March 2013.
12 March 2013	No environmental issue was observed during site inspection.	N.A.
19 March 2013	No environmental issue was observed during site inspection.	N.A.
28 March 2013	- Dusty stockpile was observed in Ha Tsuen Sewage Pumping Station, the Contractor should cover it with impervious sheet or remove it off site properly.	Dusty stockpile was removed from site on 2 April 2013.
2 April 2013	- Some construction tools were stored in the chemical waste storage area due to rainstorm, the Contractor should ensure the chemical waste storage area is used for storage of chemical waste only.	The construction tools have been removed from the chemical waste storage area on 9 April 2013.
9 April 2013	No environmental issue was observed during site inspection.	N.A.
17 April 2013	No environmental issue was observed during site inspection.	N.A.
23 April 2013	- Sand stockpile was observed at the	The sand and silt along the



	entrance/ exit of Ha Tsuen Sewage Pumping Station, the Contractor should cover it properly or removed off site a.s.a.p.	public road outside Shui Tsiu San Tsuen Sewage Station have been removed on 30 April 2013.
30 April 2013	No environmental issue was observed during site inspection.	N.A.

- 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 - January 2013	3	3	Air (2)/ Noise (1)
February 2013	0	3	NA
March 2013	0	3	NA
April 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 - January 2013	0	0	NA
February 2013	0	0	NA
March 2013	0	0	NA
April 2013	0	0	NA

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

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
February 2010 - January 2013	0	0	NA
February 2013	0	0	NA
March 2013	0	0	NA
April 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	<ul style="list-style-type: none"> <li>Wastewater were appropriately treated by treatment facilities;</li> <li>Drainage channels were provided to convey run-off into the treatment facilities;</li> <li>Drainage systems were regularly and adequately maintained.</li> <li>De-silting facility was provided to treat the discharged water; also the treated water was reused for spraying the road surface;</li> <li>Exposed stockpiles and exposed soil surfaces were covered with tarpaulin or impervious sheets to minimise dust emission;</li> <li>The stockpiles of materials were placed in the locations away from the drainage channel so as to avoid releasing materials into the channel;</li> <li>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;</li> <li>A discharge licence was issued by EPD for discharging effluent from the construction site;</li> <li>A licensed waste collector have been applied from EPD; and</li> <li>Illegal disposal of chemicals should be strictly prohibited.</li> </ul>
Air Quality	<ul style="list-style-type: none"> <li>Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather;</li> <li>Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers;</li> <li>Cover all excavated or stockpile of dusty material by impervious sheeting or sprayed with water to maintain the entire surface wet;</li> <li>Public roads around the site entrance/exit had been kept clean and free from dust;</li> <li>Tarpaulin covering of any dusty materials on a vehicle leaving the site;</li> <li>Water sprinkler system was provided at haul road to reduce dust emissions during the vehicles passing through the haul road;</li> <li>The vehicle speed within the site is limited to 5km/hr; and</li> <li>Wheel washing facilities have been provided at the site exit.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Good site practices to limit noise emissions at the sources;</li> <li>Use of quiet plant and working methods according to EP-327/2009/A;</li> <li>Use of site hoarding with noise barriers to screen noise at ground level of NSRs;</li> <li>Use of shrouds/temporary noise barriers to screen noise from relatively static PMEs according to EP-327/2009/A;</li> <li>Use of temporary noise barrier with surface density 7kg/m<sup>2</sup> 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;</li> <li>Idle equipment are turned off or throttled down;</li> <li>No construction works shall be undertaken during school examination period in the Ha Tsuen Sewage Pumping Station according to EP-327/2009/A; and</li> <li>Alternative use of quiet plant within one worksite, where practicable.</li> </ul>

Issues	Environmental Mitigation Measures
Waste and Chemical Management	<ul style="list-style-type: none"> <li>Excavated material was reused on site as far as possible to minimize off-site disposal. Scrap metals or abandoned equipment was recycled if possible;</li> <li>Waste arising was kept to a minimum and be handled, transported and disposed of in a suitable manner;</li> <li>The Contractor adopted a trip ticket system for the disposal of C&amp;D materials to any designated public filling facility and/ or landfill;</li> <li>Chemical waste was handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes;</li> <li>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;</li> <li>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;</li> <li>Any unused chemicals or those with remaining functional capacity were recycled;</li> <li>Prior to disposal of C&amp;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;</li> <li>Proper storage and site practices to minimise the potential for damage or contamination of construction materials; and</li> <li>Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.</li> </ul>
Landscape and Visual	<ul style="list-style-type: none"> <li>Hoarding was erected around site boundary properly;</li> <li>The transplanted tree and landscaping plants were kept in regular inspection;</li> <li>All preserved trees were protected and fenced off properly;</li> <li>No construction activities were carried out in the protection zone of the preserved trees.</li> </ul>
General	<ul style="list-style-type: none"> <li>The site was generally kept tidy and clean.</li> </ul>

## **9 CONCLUSIONS AND RECOMMENTATIONS**

### **CONCLUSIONS**

- 9.01 This is the **13<sup>th</sup>** 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 February to 30 April 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 and no construction noise measurement results exceeded the Limit Level were recorded in this Reporting Period.
- 9.04 No effluent quality monitoring was carried out by the Contractor in this Reporting Period.
- 9.05 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
- 9.06 A total of **13** occasions of joint site inspections were undertaken to evaluate the site environmental performance. No non-compliance was noted but **7** observations were recorded during the site inspections within the Reporting Period.
- 9.07 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.
- 9.08 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**

- 9.09 During wet season, muddy water or other water pollutants from site surface runoff into the local stream will be key environment issue. Therefore, water mitigation measures to prevent surface runoff into nearby water bodies should be paid on special attention. Moreover, mitigation measures should be properly maintained to avoid fugitive dust emissions from loose soil surface or haul road.
- 9.10 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**

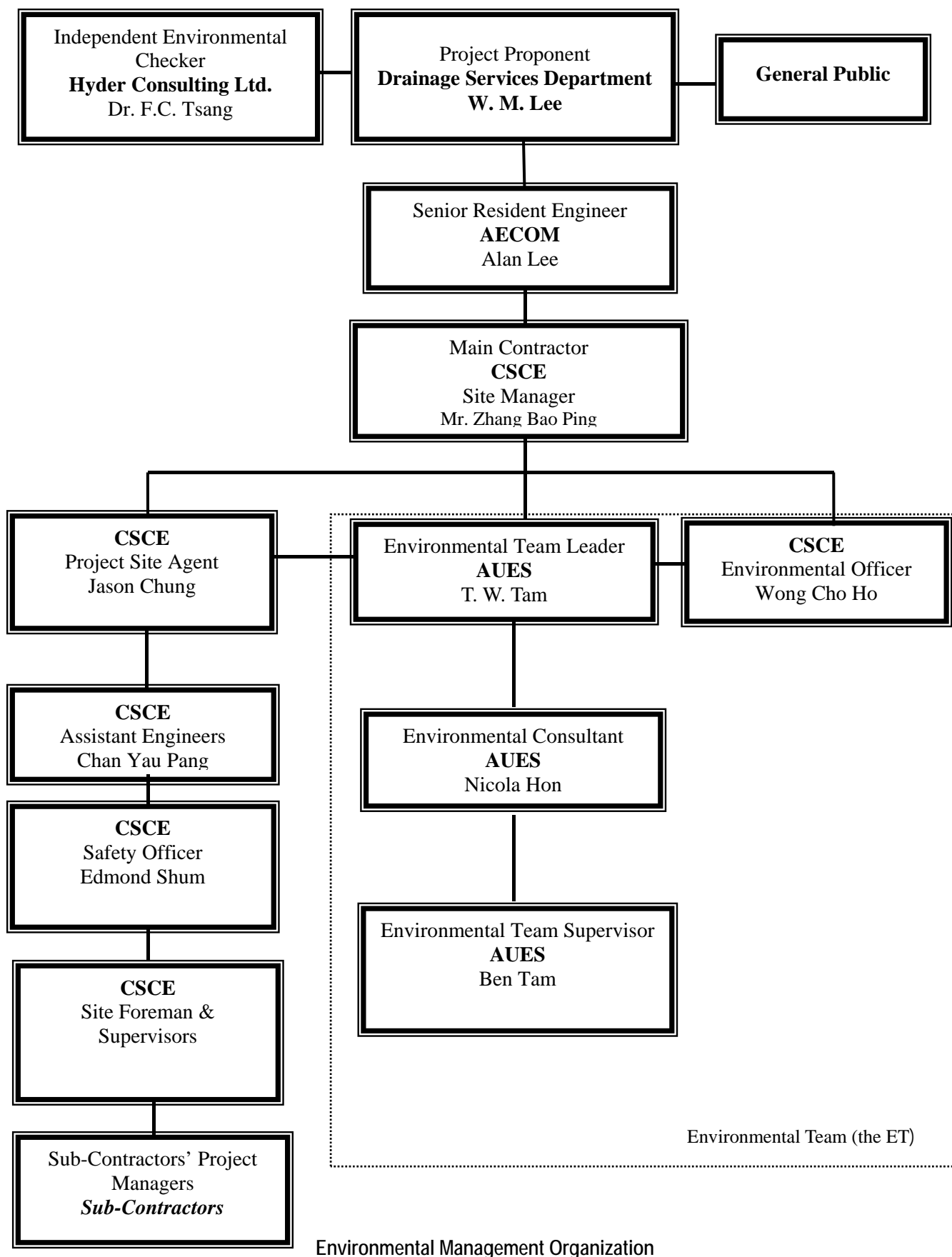
### **Site Layout Plan**





## **Appendix B**

### **Environmental Management Organization Chart**



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. Wong Cho Ho	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 Ha Tsuen Sewage Pumping Station

Activity ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish	APR	MAY	JUN	JUL	2013 AUG	SEP	OCT	NOV	DEC
1180	Summary of retaining works at HTPS	49 *	49 *	30APR13	28JUN13									
1345	W/O 282 Wooden Facade at Existing HTPS	3	3	09MAY13	11MAY13									
1350	W/O 282 Painting at Canopy and Planter	10	10	30APR13	13MAY13									
1355	Summary of W/O 320	44 *	44 *	30APR13	28JUN13									
1359	W/O 320 S.S Coping	2	2	13MAY13	14MAY13									
1360	W/O 320 Splay angle	30	30	30APR13	05JUN13									
1430	W/O 320 Glass Balustrade	5	5	06MAY13 *	10MAY13									
1435	W/O 320 S.S. Roof Railing	5	5	13MAY13	17MAY13									
1440	W/O 320 S.S. Stair Railing	30	30	20MAY13	28JUN13									
1450	W/O 320 GRP hand railing	10	10	28MAY13 *	10JUN13									
1551	W/O 320 Wooden Facade at HTPS Extension	20	20	29MAY13	25JUN13									
1555	W/O 320 Pumping System (Water Pipes)	45	45	30APR13	24JUN13									
1560	W/O 320 Additional Ground Beam	20	20	30APR13	24MAY13									
1561	W/O 320 Painting at External Wall	9	9	30APR13	10MAY13									
1565	W/O 320 Pedestrian Road	40	40	30APR13	24JUN13									
1566	W/O 320 Downpipe	45	45	30APR13	24JUN13									
1584	W/O 328 Wooden Facade at Existing CSCH	7	7	30APR13	08MAY13									
1594	W/O 331 Landscape at Existing HTPS & CSCH	44	44	30APR13	28JUN13									
1604	W/O 332 Irrigation at Existing HTPS & CSCH	44	44	30APR13	28JUN13									
1614	W/O 333 Irrigation & Landscape at HTPS Extension	44	44	30APR13	28JUN13									
1624	W/O 342 Stainles Steel Stair at Existing CSCH	10	10	15MAY13	28MAY13									

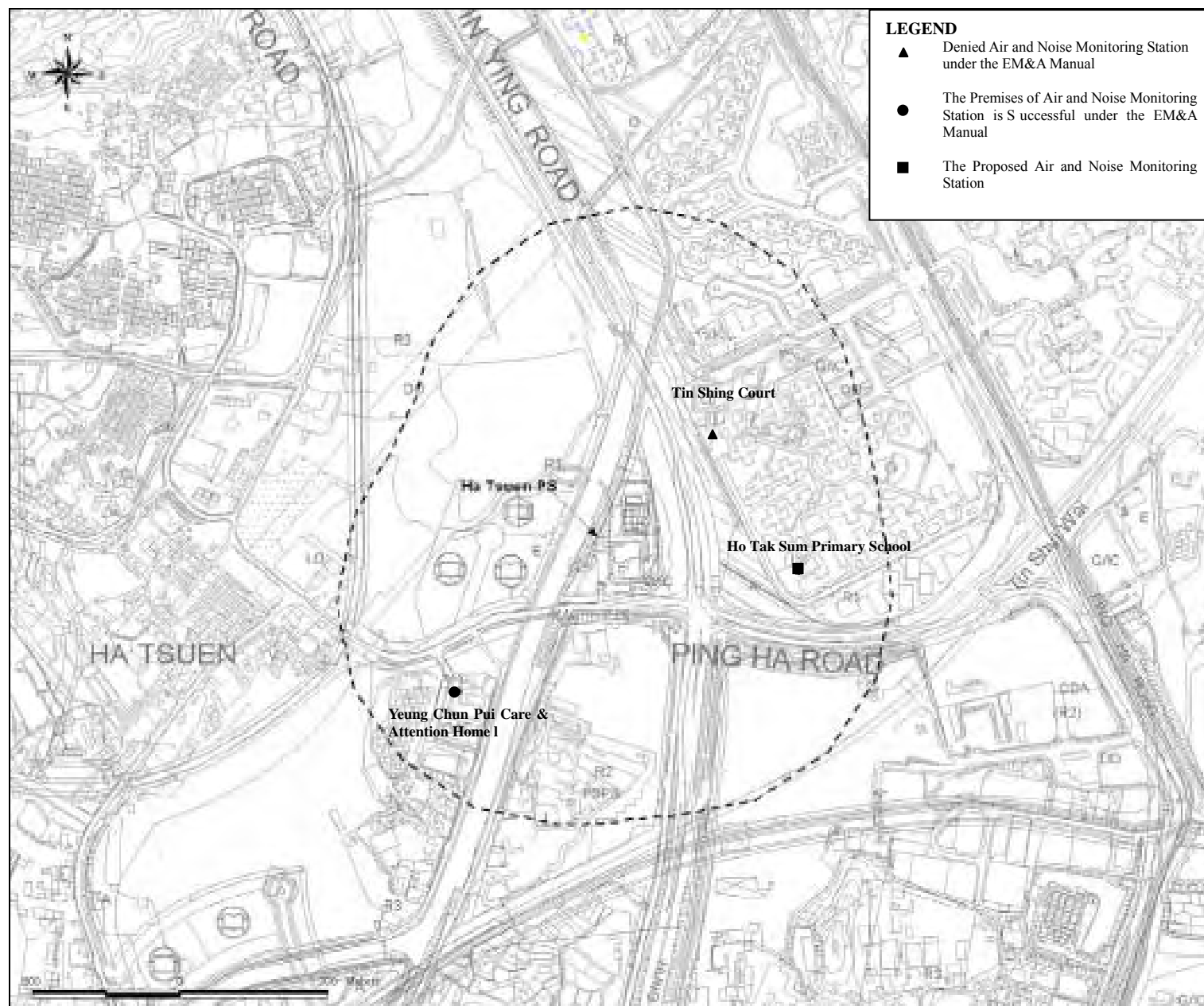
Start date	01SEP12	Early bar
Finish date	28JUN13	Progress bar
Run date	27APR13	Critical bar
Page number	1A	Summary bar
Company name	CSHK	Start milestone point
c Primavera Systems, Inc.		Finish milestone point

Programme of Remaining Works at HTPS

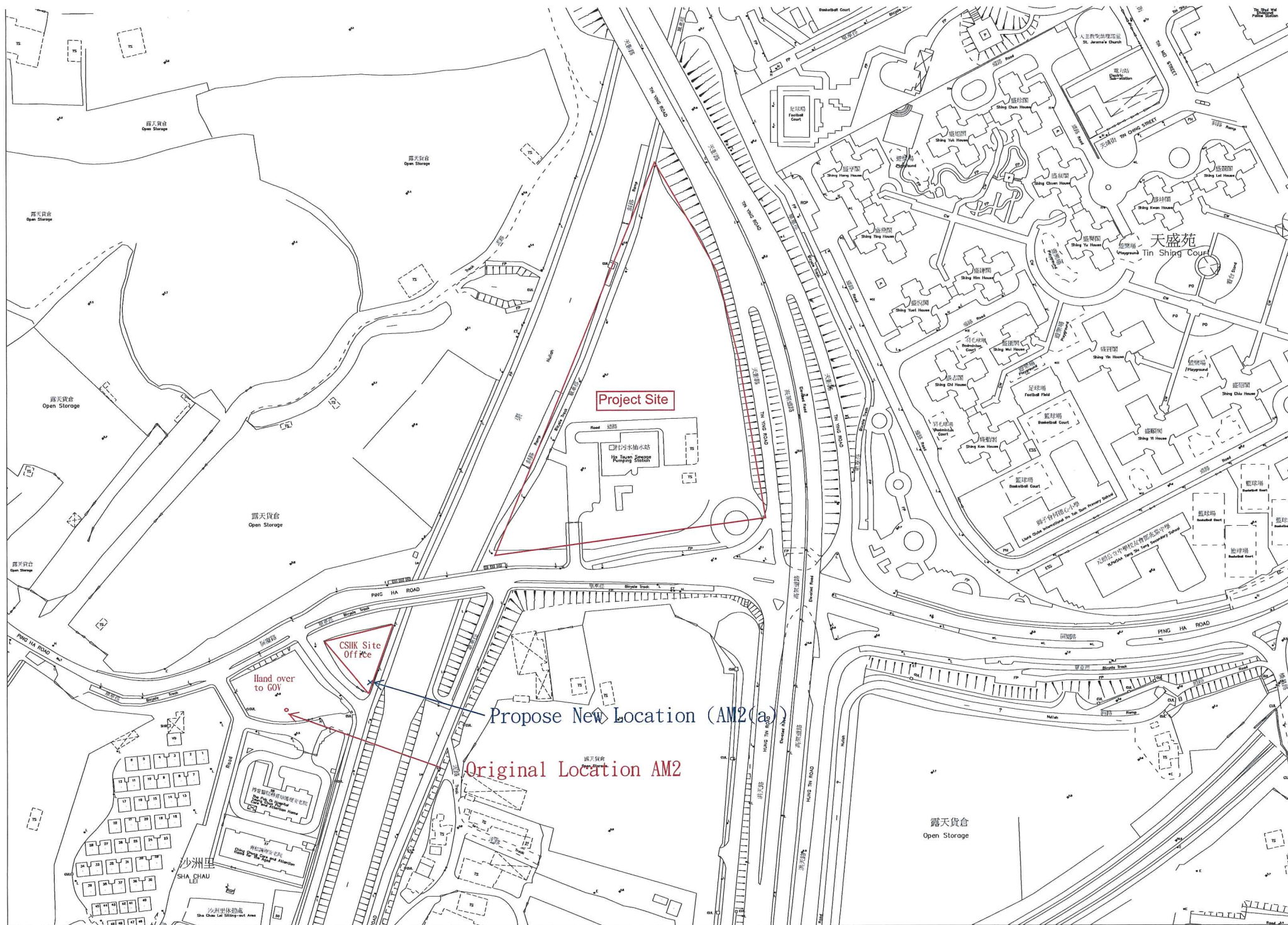
## **Appendix D**

### **Monitoring Location of EM&A Programme**

Proposed Air and Noise Monitoring Station



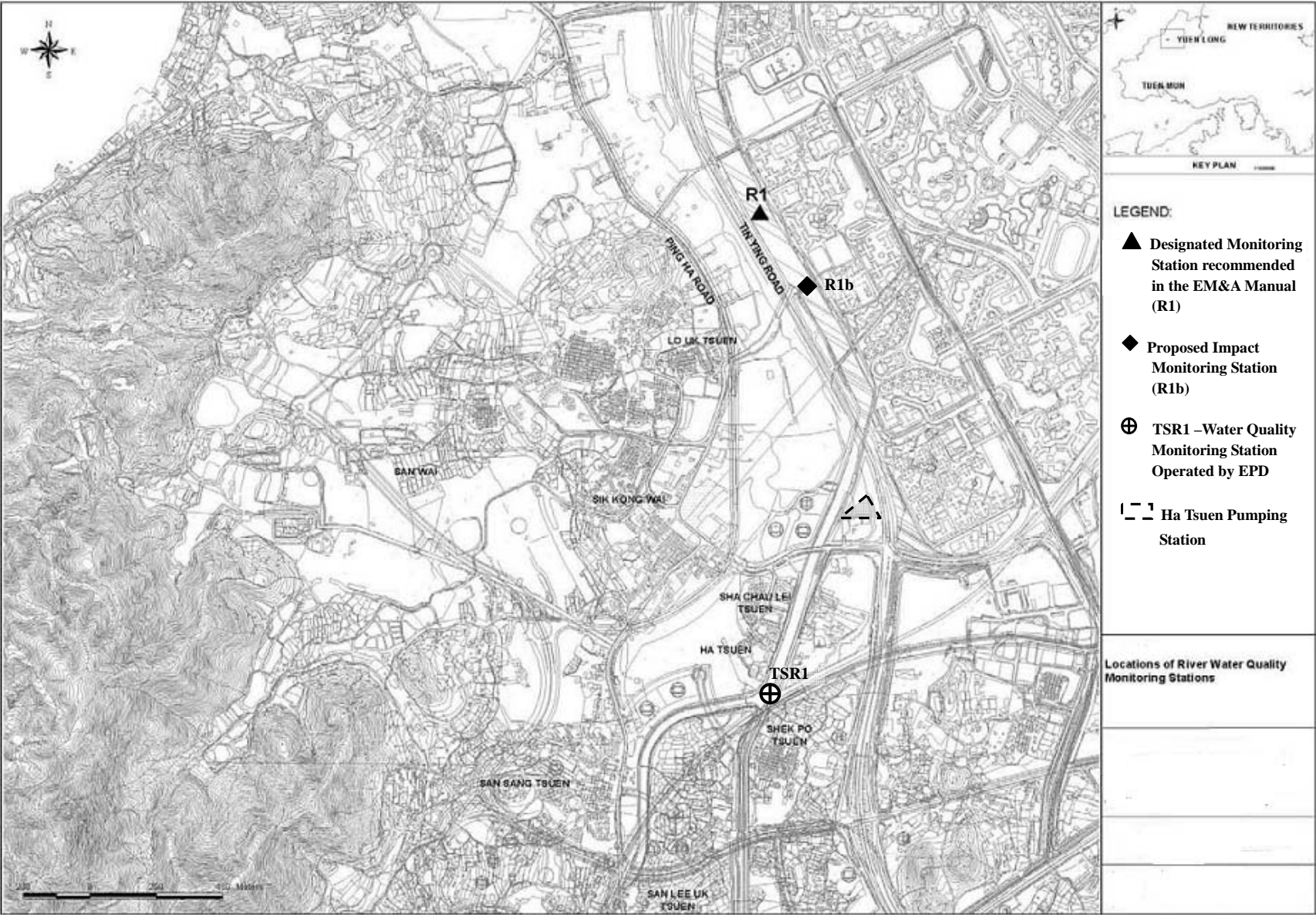




DSD Contract No. DC/2009/08 – Construction of Yuen Long South Branch Sewers  
And Extension of Ha Tsuen Sewage Pumping Station

Proposed Water Quality Monitoring Location

AUES

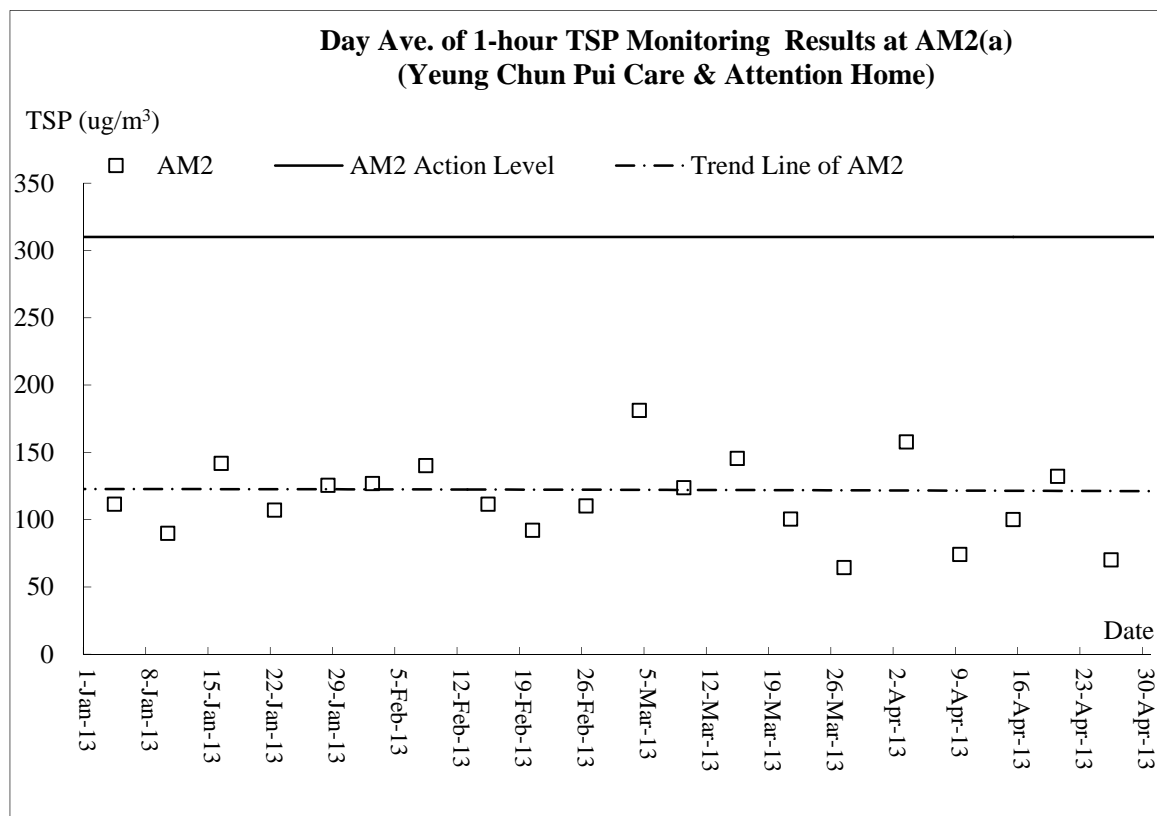
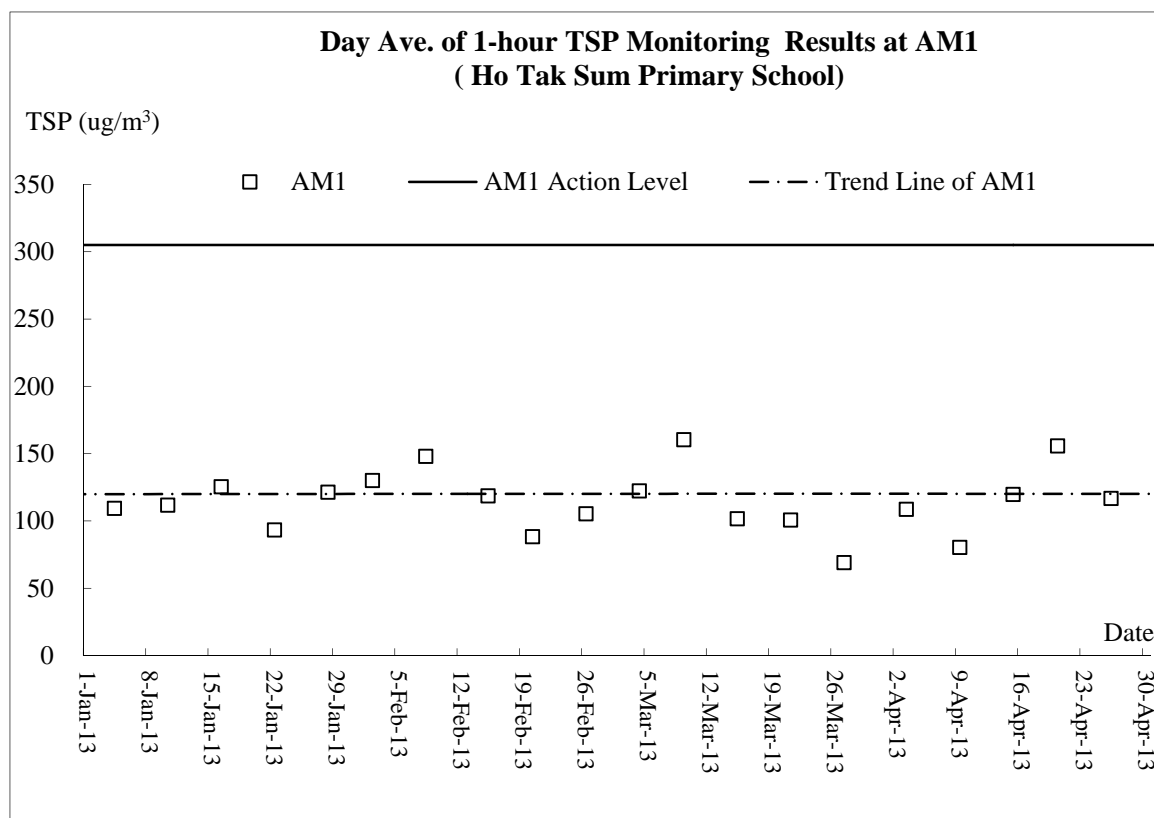


## **Appendix E**

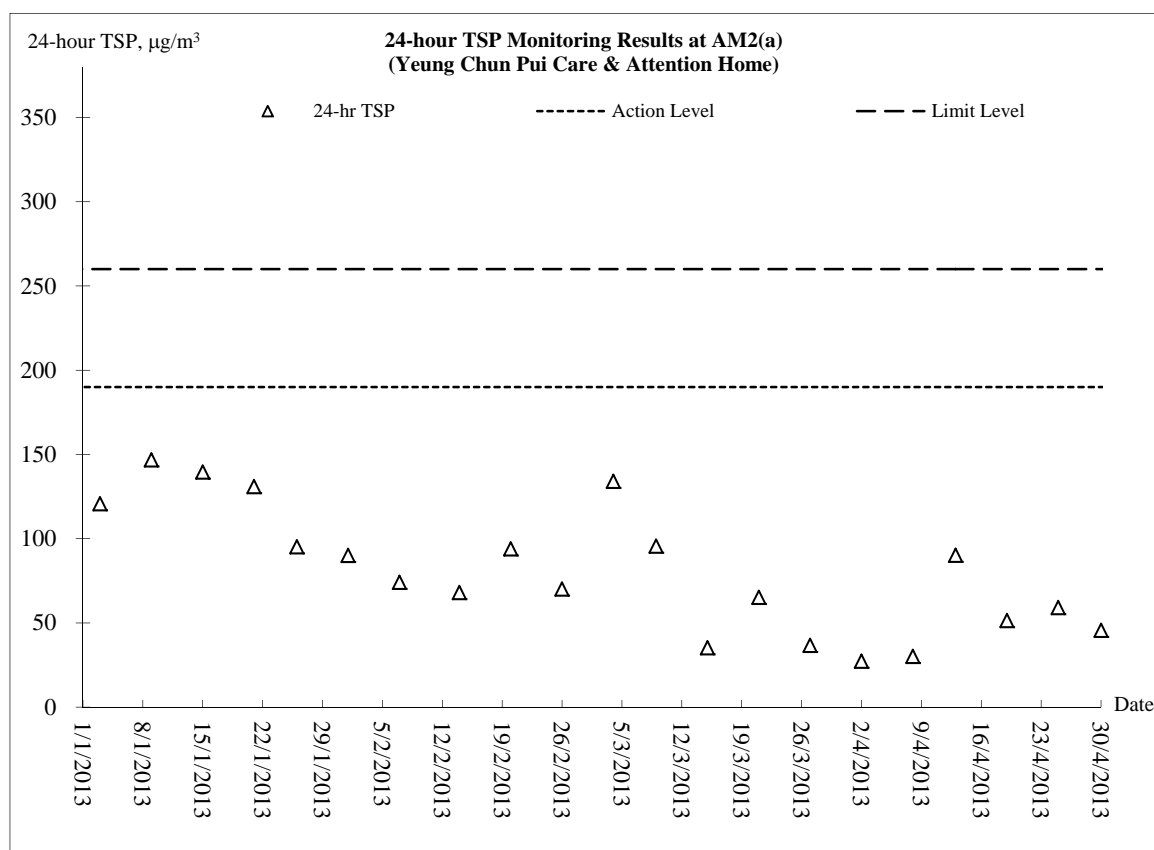
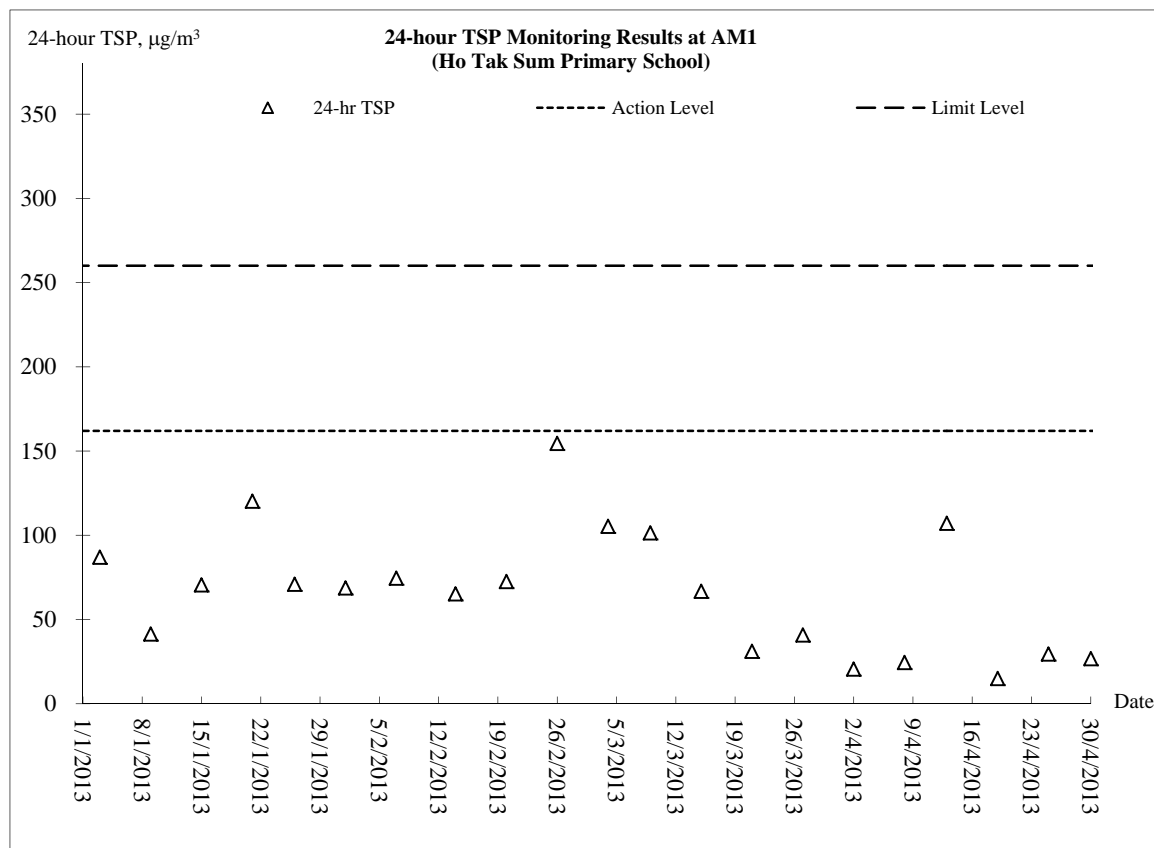
### **Graphic Plot of**

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

## Air Quality – 1-hour TSP



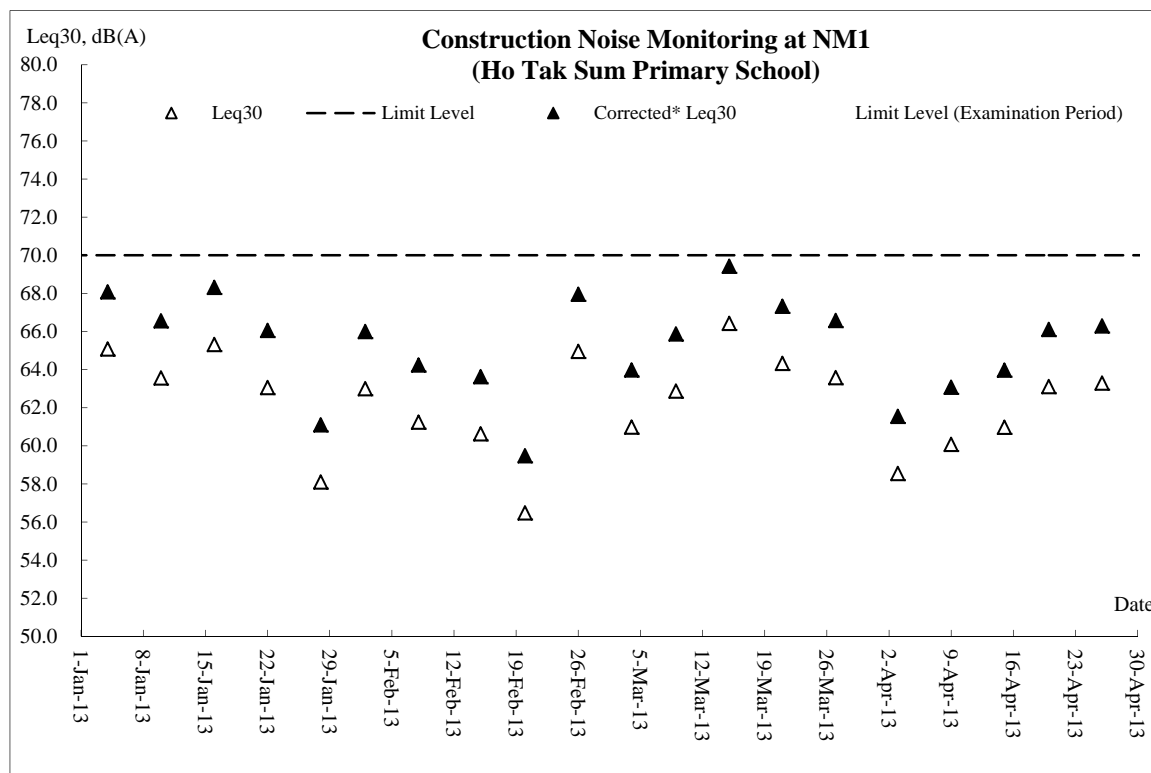
## Air Quality – 24-hour TSP



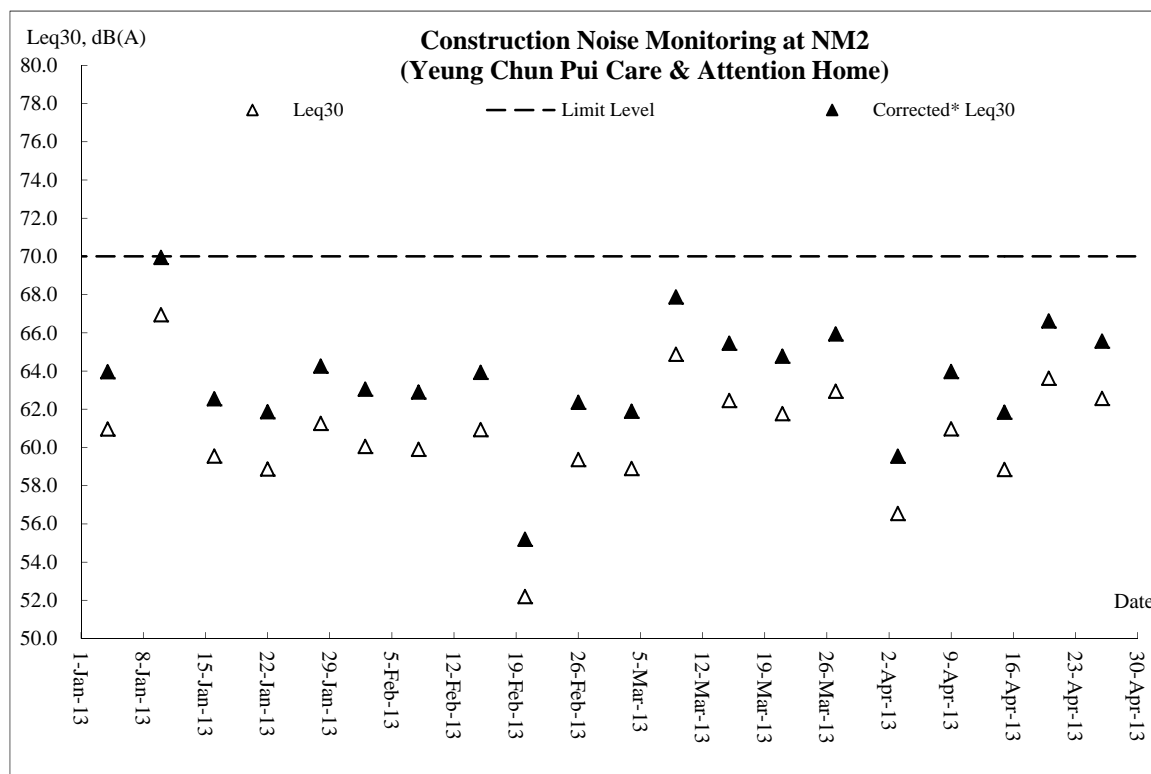
Remark: newly location AM2(a) replaced the original AM2 since 7 November 2012.



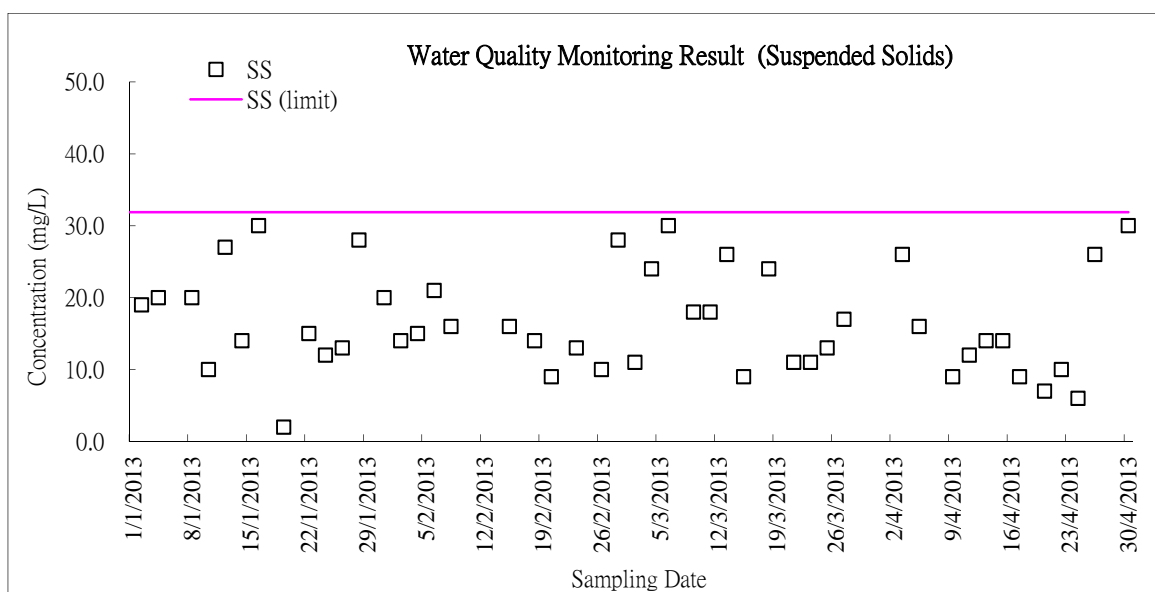
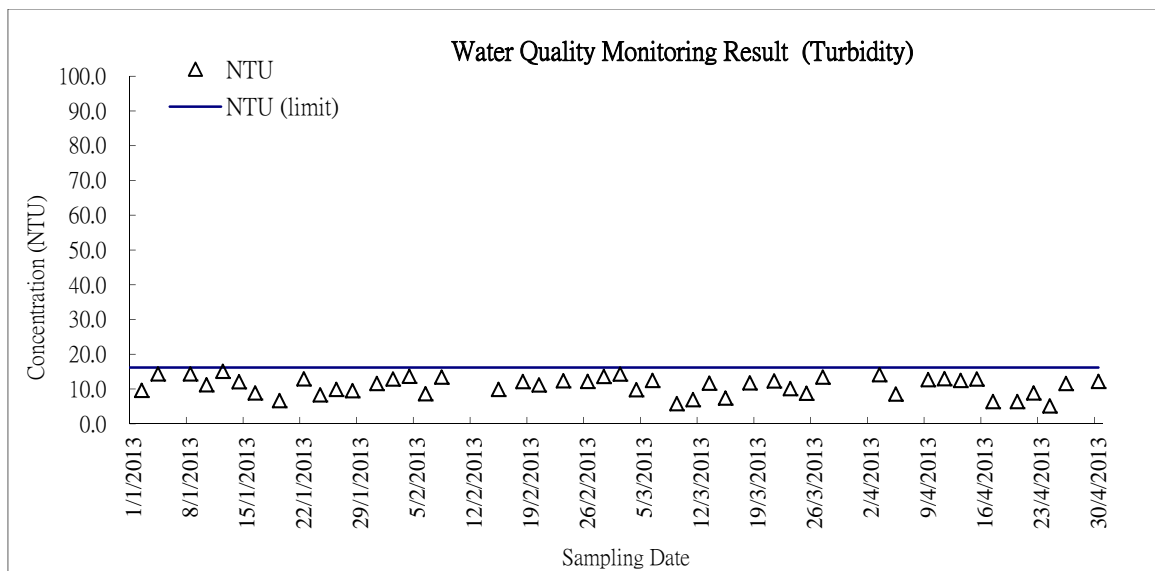
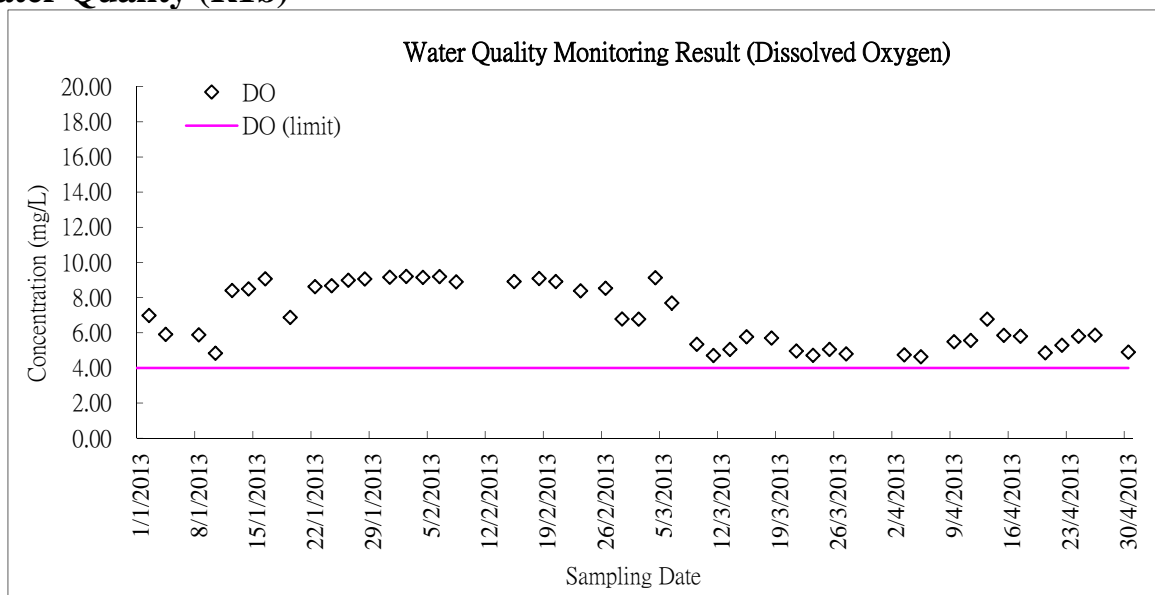
## Construction Noise



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 – February 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-Feb-13	Fri	Cloudy, fog, rain, light to moderate easterly winds.	0.0	19.5	76	130	8.8
2-Feb-13	Sat	Cloudy, fog, rain, light to moderate easterly winds.	0.0	20.8	75	70	10.7
3-Feb-13	Sun	Warm, rain, sunny periods, moderate easterly winds	0.0	20.1	82	70	10.6
4-Feb-13	Mon	Warm, sunny periods, moderate easterly winds	0.0	20.9	88	230	6.5
5-Feb-13	Tue	Warm, rain, sunny periods, moderate easterly winds	0.0	21.4	93	230	8.8
6-Feb-13	Wed	Warm, sunny periods, moderate easterly winds	0.0	21.1	89	70	12.3
7-Feb-13	Thu	Cloudy, rain, fresh east to northeasterly winds.	0.0	21.2	83	70	17.0
8-Feb-13	Fri	Warm, rain, sunny periods, moderate easterly winds	0.0	16	87	70	16.1
9-Feb-13	Sat	Cloudy, rain, fresh east to northeasterly winds.	0.0	12.2	70	30	14.3
10-Feb-13	Sun	Warm, rain, sunny periods, moderate easterly winds	0.0	14.3	77	70	8.6
11-Feb-13	Mon	Warm, rain, sunny periods, moderate easterly winds	0.0	17.9	80	80	12.2
12-Feb-13	Tue	Cloudy, rain, fresh east to northeasterly winds.	0.0	18.1	76	360	12.5
13-Feb-13	Wed	Cloudy, rain, fresh east to northeasterly winds.	0.0	15.8	72	30	11.3
14-Feb-13	Thu	Warm, rain, sunny periods, moderate easterly winds	0.0	18.5	82	60	9.1
15-Feb-13	Fri	Cloudy, sunny periods, Light winds.	0.0	20.3	78	70	12.1
16-Feb-13	Sat	Cloudy, fog, warm, light to moderate southeasterly winds	0.0	16.8	86	70	12.4
17-Feb-13	Sun	Cloudy, sunny periods, Light winds.	0.0	18.2	83	70	10.3
18-Feb-13	Mon	Cloudy, fog, warm, light to moderate southeasterly winds	0.0	19.7	89	240	8.8
19-Feb-13	Tue	Sunny periods, fog, rain, light winds, winds will freshen from the east to northeast	0.0	19.3	90	80	11.6
20-Feb-13	Wed	Cloudy, bright, fresh east to northeasterly winds.	0.0	16.7	71	20	12.4
21-Feb-13	Thu	Cloudy, sunny periods, moderate east to northeasterly winds.	0.0	17.2	77	70	11.1
22-Feb-13	Fri	Cloudy, sunny periods, moderate east to northeasterly winds.	0.0	18.4	72	350#	12.6#
23-Feb-13	Sat	Cloudy, bright, fresh east to northeasterly winds.	0.0	16.9	69	70	12.7
24-Feb-13	Sun	Cloudy, sunny periods, moderate east to northeasterly winds.	0.0	18.6	74	70	10.7
25-Feb-13	Mon	Cloudy, fog, rain, sunny intervals, fresh easterly winds.	0.0	21.4	68	70	14.9
26-Feb-13	Tue	Rain, sunny intervals, fog, moderate east to southeasterly winds.	0.0	21.8	84	70	9.3
27-Feb-13	Wed	Cloudy, rain, fog, moderate east to southeasterly winds.	0.0	22	89	240	9.2
28-Feb-13	Thu	Cloudy, rain, fog, moderate east to southeasterly winds.	0.0	20.8	85	70	15.8

# 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 – March 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-Mar-13	Fri	Fine, very dry, moderate easterly winds	0.0	21.9	87	130	16.7
2-Mar-13	Sat	Fine, dry, warm, haze, light winds.	0.5	17.6	86	70	15.1
3-Mar-13	Sun	Fine, dry, warm, haze, light winds.	0.0	13.9	62	360	18.1
4-Mar-13	Mon	Fine, very dry, moderate easterly winds	0.0	15.9	54	350	12.4
5-Mar-13	Tue	Fine, very dry, moderate easterly winds	0.0	18.6	49	70	11.1
6-Mar-13	Wed	Fine, very dry, moderate easterly winds	0.0	18.4	61	70	11.6
7-Mar-13	Thu	Fine, dry, warm, haze, light winds.	0.0	18.8	68	240	8.6
8-Mar-13	Fri	Fine, dry, warm, haze, light winds.	0.0	19.8#	58#	130	9.0
9-Mar-13	Sat	Misty, rain, sunny intervals, fresh easterly winds	0.0	19.6	69	140	15.0
10-Mar-13	Sun	Misty, rain, sunny intervals, fresh easterly winds	0.0	19.9	76	240	10.0
11-Mar-13	Mon	Misty, rain, sunny intervals, fresh easterly winds	0.0	20.5	78	80	11.8
12-Mar-13	Tue	Cloudy, misty, fine, moderate easterly winds	0.0	22	75	100#	12.2#
13-Mar-13	Wed	Cloudy, rain, fresh easterly winds	0.0	22.4	82	230#	8.7#
14-Mar-13	Thu	Cloudy, sunny intervals, moderate easterly winds.	0.0	19.5	85	70	13.2
15-Mar-13	Fri	Cloudy, sunny intervals, moderate easterly winds.	0.0	19.5	76	70	10.9
16-Mar-13	Sat	Cloudy, sunny intervals, moderate easterly winds.	0.0	20.9	74	70	10.0
17-Mar-13	Sun	Cloudy, rain, fresh easterly winds	0.0	22.1	81	140	13.3
18-Mar-13	Mon	Cloudy, sunny intervals, moderate easterly winds.	0.0	23	88	140#	8.1#
19-Mar-13	Tue	Amber Rainstorm Warning Signal Special Announcement issued at 3:50 p.m	9.5	23.8	91	140	15.0
20-Mar-13	Wed	Cloudy, mist, rain, moderate to fresh easterly winds	0.0	23.7	89	160	12.5
21-Mar-13	Thu	Cloudy, mist, rain, moderate to fresh easterly winds	0.0	21.4	85	80	12.3
22-Mar-13	Fri	Cloudy, fog, moderate southeasterly winds	0.0	22.2	85	60	11.2
23-Mar-13	Sat	Cloudy, fog, moderate southeasterly winds	0.0	23.5	83	140	9.8
24-Mar-13	Sun	Cloudy, mist, rain, fresh to strong easterly winds.	0.5	23	90	140	5.7
25-Mar-13	Mon	Cloudy, mist, rain, fresh to strong easterly winds.	0.0	22.6	83	90	18.0
26-Mar-13	Tue	Cloudy, rain, squally thunderstorms, fog, fresh easterly winds	25.0	20.3	90	100	19.3
27-Mar-13	Wed	Cloudy, showers, squally thunderstorms, moderate east to northeasterly winds.	1.0	19.7	90	70	10.0
28-Mar-13	Thu	Cloudy, mist, rain, squally thunderstorms, light to moderate easterly winds.	26.5	19.6	95	80	12.0
29-Mar-13	Fri	Cloudy, mist, rain, fresh to strong easterly winds.	0.0	20.3	92	70	8.5
30-Mar-13	Sat	Cloudy, rain, squally thunderstorms, fog, fresh easterly winds	37.5	18.9	96	90	17.6
31-Mar-13	Sun	Cloudy, mist, rain, squally thunderstorms, light to moderate easterly winds.	0.5	20	95	70	10.9

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

**Meteorological Data Extracted from HKO – April 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-Apr-13	Mon	Cloudy, showers, rain, winds from the north with rain.	0.0	21.3	82	80	9.7
2-Apr-13	Tue	Cloudy, mist, rain, fresh, moderate easterly winds.	15.0	21	93	70	8.6
3-Apr-13	Wed	Cloudy, showers, rain, winds from the north with rain.	9.0	19.2	92	80	16.4
4-Apr-13	Thu	Cloudy, showers, rain, winds from the north with rain.	0.5	20.9	92	60	13.6
5-Apr-13	Fri	Cloudy, showers, rain, squally thunderstorms, fresh southwesterly winds	54.0	23.9	96	140	21.5
6-Apr-13	Sat	Cloudy, mist, rain, fresh, moderate easterly winds.	6.0	19.7	73	350	26.3
7-Apr-13	Sun	Cloudy, rain, mist, moderate to fresh easterly winds.	0.0	17	60	40	14.1
8-Apr-13	Mon	Cloudy, rain, mist, moderate to fresh easterly winds.	0.0	18.7	79	70	12.2
9-Apr-13	Tue	Cloudy, rain, squally thunderstorms, moderate northeasterly winds, freshening later.	24.0	18.6	95	60	12.3
10-Apr-13	Wed	Cloudy, rain, moderate northeasterly winds, fresh at times.	7.0	18.1	92	60	11.7
11-Apr-13	Thu	Cloudy, rain, mist, moderate north to northeasterly winds.	23.0	16.8	97	70	9.3
12-Apr-13	Fri	Cloudy, rain, mist, moderate north to northeasterly winds.	3.0	17.4	86	90	11.1
13-Apr-13	Sat	Cloudy, sunny intervals, light winds.	0.0	19.5	71	140	7.6
14-Apr-13	Sun	Cloudy, sunny intervals, light winds.	0.0	21.3	75	250	6.9
15-Apr-13	Mon	Sunny intervals, cloudy, mist, moderate easterly winds.	0.0	22	79	90	12.2
16-Apr-13	Tue	Sunny intervals, cloudy, mist, moderate easterly winds.	0.0	22.9	89	130	7.5
17-Apr-13	Wed	Cloudy, rain, mist, moderate north to northeasterly winds.	32.0	23.7	97	140	6.9
18-Apr-13	Thu	Cloudy, showers, rain, squally thunderstorms, fresh southwesterly winds	6.0	24.1	96	130	7.6
19-Apr-13	Fri	Cloudy, rain mist, moderate north to northeasterly winds.	2.5	24.6	97	140	8.8
20-Apr-13	Sat	Cloudy, mist, rain, fresh, moderate easterly winds.	15.5	24.9	88	70	12.3
21-Apr-13	Sun	Cloudy, sunny intervals, light winds.	0.0	21.5	92	70	13.0
22-Apr-13	Mon	Cloudy, sunny intervals, light winds.	0.0	20.9	85	80	15.5
23-Apr-13	Tue	Sunny intervals, cloudy, mist, moderate easterly winds.	0.0	23.6	83	070#	15.3#
24-Apr-13	Wed	Cloudy, fog, squally thunderstorms, light winds.	0.0	24.4	86	90	9.7
25-Apr-13	Thu	Warm, sunny, moist.	9.5	25.4	87	250	9.3
26-Apr-13	Fri	Cloudy, rain, moderate to fresh easterly winds	6.0	21.7	85	80	13.0
27-Apr-13	Sat	Warm, sunny, moist.	0.0	22.2	76	70	15.3
28-Apr-13	Sun	Cloudy, rain, moderate to fresh easterly winds	0.0	23.5	85	80	15.0
29-Apr-13	Mon	Cloudy, fog, squally thunderstorms, light winds.	0.0	25	86	130	14.4
30-Apr-13	Tue	Cloudy, fog, squally thunderstorms, light winds.	28.0	24.6	89	220	17.0

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