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

8th QUARTERLY ENVIRONMENTAL MONITORING & AUDIT SUMMARY REPORT – (November 2011 to January 2012)

PREPARED FOR

CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) COMPANY LIMITED

Quality Index

Date	Reference No.	Prepared By	Certified By
29 March 2012	TCS00491/09/600/R0348v3	Nicola Hon (Environmental Consultant)	T.W. Tam (Environmental Team Leader)

Version	Date	Description
1	21 March 2012	First submission
2	27 March 2012	Amended against IEC's comments on 27 March 2012
3	29 March 2012	Amended against IEC's comments on 29 March 2012

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30 March 2012

By Post

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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 Report for Designated Project, November 2011 to January 20112 – IEC Verification

With reference to ET's captioned report (ET's ref.: TCS00491/09/600/R0348v3 dated 29 March 2012) received on 29 March 2012, we have no comment and hereby verify the captioned report excluding the Landscape and Visual Impact section of the report.

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

Should there be any queries, please feel free to contact our Arthur Chiu on 2911 2731..

Yours sincerely,

F.C. TSANG
Independent Environmental Checker
HYDER CONSULTING LIMITED

FCT/my

EXECUTIVE SUMMARY

ES.01. This is the **8th** Quarterly EM&A Summary Report for the *Expansion of Ha Tsuen Sewage Pumping Station* under Environmental Permit No.EP327/2009 (hereinafter ''the EP''), covering the period from **1 November 2011 to 31 January 2012** (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	**102**
	24-hour TSP	**30**
Construction Noise	$L_{eq(30min)}$ Daytime	**34**
Water Quality	Dissolved Oxygen	**37**
	Turbidity	**37**
	Suspended Solids (SS)	**37**
Inspection / Audit	ET Weekly Environmental Site Inspection	**14**

BREACHES OF ACTION/LIMIT LEVELS

ES.03. In the Reporting Period, monitoring results demonstrated that no exceedance of environmental quality criteria recorded in both construction noise and water quality monitoring but one (1) Action Level exceedance in 24-hour TSP was recorded at Location AM2 on 24 December 2011. Breaches of the exceedance in this Reporting Period is summarized in the following table.

Environmental Aspects	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0	--	--
	24-hour TSP	**1**	0	**1**	Not Project related	N.A.
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	0	--	--
Water Quality	Dissolved Oxygen	0	0	0	--	--
	Turbidity	0	0	0	--	--
	Suspended Solids	0	0	0	--	--

ES.04. Investigation for the air quality exceedance has been completed and it was concluded that the exceedance was not related to the works under the Project.

ES.05. The results and findings for landscape and visual monitoring, as part of the EM&A programme, will be submitted in a stand-alone submission.

ENVIRONMENTAL COMPLAINT, NOTIFICATIONS OF SUMMONS AND PROSECUTIONS

ES.06. No documented complaint, notifications of summons and successful prosecutions were received during the Reporting Period. No associated mitigation action is needed.

REPORTING CHANGES

ES.07. There are no reporting changes in this reporting month.

FUTURE KEY ISSUES

ES.08. 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 for 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;

and also with construction noise and other environmental issues special waste management, as stipulated in the Environmental Monitoring and Audit Manual.

ES.09. According to Clause 3.4 of the Environmental Permit No. EP-327/2009/A, the Contractor should cease all construction activities in Ha Tsuen Pumping Station during the Public Examination period of the school nearby.

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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 D**C/2009/08** *Construction of Yuen Long South Branch Sewers and Expansion of Ha Tsuen Sewage Pumping Station* (the Project) in October 2009.

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

1.03 The construction of expansion Ha Tsuen Sewage Pumping Station is under a statutory EIA (Register No. AEIAR-072/2003) study for "*Upgrading and expansion of San Wai Sewage Treatment Works and expansion of Ha Tsuen Pumping Station*" commissioned by the DSD. 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 the 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 **8th** Quarterly EM&A Summary Report which undertaken as part of the EM&A programme under Environmental Permit No. EP-327/2009A for the Expansion Ha Tsuen Sewage Pumping Station, covering the period from **1 November 2011 to 31 January 2012**.

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 Environmental Monitoring and Audit Requirements
Section 4 Monitoring Results and Breaches of Environmental Quality Criteria
Section 5 Waste Management
Section 6 Site Inspection
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 master tentative construction program is enclosed in ***Appendix C.*** Also, the major construction activities undertaken in this reporting period are listed below:

November 2011 • Construction of walls
December 2011 • Construction of walls
January 2012 • Construction of walls

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 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. The monitoring stations are detailed to list in ***Table 3-2*** and illustrated in ***Appendix D***.

3.03 As informed by the Contractor on 19 October 2011, an incident report was received from the Yeung Chun Pui Care & Attention Home (AM2) that the High Volume Sample (HVS) have been used by some of the old folks as a stairway to escape from the premise, causing a serious safety problem to the escapees as well as the Home of the Elderly. The person in charge of Yeung Chun Pui Care & Attention Home therefore request prompt removal of the High Volume Sampler from the premise.

3.04 Therefore, the HVS is shifted to nearby location where less than 10 meters from the original location towards the construction site on 27 October 2011. Since the shifted distance of the monitoring location is less than 10 meters, it is considered that the background condition would not have significant change, the Action Level of 1-hour and 24-hour TSP will remain unchanged as the original location and the Location ID is also remained as AM2 - Yeung Chun Pui Care & Attention Home. The newly monitoring location had been accepted by EPD, RE and IEC.

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

Monitoring Location ID	Identified Address	Remarks
AM1	Ho Tak Sum Primary School	Replace the Designated Monitoring Station Tin Shing Court
AM2*	Yeung Chun Pui Care &	Designated in the EM&A Manual

Monitoring Location ID	Identified Address	Remarks
	Attention Home	

** HVS shifted to nearby location where less than 10 meters from the original location towards the construction site on 27 October 2011.*

Construction Noise

3.05 Similarly to the air monitoring, the construction noise monitoring stations undertaken for EM&A programme was agreed by IEC and as endorsed by EPD. The detailed monitoring stations are listed in ***Table 3-3*** and shown in ***Appendix D***.

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

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 is technical difficulty and safety is concerned. So, a new sampling point located at approximately 160m upstream of the R1 (hereinafter as R1b) was therefore proposed for the local stream impact monitoring and has been verified by IEC and no further comments by EPD.

3.07 The detailed monitoring station is listed 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 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 0700-1900 hours on normal weekdays.
$L_{eq(5min)}$, L_{10} and L_{90} during the construction undertaken during Restricted Hours (from 19:00 to 07:00 hours of the following day and full day of public holiday and Sunday)

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

Water Quality Monitoring of Local Stream Course

Parameters: DO, Turbidity and SS.
Frequency: 3 days per week.
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 Manuals
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

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

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 A/L levels of air quality 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		AM1			AM2		
				1st hour	2nd hour	3rd hour	1st hour	2nd hour	3rd hour
2-Nov-11	47	87	1-Nov-11	128	111	98	159	123	171
8-Nov-11	32	71	7-Nov-11	79	123	114	119	136	108
14-Nov-11	57	75	12-Nov-11	108	124	117	131	104	96
19-Nov-11	39	47	18-Nov-11	145	126	91	167	132	111
25-Nov-11	37	99	24-Nov-11	154	128	101	100	162	134
1-Dec-11	77	124	30-Nov-11	216	189	167	206	195	169
7-Dec-11	41	104	6-Dec-11	123	145	161	186	131	109
13-Dec-11	20	163	12-Dec-11	138	159	171	202	167	152
19-Dec-11	122	149	17-Dec-11	138	186	102	201	197	131
24-Dec-11	112	***228***	23-Dec-11	201	124	152	193	176	143
30-Dec-11	156	125	29-Dec-11	168	153	126	201	178	142
5-Jan-12	117	118	4-Jan-12	163	142	113	186	213	145
11-Jan-12	97	170	10-Jan-12	103	89	124	138	151	122
17-Jan-12	73	60	16-Jan-12	142	162	159	187	179	148
26-Jan-12	33	32	21-Jan-12	134	133	112	140	123	129
			27-Jan-12	226	237	197	256	279	219
			30-Jan-12	142	168	171	176	145	127
Average (Range)	**71 (20 – 156)**	**110 (32 – 228)**	**Average (Range)**	**143 (79-237)**			**159 (96-279)**		

Remarks: Bold and italic indicated Action Level exceedance

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	Action Level	0	**1**	**1**
	Limit Level	0	0	0

4.02 As shown in ***Tables 4-1***, all 1-hour TSP monitoring results were fluctuated well below the Action Level in this Reporting Period. However, one (1) Action Level exceedance in 24-hour TSP monitoring was recorded at Location AM2 on 24 December 2011. NOE was issued to all relevant parties upon confirmation of the monitoring result and investigation report for the exceedance has been conducted and completed.

4.03 According the site information provided by the Contractor, only rebar fixing work was carried out at Ha Tsuen Sewage Pumping Station on 24 December 2011. With full implementation of the required environmental mitigation measures, in particular construction dust suppression measures including water sprays for haul roads as well as wheel washing facilities provided at the exit/entrance of the site, the construction activity is not anticipated to create adverse construction dust impacts as shown by the TSP monitoring results of the previous construction period.

4.04 During regular site inspection, it is observed that the vicinity of the site are main traffic road which dominated by heavy truck and construction site from other contracts. In addition, no complaint was received during the exceedance, indicating the occasional exceedance bore only short term impacts during dry and windy season. It is concluded that the exceedance was not related to the works under the project.

CONSTRUCTION NOISE MONITORING

4.05 Monitoring results and breaches A/L levels of construction noise 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-11	63.7	66.8
7-Nov-11	64.4	67.3
12-Nov-11	67.0	66.1
18-Nov-11	63.9	69.9
24-Nov-11	69.8	69.9
30-Nov-11	68.7	69.6
6-Dec-11	67.1	69.7
12-Dec-11	69.2	69.8
17-Dec-11	62.4	66.2
23-Dec-11	65.6	69.7
29-Dec-11	61.2	68.6
4-Jan-12	64.5	67.8
10-Jan-12	63.5 #	68.9
16-Jan-12	66.0	68.6
21-Jan-12	63.8	65.6
27-Jan-12	61.7	65.2
30-Jan-12	62.1	61.5

Remarks: (*) 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.

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		

4.06 As shown in ***Table 4-3***, all the measured noise values are fluctuated below the Limit level. Neither documented construction complaint nor exceedance of Limit level was recorded during the Reporting Period. Neither NOE nor corrective action was therefore recommended.

WATER QUALITY MONITORING – LOCAL STREAM COURSE

4.07 In this Reporting Period, a total of **37** 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	6.9	2.0
Average	5.8	11.9	16.3
Max	8.3	15.1	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	Total Exceedances in the Month
November	14	Action Level	0	0	0	0

Construction Month	No of sample analysis in each Parameter	Exceedance	DO	Turbidity	SS	Total Exceedances in the Month
2011		Limit Level	0	0	0	0
		Sub-Total	0	0	0	0
December 2011	12	Action Level	0	0	0	0
		Limit Level	0	0	0	0
		Sub-Total	0	0	0	0
January 2012	11	Action Level	0	0	0	0
		Limit Level	0	0	0	0
		Sub-Total	0	0	0	0
Total	37	**Action Level**	0	0	0	0
		Limit Level	0	0	0	0
Percentage of Exceedance in the Quarterly Month			**0%**	**0%**	**0%**	**0%**

4.09 As shown in ***Table 4-6,*** no exceedance was recorded at water samples collected from location "R1b". No NOE was issued to relevant parties upon confirmation of the results. No corrective action was therefore required.

OTHER MONITORING AND AUDIT

Landscape and Visual

4.10 The monitoring and audit works for landscaping and visual was undertaken by others and the monitoring findings will be 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 fencing erection and relevant Tree Report has been described that all the retained and transplanted trees were in good condition.

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 11	Dec 11	Jan 12	
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)	1,854	1,445	1,856	Tuen Mun Area 38

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

Type of Waste	Quantity			Disposal Location
	Nov 11	Dec 11	Jan 12	
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)	2	1	1	NENT Landfill

5.04 There was no site effluent or surface runoff discharged in the Reporting Period. 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, ***14*** events of the joint site inspection was undertaken to evaluate the site environmental performance. No non-compliance was noted but ***6*** observations and ***2*** reminders were recorded during the site inspections within the Reporting Period.

6.02 The summarized 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
1 November 2011	No Adverse environmental impacts were observed.	NA
8 November 2011	• Ponding water was observed within the site of Ha Tsuen Pumping Station. Drying off the ponding water or mosquito control measures is reminded.	Rectified at before site inspection on 16 November 2011.
16 November 2011	No Adverse environmental impacts were observed.	NA
22 November 2011	• Turbid water was observed in the discharge of sedimentation tanks at Ha Tsuen P/S. Regular clearance of the accumulated sediment in the sedimentation tanks is required.	Rectified at before site inspection on 6 December 2011.
29 November 2011	• Turbid water was observed in the discharge of sedimentation tanks in Ha Tsuen Pumping Station, improvement of the sedimentation is required.	Rectified at before site inspection on 6 December 2011.
6 December 2011	No Adverse environmental impacts were observed.	NA
15 December 2011	• Pumping of turbid water was observed in Ha Tsuen Pumping Station. Desilting of the water prior to discharge is required.	Treatment of the turbid water was observed during site inspection on 20 December 2011
20 December 2011	No Adverse environmental impacts were observed.	NA
28 December 2011	No Adverse environmental impacts were observed.	NA
3 January 2012	• Construction waste was observed within the site at Ha Tsuen Pumping Station. Regular clearance is reminded to avoid excessive accumulation.	Construction waste was found to be cleared during site inspection on 12 January 2012.
12 January 2012	• Groundwater pumping was observed within construction site at Ha Tsuen Pumping Station. Pre-treatment of the groundwater prior to discharge is reminded.	Not required for reminder.
17 January 2012	• Groundwater pumping was observed within construction site at Ha Tsuen Pumping Station. Pre-treatment of the groundwater prior to discharge is reminded.	Not required for reminder.
26 January 2012	• Neither construction activities nor adverse environmental impacts were observed during	NA

	the site inspection.	
31 January 2012	• Water ponding was observed at Ha Tsuen Pumping Station. Mosquito control measures is reminded.	To be followed in February 2012.

6.03 In general, it is reminded that good housekeeping practice should be maintained. Besides, chemical waste management shall be enhanced as oil stain was observed beside chemical store at Ha Tsuen Pumping Station and proper clearing is reminded immediately to avoid land contamination. During wet season, implement water mitigation measures to eliminate any accumulation of stagnant water on site is also recommended. Overall, the environmental performance of the Project was considered satisfactory.

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

NON-COMPLIANCE

7.01 One (1) Action Level exceedance in 24-hour TSP monitoring was recorded at Location AM2 on 24 December 2011. However, the exceedance was identified not related to the project in accordance with the investigation of finding.

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

ENVIRONMENTAL COMPLAINT

7.03 No documented noise, air quality or water quality was received by the Contractor or 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 to October 2011	3	3	Air (2)/ Noise (1)
November 2011	0	3	NA
December 2011	0	3	NA
January 2012	0	3	NA

NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS

7.04 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 to October 2011	0	0	NA
November 2011	0	0	NA
December 2011	0	0	NA
January 2012	0	0	NA

Table 7-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
February 2010 to October 2011	0	0	NA
November 2011	0	0	NA
December 2011	0	0	NA
January 2012	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 and waste.

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 is reused for spraying the road surface; • Exposed stockpiles and exposed soil surfaces were covered with tarpaulin or impervious sheets to minimise dust emission; • The stockpiles of materials were placed in the locations away from the drainage channel so as to avoid releasing materials into the channel; • Wheel washing facilities should has been provided at site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles; • Provision of site drainage systems and treatment facilities would be required to minimize the water pollution; • A discharge licence was applied from EPD for discharging effluent from the construction site; • A licensed waste collector have been applied from EPD; • Illegal disposal of chemicals should be strictly prohibited; and • Registration as a chemical waste producer have been applied from EPD.
Air Quality	• Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather; • Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers; • Cover all excavated or stockpile of dusty material by impervious sheeting or sprayed with water to maintain the entire surface wet; • Public roads around the site entrance/exit had been kept clean and free from dust; • Tarpaulin covering of any dusty materials on a vehicle leaving the site; • Sprinkler of water spray system is provided at haul road to reduce dust emissions during the vehicles passing through the haul road; • The vehicle speed within the site is limited to 5km/hr; and • Wheel washing facilities have been provided at the site exit.
Noise	• Good site practices to limit noise emissions at the sources; • Use of quite plant and working methods according to EP-329/2009; • Use of site hoarding with noise barriers to screen noise at ground level of NSRs; • Use of shrouds/temporary noise barriers to screen noise from relatively static PMEs according to EP-329/2009; • Use of temporary noise barrier with surface density 7kg/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 Pumping Station according to EP-329/2009; and • Alternative use of plant items within one worksite, where practicable.

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

9 CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

9.01 This is the **8th** quarterly EM&A summary report under Environmental Permit No.EP327/2009 for the *Expansion of Ha Tsuen Sewage Pumping Station*, covering the period from **1 November 2011 to 31 January 2012.**

9.02 No 1-hour TSP results that triggered the Action or Limit Level was recorded in this Reporting Period. However, one (1) Action Level exceedance in 24-hour TSP monitoring was recorded at Location AM2 on 24 December 2011. NOE was issued to all relevant parties upon confirmation of the monitoring result and investigation report has been conducted and completed. It is concluded that exceedance was not related to the Project.

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 The monitoring and audit works for landscaping and visual was undertaken by others 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 fencing erection and relevant Tree Report has been described that all the retained and transplanted trees were in good condition.

9.05 A total of **14** occasions of joint site inspection was undertaken to evaluate the site environmental performance. No non-compliance was noted but **6** observations and **2** reminders were recorded during the site inspections within the Reporting Period.

9.06 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.

9.07 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

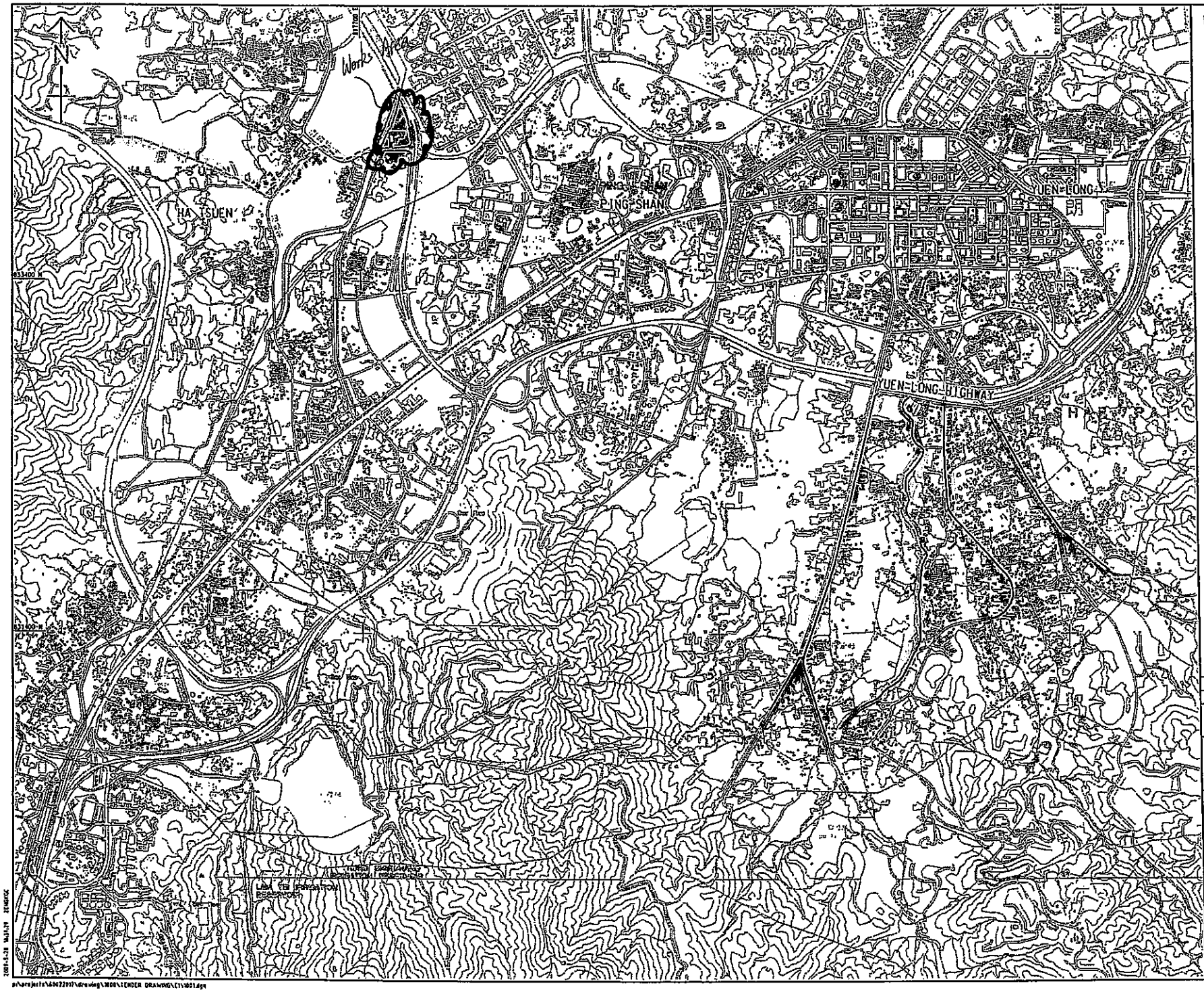
9.08 During dry season, special attention should be paid to the dust mitigation measures to avoid fugitive dust emissions from loose soil surface or haul road. Nevertheless, mitigation measures implemented for control the surface runoff including wheel wash facilities, covering of the loose soil surface 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; and also with construction noise and other environmental issues stipulated in the Environmental Monitoring and Audit Manual.

9.09 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.

9.10 According to Clause 3.4 of the Environmental Permit No. EP-327/2009/A, the Contractor should cease all construction activities in Ha Tsuen Pumping Station during the Public Examination period of the school nearby.

Appendix A

Site Layout Plan



-	TENDER DRAWING	DSD/ACTS	05.09

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

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

LOCATION PLAN

AECOM

DRG NO. 60022017/C1/1001

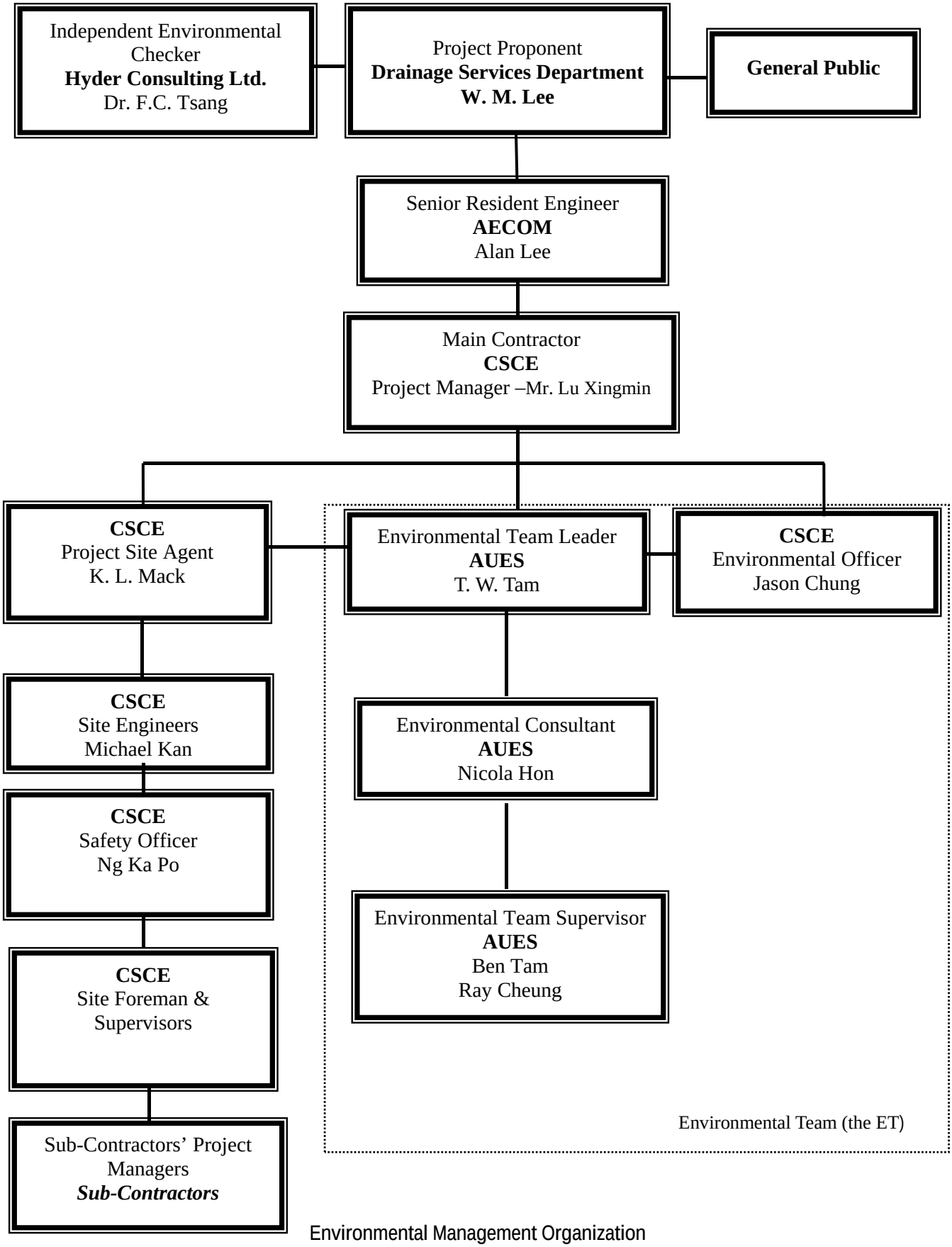
CONTRACT NO. DC/2009/08

SCALE AT A1 1 : 10000

METRES

Appendix B

On-site environmental management



Environmental Management Organization

Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
DSD	Employer	Mr. W. M. Lee	--	2827-8700
AECOM	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. Lu Xingmin	2472 0113	2472-0229
CSCE	Site Agent	Mr. K L Mack	2472 0113	2472-0229
CSCE	Site Engineer	Mr. Michael Kan	2472 0113	2472-0229
CSCE	Environmental Officer	Mr. Jason Chung	2472 0113	2472-0229
CSCE	Environmental Supervisor	Mr. Chan Yau Pang	2472 0113	2472-0229
CSCE	Safety Officer	Mr. Ng Ka Po	2472 0113	2472-0229
AUES	Environmental Team Leader	Mr. T. W. Tam	2959-6059	2959-6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959-6059	2959-6079
AUES	Assistance Environmental Consultant	Mr. Ray Cheung	2959-6059	2959-6079
AUES	Team Supervisor	Mr. Ben Tam	2959-6059	2959-6079

Legend:

DSD (Employer) – Drainage Services Department

AECOM (Engineer) – AECOM

CSCE (Main Contractor) – China State Construction Engineering (Hong Kong) Ltd

Hyder (IEC) – Hyder Consulting Limited

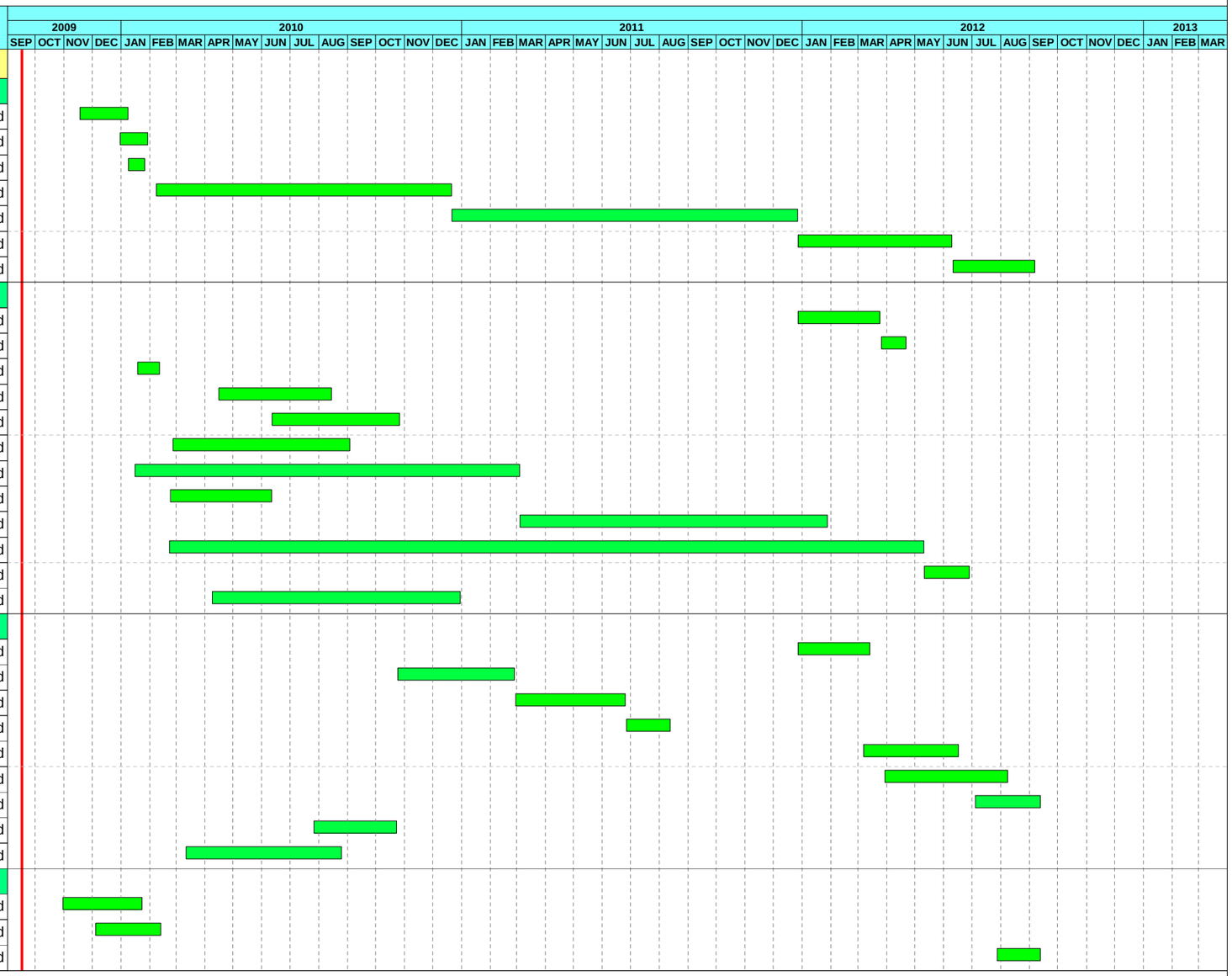
AUES (ET) – Action-United Environmental Services & Consulting

Appendix C

Master construction program

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

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



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

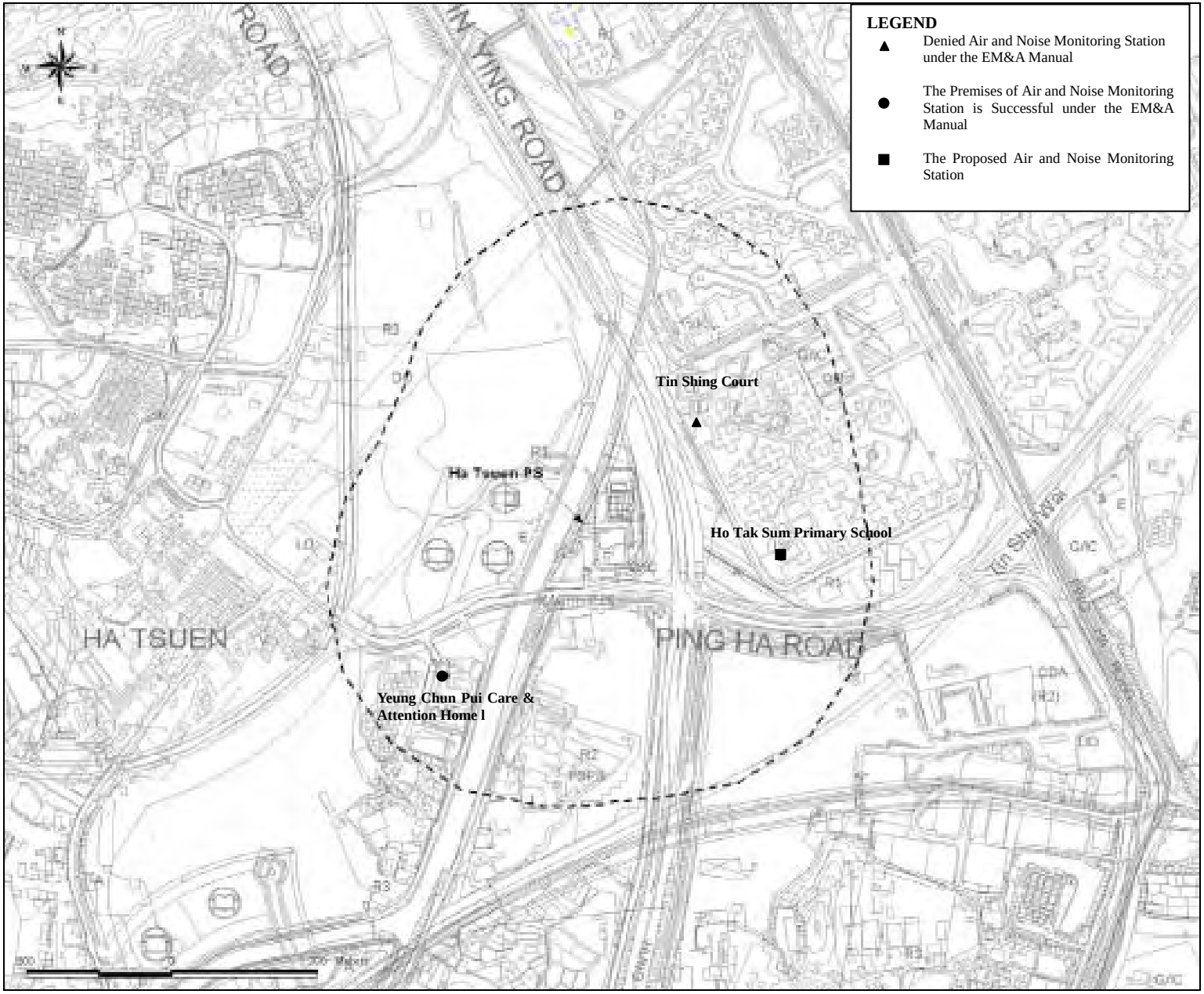
Early bar
Critical bar
Summary bar
Start milestone point
Finish milestone point

Initial Works Programme - Rev 02 (Ha Tsuen Area)

中國建築 CHINA STATE CONSTRUCTION

Appendix D

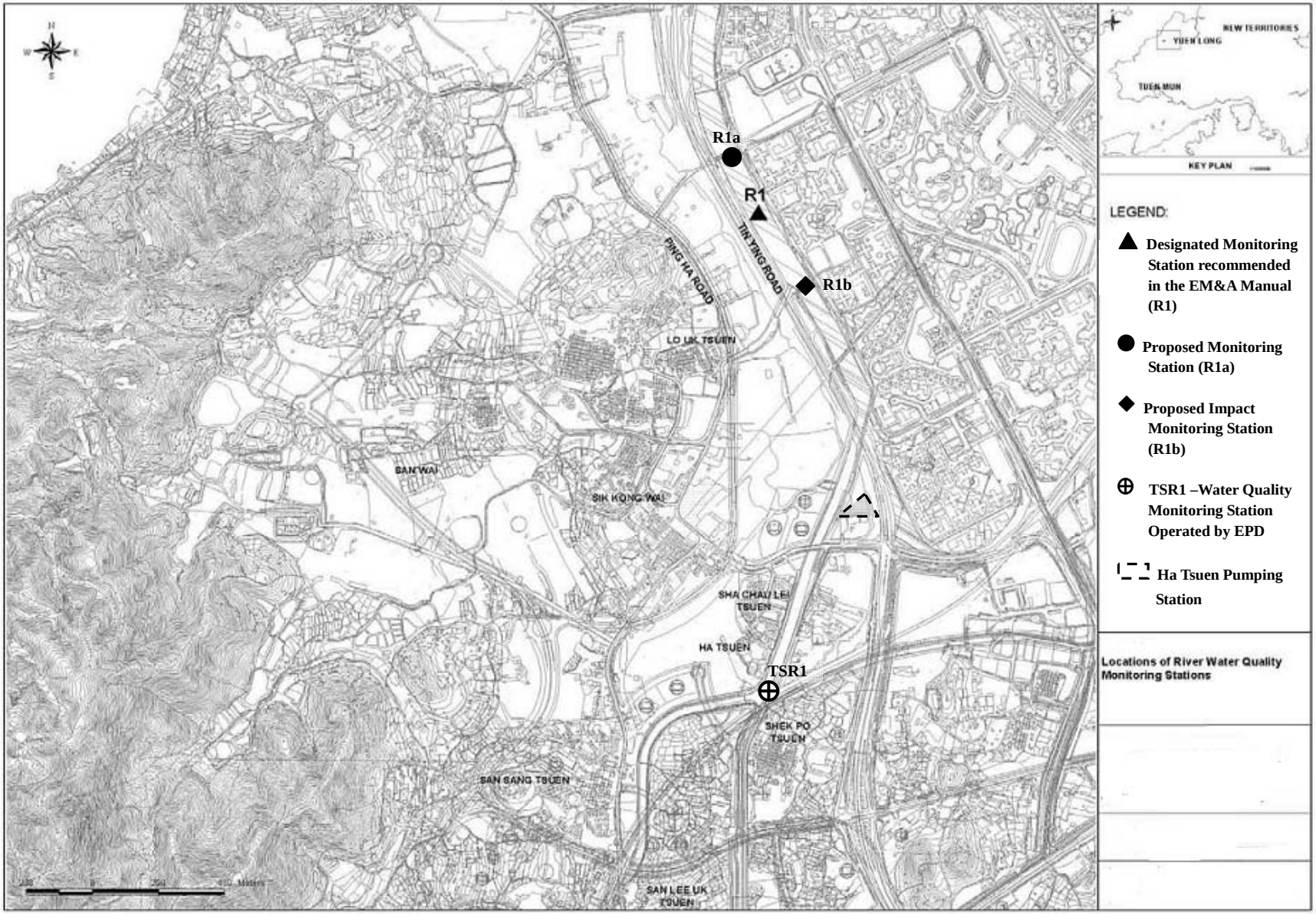
Monitoring Location of EM&A Programme


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

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

Proposed Water Quality Monitoring Location

AUES

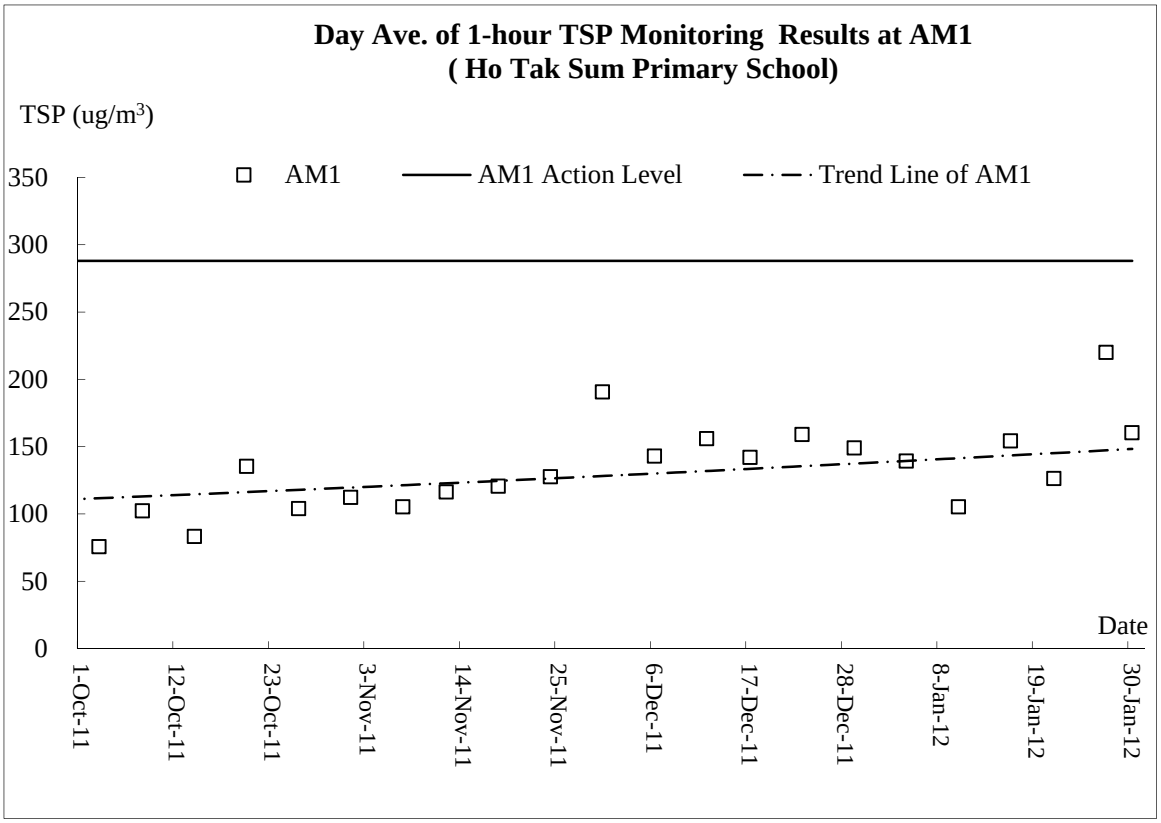


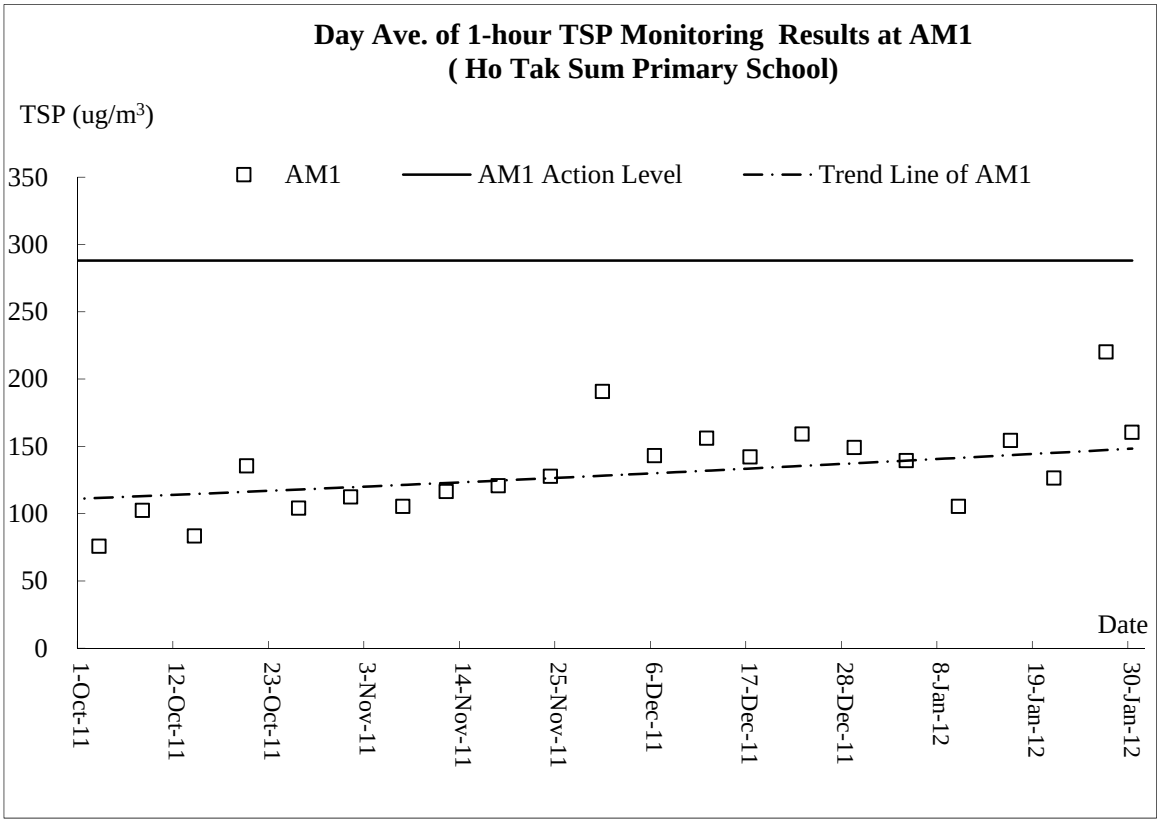
Appendix E

Graphic Plot of

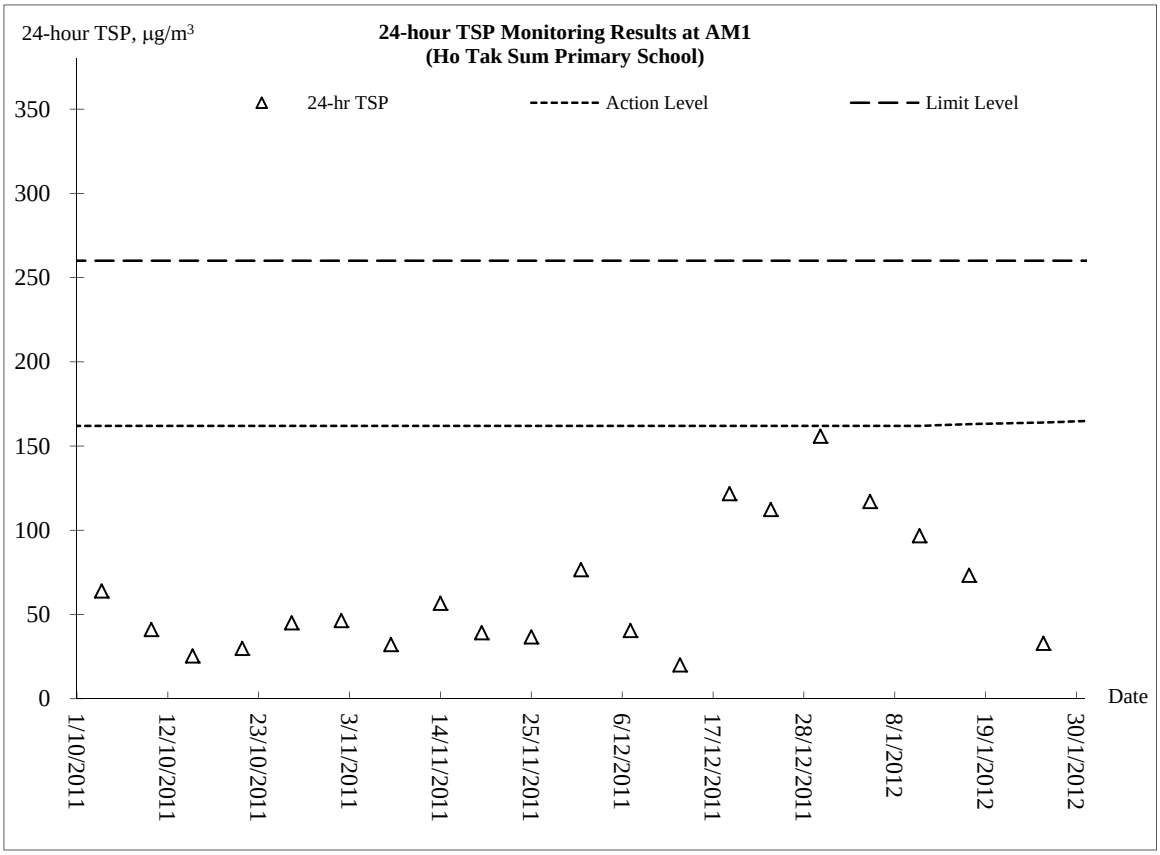
- Air Quality
- Construction Noise
- Water Quality

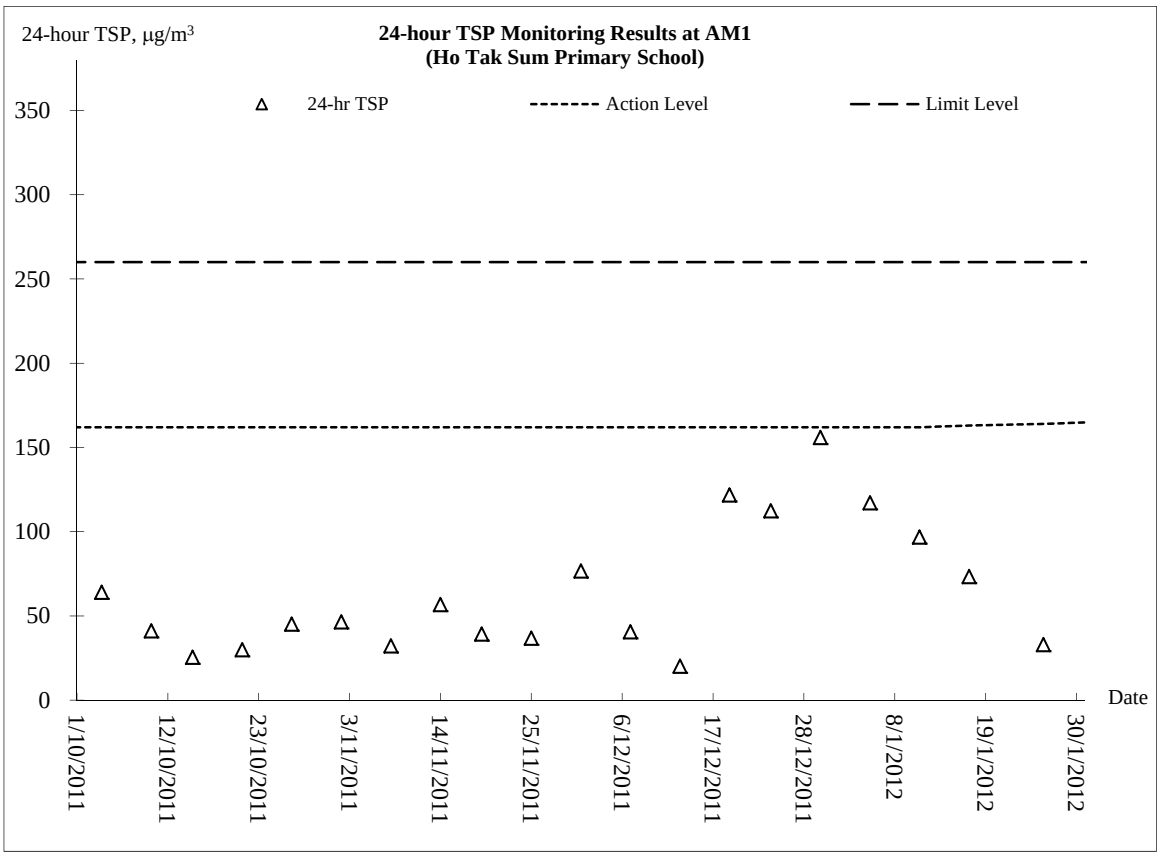
Air Quality – 1-hour TSP



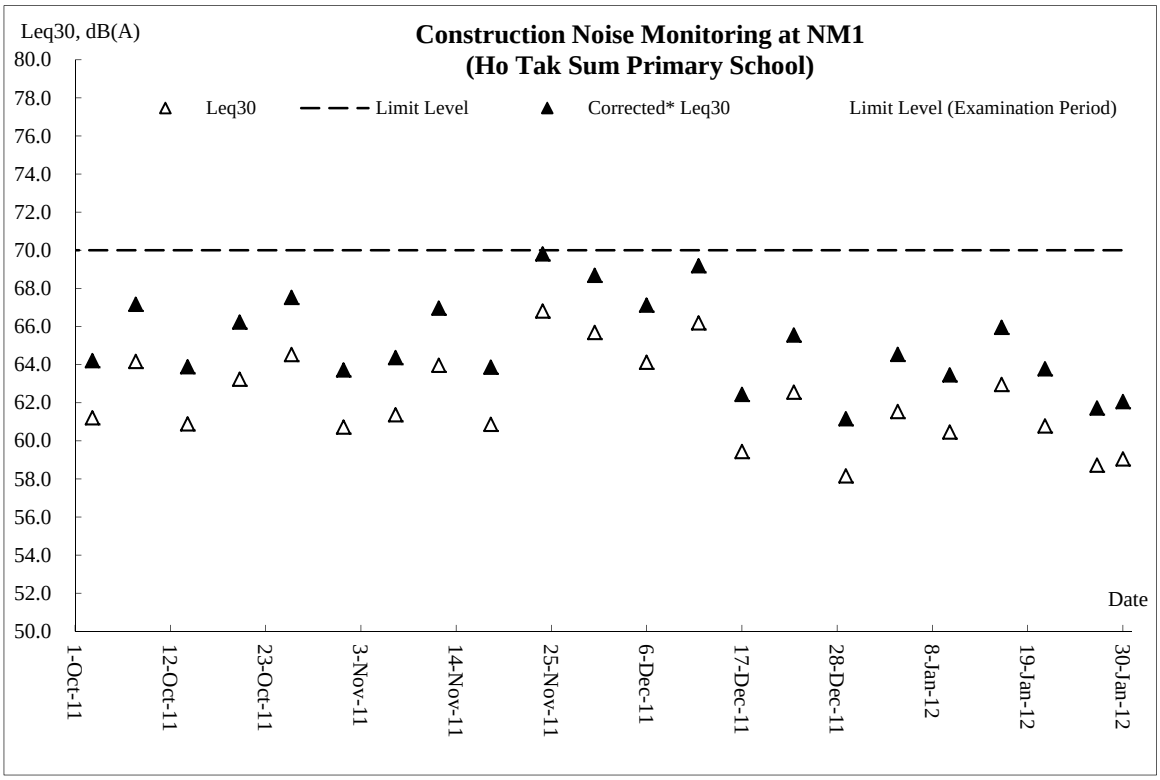


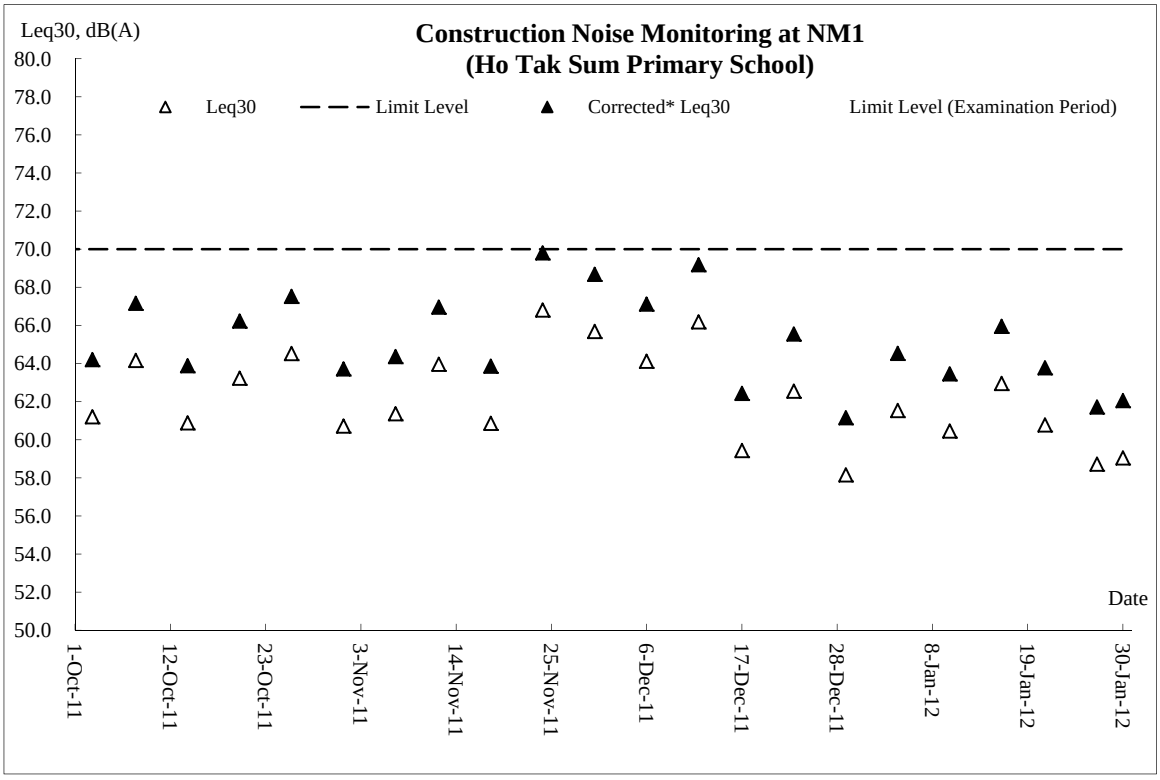
Air Quality – 24-hour TSP



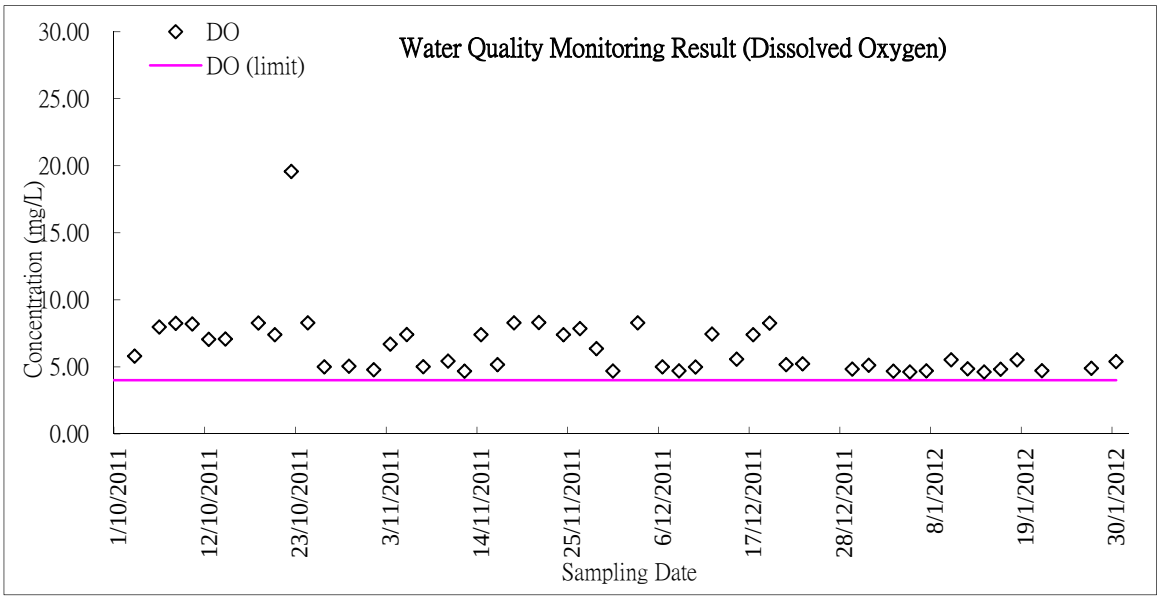


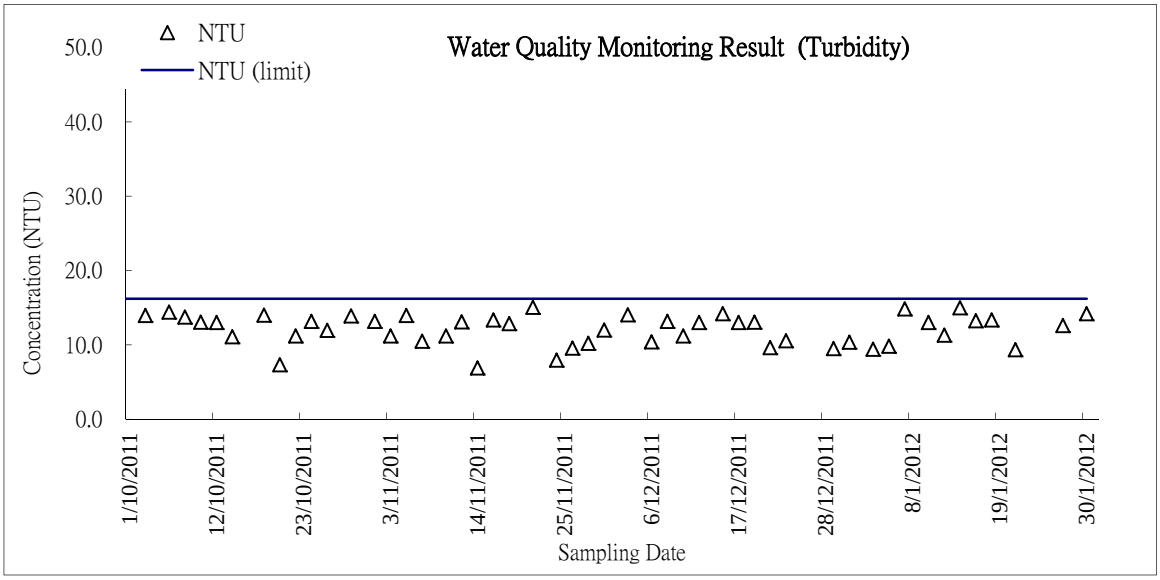
Construction Noise

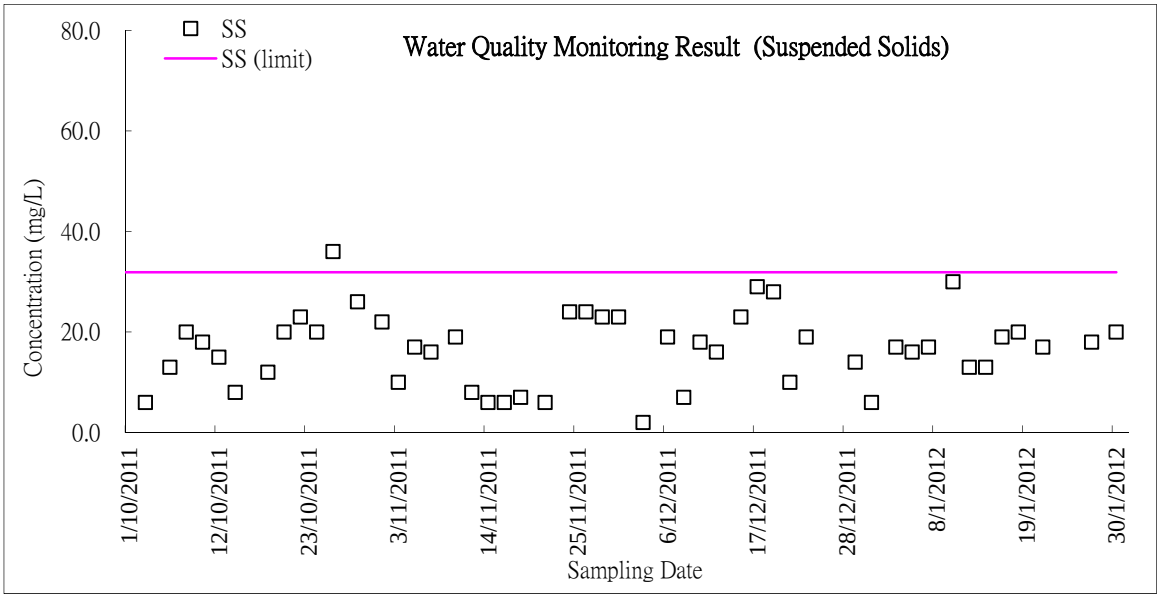




Water Quality (R1b)







Appendix F

Meteorological information

Meteorological Data Extracted from HKO – November 2011

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-11	Tue	Moderate east to northeasterly winds.	0	24	8.5	71.5	E/NE
2-Nov-11	Wed	cloudy	0	25.1	8.9	71	N/NE
3-Nov-11	Thu	Mainly cloudy with a few rain patches.	0	27.1	6.7	71	E/SE
4-Nov-11	Fri	Moderate east to northeasterly winds,	Trace	28.2	11.6	70	E/NE
5-Nov-11	Sat	Mainly cloudy with a few rain patches.	Trace	27.9	12	68.5	E/NE
6-Nov-11	Sun	Occasionally strong offshore and on high ground.	Trace	28.2	13.2	68	E
7-Nov-11	Mon	Fresh easterly winds	Trace	27.9	18.9	66	E
8-Nov-11	Tue	Cloudy to overcast with rain.	13.9	22.2	18	87.5	NE
9-Nov-11	Wed	Fresh northerly winds	44.2	19.2	14.3	95	NE
10-Nov-11	Thu	Fresh easterly winds	0.2	18.3	21	80	N
11-Nov-11	Fri	Fresh easterly winds	Trace	18.6	9	75	NE
12-Nov-11	Sat	Moderate east to northeasterly winds,	0	20.9	6.8	69.7	SE
13-Nov-11	Sun	Mainly cloudy with a few light rain patches.	0	22.2	7.7	71.5	SE
14-Nov-11	Mon	Sunny periods	Trace	24.1	9.5	73	E/NE
15-Nov-11	Tue	Mainly cloudy with a few rain patches.	0	25.7	8.3	65	E/NE
16-Nov-11	Wed	Moderate to fresh easterly winds.	0	24.2	11.6	73.2	E/NE
17-Nov-11	Thu	Moderate east to northeasterly winds,	18.1	23.4	10.2	86.5	E/NE
18-Nov-11	Fri	Fresh northerly winds	8.6	24.4	8.9	89	W/SW
19-Nov-11	Sat	Fresh easterly winds	1.1	25.5	10	70.5	E
20-Nov-11	Sun	Sunny periods	Trace	22.6	12.1	70.5	E
21-Nov-11	Mon	Moderate northeasterly winds.	Trace	22.1	12.5	65	E
22-Nov-11	Tue	Mainly cloudy.	Trace	21.7	8.3	71.2	E/NE
23-Nov-11	Wed	Cloudy with one or two rain patches.	Trace	22.7	11.7	59.7	NE
24-Nov-11	Thu	Moderate to fresh easterly winds.	0	20.2	9.1	53.5	E/NE
25-Nov-11	Fri	Moderate east to northeasterly winds,	0	20.4	10.7	70	E/NE
26-Nov-11	Sat	Mainly fine and dry	Trace	20.9	9.7	71.5	E/NE
27-Nov-11	Sun	Fresh northerly winds	0	21	11	69.5	N/NW
28-Nov-11	Mon	Mainly fine and dry	0	22.8	10.5	69.7	E
29-Nov-11	Tue	strong offshore and on high ground	0	23.7	9	70	E
30-Nov-11	Wed	Cloudy and rather cool	Trace	22.9	9.5	78	E

Meteorological Data Extracted from HKO – December 2011

Date		Weather		Lau Fau Shan Weather Station			
			Total Rainfall (mm)	Mean Air Temperature (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Dec-11	Thu	Mainly cloudy with relatively low visibility	0	17.3	23	66	N/NE
2-Dec-11	Fri	Moderate easterly winds	0	14	22	58.5	N
3-Dec-11	Sat	Sunny intervals	0	13.2	19	61	E
4-Dec-11	Sun	Moderate northeasterly winds,	0	16.7	10.4	57	N
5-Dec-11	Mon	Mainly cloudy.	1.2	19.9	14.9	66	E
6-Dec-11	Tue	Moderate easterly winds, occasionally fresh offshore.	1.2	21.4	11.9	74	E/NE
7-Dec-11	Wed	Mainly cloudy.	0	23.1	14.7	73.2	E/NE
8-Dec-11	Thu	Fresh northerly winds, occasionally strong offshore.	0	18.1	26.1	68	N
9-Dec-11	Fri	Moderate northerly winds	Trace	14.3	24.7	56.2	N/NE
10-Dec-11	Sat	fine and dry.	0	12.7	21	47.5	N/NE
11-Dec-11	Sun	It will be fine and very dry.	0	11.9	14.5	35	N
12-Dec-11	Mon	Fine and dry.	0	13.8	10	40	E/NE
13-Dec-11	Tue	Moderate northeasterly winds	Trace	16	11.4	52.7	E/NE
14-Dec-11	Wed	It will be fine and very dry.	0	18.5	8.3	54.7	E/NE
15-Dec-11	Thu	Moderate to fresh northerly winds.	0	18.9	11.8	55.2	N
16-Dec-11	Fri	Mainly cloudy.	0	16.1	18.5	50	NE
17-Dec-11	Sat	fine and dry.	Trace	15.5	11.7	52	NE
18-Dec-11	Sun	Mainly cloudy.	Trace	15.4	8.6	60	E
19-Dec-11	Mon	Moderate northeasterly winds.	0	15.6	11.3	65	E
20-Dec-11	Tue	Mainly cloudy.	Trace	17.5	11.9	68.2	E/NE
21-Dec-11	Wed	Mainly cloudy.	0	20	10.5	63.5	E/NE
22-Dec-11	Thu	Moderate north to northeasterly winds.	0	16.9	16.2	57.5	E/NE
23-Dec-11	Fri	Fine and dry.	0	13.7	16.8	59	NE
24-Dec-11	Sat	Mainly cloudy.	0	11.9	14.5	61	NE
25-Dec-11	Sun	holiday					
26-Dec-11	Mon	holiday					
27-Dec-11	Tue	holiday					
28-Dec-11	Wed	Mainly cloudy.	0	16.8	10	76	E/SE
29-Dec-11	Thu	Moderate north to northeasterly winds.	0	18.6	14.2	74	E/NE
30-Dec-11	Fri	Moderate northeasterly winds	Trace	17.6	12.5	74.5	NE
31-Dec-11	Sat	Fine and dry.	0.4	17.1	13.4	71	E.NE

Meteorological Data Extracted from HKO – January 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-Jan-12	Sun	Holiday					
2-Jan-12	Mon	Holiday					
3-Jan-12	Tue	Cloudy	0	17.4	11.7	68.5	E/NE
4-Jan-12	Wed	Fresh northerly winds	Trace	12.2	21	57.5	NE
5-Jan-12	Thu	Cloudy and misty.	0.8	8.9	14.7	77.5	NE
6-Jan-12	Fri	Mainly fine	0.5	10.5	11.4	84.7	E/NE
7-Jan-12	Sat	Mainly fine and dry.	0	12.1	12.7	81.7	E/NE
8-Jan-12	Sun	Mainly fine and dry.	0	14.4	14	70.7	N/NW
9-Jan-12	Mon	Cloudy	0	14.6	11.4	74	N/NE
10-Jan-12	Tue	Moderate north to northeasterly winds.	0	15.5	9.2	69.5	E
11-Jan-12	Wed	Cloudy and misty.	0.4	15.2	12.6	68.2	NE
12-Jan-12	Thu	Moderate north to northeasterly winds.	0.9	14.4	10	77	E/NE
13-Jan-12	Fri	Mainly fine and dry.	2.3	14.6	5.2	82.7	E/NE
14-Jan-12	Sat	Moderate north to northeasterly winds.	0.6	17.3	8.9	88.2	E/NE
15-Jan-12	Sun	Moderate easterly winds.	19.1	15.9	13.5	98.2	E/NE
16-Jan-12	Mon	Mainly fine and dry.	8.7	14.2	12.7	88.5	N/NW
17-Jan-12	Tue	Cloudy.	0	16	9.5	76	E/NE
18-Jan-12	Wed	Moderate northeasterly winds.	0	19.8	8.3	69.7	E/SE
19-Jan-12	Thu	Cloudy and cold	0	20.1	14	83.5	E
20-Jan-12	Fri	Cool	0	19.4	13.5	76	E
21-Jan-12	Sat	Cloudy and misty.	Trace	17	12.7	81	E
22-Jan-12	Sun	Holiday					
23-Jan-12	Mon	Holiday					
24-Jan-12	Tue	Holiday					
25-Jan-12	Wed	Holiday					
26-Jan-12	Thu	Cloudy and misty.	0.8	8.5	11.1	88.5	E/NE
27-Jan-12	Fri	Cloudy and misty.	0	12.2	8.5	84.2	N/NW
28-Jan-12	Sat	Moderate easterly winds.	0	16.2	7.9	82.7	N/NW
29-Jan-12	Sun	Moderate north to northeasterly winds.	0	14.7	11.5	84	W/SW
30-Jan-12	Mon	Cloudy.	0	15.5	14.4	70.5	NE
31-Jan-12	Tue	Mainly fine and dry.	0	14.5	11.6	59	NE