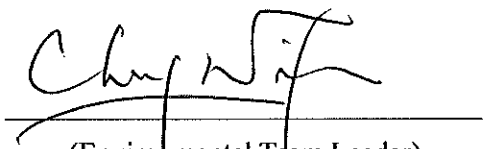
Contract No. DC/2009/23

HATS Stage 2A – Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central

Monthly Environmental Monitoring and Audit Report February 2011

(Version 1.1)

Certified By



(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties

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ABBREVIATION AND ACRONYM

AL Levels	Action and Limit Levels
DSD	Drainage Services Department
E / ER	Engineer/Engineer's Representative
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring and Audit
EMIS	Environmental Mitigation Implementation Schedule
EP	Environmental Permit
EPD	Environmental Protection Department
ET	Environmental Team
HVS	High Volume Sampler
IEC	Independent Environmental Checker
RE	Resident Engineer
RH	Relative Humidity
QA/QC	Quality Assurance / Quality Control
SLM	Sound Level Meter
WMP	Waste Management Plan
HATS 2A	Harbour Area Treatment Scheme Stage 2A

EXECUTIVE SUMMARY

Introduction

1. This is the 1st Monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for DSD Contract No. DC/2009/23 "HATS Stage 2A – Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central" (The Project) which documents the key information of EM&A and environmental monitoring works by Contract DC/2007/23 HATS Stage 2A with same Environmental Permit (Permit No. EP-322/2008/E).

2. The site activities undertaken for in the reporting month included:
   - Pit Excavation and Pre-drilling Work at North Point PTW.

Environmental Monitoring Works

3. The environmental monitoring works of the Project was conducted by the ET for the Contract: DC/2007/23 under HATS 2A with same Environmental Permit and in accordance with the EM&A Manual. The monitoring results were checked and reviewed. Site audits were conducted once per week. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.

4. Summary of the non-compliance of the reporting month is tabulated in **Table I**.

Table I Summary Table for Non-compliance Recorded in the Reporting Month

Monitoring Station	Parameter	No. of Exceedance		No. of Exceedance Due to the Project		Action Taken
		Action Level	Limit Level	Action Level	Limit Level	
AM1	1-hr TSP	0	0	0	0	N/A
	24-hr TSP	0	0	0	0	N/A
AM2	1-hr TSP	0	0	0	0	N/A
	24-hr TSP	0	0	0	0	N/A
AM3	1-hr TSP	0	0	0	0	N/A
	24-hr TSP	0	0	0	0	N/A
AM4	1-hr TSP	0	0	0	0	N/A
	24-hr TSP	0	0	0	0	N/A
NM1	Noise	0	0	0	0	N/A
NM2	Noise	0	0	0	0	N/A
NM3	Noise	0	0	0	0	N/A

1-hour TSP Monitoring

5. All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

24-hour TSP Monitoring

6. All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No

Action/Limit Level exceedance was recorded.

Construction Noise

7. All construction noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Environmental Licenses and Permits

8. Licenses/Permits granted to the Project include the Environmental Permit (EP) and Registered as a Chemical Waste Producer for North Point, Wan Chai East and Central PTWs sites.

Environmental Mitigation Implementation Schedule

9. According to the EIA Report Section 3.74, 4.56, 6.384, 9.154 and 13.44, air quality, noise, water quality, waste management and landscape and visual would be the key environmental issues and mitigation measures shall be implemented during the construction phase. Details of the implementation of mitigation measures are provided in the **Appendix J**.

Key Information in the Reporting Month

10. Summary of key information in the reporting month is tabulated in **Table II**.

Table II Summary Table for Key Information in the Reporting Month

Event	Event Details		Action Taken	Status	Remark
	Number	Nature			
Complaint received	0	---	N/A	N/A	---
Status of submissions under EP	0	---	N/A	N/A	---
Notifications of any summons & prosecutions received	0	---	N/A	N/A	---

Summary of Complaints and Prosecutions

11. No environmental complaint and prosecution was received for the Project in the reporting month.

12. There were no environmental complaint and prosecution received since the commencement of the Project. The Complaint Log is presented in **Appendix K**

Future Key Issues:

13. Major site activities for the coming two months include:
    - Pit Excavation and Pre-drilling Work at North Point PTW.

14. The environmental concerns in coming months are mainly on chemicals storage, chemical waste management; drainage system and waste water generated from the construction works.

1. INTRODUCTION

Background

1.1 The Project 'HATS Stage 2A - Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central with Contract No: DC/2009/23' mainly comprises the following major works:

- Decommissioning, demolition and removal of existing structures and buildings, including the assoicated E&M works;
- Relocation of sewers, control room, workshop equipment and the associated E&M works; and
- Construction of new buildings and structures.

1.2 The general location plan of the Project is shown in **Figure 1**.

1.3 The Project is under Harbour Area Treatment Scheme (HATS) Stage 2A and is a designated project (Register No. : AEIAR-121/2008). The environmental permit: (Permit No. EP-322/2008/E) which was issued on 24th November 2010 to the Drainage Services Department (hereinafter called the DSD) as the Permit Holder.

1.4 Leader and JEC Joint Venture (hereafter called the LJJV) was commissioned by the DSD to undertake the construction of the Contract No.DC/2009/23 "Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central". The date of commencement of construction of the Project is14th February 2011.

1.5 Cinotech Consultants Limited was commissioned by LJJV to undertake the Environmental Monitoring and Audit (EM&A) works for the project and was appointed as the Environmental Team (ET) of the Project under Condition 2.1 of the EP.

1.6 This is the 1st monthly EM&A report summarizing the EM&A works conducted for the Project in February 2011.

Project Organizations

1.7 The contacts of the Project are shown in **Table 1.1** and the organization chart of ET for Contract is shown in **Figure 2**.

Table 1.1 Key Project Contacts

Party	Role	Name	Position	Phone No.
Ove Arup & Partners Hong Kong Ltd	Engineer's Representative	Mr. Ted Tang	Principle Resident Engineer	2370-4311
	Coordinator	Ms. Natalie Kwok	Resident Engineer	67948844
Cinotech	Environmental Team	Dr. Priscilla Choy	ET Leader	2151 2089
		Mr. Gary Lau	Project Coordinator & Audit Team Leader	2151 2098
Mott MacDonald	Independent Environmental Checker	Dr. Anne Kerr	Independent Environmental Checker	28285757

Party	Role	Name	Position	Phone No.
Leader and JEC Joint Venture	Contractor	Mr. Rex Lau	Site Agent	22723680
		Mr. Y.F. Leung	Environmental Officer	96855869

Construction Programme

1.8 The site activities undertaken in the reporting month included:

- Pit Excavation and Pre-drilling Work at North Point PTW.

Summary of EM&A Requirements

1.9 The EM&A programme requires construction phase monitoring for air quality and construction noise, landscape and visual and environmental site audit. The EM&A requirements for each parameter are described in the following sections, including:

- All monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event Action Plans;
- Environmental mitigation measures, as recommended in the project EIA study final report; and
- Environmental requirements in contract documents.

1.10 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in **Section 4** of this report.

1.11 This report presents the monitoring results, observations, locations, equipment, period, for required monitoring parameter namely dust, noise levels, and audit works conducted for the Project in February 2011. For the methodology and QA/QC procedures of the monitoring parameters, please refer to the monthly report for the Contract DC/2007/23.

2. AIR QUALITY

Monitoring Requirements

2.1 1-hour and 24-hour TSP monitoring were conducted to monitor the air quality. **Appendix A** shows the established Action/Limit Levels for the environmental monitoring works.

Monitoring Locations

2.2 Four designated monitoring stations, AM1, AM2, AM3 and AM4 were selected for impact dust monitoring for the Project. Table 2.1 describes the air quality monitoring locations, which are also depicted in **Figure 1**.

Table 2.1 Locations for Air Quality Monitoring

Monitoring Station	Monitored by	Location of Measurement
AM1	DC/2007/23	Chan's Creative School
AM2		Hong Kong & Islands Regional Office, WSD
AM3		Wan Chai East PTW
AM4		A Location within the DSD Central PTW

Monitoring Equipment

2.3 **Table 2.2** summarizes the equipment used in the impact air monitoring programme. Copies of calibration certificates are attached in **Appendix B**.

Table 2.2 Air Quality Monitoring Equipment

Monitoring Station	Model and Make	
	HVS Sampler	Calibrator
AM1	GMW GS-2310 (S/N 1808)	CM-AIR-43 (S/N 9833620)
AM2	GMW GS-2310 (S/N 0145)	
AM3	GMW GS-2310 (S/N 0481)	
AM4	GMW GS-2310 (S/N 9315)	

Monitoring Parameters, Frequency and Duration

2.4 **Table 2.3** summarizes the monitoring parameters and frequencies of impact dust monitoring for the whole construction period. The air quality monitoring schedule for the reporting period is shown in **Appendix C**.

Table 2.3 Impact Dust Monitoring Parameters, Frequency and Duration

Monitoring Station	Parameter	Period	Frequency
All monitoring locations	1-hour TSP	0700-1900 hrs	3 times/ every 6 days
	24-hour TSP	0000-2400 hrs	once in every 6 days

Monitoring Methodology and QA/QC Procedure

2.5 The monitoring methodology and QA/QC procedures are presented in the monthly report for Contract DC/2007/23.

Results and Observations

2.6 **Table 2.4** summarizes the monitoring results at AM1, AM2, AM3 and AM4 in reporting month.

Table 2.4 Summary of 1-hour and 24-hour TSP Monitoring Result in Reporting Month

Air Quality Monitoring Station	Average $\mu g/m^3$	Range $\mu g/m^3$	Action Level $\mu g/m^3$	Limit Level $\mu g/m^3$
1 hour TSP				
AM1	157	116-234	340	500
AM2	171	139-213	352	
AM3	154	99-263	355	
AM4	266	181-343	393	
24 hours TSP				
AM1	87	81-101	185	260
AM2	90	87-93	182	
AM3	71	60-81	181	
AM4	100	75-132	211	

2.7 All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded. Summary of exceedance is presented in **Appendix F.**

2.8 All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded. Summary of exceedance is presented in **Appendix F.**

2.9 The monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results are extracted from the monthly reports of Contract DC/2007/23and shown in **Appendix D**.

2.10 According to field observations during site inspection, the identified dust sources at the monitoring stations were mainly from loading of material, vehicles movement and construction works in site.

3 NOISE

Monitoring Requirements

3.1 Three noise monitoring stations, namely NM1, NM2 and NM3 were designated in the EM&A Manual for impact monitoring. **Appendix A** shows the established Action and Limit Levels for the environmental monitoring works.

Monitoring Locations

3.2 Noise monitoring was conducted at three designated monitoring stations as listed in **Table 3.1.**

Table 3.1 Location of Noise Monitoring Stations

Monitoring Station	Monitored By	Location of Measurement
NM1	DC/2007/23	Chan's Creative School
NM2		Hyde Building
NM3		Goldfield Building

Monitoring Equipment

3.3 **Table 3.2** summarizes the noise monitoring equipments. Copies of calibration certificates are provided in **Appendix B**.

Table 3.2 Noise Monitoring Equipment

Monitoring Station	Model and Make	
	Sound Level Meter	Calibrator
NM1	Rion NL-31 (S/N 00320533) Rion NL-31 (S/N 00410224) Rion NL-31 (S/N 00983400)	Rion NC-73 (S/N 10786708) Rion NC-73 (S/N 10997142)
NM2		
NM3		

Monitoring Parameters, Frequency and Duration

3.4 Table 3.3 summarizes the monitoring parameters, frequency and total duration of monitoring. The noise monitoring schedule is shown in **Appendix C**.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Monitoring Stations	Parameter	Period	Frequency
NM1 NM2 NM3	L_{eq}(30 min.) dB(A)	0700-1900 hrs. on weekdays	Once per week

Monitoring Methodology and QA/QC Procedures

3.5 The monitoring methodology and QA/QC procedure could be referring to the monthly report for Contract DC/2007/23.

Results and Observations

3.6 **Table 3.4** summarizes the monitoring results at NM1, NM2 and NM3 in reporting month.

Table 3.4 Summary the Noise Monitoring Results in Reporting Month

For the time period 0700-1900 hrs. on weekdays		
Monitoring Station	Range, dB(A) L_{eq}(30 min.)	Limit Level ,dB(A) L_{eq}(30 min.)
NM1	66.2-67.6	75.0
NM2	72.7-73.4	
NM3	74.7-75.0	

3.7 The construction noise monitoring at the designated locations was conducted by the ET of Contract: DC/2007/23 as scheduled in the reporting month. The monitoring results could be referring to Annex C6, D6 and E6 of the monthly report for Contract DC/2007/23.

3.8 No construction work was conducted during the restricted hours under the Project in the reporting month.

3.9 No Action/Limit Level exceedance was recorded in the reporting month. Summary of exceedance is presented in **Appendix F.**

3.10 Noise monitoring results and graphical presentations are extracted from the monthly report of Contract DC/2007/23 and shown in **Appendix E**.

3.11 The major noise sources identified at the designated noise monitoring stations were traffic noise and construction activities.

4 ENVIRONMENTAL AUDIT

Site Audits

4.1 Site audits were carried out on a weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site.

4.2 Two Environmental site audits were conducted on 17 and 23 February 2011 in the reporting month for the Project. No non-compliance was observed during the site audits.

4.3 Site inspections were undertaken to ensure and check that the implementation and maintenance of landscape and visual mitigation measures are being properly carried out in the reporting month in accordance to section 14.1 of the EM&A Manual. No non-compliance was observed during the site inspections.

4.4 The summaries of site audits are attached in **Appendix G**.

Review of Environmental Monitoring Procedures

4.5 The monitoring works conducted by the monitoring team of Contract DC/2007/23. The monitoring procedures were reviewed by its ET.

Status of Environmental Licensing and Permitting

4.6 All permits/licenses obtained for the Contract DC/2009/23 are summarized in **Table 4.1**.

Table 4.1 Summary of Environmental Licensing and Permit Status for Contract DC/2009/23

Ref. No.	Valid Period		Details	Status
	From	To		
Water Discharge License				
N/A	N/A	N/A	Location: North Point PTW	Under Application
N/A	N/A	N/A	Location: Wan Chai East PTW	Under Application
N/A	N/A	N/A	Location: Central PTW	Under Application
Registered Chemical Waste Producer				
5213-153-L2743-01	15/02/2011	N/A	Location: North Point PTW	Valid
5213-115-L2737-01	26/01/2011	N/A	Location: Wan Chai East PTW	Valid
5213-134-L2745-01	16/02/2011	N/A	Location: Central PTW	Valid

Status of Waste Management

4.7 The amount of wastes generated by the activities of the Project in the reporting month is shown in **Appendix H.**

Implementation Status of Environmental Mitigation Measures

4.8 Details of the implementation of mitigation measures are provided in the **Appendix J.**

4.9 During the weekly environmental site inspections in the reporting period, no non-conformance was identified. The observations and recommendations for the Projects are summarized in **Table 4.2.**

Table 4.2 Observations and Recommendations of Site Audit

Parameters	Date/Ref. Number	Observations	Follow Up Action
Water Quality	**--**	--	--
Air Quality	**--**	--	--
Waste/ Chemical Management	**17/2/2011 R01**	To provide drip tray for the Chemical containers at North Point PTW.	Drip tray was provided by the Contractor to contain the chemical containers, and covered by tarpaulin
	23/2/2011 R01	To provide chemical storage area at North Point PTW	LLJV reported that chemical storage facilities had been arranged and to be deployed on site in early March 2011. The situation was remarked as item 110303-O01 on 3/3/2011.
Landscape and Visual	**23/2/2011 R02**	To erect tree protection fence for trees in pre-drill area before tree transplantation at North Point PTW	The trees in the pre-drill area were fenced off by the Contractor.
Permit/ Licences	**--**	--	--

Implementation Status of Event Action Plans

4.10 The Event Action Plans for air quality and noise are presented in **Appendix I.**

1-hr TSP

4.11 No Action/Limit Level exceedance was recorded.

24-hr TSP

4.12 No Action/Limit Level exceedance was recorded.

Construction Noise

4.13 No Action/Limit Level exceedance was recorded.

Landscape and Visual

4.14 No non-compliance was recorded.

Summary of Complaints and Prosecutions

4.15 No environmental complaint and prosecution was received for the Project in the reporting month.

4.16 There were no environmental complaint and prosecution received since the commencement of the Project. The Complaint Log is presented in **Appendix K.**

5. FUTURE KEY ISSUES

Key Issues for the Coming Month

5.1 Key environmental issues in the coming month include:

- Generation of dust from stockpiles of excavated and dusty materials, unpaved site area and vehicle movement, roadworks, excavation works and loading and unloading dusty materials on-site;
- Noise from operation of equipment and machinery on-site;
- Storage of chemicals/fuel and chemical waste/waste oil on-site;
- Ponding water generated in pre-drillings;
- Drainage system should be well designed and maintained to prevent flooding and silty water getting into the public area during and after rainstorm;
- Silty surface runoff generated from the site area; and
- Silt and dust getting into the public area by the leaving site vehicles at the site exits without adequate wheel washing facilities.

Monitoring Schedule for the Next Month

5.2 The tentative environmental monitoring schedules for the next month are shown in **Appendix C**.

Construction Program for the Next Month

5.3 The tentative construction program is provided in **Appendix L.**

6. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

6.1 Environmental monitoring and audit works were performed in the reporting month and all monitoring results were checked and reviewed.

1-hour TSP Monitoring

6.2 All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

24-hour TSP Monitoring

6.3 All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Construction Noise Monitoring

6.4 All Consturction Noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Environmental Audit

6.5 Environmental site audits were conducted as weekly basis in the reporting month. No non-compliance was recorded.

Complaint and Prosecution

6.6 No environmental complaint and prosecution was received in the reporting month.

Recommendations

6.7 According to the environmental audit performed in the reporting month, the following recommendations were made:

Dust Impact

- To prohibit any open burning on site;
- To regularly maintain the machinery and vehicles on site;
- To follow up any exceedance caused by the construction works;

Noise Impact

- To inspect the noise sources inside the site;
- To follow up any exceedance caused by the construction works;
- To space out noisy equipment and position the equipment as far away as possible from sensitive receivers;
- To provide temporary noise barriers for operations of noisy equipment near the noise sensitive receivers in an appropriate location.
- To provide adequate lubricant on mechanical equipments to reduce frictional noise; and
- To well maintain the mechanical equipments / machineries to avoid abnormal noise nuisance.

Water Impact

- To identify any discharge of wastewater from the construction site;
- To avoid any discharge of wastewater by-pass/ without the desilting facilities from the construction site;
- To avoid water from accumulation on site and carry out larviciding against mosquito breeding for stagnant water when mosquito larvae are observed.

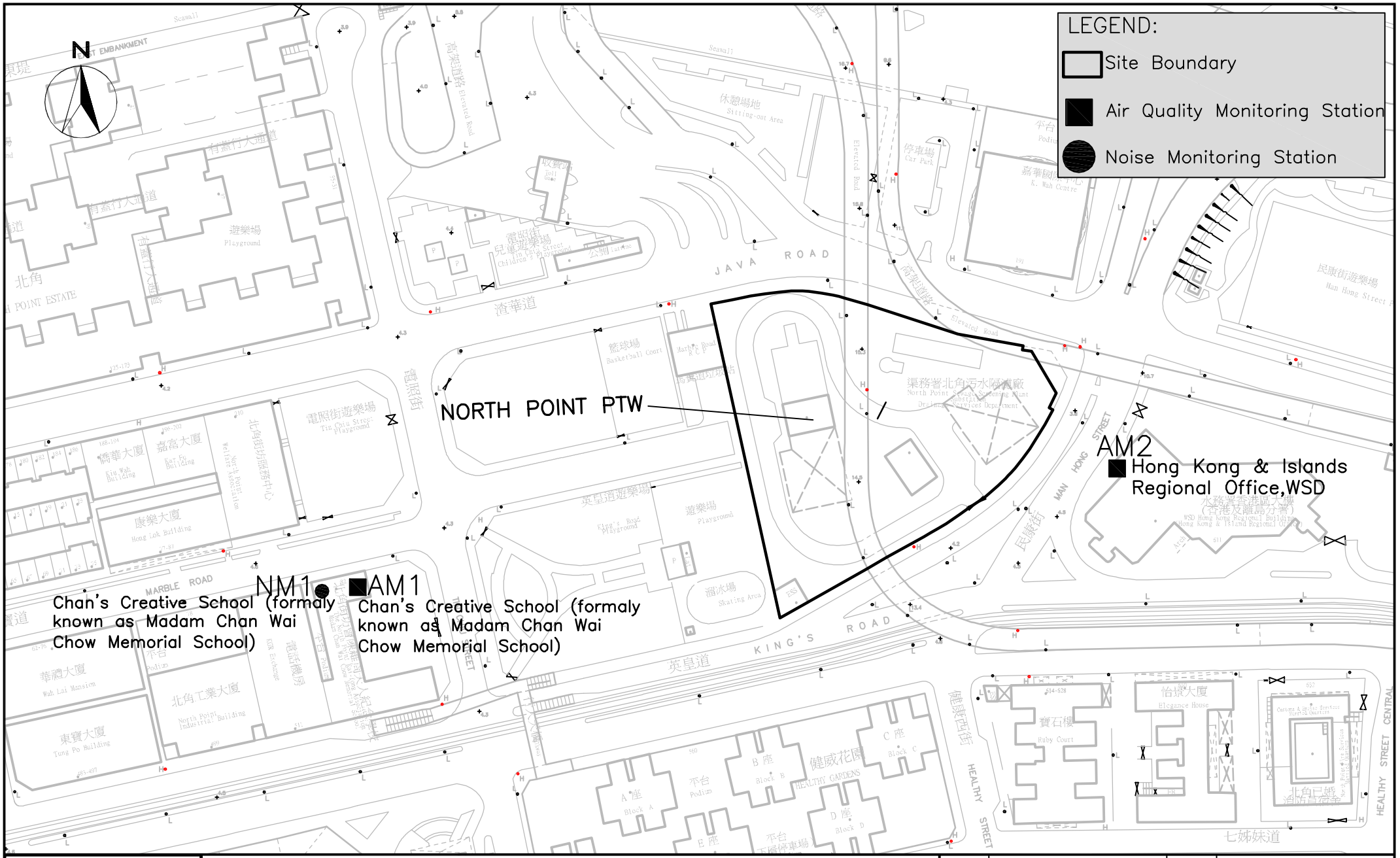
Waste/Chemical Management

- To provide proper rubbish bins / skips for waste collection;
- To check for any accumulation of wasted materials or rubbish on site;
- To provide proper storage area or drip trays for oil containers/ equipments on site;
- To avoid any discharge or accidental spillage of chemical waste or oil directly from the equipment;
- To well maintain the equipments and drip trays to avoid oil leakage; and
- To avoid improper handling or storage of oil drum on site.

Landscape and Visual

- To erect and maintain the protection fence around the retaining tree;
- To avoid any heavy materials placed into tree protection zone.

FIGURES



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Contract No. DC/2009/23 – Harbour Area Treatment Stage 2A – Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central

Impact Air Quality & Noise Monitoring Stations (North Point)

SCALE	N.T.S	DATE	11 MAR 2011
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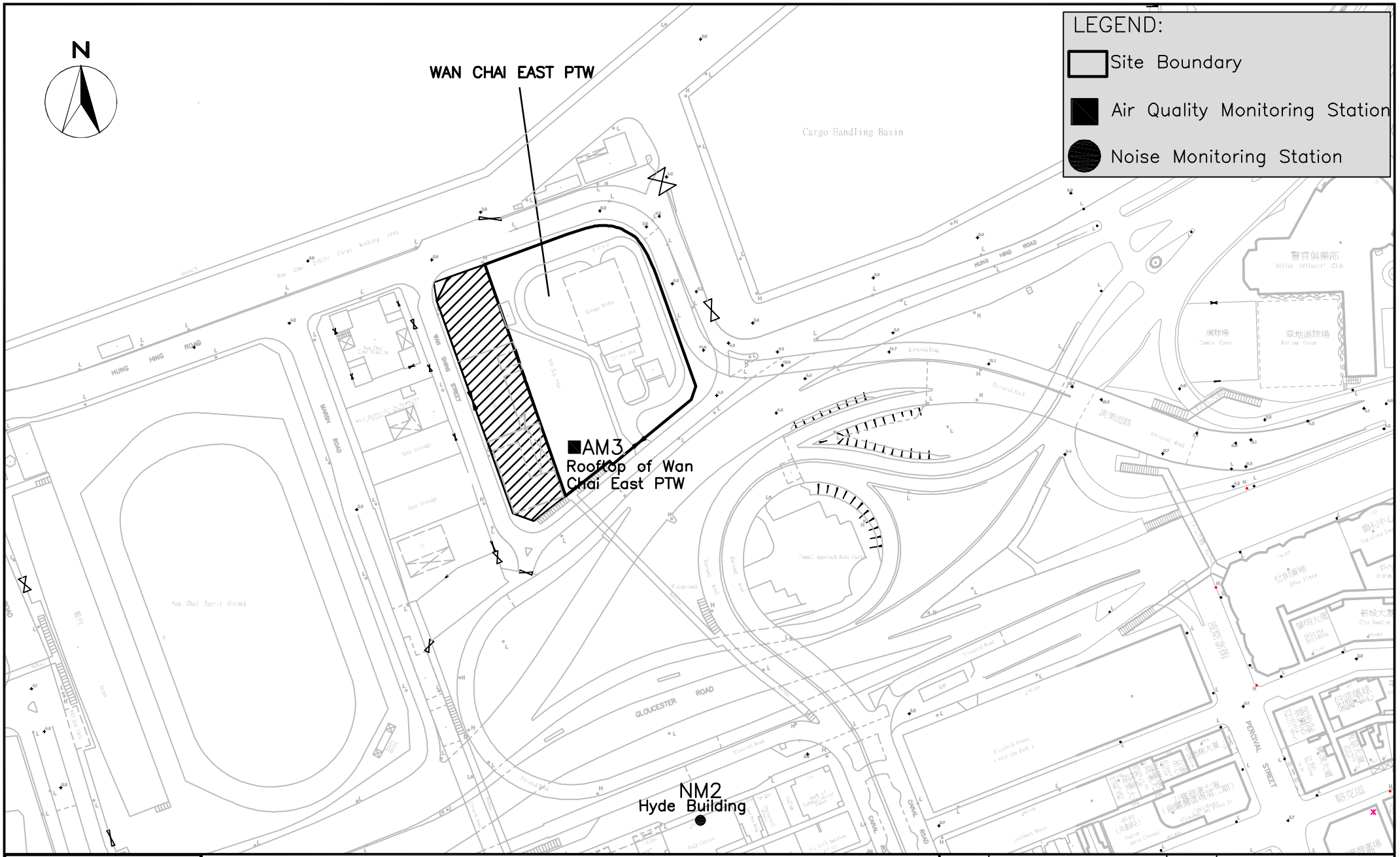
PROJECT NO.	MA11003	FIGURE NO.	1A
		REV	–



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Contract No. DC/2009/23 – Harbour Area Treatment Stage 2A – Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central

Impact Air Quality & Noise Monitoring Stations (Wan Chai East)

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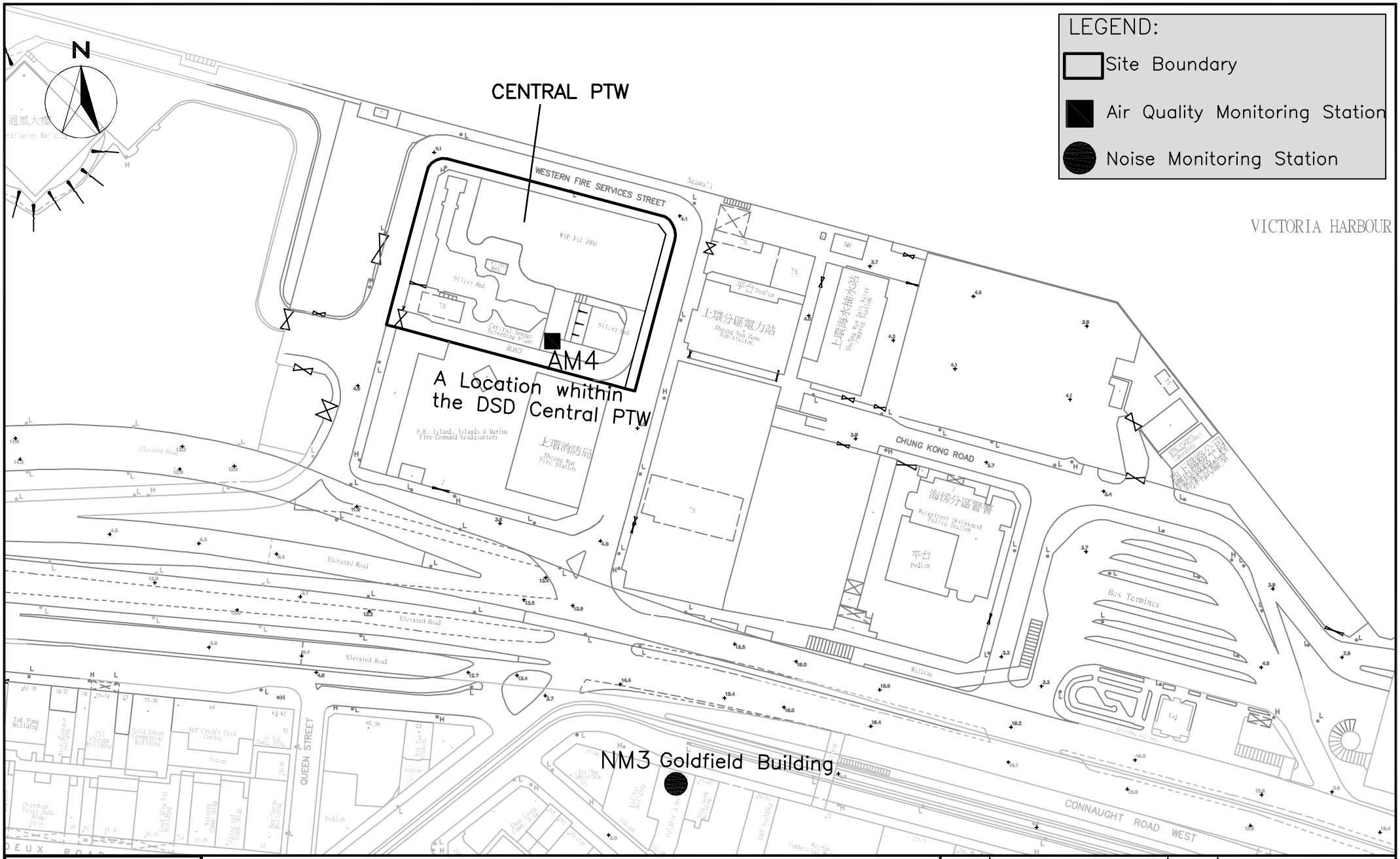
PROJECT NO.	MA11003	FIGURE NO.	1B
		REV	–



CINOTECH consultants limited

Contract No. DC/2009/23 – Harbour Area Treatment Stage 2A – Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central

Impact Air Quality & Noise Monitoring Stations (Central)

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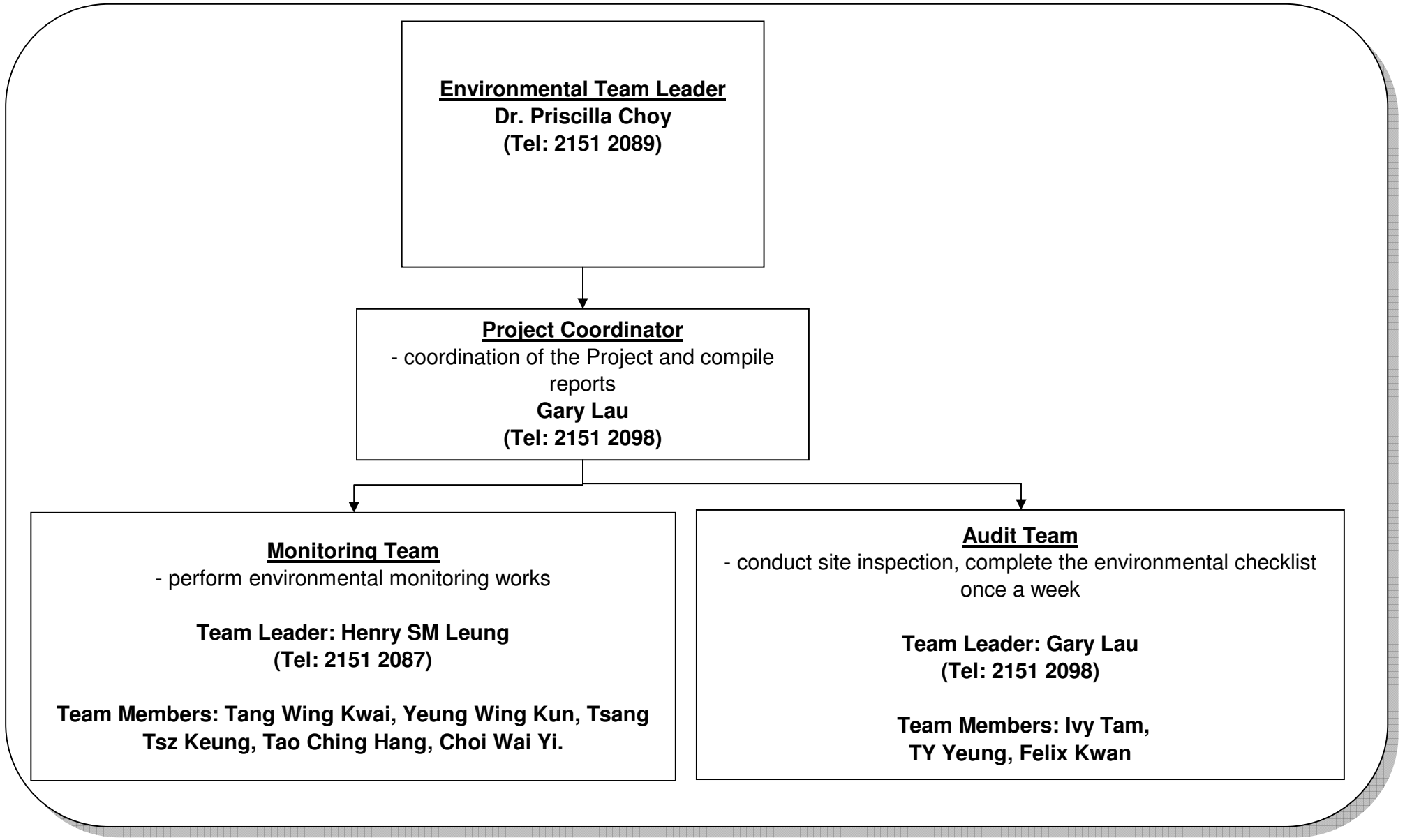
CHECK	GL	DRAWN	TW
PROJECT NO.	MA11003	FIGURE NO.	1C
		REV	–



Title: Contract No. DC/2009/17 HATS 2A - Sludge Dewatering Facilities at Stonecutters Island STW ET's Organization Chart	Scale: N.T.S	Project No.: MA0063	CINOTECH
	Date: Nov-10	Figure: 2	

APPENDIX A
ACTION AND LIMIT LEVELS FOR AIR QUALITY AND NOISE QUALITY

Appendix A Action and Limit Levels

Table A-1 Action and Limit Levels for 1-Hour TSP and 24-Hour TSP

Monitoring Stations	Action Level ($\mu g/m^3$)		Limit Level ($\mu g/m^3$)	
	1-hour	24-hour	1-hour	24-hour
AM1	340	185	500	260
AM2	352	182		
AM3	355	181		
AM4	393	211		

Table A-2 Action and Limit Level for Construction Noise

Monitoring Stations	Time Period	Action Level	Limit Level in dB(A)
NM1, NM2 and NM3	0700-1900 hours on normal weekdays	When one documented complaint is received	75

APPENDIX B
COPIES OF CALIBRATION CERTIFICATES

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

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 10, 2010 Rootsmeter S/N 9833620 Ta (K) - 296
Operator Tisch Orifice I.D. - 1785 Pa (mm) - 750.57

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3960	3.2	2.00
2	NA	NA	1.00	0.9840	6.4	4.00
3	NA	NA	1.00	0.8790	7.9	5.00
4	NA	NA	1.00	0.8390	8.7	5.50
5	NA	NA	1.00	0.6940	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9900	0.7092	1.4102		0.9957	0.7133	0.8881
0.9858	1.0018	1.9943		0.9915	1.0076	1.2560
0.9837	1.1191	2.2296		0.9894	1.1256	1.4042
0.9827	1.1713	2.3385		0.9884	1.1781	1.4728
0.9774	1.4084	2.8203		0.9830	1.4165	1.7762
Qstd slope (m) =	2.01637			Qa slope (m) =	1.26262	
intercept (b) =	-0.02316			intercept (b) =	-0.01458	
coefficient (r) =	0.99996			coefficient (r) =	0.99996	
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

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

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

For subsequent flow rate calculations:

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

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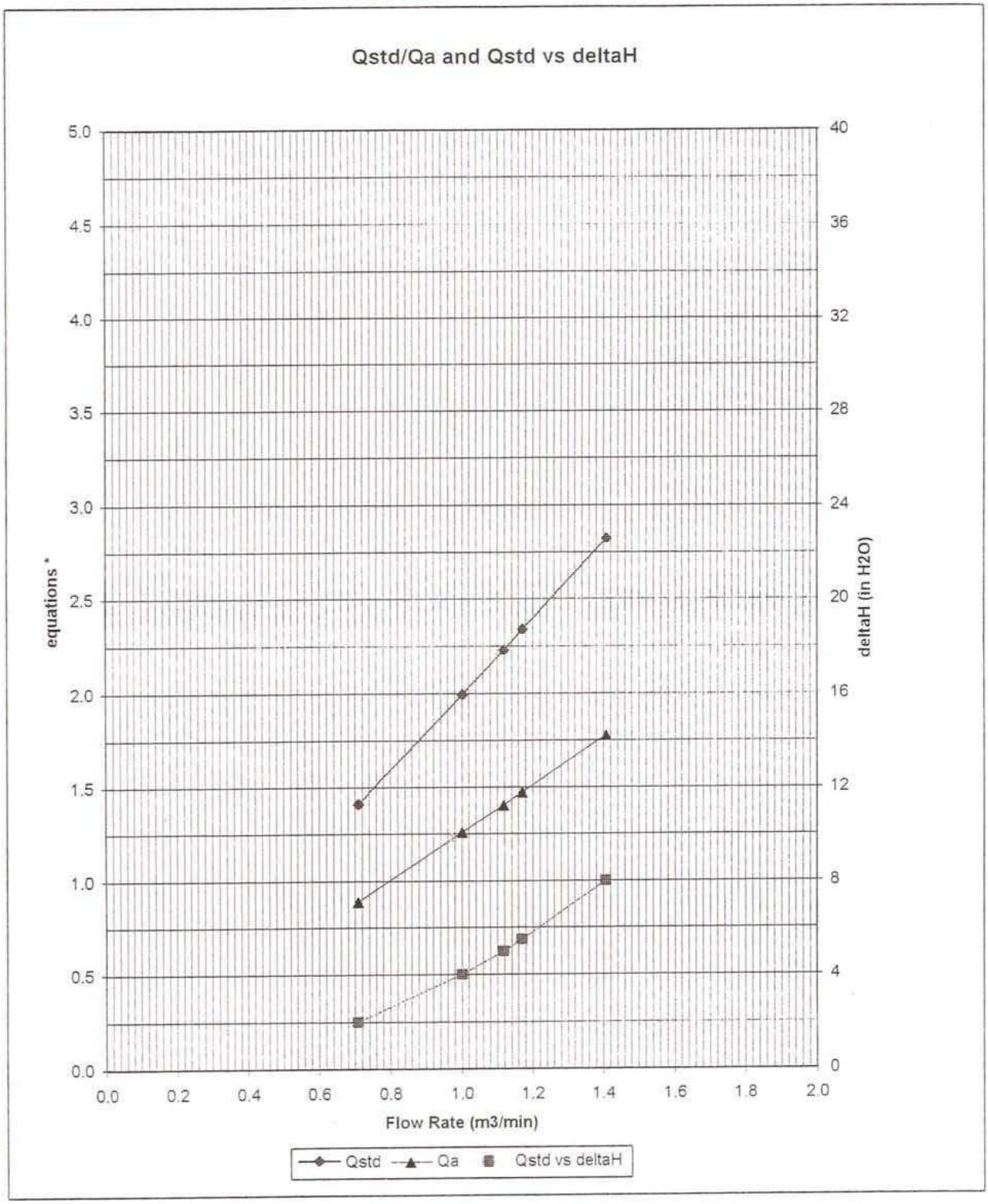
877.263.7610 TOLL FREE
513.467.9009 FAX
WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT



* y-axis equations:

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

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

#1785

High-Volume TSP Sampler
5-Point Calibration Record

Location : AM1
Calibrated by : K.T.Ho
Date : 20/01/2011

Sampler
Model : GMWS-2310 ACCU-VOL
Serial Number : S/N 1808

Calibration Orfice and Standard Calibration Relationship
Serial Number : 1785
Service Date : 10 May 2010
Slope (m) : 2.01637
Intercept (b) : -0.02316
Correlation Coefficient(r) : 0.99996

Standard Condition
Pstd (hpa) : 1013
Tstd (K) : 298.18

Calibration Condition
Pa (hpa) : 1013
Ta(K) : 297

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	12.6	3.609	1.801	67	68.1
2	13 holes	10.0	3.215	1.606	58	59.0
3	10 holes	7.8	2.839	1.420	50	50.8
4	7 holes	5.0	2.273	1.139	38	38.6
5	5 holes	3.1	1.790	0.899	27	27.5

Sampler Calibration Relationship

Slope(m):44.753 Intercept(b): -12.646 Correlation Coefficient(r): 0.9999

Checked by: Magnum Fan Date: 24/01/2011

High-Volume TSP Sampler
5-Point Calibration Record

Location : AM2
Calibrated by : K.T.Ho
Date : 20/01/2011

Sampler
Model : GMWS-2310 ACCU-VOL
Serial Number : S/N 0145

Calibration Orfice and Standard Calibration Relationship
Serial Number : 1785
Service Date : 10 May 2010
Slope (m) : 2.01637
Intercept (b) : -0.02316
Correlation Coefficient(r) : 0.99996

Standard Condition
Pstd (hpa) : 1013
Tstd (K) : 298.18

Calibration Condition
Pa (hpa) : 1013
Ta(K) : 297

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	11.8	3.492	1.743	64	65.1
2	13 holes	9.4	3.117	1.557	57	58.0
3	10 holes	7.2	2.728	1.364	49	49.8
4	7 holes	4.6	2.181	1.093	39	39.7
5	5 holes	2.8	1.701	0.855	29	29.5

Sampler Calibration Relationship

Slope(m):39.917 Intercept(b): -4.403 Correlation Coefficient(r): 0.9998

Checked by: Magnum Fan Date: 24/01/2011

High-Volume TSP Sampler
5-Point Calibration Record

Location : AM3
Calibrated by : K.T.Ho
Date : 20/01/2011

Sampler
Model : GMWS-2310 ACCU-VOL
Serial Number : S/N 0481

Calibration Orfice and Standard Calibration Relationship
Serial Number : 1785
Service Date : 10 May 2010
Slope (m) : 2.01637
Intercept (b) : -0.02316
Correlation Coefficient(r) : 0.99996

Standard Condition
Pstd (hpa) : 1013
Tstd (K) : 298.18

Calibration Condition
Pa (hpa) : 1013
Ta(K) : 297

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	12.3	3.566	1.780	64	65.1
2	13 holes	9.2	3.084	1.541	54	54.9
3	10 holes	6.9	2.671	1.336	45	45.8
4	7 holes	4.5	2.157	1.081	34	34.6
5	5 holes	2.7	1.671	0.840	23	23.4

Sampler Calibration Relationship

Slope(m):44.334 Intercept(b): -13.590 Correlation Coefficient(r): 0.9999

Checked by: Magnum Fan Date: 24/01/2011

High-Volume TSP Sampler
5-Point Calibration Record

Location : AM4
Calibrated by : K.T.Ho
Date : 20/01/2011

Sampler
Model : GMWS-2310 ACCU-VOL
Serial Number : S/N 9315

Calibration Orfice and Standard Calibration Relationship
Serial Number : 1785
Service Date : 10 May 2009
Slope (m) : 2.01637
Intercept (b) : -0.02316
Correlation Coefficient(r) : 0.99996

Standard Condition
Pstd (hpa) : 1013
Tstd (K) : 298.18

Calibration Condition
Pa (hpa) : 1013
Ta(K) : 297

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	12.2	3.551	1.773	64	65.1
2	13 holes	9.0	3.050	1.524	54	54.9
3	10 holes	7.0	2.690	1.346	47	47.8
4	7 holes	4.7	2.204	1.105	38	38.6
5	5 holes	2.8	1.701	0.855	28	28.5

Sampler Calibration Relationship

Slope(m):36.689 Intercept(b): -5.436 Correlation Coefficient(r): 0.9999

Checked by: Magnum Fan Date: 24/01/2011

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

Certificate No. : C103766

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Calibrator

Manufacturer : Rion

Model No. : NC-73

Serial No. : 10786708

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C103766.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Date of Issue : 13 July 2010

Certified by : K C Lee

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

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

Report No. : C103766

Calibration Report

ITEM TESTED

DESCRIPTION : Sound Level Calibrator
MANUFACTURER : Rion
MODEL NO. : NC-73
SERIAL NO. : 10786708

TEST CONDITIONS

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

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 12 July 2010 ***JOB NO.*** : IC10-1738

TEST RESULTS

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

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

Tested by : *L L Cheung* *Date : 13 July 2010*

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

Report No. : C103766

Calibration Report

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

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

3. Test equipment :

Equipment ID	Description	Certificate No.
TST150A	Measuring Amplifier	C101008
CL130	Universal Counter	C103289
CL281	Multifunction Acoustic Calibrator	C1005490

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.5	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	0.991 0	1 kHz ± 2 %	± 0.1

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

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

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Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C103778

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Meter

Manufacturer : Rion

Model No. : NL-31

Serial No. : 00320533

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C103778.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Date of Issue : 13 July 2010

Certified by : K C Lee

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

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

Report No. : C103778

Calibration Report

ITEM TESTED

DESCRIPTION	:	Sound Level Meter
MANUFACTURER	:	Rion
MODEL NO.	:	NL-31
SERIAL NO.	:	00320533

TEST CONDITIONS

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

LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 12 July 2010 ***JOB NO.*** : IC10-1738

TEST RESULTS

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

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

Tested by : *L L Cheung* *Date : 13 July 2010*

Report No. : C103778

Calibration Report

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

2. Self-calibration was performed before the test.

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C100067
CL281	Multifunction Acoustic Calibrator	C1005490

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	94.3	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L_A	A	Fast	94.00	1	94.3 (Ref.)
				104.00		104.3
				114.00		114.3

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	94.3	Ref.
			Slow			94.2	± 0.1

Report No. : C103778

Calibration Report

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_A	A	Fast	94.00	31.5 Hz	55.3	-39.4 ± 1.5
					63 Hz	68.4	-26.2 ± 1.5
					125 Hz	78.4	-16.1 ± 1.0
					250 Hz	85.8	-8.6 ± 1.0
					500 Hz	91.1	-3.2 ± 1.0
					1 kHz	94.3	Ref.
					2 kHz	95.3	+1.2 ± 1.0
					4 kHz	94.5	+1.0 ± 1.0
					8 kHz	90.5	-1.1 (+1.5 ; -3.0)
					12.5 kHz	85.0	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_C	C	Fast	94.00	31.5 Hz	91.5	-3.0 ± 1.5
					63 Hz	93.7	-0.8 ± 1.5
					125 Hz	94.2	-0.2 ± 1.0
					250 Hz	94.4	0.0 ± 1.0
					500 Hz	94.4	0.0 ± 1.0
					1 kHz	94.3	Ref.
					2 kHz	94.0	-0.2 ± 1.0
					4 kHz	92.8	-0.8 ± 1.0
					8 kHz	88.7	-3.0 (+1.5 ; -3.0)
					12.5 kHz	82.4	-6.2 (+3.0 ; -6.0)

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
20 - 110	L_{Aeq}	A	60 sec.	4	1	$1/10^3$	110.0	80	80.7	± 1.0
			5 min.			$1/10^4$		70	70.7	± 1.0

Report No. : C103778

Calibration Report

Remarks : - Mfr's Spec. : IEC 60651 Type 1 & IEC 60804 Type 1

- Uncertainties of Applied Value :

94 dB	:	31.5 Hz - 125 Hz	: ± 0.35 dB
		250 Hz - 1 kHz	: ± 0.30 dB
		2 kHz - 4 kHz	: ± 0.35 dB
		8 kHz	: ± 0.45 dB
		12.5 kHz	: ± 0.70 dB
104 dB	:	1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	:	1 kHz	: ± 0.10 dB (Ref. 94 dB)

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

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

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

輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C102904

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Meter

Manufacturer : Rion

Model No. : NL-31

Serial No. : 00410224

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C102904.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Date of Issue : 31 May 2010

Certified by :

K C Lee

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

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

Report No. : C102904

Calibration Report

ITEM TESTED

DESCRIPTION : Sound Level Meter
MANUFACTURER : Rion
MODEL NO. : NL-31
SERIAL NO. : 00410224

TEST CONDITIONS

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

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 31 May 2010 ***JOB NO.*** : IC10-1356

TEST RESULTS

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

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

Tested by : *L L Cheung* *Date : 31 May 2010*

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

Report No. : C102904

Calibration Report

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

2. Self-calibration was performed before the test.

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C100067
CL179	Acoustical Calibrator	C095223

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	93.9	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L_A	A	Fast	94.00	1	93.9 (Ref.)
				114.00		113.9

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	93.9	Ref.
			Slow			93.8	± 0.1

Report No. : C102904

Calibration Report

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_A	A	Fast	94.00	31.5 Hz	54.2	-39.4 ± 1.5
					63 Hz	67.6	-26.2 ± 1.5
					125 Hz	77.7	-16.1 ± 1.0
					250 Hz	85.2	-8.6 ± 1.0
					500 Hz	90.6	-3.2 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	90.0	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_C	C	Fast	94.00	31.5 Hz	90.6	-3.0 ± 1.5
					63 Hz	93.1	-0.8 ± 1.5
					125 Hz	93.7	-0.2 ± 1.0
					250 Hz	93.9	0.0 ± 1.0
					500 Hz	93.9	0.0 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	93.9	-0.2 ± 1.0
					4 kHz	93.3	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	88.1	-6.2 (+3.0 ; -6.0)

Report No. : C102904

Calibration Report

6.4 Time Averaging

UUT Setting				Applied Value					UUT	IEC 60804
Range (dB)	Mode	Frequency Weighting	Time Weighting	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)	Reading (dB)	Type 1 Spec. (dB)
20 - 110	L_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	100.0	± 0.5
						$1/10^2$		90	90.0	± 0.5
			60 sec.			$1/10^3$		80	80.0	± 1.0
			5 min.			$1/10^4$		70	70.0	± 1.0

Remarks : - Mfr's Spec. : IEC 60651 Type 1 & IEC 60804 Type 1

- Uncertainties of Applied Value : 94 dB : 31.5 Hz - 125 Hz : ± 0.35 dB
  250 Hz - 1 kHz : ± 0.30 dB
  2 kHz - 4 kHz : ± 0.35 dB
  8 kHz : ± 0.45 dB
  12.5 kHz : ± 0.70 dB
  114 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)

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

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

Calibration and Testing Laboratory of Sun Creation Engineering Limited
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Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

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

Certificate No. : C105886

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Meter

Manufacturer : Rion

Model No. : NL-31

Serial No. : 00983400

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C105886.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Date of Issue : 26 October 2010

Certified by : K C Lee

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

Report No. : C105886

Calibration Report

ITEM TESTED

DESCRIPTION : Sound Level Meter
MANUFACTURER : Rion
MODEL NO. : NL-31
SERIAL NO. : 00983400

TEST CONDITIONS

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

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 25 October 2010 ***JOB NO.*** : IC10-2726

TEST RESULTS

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

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

Tested by : L L Cheung *Date : 26 October 2010*

Report No. : C105886

Calibration Report

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

2. Self-calibration was performed before the test.

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C100067
CL281	Multifunction Acoustic Calibrator	C1006860

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	94.0	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L_A	A	Fast	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.1

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	94.0	Ref.
			Slow			93.9	± 0.3

Report No. : C105886

Calibration Report

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_A	A	Fast	94.00	63 Hz	67.6	-26.2 ± 1.5
					125 Hz	77.7	-16.1 ± 1.5
					250 Hz	85.2	-8.6 ± 1.4
					500 Hz	90.7	-3.2 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	95.3	+1.2 ± 1.6
					4 kHz	95.1	+1.0 ± 1.6
					8 kHz	93.0	-1.1 (+2.1 ; -3.1)
					12.5 kHz	90.1	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_C	C	Fast	94.00	63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.5
					250 Hz	94.0	0.0 ± 1.4
					500 Hz	94.0	0.0 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	93.9	-0.2 ± 1.6
					4 kHz	93.4	-0.8 ± 1.6
					8 kHz	91.1	-3.0 (+2.1 ; -3.1)
					12.5 kHz	88.3	-6.2 (+3.0 ; -6.0)

Report No. : C105886

Calibration Report

Remarks : - Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	63 Hz - 125 Hz	± 0.35 dB
	250 Hz - 500 Hz	± 0.30 dB
	1 kHz	± 0.20 dB
	2 kHz - 4 kHz	± 0.35 dB
	8 kHz	± 0.45 dB
	12.5 kHz	± 0.70 dB
104 dB	1 kHz	± 0.10 dB (Ref. 94 dB)
114 dB	1 kHz	± 0.10 dB (Ref. 94 dB)

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

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

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

輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C103765

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Calibrator

Manufacturer : Rion

Model No. : NC-73

Serial No. : 10997142

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C103765.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Date of Issue : 13 July 2010

Certified by :

K C Lee

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

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

Report No. : C103765

Calibration Report

ITEM TESTED

DESCRIPTION : Sound Level Calibrator
MANUFACTURER : Rion
MODEL NO. : NC-73
SERIAL NO. : 10997142

TEST CONDITIONS

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

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 12 July 2010 ***JOB NO.*** : IC10-1738

TEST RESULTS

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

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

Tested by : *L L Cheung* *Date : 13 July 2010*

Report No. : C103765

Calibration Report

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

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

3. Test equipment :

Equipment ID	Description	Certificate No.
TST150A	Measuring Amplifier	C101008
CL130	Universal Counter	C103289
CL281	Multifunction Acoustic Calibrator	C1005490

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.1	± 0.5	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	0.991 1	1 kHz ± 2 %	± 0.1

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

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

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

APPENDIX C
ENVIRONMENTAL MONITORING SCHEDULES

Contract No. DC/2009/23 HATS 2A – Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central

Impact Air Quality and Noise Monitoring Schedule for February 2011

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Feb	2-Feb	3-Feb	4-Feb	5-Feb
			1-hr & 24-hr TSP (AM1) 1-hr & 24-hr TSP (AM2) 1-hr & 24-hr TSP (AM3) 1-hr & 24-hr TSP (AM4) Noise Monitoring (NM1) Noise Monitoring (NM2) Noise Monitoring (NM3)			
6-Feb	7-Feb	8-Feb	9-Feb	10-Feb	11-Feb	12-Feb
	1-hr & 24-hr TSP (AM1) 1-hr & 24-hr TSP (AM2) Noise Monitoring (NM1)	Noise Monitoring (NM2) Noise Monitoring (NM3) 1-hr & 24-hr TSP (AM3) 1-hr & 24-hr TSP (AM4)			Noise Monitoring (NM1)	1-hr & 24-hr TSP (AM1) 1-hr & 24-hr TSP (AM2) 1-hr & 24-hr TSP (AM3)
13-Feb	14-Feb	15-Feb	16-Feb	17-Feb	18-Feb	19-Feb
	Noise Monitoring (NM2) Noise Monitoring (NM3) 1-hr & 24-hr TSP (AM3) 1-hr & 24-hr TSP (AM4)			Noise Monitoring (NM1)	1-hr & 24-hr TSP (AM1) 1-hr & 24-hr TSP (AM2)	1-hr & 24-hr TSP (AM3) 1-hr & 24-hr TSP (AM4)
20-Feb	21-Feb	22-Feb	23-Feb	24-Feb	25-Feb	26-Feb
				1-hr & 24-hr TSP (AM1) 1-hr & 24-hr TSP (AM2)	Noise Monitoring (NM2) Noise Monitoring (NM3) 1-hr & 24-hr TSP (AM3) 1-hr & 24-hr TSP (AM4)	
27-Feb	28-Feb					

Air Quality Monitoring Station

AM1 - Works site boundary of DC/2007/23
AM2 - Hong Kong & Islands Regional Office, WSD
AM3 - Wan Chai East PTW
AM4 - A Location within the DSD Central PTW

Noise Monitoring Station

NM1 - Chan's Creative School
NM2 - Hyde Building
NM3 - Goldfield Building

Contract No. DC/2009/23 HATS 2A – Upgrading of Preliminary Treatment Works at North Point, Wan Chai East and Central

Tentative Impact Air Quality and Noise Monitoring Schedule for March 2011

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Mar	2-Mar	3-Mar	4-Mar	5-Mar
			1-hr & 24-hr TSP (AM1) 1-hr & 24-hr TSP (AM2) Noise Monitoring (NM1)	1-hr & 24-hr TSP (AM3) Noise Monitoring (NM2) 1-hr & 24-hr TSP (AM4) Noise Monitoring (NM3)		
6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	12-Mar
		Noise Monitoring (NM1) 1-hr & 24-hr TSP (AM1) 1-hr & 24-hr TSP (AM2)	1-hr & 24-hr TSP (AM3) Noise Monitoring (NM2) 1-hr & 24-hr TSP (AM4) Noise Monitoring (NM3)			
13-Mar	14-Mar	15-Mar	16-Mar	17-Mar	18-Mar	19-Mar
	Noise Monitoring (NM1) 1-hr & 24-hr TSP (AM1) 1-hr & 24-hr TSP (AM2)	1-hr & 24-hr TSP (AM3) Noise Monitoring (NM2) 1-hr & 24-hr TSP (AM4) Noise Monitoring (NM3)				1-hr & 24-hr TSP (AM1) 1-hr & 24-hr TSP (AM2)
20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar
	1-hr & 24-hr TSP (AM3) Noise Monitoring (NM2) 1-hr & 24-hr TSP (AM4) Noise Monitoring (NM3)				Noise Monitoring (NM1) 1-hr & 24-hr TSP (AM1) 1-hr & 24-hr TSP (AM2)	1-hr & 24-hr TSP (AM4)
27-Mar	28-Mar	29-Mar	30-Mar	31-Mar		
				Noise Monitoring (NM1) 1-hr & 24-hr TSP (AM1) 1-hr & 24-hr TSP (AM2)		

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

Air Quality Monitoring Station

AM1 - Works site boundary of DC/2007/23
AM2 - Hong Kong & Islands Regional Office, WSD
AM3 - Wan Chai East PTW
AM4 - A Location within the DSD Central PTW

Noise Monitoring Station

NM1 - Chan's Creative School
NM2 - Hyde Building
NM3 - Goldfield Building

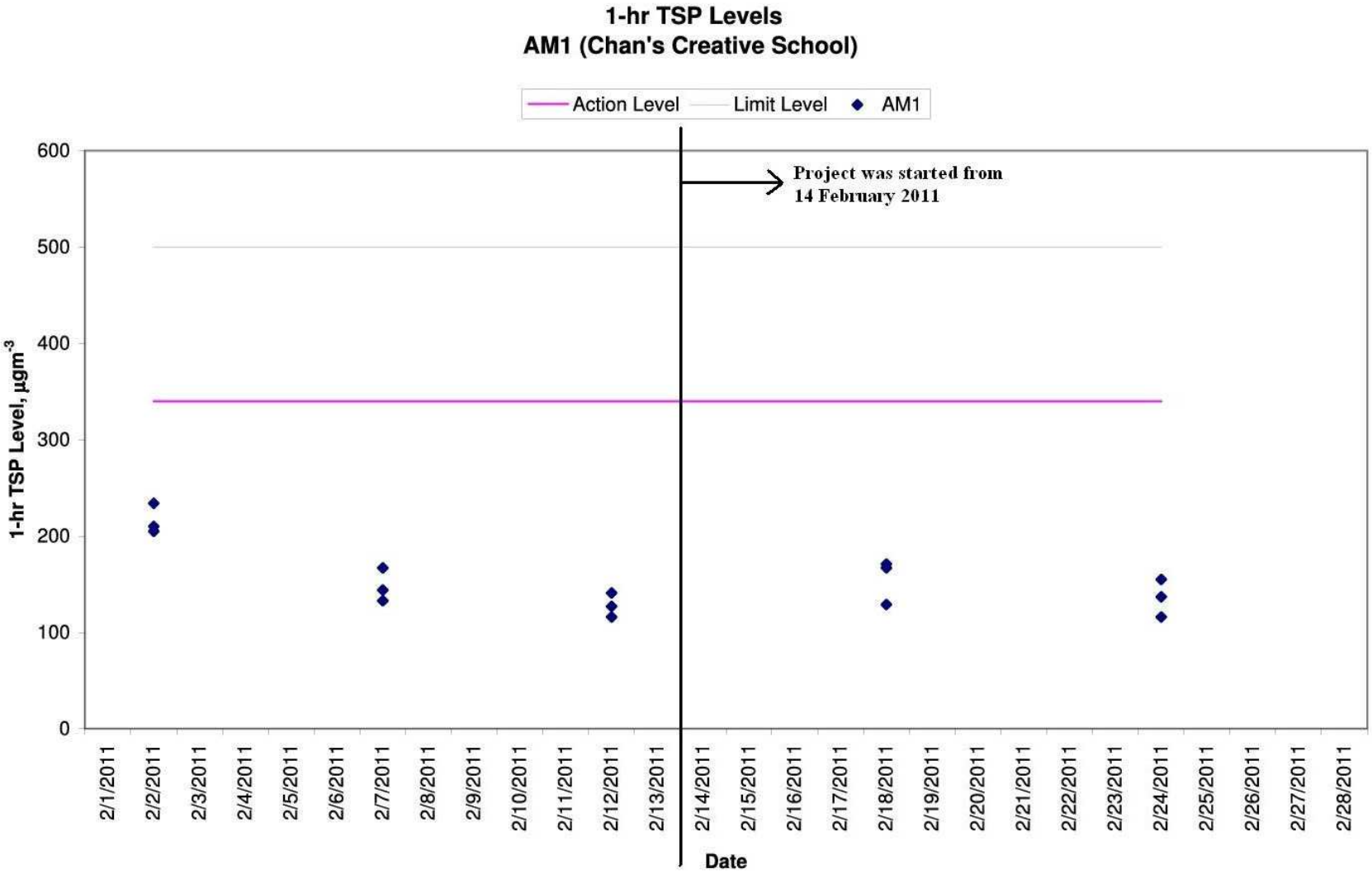
APPENDIX D
1-HOUR AND 24-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix D - 1-hour and 24-hour TSP Monitoring Results and Graphical Presentations

1-hour TSP Monitoring Results

Station AM1

Date	Start Time	Finish Time	Weather	TSP Concentration ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)	Site Conditions / Observations / Remarks	Temperature (°C)	Wind Speed * (m/s)	Sampler ID	Filter ID
2-Feb-11	10:27	11:27	Sunny	205	340	500	Construction work in progress	15	4.7	1808	7979
	11:30	12:30	Sunny	210	340	500	Construction work in progress	15	4.7	1808	7987
	12:32	13:32	Sunny	234	340	500	Construction work in progress	15	4.7	1808	7980
7-Feb-11	11:15	12:15	Sunny	167	340	500	Construction work in progress	19	4.3	1808	8176
	12:20	13:20	Sunny	144	340	500	Construction work in progress	19	4.3	1808	8178
	13:25	14:25	Sunny	133	340	500	Construction work in progress	19	4.3	1808	8181
12-Feb-11	9:00	10:00	Fine	116	340	500	Construction work in progress	14	3.3	1808	8185
	10:06	11:06	Fine	127	340	500	Construction work in progress	14	3.3	1808	8186
	11:10	12:10	Fine	141	340	500	Construction work in progress	14	3.3	1808	8189
18-Feb-11	9:20	10:20	Cloudy	167	340	500	Construction work in progress	14	2.8	1808	7984
	10:22	11:22	Cloudy	171	340	500	Construction work in progress	14	2.8	1808	8198
	11:25	12:25	Cloudy	129	340	500	Construction work in progress	14	2.8	1808	8192
24-Feb-11	9:35	10:35	Sunny	155	340	500	Construction work in progress	20	3.2	1808	8195
	10:38	11:38	Sunny	137	340	500	Construction work in progress	20	3.2	1808	8298
	11:40	12:40	Sunny	116	340	500	Construction work in progress	20	3.2	1808	8300
			Min.	**116**							
			Max.	**234**							
			Average	**157**							

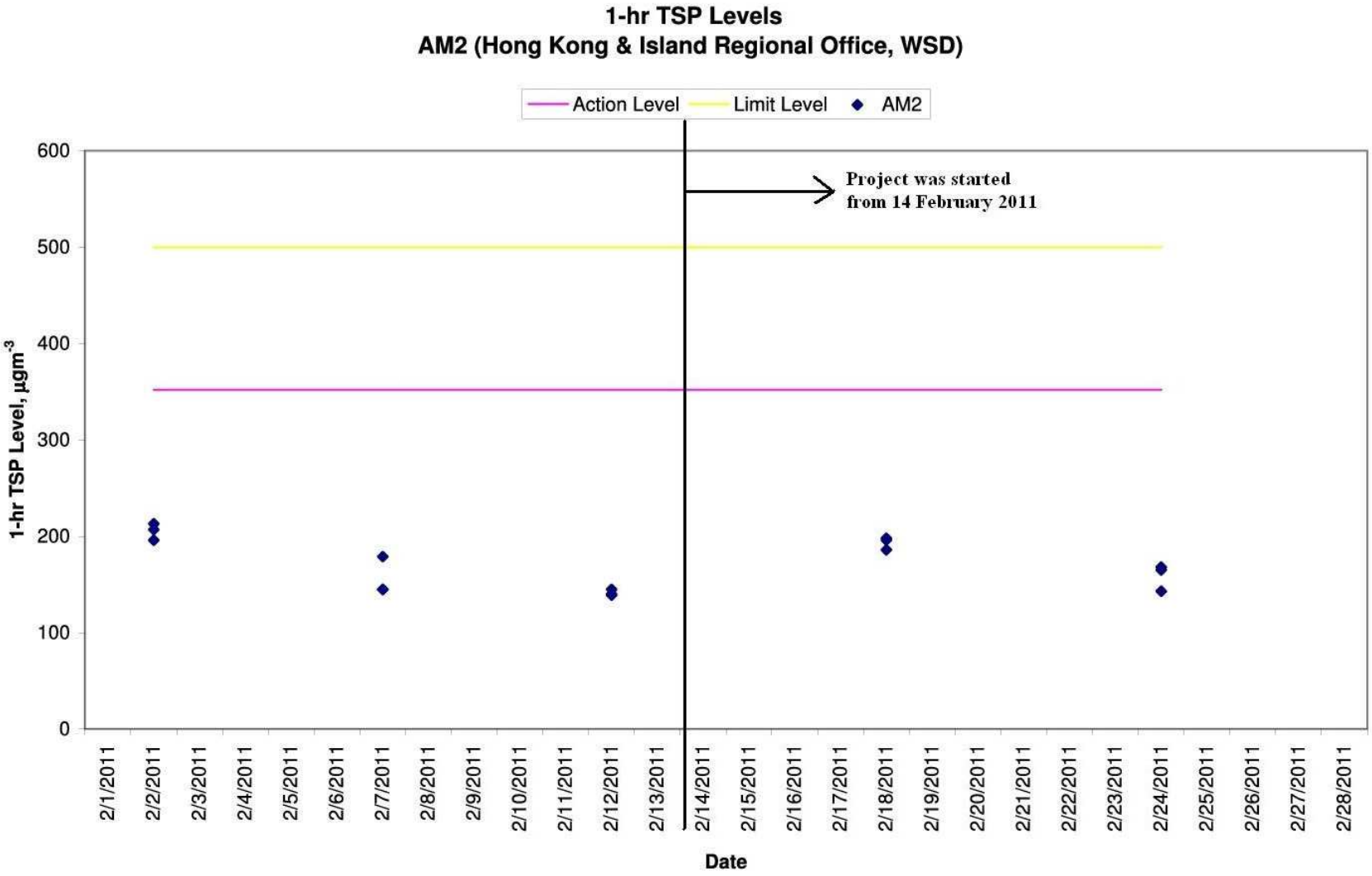

1-hr TSP Levels
AM1 (Chan's Creative School)
Action Level
Limit Level
AM1
Project was started from
14 February 2011
1-hr TSP Level, µgm-3
600
500
400
300
200
100
0
2/1/2011
2/2/2011
2/3/2011
2/4/2011
2/5/2011
2/6/2011
2/7/2011
2/8/2011
2/9/2011
2/10/2011
2/11/2011
2/12/2011
2/13/2011
2/14/2011
2/15/2011
2/16/2011
2/17/2011
2/18/2011
2/19/2011
2/20/2011
2/21/2011
2/22/2011
2/23/2011
2/24/2011
2/25/2011
2/26/2011
2/27/2011
2/28/2011
Date

Appendix D - 1-hour and 24-hour TSP Monitoring Results and Graphical Presentations

1-hour TSP Monitoring Results

Station AM2

Date	Start Time	Finish Time	Weather	TSP Concentration ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)	Site Conditions / Observations / Remarks	Temperature (°C)	Wind Speed * (m/s)	Sampler ID	Filter ID
2-Feb-11	10:10	11:10	Sunny	196	352	500	Construction work in progress	15	4.7	0145	7988
	11:13	12:13	Sunny	213	352	500	Construction work in progress	15	4.7	0145	7986
	12:16	13:16	Sunny	207	352	500	Construction work in progress	15	4.7	0145	7981
7-Feb-11	11:40	12:40	Sunny	145	352	500	Construction work in progress	19	4.3	0145	8177
	12:45	13:45	Sunny	145	352	500	Construction work in progress	19	4.3	0145	8179
	13:50	14:50	Sunny	179	352	500	Construction work in progress	19	4.3	0145	8180
12-Feb-11	9:20	10:20	Fine	139	352	500	Construction work in progress	14	3.3	0145	8184
	10:22	11:22	Fine	140	352	500	Construction work in progress	14	3.3	0145	8187
	11:23	12:23	Fine	145	352	500	Construction work in progress	14	3.3	0145	8188
18-Feb-11	9:40	10:40	Cloudy	196	352	500	Construction work in progress	14	2.8	0145	7989
	10:43	11:43	Cloudy	186	352	500	Construction work in progress	14	2.8	0145	8191
	11:46	12:46	Cloudy	198	352	500	Construction work in progress	14	2.8	0145	8196
24-Feb-11	10:00	11:00	Sunny	165	352	500	Construction work in progress	20	3.2	0145	8296
	11:02	12:02	Sunny	143	352	500	Construction work in progress	20	3.2	0145	8297
	12:04	13:04	Sunny	168	352	500	Construction work in progress	20	3.2	0145	8299
			Min.	**139**							
			Max.	**213**							
			Average	**171**							

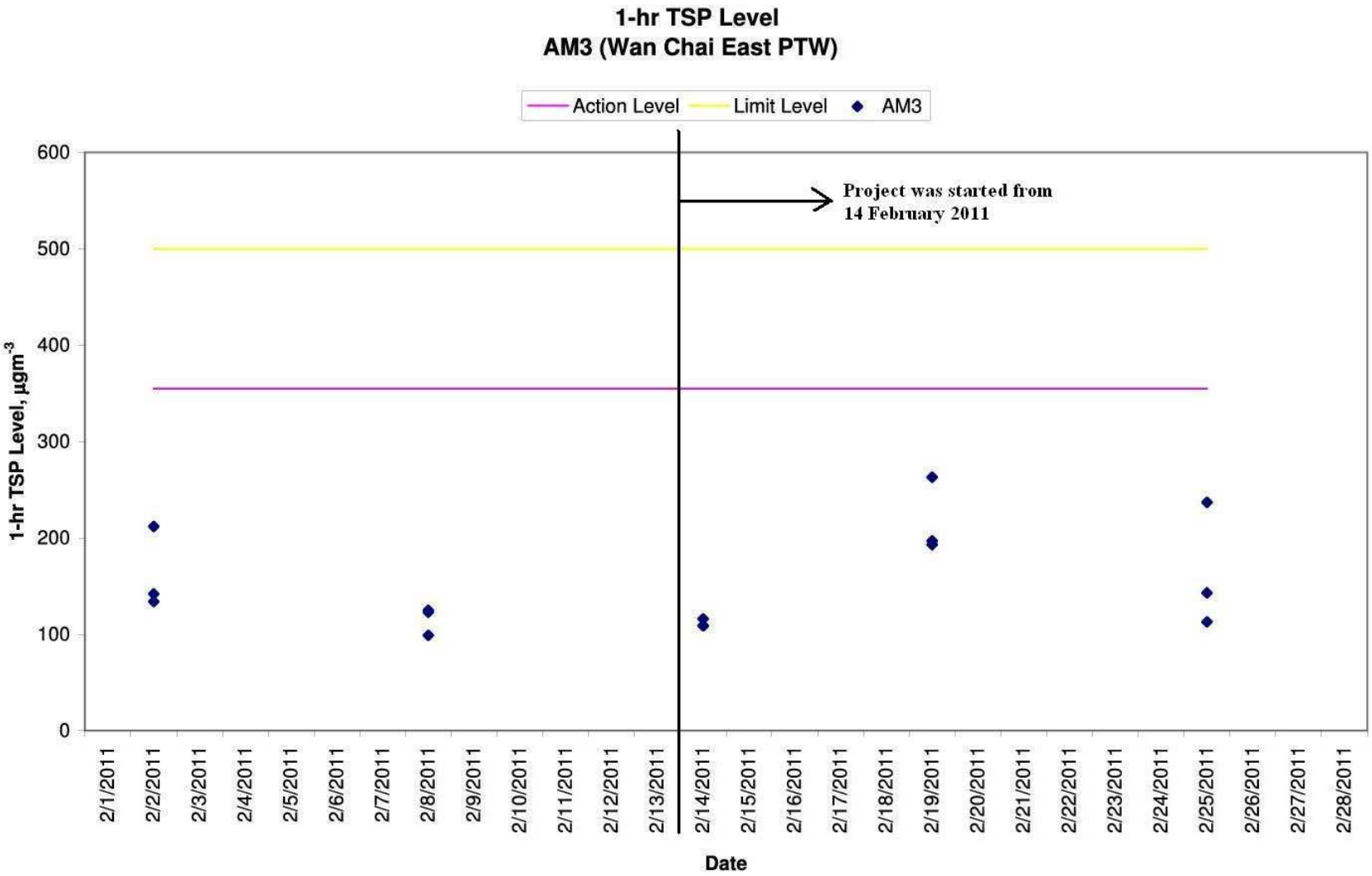

1-hr TSP Levels
AM2 (Hong Kong & Island Regional Office, WSD)
Action Level
Limit Level
AM2
Project was started
from 14 February 2011
1-hr TSP Level, µgm-3
600
500
400
300
200
100
0
2/1/2011
2/2/2011
2/3/2011
2/4/2011
2/5/2011
2/6/2011
2/7/2011
2/8/2011
2/9/2011
2/10/2011
2/11/2011
2/12/2011
2/13/2011
2/14/2011
2/15/2011
2/16/2011
2/17/2011
2/18/2011
2/19/2011
2/20/2011
2/21/2011
2/22/2011
2/23/2011
2/24/2011
2/25/2011
2/26/2011
2/27/2011
2/28/2011
Date

Appendix D - 1-hour and 24-hour TSP Monitoring Results and Graphical Presentations

1-hour TSP Monitoring Results

Station AM3

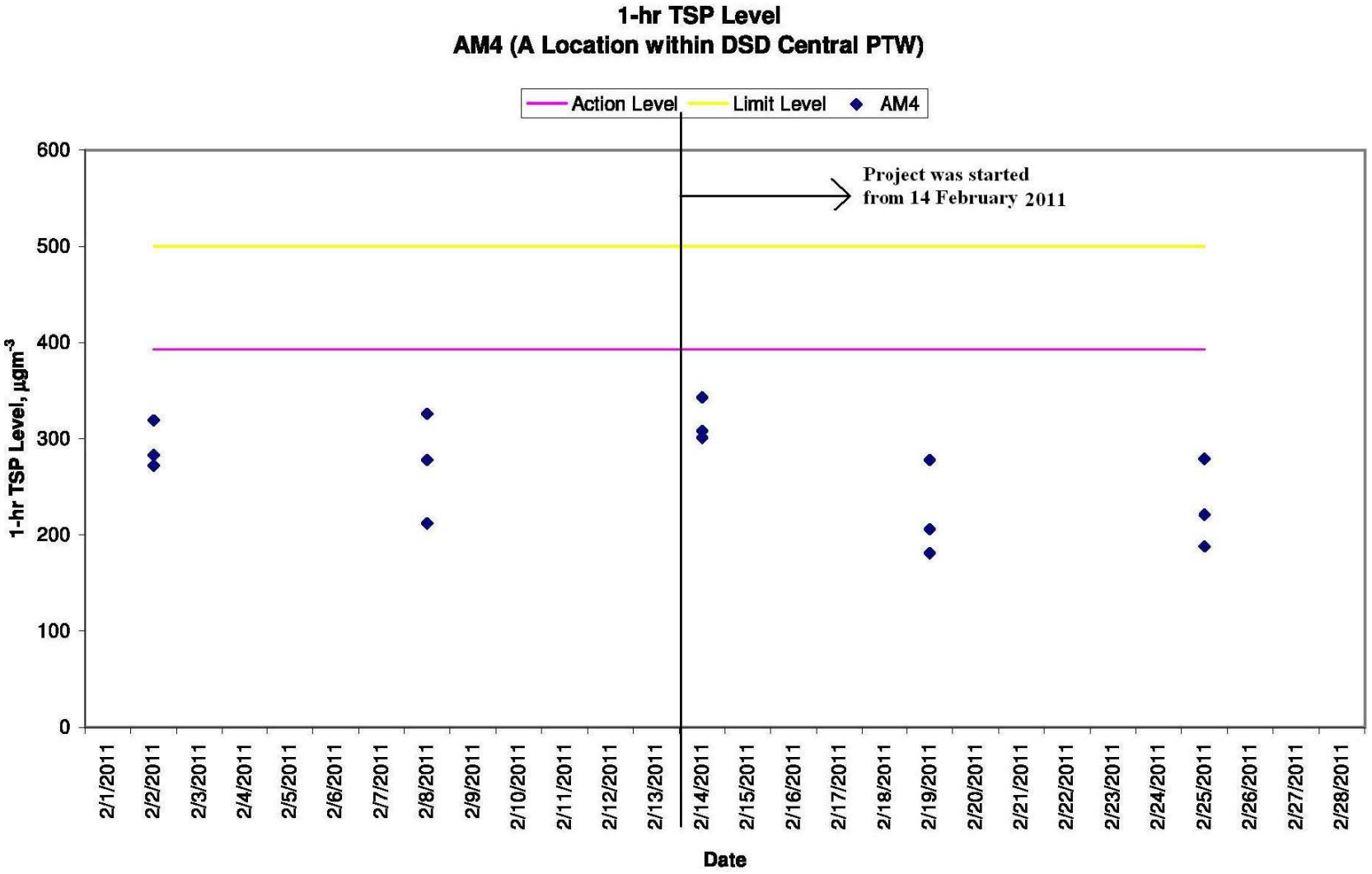
Date	Start Time	Finish Time	Weather	TSP Concentration ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)	Site Conditions / Observations / Remarks	Temperature (°C)	Wind Speed * (m/s)	Sampler ID	Filter ID
2-Feb-11	13:10	14:10	Sunny	142	355	500	Construction work in progress	15	2.4	0481	0812
	14:12	15:12	Sunny	134	355	500	Construction work in progress	15	2.4	0481	0811
	15:16	16:16	Sunny	212	355	500	Construction work in progress	15	2.4	0481	0828
8-Feb-11	13:00	14:00	Sunny	99	355	500	Construction work in progress	21	2.8	0481	0829
	14:02	15:02	Sunny	123	355	500	Construction work in progress	21	2.8	0481	0830
	15:10	16:10	Sunny	125	355	500	Construction work in progress	21	2.8	0481	0832
14-Feb-11	8:30	9:30	Cloudy	109	355	500	Construction work in progress	10	2.4	0481	0833
	9:32	10:32	Cloudy	116	355	500	Construction work in progress	10	2.4	0481	0834
	10:34	11:34	Cloudy	109	355	500	Construction work in progress	10	2.4	0481	0836
19-Feb-11	8:30	9:30	Cloudy	263	355	500	Construction work in progress	12	3.3	0481	0837
	9:32	10:32	Cloudy	197	393	500	Construction work in progress	12	3.3	0481	0838
	10:35	11:35	Cloudy	193	355	500	Construction work in progress	12	3.3	0481	0840
25-Feb-11	12:05	13:05	Sunny	143	355	500	Construction work in progress	20	3.9	0481	0841
	13:07	14:07	Sunny	237	393	500	Construction work in progress	20	3.9	0481	0842
	14:10	15:10	Sunny	113	355	500	Construction work in progress	20	3.9	0481	0861
			Min.	**99**							
			Max.	**263**							
			Average	**154**							


1-hr TSP Level
AM3 (Wan Chai East PTW)
Action Level
Limit Level
AM3
Project was started from
14 February 2011
1-hr TSP Level, µgm-3
600
500
400
300
200
100
0
2/1/2011
2/2/2011
2/3/2011
2/4/2011
2/5/2011
2/6/2011
2/7/2011
2/8/2011
2/9/2011
2/10/2011
2/11/2011
2/12/2011
2/13/2011
2/14/2011
2/15/2011
2/16/2011
2/17/2011
2/18/2011
2/19/2011
2/20/2011
2/21/2011
2/22/2011
2/23/2011
2/24/2011
2/25/2011
2/26/2011
2/27/2011
2/28/2011
Date

1-hour TSP Monitoring Results

Station AM4

Date	Start Time	Finish Time	Weather	TSP Concentration ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)	Site Conditions / Observations / Remarks	Temperature (℃)	Wind Speed * (m/s)	Sampler ID	Filter ID
2-Feb-11	9:00	10:00	Sunny	272	393	500	Construction work in progress	15	2.4	9315	0621
	10:05	11:05	Sunny	283	393	500	Construction work in progress	15	2.4	9315	0623
	11:15	12:15	Sunny	319	393	500	Construction work in progress	15	2.4	9315	0624
8-Feb-11	8:30	9:30	Sunny	326	393	500	Construction work in progress	21	2.8	9315	0627
	9:33	10:33	Sunny	278	393	500	Construction work in progress	21	2.8	9315	0625
	10:40	11:40	Sunny	212	393	500	Construction work in progress	21	2.8	9315	0643
14-Feb-11	12:30	13:30	Cloudy	301	393	500	Construction work in progress	10	2.4	0481	0844
	13:32	14:32	Cloudy	308	393	500	Construction work in progress	10	2.4	0481	0845
	14:40	15:40	Cloudy	343	393	500	Construction work in progress	10	2.4	0481	0846
19-Feb-11	12:15	13:15	Cloudy	278	393	500	Construction work in progress	12	3.3	9315	0649
	13:18	14:18	Cloudy	181	393	500	Construction work in progress	12	3.3	9315	0850
	14:20	15:20	Cloudy	206	393	500	Construction work in progress	12	3.3	9315	0851
25-Feb-11	8:10	9:10	Sunny	188	393	500	Construction work in progress	20	3.9	9315	0852
	9:12	10:12	Sunny	279	393	500	Construction work in progress	20	3.9	9315	0854
	10:14	11:14	Sunny	221	393	500	Construction work in progress	20	3.9	9315	0855
			Min.	**181**							
			Max.	**343**							
			Average	**266**							


1-hr TSP Level
AM4 (A Location within DSD Central PTW)
Action Level
Limit Level
AM4
Project was started
from 14 February 2011
1-hr TSP Level, µgm-3
600
500
400
300
200
100
0
2/1/2011
2/2/2011
2/3/2011
2/4/2011
2/5/2011
2/6/2011
2/7/2011
2/8/2011
2/9/2011
2/10/2011
2/11/2011
2/12/2011
2/13/2011
2/14/2011
2/15/2011
2/16/2011
2/17/2011
2/18/2011
2/19/2011
2/20/2011
2/21/2011
2/22/2011
2/23/2011
2/24/2011
2/25/2011
2/26/2011
2/27/2011
2/28/2011
Date

Appendix D - 1-hour and 24-hour TSP Monitoring Results and Graphical Presentations

24-hour TSP Monitoring Results

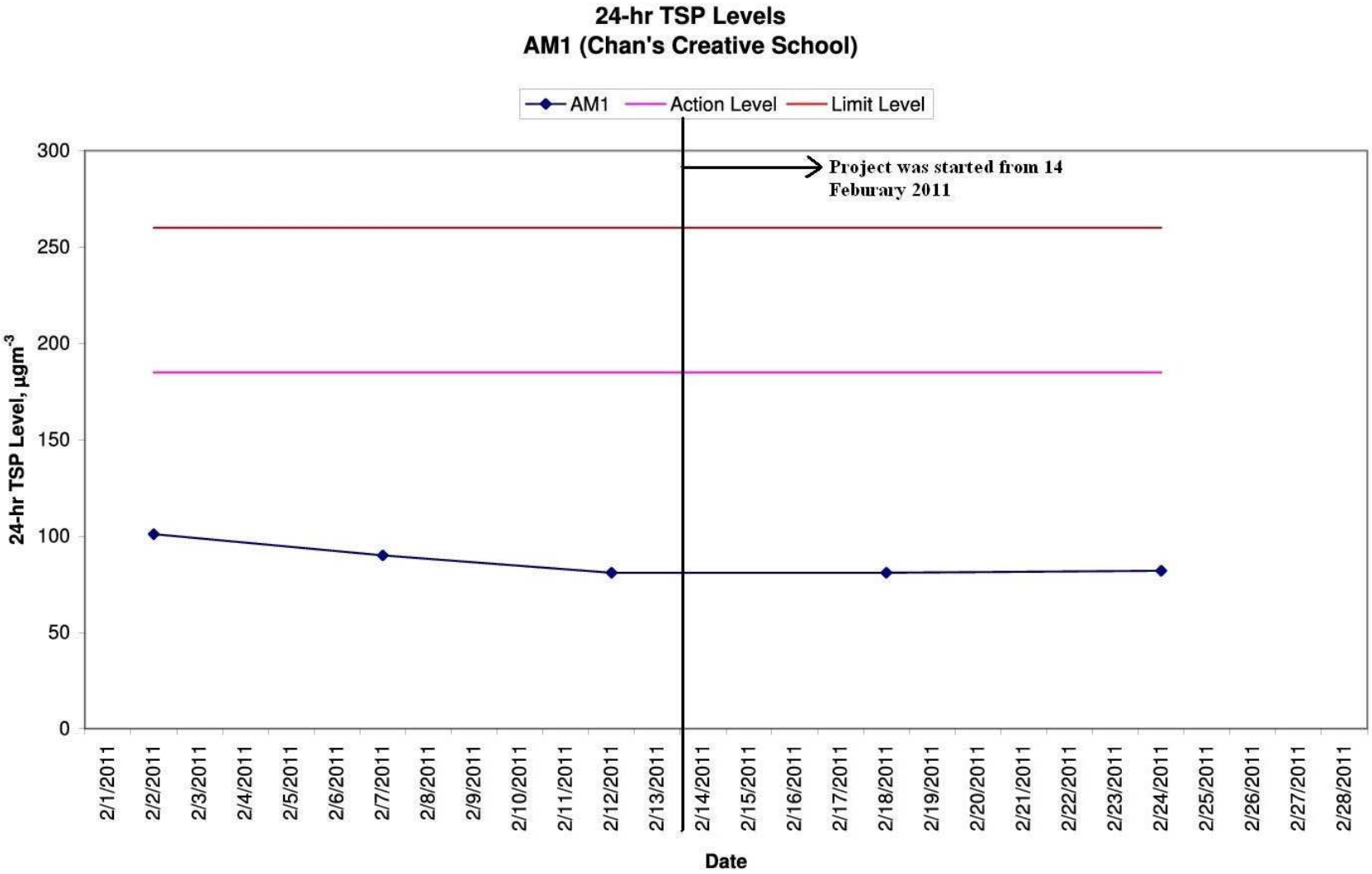
Station AM1

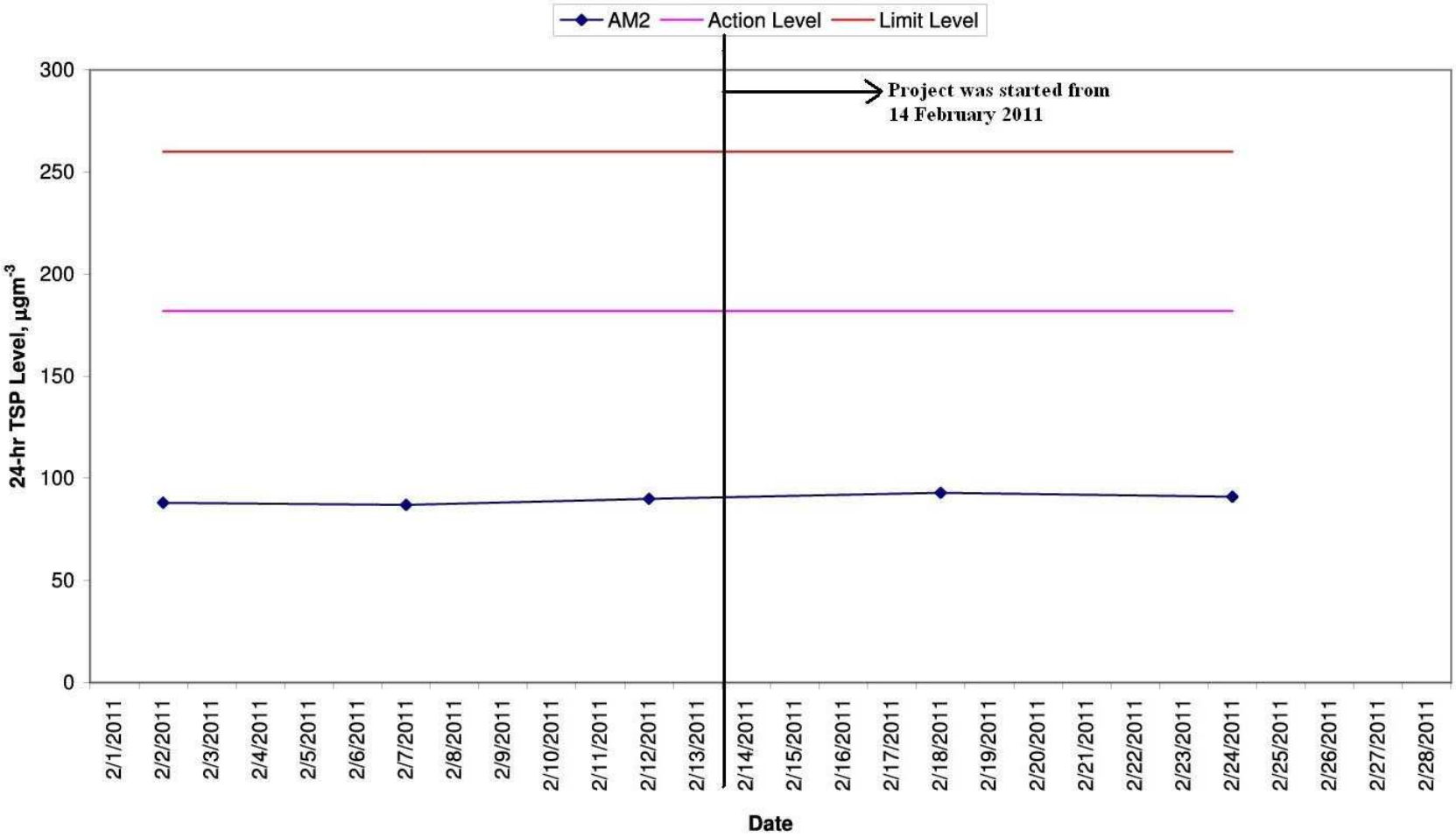
Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time	Flow Rate (m^3/min)			TSP Conc.	Action Level	Limit Level	Observations / Remarks	Sampler	Filter
Date	Time	Date	Time		Initial	Final	Initial	Final	(hrs)	Initial	Final	Average	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)		ID	ID
2-Feb-11	13:35	3-Feb-11	13:35	Sunny	2.8525	3.0249	12175.03	12199.03	24.00	1.18	1.18	1.18	101	185	260	Construction work in progress	1808	7982
7-Feb-11	15:05	8-Feb-11	15:05	Sunny	2.8542	3.0078	12202.03	12226.03	24.00	1.18	1.18	1.18	90	185	260	Construction work in progress	1808	8182
12-Feb-11	12:12	13-Feb-11	12:12	Fine	2.8732	3.0112	12229.03	12253.03	24.00	1.18	1.18	1.18	81	185	260	Construction work in progress	1808	8197
18-Feb-11	12:30	19-Feb-11	12:30	Cloudy	2.8714	3.0084	12256.03	12280.03	24.00	1.18	1.18	1.18	81	185	260	Construction work in progress	1809	8193
24-Feb-11	12:44	25-Feb-11	12:44	Sunny	2.8609	3.0007	12283.03	12307.03	24.00	1.18	1.18	1.18	82	185	260	Construction work in progress	1809	8301
												Min.	81					
												Max.	101					
												Average	87					

24-hour TSP Monitoring Results

Station AM2

Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time	Flow Rate (m^3/min)			TSP Conc.	Action Level	Limit Level	Observations / Remarks	Sampler	Filter
Date	Time	Date	Time		Initial	Final	Initial	Final	(hrs)	Initial	Final	Average	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)		ID	ID
2-Feb-11	13:20	3-Feb-11	13:20	Sunny	2.8806	3.0344	12739.93	12763.93	24.00	1.21	1.21	1.21	88	182	260	Construction work in progress	0145	7983
7-Feb-11	15:20	8-Feb-11	15:20	Sunny	2.8707	3.0219	12766.93	12790.93	24.00	1.21	1.21	1.21	87	182	260	Construction work in progress	0145	8183
12-Feb-11	12:25	13-Feb-11	12:25	Fine	2.8359	2.9924	12793.93	12817.93	24.00	1.21	1.21	1.21	90	182	260	Construction work in progress	0145	8190
18-Feb-11	12:50	19-Feb-11	12:50	Cloudy	2.8098	2.9727	12820.93	12844.93	24.00	1.21	1.21	1.21	93	182	260	Construction work in progress	0145	8194
24-Feb-11	13:10	25-Feb-11	13:10	Sunny	2.8834	3.0416	12847.93	12871.93	24.00	1.21	1.21	1.21	91	182	260	Construction work in progress	0145	8302
												Min.	87					
												Max.	93					
												Average	90					


24-hr TSP Levels
AM1 (Chan's Creative School)
AM1
Action Level
Limit Level
Project was started from 14 Feburary 2011
24-hr TSP Level, µgm-3
300
250
200
150
100
50
0
2/1/2011
2/2/2011
2/3/2011
2/4/2011
2/5/2011
2/6/2011
2/7/2011
2/8/2011
2/9/2011
2/10/2011
2/11/2011
2/12/2011
2/13/2011
2/14/2011
2/15/2011
2/16/2011
2/17/2011
2/18/2011
2/19/2011
2/20/2011
2/21/2011
2/22/2011
2/23/2011
2/24/2011
2/25/2011
2/26/2011
2/27/2011
2/28/2011
Date

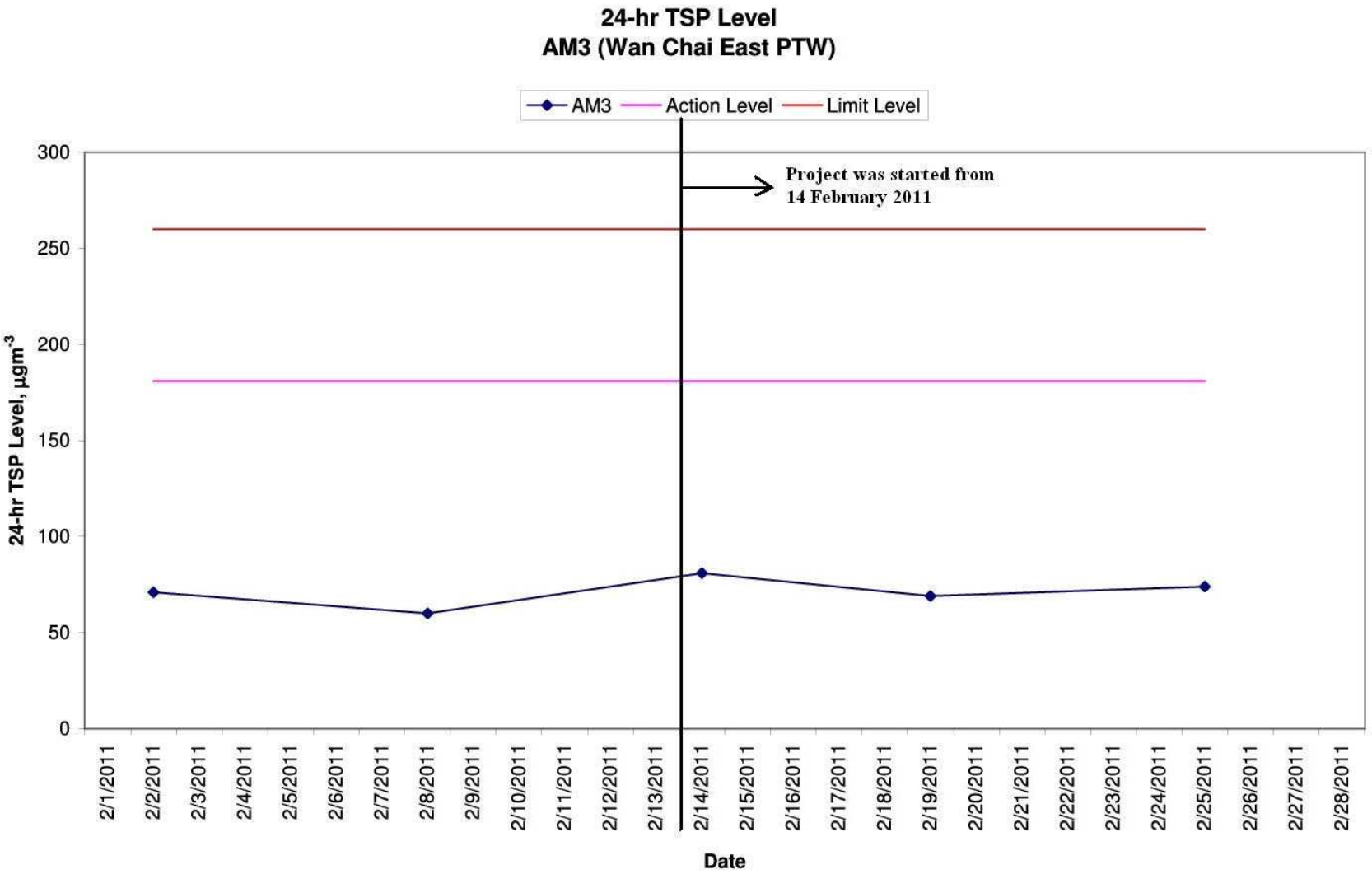

24-hr TSP Levels
AM2 (Hong Kong & Island Regional Office, WSD)
AM2
Action Level
Limit Level
Project was started from
14 February 2011
24-hr TSP Level, µgm-3
300
250
200
150
100
50
0
2/1/2011
2/2/2011
2/3/2011
2/4/2011
2/5/2011
2/6/2011
2/7/2011
2/8/2011
2/9/2011
2/10/2011
2/11/2011
2/12/2011
2/13/2011
2/14/2011
2/15/2011
2/16/2011
2/17/2011
2/18/2011
2/19/2011
2/20/2011
2/21/2011
2/22/2011
2/23/2011
2/24/2011
2/25/2011
2/26/2011
2/27/2011
2/28/2011
Date

Appnedix D - 1-hour and 24-hour TSP Monitoring Results and Graphical Presentations

24-hour TSP Monitoring Results

Station AM3

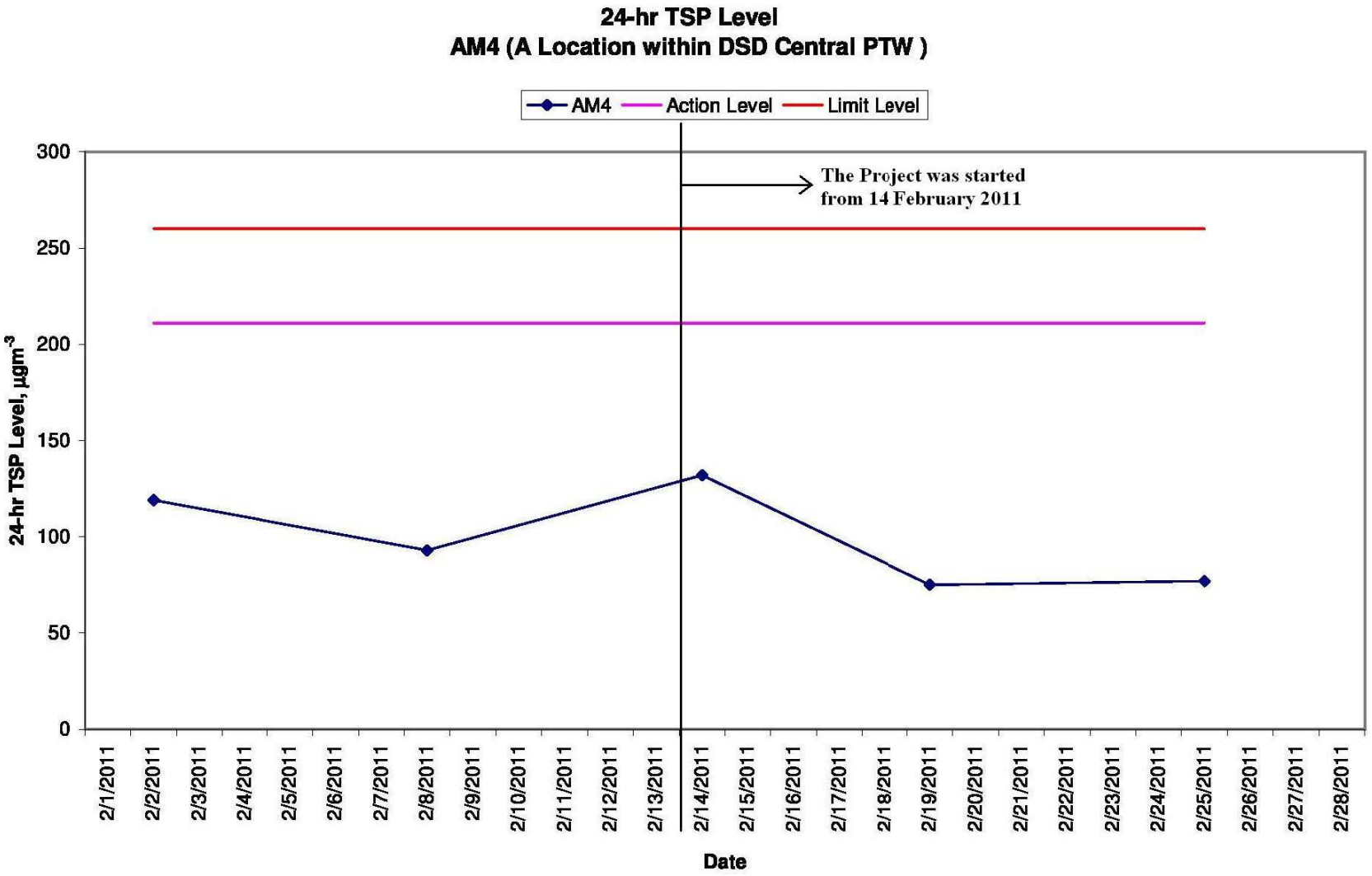
Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time	Flow Rate (m^3/min)			TSP Conc.	Action Level	Limit Level	Observations / Remarks	Sampler ID	Filter ID
Date	Time	Date	Time		Initial	Final	Initial	Final	(hrs)	Initial	Final	Average	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)			
2-Feb-11	16:20	3-Feb-11	16:20	Sunny	2.8652	2.9889	4359.32	4383.32	24.00	1.21	1.21	1.21	71	181	260	Construction work in progress	0481	0810
8-Feb-11	16:14	9-Feb-11	16:14	Sunny	2.8876	2.9915	4386.32	4410.32	24.00	1.21	1.21	1.21	60	181	260	Construction work in progress	0481	0831
14-Feb-11	11:40	15-Feb-11	11:40	Cloudy	2.8633	3.0053	4413.22	4437.32	24.10	1.21	1.21	1.21	81	181	260	Construction work in progress	0481	1835
19-Feb-11	11:38	20-Feb-11	11:38	Cloudy	2.8567	2.9763	4439.32	4463.32	24.00	1.21	1.21	1.21	69	181	260	Construction work in progress	0481	0839
25-Feb-11	15:12	26-Feb-11	15:12	Sunny	2.8108	2.9406	4466.32	4490.32	24.00	1.21	1.21	1.21	74	181	260	Construction work in progress	0481	0860
												Min.	60					
												Max.	81					
												Average	71					


24-hr TSP Level
AM3 (Wan Chai East PTW)
AM3
Action Level
Limit Level
Project was started from
14 February 2011
24-hr TSP Level, µgm-3
300
250
200
150
100
50
0
2/1/2011
2/2/2011
2/3/2011
2/4/2011
2/5/2011
2/6/2011
2/7/2011
2/8/2011
2/9/2011
2/10/2011
2/11/2011
2/12/2011
2/13/2011
2/14/2011
2/15/2011
2/16/2011
2/17/2011
2/18/2011
2/19/2011
2/20/2011
2/21/2011
2/22/2011
2/23/2011
2/24/2011
2/25/2011
2/26/2011
2/27/2011
2/28/2011
Date

24-hour TSP Monitoring Results

Station AM4

Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time	Flow Rate (m^3/min)			TSP Conc.	Action Level	Limit Level	Observations / Remarks	Sampler	Filter
Date	Time	Date	Time		Initial	Final	Initial	Final	(hrs)	Initial	Final	Average	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)		ID	ID
2-Feb-11	12:20	3-Feb-11	12:20	Sunny	2.8457	3.0521	18611.85	18635.85	24.00	1.20	1.20	1.20	119	211	260	Construction work in progress	9315	0622
8-Feb-11	11:50	9-Feb-11	11:50	Sunny	2.8357	2.9969	18638.85	18662.85	24.00	1.20	1.20	1.20	93	211	260	Construction work in progress	9315	0626
14-Feb-11	16:02	15-Feb-11	16:02	Cloudy	2.8736	3.1022	18665.85	18689.85	24.00	1.20	1.20	1.20	132	211	260	Construction work in progress	9315	0847
19-Feb-11	15:24	20-Feb-11	15:24	Cloudy	2.8665	2.9967	18692.65	18716.65	24.00	1.20	1.20	1.20	75	211	260	Construction work in progress	9315	0848
25-Feb-11	11:20	26-Feb-11	11:20	Sunny	2.8590	2.9924	18719.85	18743.85	24.00	1.20	1.20	1.20	77	211	260	Construction work in progress	9315	0853
												Min.	75					
												Max.	132					
												Average	100					


24-hr TSP Level
AM4 (A Location within DSD Central PTW)
AM4
Action Level
Limit Level
The Project was started
from 14 February 2011
24-hr TSP Level, µgm-3
300
250
200
150
100
50
0
2/1/2011
2/2/2011
2/3/2011
2/4/2011
2/5/2011
2/6/2011
2/7/2011
2/8/2011
2/9/2011
2/10/2011
2/11/2011
2/12/2011
2/13/2011
2/14/2011
2/15/2011
2/16/2011
2/17/2011
2/18/2011
2/19/2011
2/20/2011
2/21/2011
2/22/2011
2/23/2011
2/24/2011
2/25/2011
2/26/2011
2/27/2011
2/28/2011
Date

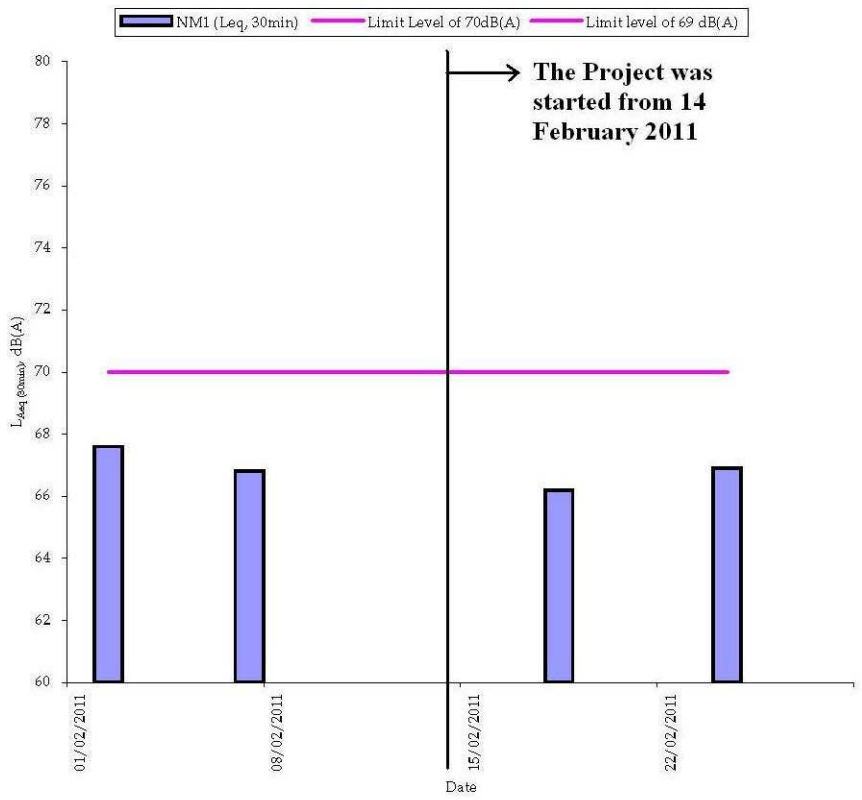
APPENDIX E
NOISE MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Daytime Noise Monitoring Results

Station NM1

Date	Start Time	End Time	Weather	Noise level (dB(A)), 30 min			Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
2-Feb-11	14:40	15:10	Sunny	67.6	69.9	64.0	-	Traffic noise	-	15	0.2	RION- NL31 (S/N 00983400)	RION - NC73 (S/N 10997142)
7-Feb-11	14:30	15:00	Sunny	66.8	69.2	63.1	-	Traffic noise, noise from nearby playground	-	19	0.3	RION- NL31 (S/N 00983400)	RION - NC73 (S/N 10997142)
18-Feb-11	15:40	15:55	Trace Rain	66.2	68.1	61.5	Noise from pass-by and nearby playgroudn	Traffic noise	-	14	0.6	RION- NL31 (S/N 00983400)	RION - NC73 (S/N 10997142)
24-Feb-11	9:00	9:30	Sunny	66.9	69.0	63.9	-	Mainly traffic noise	-	19	0.2	RION- NL31 (S/N 00983400)	RION - NC73 (S/N 10997142)
			Min.	**66.2**									
			Max.	**67.6**									

Normal Weekdays Noise Monitoring Results at NM1 ($L_{eq, 30min}$)

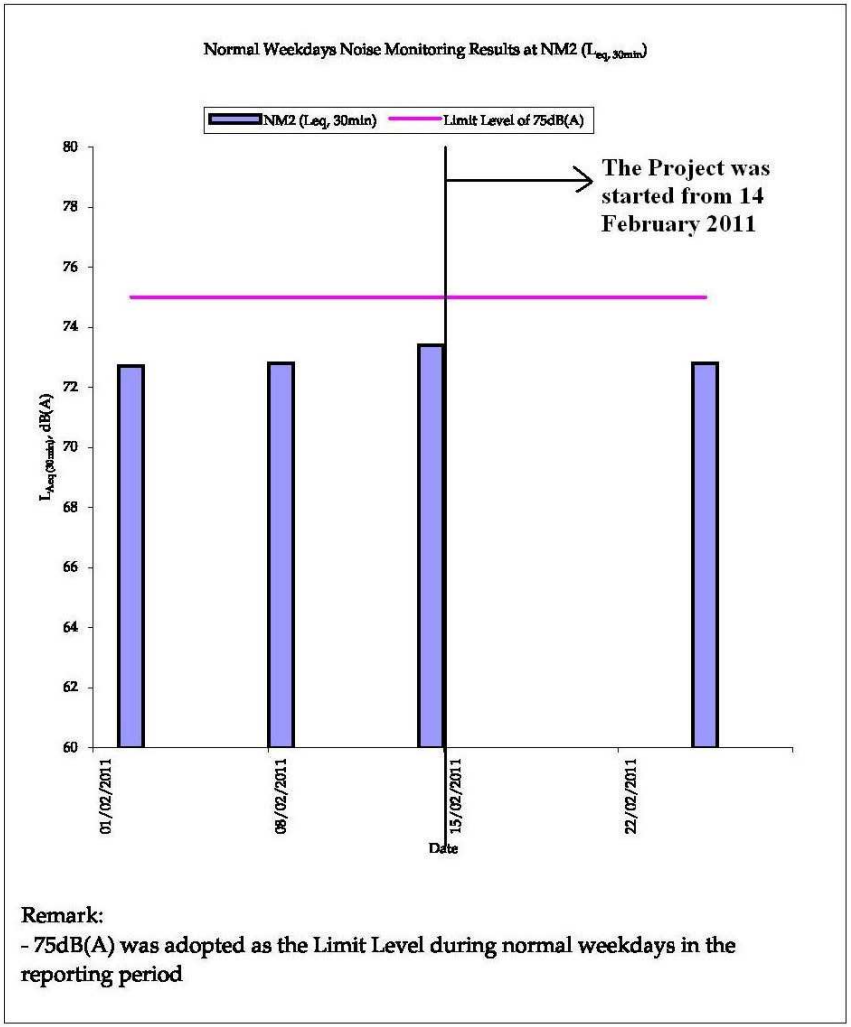


Remark:
- 70dB(A) was adopted as the Limit Level during school normal teaching period in the reporting period

Daytime Noise Monitoring Results

Station NM2

Date	Start Time	End Time	Weather	Noise level (dB(A)), 30 min			Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
2-Feb-11	15:30	16:00	Sunny	72.7	73.7	71.6	No outdoor construction noise	Mainly traffic noise	-	15	0.3	RION- NL31 (S/N 00983400)	RION - NC73 (S/N 10997142)
8-Feb-11	14:20	14:50	Sunny	72.8	74.0	71.7	No outdoor construction noise, sheet piling (near site)	Mainly traffic noise	-	21	0.2	RION- NL31 (S/N 00983400)	RION - NC73 (S/N 10997142)
14-Feb-11	10:48	11:48	Cloudy	73.4	74.2	72.5	Breaker noise, sheet piling (near site)	Mainly traffic noise	-	10	0.5	RION- NL31 (S/N 00983400)	RION - NC73 (S/N 10997142)
25-Feb-11	13:22	13:52	Sunny	72.8	74.0	71.6	Excavation work (near site)	Mainly traffic noise	-	20	0.3	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
			Min.	72.7									
			Max.	73.4									



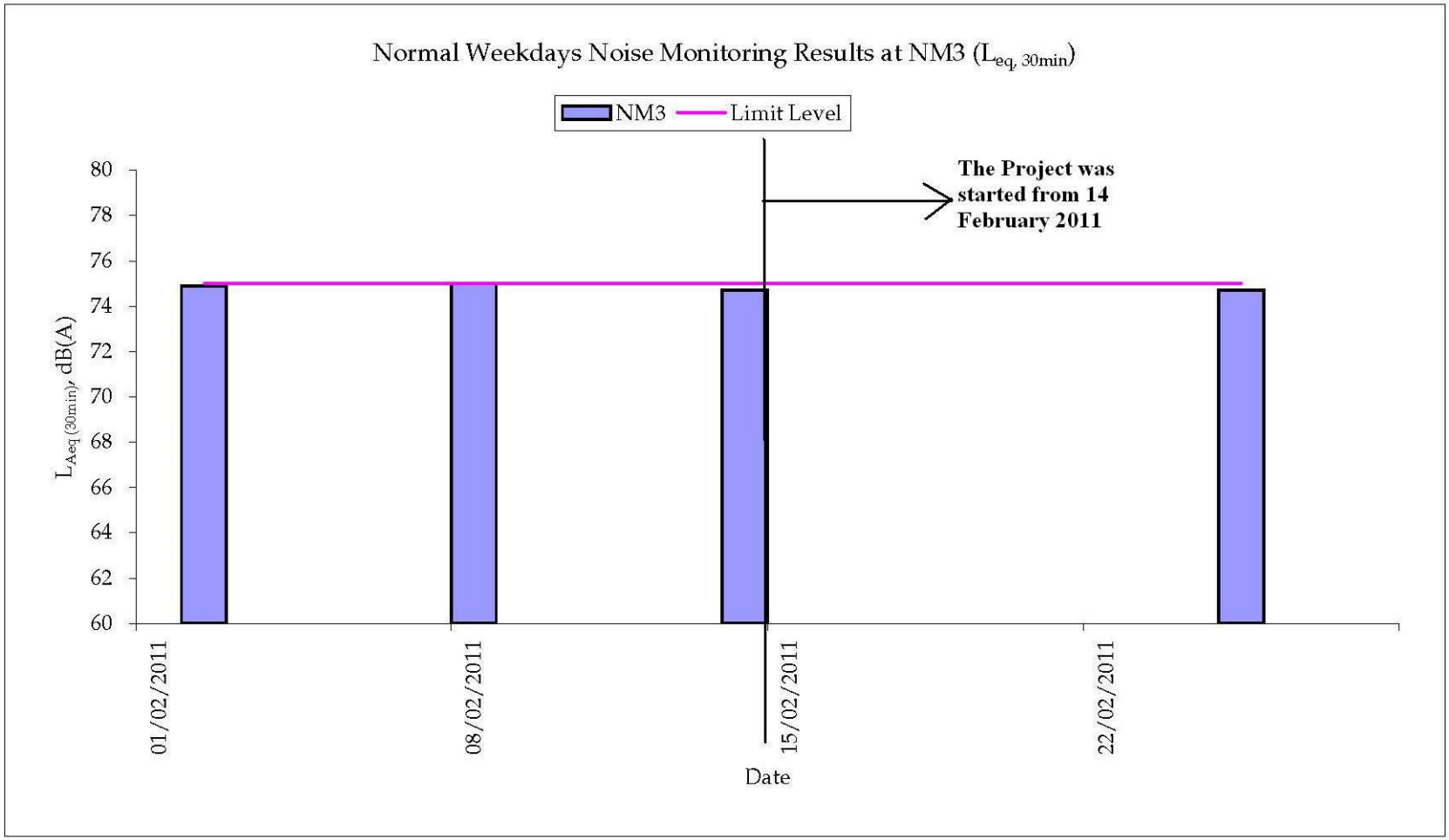
Remark:

- 75dB(A) was adopted as the Limit Level during normal weekdays in the reporting period

Daytime Noise Monitoring Results

Station NM3

Date	Start Time	End Time	Weather	Noise level (dB(A)), 30 min			Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
2-Feb-11	9:15	9:45	Sunny	74.9	76.5	72.7	Breaker noise	Mainly traffic noise	-	15	0.2	RION- NL31 (S/N 00983400)	RION - NC73 (S/N 10997142)
8-Feb-11	9:48	10:18	Sunny	75.0	76.2	73.0	Breaker noise	Mainly traffic noise	-	21	0.2	RION- NL31 (S/N 00983400)	RION - NC73 (S/N 10997142)
14-Feb-11	13:46	14:16	Cloudy	74.7	76.7	72.6	Breaker noise	Mainly traffic noise	-	10	0.8	RION- NL31 (S/N 00983400)	RION - NC73 (S/N 10997142)
25-Feb-11	9:25	9:55	Sunny	74.7	76.1	72.7	Excavation work	Mainly traffic noise	-	20	0.3	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
			Min.	**74.7**									
			Max.	**75.0**									


Normal Weekdays Noise Monitoring Results at NM3 ($L_{eq, 30min}$)
NM3
Limit Level
The Project was started from 14 February 2011
80
78
76
74
72
70
68
66
64
62
60
$L_{Aeq\ (30min)}$, dB(A)
01/02/2011
08/02/2011
15/02/2011
22/02/2011
Date

APPENDIX F
SUMMARY OF EXCEEDANCE

APPENDIX F – SUMMARY OF EXCEEDANCE

Reporting Month: February 2011

a) Exceedance Report for 1-hr TSP (NIL)

b) Exceedance Report for 24-hr TSP (NIL)

c) Exceedance Report for Construction Noise (NIL)

APPENDIX G
SITE AUDIT SUMMARY

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	110217
Date	17 February 2011 (Thuesday)
Time	09:30-10:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
110217-R01	***Part A - Water Quality*** • No environmental deficiency was identified during the site inspection. ***Part B – Landscape and Visual*** • No environmental deficiency was identified during the site inspection. ***Part C - Air Quality*** • No environmental deficiency was identified during the site inspection. ***Part D – Noise*** • No environmental deficiency was identified during the site inspection. ***Part E – Waste / Chemical Management*** • To provide drip tray for the Chemical containers at North Point PTW. ***Part F - Permit / Licenses*** • No environmental deficiency was identified during the site inspection. ***Others*** • Follow-up on previous audit sessions: N/A	E 3i and 7ii

	Name	Signature	Date
Recorded by	Gary Lau		18 February 2011
Checked by	Dr. Priscilla Choy		18 February 2011

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	110223
Date	23 February 2011 (Thuesday)
Time	11:00-11:45

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
110223-R02	***Part A - Water Quality*** • No environmental deficiency was identified during the site inspection. ***Part B – Landscape and Visual*** • To erect tree protection fence for trees in pre-drill area before tree transplantation at North Point PTW ***Part C - Air Quality*** • No environmental deficiency was identified during the site inspection. ***Part D – Noise*** • No environmental deficiency was identified during the site inspection.	B2
110223-R01	***Part E – Waste / Chemical Management*** • To provide chemical storage area at North Point PTW ***Part F - Permit / Licenses*** • No environmental deficiency was identified during the site inspection. ***Others*** • Follow-up on previous audit session (Ref. 100217), all environmental deficiencies have been improved/ rectified during site inspection.	E 2i

	Name	Signature	Date
Recorded by	Gary Lau		24 February 2011
Checked by	Dr. Priscilla Choy		24 February 2011

APPENDIX H
SUMMARY OF AMOUNT OF WASTE GENERATED

Name of Department : Harbour Area Treatment Scheme Stage 2A – Upgrading of Preliminary Treatment Works at North Point , Wan Chai East and Central

Contract No. : DC/2009/23

APPENDIX H MONTHLY SUMMARY WASTE FLOW TABLE FOR 2011 (YEAR)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Borken Concrete (4)	Reused in the Contract	Reused in other Projects	Disposal as Public Fill	Import Fill	Metals	Paper / Cardboard Packaging	Plastics (3)	Chemical Waste	Other, e.g. general refuse
	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000kg]	[in '000kg]	[in '000kg]	[in '000L]	[in '000m^3]
JAN	0	0	0	0	0	0	0	0	0	0	0
FEB	0	0	0	0	0	0	0	0	0	0	0
MAR											
APR											
MAY											
JUNE											
SUB-TOTAL											
JULY											
AUG											
SEPT											
OCT											
NOV											
DEC											
TOTAL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Forecast of Total Quantities of C&D materials to be Generated from the Contracts *										
Total	Borken	Reused in the	Reused in	Disposal as	Import Fill	Metals	Paper /	Plastics (3)	Chemical	Other, e.g.
[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000kg]	[in '000kg]	[in '000kg]	[in '000kg]	[in '000m^3]
18.2	3	1.73	1	7	0	0	2.47	0	1	2

Notes :
(1) The performance targets are given in PS Clause 6(14).
(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the site.
(3) Plastics refer to plastic bottles / containers, plastic sheets / foam from packaging material.
* (4) The contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where to total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000m3. (PS Clause 5(4)(b) referes).
[Delete Note (4) and the table above on the forecast, where inapplicable].

APPENDIX I
EVENT ACTION PLANS

APPENDIX I – Event / Action Plans

Table I-1 Event / Action Plan For Air Quality

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of failurein writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented	1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
	actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring			
LIMIT LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
2. Exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 5. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Table J-2 Event / Action Plan For Construction Noise

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
Action Level being exceeded	1. Notify ER, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness	1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Advise the ER on the effectiveness of the proposed remedial measures	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures	1. Submit noise mitigation proposals to IEC and ER; 2. Implement noise mitigation proposals
Limit Level being exceeded	1. Inform IEC, ER, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and ER on remedial measures required; 7. Assess effectiveness of	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; 5. Stop the relevant portion of works as instructed by

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
	Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring		until the exceedance is abated	the ER until the exceedance is abated

APPENDIX J
ENVIRONMENTAL MITIGATION
IMPLEMENTATION SCHEDULE (EMIS)

APPENDIX J IMPLEMENTATION SCHEDULE OF ENVIRONMENTAL MITIGATION MEASURES (EMIS)

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
A	**Air Quality**		
3.74	Skip hoist for material transport should be totally enclosed by impervious sheeting.	All construction sites	^
	Vehicle washing facilities should be provided at every vehicle exit point.		^
	The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcore.		^
	Where a site boundary adjoins a road, streets or other areas accessible to the public, hoarding of not less than 2.4 m high from ground level should be provided along the entire length except for a site entrance or exit.		N/A
	Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.		^
	Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.		^
	Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs.		^
	Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.		^
	Imposition of speed controls for vehicles on unpaved site roads. Ten kilometers per hour is the recommended limit.		^
	Every stock of more than 20 bags of cement should be covered entirely by impervious sheeting placed in an area sheltered on the top and the 3 sides.		^
	Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites.		^
3.74	Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All construction sites	^

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
B	**Airborne Noise**		
4.56–4.61	Use of quiet PME, movable barriers and acoustic mats.	All construction sites	^
4.67	Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program.		^
	Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program.		^
	Mobile plant, if any, shall be sited as far away from NSRs as possible.		^
	Machines and plant (such as trucks) that may be in intermittent use shall be shut down between works periods or shall be throttled down to a minimum.		^
4.67	Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.		^
	Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities.		^
C	**Water Quality**		
6.349 to 6.375	Construction Site Runoff and General Construction Activities The mitigation measures as outlined in the ProPECC PN 1/94 Construction Site Drainage should be adopted where applicable.	All construction sites	^
6.376	Effluent Discharge There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the WPCO license which is under the ambit of regional office (RO) of EPD. Minimum distances of 100 m should be maintained between the discharge points of construction site effluent and the existing saltwater intakes.		^
6.377	Accidental Spillage of Chemicals Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General)		^

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
	Regulation should be observed and complied with for control of chemical wastes.		
6.378	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.		^
6.379	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: • Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. • Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. • Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.		^
6.380	Construction Works in Close Proximity of Storm Drains or Seafront To minimize the potential water quality impacts from the construction works located at or near any watercourse, the practices outlined below should be adopted where applicable. • The use of less or smaller construction plants may be specified to reduce the disturbance to the storm water courses or marine environment. • Temporary storage of materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction materials should be located well away from any water courses during carrying out of the construction works. • Stockpiling of construction materials and dusty materials should be covered and located away from any water courses. • Construction debris and spoil should be covered up and/or disposed of as soon as possible to avoid being washed into the nearby water receivers. • Construction activities, which generate large amount of wastewater, should be carried out in a distance away from the waterfront, where practicable. • Proper shoring may need to be erected in order to prevent soil/mud from slipping into	All construction sites	^

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
	the storm culvert or sea.		
D	**Waste Management**		
9.107	Reusable steel or concrete panel shutters, fencing and hoarding and signboard should be used as a preferred alternative to items made of wood, to minimise wastage of wood. Attention should be paid to WBTC No. 19/2001 - Metallic Site Hoardings and Signboards to reduce the amount of timber used on construction sites. Metallic alternatives to timber are readily available and should be used rather than new timber. Precast concrete units should be adopted wherever feasible to minimize the use of timber formwork.	All construction sites	^
9.109	All waste materials should be segregated into categories covering: • excavated materials suitable for reuse on-site; • excavated materials suitable for public filling facilities; • remaining C&D waste for landfill; • chemical waste; and • general refuse for landfill.	All construction sites	^
9.113	Sort C&D waste from demolition of existing facilities to recover recyclable portions such as metals;		^
	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.		^
	Encourage collection of aluminium cans, PET bottles and paper by providing separate labelled bins to enable these wastes to be segregated from other general refuse generated by the work force.		^
	Any unused chemicals or those with remaining functional capacity shall be recycled.		^
	Proper storage and site practices to minimise the potential for damage or contamination of construction materials.		#
9.115	Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.		^
	Training of site personnel in proper waste management and chemical waste handling procedures.		^
9.115	Develop and provide toolbox talk for on-site sorting of C&D materials to enhance worker's awareness in handling, sorting, reuse and recycling of C&D materials.		^

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
	Provision of sufficient waste disposal points and regular collection of waste.		^
	Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.		^
9.125	Bentonite slurries used in diaphragm wall construction should be reconditioned and reused wherever practicable. The disposal of residual used bentonite slurry should follow the good practice guidelines stated in ProPECC PN 1/94 "Construction Site Drainage"	All construction sites	^
9.131	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.		^
9.133	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.		^
9.135	The recyclable component of the municipal waste generated by the workforce, such as aluminium cans, paper and cleansed plastic containers should be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste should be set up by the Contractor. The Contractor should also be responsible for arranging recycling companies to collect these materials.		^
9.137	If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the approved Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.		N/A
9.142	Prior to excavation of the marine deposit layer, the deposit should be tested in accordance with the ETWB TC(W) No. 34/2002 and the results should be presented in a Preliminary Sediment Quality Report. The marine deposit should be disposed of at the disposal site designated by the Marine Fill Committee (MFC) or Director of Environmental Protection (DEP) depending on the test results.		N/A

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
E	**Terrestrial Ecology**		
10.94	To implement effective noise mitigation measures as recommended in Section 4 of EIA.	All construction sites	N/A
10.95	Dust control practices such as regular watering, complete coverage of any aggregate or dusty material storage piles, and re-schedule of dusty activities during high-wind conditions as well as other measures recommended in Section 3 of EIA, should be implemented.		^
10.96	Fences/hoardings should be erected and installed along the boundary of the works areas.		^
10.97	Standard good site practices as suggested in Section 10 of EIA should be implemented.		N/A
10.98	Provision of proper drainage system and runoff control measures such as use of sand/silt traps, oil/grease separators, sedimentation tanks, etc.		^
F	**Landscape and Visual**		
Table 13.7	Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical.	All construction sites	^
	Existing trees to be retained on site should be carefully protected during construction.		*
	Trees unavoidably affected by the works should be transplanted where practical.		^
	Compensatory tree planting should be provided to compensate for felled trees.		^
	Control of night-time lighting.		^
Table 13.7	Erection of decorative screen hoarding compatible with the surrounding setting.	All construction sites	N/A
G	**Marine Ecology**		
11.137	To minimize the potential indirect impacts on water quality from construction site runoff and various construction activities, the practices outlined in ProPECC PN 1/94 Construction Site Drainage should be adopted.	All construction sites	^
H	**Hazard to Life**		
14A.201	Limiting use of cranes in terms of locations, lifting height, swing angle and setting up safety zone.	Exact location will be determined on construction site by the engineer	^

Remarks:	^ Compliance of mitigation measure;
	N/A Not Applicable;
	* Recommendation was made during site audit but improved/rectified by the contractor.
	# Recommendation was made during site audit and to be improved / rectified by the contractor.
	X Non-compliance of mitigation measure;
	● Non-compliance but rectified by the contractor;

APPENDIX K
COMPLAINT LOG

APPENDIX K – COMPLAINT LOG

Reporting Month: February 2011

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Remarks: No environmental complaint was received in the reporting month.

APPENDIX L
CONSTRUCTION PROGRAMME

Act ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors
DSD - HATSS2-Upgrading of PTW										
Particulars										
Key Dates										
Commencement / Completion										
GN0030	Date of Commencement of Contract	0	0	06JAN11 *		06JAN11 *		0		CT00110, CT00130, CT00170, CT00200, CT00250, CT06100, CT06200, CT06250, CT07300,
GN0040	Time for Completion for Project	1393	1393	06JAN11	29OCT14	06JAN11	29OCT14	0	GN0030	GN0050
Portions of the Site										
Central										
Possession / Vacation of Portions										
CT00110	H/O Date_CTL-1 (45 days after start)	0	0	19FEB11		19FEB11		0 *	GN0030	CT08300
CT00130	H/O Date_CTL-2 (45 days after start)	0	0	19FEB11		19FEB11		0 *	GN0030	
CT00170	H/O Date_CTL-T	0	0	06JAN11		06JAN11		0 *	GN0030	
Management Plans										
Contractor's Design, Submission / Approval										
Particulars										
GN0200	Prepare/Submit Safety Plan	14	14	06JAN11	19JAN11	16OCT15	29OCT15	1744d	GN0010	
GN0300	Prepare/Submit Environmental Manag. Plan	21	21	06JAN11	26JAN11	09OCT15	29OCT15	1737d	GN0030	
GN0390	Prepare / Submit Subcontractor Management Plan	30	30	06JAN11	04FEB11	30SEP15	29OCT15	1728d	GN0030	
GN0400	Prepare / Submit Interface Management Plan	55	55	06JAN11	01MAR11	11JAN11	06MAR11	5d	GN0030	GN0450
GN0450	Comments / Approval of Interface Management Plan	45	45	02MAR11	15APR11	07MAR11	20APR11	5d	GN0400	GN0500
North Point PTW										
Key Dates										
Time for Completion										
GN0070	Time for Completion of Section 1	878	878	06JAN11	01JUN13	06JAN11	01JUN13	0	GN0030	NP00020, NP00050, NP20100, NP32050
GN0080	Time for Completion of Section 2	1168	1168	25JAN11	06APR14	18AUG12	29OCT15	571d	GN0030, NP25500	
GN0090	Time for Completion of Section 3	1378	1378	06JAN11	14OCT14	06JAN11	14OCT14	0	GN0030, NP37150	NP00040, NP00060
Wan Chai East PTW										
Key Dates										
Time for Completion										
GN0100	Time for Completion of Section 4	388	388	06JAN11	28JAN12	06JAN11	28JAN12	0	GN0030	WC01800
GN0105	Time for Completion of Section 4 (ii)	313	313	06JAN11	14NOV11	06JAN11	14NOV11	0	GN0030	WC00040, WC01700
GN0110	Time for Completion of Section 5	1053	1053	06JAN11	23NOV13	06JAN11	23NOV13	0	GN0030	WC00020, WC00060, WC00080, WC00100
GN0115	Time for Completion of Section 5(iv)	840	840	06JAN11	24APR13	06JAN11	24APR13	0	GN0030	WC00050
GN0120	Time for Completion of Section 6	1233	1233	06JAN11	22MAY14	06JAN11	22MAY14	0	GN0030, WC55150	GN0365, WC00120, WC00140
Central PTW										
Key Dates										
Time for Completion										
GN0130	Time for Completion of Section 7	1059	1059	06JAN11	29NOV13	17FEB11	10JAN14	42d	GN0030	CT05150
GN0140	Time for Completion of Section 8	806	806	06JAN11	21MAR13	06JAN11	21MAR13	0	GN0030	CT00150
GN0150	Time for Completion of Section 9	1236	1236	06JAN11	25MAY14	06JAN11	25MAY14	0	GN0030	CT00120, CT00140
GN0160	Time for Completion of Section 10	1393	1393	06JAN11	29OCT14	06JAN11	29OCT14	0	GN0030	CT40300, CT40350
GN0170	Time for Completion of Section 11	1393	1393	06JAN11	29OCT14	19MAY11	11MAR15	133d	GN0030	CT47150
Temporary Land										
Key Dates										
Possession / Vacation of Portions										
GN0350	H/O_ABN-T (1 day after start)	0	0	06JAN11		06JAN11		0 *	GN0030	
GN0360	H/O Date_SBY-T1 (60 days after start)	0	0	06MAR11		06MAR11		0 *	GN0030	
GN0370	H/O Date_SBY-T2 (60 days after start)	0	0	06MAR11		06MAR11		0 *	GN0030	GN0375
GN0380	H/O Date_SBY-T3 (60 days after start)	0	0	06MAR11		06MAR11		0 *	GN0030	GN0385
Civil Works										
Contractor's Design, Submission / Approval										
Technical Information & Drawings										
GN0600	Prepare / Submit Major Method Statement	28	28	07MAR11	03APR11	25MAR11	21APR11	18d	GN0030	GN0650
GN0700	Prepare / Submit Temp. Works Proposal	30	30	07MAR11	05APR11	09MAR11	07APR11	2d	GN0030	GN0750
GN0900	Prepare/Submit Tech. Data, Civil Wks Design	28	28	07MAR11	03APR11	11MAR11	07APR11	4d	GN0030	GN0950
Electrical & Mechanical Plant Installation										
Contractor's Design, Submission / Approval										
Technical Information & Drawings										
GN1100	Prepare / Submit Method Statement	60	60	22MAR11	20MAY11	24APR11	22JUN11	33d	GN0030	GN1150
GN1200	Prepare/Submit Tech. Data, Shop/Bldr's Wks Drwgs	65	65	07MAR11	10MAY11	08MAR11	11MAY11	1d	GN0030	GN1250
Equipment Catalogue and Samples										
GN1400	Prepare & Submit Equipment Catalog / Samples	84	84	07MAR11	29MAY11	07MAR11	29MAY11	0	GN0030	GN1450
Works for Section 4										

Start date	30DEC10
Finish date	29OCT15
Data date	06JAN11
Run date	26JAN11
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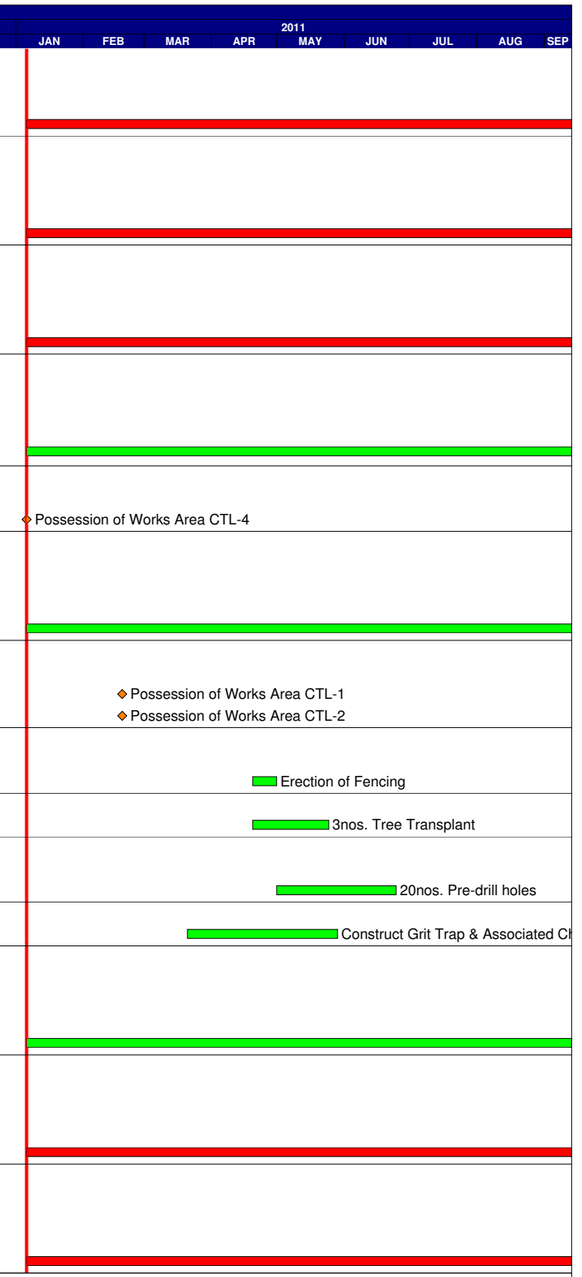
Leader-JEC JV
DSD - HATSS2-Upgrading of PTW
3month Rolling Programme

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

Act ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors
Wan Chai East										
Time for Completion										
WC00160	Time for Completion of Section 4	388	388	06JAN11	28JAN12	06JAN11	28JAN12	0	GN0030	WC01800
Works for Section 5										
Wan Chai East										
Time for Completion										
WC01850	Time for Completion of Section 5	1053	1053	06JAN11	23NOV13	06JAN11	23NOV13	0	GN0030	WC23400
Works for Section 6										
Wan Chai East										
Time for Completion										
WC30500	Time for Completion of Section 6	1233	1233	06JAN11	22MAY14	06JAN11	22MAY14	0	GN0030	WC55150
Works for Section 7										
Central										
Time for Completion										
CT00200	Time for Completion - Section 7	1059	1059	06JAN11	29NOV13	17FEB11	10JAN14	42d	GN0030	CT05150
Possession / Vacation of Portions										
CT00250	Possession of Works Area CTL-4	0	0	06JAN11		30OCT15		758d	GN0030	
Works for Section 8										
Central										
Time for Completion										
CT06100	Time for Completion - Section 8	806	806	06JAN11	21MAR13	11MAR11	24MAY13	64d	GN0030	CT14150
Possession / Vacation of Portions										
CT06200	Possession of Works Area CTL-1	0	0	19FEB11		19FEB11		0 *	GN0030	CT07200
CT06250	Possession of Works Area CTL-2	0	0	19FEB11		19FEB11		0 *	GN0030	CT07200
CTL-1 & CTL-2 Demolition / Modification Works										
Site Clearance & Prep.works										
CT07200	Erection of Fencing	10	10	20APR11	30APR11	27JUN12	07JUL12	369d	CT06200, CT06250	CT07250, CT07700, CT08050
Transplantion, landscape works										
CT07250	3nos. Tree Transplant	30	30	20APR11	24MAY11	30JUN15	03AUG15	1301d	CT07200	CT08100
Civil Works										
Foundation works										
CT08050	20nos. Pre-drill holes	55	55	01MAY11	24JUN11	27MAY15	20JUL15	1487d	CT07200	CT08100
RC Structural Works										
CT08300	Construct Grit Trap & Associated Channels	60	60	21MAR11	28MAY11	12APR12	20JUN12	330d	CT00110	CT09300
Works for Section 9										
Central										
Time for Completion										
CT16100	Time for Completion - Section 9	1236	1236	06JAN11	25MAY14	07MAR11	24JUL14	60d	GN0030	CT36200
Works for Section 10										
Central										
Time for Completion										
CT40100	Time for Completion - Section 10	1393	1393	06JAN11	29OCT14	06JAN11	29OCT14	0	GN0030	CT40300, CT40350, CT47150
Works for Section 11										
SCISTW										
Time for Completion										
CT50100	Time for Completion of Section 11	1393	1393	06JAN11	29OCT14	06JAN11	29OCT14	0	GN0030	CT53450



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c Primavera Systems, Inc.	

Leader-JEC JV
DSD - HATSS2-Upgrading of PTW
3month Rolling Programme

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