Gammon Construction Limited

Contract No. DC/2007/23 Harbour Area Treatment Scheme Stage 2A Construction of Sewage Conveyance System from North Point to Stonecutters Island: *Sixteenth Quarterly EM&A Report*

November 2013

Environmental Resources Management
16/F DCH Commercial Centre
25 Westlands Road, Quarry Bay
Hong Kong
Telephone: (852) 2271 3000
Facsimile: (852) 2723 5660
E-mail: post.hk@erm.com
http://www.erm.com

Gammon Construction Limited

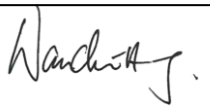
Contract No. DC/2007/23 Harbour Area Treatment Scheme Stage 2A Construction of Sewage Conveyance System from North Point to Stonecutters Island: *Sixteenth Quarterly EM&A Report*

November 2013

Reference 0104887

For and on behalf of ERM-Hong Kong, Limited

Approved by: Frank Wan

Signed: 

Position: Partner

Certified by:
(Environmental Team Leader – Winnie Ko)

Date: 14 March 2014

Our ref KMY/AFK/MR/TK/bw/T261332/22.01/L-0707
T 2828 5757
E Anne.Kerr@mottmac.com.hk
Your ref

Mott MacDonald

CE/Harbour Area Treatment Scheme
Drainage Services Department
Sewage Services Branch
Harbour Area Treatment Scheme Division
5/F, Western Magistracy
2A Pokfulam Road, Hong Kong

14 March 2014
By Post

Attn: Mr. Danny Tang

Dear Sir,

Agreement No. CE 8/2009(EP)
Harbour Area Treatment Scheme (HATS) Stage 2A
Independent Environmental Checker for Construction Phase – Investigation

Contract no. DC/2007/23
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Submission of 16th Quarterly EM&A Report for September to November 2013

We refer to the revised 16th Quarterly EM&A Report for September to November 2013 received on 13 March 2014 via email. We confirm we have no comment on the said report.

Yours faithfully
for MOTT MACDONALD HONG KONG LIMITED

Dr. Anne F Kerr
Independent Environmental Checker

c.c.	AECOM	Mr. K Y Chan	By email
	Gammon	Mr. Max Ko	By email
	ERM	Ms. Winnie Ko	By email

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EXECUTIVE SUMMARY

The construction works of **DC/2007/23 of Harbour Area Treatment Scheme Stage 2A (HATS2A) - Construction of Sewage Conveyance System from North Point to Stonecutters Island (the Project)** had commenced on 1 December 2009. This is the 16th quarterly Environmental Monitoring and Audit (EM&A) report presenting the EM&A work carried out during the period from 1 September 2013 to 30 November 2013 in accordance with the EM&A Manual.

North Point Production and Drop Shafts

Summary of Construction Works undertaken during Reporting Period

The major construction works undertaken included:

- Pre-excavation grouting at Production Shaft;
- Drilling and blasting at Production Shaft;
- Base preparation for tunnelling lining construction at Production Shaft;
- Construction of shaft bottom junction at Drop Shaft.

Environmental Monitoring and Audit Progress

A summary of the monitoring activities in this reporting period is listed below:

• 24-hour averaged TSP Monitoring at each monitoring station (AM1)	16 sets
• 1-hour averaged TSP Monitoring at each monitoring station (AM1)	48 sets
• 24-hour averaged TSP Monitoring at each monitoring station (AM2)	16 sets
• 1-hour averaged TSP Monitoring at each monitoring station (AM2)	48 sets
• Construction Noise Monitoring during Normal Weekdays at NM1	13 sets
• Construction Noise Monitoring during Restricted Hours at NM1	13 times
• Joint Environmental Site Inspection	13 times
• Landscape & Visual Monitoring	3 times

Environmental Exceedance/Non-conformance/Complaint/Summons and Prosecution

No exceedance of Action and Limit Levels of 1-hr and 24-hr averaged TSP was recorded during the reporting period.

No exceedance of the Noise Limit Levels was recorded at the monitoring station during both normal working hours and restricted hours in the reporting period.

No non-compliance event was recorded during the reporting period.

There was no complaint/summon/prosecution received during the reporting period.

Wan Chai East Production and Drop Shaft

Summary of Construction Works undertaken during Reporting period

The major construction works undertaken included:

- Pre-excavation grouting at Production shaft;
- Drilling and blasting at Production shaft;
- Permanent structural lining construction at lower shaft at Drop Shaft;
- Permanent structural lining construction at upper shaft at Drop Shaft; and
- Construction of shaft lining wall at Drop Shaft.

Environmental Monitoring and Audit Progress

A summary of the monitoring activities in this reporting period is listed below:

• 24-hour averaged TSP Monitoring at AM3	16 sets
• 1-hour averaged TSP Monitoring at AM3	48 sets
• Construction Noise Monitoring during Normal Weekdays at NM2	13 sets
• Construction Noise Monitoring during Restricted hours at NM2	13 times
• Joint Environmental Site Inspection	11 times
• Landscape & Visual Monitoring	3 times

Environmental Exceedance/Non-conformance/Complaint/Summons and Prosecution

No exceedance of Action and Limit Levels of 1-hr and 24-hr average TSP was recorded during the reporting period.

No exceedance of noise limit level was recorded during normal working hours. However, 32 exceedances of noise Limit Level during restricted hours were reported on 1, 10, 15, 24 and 29 September 2013; 8, 13 and 27 October 2013; and 5, 10, 19 and 24 November 2013.

The exceedances were investigated. Referring to the works summary provided by the Contractor, no noisy outdoor construction activity was conducted at the Wan Chai East Production and Drop Shafts during the noise monitoring sessions. Other potential noise sources were also identified in the vicinity (i.e., traffic) to contribute to the measured noise level. In view of no noisy outdoor construction works carried out and contribution from other potential noise source in vicinity (i.e., traffic), it is considered that the exceedances were not due to the Contract 23 construction works. However, the Contractor was reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures to avoid exceedance of noise limit levels or causing nuisance.

No non-compliance event was recorded during the reporting period.

No complaint/ summon/prosecution was received in this reporting period.

Central Drop Shaft

Summary of Construction Works undertaken during the Reporting Period

The major construction works undertaken included:

- Control hole drilling for grouting before raise boring at Drop Shaft; and
- Concreting on shaft bottom for two footings.

Environmental Monitoring and Audit Progress

A summary of the monitoring activities in this reporting period is listed below:

• 24-hour averaged TSP Monitoring at AM4	16 sets
• 1-hour averaged TSP Monitoring at AM4	48 sets
• Construction Noise Monitoring during Normal Weekdays at NM3	13 sets
• Joint Environmental Site Inspection	6 times
• Landscape & Visual Monitoring	3 times

Environmental Exceedance/Non-conformance/Complaint/Summon and Prosecution

No exceedance of the Action and Limit Levels of the 1-hour and 24-hour averaged TSP was recorded during the reporting period.

No non-compliance event was recorded during the reporting period.

There was no complaint/summon/prosecution received during the reporting period.

Sai Ying Pun Junction Shaft

Summary of Construction Works undertaken during the reporting period

The major construction works undertaken included:

- Pre-excavation grouting; and
- Drilling and blasting

Environmental Monitoring and Audit Progress

A summary of the monitoring activities in this reporting period is listed below:

• 24-hour averaged TSP Monitoring at AM5	17 sets
• 1-hour averaged TSP Monitoring at AM5	51 sets
• Construction Noise Monitoring during Normal Weekdays at NM4	13 sets
• Construction Noise Monitoring during Restricted hours at NM4	13 times
• Joint Environmental Site Inspection	13 times
• Landscape & Visual Monitoring	3 times
• Vibration Monitoring at 67 & 69 Des Voeux Road	10 sets

Environmental Exceedance/Non-conformance/Complaint/Summon and Prosecution

No exceedance of the Action and Limit Levels of the 1-hour and 24-hour averaged TSP was recorded during the reporting period

No exceedance of the Noise Limit Levels was recorded at the monitoring station during both normal working hours and restricted hours in the reporting period.

No exceedance of maximum limit for safe vibration level (25 mm/s) was recorded during the reporting period.

No non-compliance event was recorded during the reporting period.

There was no complaint/summon/prosecution received during the reporting period.

Stonecutters Island Production and Riser Shafts

Summary of Construction Works undertaken during the Reporting Period

The major construction works undertaken included:

- Pre-excavation grouting at Production shaft;
- Drilling and blasting at Production shaft;
- Raise boring – reaming at Riser shaft;
- Water inflow diversion at Riser Shaft; and
- Preparation of shaft bottom at Riser Shaft.

Environmental Monitoring and Audit Progress

A summary of the monitoring activities in this reporting period is listed below:

• 24-hour averaged TSP Monitoring at AM6	16 sets
• 1-hour averaged TSP Monitoring at AM6	48 sets
• Construction Noise Monitoring during Normal Weekdays at NM5	13 times
• Construction Noise Monitoring during Restricted Hours at NM5	13 times
• Joint Environmental Site Inspection	13 times
• Landscape & Visual Monitoring	3 times

Environmental Exceedance/Non-conformance/Complaint/Summon and Prosecution

No exceedance of Action and Limit Levels of 1-hr and 24-hr averaged TSP was recorded during the reporting period.

No exceedance of the Noise Limit Levels was recorded at the monitoring station during both normal working hours and restricted hours in the reporting period.

No non-compliance event was recorded during the reporting period.

One complaint about noise was received on 22 July 2013. Investigation into the complaint had been conducted in August 2013. The findings of the investigation are presented in the 46th monthly EM&A report issued in September 2013. The findings are also presented in *Annex G8* of this report.

There was no summon/prosecution received during the reporting period.

1 INTRODUCTION

ERM-Hong Kong, Limited (ERM) has been appointed by Gammon Construction Limited (the Contractor) as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme for the Contract - *"DC/2007/23 of Harbour Area Treatment Scheme Stage 2A (HATS2A) - Construction of Sewage Conveyance System from North Point to Stonecutters Island" (*the Project*).*

1.1 PURPOSE OF THE REPORT

This is the fourteenth quarterly EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme during the reporting period from **1 September 2013 to 30 November 2013**.

1.2 STRUCTURE OF THE REPORT

The structure of the report is as follows:

Section 1 : **Introduction**
It details the scope and structure of the report.

Section 2 : **Project Information**
It summarises the background and scope of the project, site description, project organisation and contact details.

Section 3 : **North Point Production and Drop Shafts**

- **Construction Activities**
  It summarises the construction activities conducted during the reporting period.
- **Status of Environmental Approval Documents**
  It summarises the required environmental documents submitted under the relevant EP conditions during the reporting period.
- **Environmental Monitoring Requirement**
  It summarises the environmental monitoring including monitoring parameters, programmes, methodologies, frequency, and locations, Action and Limit Levels, Event and Action Plans, environmental mitigation measures as recommended in the EIA report and relevant environmental requirements.
- **Implementation Status on Environmental Mitigation Measures**
  It summarises the implementation of environmental protection measures during the reporting period.
- **Monitoring Results**
  It summarises the monitoring results obtained in the reporting period.
- **Environmental Site Inspection**

It summarises the audit findings of the weekly site inspections undertaken within the reporting period.

- **Environmental Non-conformance**

  It summarises any monitoring exceedance, environmental complaints and environmental summons within the reporting period.

Section 4 : **Wan Chai East Production and Drop Shafts**

- **Construction Activities**

  It summarises the construction activities conducted during the reporting period.

- **Status of Environmental Approval Documents**

  It summarises the environmental documents submissions under the EP condition during the reporting period.

- **Environmental Monitoring Requirement**

  It summarises the environmental monitoring including monitoring parameters, programmes, methodologies, frequency, and locations, Action and Limit Levels, Event and Action Plans, environmental mitigation measures as recommended in the EIA report and relevant environmental requirements.

- **Implementation Status on Environmental Mitigation Measures**

  It summarises the implementation of environmental protection measures during the reporting period.

- **Monitoring Results**

  It summarises the monitoring results obtained in the reporting period.

- **Environmental Site Inspection**

  It summarises the audit findings of the weekly site inspections undertaken within the reporting period.

- **Environmental Non-conformance**

  It summarises any monitoring exceedance, environmental complaints and environmental summons within the reporting period.

Section 5 : **Central Drop Shaft**

- **Construction Activities**

  It summarises the construction activities conducted during the reporting period.

- **Status of Environmental Approval Documents**

  It summarises the environmental documents submissions under the EP condition during the reporting period.

- **Environmental Monitoring Requirement**

  It summarises the environmental monitoring including monitoring parameters, programmes, methodologies, frequency and locations, Action and Limit Levels, Event and Action Plans, environmental mitigation measures as recommended in the EIA report and relevant environmental requirements.

- **Implementation Status on Environmental Mitigation Measures**

It summarises the implementation of environmental protection measures during the reporting period.

- **Monitoring Results**
  It summarises the monitoring results obtained in the reporting period.
- **Environmental Site Inspection**
  It summarises the audit findings of the weekly site inspections undertaken within the reporting period.
- **Environmental Non-conformance**
  It summarises any monitoring exceedance, environmental complaints and environmental summons within the reporting period.

Section 6 : **Sai Ying Pun Junction Shaft**

- **Construction Activities**
  It summarises the construction activities conducted during the reporting period.
- **Status of Environmental Approval Documents**
  It summarises the environmental documents submissions under the EP condition during the reporting period.
- **Environmental Monitoring Requirement**
  It summarises the environmental monitoring including monitoring parameters, programmes, methodologies, frequency and locations, Action and Limit Levels, Event and Action Plans, environmental mitigation measures as recommended in the EIA report and relevant environmental requirements.
- **Implementation Status on Environmental Mitigation Measures**
  It summarises the implementation of environmental protection measures during the reporting period.
- **Monitoring Results**
  It summarises the monitoring results obtained in the reporting period.
- **Environmental Site Inspection**
  It summarises the audit findings of the weekly site inspections undertaken within the reporting period.
- **Environmental Non-conformance**
  It summarises any monitoring exceedance, environmental complaints and environmental summons within the reporting period.

Section 7 : **Stonecutters Island Production and Riser Shafts**

- **Construction Activities**
  It summarises the construction activities conducted during the reporting period.
- **Status of Environmental Approval Documents**
  It summarises the environmental documents submissions under the EP condition during the reporting period.
- **Environmental Monitoring Requirement**

It summarises the environmental monitoring including monitoring parameters, programmes, methodologies, frequency and locations, Action and Limit Levels, Event and Action Plans, environmental mitigation measures as recommended in the EIA report and relevant environmental requirements.

- **Implementation Status on Environmental Mitigation Measures**
  It summarises the implementation of environmental protection measures during the reporting period.
- **Monitoring Results**
  It summarises the monitoring results obtained in the reporting period.
- **Environmental Site Inspection**
  It summarises the audit findings of the weekly site inspections undertaken within the reporting period.
- **Environmental Non-conformance**
  It summarises any monitoring exceedance, environmental complaints and environmental summons within the reporting period.

Section 8 : **Conclusions**

2 PROJECT INFORMATION

2.1 BACKGROUND AND GENERAL SITE DESCRIPTION

The Project comprises the construction of production shafts, drop shafts and a riser shaft and approximately 12 km of tunnel excavation from North Point (NP) via Sai Ying Pun (SYP) to Stonecutters Island (SCI). Shafts vary in depth from 140 m to 170 m below ground with 10 - 12 m diameter. Tunnel-face area ranges from 16 m^2 to 23 m^2. Embedded drainage pipelines will be installed upon the completion of tunnel excavation.

Construction works to be carried out under this Contract include the following major items:

- construction of sewage conveyance system (SCS) from North Point Preliminary Treatment Works (PTW) to Stonecutters Island Sewage Treatment Works (STW) via Wan Chai East (WCE) Preliminary Treatment Works, Central (CEN) Preliminary Treatment Works and Fung Mat Street Sai Ying Pun junction shaft;
- construction of drop shafts at NP PTW, WCE PTW and CEN PTW;
- construction of riser shafts at SCI STW;
- construction of junction shafts at SYP;
- construction of temporary production shafts at NP, WCE and SCI to provide access for the construction of SCS;
- construction of connection channels, pipes, chambers and tunnels connecting the proposed drop shafts / riser shafts to the facilities of the preliminary treatment works / sewage treatment works;
- carrying out surveys of existing buildings, taking over of existing buildings and installation of new piezometers and ground settlement markers and subsequent vibration monitoring along the alignment of the SCS;
- miscellaneous building, civil, electrical and mechanical works; and
- landscape works.

The potential environmental impacts of the Project have been studied in the *"Harbour Area Treatment Scheme (HATS) Stage 2A"* (EIAO Register No: AEIAR-121/2008). The EIA was approved on 2 June 2008 under the *Environmental Impact Assessment Ordinance* (EIAO) and an updated Environmental Permit (EP-322/2008/E) for the works was granted on 24 November 2010. An application for a variation of EP was made by Drainage Service Department (DSD) on 21 Sep 2012, and EP-322/2008/F was issued on 10 Oct 2012, which superseded EP-322/2008/E. Under the requirements of Condition 4.1 of Environmental Permit EP-322/2008/F, an EM&A programme as set out in the EM&A Manual is required to be implemented.

The construction works of this Project commenced on 1 December 2009 and are scheduled to be completed by 2014.

The general layout plan of the Project is shown in *Annex A*.

2.2 *STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS AND REQUIRED SUBMISSIONS*

A summary of the relevant permits, licences, and/or notifications on environmental protection for this Project since November 2008 is presented in *Table 2.1.*

Table 2.1 Summary of Environmental Licensing, Notification and Permit Status for the Contract [(a)]

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Environmental Permit	EP-322/2008	Expired on 10 July 2009	• Permit granted on 19 November 2008. • Superseded on 10 July 2009.
	EP-322/2008/A	Expired on 2 November 2009	• Permit granted on 10 July 2009. • Superseded on 2 November 2009.
	EP-322/2008/B	Expired on 14 May 2010	• Permit granted on 2 November 2009. • Superseded on 14 May 2010.
	EP-322/2008/C	Expired on 14 July 2010	• Permit granted on 14 May 2010 • Superseded on 14 July 2010.
	EP-322/2008/D	Expired on 24 November 2010	• Permit granted on 14 July 2010 • Superseded on 24 November 2010
	EP-322/2008/E	Expired on 10 Oct 2012	• Permit granted on 24 November 2010 • Superseded on 10 Oct 2012
	EP-322/2008/F	Throughout the Contract	• Permit granted on 10 Oct 2012
Notification of Construction Works under Air Pollution Control (Construction Dust) Regulation	--	04 August 2009 – 06 November 2013	• Reference number for Notification Pursuant to APC (Construction Dust) Regulation: 308136
Marine Dumping Permits (b)			
Type 1 Marine Deposit	EP/MD/11-136	20 February 2011 – 29 June 2011	--
Type 2 Marine Deposit	EP/MD/11-118	20 February 2011 – 21 April 2011	-
Type 3 Marine Deposit	8771	23 July 2010 – 22 January 2011	-

Permit/ Licences/ Notification	Reference	Validity Period	Remarks

Note:

(a) The status on environmental licensing and permit for each worksite is discussed in the following sections.

(b) Marine deposits from all sites have been disposed of in accordance with their respective disposal methods (ie Type 1, 2, or 3 disposal methods), and no further marine deposit is anticipated to generate. When marine deposits are encountered, relevant dumping permits will be obtained and they will be disposed of properly.

Status of required submissions under the current EP during the reporting period is presented in *Table 2.2*.

Table 2.2 Status of Required Submission for all Sites

EP Condition	Submission	Submission Date
Condition 4.4	Submission of 46th Monthly EM&A Report	16 October 2013
	Submission of 47th Monthly EM&A Report	14 November 2013
	Submission of 48th Monthly EM&A Report	13 December 2013

2.3 PROJECT ORGANISATION

The project organisational chart and contact details are shown in *Annex B*.

3.1 CONSTRUCTION ACTIVITIES DURING THE REPORTING PERIOD

A summary of the major construction activities undertaken in this reporting period is shown in *Table 3.1*. The locations of the construction activities are shown in *Annex C1*.

Table 3.1 Summary of Construction Activities Undertaken from 1 September 2013 to 30 November 2013 at North Point Production and Drop Shafts

Worksite	Construction Activities Undertaken
Production Shaft	• Pre-excavation grouting; • Drilling and blasting; and • Base preparation for tunneling lining construction.
Drop Shaft	• Construction of shaft bottom junction.

3.2 STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS

A summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this reporting period is presented in *Table 3.2*.

Table 3.2 Summary of Environmental Licensing, Notification and Permit Status at North Point Production and Drop Shafts

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Wastewater Discharge License	North Point PTW Drop Shaft WT00005153-2009	31 January 2012 - 31 October 2014	--
	North Point Production Shaft WT00007055-2010	9 July 2010 - 31 March 2015	--
	Discharge License (Public Car Parking Area, North of North Point Preliminary Treatment Plant)	12 April 2012 – 30 April 2017	
Chemical Waste Producer Registration	North Point Production Shaft 5213-153-G2484-01	Throughout the Contract	--
	North Point PTW Drop Shaft 5213-153-G2483-01	Throughout the Contract	--
Construction Noise Permit (CNP)	North Point Production Shaft GW-RS0177-13	13 March 2013 - 12 September 2013	--
	North Point Production Shaft GW-RS0913-13	12 September 2013 – 11 March 2014	--
	North Point PTW Drop	1 May 2013 – 31	--

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
	Shaft GW-RS0367-13	October 2013	
	North Point PTW Drop Shaft GW-RS1100-13	1 November 2013 – 30 April 2014	--

3.3 ENVIRONMENTAL MONITORING REQUIREMENTS

3.3.1 Air Quality Monitoring

Monitoring Location

In accordance with the EM&A Manual, 24-hour and 1-hour averaged Total Suspended Particulates (TSP) levels should be conducted at designated monitoring stations. Since access to some of the proposed monitoring locations stated in the EM&A Manual were rejected or not available, alternative locations, therefore, were proposed and agreed by the Engineer Representative (ER) and Independent Environmental Checker (IEC). Owing to the security issues with the High Volume Sampler (HVS) mounted at the designated monitoring stations CM_NP2 (rooftop of WSD office) especially under adverse weather conditions, an alternative location which is one floor below the rooftop was identified and agreed by ER and IEC in July 2010.

The construction air quality monitoring stations for this Contract are listed in *Table 3.3* and shown in *Annex C2*.

Table 3.3 Construction Phase Air Monitoring Location at North Point Production and Drop Shafts

Worksite	Construction Air Quality Monitoring Stations			
	ID in EM&A Manual	ID	Location	Remark
North Point	-	AM1	Chan's Creative School (formerly known as Madam Chan Wai Chow Memorial School)	• Access for station setup to K.Wah Centre (CM_NP1) and Tin Chiu Street Children's Playground (CM_NP3) was refused.
	CM_NP2	AM2	Hong Kong & Islands Regional Office, WSD	

Monitoring Parameters, Frequency and Programme

Air quality monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual (*Table 3.4*).

Table 3.4 TSP Monitoring Parameter and Frequency

Parameter	Frequency

Parameter	Frequency
24-hour averaged TSP	Once every 6 days
1-hour averaged TSP	3 times every 6 days

Monitoring Equipment

Continuous 24-hour and three 1-hour averaged TSP monitoring were performed using HVS with appropriate sampling inlets installed and located at the designated monitoring station. The performance specification of HVS complied with the standard method "*Determination of Suspended Particulate Matter in the Atmosphere (High Volume Method)*" as stipulated in *US EPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50 Appendix B)*. The equipment that was deployed for the 24-hour and 1-hour averaged TSP monitoring is listed in *Annex C5*.

Monitoring Methodology

Installation

The setup locations of the HVSs at monitoring stations were listed in *Table 3.3*. All HVSs were free-standing with no obstruction.

The following criteria were considered in the installation of the HVSs:

- appropriate support to secure the samplers against gusty wind was provided at AM1 and AM2;
- a minimum of 2 m separation from walls, parapets and penthouses was required for rooftop samplers;
- no furnace or incinerator flues was nearby;
- airflow around the sampler was unrestricted; and
- permission was obtained to set up the samplers and to gain access to the monitoring stations.

Preparation of Filter Papers

- glass fibre filters were labelled and filters that were clean and without pinholes were selected;
- all filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and did not net vary by more than ± 3 °C; the relative humidity (RH) was 40%; and
- SGS Hong Kong Ltd, a HOKLAS accredited laboratory, implements comprehensive quality assurance and quality control programmes.

Field Monitoring

- the power supply was checked to ensure that the HVSs were working properly;
- the filter holder and the area surrounding the filter were cleaned;
- the filter holder was removed by loosening the foul bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully;
- the filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter;
- the swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges;
- the shelter lid was closed and secured with an aluminium strip;
- the HVSs were warmed-up for about 5 minutes to establish run-temperature conditions;
- a new flow rate record sheet was set into the flow recorder;
- the flow rates of the HVSs were checked and adjusted to between 1.22 - 1.37 m^3min^{-1} which were within the range specified in the EM&A Manual (ie 0.6 – 1.7 m^3min^{-1});
- the programmable timer was set for a sampling period of 24 hours ± 1 hour, and the starting time, weather condition and the filter number were recorded;
- the initial elapsed time was recorded;
- at the end of sampling, the sampled filter was removed carefully and folded in half so that only surfaces with collected particulate matter were in contact;
- the filter paper was placed in a clean plastic envelope and sealed;
- all monitoring information was recorded on a standard data sheet; and
- filters were sent to SGS Hong Kong Ltd for analysis.

<u>Maintenance and Calibration</u>

- the HVSs and their accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply; and
- the flow rate of each HVS with a mass flow controller was calibrated using an orifice calibrator. Initial calibrations of the dust monitoring equipment were conducted upon installation and prior to commissioning. Five-point calibration was carried out for HVSs using CM-AIR-43 Calibration

Kit. HVSs are calibrated on a bi-monthly basis. The calibration records for the HVSs are given in *Annex H*.

Wind Data Monitoring

The nearest weather station to North Point Production and Drop Shafts is Kai Tak Station. The average wind data (wind speed and wind direction) during the monitoring period were obtained from the meteorological station at Kai Tak of the Hong Kong Observatory (HKO) and are presented in *Annex C5*.

Action and Limit Levels

The Action and Limit levels have been established and are presented in *Table 3.5*.

Table 3.5 Action and Limit Levels for Air Quality at North Point Production and Drop Shafts

Parameter	Air Monitoring Station	Action Level, μgm^{-3}	Limit Level, μgm^{-3}
24-hour averaged TSP	AM1	185	260
	AM2	182	260
1-hour averaged TSP	AM1	340	500
	AM2	352	500

Event and Action Plan

The Event and Action Plan (EAP) for air quality monitoring is presented in *Annex I*.

3.3.2 Noise Monitoring

Monitoring Location

In accordance with the EM&A Manual, monitoring of construction noise impact should be conducted at the designated monitoring stations. Since access to some of the proposed monitoring locations stated in the EM&A Manual were refused or not available; alternative locations, therefore, were proposed and agreed by the ER and IEC. Construction activities during restricted hours (1900 – 2300 on weekdays and 0700 – 2300 on public holidays and Sundays) commenced in August 2010. Chan's Creative School (the noise monitoring station NM1) is not accessible during its closing hours (from 1900 to 0700 on normal week days and from 0000 to 2400 on public holidays as well as Sundays). During these hours, noise monitoring would be conducted on the pedestrian walkway adjacent to the school boundary along Tin Chiu Street, which was agreed by the ER and IEC. The construction noise monitoring location for this Contract is listed in *Table 3.6* and shown in *Annex C2*.

Table 3.6 ***Construction Phase Noise Monitoring Station at North Point Production and Drop Shafts***

Worksite	Proposed Construction Noise Monitoring Station				
	ID in EM&A Manual	ID	Location	Type of Measurement	Remark
North Point	M1	NM1	Rooftop of Chan's Creative School (formerly known as Madam Chan Wai Chow Memorial School)	Façade	0700 to 1900 on normal weekdays
			Pedestrian walkway adjacent to Chan's Creative School (formerly known as Madam Chan Wai Chow Memorial School) boundary along Tin Chiu Street	Façade	1900 – 2300 on all days and 0700 – 2300 on general holidays and Sundays

Monitoring Parameters, Frequency and Programme

Weekly construction noise monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual. Additional noise monitoring was also conducted as per the requirement in the EM&A Manual when works were carried out during restricted periods.

The construction noise levels were measured in terms of A-weighted equivalent continuous sound pressure level (L_{eq}) in decibels dB(A). $L_{Aeq\ (30min)}$ was used as the monitoring parameter for the time period between 0700 – 1900 hours on normal weekdays, and $L_{Aeq\ (5min)}$ was used as the monitoring parameter for all the restricted periods. Supplementary information (two statistical sound levels L_{10} and L_{90}; the levels exceeded for 10 and 90 percent of the time respectively) was also recorded during the monitoring for data auditing. The measured noise levels were logged every 5 minutes throughout the impact monitoring period.

Monitoring Equipment and Methodology

Construction noise measurements were conducted in accordance with the calibration and measurement procedures as stated in *Annex – General Calibration and Measurement Procedures* of *Technical Memorandum on Noise from Construction Work other than Percussive Piling* (*GW-TM*) issued under the *Noise Control Ordinance* (*NCO*) (Cap.400).

The sound level meters and calibrator used for the noise measurement, as listed in *Annex C-6*, comply with IEC 651: 1979 and 804:1985 (Type 1) specification. The calibration certificates of the sound level meters are included in *Annex H*.

Immediately prior to and following the noise measurements, the accuracy of the measurement equipment was checked using an acoustic calibrator generating a known sound pressure level at a known frequency.

Action and Limit Levels

The action and limit levels for noise monitoring during different monitoring periods are summarised in *Table 3.7*.

Table 3.7 Action and Limit Levels for Noise Monitoring at North Point Production and Drop Shafts

Noise Monitoring Location	Measurement Parameter	Noise Criteria (dB(A))	Remark
NM1	$L_{Aeq\ (30mins)}$	70	During normal teaching period
	$L_{Aeq\ (30mins)}$	69 [(a)]	During the school examination period
	$L_{Aeq\ (30mins)}$	75	During school holidays
	$L_{Aeq\ (5mins)}$	70	Evening (1900-2300) and Sundays and public holidays (0700-2300)
	$L_{Aeq\ (5mins)}$	55	Night-time (2300-0700)

Note:

(a) With reference to the Baseline Monitoring Report, the average $L_{Aeq,30min}$ measured at NM1 between 0700 and 1900 hours is 69.0 dB(A), exceeded the Limit Level of daytime construction noise during the examination periods (65 dB(A)). Hence it was therefore adopted as the Limit Level during the examination period at NM1.

Event and Action Plan

The Event and Action Plan (EAP) for noise monitoring is presented in *Annex I*.

3.3.3 Cultural Heritage

No vibration monitoring is required for this reporting period as no blasting of tunnel / shaft works was carried out in the vicinity of the historical buildings listed in the EM&A Manual.

3.3.4 Landscape and Visual Monitoring

In accordance with the EM&A Manual, landscape and visual monitoring is required to ensure that the design, implementation and maintenance of landscape and visual mitigation measures are fully achieved. The landscape and visual monitoring is carried out on site as part of the environmental site inspection. The monitoring procedures and criteria as described in the EM&A Manual were adopted.

Event and Action Plan

The Event and Action Plan (EAP) for landscape and visual monitoring is presented in *Annex I*.

3.4 IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS

The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Report, Environmental Permit and EM&A Manual. The implementation status during the reporting period is summarized in *Annex C4*.

3.5 MONITORING RESULTS

3.5.1 Air Quality

A total of 16 sets of 24-hour averaged and 48 sets of 1-hour averaged TSP measurements were carried out at both AM1 and AM2 during the reporting period. The monitoring data for 24-hour and 1-hour averaged TSP together with wind data and graphical presentations are presented in *Annex C5*.

The weather condition during the monitoring period varied from sunny and cloudy to fine and rainy. The local impacts near the monitoring stations of AM1 to AM2 were mainly associated with vehicle emissions. No exceedance of Action and Limit Levels of 1-hr and 24-hr TSP was recorded during the reporting period.

3.5.2 Noise

A total of 13 sets of 30-minute construction noise measurements were carried out at the monitoring station NM1 during normal weekdays of the reporting period. 13 sets of 3 x 5-minute construction noise measurements were carried out during restricted hours (between 1900 and 0700 hours on weekdays, and any time on Sundays and public holidays) on 1, 10, 15, 24 and 29 September 2013; 8, 13, 22 and 27 October 2013; and 5, 10, 19 and 24 November 2013. No exceedance of the noise limit level was recorded during the reporting period.

The monitoring results together with their graphical presentations are presented in *Annex C6*.

3.5.3 Landscape and Visual

In accordance with the EM&A Manual, monthly landscape and visual monitoring is required to ensure that the design, implementation and maintenance of landscape and visual mitigation measures are fully achieved. The monitoring has commenced since December 2009 during weekly site inspections. No major finding was observed during the reporting period.

3.5.4 Cultural Heritage

No vibration monitoring was conducted for this reporting period as the blasting of tunnel/shaft works has not commenced in the vicinity of the historical buildings listed in the EM&A Manual.

3.5.5 Waste Management

Waste generated from this Project includes inert construction and demolition (C&D) materials, non-inert C&D materials and marine deposit. Non-inert C&D materials are made up of general refuse, steel and paper/cardboard packaging materials. Steel materials generated from the project are also grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. No marine deposit requiring type 1, type 2, or type 3 disposal methods was generated.

The quantity of different types of wastes generated in the reporting period has been shown in the Monthly Summary Waste Flow Table prepared by the Contractor (*Annex J*).

3.6 ENVIRONMENTAL SITE INSPECTION

Weekly site inspections were carried out by the representatives of the Contractor, Engineer and the ET. A total of 13 numbers of site inspections were conducted on 5, 12, 19 and 26 September 2013; 3, 10, 17, 24 and 31 October 2013; and 7, 14, 21 and 28 November 2013. A representative of the IEC joined the site inspection on 26 September 2013, 31 October 2013, and 28 November 2013. There was no non-compliance recorded during this reporting period.

Observations during site inspections and follow-up actions in the reporting period are presented in *Annex K*. All the follow-up actions requested by IEC and Contractor's ET during the site inspection were undertaken as reported by the Contractor and confirmed in the following weekly site inspection conducted during the reporting period.

3.7 ENVIRONMENTAL NON-CONFORMANCE

3.7.1 Summary of Monitoring Exceedance

No exceedance of the Action and Limit Levels of 1-hour averaged and 24-hour averaged TSP was recorded at monitoring stations during the reporting period.

No exceedance of the Noise Limit Levels was recorded at monitoring station during both normal working hours and restricted hours in the reporting period.

3.7.2 Summary of Environmental Non-Compliance

No non-compliance event was recorded during the reporting period.

3.7.3 Summary of Environmental Complaint

No complaint was received during the reporting period. The cumulative complaints log is shown in *Annex C7*.

3.7.4 Summary of Environmental Summon and Successful Prosecution

No summon or prosecution was received during the reporting period. The cumulative summon and prosecution log is shown in *Annex C7*.

4.1 CONSTRUCTION ACTIVITIES DURING THE REPORTING PERIOD

A summary of the major construction activities undertaken during the reporting period is shown in *Table 4.1*. The locations of the construction activities are shown in *Annex D1*.

Table 4.1 Summary of Construction Activities Undertaken from 1 September 2013 to 30 November 2013 at Wan Chai East Production and Drop Shafts

Worksite	Construction Activities Undertaken
Production Shaft	• Pre-excavation grouting; and • Drilling and blasting.
Drop Shaft	• Permanent structural lining construction at lower shaft; • Permanent structural lining construction at upper shaft; • Construction of shaft lining wall.

4.2 STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS

A summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this reporting period is presented in *Table 4.2*.

Table 4.2 Summary of Environmental Licensing, Notification and Permit Status at Wan Chai East Production and Drop Shafts

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Wastewater Discharge License	Wan Chai East Production Shaft and Drop Shaft WT00008533-2011	21 February 2011 - 31 October 2014	--
Chemical Waste Producer Registration	Wan Chai East Production Shaft and Drop Shaft 5213-135-G2308-03	Throughout the Contract	--
Construction Noise Permit	Wan Chai East Production Shaft GW-RS0859-13	9 August 2013 - 8 February 2014	--
	Wan Chai East Drop Shaft GW-RS0768-13	14 July 2013 – 13 January 2014.	Superseded by GW-RS1121-13.
	Wan Chai East Drop Shaft GW-RS1121-13	17 October 2013 – 14 April 2014	--

4.3 ENVIRONMENTAL MONITORING REQUIREMENTS

4.3.1 Air Quality Monitoring

Monitoring Location

In accordance with the EM&A Manual, 24-hour and 1-hour averaged Total Suspended Particulates (TSP) levels should be conducted at designated monitoring stations. Since access to some of the proposed monitoring locations stated in the EM&A Manual was denied or not available, alternative locations, therefore, were proposed and agreed by the ER and IEC. The construction air quality monitoring station for this Contract is listed in *Table 4.3* and shown in *Annex D2*.

Table 4.3 Construction Phase Air Monitoring Location at Wan Chai East Production and Drop Shafts

Worksite	Construction Air Quality Monitoring Station			
	ID in EM&A Manual	ID	Location	Remark
Wan Chai East	-	AM3	Rooftop of Wan Chai East PTW	• The rooftop of Society for the Prevention of Cruelty to Animals building (CM_WC1) was crowded with existing facilities (eg water tanks) that setup of HVSs for baseline monitoring was not feasible.

Monitoring Parameters, Frequency and Programme

Air quality monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual (*Table 4.4*).

Table 4.4 TSP Monitoring Parameter and Frequency at Wan Chai East Production and Drop Shafts

Parameter	Frequency
24-hour averaged TSP	Once every 6 days
1-hour averaged TSP	3 times every 6 days

Monitoring Equipment

*Continuous 24-hour and 1-hour averaged TSP monitoring were performed using High Volume Samplers (HVS) with appropriate sampling inlets installed, located at the designated monitoring station. The performance specification of HVS complied with the standard method "*Determination of Suspended Particulate Matter in the Atmosphere (High Volume Method)*" as stipulated in US EPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50 Appendix B). The equipment that was deployed for the 24-hour and 1-hour averaged TSP monitoring is listed in* Annex D5.*Monitoring Methodology.*

Installation

The setup location of the HVS at monitoring stations was listed in *Table 4.3*. The HVS was free-standing with no obstruction.

The following criteria were considered in the installation of the HVSs:

- appropriate support to secure the sampler against gusty wind was provided at AM3;
- a minimum of 2 m separation from walls, parapets and penthouses was required for rooftop samplers;
- no furnace or incinerator flues was nearby;
- airflow around the sampler was unrestricted; and
- permission was obtained to set up the samplers and to gain access to the monitoring stations.

Preparation of Filter Papers

- glass fibre filters were labelled and sufficient filters that were clean and without pinholes were selected;
- all filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ± 3 °C; the relative humidity (RH) was 40%; and
- SGS Hong Kong Ltd, a HOKLAS accredited laboratory, implements comprehensive quality assurance and quality control programmes.

Field Monitoring

- the power supply was checked to ensure that the HVSs were working properly;
- the filter holder and the area surrounding the filter were cleaned;
- the filter holder was removed by loosening the foul bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully;
- the filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter;
- the swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges;
- then the shelter lid was closed and secured with the aluminium strip;

- the HVSs were warmed-up for about 5 minutes to establish run-temperature conditions;
- a new flow rate record sheet was set into the flow recorder;
- the flow rates of the HVSs were checked and adjusted to between 1.22 - 1.37 m^3min^{-1} which were within the range specified in the EM&A Manual (ie 0.6 – 1.7 m^3min^{-1});
- the programmable timer was set for a sampling period of 24 hours ± 1 hour, and the starting time, weather condition and the filter number were recorded;
- the initial elapsed time was recorded;
- at the end of sampling, the sampled filter was removed carefully and folded in half so that only surfaces with collected particulate matter were in contact;
- the filter paper was placed in a clean plastic envelope and sealed;
- all monitoring information was recorded on a standard data sheet; and
- filters were sent to SGS Hong Kong Ltd for analysis.

Maintenance and Calibration

- the HVSs and their accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply; and
- the flow rate of each HVS with mass flow controller was calibrated using an orifice calibrator. Initial calibrations of the dust monitoring equipment were conducted upon installation and prior to commissioning. Five-point calibration was carried out for HVSs using CM-AIR-43 Calibration Kit. HVSs are calibrated on a bi-monthly basis. The calibration record for the HVS is given in *Annex H*.

Wind Data Monitoring

The nearest weather station to Wan Chai East Production and Drop Shafts is located at King's Park. The average wind data (wind speed and wind direction) during the monitoring period were obtained from the meteorological station at King's Park of the Hong Kong Observatory (HKO) and is presented in *Annex D5*.

Action and Limit Levels

The Action and Limit levels have been established and presented in *Table 4.5*.

Table 4.5 ***Action and Limit Levels for Air Quality at Wan Chai East Production and Drop Shafts***

Parameter	Air Monitoring Station	Action Level, μgm^{-3}	Limit Level, μgm^{-3}
24-hour averaged TSP	AM3	181	260
1-hour averaged TSP	AM3	355	500

Event and Action Plan

The Event and Action Plan (EAP) for air quality monitoring is presented in *Annex I*.

4.3.2 Noise Monitoring

Monitoring Location

In accordance with the EM&A Manual, monitoring of construction noise impact should be conducted at the designated monitoring stations. Since access to some of the proposed monitoring locations stated in the EM&A Manual was denied or not available, alternative locations were proposed and agreed by the ER and IEC. The construction noise monitoring location for this Contract is listed in *Table 4.6* and shown in *Annex D2*.

Table 4.6 ***Construction Phase Noise Monitoring Station at Wan Chai East Production and Drop Shafts***

Worksite	Construction Noise Monitoring Station				
	ID in EM&A Manual	ID	Location	Type of Measurement	Remark
Wan Chai East	-	NM2	Rooftop of Hyde Building	Façade	• No guaranteed access for equipment set-up due to no caretaker of Kei Wah Building (M2) • Alternative location, NM2, is located next to Kei Wah Building and is also the background noise monitoring station in the HATS2A EIA study.

Monitoring Parameters, Frequency and Programme

Weekly construction noise monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual. Additional noise monitoring was also conducted as per required the EM&A Manual when works were carried out during restricted periods. The monitoring programme for this reporting period is shown in *Annex D3*.

The construction noise levels were measured in terms of A-weighted equivalent continuous sound pressure level (Leq) in decibels dB(A).

$L_{Aeq(30min)}$ was used as the monitoring parameter for the time period between 0700 – 1900 hours on normal weekdays, and $L_{Aeq(5min)}$ was used as the monitoring parameter for all restricted periods. Supplementary information for data auditing (two statistical sound levels L_{10} and L_{90}which are the levels exceeded for 10 and 90 percent of the time respectively) was also recorded during the monitoring period for reference. The measured noise levels were logged every 5 minutes throughout the impact monitoring period.

Monitoring Equipment and Methodology

Construction noise measurements were conducted in accordance with the calibration and measurement procedures as stated in *Annex – General Calibration and Measurement Procedures* of *Technical Memorandum on Noise from Construction Work other than Percussive Piling* (*GW-TM*) issued under the *Noise Control Ordinance* (*NCO*) (Cap.400).

The sound level meters and calibrator used for the noise measurement, as listed in *Annex D6*, complies with IEC 651: 1979 and 804:1985 (Type 1) specification. The calibration certificates of the sound level meters are included in *Annex H*.

Immediately prior to and following the noise measurements, the accuracy of the measurement equipment was checked using an acoustic calibrator generating a known sound pressure level at a known frequency.

Action and Limit Levels

The action and limit levels for noise monitoring during different monitoring periods are summarized in *Table 4.7*.

Table 4.7 Action and Limit Levels for Noise Monitoring at Wan Chai East Production and Drop Shafts

Noise Monitoring Location	Measurement Parameter	Noise Criteria (dB(A))	Remark
NM2	$L_{Aeq\ (30mins)}$	75	Normal working hours during weekdays
	$L_{Aeq\ (5mins)}$	70	Evening (1900-2300); and Sundays and public holidays (0700-2300)
	$L_{Aeq\ (5mins)}$	55	Night-time (2300-0700)

Event and Action Plan

The Event and Action Plan (EAP) for noise monitoring is presented in *Annex I*.

4.3.3 Cultural Heritage

No vibration monitoring is required for this reporting period as blasting of tunnel / shaft works was not carried out in the vicinity of the historical buildings listed in EM&A manual.

4.3.4 *Landscape and Visual Monitoring*

In accordance with the EM&A Manual, landscape and visual monitoring is required to ensure that the design, implementation and maintenance of landscape and visual mitigation measures are fully achieved. The landscape and visual monitoring is carried out on site within the environmental site inspection. The monitoring procedures and criteria as described in the EM&A Manual were adopted.

Event and Action Plan

The EAP for landscape and visual monitoring is presented in *Annex I*.

4.4 *IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS*

The Contractor had implemented environmental mitigation measures and requirements as stated in the EIA Report, the Environmental Permit and EM&A Manual. The implementation status during the reporting period is summarized in *Annex D4*.

4.5 *MONITORING RESULTS*

4.5.1 *Air Quality*

A total of 16 sets of 24-hour averaged and 48 sets of 1-hour averaged TSP measurements were carried out at AM3 during the reporting period. The monitoring data for 24-hour TSP and 1-hour TSP together with wind data and graphical presentations are presented in *Annex D5*.

The weather conditions during the monitoring period varied from sunny and rainy to fine and cloudy. The local impacts near the monitoring stations of AM3 were mainly associated with vehicle emissions. No exceedance of Action and Limit Levels of 1-hr and 24-hr TSP was recorded during the reporting period.

4.5.2 *Noise*

A total of 13 sets of 30-minute construction noise measurements were carried out at the monitoring station NM2 during normal working hours of weekdays of the reporting period. 13 sets of 3 x 5-minute construction noise measurements were carried out during restricted hours (between 1900 and 0700 hours on weekdays, and any time on Sundays and public holidays) on 1, 10, 15, 24 and 29 September 2013; 8, 13, 22 and 27 October 2013; and 5, 10, 19 and 24 November 2013 during the reporting period. The monitoring results together with graphical presentations are presented in *Annex D6*.

No exceedance of limit level was recorded during normal working hours; however, 32 numbers of exceedance of the limit level were recorded during restricted hours at NM2, namely on 1, 10, 15, 24 and 29 September 2013; 8, 13 and 27 October 2013; and 5, 10, 19 and 24 November 2013. Investigations had

been conducted to identify the potential causes for the recorded noise level. A summary of the investigation results is presented in *Section 4.7.1*.

4.5.3 Landscape and Visual

Implementation and maintenance of landscape and visual mitigation measures are fully achieved and no major findings were observed during the reporting period.

4.5.4 Cultural Heritage

No vibration monitoring is required for this reporting period as blasting of tunnel / shaft works was not carried out in the vicinity of the historical buildings listed in EM&A manual.

4.5.5 Waste Management

Waste generated from this Project includes inert C&D materials, non-inert C&D materials and marine deposit. Non-inert C&D materials are made up of general refuse, steel and paper/cardboard packaging materials. Steel materials generated from the project are also grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. No marine deposit requiring type 1, type 2, or type 3 disposal methods was generated.

The inert C&D materials and general refuse generated from the Project were disposed of at Tuen Mun Area 38/Tseung Kwan O Area 137 Fill Bank/Chai Wan Barging Point and SENT Landfill, respectively.

The quantity of different types of wastes generated in the reporting period has been shown in the Monthly Summary Waste Flow Table prepared by the Contractor (*Annex J*).

4.6 ENVIRONMENTAL SITE INSPECTION

Weekly site inspections were carried out by the representatives of the Contractor, Engineer and ET. 11 site inspections were conducted on 5, 12 and 19 September 2013; 3, 10, 17 and 24 October 2013; and 7, 14, 21 and 28 November 2013. A representative of the IEC participated in the site inspection on 28 November 2013. Due to the scheduled SSEMC meetings on 26 September 2013 and 31 October 2013 immediately after the joint inspections, inspections were not arranged for the WCE site on those days. No non-compliance was recorded during the site inspections.

Observations during site inspections and follow-up actions in the reporting period are presented in *Annex K*. All the follow-up actions requested by IEC and Contractor's ET during the site inspections were undertaken as reported by the Contractor and confirmed in the following weekly site inspection conducted during the reporting period.

4.7 ENVIRONMENTAL NON-CONFORMANCE

4.7.1 Summary of Monitoring Exceedance

No exceedance of the Action and Limit Levels of 1-hour TSP and 24-hour averaged TSP were recorded at monitoring stations during the reporting period.

32 numbers of exceedances of noise Limit Level during restricted hours were reported at NM2 1, 10, 15, 24 and 29 September 2013; 8, 13 and 27 October 2013; and 5, 10, 19 and 24 November 2013. The exceedances were investigated and they are detailed in *Annex D7*. Referring to the works summary provided by the Contractor, no noisy outdoor construction activities were conducted at the Wan Chai East Production and Drop Shafts during the noise monitoring sessions. Other potential noise source was also identified in the vicinity (i.e., traffic) to contribute to the measured noise level. In view of no noisy outdoor construction works carried out and contribution from other potential noise sources in vicinity (i.e., traffic), it is considered that the exceedances were not due to the Contract 23 construction works. However, the Contractor was reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures to avoid exceedance of noise limit levels or causing nuisance.

4.7.2 Summary of Environmental Non-Compliance

No non-compliance event was recorded during the reporting period.

4.7.3 Summary of Environmental Complaint

No complaint was received during the reporting period. The cumulative complaints log is shown in *Annex D8*.

4.7.4 Summary of Environmental Summon and Successful Prosecution

No summon or prosecution was received during the reporting period. The cumulative summon and prosecution log is shown in *Annex D8*.

5 CENTRAL DROP SHAFT

5.1 CONSTRUCTION ACTIVITIES DURING THE REPORTING PERIOD

A summary of the major construction activities undertaken in this reporting period is shown in *Table 5.1*. The location of the construction activities is shown in *Annex E1*.

Table 5.1 Summary of Construction Activities Undertaken from 1 September 2013 to 30 November 2013 at Central Drop Shaft

Construction Activities Undertaken
• Control hole drilling for grouting before raise boring and • Concreting on shaft bottom for two footings.

5.2 STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS

A summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this reporting period is presented in *Table 5.2*.

Table 5.2 Summary of Environmental Licensing, Notification and Permit Status at Central Drop Shaft

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Wastewater Discharge License	Central PTW Drop Shaft WT0005131-2009	09 October 2009 - 31 October 2014	--
Chemical Waste Producer Registration	Central PTW Drop Shaft 5213-115-G2347-06	Throughout the contract	--
Construction Noise Permit (CNP)	Central PTW Drop Shaft GW-RS0904-13	19 August 2013 – 18 February 2014	No CNP was required before 19 August 2013 as no construction works had been taken place during restricted hours.

5.3 ENVIRONMENTAL MONITORING REQUIREMENTS

5.3.1 Air Quality Monitoring

Monitoring Location

In accordance with the EM&A Manual, 24-hour and 1-hour averaged TSP levels should be conducted at designated monitoring stations. Since access to some of the proposed monitoring locations stated in the EM&A Manual were rejected or not available, alternative locations, therefore, were proposed and

agreed by the ER and the IEC. The construction air quality monitoring station for this Contract is listed in *Table 5.3* and shown in *Annex E2*.

Table 5.3 Construction Phase Air Monitoring Location at Central Drop Shaft

Worksite	Construction Air Quality Monitoring Station			
	ID in EM&A Manual	ID	Location	Remark
Central	-	AM4_2	A Location within the DSD Central PTW	• Access to Sheung Wan Fire Station (CM_C1) was rejected. • All possible locations along Connaught Road West and Connaught Road East have been exhausted and no suitable location is identified due to rejection by the premise owner, security reason, without guaranteed access or inaccessible. AM4 is the alternative location. • Since air monitoring station AM4 has to return to DSD for other Work Contract, AM4_2 is the alternative location to replace AM4.

Monitoring Parameters, Frequency and Programme

Air quality monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual (*Table 5.4*).

Table 5.4 TSP Monitoring Parameter and Frequency at Central Drop Shaft

Parameter	Frequency
24-hour averaged TSP	Once every 6 days
1-hour averaged TSP	3 times every 6 days

Monitoring Equipment

Continuous 24-hour and 1-hour TSP monitoring were performed using HVS with appropriate sampling inlets installed, located at the designated monitoring station. The performance specification of HVS complied with the standard method "*Determination of Suspended Particulate Matter in the Atmosphere (High Volume Method)*" as stipulated in *US EPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50 Appendix B)*. The equipment that was deployed for the 24-hour and 1-hour average TSP monitoring is listed in *Annex E5*.

Monitoring Methodology

Installation

The setup location of the HVS at monitoring stations was listed in *Table 5.3*. The HVS was free-standing with no obstruction.

The following criteria were considered in the installation of the HVSs:

- appropriate support to secure the samplers against gusty wind were provided at AM4;
- a minimum of 2 m separation from walls, parapets and penthouses was required for rooftop samplers;
- no furnace or incinerator flues were nearby;
- airflow around the sampler was unrestricted; and
- permission was obtained to set up the samplers and to gain access to the monitoring stations.

Preparation of Filter Papers

- glass fibre filters were labelled and sufficient filters that were clean and without pinholes were selected;
- all filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ± 3 °C; the relative humidity (RH) was 40%; and
- SGS Hong Kong Ltd, a HOKLAS accredited laboratory, implements comprehensive quality assurance and quality control programmes.

Field Monitoring

- the power supply was checked to ensure that the HVSs were working properly;
- the filter holder and the area surrounding the filter were cleaned;
- the filter holder was removed by loosening the foul bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully;
- the filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter;
- the swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges;

- then the shelter lid was closed and secured with the aluminium strip;
- the HVSs were warmed-up for about 5 minutes to establish run-temperature conditions;
- a new flowrate record sheet was set into the flow recorder;
- the flow rates of the HVSs were checked and adjusted to between 1.22 - 1.37 m^3min^{-1} which were within the range specified in the EM&A Manual (i.e. 0.6 – 1.7 m^3min^{-1});
- the programmable timer was set for a sampling period of 24 hours ± 1 hour, and the starting time, weather condition and the filter number were recorded;
- the initial elapsed time was recorded;
- at the end of sampling, the sampled filter was removed carefully and folder in half length so that only surfaces with collected particulate matter were in contact;
- it was then placed in a clean plastic envelope and sealed;
- all monitoring information was recorded on a standard data sheet; and
- filters were sent to SGS Hong Kong Ltd for analysis.

Maintenance and Calibration

- the HVSs and their accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply; and
- the flow rate of each HVS with mass flow controller were calibrated using an orifice calibrator. Initial calibrations of the dust monitoring equipment were conducted upon installation and prior to commissioning. Five-point calibration was carried out for HVSs using CM-AIR-43 Calibration Kit. HVSs are calibrated on a bi-monthly basis. The calibration record for the HVS is given in *Annex H*.

Wind Data Monitoring

The nearest weather stations to at Central Drop Shaft are King's Park Station and Green Island Station. Average wind data (wind speed and wind direction) during the monitoring period were obtained from the meteorological stations at Green Island and King's Park of the Hong Kong Observatory (HKO) and is presented in *Annex E5*.

Action and Limit Levels

The Action and Limit levels have been established and presented in *Table 5.5*.

Table 5.5 Action and Limit Levels for Air Quality at Central Drop Shaft

Parameter	Air Monitoring Station	Action Level, μgm^{-3}	Limit Level, μgm^{-3}
24-hour TSP	AM4	211	260
1-hour TSP	AM4	393	500

Event and Action Plan

The EAP for air quality monitoring is presented in *Annex I*.

5.3.2 Noise Monitoring

Monitoring Location

In accordance with the EM&A Manual, monitoring of construction noise impact should be conducted at the designated monitoring stations. Since access to some of the proposed monitoring locations stated in the EM&A Manual were rejected or not available; alternative locations, therefore, were proposed and agreed by the ER and the IEC. The construction noise monitoring locations for this Contract are listed in *Table 5.6* and are shown in *Annex E2*.

Table 5.6 Construction Phase Noise Monitoring Station at Central Drop Shaft

Worksite	Construction Noise Monitoring Station				
	ID in EM&A Manual	ID	Location	Type of Measurement	Remark
Central	-	NM3	Rooftop of Goldfield Building	Façade	• Chi Cheung Building (M4) is not accessible.

Monitoring Parameters, Frequency and Programme

Weekly construction noise monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual. Additional noise monitoring were also conducted as per required in the EM&A Manual when works were carried out during restricted periods.

The construction noise levels were measured in terms of A-weighted equivalent continuous sound pressure level (L_{eq}) in decibels dB(A). $L_{Aeq(30min)}$ were used as the monitoring parameter for the time period in between 0700 – 1900 hours on normal weekdays, and $L_{Aeq\ (5min)}$ were used as the monitoring parameter for all restricted periods. Supplementary information for data auditing, two statistical sound levels L_{10} and L_{90}; the levels exceeded for 10 and 90 percent of the time respectively, were also recorded during the monitoring for reference. The measured noise levels were logged in every 5 minutes throughout the impact monitoring period.

Monitoring Equipment and Methodology

Construction noise measurements were conducted in accordance with the calibration and measurement procedures as stated in *Annex – General Calibration and Measurement Procedures* of *Technical Memorandum on Noise from Construction Work other than Percussive Piling* (*GW-TM*) issued under the *Noise Control Ordinance* (*NCO*) (Cap.400).

The sound level meters and calibrator used for the noise measurement, as listed in *Annex E6*, complies with IEC 651: 1979 and 804:1985 (Type 1) specification. The calibration certificates of the sound level meters are included in *Annex H*.

Immediately prior to and following the noise measurements, the accuracy of the measurement equipment was checked using an acoustic calibrator generating a known sound pressure level at a known frequency.

Measurements were accepted as the calibration level from before and after the noise measurement agree to within 1.0 dB.

Action and Limit Levels

The action and limit levels for the noise monitoring during different monitoring periods are summarized in *Table 5.7*.

Table 5.7 Action and Limit Levels for Noise Monitoring at Central Drop Shaft

Noise Monitoring Location	Measurement Parameter	Noise Criteria (dB(A))	Remark
NM3	$L_{Aeq\ (30mins)}$	75	Normal working hours during weekdays
	$L_{Aeq\ (5mins)}$	70	Evening (1900-2300); and Sundays and public holidays (0700-2300)
	$L_{Aeq\ (5mins)}$	55	Night-time (2300-0700)

Event and Action Plan

The EAP for noise monitoring is presented in *Annex I*.

5.3.3 Cultural Heritage

No vibration monitoring is required for this reporting period as blasting of tunnel / shaft works was not carried out in the vicinity of the historical buildings listed in EM&A manual.

5.3.4 Landscape and Visual Monitoring

In accordance with the EM&A Manual, landscape and visual monitoring is required to ensure that the design, implementation and maintenance of landscape and visual mitigation measures are fully achieved. The landscape and visual monitoring is carried out on site within the environmental site

inspection. The monitoring procedures and criteria as described in the EM&A Manual were adopted.

Event and Action Plan

The EAP for landscape and visual monitoring is presented in *Annex I*.

5.4 IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS

The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Report, the Environmental Permit and EM&A Manual. The implementation status during the reporting period is summarized in *Annex E4*.

5.5 MONITORING RESULTS

5.5.1 Air Quality

A total of 16 sets of 24-hour averaged and 48 sets of 1-hour averaged TSP measurements were carried out at AM4_2 during the reporting period. The monitoring data for 24-hour TSP and 1-hour TSP together with wind data and graphical presentations are presented in *Annex E5*.

The weather conditions during the monitoring period varied from sunny and cloudy to rainy and fine. The local impacts near the monitoring stations of AM4 were mainly associated with vehicle emissions. No exceedance of Action and Limit Levels of 1-hr and 24-hr TSP was recorded during the reporting period.

5.5.2 Noise

A total of 13 sets of 30-minute construction noise measurements were carried out at the monitoring station NM3 during normal weekdays of the reporting period. The monitoring results together with graphical presentations are presented in *Annex E6*. The local impacts observed near the monitoring stations of NM3 were traffic noise from Connaught Road Central.

No exceedance of Action and Limit Levels of construction noise was recorded during the reporting period.

5.5.3 Landscape and Visual

Implementation and maintenance of landscape and visual mitigation measures are fully achieved and no major finding was observed during the reporting period.

5.5.4 Cultural Heritage

No vibration monitoring is required for this reporting period as blasting of tunnel / shaft works was not carried out in the vicinity of the historical buildings listed in EM&A manual.

5.5.5 Waste Management

Waste generated from this Project includes inert C&D materials, non-inert C&D materials and marine deposit. Non-inert C&D materials are made up of general refuse, steel and paper/cardboard packaging materials. Steel materials generated from the project are also grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. No marine deposit requiring type 1, type 2, or type 3 disposal methods was generated.

The inert C&D materials and general refuse generated from the Project were disposed of at Tuen Mun Area 38/Tseung Kwan O Area 137 Fill Bank/Chai Wan Barging Point and SENT Landfill respectively.

The quantity of different types of wastes generated in the reporting period has been shown in the Monthly Summary Waste Flow Table prepared by the Contractor (*Annex J*).

5.6 ENVIRONMENTAL SITE INSPECTION

Weekly site inspections were carried out by the representatives of the Contractor, Engineer and the ET. Six site inspections were conducted on 19 September 2013; 3, 10 and 17 October 2013 and 21 and 28 November 2013. A representative of the IEC participated in the joint inspection on 28 November 2013. Because of no major construction works taking place on 5 and 12 September and 24 October 2013 and 7 and 14 November 2013; and the scheduled SSEMC meetings on 26 September 2013 and 31 October 2013 immediately after the joint inspections, inspections were not arranged for the Central site on those days.

Observations during site inspections and follow-up actions in the reporting period are presented in *Annex K*. All the follow-up actions requested by IEC and Contractor's ET during the site inspections were undertaken as reported by the Contractor and confirmed in the following weekly site inspection conducted during the reporting period.

5.7 ENVIRONMENTAL NON-CONFORMANCE

5.7.1 Summary of Monitoring Exceedance

No exceedance of the Action and Limit Levels of 1-hour TSP and 24-hour averaged TSP were recorded at the monitoring station during the reporting period.

No exceedance of the Action and Limit Levels of noise was recorded at the monitoring station during the reporting period.

5.7.2 Summary of Environmental Non-Compliance

No non-compliance event was recorded during the reporting period.

5.7.3 Summary of Environmental Complaint

No complaint was received during the reporting period. The cumulative complaints log is shown in *Annex E7*.

5.7.4 Summary of Environmental Summon and Successful Prosecution

No summon or prosecution was received during the reporting period. The cumulative summon and prosecution log is shown in *Annex E7*.

6 SAI YING PUN JUNCTION SHAFT

6.1 CONSTRUCTION ACTIVITIES DURING THE REPORTING PERIOD

A summary of the major construction activities undertaken in this reporting period is shown in *Table 6.1*. The location of the construction activities is shown in *Annex F1*.

Table 6.1 Summary of Construction Activities Undertaken from 1 September 2013 to 30 November 2013 at Sai Ying Pun Junction Shaft

Construction Activities Undertaken
• Pre-excavation grouting; and • Drilling and blasting.

6.2 STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS

A summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this reporting period is presented in *Table 6.2*.

Table 6.2 Summary of Environmental Licensing, Notification and Permit Status at Sai Ying Pun Junction Shaft

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Wastewater Discharge License	Sai Ying Pun Junction Shaft WT00006884-2010	11 June 2010 - 31 October 2014	--
Chemical Waste Producer Registration	Sai Ying Pun Junction Shaft 5213-112-G2347-05	Throughout the Contractor	--
Construction Noise Permit (CNP)	Sai Ying Pun Junction Shaft GW-RS0356-13	4 May 2013 – 3 November 2013	Superseded by GW-RS1120-13
	Sai Ying Pun Junction Shaft GW-RS1120-13	4 November 2013 – 3 April 2014	--

6.3 ENVIRONMENTAL MONITORING REQUIREMENTS

6.3.1 Air Quality Monitoring

Due to contractual arrangements, air quality monitoring was implemented by the Environmental Team of Contract No. *DC/2007/24 of Harbour Area Treatment Scheme Stage 2A (HATS2A) - Construction of Sewage Conveyance System from Aberdeen to Stonecutters Island.*

Monitoring Location

In accordance with the EM&A Manual, 24-hour and 1-hour averaged TSP levels should be conducted at designated monitoring stations. Since access to some of the proposed monitoring locations stated in the EM&A Manual were rejected or not available, alternative locations, therefore, were proposed and agreed by the ER and the IEC. The construction air quality monitoring station for this Contract is listed in *Table 6.3* and shown in *Annex F2*.

Table 6.3 Construction Phase Air Monitoring Location at Sai Ying Pun Junction Shaft

Worksite	Construction Air Quality Monitoring Station			
	ID in EM&A Manual	ID	Location	Remark
Fung Mat Street	CM_FM1	AM5	Western Wholesale Food Market	-

Monitoring Parameters, Frequency and Programme

Air quality monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual (*Table 6.4*).

Table 6.4 TSP Monitoring Parameter and Frequency at Sai Ying Pun Junction Shaft

Parameter	Frequency
24-hour averaged TSP	Once every 6 days
1-hour averaged TSP	3 times every 6 days

Wind Data Monitoring

The nearest weather stations to Sai Ying Pun Junction Shaft are King's Park Station and Green Island Station. Average wind data (wind speed and wind direction) during the monitoring period were obtained from the meteorological stations at King's Park and Green Island of the Hong Kong Observatory (HKO) and are presented in *Annex F5*.

Action and Limit Levels

The Action and Limit levels have been established and presented in *Table 6.5*.

Table 6.5 Action and Limit Levels for Air Quality at Sai Ying Pun Junction Shaft

Parameter	Air Monitoring Station	Action Level, μgm^{-3}	Limit Level, μgm^{-3}
24-hour averaged TSP	AM5	188	260
1-hour averaged TSP	AM5	332	500

Event and Action Plan

The EAP for air quality monitoring is presented in *Annex I*.

6.3.2 Noise Monitoring

Monitoring Location

In accordance with the EM&A Manual, monitoring of construction noise impact should be conducted at designated monitoring stations. Since access to some of the proposed monitoring locations stated in the EM&A Manual were rejected or not available; alternative locations, therefore, were proposed and agreed by the ER and the IEC. The construction noise monitoring location for this Contract is listed in *Table 6.6* and is shown in *Annex F2*.

Table 6.6 Construction Phase Noise Monitoring Station at Sai Ying Pun Junction Shaft

Worksite	Construction Noise Monitoring Station				
	ID in EM&A Manual	ID	Location	Type of Measurement	Remark
Fung Mat Road	M3	NM4	Rooftop of Block A, Kwan Yick Building Phase III	Façade	-

Monitoring Parameters, Frequency and Programme

Weekly construction noise monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual. Additional noise monitoring were also conducted as per required in the EM&A Manual when works were carried out during restricted periods.

The construction noise levels were measured in terms of A-weighted equivalent continuous sound pressure level (L_{eq}) in decibels dB(A). $L_{Aeq\ (30min)}$ were used as the monitoring parameter for the time period in between 0700 – 1900 hours on normal weekdays, and $L_{Aeq\ (5min)}$ were used as the monitoring parameter for all restricted periods. Supplementary information for data auditing, two statistical sound levels L_{10} and L_{90}; the levels exceeded for 10 and 90 percent of the time respectively, were also recorded during the monitoring for reference. The measured noise levels were logged in every 5 minutes throughout the impact monitoring period.

Monitoring Equipment and Methodology

Construction noise measurements were conducted in accordance with the calibration and measurement procedures as stated in *Annex – General Calibration and Measurement Procedures* of *Technical Memorandum on Noise from Construction Work other than Percussive Piling* (*GW-TM*) issued under the *Noise Control Ordinance* (*NCO*) (Cap.400).

The sound level meters and calibrator used for the noise measurement, as listed in *Annex F*, complies with IEC 651: 1979 and 804:1985 (Type 1) specification. The calibration certificates of the sound level meters are included in *Annex H*.

Immediately prior to and following the noise measurements, the accuracy of the measurement equipment was checked using an acoustic calibrator generating a known sound pressure level at a known frequency.

Measurements were accepted as the calibration level from before and after the noise measurement agree to within 1.0 dB.

Action and Limit Levels

The action and limit levels for the noise monitoring during different monitoring periods are summarized in *Table 6.7*.

Table 6.7 Action and Limit Levels for Noise Monitoring at Sai Ying Pun Junction Shaft

Noise Monitoring Location	Measurement Parameter	Noise Criteria (dB(A))	Remark
NM4	$L_{Aeq\ (30mins)}$	75	Normal working hours during weekdays
	$L_{Aeq\ (5mins)}$	70	Evening (1900-2300); and Sundays and public holidays (0700-2300)
	$L_{Aeq\ (5mins)}$	55	Night-time (2300-0700)

Event and Action Plan

The Event and Action Plan (EAP) for noise monitoring is presented in *Annex I*.

6.3.3 Cultural Heritage

In order to prevent potential damage to historical buildings and structures, maximum limits for safe vibration levels have been set at 25 mm/s. This vibration limit has been applied in controlling vibrations due to blasting operations in Hong Kong by CEDD and MTRC. Vibration monitoring shall be undertaken during blasting for tunnel, shafts and effluent conveyance system in the vicinity of the buildings / structures as a requirement of EM&A programme in such a way that a maximum vibration level of 25 mm/s is not exceeded. To ensure that this maximum limit is not exceeded, a monitoring schedule shall be implemented. The monitoring should be undertaken through the use of measures such as tell tales and tilting monitoring points to the historic buildings and structures on a weekly basis. If vibration levels are found to exceed the maximum limit of 25 mm/s, immediate corrective action shall be taken by reducing the rate of forward progress, as necessary, to bring PPV levels within compliance. Monitoring results should be submitted to the engineer in an agreed format within two days of each monitoring undertaken.

6.3.4 Landscape and Visual Monitoring

In accordance with the EM&A Manual, landscape and visual monitoring is required to ensure that the design, implementation and maintenance of landscape and visual mitigation measures are fully achieved. The landscape and visual monitoring is carried out on site within the environmental site inspection. The monitoring procedures and criteria as described in the EM&A Manual were adopted.

Event and Action Plan

The EAP for landscape and visual monitoring is presented in *Annex I*.

6.4 IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS

The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Report, the Environmental Permit and EM&A Manual. The implementation status during the reporting period is summarized in *Annex F4*.

6.5 MONITORING RESULTS

6.5.1 Air Quality

A total of 17 sets of 24-hour and 51 sets of 1-hour TSP measurements were carried out at AM5 during the reporting period. The monitoring data for 24-hour TSP and 1-hour averaged TSP together with wind data and graphical presentations are presented in *Annex F5*. The weather condition during the monitoring period varied from sunny to fine. The local impacts near the monitoring stations of AM5 were mainly associated with vehicle emissions.

No exceedance of Action and Limit Levels of 1-hr and 24-hr TSP were recorded during the reporting period.

6.5.2 Noise

A total of 13 sets of 30-minute construction noise measurements were carried out at the monitoring station NM4 during normal working hours of weekdays of the reporting period. 13 sets of 3 x 5-minute construction noise measurements were carried out during restricted hours (between 1900 and 0700 hours on weekdays, and any time on Sundays and public holidays) on 1, 10, 15, 24 and 29 September 2013; 8, 13, 22 and 27 October 2013; and 5, 10, 19 and 24 November 2013 during the reporting period. The monitoring results together with graphical presentations are presented in *Annex F6*. The local impacts observed near the monitoring stations of NM4 were noise from traffic movement on nearby roads.

No exceedance of limit level for noise monitoring during both normal and restricted hours were recorded.

6.5.3 Landscape and Visual

Implementation and maintenance of landscape and visual mitigation measures are fully achieved and no major findings were observed during the reporting period.

6.5.4 Cultural Heritage

No shaft blasting was undertaken from September 2013 to October 2013. Hence, no vibration monitoring was conducted in these two months. Shaft blasting was carried out at tunnel K in November 2013. In total, 10 sets of vibration monitoring were conducted for two old Shophouses at 67 & 69 Des Voeux Road in November 2013. No exceedance of maximum limit for safe

vibration level (25 mm/s) was recorded. The monitoring result is presented in *Annex F8*.

6.5.5 Waste Management

Waste generated from this Project includes inert C&D materials, non-inert C&D materials and marine deposit. Non-inert C&D materials are made up of general refuse, steel and paper/cardboard packaging materials. Steel materials generated from the project are also grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. No marine deposit requiring type 1, type 2, or type 3 disposal methods was generated. The inert C&D materials and general refuse generated from the Project were disposed of at Tuen Mun Area 38/Tseung Kwan O Area 137 Fill Bank/Chai Wan Barging Point and SENT Landfill respectively.

The quantity of different types of wastes generated in the reporting period has been shown in the Monthly Summary Waste Flow Table prepared by the Contractor (*Annex J*).

6.6 ENVIRONMENTAL SITE INSPECTION

Weekly site inspections were carried out by the representatives of the Contractor, Engineer and the ET. 13 site inspections were conducted on 5, 12, 19 and 26 September 2013; 3, 10, 17, 24 and 31 October 2013; and 7, 14, 21 and 28 November 2013. The representative of the IEC joined the site inspections on 26 September, 31 October and 28 November 2013. There was no non-compliance recorded during the site inspections. Observations during site inspections and follow-up actions in the reporting period are presented in *Annex K*. All follow-up actions requested by the IEC and the Contractor's ET during the site inspections were undertaken as reported by the Contractor and confirmed in the following weekly site inspection conducted during the reporting period.

6.7 ENVIRONMENTAL NON-CONFORMANCE

6.7.1 Summary of Monitoring Exceedance

No exceedance of the Action and Limit Levels of 1-hour TSP and 24-hour averaged TSP was recorded at monitoring stations during the reporting period.

No exceedance of the Noise Limit Levels was recorded at monitoring station during both normal working hours and restricted hours in the reporting period.

No exceedance of maximum limit for safe vibration level (25 mm/s) was recorded during the reporting period.

6.7.2 Summary of Environmental Non-Compliance

No non-compliance event was recorded during the reporting period.

6.7.3 Summary of Environmental Complaint

No complaint was recorded during the reporting period.

The cumulative complaint log is shown in *Annex F7*.

6.7.4 Summary of Environmental Summon and Successful Prosecution

No summon or prosecution was received during the reporting period. The cumulative summon and prosecution log is shown in *Annex F7*.

7 STONECUTTERS ISLAND PRODUCTION AND RISER SHAFTS

7.1 CONSTRUCTION ACTIVITIES DURING THE REPORTING PERIOD

A summary of the major construction activities undertaken in this reporting period is shown in *Table 7.1*. The locations of the construction activities are shown in *Annex G1*.

Table 7.1 Summary of Construction Activities Undertaken from 1 September 2013 to 30 November 2013 at Stonecutters Island Production and Riser Shafts

Construction Activities Undertaken
Riser Shaft
• Raise boring – reaming;
• Water inflow diversion; and
• Preparation of shaft bottom.
Production Shaft
• Pre-excavation grouting; and
• Drilling and blasting;

7.2 STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS

A summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this reporting period is presented in *Table 7.2*.

Table 7.2 ***Summary of Environmental Licensing, Notification and Permit Status at Stonecutters Island Production and Riser Shafts***

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Wastewater Discharge License	Stonecutters Island Production Shaft and Riser Shaft WT00005069-2009	3 November 2010 - 31 October 2014	--
Chemical Waste Producer Registration	Stonecutters Island Production Shaft and Riser Shaft 5213-269-G2449-07	Throughout the Contract	--
Construction Noise Permit (CNP)	Stonecutters Island Production Shaft and Riser Shaft GW-RW0258-13	23 April 2013 – 22 October 2013	--
	Stonecutters Island Production Shaft and Riser Shaft GW-0692-13	23 October 2013 – 22 April 2014	--
	Stonecutters Island Area K-1 GW-RW0388-13	9 July 2013 – 8 January 2014	--

7.3 ENVIRONMENTAL MONITORING REQUIREMENTS

7.3.1 Air Quality Monitoring

Monitoring Location

In accordance with the EM&A Manual, 24-hour and 1-hour averaged TSP levels should be conducted at designated monitoring stations. Since access to some of the proposed monitoring locations stated in the EM&A Manual were rejected or not available, alternative locations, therefore, were proposed and agreed by the ER and the IEC. The construction air quality monitoring station for this Contract is listed in *Table 7.3* and shown in *Annex G2*.

Table 7.3 Construction Phase Air Monitoring Location at Stonecutters Island Production and Riser Shafts

Worksite	Construction Air Quality Monitoring Station			
	ID in EM&A Manual	ID	Location	Remark
SCISTW	-	AM6	Works Site Boundary	• Power Access supply for operation of HVS was not feasible to the rooftop of Government Dockyard Offices (CM_SCI1). • For COSCO HIT Terminal (CM_SCI2), access application was verbally rejected. • Club House (CM_SCI3) is blocked by a high building which will affect the dust levels during measurement. • Work Site Boundary (near Ngong Shuen Chau Barracks Group 2 (CM_SCI4) was designed for the HATS2A Disinfection Facilities works and the station is separated by a small hill. • Baseline dust monitoring data measured under HATS2A – Provision of Disinfection Facilities at SCISTW will also be obtained for the establishment of the action level for the impact monitoring.

Monitoring Parameters, Frequency and Programme

Air quality monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual (*Table 7.4*).

Table 7.4 TSP Monitoring Parameter and Frequency at Stonecutters Island Production and Riser Shafts

Parameter	Frequency
24-hour averaged TSP	Once every 6 days
1-hour averaged TSP	3 times every 6 days

Monitoring Equipment

Continuous 24-hour and 1-hour averaged TSP monitoring were performed using HVS with appropriate sampling inlets installed, located at the designated monitoring station. The performance specification of HVS complied with the standard method "*Determination of Suspended Particulate Matter in the Atmosphere (High Volume Method)*" as stipulated in *US EPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50 Appendix B)*. The equipment that was deployed for the 24-hour and 1-hour averaged TSP monitoring is listed in *Annex G5*.

Monitoring Methodology

Installation

The setup location of the HVS at monitoring station was listed in *Table 7.3*. The HVS was free-standing with no obstruction.

The following criteria were considered in the installation of the HVSs:

- appropriate support to secure the samplers against gusty wind were provided at AM6;
- a minimum of 2 m separation from walls, parapets and penthouses was required for rooftop samplers;
- no furnace or incinerator flues were nearby;
- airflow around the sampler was unrestricted; and
- permission was obtained to set up the samplers and to gain access to the monitoring stations.

Preparation of Filter Papers

- glass fibre filters were labelled and sufficient filters that were clean and without pinholes were selected;
- all filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ± 3 °C; the relative humidity (RH) was 40%; and
- SGS Hong Kong Ltd, a HOKLAS accredited laboratory, implements comprehensive quality assurance and quality control programmes.

Field Monitoring

- the power supply was checked to ensure that the HVSs were working properly;
- the filter holder and the area surrounding the filter were cleaned;
- the filter holder was removed by loosening the foul bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully;
- the filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter;
- the swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges;
- then the shelter lid was closed and secured with the aluminium strip;

- the HVSs were warmed-up for about 5 minutes to establish run-temperature conditions;
- a new flowrate record sheet was set into the flow recorder;
- the flow rates of the HVSs were checked and adjusted to between 1.22 - 1.37 m^3min^{-1} which were within the range specified in the EM&A Manual (ie 0.6 – 1.7 m^3min^{-1});
- the programmable timer was set for a sampling period of 24 hours ± 1 hour, and the starting time, weather condition and the filter number were recorded;
- the initial elapsed time was recorded;
- at the end of sampling, the sampled filter was removed carefully and folder in half length so that only surfaces with collected particulate matter were in contact;
- it was then placed in a clean plastic envelope and sealed;
- all monitoring information was recorded on a standard data sheet; and
- filters were sent to SGS Hong Kong Ltd for analysis.

Maintenance and Calibration

- the HVSs and their accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply; and
- the flow rate of each HVS with mass flow controller were calibrated using an orifice calibrator. Initial calibrations of the dust monitoring equipment were conducted upon installation and prior to commissioning. Five-point calibration was carried out for HVSs using CM-AIR-43 Calibration Kit. HVSs are calibrated on a bi-monthly basis. The calibration record for the HVS is given in *Annex H*.

Wind Data Monitoring

The nearest weather station to Stonecutters Island Production and Riser Shafts is Tsing Yi Station. Average wind data (wind speed and wind direction) during the monitoring period were obtained from the meteorological station at Tsing Yi of the Hong Kong Observatory (HKO) and are presented in *Annex G5*.

Action and Limit Levels

The Action and Limit levels have been established and presented in *Table 7.5.* The baseline air monitoring data (24-hr and 1-hr TSP average) measured under *HATS2A – Provision of Disinfection Facilities at SCISTW* (DF) is also included to establish the Action Level at AM6.

Table 7.5 ***Action and Limit Levels for Air Quality at Stonecutters Island Production and Riser Shafts***

Parameter	Air Monitoring Station	Action Level, μgm^{-3}	Limit Level, μgm^{-3}
24-hour averaged TSP	AM6 (with 24-hr TSP data from DF project)	196	260
1-hour averaged TSP	AM6 (with 1-hr TSP data from DF project)	346	500

Event and Action Plan

The EAP for air quality monitoring is presented in *Annex I*.

7.3.2 Noise Monitoring

Monitoring Location

In accordance with the EM&A Manual, monitoring of construction noise impact should be conducted at the designated monitoring stations. Since access to some of the proposed monitoring locations stated in the EM&A Manual were rejected or not available; alternative locations, therefore, were proposed and agreed by the ER and the IEC. The construction noise monitoring location for this Contract is listed in *Table 7.6* and is shown in *Annex G2*.

Table 7.6 ***Construction Phase Noise Monitoring Station at Stonecutters Island Production and Riser Shafts***

Worksite	Construction Noise Monitoring Station				
	ID in EM&A Manual	ID	Location	Type of Measurement	Remark
SCISTW	-	NM5	A Location near the FSD Diving Rescue and Diving Training Centre near the Site Boundary	Free-Field (3dB(A) was added to the measured results)	• Access to FSD Fire Rescue and Diving Training Centre (M11) was declined. • NM5 is located next to the original proposed location.

Monitoring Parameters, Frequency and Programme

Weekly construction noise monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual. Additional noise monitoring were also conducted as per required in the EM&A Manual when works were carried out during restricted periods.

The construction noise levels were measured in terms of A-weighted equivalent continuous sound pressure level (L_{Aeq}) in decibels dB(A). $L_{Aeq\ (30min)}$ were used as the monitoring parameter for the time period in between 0700 – 1900 hours on normal weekdays, and $L_{Aeq\ (5min)}$ were used as the

monitoring parameter for all restricted periods. Supplementary information for data auditing, two statistical sound levels L_{10} and L_{90}; the levels exceeded for 10 and 90 percent of the time respectively, were also recorded during the monitoring for reference. The measured noise levels were logged every 5 minutes throughout the impact monitoring period.

Monitoring Equipment and Methodology

Construction noise measurements were conducted in accordance with the calibration and measurement procedures as stated in *Annex – General Calibration and Measurement Procedures* of *Technical Memorandum on Noise from Construction Work other than Percussive Piling* (*GW-TM*) issued under the *Noise Control Ordinance* (*NCO*) (Cap.400).

The sound level meters and calibrator used for the noise measurement, as listed in *Annex G6*, complies with IEC 651: 1979 and 804:1985 (Type 1) specification. The calibration certificates of the sound level meters are included in *Annex H*.

Immediately prior to and following the noise measurements, the accuracy of the measurement equipment was checked using an acoustic calibrator generating a known sound pressure level at a known frequency.

Measurements were accepted as the calibration level from before and after the noise measurement agree to within 1.0 dB. A correction of +3dB(A) was made to the free field measurement at NM5.

Action and Limit Levels

The action and limit levels for the noise monitoring during different monitoring periods are summarized in *Table 7.7*.

Table 7.7 Action and Limit Levels for Noise Monitoring at Stonecutters Island Production and Riser Shaft

Noise Monitoring Location	Measurement Parameter	Noise Criteria (dB(A))	Remark
NM5	$L_{Aeq\ (30mins)}$	75	Normal working hours during weekdays
	$L_{Aeq\ (5mins)}$	70	Evening (1900-2300); and Sundays and public holidays (0700-2300)
	$L_{Aeq\ (5mins)}$	55	Night-time (2300-0700)

Event and Action Plan

The EAP for noise monitoring is presented in *Annex I*.

7.3.3 Cultural Heritage

No vibration monitoring is required for this reporting period as blasting of tunnel / shaft works was not carried out in the vicinity of the historical buildings listed in EM&A manual.

7.3.4 *Landscape and Visual Monitoring*

In accordance with the EM&A Manual, landscape and visual monitoring is required to ensure that the design, implementation and maintenance of landscape and visual mitigation measures are fully achieved. The landscape and visual monitoring is carried out on site within the environmental site inspection. The monitoring procedures and criteria as described in the EM&A Manual were adopted.

Event and Action Plan

The Event and Action Plan (EAP) for landscape and visual monitoring is presented in *Annex I*.

7.4 *IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS*

The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Report, the Environmental Permit and EM&A Manual. The implementation status during the reporting period is summarized in *Annex G4*.

7.5 *MONITORING RESULTS*

7.5.1 *Air Quality*

A total of 16 sets of 24-hour and 48 sets of 1-hour averaged TSP measurements were carried out at AM6 during the reporting period. The monitoring data for 24-hour TSP and 1-hour averaged TSP together with wind data and graphical presentations are presented in *Annex G5*.

The weather condition during the monitoring period varied from sunny to cloudy. The local impacts near the monitoring stations of AM6 were mainly associated with vehicle emissions. No exceedance of Action and Limit Levels of 1-hr and 24-hr TSP was recorded during the reporting period.

7.5.2 *Noise*

A total of 13 sets of 30-minute construction noise measurements were carried out at the monitoring station NM5 during normal weekdays of the reporting period. 13 sets of 3 x 5-minute construction noise measurements were carried out during restricted hours (between 1900 and 0700 hours on weekdays, and any time on Sundays and public holidays) on 3, 8, 17, 22 and 30 September 2013; 6, 15, 20 and 29 October 2013; and 3, 12, 17 and 26 November 2013 during the reporting period. The monitoring results together with graphical presentations are presented in *Annex G6*. The local impacts observed near the monitoring stations of NM5 included operations at the Government Dockyard, other construction sites activities and traffic within the SCI STW in the vicinity.

No exceedance of limit level for noise monitoring during both normal and restricted hours was recorded.

7.5.3 Landscape and Visual

Implementation and maintenance of landscape and visual mitigation measures are fully achieved and no major finding was observed during the reporting period.

7.5.4 Cultural Heritage

No vibration monitoring is required for this reporting period as blasting of tunnel / shaft works was not carried out in the vicinity of the historical buildings listed in EM&A manual.

7.5.5 Waste Management

Waste generated from this Project includes inert C&D materials, non-inert C&D materials and marine deposit. Non-inert C&D materials are made up of general refuse, steel and paper/cardboard packaging materials. Steel materials generated from the project are also grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. No marine deposit requiring type 1, type 2, or type 3 disposal methods was generated. The inert C&D materials and general refuse generated from the Project were disposed of at Tuen Mun Area 38/Tseung Kwan O Area 137 Fill Bank/Chai Wan Barging Point and SENT Landfill respectively.

The quantity of different types of wastes generated in the reporting period has been shown in the Monthly Summary Waste Flow Table prepared by the Contractor (*Annex J*).

7.6 ENVIRONMENTAL SITE INSPECTION

Weekly site inspections were carried out by the representatives of the Contractor, Engineer and the ET. 13 site inspections were conducted on 5, 12, 19 and 26 September 2013; 3, 10, 17, 24 and 31 October 2013; and 7, 14, 21 and 28 November 2013. The representative of the IEC joined the site inspections on 26 September, 31 October and 28 November 2013. There was no non-compliance recorded during the site inspections.

Observations during site inspections and follow-up actions in the reporting period are presented in *Annex K*. All the follow-up actions requested by IEC and Contractor's ET during the site inspection were undertaken as reported by the Contractor and confirmed in the following weekly site inspection conducted during the reporting period.

7.7 ENVIRONMENTAL NON-CONFORMANCE

7.7.1 Summary of Monitoring Exceedance

No exceedance of the Action and Limit Levels of 1-hour TSP and 24-hour averaged TSP was recorded at monitoring stations during the reporting period.

No exceedance of Action and Limit Levels for noise monitoring during both normal and restricted hours was recorded.

7.7.2 Summary of Environmental Non-Compliance

No non-compliance event was recorded during the reporting period.

7.7.3 Summary of Environmental Complaint

One complaint about noise was received on 22 July 2013. Investigation into the complaint had been conducted in August 2013. The findings of the investigation are presented in the 46th monthly EM&A report issued in September 2013. The findings are also presented in *Annex G8* of this report.

The cumulative complaint log is shown in *Annex G7*.

7.7.4 Summary of Environmental Summon and Successful Prosecution

No summon or prosecution was received during the reporting period. The cumulative summon and prosecution log is shown in *Annex G7*.

8 CONCLUSIONS

This Environmental Monitoring and Audit (EM&A) Report presents the EM&A works undertaken during the period from 1 September 2013 to 30 November 2013 in accordance with EM&A Manual and the relevant requirements under EP-322/2008/F. The conclusions for different sites are summarised below.

8.1 NORTH POINT PRODUCTION AND DROP SHAFTS

No exceedance of the Action and Limit Levels of the 1-hour and 24-hour averaged TSP was recorded at the air quality monitoring stations during the reporting period.

No exceedance of Limit Levels for construction noise was recorded at the monitoring station during the reporting period.

No non-compliance event was recorded during the reporting period.

No complaint/summon/prosecution was received during the reporting period.

8.2 WAN CHAI EAST PRODUCTION AND DROP SHAFTS

No exceedance of the Action and Limit Levels of the 1-hour and 24-hour averaged TSP was recorded at the air quality monitoring stations during the reporting period.

No exceedance of noise limit level was recorded during normal working hours but 32 exceedances of noise Limit Level during restricted hours were reported on 1, 10, 15, 24 and 29 September 2013; 8, 13 and 27 October 2013; and 5, 10, 19 and 24 November 2013.

The exceedances were investigated and the information is presented in detail in *Annex D7*. Referring to the works summary provided by the Contractor, no noisy outdoor construction activity was conducted at Wan Chai East Production and Drop Shafts during the noise monitoring sessions. Other potential noise sources were also identified in the vicinity (i.e., traffic) to contribute to the measured noise level. In view of no noisy outdoor construction works carried out and contribution from other potential noise sources in vicinity (i.e., traffic), it is considered that the exceedances were not due to the Contract 23 construction works. However, the Contractor was reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures to avoid exceedance of noise limit levels or causing nuisance.

No non-compliance/event was recorded during the reporting period.

There was no complaint/summon/prosecution received during the reporting period.

8.3 CENTRAL DROP SHAFT

No exceedance of the Action and Limit Levels of the 1-hour and 24-hour averaged TSP was recorded at the air quality monitoring stations during the reporting period.

No exceedance of the Action and Limit Levels for construction noise was recorded at the monitoring stations during the reporting period.

No non-compliance event was recorded during the reporting period.

There was no complaint/summon/prosecution received during the reporting period.

8.4 SAI YING PUN JUNCTION SHAFT

No exceedance of the Action and Limit Levels of the 1-hour and 24-hour average TSP was recorded at the air quality monitoring stations during the reporting period.

No exceedance of Limit Levels for construction noise was recorded at the monitoring station during the reporting period.

No exceedance of maximum limit for safe vibration level (25 mm/s) was recorded during the reporting period.

No non-compliance event was recorded during the reporting period.

8.5 STONECUTTERS ISLAND PRODUCTION AND RISER SHAFTS

No exceedance of the Action and Limit Levels of the 1-hour and 24-hour averaged TSP was recorded at the air quality monitoring stations during the reporting period.

No exceedance of Limit Levels for construction noise was recorded at the monitoring station during the reporting period.

No non-compliance event was recorded during the reporting period.

One complaint about noise was received on 22 July 2013. Investigation into the complaint had been conducted in August 2013. The findings of the investigation are presented in the 46th monthly EM&A report issued in September 2013. The findings are also presented in *Annex G8* of this report.

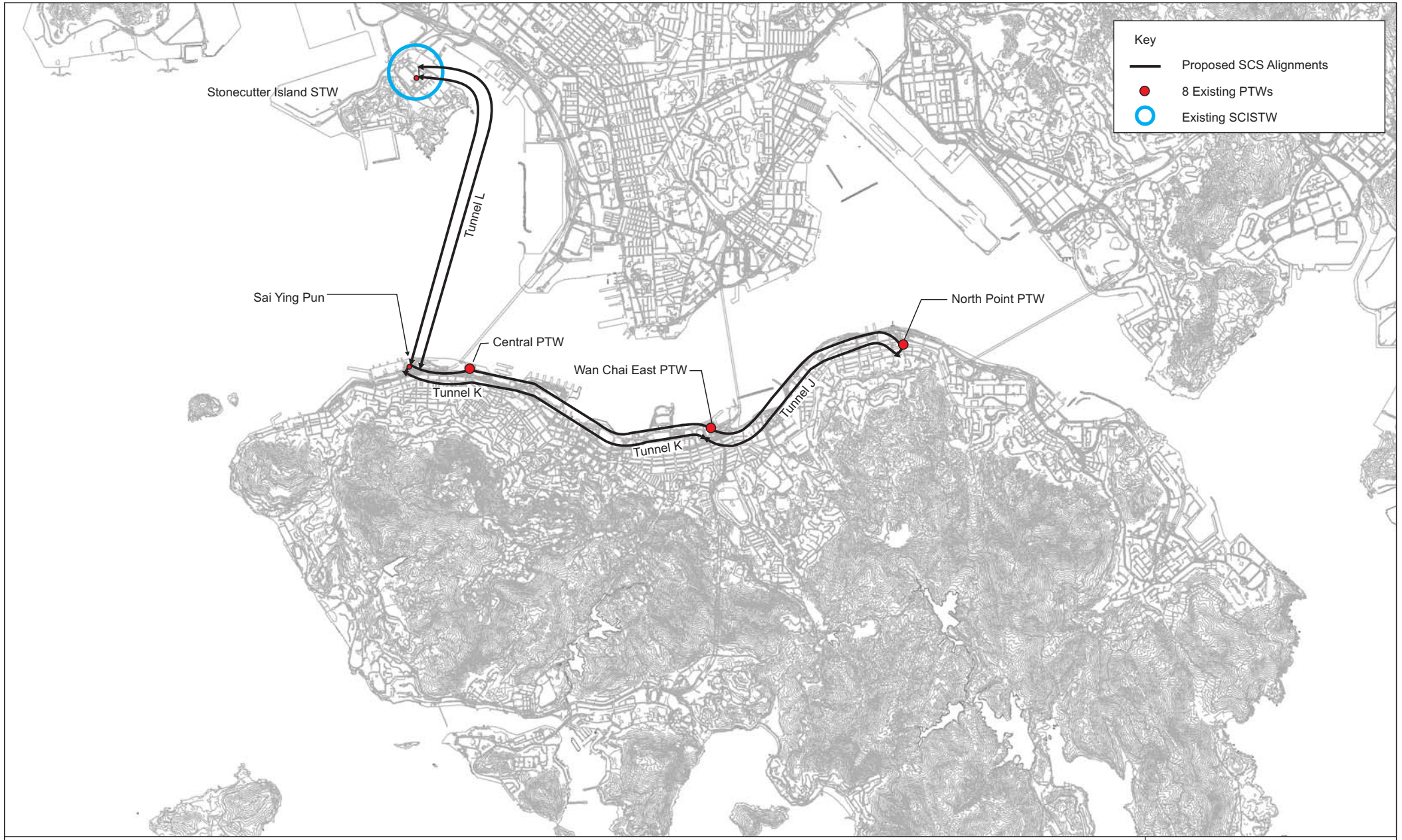
There was no summon/prosecution received during the reporting period.

8.6 OVERALL

The ET has followed the EM&A programme to monitor compliance status of environmental requirements and to verify proper implementation of all necessary mitigation measures.

Annex A

Locations of Works Areas



Annex A

General Layout Plan of HATS Stage 2A

FILE: 0104887h5
DATE: 17/05/2010

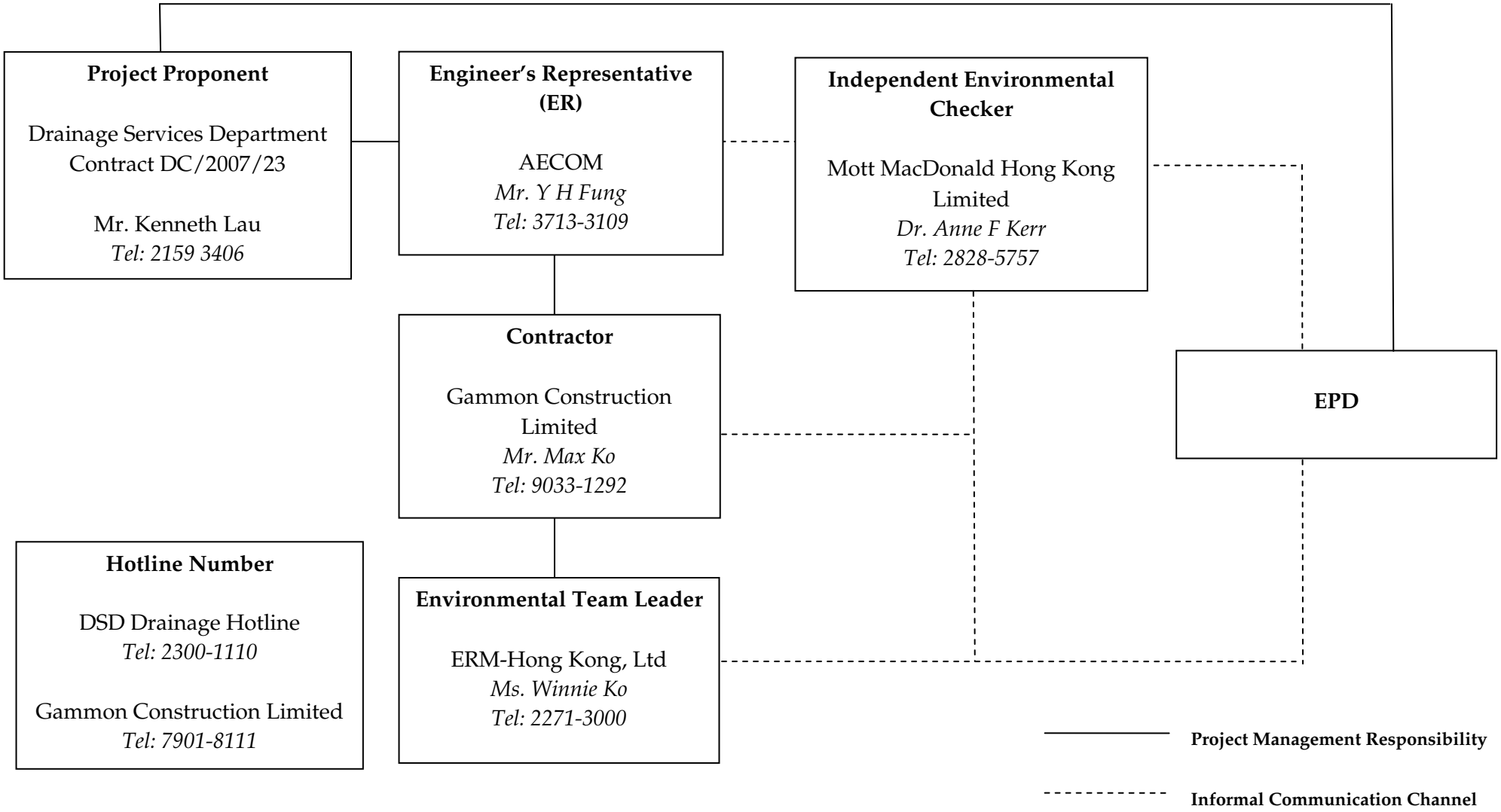
Environmental Resources Management

ERM

Annex B

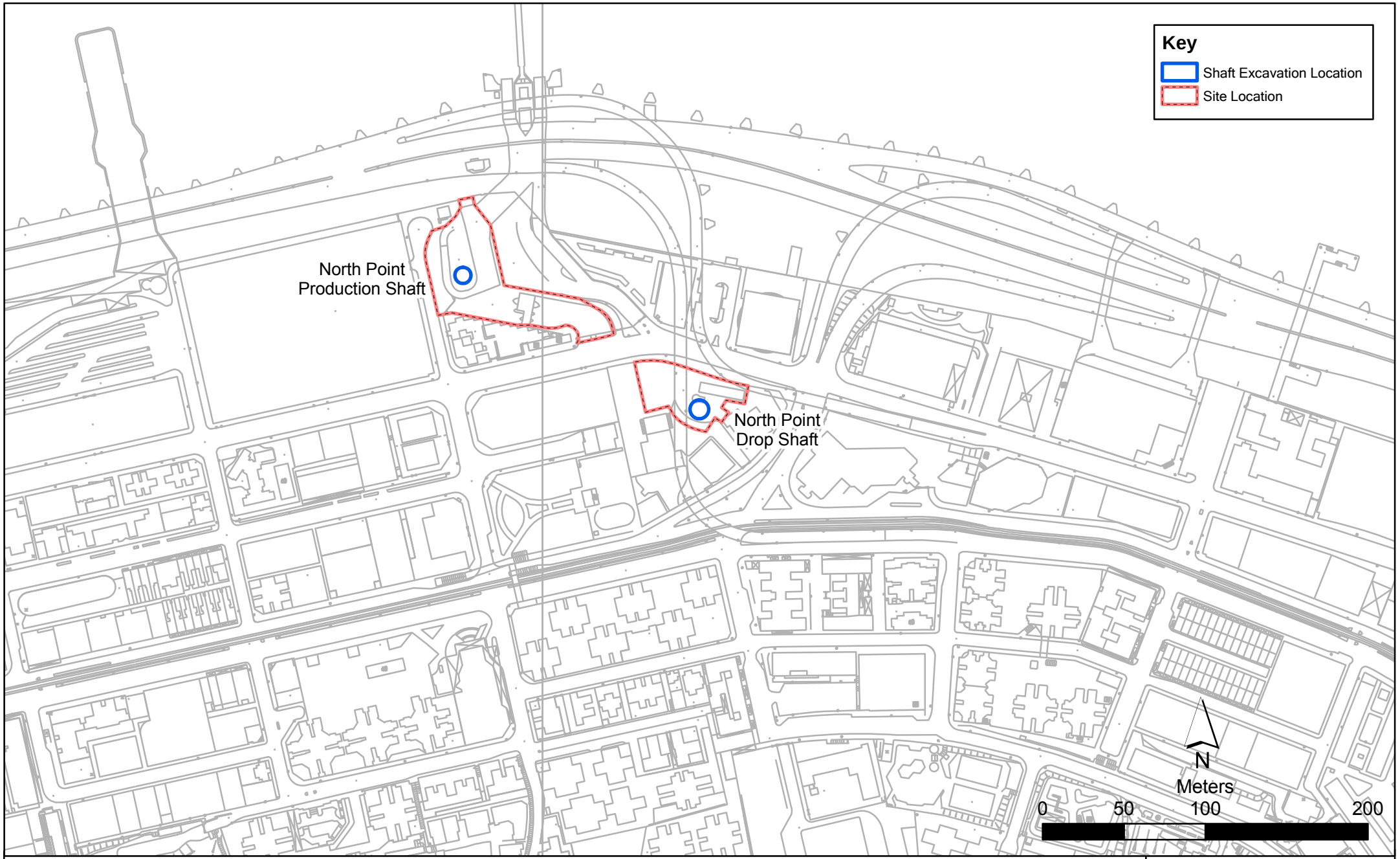
Project Organization Chart and Contact Detail

Project Organization



Annex C

North Point Production and Drop Shafts



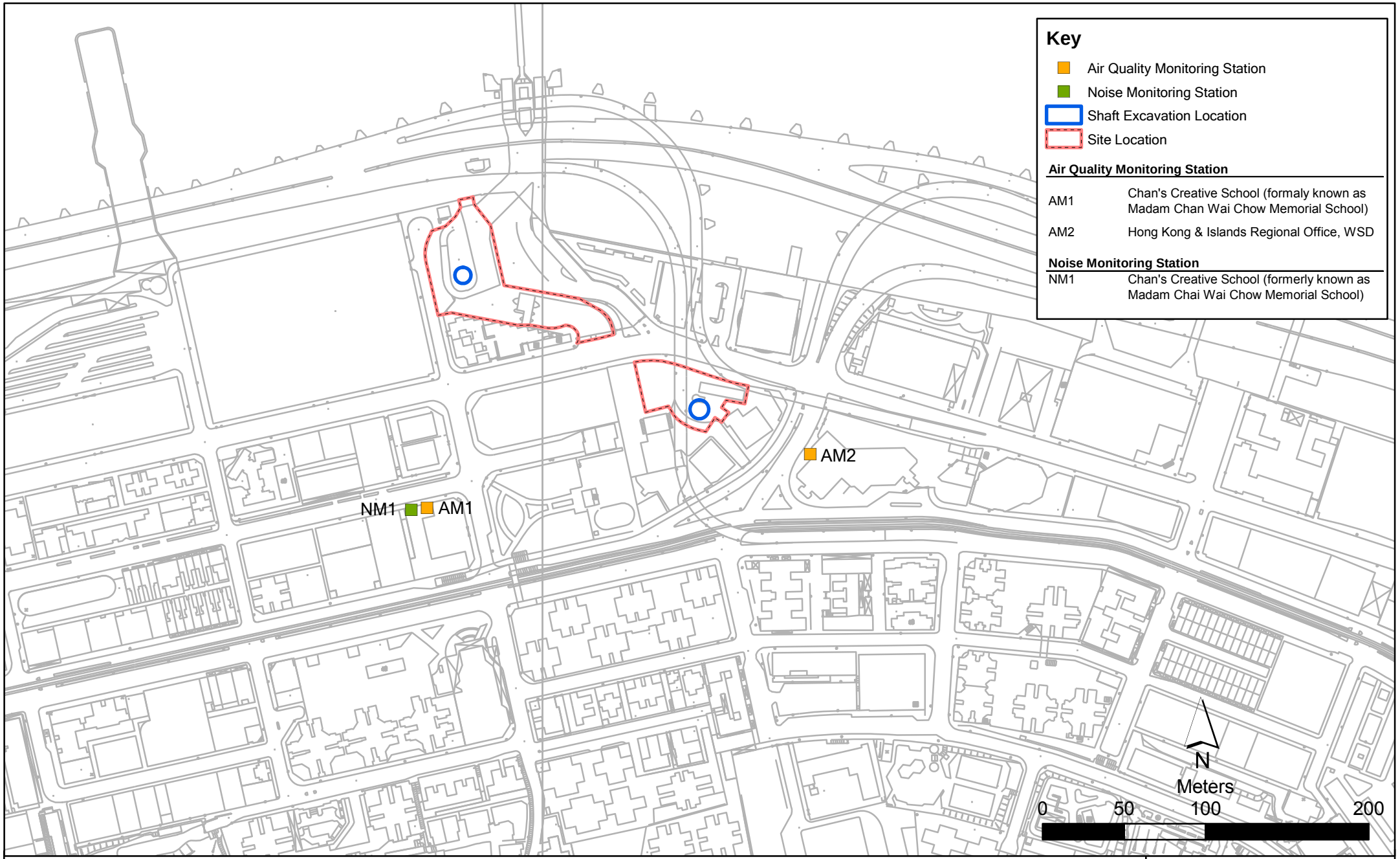
Annex C1

Contract No. DC/2007/23
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Construction Site Locations at North Point

File: EM&A and proposed station\0104887_North Point.mxd
Date: 29/10/2009

Environmental Resources Management

ERM



Annex C2

Contract No. DC/2007/23
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Impact Air Quality & Noise Monitoring Stations (North Point)

File: EM&A and proposed station\0104887_North Point_NMAM.mxd
Date: 03/03/2010

Environmental Resources Management

ERM

Annex C3 Not Used

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase			
Air Quality	The Air Pollution Control (Construction Dust) Regulation shall be implemented and good site practices shall be incorporated in the contract clauses to minimize construction dust impact. Control measures relevant to this Project are listed below: • skip hoist for material transport should be totally enclosed by impervious sheeting; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site; • 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 hardcores; • where a site boundary adjoins a road, streets or other 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; • 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; • regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather; • site enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines; • open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible; • tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and • instigation of an environmental monitoring auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	The following watering measures for specific site would be required to control the fugitive dust impacts: • watering twice per day within the worksites at North Point PTW; and • watering 8 times per day within worksites at the SCS works area at North Point.	All work sites / during construction	√
Operational Phase			
Air Quality	Good housekeeping for SCISTW and PTWs listed below should be followed to ameliorate any odour impact from the plant and these standard practices should be included in the plant operator manual. • Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers to minimize odour escape • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality	Commissioning tests for all deodorization system should be included in the Design and Construction Contract Document.	All PTW and SCISTW/ during operational phase	
Construction Phase			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Good Site Practice: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program; • mobile plant, if any, should be sited as far from NSRs as possible; • machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities; Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.	All work sites / during construction	√
Construction Phase			
Water Quality	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 work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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.	All work sites / during construction	√
Water Quality	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) Regulation should be observed and complied with for control of chemical wastes.	All work sites / during construction	<>
Water Quality	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.	All work sites / during construction	<>

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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 the storm culvert or sea	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Operational Phase			
Water Quality	Dual power supply, standby facilities for the main treatment units and standby equipment parts / accessories should be provided as far as possible at the SCISTW to minimize the chance of emergency discharge.	SCISTW and all the Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Waste	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 work sites / during the construction period	√
Waste	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 work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Recommendations to achieve waste reduction include: • 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; and • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All work sites / during the construction period	√
Waste	Recommendations for good site practices during construction activities include:- • 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 • 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. • Provision of sufficient waste disposal points and regular collection of waste • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.	All work sites / during the construction period	√
Waste	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	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.	All work sites / during the construction period	√
Construction Phase			
Landscape & Visual	• Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. • 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. • Erection of decorative screen hoarding compatible with the surrounding setting.	All the works areas, PTWs and SCISTW/ during the construction period	√
Operational Phase	•		
Landscape & Visual	• Aesthetic design of the façade of PTW and associated structures to harmonize with the surrounding settings. • Shrub and Climbing Plants to soften proposed structures / Roof Greening. • Buffer Tree and Shrub Planting to screen proposed associated structures. • Reinstated of disturbed area	All the works areas, PTWs and SCISTW/ during the construction period	NA. Measures not required until commencement of operational phase
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Cultural Heritage	The construction vibration control limit (ppv of 25mm/s) shall be strictly followed.	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.

Remark:
√ Compliance of Mitigation Measures
<> Compliance of Mitigation but need improvement
x Non-compliance of Mitigation Measures
Δ Deficiency of Mitigation Measures but rectified by the Contractor
NA Not Applicable

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase			
Air Quality	The Air Pollution Control (Construction Dust) Regulation shall be implemented and good site practices shall be incorporated in the contract clauses to minimise construction dust impact. Control measures relevant to this Project are listed below: • skip hoist for material transport should be totally enclosed by impervious sheeting; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site; • 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 hardcores; • where a site boundary adjoins a road, streets or other 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; • 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; • regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather; • site enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines; • open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible; • tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and • instigation of an environmental monitoring auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All work sites / during construction	<>

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	The following watering measures for specific site would be required to control the fugitive dust impacts: • watering twice per day within the worksites at North Point PTW; and • watering 8 times per day within worksites at the SCS works area at North Point.	All work sites / during construction	√
Operational Phase			
Air Quality	Good housekeeping for SCISTW and PTWs listed below should be followed to ameliorate any odour impact from the plant and these standard practices should be included in the plant operator manual. • Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers to minimise odour escape • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality	Commissioning tests for all deodorisation system should be included in the Design and Construction Contract Document.	All PTW and SCISTW/ during operational phase	NA. Measures not required until commencement of operational phase
Construction Phase			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Good Site Practice: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction program; • mobile plant, if any, should be sited as far from NSRs as possible; • machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • Air compressors should be properly labelled with valid noise emission labels. • plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities; Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.	All work sites / during construction	<>
Construction Phase			
Water Quality	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 work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Effluent Discharge There is a need to apply to EPD for a discharge license for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge license. 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.	All work sites / during construction	√
Water Quality	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) Regulation should be observed and complied with for control of chemical wastes.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront To minimise 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 the storm culvert or sea	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Operational Phase			
Water Quality	Dual power supply, standby facilities for the main treatment units and standby equipment parts / accessories should be provided as far as possible at the SCISTW to minimise the chance of emergency discharge.	SCISTW and all the Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Waste	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 minimise the use of timber formwork.	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Recommendations to achieve waste reduction include: • 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; and • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All work sites / during the construction period	√
Waste	Recommendations for good site practices during construction activities include:- • 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 • 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. • Provision of sufficient waste disposal points and regular collection of waste • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors	All work sites / during the construction period	<>
Waste	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 work sites / during the construction period	NA

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.	All work sites / during the construction period	√
Waste	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Waste	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, oxidising, 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.	All work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	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.	All work sites / during the construction period	√
Construction Phase			
Landscape & Visual	• Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. • 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. • Erection of decorative screen hoarding compatible with the surrounding setting.	All the works areas, PTWs and SCISTW/ during the construction period	√
Operational Phase	•		
Landscape & Visual	• Aesthetic design of the façade of PTW and associated structures to harmonise with the surrounding settings. • Shrub and Climbing Plants to soften proposed structures / Roof Greening. • Buffer Tree and Shrub Planting to screen proposed associated structures. • Reinstated of disturbed area	All the works areas, PTWs and SCISTW/ during the construction period	NA. Measures not required until commencement of operational phase
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Cultural Heritage	The construction vibration control limit (ppv of 25mm/s) shall be strictly followed.	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.

Remark:
√ Compliance of Mitigation Measures
<> Compliance of Mitigation but need improvement
x Non-compliance of Mitigation Measures
Δ Deficiency of Mitigation Measures but rectified by the Contractor
NA Not Applicable

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase			
Air Quality	The Air Pollution Control (Construction Dust) Regulation shall be implemented and good site practices shall be incorporated in the contract clauses to minimise construction dust impact. Control measures relevant to this Project are listed below: • skip hoist for material transport should be totally enclosed by impervious sheeting; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site; • 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 hardcores; • where a site boundary adjoins a road, streets or other 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; • 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; • regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather; • site enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines; • open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible; • tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and • instigation of an environmental monitoring auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All work sites / during construction	<>

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	The following watering measures for specific site would be required to control the fugitive dust impacts: • watering twice per day within the worksites at North Point PTW; and • watering 8 times per day within worksites at the SCS works area at North Point.	All work sites / during construction	√
Operational Phase			
Air Quality	Good housekeeping for SCISTW and PTWs listed below should be followed to ameliorate any odour impact from the plant and these standard practices should be included in the plant operator manual. • Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers to minimise odour escape • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality	Commissioning tests for all deodorisation system should be included in the Design and Construction Contract Document.	All PTW and SCISTW/ during operational phase	NA. Measures not required until commencement of operational phase
Construction Phase			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Good Site Practice: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction program; • mobile plant, if any, should be sited as far from NSRs as possible; • machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • Air compressors should be properly labelled with valid noise emission labels. • plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities; Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.	All work sites / during construction	<>
Construction Phase			
Water Quality	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 work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Effluent Discharge There is a need to apply to EPD for a discharge license for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge license. 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.	All work sites / during construction	√
Water Quality	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) Regulation should be observed and complied with for control of chemical wastes.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront To minimise 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 the storm culvert or sea	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Operational Phase			
Water Quality	Dual power supply, standby facilities for the main treatment units and standby equipment parts / accessories should be provided as far as possible at the SCISTW to minimise the chance of emergency discharge.	SCISTW and all the Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Waste	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 minimise the use of timber formwork.	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Recommendations to achieve waste reduction include: • 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; and • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All work sites / during the construction period	√
Waste	Recommendations for good site practices during construction activities include:- • 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 • 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. • Provision of sufficient waste disposal points and regular collection of waste • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors	All work sites / during the construction period	<>
Waste	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 work sites / during the construction period	NA

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.	All work sites / during the construction period	√
Waste	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Waste	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, oxidising, 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.	All work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	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.	All work sites / during the construction period	√
Construction Phase			
Landscape & Visual	• Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. • 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. • Erection of decorative screen hoarding compatible with the surrounding setting.	All the works areas, PTWs and SCISTW/ during the construction period	√
Operational Phase	•		
Landscape & Visual	• Aesthetic design of the façade of PTW and associated structures to harmonise with the surrounding settings. • Shrub and Climbing Plants to soften proposed structures / Roof Greening. • Buffer Tree and Shrub Planting to screen proposed associated structures. • Reinstated of disturbed area	All the works areas, PTWs and SCISTW/ during the construction period	NA. Measures not required until commencement of operational phase
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Cultural Heritage	The construction vibration control limit (ppv of 25mm/s) shall be strictly followed.	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.

Remark:
√ Compliance of Mitigation Measures
<> Compliance of Mitigation but need improvement
x Non-compliance of Mitigation Measures
Δ Deficiency of Mitigation Measures but rectified by the Contractor
NA Not Applicable

Annex C5 24-hour and 1-hour TSP Monitoring Results

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
04-Sep-13	8:47	9:47	Rainy	115	340	500	Construction work in progress	29	<5	GMW GS 2310 (S/N 1808)	8274
	9:49	10:49	Rainy	127	340	500	Construction work in progress	29	<5	GMW GS 2310 (S/N 1808)	7951
	10:51	11:51	Rainy	190	340	500	Construction work in progress	29	<5	GMW GS 2310 (S/N 1808)	7952
10-Sep-13	13:35	14:35	Sunny	183	340	500	Construction work in progress	30	<5	GMW GS 2310 (S/N 1808)	7957
	14:37	15:37	Sunny	189	340	500	Construction work in progress	30	<5	GMW GS 2310 (S/N 1808)	7959
	15:39	16:39	Sunny	194	340	500	Construction work in progress	30	<5	GMW GS 2310 (S/N 1808)	7960
16-Sep-13	11:48	12:48	Sunny	134	340	500	Construction work in progress	30	<5	GMW GS 2310 (S/N 1808)	8373
	12:50	13:50	Sunny	149	340	500	Construction work in progress	30	<5	GMW GS 2310 (S/N 1808)	8395
	13:52	14:52	Sunny	125	340	500	Construction work in progress	30	<5	GMW GS 2310 (S/N 1808)	8376
21-Sep-13	9:00	10:00	Fine	149	340	500	Construction work in progress	29	<5	GMW GS 2310 (S/N 1808)	8393
	10:02	11:02	Fine	160	340	500	Construction work in progress	29	<5	GMW GS 2310 (S/N 1808)	8379
	11:04	12:04	Fine	154	340	500	Construction work in progress	29	<5	GMW GS 2310 (S/N 1808)	8382
27-Sep-13	11:10	12:10	Sunny	151	340	500	Construction work in progress	29	<5	GMW GS 2310 (S/N 1808)	8391
	12:12	13:12	Sunny	137	340	500	Construction work in progress	29	<5	GMW GS 2310 (S/N 1808)	8389
	13:14	14:14	Sunny	145	340	500	Construction work in progress	29	<5	GMW GS 2310 (S/N 1808)	8388
			Min.	**115**							
			Max.	**194**							
			Average	**153**							

* Wind Speed data is presented in the Meteorological Data table

Annex C5 24-hour and 1-hour TSP Monitoring Results

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
04-Sep-13	9:05	10:05	Rainy	149	352	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0145)	8273
	10:07	11:07	Rainy	132	352	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0145)	7950
	11:09	12:09	Rainy	139	352	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0145)	7953
10-Sep-13	13:50	14:50	Sunny	191	352	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0145)	7956
	14:52	15:52	Sunny	187	352	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0145)	7958
	15:54	16:54	Sunny	190	352	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0145)	7961
16-Sep-13	12:10	13:10	Sunny	145	352	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0145)	8374
	13:12	14:12	Sunny	150	352	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0145)	8396
	14:14	15:14	Sunny	146	352	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0145)	8375
21-Sep-13	9:20	10:20	Fine	173	352	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0145)	8794
	10:22	11:22	Fine	161	352	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0145)	8380
	11:24	12:24	Fine	178	352	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0145)	8381
27-Sep-13	11:30	12:30	Sunny	127	352	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0145)	8384
	12:32	13:32	Sunny	154	352	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0145)	8390
	13:34	14:34	Sunny	138	352	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0145)	8387
			Min.	**127**							
			Max.	**191**							
			Average	**157**							

* Wind Speed data is presented in the Meteorological Data table

Annex C5 24-hour and 1-hour TSP Monitoring Results

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
03-Oct-13	9:37	10:37	Sunny	181	340	500	Construction work in progress	30	<5	GMW GS 2310 (S/N 1808)	8295
	10:35	11:35	Sunny	183	340	500	Construction work in progress	30	<5	GMW GS 2310 (S/N 1808)	8278
	11:37	12:37	Sunny	175	340	500	Construction work in progress	30	<5	GMW GS 2310 (S/N 1808)	8279
09-Oct-13	11:45	12:45	Sunny	159	340	500	Construction work in progress	28	<5	GMW GS 2310 (S/N 1808)	8282
	12:47	13:47	Sunny	161	340	500	Construction work in progress	28	<5	GMW GS 2310 (S/N 1808)	8292
	13:49	14:49	Sunny	144	340	500	Construction work in progress	28	<5	GMW GS 2310 (S/N 1808)	8284
15-Oct-13	10:52	11:52	Sunny	169	340	500	Construction work in progress	28	<5	GMW GS 2310 (S/N 1808)	8288
	11:54	12:54	Sunny	179	340	500	Construction work in progress	28	<5	GMW GS 2310 (S/N 1808)	8287
	12:56	13:56	Sunny	173	340	500	Construction work in progress	28	<5	GMW GS 2310 (S/N 1808)	8603
21-Oct-13	8:35	9:35	Sunny	199	340	500	Construction work in progress	28	<5	GMW GS 2310 (S/N 1808)	8624
	9:37	10:37	Sunny	190	340	500	Construction work in progress	28	<5	GMW GS 2310 (S/N 1808)	8607
	10:39	11:39	Sunny	177	340	500	Construction work in progress	28	<5	GMW GS 2310 (S/N 1808)	8622
26-Oct-13	9:02	10:02	Sunny	181	340	500	Construction work in progress	25	<5	GMW GS 2310 (S/N 1808)	8611
	10:04	11:04	Sunny	180	340	500	Construction work in progress	25	<5	GMW GS 2310 (S/N 1808)	8612
	11:06	12:06	Sunny	161	340	500	Construction work in progress	25	<5	GMW GS 2310 (S/N 1808)	8615
			Min.	**144**							
			Max.	**199**							
			Average	**174**							

* Wind Speed data is presented in the Meteorological Data table

Annex C5 24-hour and 1-hour TSP Monitoring Results

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
03-Oct-13	9:45	10:45	Sunny	179	352	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0145)	8276
	10:47	11:47	Sunny	167	352	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0145)	8277
	11:50	12:50	Sunny	169	352	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0145)	8280
09-Oct-13	12:00	13:00	Sunny	157	352	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0145)	8281
	13:02	14:02	Sunny	168	352	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0145)	8291
	14:04	15:04	Sunny	141	352	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0145)	8283
15-Oct-13	11:10	12:10	Sunny	163	352	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0145)	8289
	12:12	13:12	Sunny	160	352	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0145)	8286
	13:14	14:14	Sunny	165	352	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0145)	8604
21-Oct-13	9:00	10:00	Sunny	182	352	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0145)	8605
	10:02	11:02	Sunny	201	352	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0145)	8606
	11:04	12:04	Sunny	194	352	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0145)	8623
26-Oct-13	9:20	10:20	Sunny	198	352	500	Construction work in progress	25	<5	GMW GS-2310 (S/N 0145)	8610
	10:22	11:22	Sunny	187	352	500	Construction work in progress	25	<5	GMW GS-2310 (S/N 0145)	8613
	11:24	12:24	Sunny	190	352	500	Construction work in progress	25	<5	GMW GS-2310 (S/N 0145)	8614
			Min.	**141**							
			Max.	**201**							
			Average	**175**							

* Wind Speed data is presented in the Meteorological Data table

Annex C5 24-hour and 1-hour TSP Monitoring Results

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
01-Nov-13	12:00	13:00	Sunny	192	340	500	Construction work in progress	26	<5	GMW GS 2310 (S/N 1808)	8621
	13:02	14:02	Sunny	188	340	500	Construction work in progress	26	<5	GMW GS 2310 (S/N 1808)	8619
	14:04	15:04	Sunny	180	340	500	Construction work in progress	26	<5	GMW GS 2310 (S/N 1808)	8647
07-Nov-13	10:55	11:55	Sunny	191	340	500	Construction work in progress	27	<5	GMW GS 2310 (S/N 1808)	8644
	11:57	12:57	Sunny	191	340	500	Construction work in progress	27	<5	GMW GS 2310 (S/N 1808)	8626
	13:00	14:00	Sunny	180	340	500	Construction work in progress	27	<5	GMW GS 2310 (S/N 1808)	8627
13-Nov-13	9:35	10:35	Cloudy	185	340	500	Construction work in progress	22	<5	GMW GS 2310 (S/N 1808)	8631
	10:37	11:37	Cloudy	172	340	500	Construction work in progress	22	<5	GMW GS 2310 (S/N 1808)	8633
	11:39	12:39	Cloudy	169	340	500	Construction work in progress	22	<5	GMW GS 2310 (S/N 1808)	8635
19-Nov-13	9:02	10:02	Fine	173	340	500	Construction work in progress	23	<5	GMW GS 2310 (S/N 1808)	8636
	10:04	11:04	Fine	184	340	500	Construction work in progress	23	<5	GMW GS 2310 (S/N 1808)	8801
	11:06	12:06	Fine	191	340	500	Construction work in progress	23	<5	GMW GS 2310 (S/N 1808)	8803
25-Nov-13	11:30	12:30	Sunny	185	340	500	Construction work in progress	22	<5	GMW GS 2310 (S/N 1808)	8823
	12:32	13:32	Sunny	207	340	500	Construction work in progress	22	<5	GMW GS 2310 (S/N 1808)	8821
	13:34	14:34	Sunny	221	340	500	Construction work in progress	22	<5	GMW GS 2310 (S/N 1808)	8819
30-Nov-13	9:00	10:00	Sunny	189	340	500	Construction work in progress	21	<5	GMW GS 2310 (S/N 1808)	8806
	10:00	11:00	Sunny	188	340	500	Construction work in progress	21	<5	GMW GS 2310 (S/N 1818)	8807
	11:04	12:04	Sunny	208	340	500	Construction work in progress	21	<5	GMW GS 2310 (S/N 1818)	8808
			Min.	**169**							
			Max.	**221**							
			Average	**189**							

* Wind Speed data is presented in the Meteorological Data table

Annex C5 24-hour and 1-hour TSP Monitoring Results

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
01-Nov-13	12:15	13:15	Sunny	201	352	500	Construction work in progress	26	<5	GMW GS-2310 (S/N 0145)	8620
	13:17	14:17	Sunny	183	352	500	Construction work in progress	26	<5	GMW GS-2310 (S/N 0145)	8618
	14:19	15:19	Sunny	188	352	500	Construction work in progress	26	<5	GMW GS-2310 (S/N 0145)	8648
07-Nov-13	11:10	12:10	Sunny	198	352	500	Construction work in progress	27	<5	GMW GS-2310 (S/N 0145)	8643
	12:12	13:12	Sunny	215	352	500	Construction work in progress	27	<5	GMW GS-2310 (S/N 0145)	8625
	13:14	14:14	Sunny	187	352	500	Construction work in progress	27	<5	GMW GS-2310 (S/N 0145)	8628
13-Nov-13	9:50	10:50	Cloudy	168	352	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 0145)	8632
	10:52	11:52	Cloudy	186	352	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 0145)	8634
	11:54	12:54	Cloudy	179	352	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 0145)	8638
19-Nov-13	9:20	10:20	Fine	173	352	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 0145)	8802
	10:22	11:22	Fine	179	352	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 0145)	8639
	11:24	12:24	Fine	190	352	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 0145)	8805
25-Nov-13	11:50	12:50	Sunny	163	352	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 0145)	8824
	12:52	13:52	Sunny	167	352	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 0145)	8822
	13:54	14:54	Sunny	190	352	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 0145)	8820
30-Nov-13	9:20	10:20	Sunny	169	352	500	Construction work in progress	21	<5	GMW GS 2310 (S/N 1808)	8809
	10:22	11:22	Sunny	196	352	500	Construction work in progress	21	<5	GMW GS 2310 (S/N 1818)	8810
	11:24	12:24	Sunny	186	352	500	Construction work in progress	21	<5	GMW GS 2310 (S/N 1808)	8811
			Min.	**163**							
			Max.	**215**							
			Average	**184**							

* Wind Speed data is presented in the Meteorological Data table

Annex C5 24-hour and 1-hour TSP Monitoring Results

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	(μg/m^3)	(μg/m^3)	(μg/m^3)		ID	ID
04-Sep-13	11:53	05-Sep-13	11:53	Rainy	2.7905	2.9427	16484.03	16508.03	24.00	1.22	1.22	1.22	87	185	260	Construction work in progress	GMW GS 2310 (S/N 1808)	7955
10-Sep-13	10:42	11-Sep-13	10:42	Sunny	2.7907	2.9415	16511.03	16535.03	24.00	1.22	1.22	1.22	86	185	260	Construction work in progress	GMW GS 2310 (S/N 1808)	8296
16-Sep-13	14:54	17-Sep-13	14:54	Sunny	2.8124	2.9676	16538.03	16562.03	24.00	1.22	1.22	1.22	87	185	260	Construction work in progress	GMW GS 2310 (S/N 1808)	8377
21-Sep-13	12:06	22-Sep-13	12:06	Fine	2.8242	2.9771	16565.03	16589.03	24.00	1.22	1.22	1.22	87	185	260	Construction work in progress	GMW GS 2310 (S/N 1808)	8383
27-Sep-13	14:16	28-Sep-13	14:16	Sunny	2.8049	2.9600	16592.03	16616.03	24.00	1.24	1.24	1.24	87	185	260	Construction work in progress	GMW GS 2310 (S/N 1808)	8386
												Min.	**86**					
												Max.	**87**					
												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	(μg/m^3)	(μg/m^3)	(μg/m^3)		ID	ID
04-Sep-13	12:11	05-Sep-13	12:11	Rainy	2.7831	2.9300	12144.93	12168.93	24.00	1.21	1.21	1.21	84	182	260	Construction work in progress	GMW GS 2310 (S/N 0145)	7954
10-Sep-13	16:57	11-Sep-13	16:57	Sunny	2.7910	2.9449	12171.93	12195.93	24.00	1.21	1.21	1.21	88	182	260	Construction work in progress	GMW GS 2310 (S/N 0145)	8275
16-Sep-13	15:16	17-Sep-13	15:16	Sunny	2.8069	2.9579	12198.93	12222.93	24.00	1.21	1.21	1.21	87	182	260	Construction work in progress	GMW GS 2310 (S/N 0145)	8378
21-Sep-13	12:26	22-Sep-13	12:26	Fine	2.8243	2.9798	12225.93	12249.93	24.00	1.21	1.21	1.21	89	182	260	Construction work in progress	GMW GS 2310 (S/N 0145)	8392
27-Sep-13	14:36	28-Sep-13	14:36	Sunny	2.7986	2.9492	12252.93	12276.93	24.00	1.23	1.23	1.23	85	182	260	Construction work in progress	GMW GS 2310 (S/N 0145)	8385
												Min.	**84**					
												Max.	**89**					
												Average	**87**					

Annex C5 24-hour and 1-hour TSP Monitoring Results

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	(μg/m^3)	(μg/m^3)	(μg/m^3)		ID	ID
03-Oct-13	12:40	04-Oct-13	12:40	Sunny	2.8003	2.9676	16619.03	16643.03	24.00	1.24	1.24	1.24	94	185	260	Construction work in progress	GMW GS 2310 (S/N 1808)	8293
09-Oct-13	14:52	10-Oct-13	14:52	Sunny	2.7841	2.9575	16646.03	16670.03	24.00	1.24	1.24	1.24	97	185	260	Construction work in progress	GMW GS 2310 (S/N 1808)	8290
15-Oct-13	14:00	16-Oct-13	14:00	Sunny	2.8121	2.9771	16673.03	16697.03	24.00	1.24	1.24	1.24	92	185	260	Construction work in progress	GMW GS 2310 (S/N 1808)	8601
21-Oct-13	11:42	22-Oct-13	11:42	Sunny	2.8265	2.9911	16700.03	16724.03	24.00	1.24	1.24	1.24	92	185	260	Construction work in progress	GMW GS 2310 (S/N 1808)	8608
26-Oct-13	12:08	27-Oct-13	12:08	Sunny	2.8209	2.9900	16727.03	16751.03	24.00	1.24	1.24	1.24	95	185	260	Construction work in progress	GMW GS 2310 (S/N 1808)	8617
												Min.	92					
												Max.	97					
												Average	94					

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	(μg/m^3)	(μg/m^3)	(μg/m^3)		ID	ID
03-Oct-13	12:52	04-Oct-13	12:52	Sunny	2.9956	2.9559	12279.93	12303.93	24.00	1.23	1.23	1.23	91	182	260	Construction work in progress	GMW GS 2310 (S/N 0145)	8294
09-Oct-13	15:06	10-Oct-13	15:06	Sunny	2.7843	2.9607	12306.93	12330.93	24.00	1.23	1.23	1.23	91	182	260	Construction work in progress	GMW GS 2310 (S/N 0145)	8285
15-Oct-13	14:16	16-Oct-13	14:16	Sunny	2.8244	2.9809	12333.93	12357.93	24.00	1.23	1.23	1.23	88	182	260	Construction work in progress	GMW GS 2310 (S/N 0145)	8602
21-Oct-13	12:06	22-Oct-13	12:06	Sunny	2.8192	2.9797	12360.93	12384.93	24.00	1.23	1.23	1.23	91	182	260	Construction work in progress	GMW GS 2310 (S/N 0145)	8609
26-Oct-13	12:26	27-Oct-13	12:26	Sunny	2.8177	2.9900	12387.93	12411.93	24.00	1.23	1.23	1.23	97	182	260	Construction work in progress	GMW GS 2310 (S/N 0145)	8616
												Min.	88					
												Max.	97					
												Average	92					

Annex C5 24-hour and 1-hour TSP Monitoring Results

24-hour TSP Monitoring Results

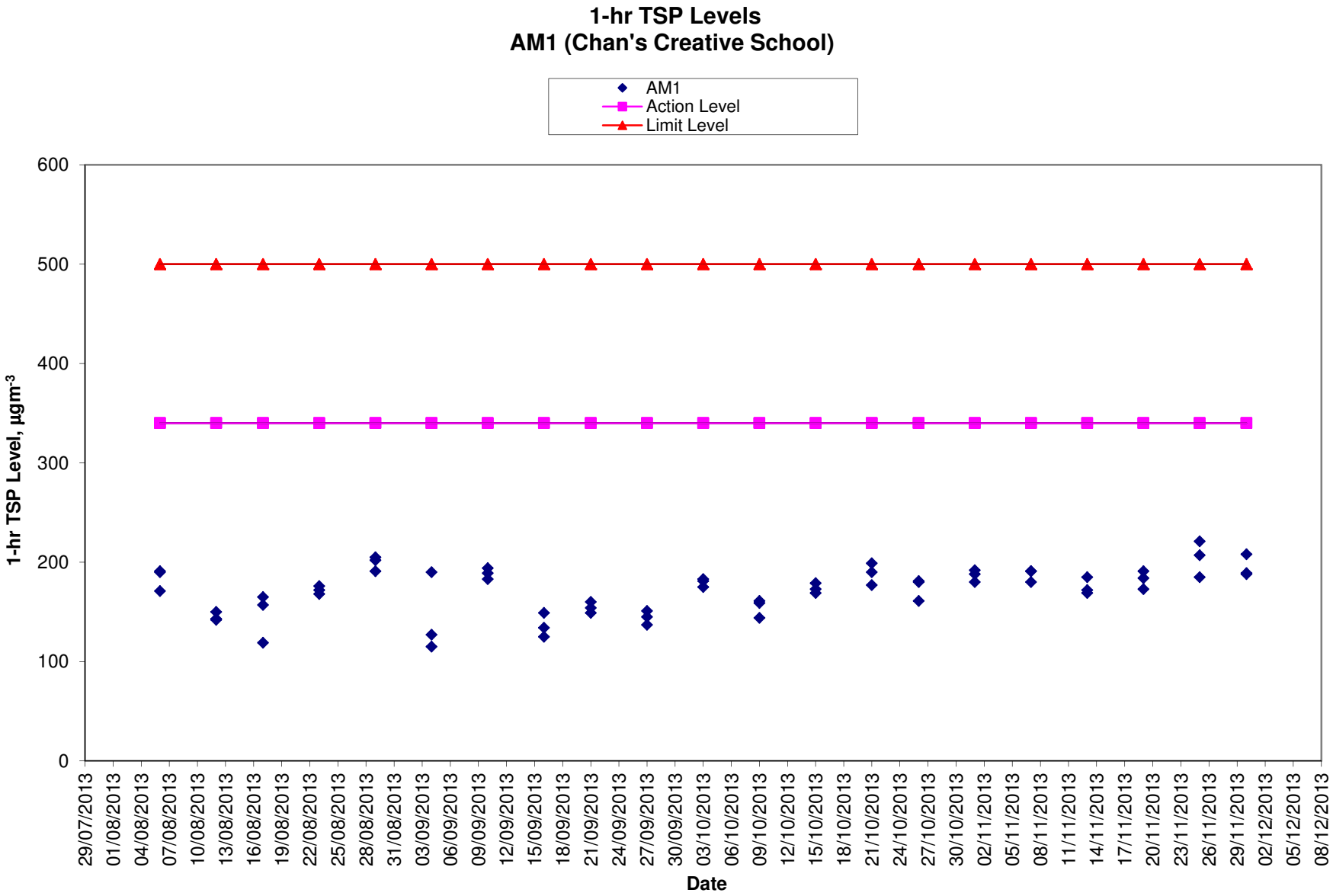
Station AM1

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
01-Nov-13	15:06	02-Nov-13	15:06	Sunny	2.8300	2.9927	16754.03	16778.03	24.00	1.24	1.24	1.24	91	185	260	Construction work in progress	GMW GS 2310 (S/N 1808)	8646
07-Nov-13	14:02	08-Nov-13	14:02	Sunny	2.8099	2.9714	16781.03	16805.03	24.00	1.24	1.24	1.24	90	185	260	Construction work in progress	GMW GS 2310 (S/N 1808)	8630
13-Nov-13	12:41	14-Nov-13	12:41	Cloudy	2.7997	2.9595	16808.03	16832.03	24.00	1.24	1.24	1.24	89	185	260	Construction work in progress	GMW GS 2310 (S/N 1808)	8642
19-Nov-13	12:10	20-Nov-13	12:10	Fine	2.7842	2.9551	16835.03	16859.03	24.00	1.24	1.24	1.24	96	185	260	Construction work in progress	GMW GS 2310 (S/N 1808)	8804
25-Nov-13	14:40	26-Nov-13	14:40	Sunny	2.7811	3.0021	16862.03	16886.03	24.00	1.25	1.25	1.25	123	185	260	Construction work in progress	GMW GS 2310 (S/N 1808)	8817
30-Nov-13	12:06	01-Dec-13	12:06	Sunny	2.7849	2.9507	16889.03	16913.03	24.00	1.25	1.25	1.25	92	185	260	Construction work in progress	GMW GS 2310 (S/N 1808)	8812
												Min.	**89**					
												Max.	**123**					
												Average	**97**					

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
01-Nov-13	15:21	02-Nov-13	15:21	Sunny	2.8249	2.9861	12391.93	12415.93	24.00	1.23	1.23	1.23	91	182	260	Construction work in progress	GMW GS 2310 (S/N 0145)	8645
07-Nov-13	14:16	08-Nov-13	14:16	Sunny	2.8167	2.9811	12418.93	12442.93	24.00	1.23	1.23	1.23	93	182	260	Construction work in progress	GMW GS 2310 (S/N 0145)	8629
13-Nov-13	12:56	14-Nov-13	12:56	Cloudy	2.8257	3.0024	12445.93	12469.93	24.00	1.23	1.23	1.23	100	182	260	Construction work in progress	GMW GS 2310 (S/N 0145)	8641
19-Nov-13	12:30	20-Nov-13	12:30	Fine	2.8305	3.0117	12472.93	12496.93	24.00	1.23	1.23	1.23	102	182	260	Construction work in progress	GMW GS 2310 (S/N 0145)	8640
25-Nov-13	14:56	26-Nov-13	14:56	Sunny	2.7869	2.9911	12499.93	12523.93	24.00	1.27	1.27	1.27	112	182	260	Construction work in progress	GMW GS 2310 (S/N 0145)	8818
30-Nov-13	12:26	01-Dec-13	12:26	Sunny	2.7844	2.9394	12526.93	12550.93	24.00	1.27	1.27	1.27	85	182	260	Construction work in progress	GMW GS 2310 (S/N 1808)	8813
												Min.	***85***					
												Max.	***112***					
												Average	***97***					


1-hr TSP Levels
AM1 (Chan's Creative School)
AM1
Action Level
Limit Level
1-hr TSP Level, µgm-3
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500
400
300
200
100
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01/08/2013
04/08/2013
07/08/2013
10/08/2013
13/08/2013
16/08/2013
19/08/2013
22/08/2013
25/08/2013
28/08/2013
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08/11/2013
11/11/2013
14/11/2013
17/11/2013
20/11/2013
23/11/2013
26/11/2013
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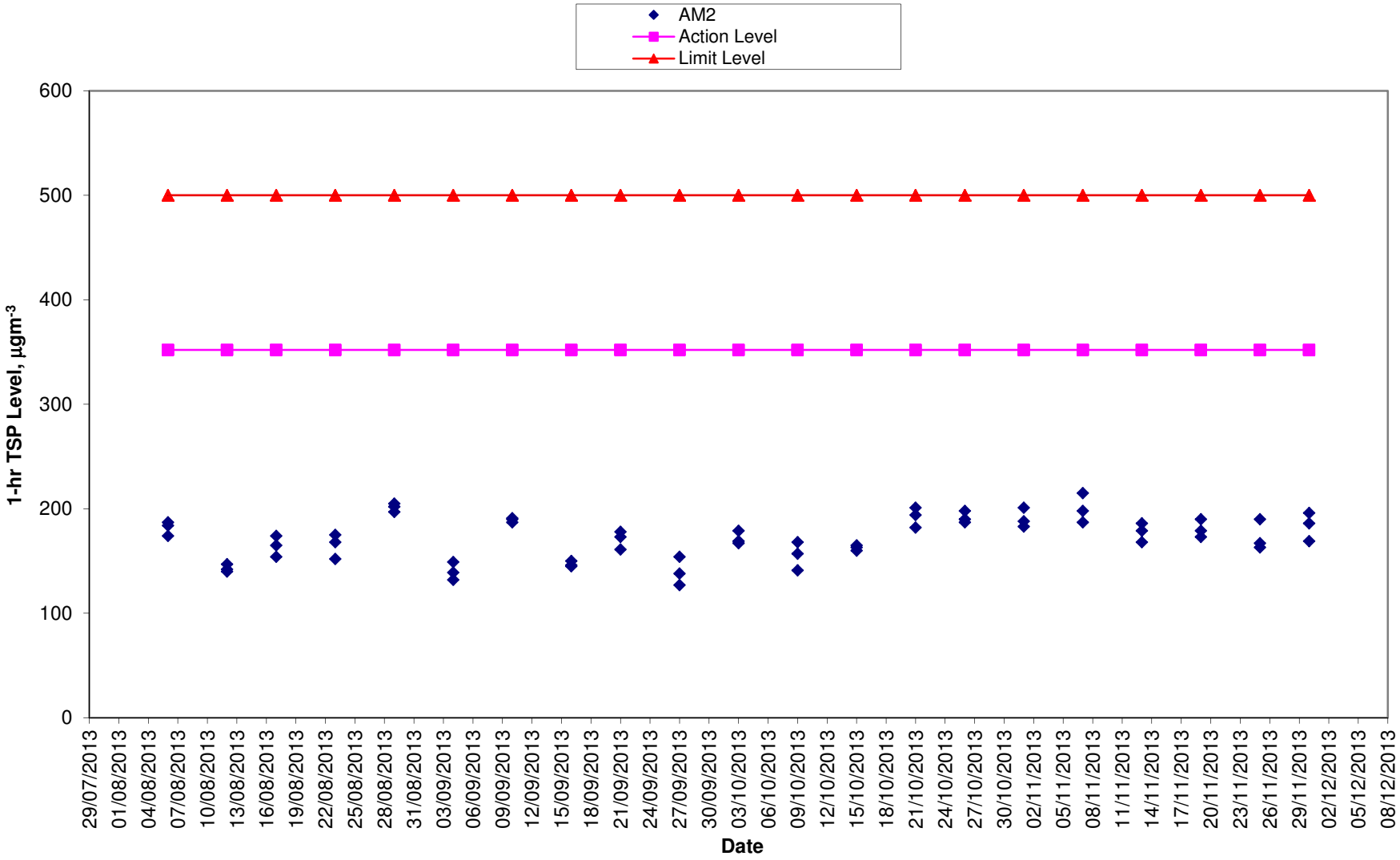
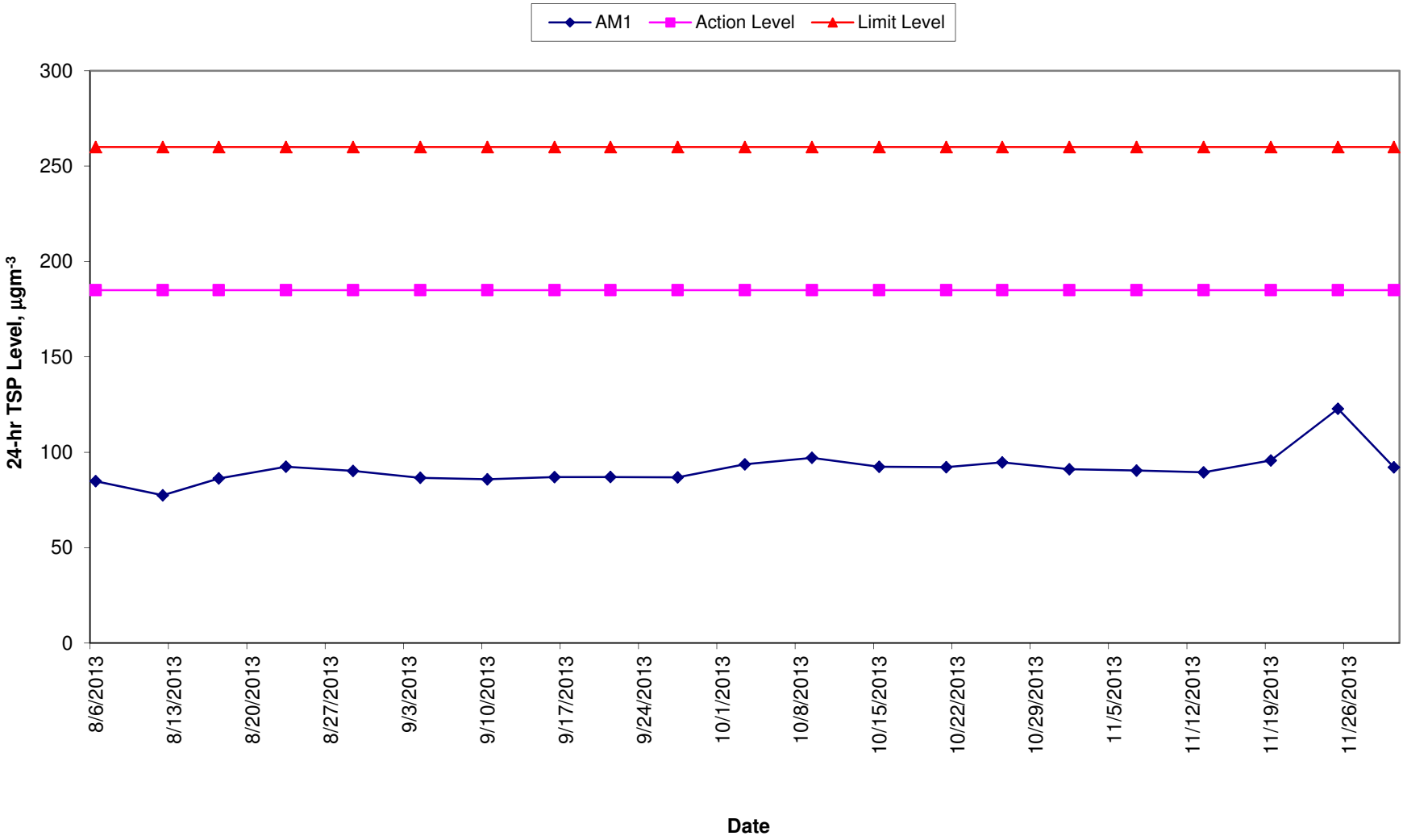
02/12/2013
05/12/2013
08/12/2013
Date

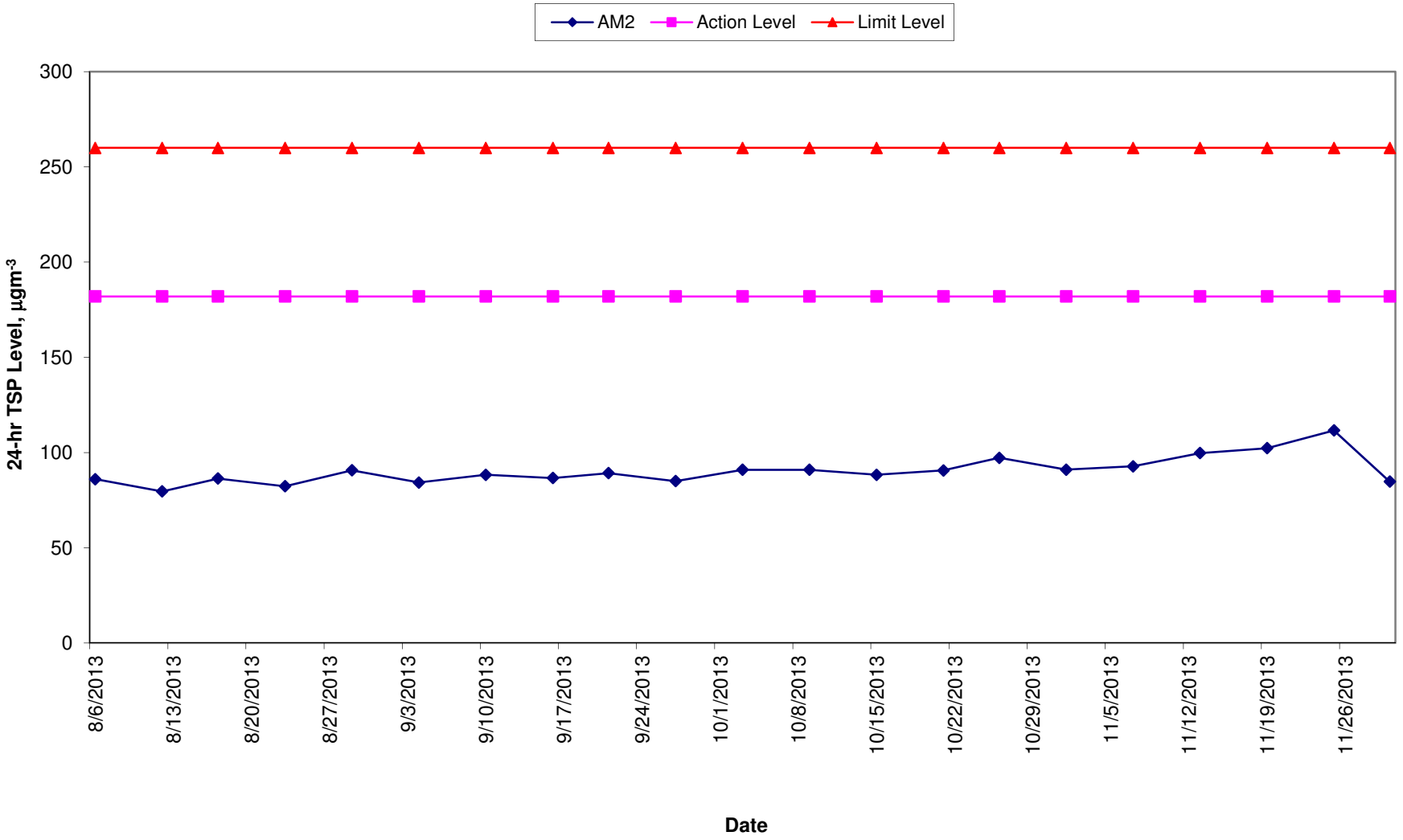
1-hr TSP Levels
AM2 (Hong Kong & Island Regional Office, WSD)



24-hr TSP Levels
AM1 (Chan's Creative School)



24-hr TSP Levels
AM2 (Hong Kong & Island Regional Office, WSD)



Meteorological Data Extracted from the Hong Kong Observatory

		King's Park Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	28	70-94	1.0	0-15	NW
2013-09-03	-	27	82-98	5.0	0-14	SE
2013-09-04	Sunny	25	90-99	88.9	0-21	SE
2013-09-08	-	28	63-88	0.0	2-17	SE
2013-09-10	Sunny	29	66-88	0.0	2-16	SE
2013-09-15	Sunny	28	66-94	15.2	0-20	SE/NW
2013-09-16	Sunny	25	68-95	0.8	1-24	SE
2013-09-17	-	28	61-82	0.0	7-23	SE
2013-09-19	Cloudy	29	62-86	0.0	0-27	SE
2013-09-20	-	30	58-87	0.0	0-12	SE/W
2013-09-21	Fine	31	51-88	0.0	0-21	N
2013-09-22	Cloudy	28	58-93	30.6	3-40	N/NW
2013-09-23	-	28	79-98	56.9	0-37	SW
2013-09-24	Sunny	29	78-94	1.3	7-20	SE
2013-09-26	Sunny	27	66-84	0.1	1-18	E
2013-09-27	Sunny	26	67-87	0.1	1-18	SE/NE
2013-09-29	Sunny	26	74-97	2.9	2-16	NE/E
2013-09-30	Fine	25	84-97	10.0	3-21	E

		Tsing Yi Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%) *	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	27	70-94	1.0	1-18	S/NW
2013-09-03	-	26	82-98	5.0	1-16	S
2013-09-04	Rainy	25	90-99	88.9	1-21	E
2013-09-08	-	29	63-88	0.0	3-19	SE
2013-09-10	Sunny	30	66-88	0.0	1-20	N
2013-09-15	Sunny	28	66-94	15.2	1-14	--
2013-09-16	Sunny	29	68-95	0.8	1-22	--
2013-09-17	-	29	61-82	0.0	4-23	--
2013-09-19	Cloudy	29	62-86	0.0	1-26	--
2013-09-20	-	30	58-87	0.0	1-13	--
2013-09-21	Fine	31	51-88	0.0	1-22	--
2013-09-22	Cloudy	29	58-93	30.6	8-50	--
2013-09-23	-	27	79-98	56.9	8-48	--
2013-09-24	Sunny	29	78-94	1.3	6-22	--
2013-09-26	Sunny	28	66-84	0.1	1-15	--
2013-09-27	Sunny	27	67-87	0.1	1-15	--
2013-09-29	Sunny	26	74-97	2.9	1-10	--
2013-09-30	Fine	26	84-97	10.0	1-14	--

		Kai Tak Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	28	70-94	1.0	0-22	SE/NW
2013-09-03	-	27	82-98	5.0	1-18	SE
2013-09-04	Sunny	25	90-99	88.9	1-25	SE
2013-09-08	-	28	63-88	0.0	1-24	E/SE
2013-09-10	Sunny	29	66-88	0.0	4-22	E/SE
2013-09-15	Sunny	28	66-94	15.2	1-23	SE
2013-09-16	Sunny	25	68-95	0.8	8-31	E
2013-09-17	-	28	61-82	0.0	11-32	E
2013-09-19	Cloudy	29	62-86	0.0	2-31	E
2013-09-20	-	30	58-87	0.0	1-16	SE/SW
2013-09-21	Fine	31	51-88	0.0	3-25	NW
2013-09-22	Cloudy	28	58-93	30.6	3-52	NW
2013-09-23	-	28	79-98	56.9	2-39	S/SE
2013-09-24	Sunny	29	78-94	1.3	12-28	E
2013-09-26	Sunny	27	66-84	0.1	5-22	NE
2013-09-27	Sunny	26	67-87	0.1	3-24	E

		Green Island Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	28	70-94	1.0	1-39	SW
2013-09-03	-	27	82-98	5.0	1-21	S
2013-09-04	Sunny	25	90-99	88.9	5-45	SW/NE
2013-09-08	-	28	63-88	0.0	9-32	NE
2013-09-10	Sunny	29	66-88	0.0	17-38	NE
2013-09-15	Sunny	28	66-94	15.2	1-36	NW/NE
2013-09-16	Sunny	25	68-95	0.8	12-48	NE
2013-09-17	-	28	61-82	0.0	30-57	NE
2013-09-19	Cloudy	29	62-86	0.0	18-57	NE
2013-09-20	-	30	58-87	0.0	1-31	N/S
2013-09-21	Fine	31	51-88	0.0	8-38	N
2013-09-22	Cloudy	28	58-93	30.6	19-77	N
2013-09-23	-	28	79-98	56.9	19-79	S
2013-09-24	Sunny	29	78-94	1.3	10-40	E/NE
2013-09-26	Sunny	27	66-84	0.1	14-43	NE
2013-09-27	Sunny	26	67-87	0.1	14-35	NE

Meteorological Data Extracted from the Hong Kong Observatory

		King's Park Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	0-15	NE
2013-10-03	Sunny	27	51 - 86	0.0	0-12	NE
2013-10-06	Sunny	28	38 - 57	0.0	0-19	N
2013-10-07	Sunny	29	48 - 61	0.0	0-21	N
2013-10-08	Fine	27	58 - 73	0.0	0-16	NE
2013-10-09	Sunny	28	65 - 85	0.0	0-19	SE
2013-10-12	Sunny	28	50 - 79	Trace	0-19	SE
2013-10-13	Sunny	28	57 - 77	0.0	3-26	SE
2013-10-15	Sunny	28	61 - 84	0.0	0-18	SE
2013-10-18	Sunny	26	53 - 75	Trace	2-18	E
2013-10-20	Sunny	26	56 - 82	0.0	0-16	SE
2013-10-21	Sunny	25	63 - 82	0.1	0-11	NE
2013-10-22	Fine	26	50 - 79	0.0	0-16	NE
2013-10-24	Sunny	25	29 - 51	0.0	0-20	NE
2013-10-26	Sunny	23	40 - 66	0.0	0-17	SE/NE
2013-10-27	Sunny	22	54 - 76	0.0	0-17	SE
2013-10-29	Sunny	24	56 - 83	0.0	1-17	SE
2013-10-30	Sunny	25	62 - 83	0.0	0-19	SE

		Tsing Yi Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%) *	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	1-13	--
2013-10-03	Sunny	27	51 - 86	0.0	1-14	--
2013-10-06	Sunny	27	38 - 57	0.0	1-21	--
2013-10-07	Sunny	29	48 - 61	0.0	2-22	--
2013-10-08	Fine	27	58 - 73	0.0	1-19	--
2013-10-09	Sunny	28	65 - 85	0.0	1-16	--
2013-10-12	Sunny	28	50 - 79	Trace	1-23	--
2013-10-13	Sunny	28	57 - 77	0.0	3-20	--
2013-10-15	Sunny	28	61 - 84	0.0	2-21	--
2013-10-18	Sunny	27	53 - 75	Trace	1-15	--
2013-10-20	Sunny	25	56 - 82	0.0	1-12	--
2013-10-21	Sunny	26	63 - 82	0.1	1-14	--
2013-10-22	Fine	26	50 - 79	0.0	1-16	--
2013-10-24	Sunny	24	29 - 51	0.0	1-19	--
2013-10-26	Sunny	23	40 - 66	0.0	1-17	--
2013-10-27	Sunny	22	54 - 76	0.0	1-15	--
2013-10-29	Sunny	25	56 - 83	0.0	1-19	--
2013-10-30	Sunny	25	62 - 83	0.0	1-21	--

		Kai Tak Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	1-16	NE
2013-10-03	Sunny	27	51 - 86	0.0	1-19	SE/N
2013-10-06	Sunny	28	38 - 57	0.0	1-23	NW
2013-10-07	Sunny	29	48 - 61	0.0	2-27	NW
2013-10-08	Fine	27	58 - 73	0.0	1-22	NW/N
2013-10-09	Sunny	28	65 - 85	0.0	1-25	SE
2013-10-12	Sunny	28	50 - 79	Trace	1-27	E
2013-10-13	Sunny	28	57 - 77	0.0	6-29	E
2013-10-15	Sunny	28	61 - 84	0.0	4-23	E
2013-10-18	Sunny	26	53 - 75	Trace	5-24	NE/SE
2013-10-20	Sunny	26	56 - 82	0.0	1-16	SE
2013-10-21	Sunny	25	63 - 82	0.1	1-19	SE/NE
2013-10-22	Fine	26	50 - 79	0.0	1-15	N/NE
2013-10-24	Sunny	25	29 - 51	0.0	1-19	N
2013-10-26	Sunny	23	40 - 66	0.0	2-19	N
2013-10-27	Sunny	22	54 - 76	0.0	2-24	E

		Green Island Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	1-22	NE/SW
2013-10-03	Sunny	27	51 - 86	0.0	2-28	NE/SW
2013-10-06	Sunny	28	38 - 57	0.0	4-39	N
2013-10-07	Sunny	29	48 - 61	0.0	19-42	N
2013-10-08	Fine	27	58 - 73	0.0	12-34	N
2013-10-09	Sunny	28	65 - 85	0.0	5-33	NE/N
2013-10-12	Sunny	28	50 - 79	Trace	4-46	NE/N
2013-10-13	Sunny	28	57 - 77	0.0	10-50	NE
2013-10-15	Sunny	28	61 - 84	0.0	11-37	NE
2013-10-18	Sunny	26	53 - 75	Trace	3-41	NE
2013-10-20	Sunny	26	56 - 82	0.0	3-24	NE/S
2013-10-21	Sunny	25	63 - 82	0.1	1-24	N
2013-10-22	Fine	26	50 - 79	0.0	1-37	N
2013-10-24	Sunny	25	29 - 51	0.0	2-34	NE
2013-10-26	Sunny	23	40 - 66	0.0	7-34	NE
2013-10-27	Sunny	22	54 - 76	0.0	8-34	NE

Meteorological Data Extracted from the Hong Kong Observatory

		King's Park Station				
Date	Weather	Average Air Temperature (℃)	Average Relative Humiditiy (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	0-16	NE/SE
2013-11-03	Sunny	26	65 - 66	0.4	5-25	NE
2013-11-05	Sunny	23	79 - 98	3.6	0-18	E
2013-11-07	Sunny	25	65 - 90	0.0	0-19	SE
2013-11-10	Fine	25	77 - 96	7.6	2-25	SE/E
2013-11-11	Sunny	24	82 - 87	Trace	12-28	SE
2013-11-13	Cloudy	21	84 - 100	3.9	0-12	NE/E
2013-11-15	Sunny	22	62 - 83	0.0	0-15	SE
2013-11-17	Sunny	21	50 - 66	0.0	0-15	NE/SE
2013-11-19	Fine	20	56 - 77	0.0	1-15	NE/E
2013-11-21	Sunny	20	55 - 79	0.5	0-17	SE/E
2013-11-24	Sunny	26	72 - 96	15.2	0-21	NE/SE
2013-11-25	Sunny	20	40 - 80	0.0	0-17	NE/N
2013-11-26	Cloudy	20	59 - 80	0.0	0-17	SE/E
2013-11-27	Sunny	20	68 - 88	0.5	-	SE/NE
2013-11-30	Sunny	16	43 - 66	0.0	0-14	NE/SE

		Tsing Yi Station				
Date	Weather	Average Air Temperature (℃)	Average Relative Humiditiy (%) *	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	1-18	--
2013-11-03	Sunny	26	65 - 66	0.4	0-18	--
2013-11-05	Sunny	23	79 - 98	3.6	1-10	--
2013-11-07	Sunny	25	65 - 90	0.0	1-15	--
2013-11-10	Fine	26	77 - 96	7.6	9-21	--
2013-11-11	Sunny	--	82 - 87	Trace	10-31	--
2013-11-13	Cloudy	22	84 - 100	3.9	1-13	--
2013-11-15	Sunny	22	62 - 83	0.0	1-12	--
2013-11-17	Sunny	22	50 - 66	0.0	1-15	--
2013-11-19	Fine	20	56 - 77	0.0	0-12	--
2013-11-21	Sunny	20	55 - 79	0.5	1-16	--
2013-11-24	Sunny	24	72 - 96	15.2	1-21	--
2013-11-25	Sunny	20	40 - 80	0.0	0-25	--
2013-11-26	Cloudy	20	59 - 80	0.0	0-19	--
2013-11-27	Sunny	20	68 - 88	0.5	3-18	--
2013-11-30	Sunny	17	43 - 66	0.0	1-16	--

		Kai Tak Station				
Date	Weather	Average Air Temperature (℃) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	0-22	E/NE
2013-11-03	Sunny	26	65 - 66	0.4	3-26	NE
2013-11-05	Sunny	23	79 - 98	3.6	1-19	E/NE
2013-11-07	Sunny	25	65 - 90	0.0	5-23	E
2013-11-10	Fine	25	77 - 96	7.6	16 -30	E
2013-11-11	Sunny	24	82 - 87	Trace	20 - 42	E
2013-11-13	Cloudy	21	84 - 100	3.9	3-17	NE/N
2013-11-15	Sunny	22	62 - 83	0.0	1-20	NW/NE
2013-11-17	Sunny	21	50 - 66	0.0	1-19	NW/NE
2013-11-19	Fine	20	56 - 77	0.0	3-22	NE/E
2013-11-21	Sunny	20	55 - 79	0.5	3-21	NE/E
2013-11-24	Sunny	26	72 - 96	15.2	1-22	NW/SE
2013-11-25	Sunny	20	40 - 80	0.0	3-30	NW/NE
2013-11-26	Cloudy	20	59 - 80	0.0	3-21	NE/E
2013-11-27	Sunny	20	68 - 88	0.5	3-24	NW/E

		Green Island Station				
Date	Weather	Average Air Temperature (℃) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	1-36	NE/S
2013-11-03	Sunny	26	65 - 66	0.4	29-52	NE
2013-11-05	Sunny	23	79 - 98	3.6	13-45	NE
2013-11-07	Sunny	25	65 - 90	0.0	15-41	NE
2013-11-10	Fine	25	77 - 96	7.6	29-57	NE
2013-11-11	Sunny	24	82 - 87	Trace	35 - 65	NE
2013-11-13	Cloudy	21	84 - 100	3.9	6 - 45	NE/N
2013-11-15	Sunny	22	62 - 83	0.0	3-28	NE/NW
2013-11-17	Sunny	21	50 - 66	0.0	1-25	NE/N
2013-11-19	Fine	20	56 - 77	0.0	12-36	NE/N
2013-11-21	Sunny	20	55 - 79	0.5	3-40	NE
2013-11-24	Sunny	26	72 - 96	15.2	4-52	NW
2013-11-25	Sunny	20	40 - 80	0.0	2-48	N
2013-11-26	Cloudy	20	59 - 80	0.0	13-47	NE/N
2013-11-27	Sunny	20	68 - 88	0.5	5-42	NE/N

Annex C6 Noise Monitoring Results

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							
04-Sep-13	8:15	8:45	Sunny	68	69	66	Noise from nearby playground	Traffic Noise	-	30	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
10-Sep-13	13:02	13:32	Sunny	70	71	68	Noise from nearby playground	Traffic Noise	-	30	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
16-Sep-13	11:14	11:44	Sunny	68	70	66	Minor noise from nearby site	Traffic Noise	-	29	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
27-Sep-13	10:35	11:05	Sunny	69	71	66	-	Traffic Noise	-	29	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
			Min.	**68**									
			Max.	**70**									

Annex C6 Noise Monitoring Results

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							
03-Oct-13	9:00	9:30	Sunny	69	70	67	-	Traffic noise	-	27	0.8	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
09-Oct-13	11:10	11:40	Sunny	67	69	65	Minor noise from nearby site	Traffic noise	-	26	0.4	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
15-Oct-13	10:19	10:49	Sunny	68	69	66	Noise from nearby site	Traffic noise	-	26	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
21-Oct-13	8:00	8:30	Sunny	69	70	66	Noise from nearby site	Traffic noise	-	27	0.4	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
			Min.	**67**									
			Max.	**69**									

Annex C6 Noise Monitoring Results

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							
01-Nov-13	11:20	11:50	Sunny	68	70	66	-	Traffic noise	-	26	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
07-Nov-13	10:21	10:51	Fine	69	71	67	Noise from nearby site	Traffic noise	-	27	0.3	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
13-Nov-13	9:00	9:30	Cloudy	69	71	68	Noise from nearby playground	Traffic noise	-	22	1.0	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
19-Nov-13	8:30	9:00	Fine	69	71	67	Noise from nearby playground	Traffic noise	-	23	0.8	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
25-Nov-13	10:54	11:24	Sunny	68	70	67	Noise from nearb site	Traffic noise	-	22	1	RION- NL31 (S/N 00410224)	RION- NL31 (S/N 00410224)
			Min.	**68**									
			Max.	**69**									

Annex C6 Noise Monitoring Results

Restricted Hours Noise Monitoring Results [1]

Station NM1

Date	Start Time	End Time	Weather	Noise level (dB(A)), 5 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							
01-Sep-13	16:00	16:05	Fine	67	69	64	No outdoor construction noise	Traffic noise	-	31	0.3	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	16:05	16:10	Fine	67	69	63			-				
	16:10	16:15	Fine	68	69	63			-				
	16:00	16:15	Fine	67	69	63			-				
10-Sep-13	20:20	20:25	Fine	67	69	63	No outdoor construction noise	Traffic noise	-	29	0.3	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	20:25	20:30	Fine	65	67	62			-				
	20:30	20:35	Fine	67	68	63			-				
	20:20	20:35	Fine	66	68	63							
15-Sep-13	11:13	11:18	Sunny	67	68	64	No outdoor construction noise	Traffic noise	-	28	0.4	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	11:18	11:23	Sunny	67	70	64			-				
	11:23	11:28	Sunny	67	69	64			-				
	11:13	11:28	Sunny	67	69	64			-				
24-Sep-13	21:30	21:35	Fine	68	71	64	No outdoor construction noise	Traffic noise	-	29	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	21:35	21:40	Fine	69	72	65			-				
	21:40	21:45	Fine	67	70	64			-				
	21:30	21:45	Fine	68	71	64			-				
29-Sep-13	10:25	10:30	Sunny	67	70	65	No outdoor construction noise	Mainly traffic noise	-	29	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	10:30	10:35	Sunny	68	70	65			-				
	10:35	10:40	Sunny	68	72	65			-				
	10:25	10:40	Sunny	68	71	65			-				
			Min.	**65**									
			Max.	**69**									

[1] No class was held at the school during all the measurement period.

Annex C6 Noise Monitoring Results

Restricted Hours Noise Monitoring Results [1]

Station NM1

Date	Start Time	End Time	Weather	Noise level (dB(A)), 5 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							
08-Oct-13	19:02	19:07	Fine	67	69	66	Noise from nearby playground	Traffic noise	-	30	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	19:07	19:12	Fine	68	69	65			-				
	19:12	19:17	Fine	70	72	64			-				
	19:02	19:17	Fine	68	70	65			-				
13-Oct-13	13:00	13:05	Sunny	66	70	66	-	Traffic noise	-	30	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	13:05	13:10	Sunny	65	70	65			-				
	13:10	13:15	Sunny	66	70	66			-				
	13:00	13:15	Sunny	65	70	65							
22-Oct-13	21:30	21:35	Fine	65	67	62	Noise from nearby playground	Traffic noise	-	27	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	21:35	21:40	Fine	69	70	64			-				
	21:40	21:45	Fine	66	67	63			-				
	21:30	21:45	Fine	67	68	63			-				
27-Oct-13	13:00	13:05	Sunny	66	68	64	Noise from nearby playground	Traffic noise	-	25	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	13:05	13:10	Sunny	67	69	65			-				
	13:10	13:15	Sunny	67	69	64			-				
	13:00	13:15	Sunny	67	69	65			-				
			Min.	**65**									
			Max.	**70**									

[1] No class was held at the school during all the measurement period.

Annex C6 Noise Monitoring Results

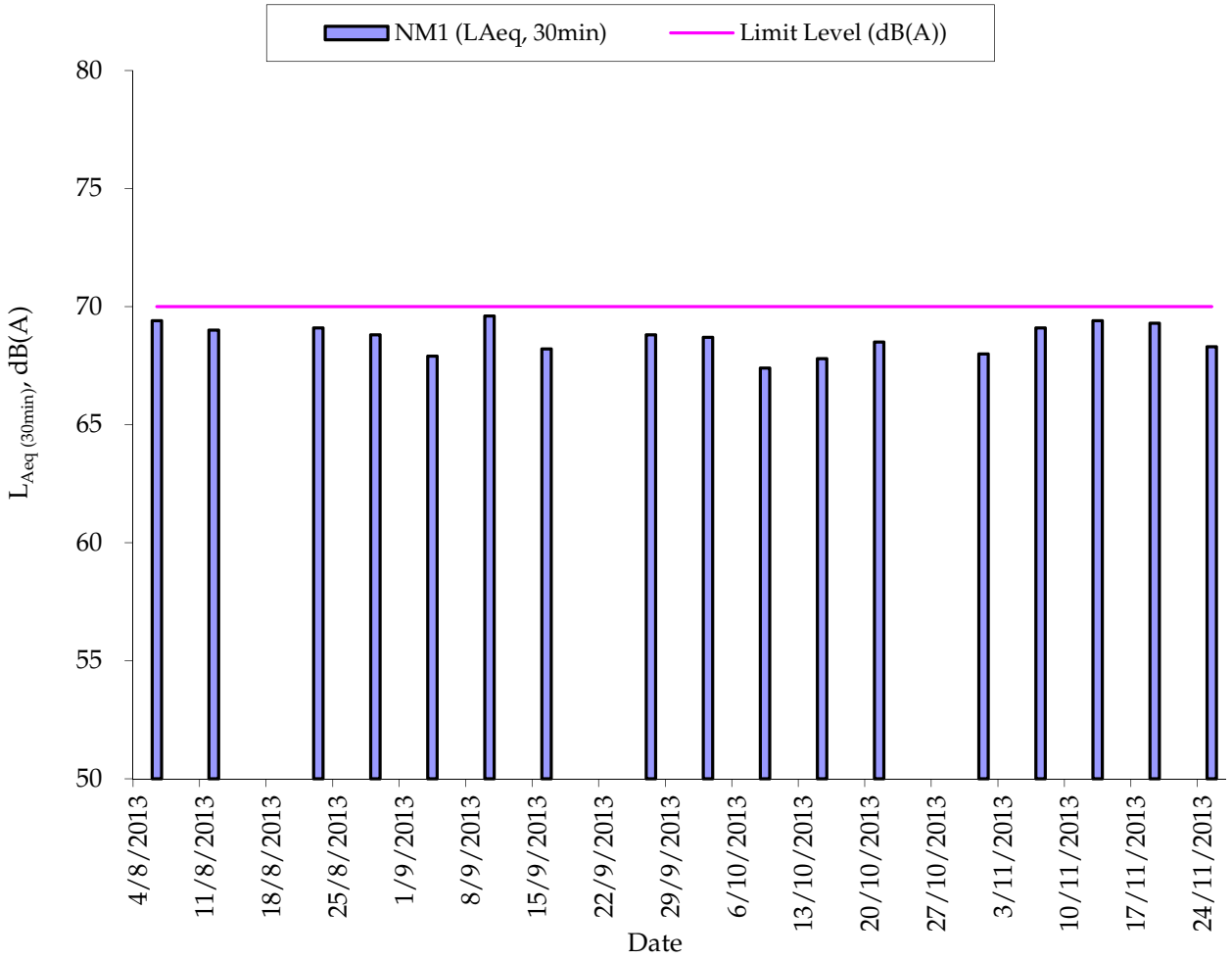
Restricted Hours Noise Monitoring Results [1]

Station NM1

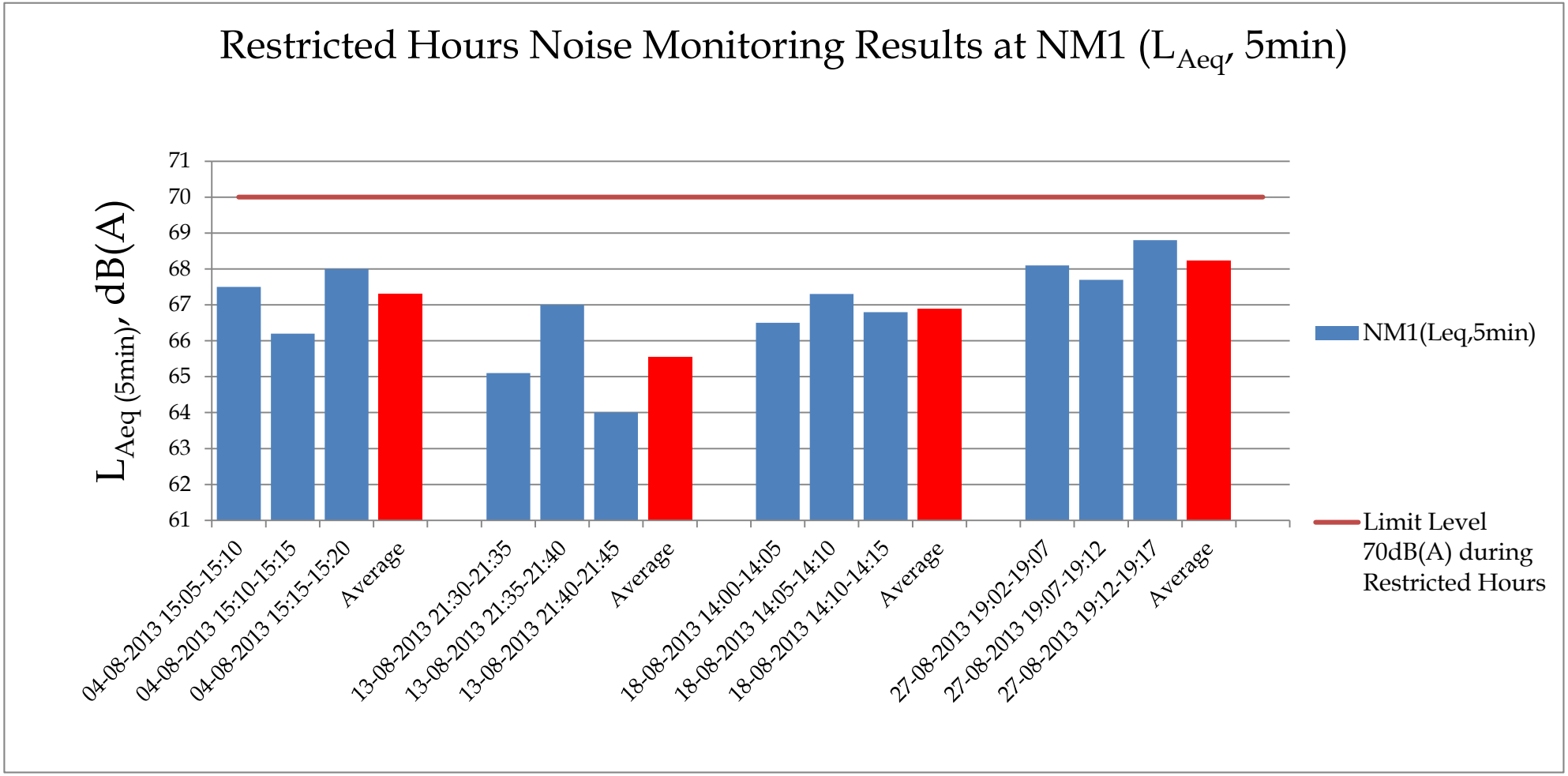
Date	Start Time	End Time	Weather	Noise level (dB(A)), 5 min			Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
05-Nov-13	22:00	22:05	Fine	67	69	63	-	Traffic Noise	-	26	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	22:05	22:10	Fine	65	68	63			-				
	22:10	22:15	Fine	67	70	65			-				
	22:00	22:15	Fine	67	69	64			-				
10-Nov-13	11:30	11:35	Fine	68	71	67	Noise from Nearby Playground	Traffic Noise	-	22	0.3	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	11:35	11:40	Fine	69	72	67			-				
	11:40	11:45	Fine	69	72	68			-				
	11:30	11:45	Fine	69	72	68							
19-Nov-13	21:18	21:23	Fine	67	69	65	Noise from Nearby Playground	Traffic Noise	-	23	0.4	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	21:23	21:28	Fine	68	69	65			-				
	21:28	21:33	Fine	67	69	64			-				
	21:18	21:33	Fine	67	69	65			-				
24-Nov-13	14:00	14:05	Sunny	67	69	63	Noise from Nearby Playground	Traffic Noise	-	24	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	14:05	14:10	Sunny	69	71	65			-				
	14:10	14:15	Sunny	68	70	65			-				
	14:00	14:15	Sunny	68	70	65			-				
			Min.	**65**									
			Max.	**69**									

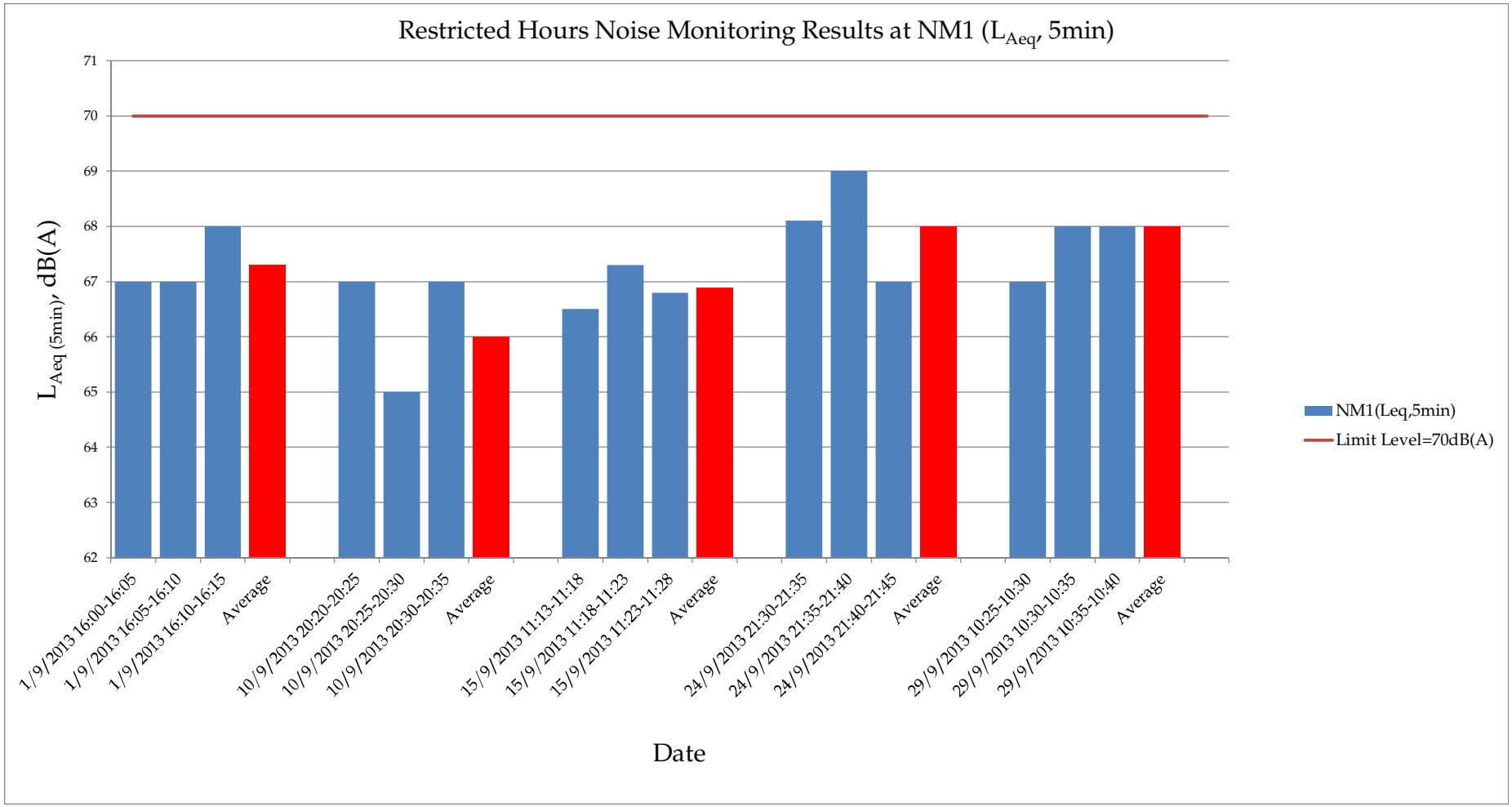
[1] No class was held at the school during all the measurement period.

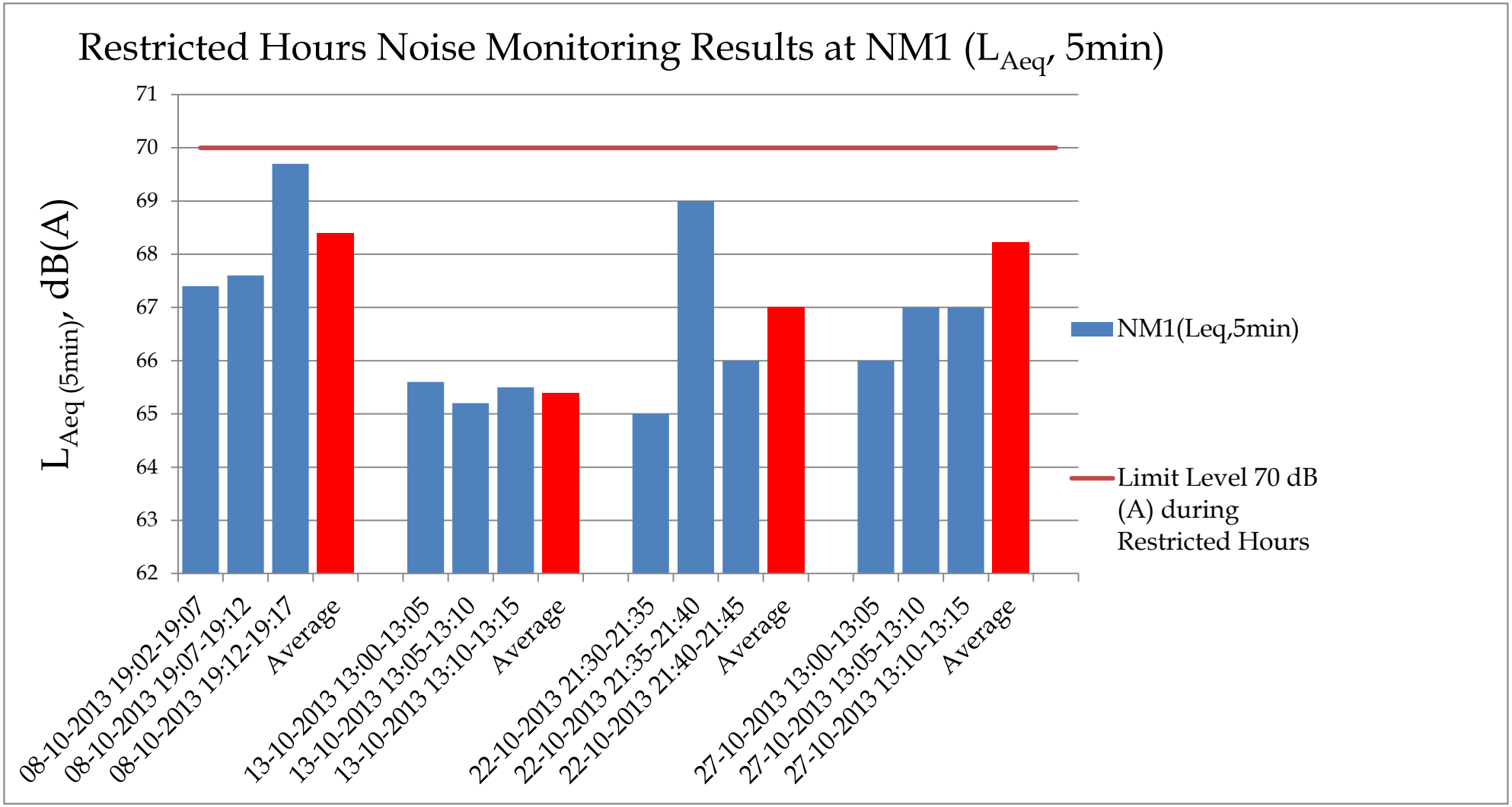
Normal Weekdays Noise Monitoring Results at NM1 ($L_{Aeq, 30min}$)

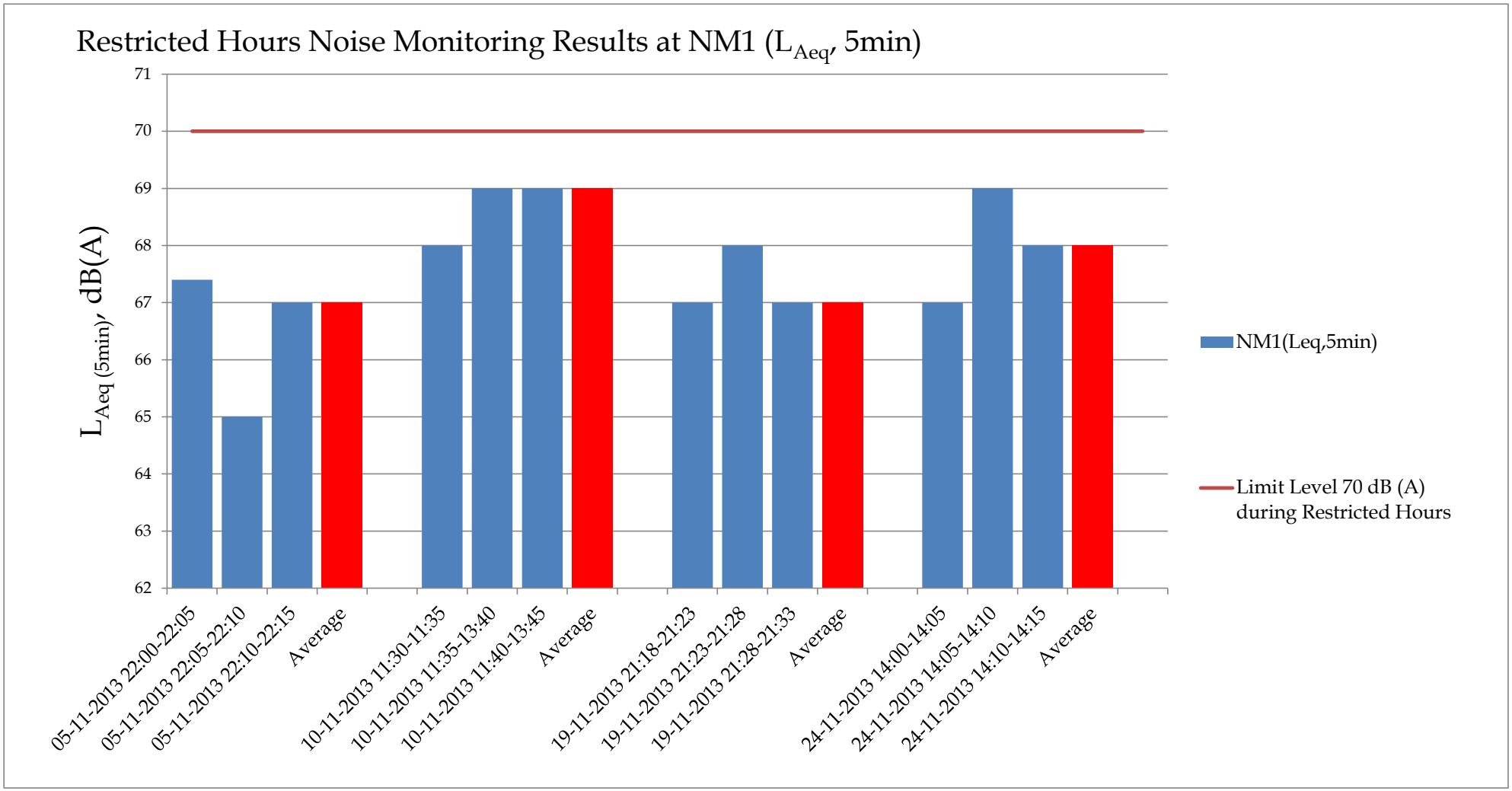


Remark:
- 70 dB(A) was adopted as the Limit Level during school normal teaching period in the reporting period
- 75 dB(A) was adopted as the Limit Level during school holiday in the reporting period


Restricted Hours Noise Monitoring Results at NM1 (L_{Aeq}, 5min)
$L_{Aeq\ (5min)}$, dB(A)
71
70
69
68
67
66
65
64
63
62
61
04-08-2013 15:05-15:10
04-08-2013 15:10-15:15
04-08-2013 15:15-15:20
Average
13-08-2013 21:30-21:35
13-08-2013 21:35-21:40
13-08-2013 21:40-21:45
Average
18-08-2013 14:00-14:05
18-08-2013 14:05-14:10
18-08-2013 14:10-14:15
Average
27-08-2013 19:02-19:07
27-08-2013 19:07-19:12
27-08-2013 19:12-19:17
Average
NM1(Leq,5min)
Limit Level 70dB(A) during Restricted Hours


Restricted Hours Noise Monitoring Results at NM1 (L_{Aeq}, 5min)
$L_{Aeq\ (5min)}$, dB(A)
71
70
69
68
67
66
65
64
63
62
1/9/2013 16:00-16:05
1/9/2013 16:05-16:10
1/9/2013 16:10-16:15
Average
10/9/2013 20:20-20:25
10/9/2013 20:25-20:30
10/9/2013 20:30-20:35
Average
15/9/2013 11:13-11:18
15/9/2013 11:18-11:23
15/9/2013 11:23-11:28
Average
24/9/2013 21:30-21:35
24/9/2013 21:35-21:40
24/9/2013 21:40-21:45
Average
29/9/2013 10:25-10:30
29/9/2013 10:30-10:35
29/9/2013 10:35-10:40
Average
Date
NM1(Leq,5min)
Limit Level=70dB(A)


Restricted Hours Noise Monitoring Results at NM1 (L_{Aeq}, 5min)
$L_{Aeq\ (5min)}$, dB(A)
71
70
69
68
67
66
65
64
63
62
08-10-2013 19:02-19:07
08-10-2013 19:07-19:12
08-10-2013 19:12-19:17
Average
13-10-2013 13:00-13:05
13-10-2013 13:05-13:10
13-10-2013 13:10-13:15
Average
22-10-2013 21:30-21:35
22-10-2013 21:35-21:40
22-10-2013 21:40-21:45
Average
27-10-2013 13:00-13:05
27-10-2013 13:05-13:10
27-10-2013 13:10-13:15
Average
NM1(Leq,5min)
Limit Level 70 dB (A) during Restricted Hours


Restricted Hours Noise Monitoring Results at NM1 (L_{Aeq}, 5min)
$L_{Aeq\ (5min)}$, dB(A)
71
70
69
68
67
66
65
64
63
62
05-11-2013 22:00-22:05
05-11-2013 22:05-22:10
05-11-2013 22:10-22:15
Average
10-11-2013 11:30-11:35
10-11-2013 11:35-13:40
10-11-2013 11:40-13:45
Average
19-11-2013 21:18-21:23
19-11-2013 21:23-21:28
19-11-2013 21:28-21:33
Average
24-11-2013 14:00-14:05
24-11-2013 14:05-14:10
24-11-2013 14:10-14:15
Average
NM1(Leq,5min)
Limit Level 70 dB (A) during Restricted Hours

Annex C7 Cumulative Complaint and Summons/Prosecutions Log

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
December 2009	0	0
January 2010	0	0
February 2010	0	0
March 2010	0	0
April 2010	0	0
May 2010	0	0
June 2010	0	0
July 2010	0	0
August 2010	0	0
September 2010	0	0
October 2010	0	0
November 2010	0	0
December 2010	0	0
January 2011	0	0
February 2011	0	0
March 2011	0	0
April 2011	0	0
May 2011	0	0

Annex C7 Cumulative Complaint and Summons/Prosecutions Log

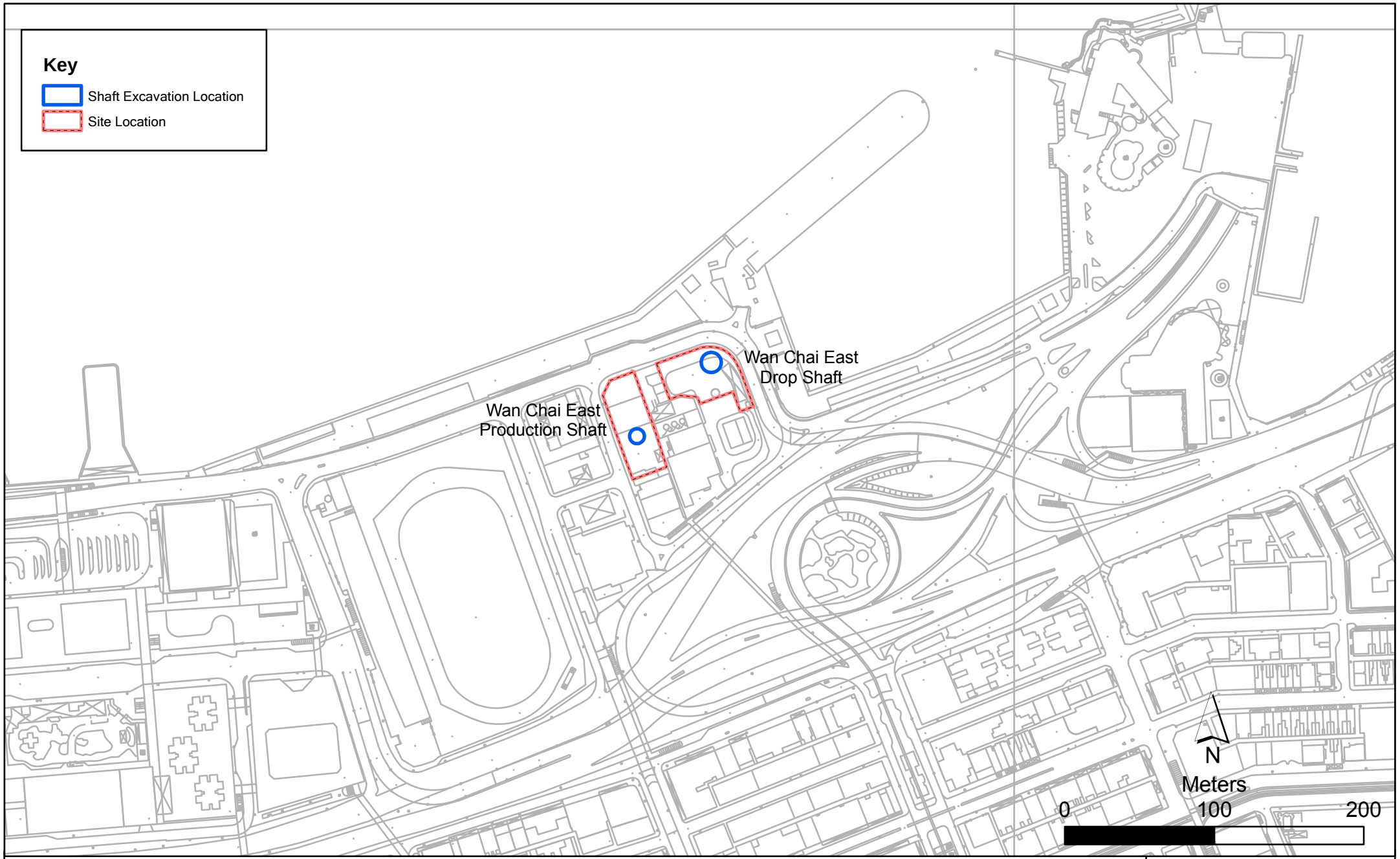
Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
June 2011	0	0
July 2011	0	0
August 2011	0	0
September 2011	0	0
October 2011	0	0
November 2011	0	0
December 2011	0	0
January 2012	0	0
February 2012	0	0
March 2012	0	0
April 2012	0	0
May 2012	0	0
June 2012	0	0
July 2012	0	0
August 2012	0	0
September 2012	0	0
October 2012	0	0
November 2012	0	0

Annex C7 Cumulative Complaint and Summons/Prosecutions Log

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
December 2012	0	0
January 2013	0	0
February 2013	0	0
March 2013	0	0
April 2013	0	0
May 2013	0	0
June 2013	0	0
July 2013	0	0
August 2013	0	0
September 2013	0	0
October 2013	0	0
November 2013	0	0
Overall Total	0	0

Annex D

Wan Chai East Production and Drop Shafts



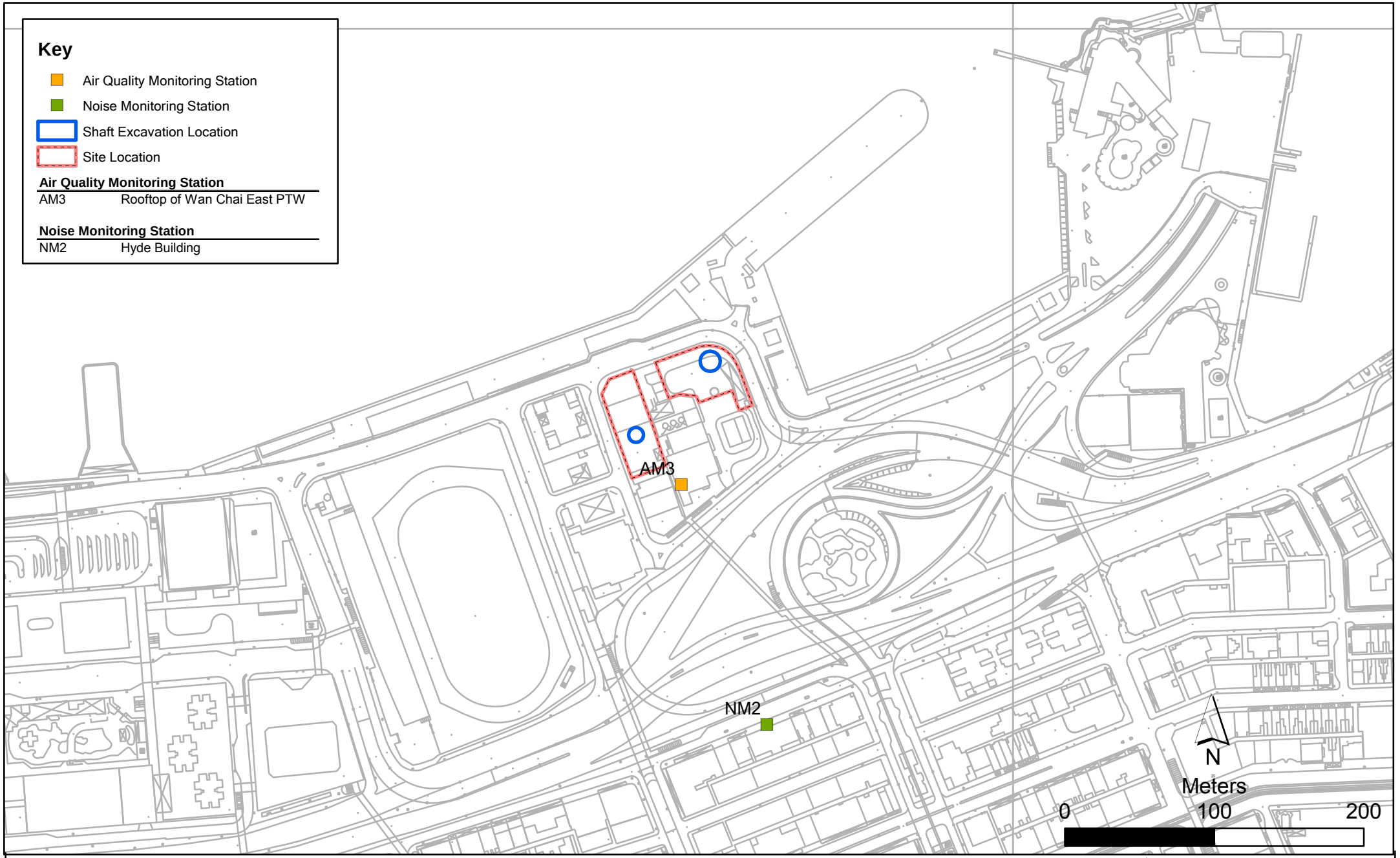
Annex D1

Contract No. DC/2007/23
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Construction Site Locations at Wai Chai East

File: EM&A and proposed station\0104887_Wan Chai.mxd
Date: 29/10/2009

Environmental Resources Management

ERM



Annex D2

Contract No. DC/2007/23
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Impact Air Quality & Noise Monitoring Stations (Wan Chai East)

File: EM&A and proposed station\0104887_Wan Chai_NMAM.mxd
Date: 03/03/2010

Environmental Resources Management

ERM

Annex D3 Not Used

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase			
Air Quality	The Air Pollution Control (Construction Dust) Regulation shall be implemented and good site practices shall be incorporated in the contract clauses to minimise construction dust impact. Control measures relevant to this Project are listed below: • skip hoist for material transport should be totally enclosed by impervious sheeting; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site; • 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 hardcores; • where a site boundary adjoins a road, streets or other 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; • 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; • regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather; • site enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines; • open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible; • tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and • instigation of an environmental monitoring auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	The following watering measures for specific site would be required to control the fugitive dust impacts: • watering twice per day within the worksites at Wan Chai East PTW; • the barging points should be continuous watering throughout the whole unloading process; and • watering 8 times per day within worksites at the SCS works area at Wan Chai East.	All work sites / during construction	√
Operational Phase			
Air Quality	Good housekeeping for SCISTW and PTWs listed below should be followed to ameliorate any odour impact from the plant and these standard practices should be included in the plant operator manual. • Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers to minimise odour escape • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality	Commissioning tests for all deodorisation system should be included in the Design and Construction Contract Document.	All PTW and SCISTW/ during operational phase	NA. Measures not required until commencement of operational phase
Construction Phase			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Good Site Practice: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction program; • mobile plant, if any, should be sited as far from NSRs as possible; • machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities; Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.	All work sites / during construction	√
Construction Phase			
Water Quality	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 work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Effluent Discharge There is a need to apply to EPD for a discharge license for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge license. 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.	All work sites / during construction	√
Water Quality	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) Regulation should be observed and complied with for control of chemical wastes.	All work sites / during construction	<>
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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.	All work sites / during construction	<>

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront To minimise 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 the storm culvert or sea	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Operational Phase			
Water Quality	Dual power supply, standby facilities for the main treatment units and standby equipment parts / accessories should be provided as far as possible at the SCISTW to minimise the chance of emergency discharge.	SCISTW and all the Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Waste	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 minimise the use of timber formwork.	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Recommendations to achieve waste reduction include: • 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; and • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All work sites / during the construction period	√
Waste	Recommendations for good site practices during construction activities include:- • 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 • 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. • Provision of sufficient waste disposal points and regular collection of waste • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	NA

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.	All work sites / during the construction period	√
Waste	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Waste	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, oxidising, 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.	All work sites / during the construction period	<>

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	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.	All work sites / during the construction period	√
Construction Phase			
Landscape & Visual	• Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. • 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. • Erection of decorative screen hoarding compatible with the surrounding setting.	All the works areas, PTWs and SCISTW/ during the construction period	√
Operational Phase	•		
Landscape & Visual	• Aesthetic design of the façade of PTW and associated structures to harmonise with the surrounding settings. • Shrub and Climbing Plants to soften proposed structures / Roof Greening. • Buffer Tree and Shrub Planting to screen proposed associated structures. • Reinstated of disturbed area	All the works areas, PTWs and SCISTW/ during the construction period	NA. Measures not required until commencement of operational phase
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Cultural Heritage	The construction vibration control limit (ppv of 25mm/s) shall be strictly followed.	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.

Remark:
√ Compliance of Mitigation Measures
<> Compliance of Mitigation but need improvement
x Non-compliance of Mitigation Measures
Δ Deficiency of Mitigation Measures but rectified by Gammon Construction Limited
NA Not Applicable

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase			
Air Quality	The Air Pollution Control (Construction Dust) Regulation shall be implemented and good site practices shall be incorporated in the contract clauses to minimise construction dust impact. Control measures relevant to this Project are listed below: • skip hoist for material transport should be totally enclosed by impervious sheeting; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site; • 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 hardcores; • where a site boundary adjoins a road, streets or other 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; • 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; • regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather; • site enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines; • open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible; • tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and • instigation of an environmental monitoring auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All work sites / during construction	<>

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	The following watering measures for specific site would be required to control the fugitive dust impacts: • watering twice per day within the worksites at Wan Chai East PTW; • the barging points should be continuous watering throughout the whole unloading process; and • watering 8 times per day within worksites at the SCS works area at Wan Chai East.	All work sites / during construction	√
Operational Phase			
Air Quality	Good housekeeping for SCISTW and PTWs listed below should be followed to ameliorate any odour impact from the plant and these standard practices should be included in the plant operator manual. • Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers to minimise odour escape • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality	Commissioning tests for all deodorisation system should be included in the Design and Construction Contract Document.	All PTW and SCISTW/ during operational phase	NA. Measures not required until commencement of operational phase
Construction Phase			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Good Site Practice: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction program; • mobile plant, if any, should be sited as far from NSRs as possible; • machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities; Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.	All work sites / during construction	√
Construction Phase			
Water Quality	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 work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Effluent Discharge There is a need to apply to EPD for a discharge license for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge license. 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.	All work sites / during construction	√
Water Quality	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) Regulation should be observed and complied with for control of chemical wastes.	All work sites / during construction	<>
Water Quality	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.	All work sites / during construction	<>

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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.	All work sites / during construction	<>

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront To minimise 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 the storm culvert or sea	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Operational Phase			
Water Quality	Dual power supply, standby facilities for the main treatment units and standby equipment parts / accessories should be provided as far as possible at the SCISTW to minimise the chance of emergency discharge.	SCISTW and all the Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Waste	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 minimise the use of timber formwork.	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Recommendations to achieve waste reduction include: • 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; and • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All work sites / during the construction period	√
Waste	Recommendations for good site practices during construction activities include:- • 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 • 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. • Provision of sufficient waste disposal points and regular collection of waste • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	NA

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.	All work sites / during the construction period	√
Waste	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Waste	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, oxidising, 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.	All work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	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.	All work sites / during the construction period	√
Construction Phase			
Landscape & Visual	• Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. • 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. • Erection of decorative screen hoarding compatible with the surrounding setting.	All the works areas, PTWs and SCISTW/ during the construction period	√
Operational Phase	•		
Landscape & Visual	• Aesthetic design of the façade of PTW and associated structures to harmonise with the surrounding settings. • Shrub and Climbing Plants to soften proposed structures / Roof Greening. • Buffer Tree and Shrub Planting to screen proposed associated structures. • Reinstated of disturbed area	All the works areas, PTWs and SCISTW/ during the construction period	NA. Measures not required until commencement of operational phase
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Cultural Heritage	The construction vibration control limit (ppv of 25mm/s) shall be strictly followed.	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.

Remark:
√ Compliance of Mitigation Measures
<> Compliance of Mitigation but need improvement
x Non-compliance of Mitigation Measures
Δ Deficiency of Mitigation Measures but rectified by Gammon Construction Limited
NA Not Applicable

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase			
Air Quality	The Air Pollution Control (Construction Dust) Regulation shall be implemented and good site practices shall be incorporated in the contract clauses to minimise construction dust impact. Control measures relevant to this Project are listed below: • skip hoist for material transport should be totally enclosed by impervious sheeting; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site; • 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 hardcores; • where a site boundary adjoins a road, streets or other 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; • 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; • regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather; • site enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines; • open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible; • tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and • instigation of an environmental monitoring auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All work sites / during construction	<>

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	The following watering measures for specific site would be required to control the fugitive dust impacts: • watering twice per day within the worksites at Wan Chai East PTW; • the barging points should be continuous watering throughout the whole unloading process; and • watering 8 times per day within worksites at the SCS works area at Wan Chai East.	All work sites / during construction	√
Operational Phase			
Air Quality	Good housekeeping for SCISTW and PTWs listed below should be followed to ameliorate any odour impact from the plant and these standard practices should be included in the plant operator manual. • Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers to minimise odour escape • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality	Commissioning tests for all deodorisation system should be included in the Design and Construction Contract Document.	All PTW and SCISTW/ during operational phase	NA. Measures not required until commencement of operational phase
Construction Phase			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Good Site Practice: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction program; • mobile plant, if any, should be sited as far from NSRs as possible; • machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities; Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.	All work sites / during construction	√
Construction Phase			
Water Quality	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 work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Effluent Discharge There is a need to apply to EPD for a discharge license for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge license. 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.	All work sites / during construction	√
Water Quality	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) Regulation should be observed and complied with for control of chemical wastes.	All work sites / during construction	<>
Water Quality	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.	All work sites / during construction	<>

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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.	All work sites / during construction	<>

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront To minimise 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 the storm culvert or sea	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Operational Phase			
Water Quality	Dual power supply, standby facilities for the main treatment units and standby equipment parts / accessories should be provided as far as possible at the SCISTW to minimise the chance of emergency discharge.	SCISTW and all the Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Waste	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 minimise the use of timber formwork.	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Recommendations to achieve waste reduction include: • 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; and • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All work sites / during the construction period	√
Waste	Recommendations for good site practices during construction activities include:- • 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 • 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. • Provision of sufficient waste disposal points and regular collection of waste • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	NA

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.	All work sites / during the construction period	√
Waste	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Waste	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, oxidising, 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.	All work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	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.	All work sites / during the construction period	√
Construction Phase			
Landscape & Visual	• Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. • 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. • Erection of decorative screen hoarding compatible with the surrounding setting.	All the works areas, PTWs and SCISTW/ during the construction period	√
Operational Phase	•		
Landscape & Visual	• Aesthetic design of the façade of PTW and associated structures to harmonise with the surrounding settings. • Shrub and Climbing Plants to soften proposed structures / Roof Greening. • Buffer Tree and Shrub Planting to screen proposed associated structures. • Reinstated of disturbed area	All the works areas, PTWs and SCISTW/ during the construction period	NA. Measures not required until commencement of operational phase
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Cultural Heritage	The construction vibration control limit (ppv of 25mm/s) shall be strictly followed.	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.

Remark:
√ Compliance of Mitigation Measures
<> Compliance of Mitigation but need improvement
x Non-compliance of Mitigation Measures
Δ Deficiency of Mitigation Measures but rectified by Gammon Construction Limited
NA Not Applicable

Annex D5 24-hour and 1-hour TSP Monitoring Results

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
04-Sep-13	11:00	12:00	Rainy	123	355	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0481)	2105
	12:02	13:02	Rainy	113	355	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0481)	2106
	13:04	14:04	Rainy	123	355	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0481)	2108
10-Sep-13	11:50	12:50	Sunny	129	355	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0481)	2109
	12:52	13:52	Sunny	128	355	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0481)	2121
	13:54	14:54	Sunny	136	355	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0481)	2122
16-Sep-13	8:00	9:00	Sunny	193	355	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0481)	2124
	9:02	10:02	Sunny	154	355	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0481)	2125
	10:04	11:04	Sunny	157	355	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0481)	2126
21-Sep-13	8:00	9:00	Fine	164	355	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0481)	2127
	9:02	10:02	Fine	178	355	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0481)	2128
	10:04	11:04	Fine	194	355	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0481)	2130
27-Sep-13	8:00	9:00	Sunny	149	355	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0481)	2079
	9:02	10:02	Sunny	138	355	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0481)	2151
	10:04	11:04	Sunny	205	355	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 0481)	2152
			Min.	**113**							
			Max.	**205**							
			Average	**152**							

* Wind Speed data is presented in the Meteorological Data table

Annex D5 24-hour and 1-hour TSP Monitoring Results

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
03-Oct-13	8:00	9:00	Sunny	154	355	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0481)	2154
	9:02	10:02	Sunny	142	355	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0481)	2156
	10:04	11:04	Sunny	202	355	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 0481)	2157
09-Oct-13	8:00	9:00	Sunny	135	355	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0481)	2158
	9:02	10:02	Sunny	149	355	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0481)	2159
	10:04	11:04	Cloudy	145	355	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0481)	2171
15-Oct-13	11:40	12:40	Sunny	116	355	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0481)	2172
	12:42	13:42	Sunny	169	355	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0481)	2174
	13:44	14:44	Sunny	131	355	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0481)	2175
21-Oct-13	11:40	12:40	Sunny	163	355	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0481)	2177
	12:42	13:42	Sunny	168	355	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0481)	2178
	13:44	14:44	Sunny	194	355	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 0481)	2179
26-Oct-13	11:40	12:40	Sunny	127	355	500	Construction work in progress	25	<5	GMW GS-2310 (S/N 0481)	2181
	12:42	13:42	Sunny	157	355	500	Construction work in progress	25	<5	GMW GS-2310 (S/N 0481)	2182
	13:44	14:44	Sunny	168	355	500	Construction work in progress	25	<5	GMW GS-2310 (S/N 0481)	2183
			Min.	**116**							
			Max.	**202**							
			Average	**155**							

* Wind Speed data is presented in the Meteorological Data table

Annex D5 24-hour and 1-hour TSP Monitoring Results

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
01-Nov-13	8:00	9:00	Sunny	168	355	500	Construction work in progress	26	<5	GMW GS-2310 (S/N 0481)	2185
	9:02	10:02	Sunny	219	355	500	Construction work in progress	26	<5	GMW GS-2310 (S/N 0481)	2186
	10:04	11:04	Sunny	301	355	500	Construction work in progress	26	<5	GMW GS-2310 (S/N 0481)	2187
07-Nov-13	11:50	12:50	Sunny	158	355	500	Construction work in progress	27	<5	GMW GS-2310 (S/N 0481)	2188
	12:12	13:12	Sunny	214	355	500	Construction work in progress	27	<5	GMW GS-2310 (S/N 0481)	2189
	13:54	14:54	Sunny	234	355	500	Construction work in progress	27	<5	GMW GS-2310 (S/N 0481)	2211
13-Nov-13	8:00	9:00	cloudy	123	355	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 0481)	2215
	9:02	10:02	Cloudy	128	355	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 0481)	2214
	10:04	11:04	Cloudy	134	355	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 0481)	2213
19-Nov-13	11:50	12:50	Fine	146	355	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 0481)	2217
	12:52	13:52	Fine	157	355	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 0481)	2218
	13:54	14:54	Fine	131	355	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 0481)	2219
25-Nov-13	8:00	9:00	Sunny	114	355	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 0481)	2224
	9:02	10:02	Sunny	205	355	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 0481)	2225
	10:04	11:04	Sunny	128	355	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 0481)	2226
30-Nov-13	8:00	9:00	Sunny	84	355	500	Construction work in progress	21	<5	GMW GS 2310 (S/N 1808)	2227
	9:02	10:02	Sunny	142	355	500	Construction work in progress	21	<5	GMW GS 2310 (S/N 1818)	2228
	10:04	11:04	Sunny	156	355	500	Construction work in progress	21	<5	GMW GS 2310 (S/N 1818)	2229
			Min.	**84**							
			Max.	**301**							
			Average	**163**							

* Wind Speed data is presented in the Meteorological Data table

Annex D5 24-hour and 1-hour TSP Monitoring Results

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	Filter
Date	Time	Date	Time		Initial	Final	Initial	Final	(hrs)	Initial	Final	Average	(μg/m^3)	(μg/m^3)	(μg/m^3)		ID	ID
04-Sep-13	14:06	05-Sep-13	14:06	Rainy	2.8980	3.0129	8788.32	8812.72	24.40	1.25	1.25	1.25	63	181	260	Construction work in progress	GMW GS 2310 (S/N 0481)	2107
10-Sep-13	15:00	11-Sep-13	15:00	Sunny	2.8461	2.9956	8815.32	8839.32	24.00	1.25	1.25	1.25	83	181	260	Construction work in progress	GMW GS 2310 (S/N 0481)	2110
16-Sep-13	11:06	17-Sep-13	11:06	Sunny	2.8579	2.9911	8842.32	8866.32	24.00	1.25	1.25	1.25	74	181	260	Construction work in progress	GMW GS 2310 (S/N 0481)	2123
21-Sep-13	11:06	22-Sep-13	11:06	Fine	2.8477	2.9961	8869.32	8893.32	24.00	1.22	1.22	1.22	84	181	260	construction work in progress	GMW GS 2310 (S/N 0481)	2129
27-Sep-13	11:06	28-Sep-13	11:06	Sunny	2.8607	3.0279	8896.32	8920.32	24.00	1.22	1.22	1.22	95	181	260	construction work in progress	GMW GS 2310 (S/N 0481)	2153
												Min.	**63**					
												Max.	**95**					
												Average	**80**					

Annex D5 24-hour and 1-hour TSP Monitoring Results

24-hour TSP Monitoring Results

Station AM3

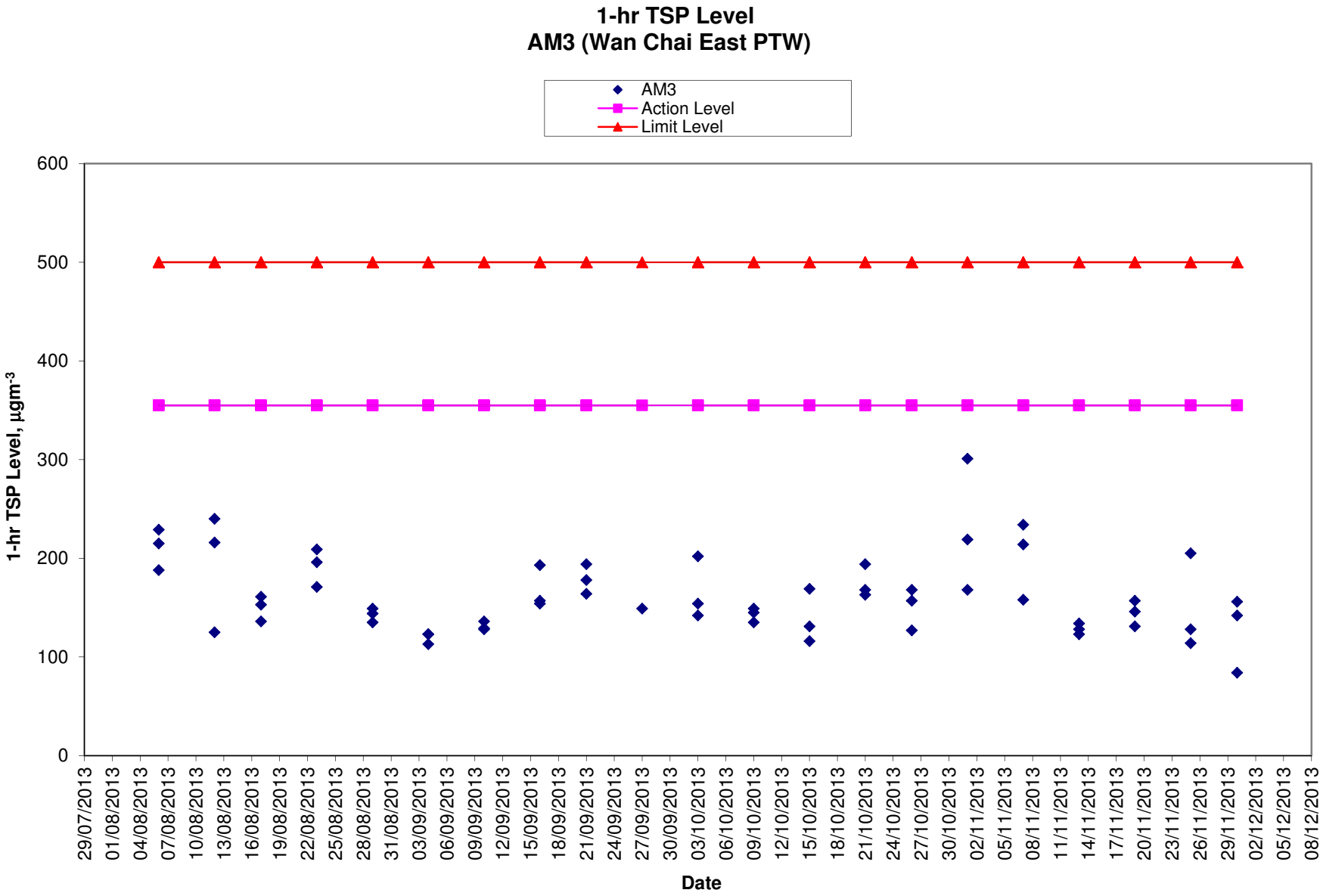
Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time	Flow Rate (m^3/min)			TSP Conc.	Action Level	Limit Level	Observations / Remarks	Sampler	Filter
Date	Time	Date	Time		Initial	Final	Initial	Final	(hrs)	Initial	Final	Average	(μg/m^3)	(μg/m^3)	(μg/m^3)		ID	ID
03-Oct-13	11:06	04-Oct-13	11:06	Sunny	2.8612	3.0211	8923.3200	8947.3200	24.00	1.22	1.22	1.22	91	181	260	Construction work in progress	GMW GS 2310 (S/N 0481)	2155
09-Oct-13	11:06	10-Oct-13	11:06	Sunny	2.8540	2.9984	8950.3200	8974.3200	24.00	1.22	1.22	1.22	82	181	260	Construction work in progress	GMW GS 2310 (S/N 0481)	2160
15-Oct-13	14:10	16-Oct-13	14:10	Sunny	2.8631	3.0077	8977.3200	9001.3200	24.00	1.22	1.22	1.22	82	181	260	Construction work in progress	GMW GS 2310 (S/N 0481)	2173
21-Oct-13	14:50	22-Oct-13	14:50	Sunny	2.8779	3.0441	9004.3200	9028.3200	24.00	1.22	1.22	1.22	95	181	260	Construction work in progress	GMW GS 2310 (S/N 0481)	2176
26-Oct-13	14:46	27-Oct-13	14:46	Sunny	2.8598	3.0117	9031.3200	9055.3200	24.00	1.22	1.22	1.22	86	181	260	construction work in progress	GMW GS 2310 (S/N 0481)	2180
												Min.	**82**					
												Max.	**95**					
												Average	**87**					

Annex D5 24-hour and 1-hour TSP Monitoring Results

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	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
01-Nov-13	11:06	02-Nov-13	11:06	Sunny	2.8635	3.1238	9058.3200	9082.3200	24.00	1.22	1.22	1.22	148	181	260	construction work in progress	GMW GS 2310 (S/N 0481)	2184
07-Nov-13	15:00	08-Nov-13	15:00	Sunny	2.8593	3.0228	9085.3200	9109.3200	24.00	1.22	1.22	1.22	93	181	260	construction work in progress	GMW GS 2310 (S/N 0481)	2190
13-Nov-13	11:06	14-Nov-13	11:06	Cloudy	2.7558	2.9104	9112.3200	9136.3200	24.00	1.22	1.22	1.22	88	181	260	construction work in progress	GMW GS 2310 (S/N 0481)	2212
19-Nov-13	15:00	20-Nov-13	15:00	Fine	2.7866	2.9497	9139.3200	9163.3200	24.00	1.22	1.22	1.22	93	181	260	construction work in progress	GMW GS 2310 (S/N 0481)	2216
25-Nov-13	11:06	26-Nov-13	11:06	Fine	2.7735	2.9112	9166.3200	9190.3200	24.00	1.21	1.21	1.21	79	181	260	construction work in progress	GMW GS 2310 (S/N 0481)	2220
30-Nov-13	11:06	01-Dec-13	11:06	Sunny	2.7630	2.9351	9193.3200	9217.3200	24.00	1.21	1.21	1.21	99	181	260	Construction work in progress	GMW GS 2310 (S/N 1808)	2230
												Min.	**79**					
												Max.	**148**					
												Average	**100**					


1-hr TSP Level
AM3 (Wan Chai East PTW)
AM3
Action Level
Limit Level
1-hr TSP Level, µgm-3
600
500
400
300
200
100
0
29/07/2013
01/08/2013
04/08/2013
07/08/2013
10/08/2013
13/08/2013
16/08/2013
19/08/2013
22/08/2013
25/08/2013
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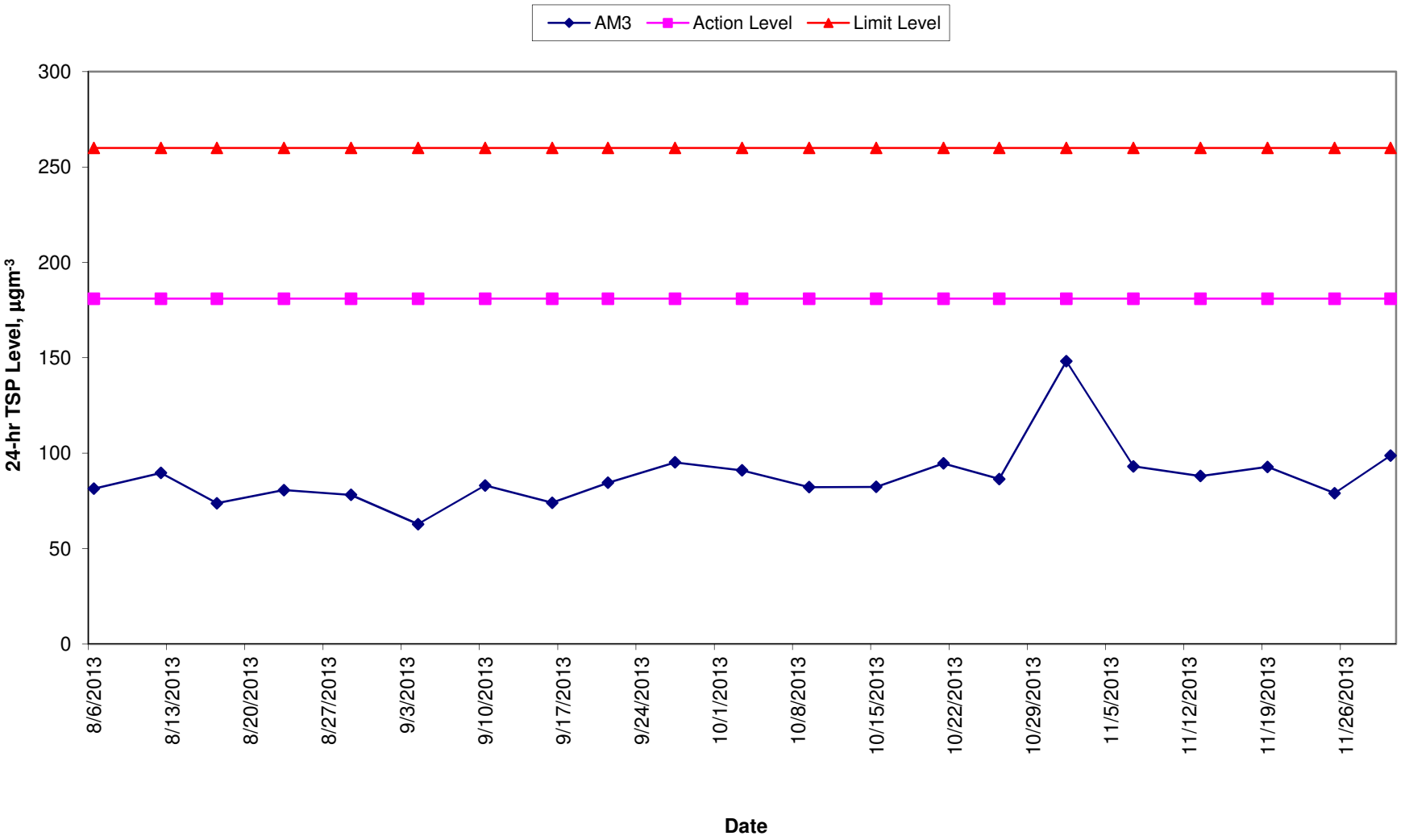
08/11/2013
11/11/2013
14/11/2013
17/11/2013
20/11/2013
23/11/2013
26/11/2013
29/11/2013
02/12/2013
05/12/2013
08/12/2013
Date

24-hr TSP Level
AM3 (Wan Chai East PTW)



Meteorological Data Extracted from the Hong Kong Observatory

		King's Park Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	28	70-94	1.0	0-15	NW
2013-09-03	-	27	82-98	5.0	0-14	SE
2013-09-04	Sunny	25	90-99	88.9	0-21	SE
2013-09-08	-	28	63-88	0.0	2-17	SE
2013-09-10	Sunny	29	66-88	0.0	2-16	SE
2013-09-15	Sunny	28	66-94	15.2	0-20	SE/NW
2013-09-16	Sunny	25	68-95	0.8	1-24	SE
2013-09-17	-	28	61-82	0.0	7-23	SE
2013-09-19	Cloudy	29	62-86	0.0	0-27	SE
2013-09-20	-	30	58-87	0.0	0-12	SE/W
2013-09-21	Fine	31	51-88	0.0	0-21	N
2013-09-22	Cloudy	28	58-93	30.6	3-40	N/NW
2013-09-23	-	28	79-98	56.9	0-37	SW
2013-09-24	Sunny	29	78-94	1.3	7-20	SE
2013-09-26	Sunny	27	66-84	0.1	1-18	E
2013-09-27	Sunny	26	67-87	0.1	1-18	SE/NE
2013-09-29	Sunny	26	74-97	2.9	2-16	NE/E
2013-09-30	Fine	25	84-97	10.0	3-21	E

		Tsing Yi Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%) *	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	27	70-94	1.0	1-18	S/NW
2013-09-03	-	26	82-98	5.0	1-16	S
2013-09-04	Rainy	25	90-99	88.9	1-21	E
2013-09-08	-	29	63-88	0.0	3-19	SE
2013-09-10	Sunny	30	66-88	0.0	1-20	N
2013-09-15	Sunny	28	66-94	15.2	1-14	--
2013-09-16	Sunny	29	68-95	0.8	1-22	--
2013-09-17	-	29	61-82	0.0	4-23	--
2013-09-19	Cloudy	29	62-86	0.0	1-26	--
2013-09-20	-	30	58-87	0.0	1-13	--
2013-09-21	Fine	31	51-88	0.0	1-22	--
2013-09-22	Cloudy	29	58-93	30.6	8-50	--
2013-09-23	-	27	79-98	56.9	8-48	--
2013-09-24	Sunny	29	78-94	1.3	6-22	--
2013-09-26	Sunny	28	66-84	0.1	1-15	--
2013-09-27	Sunny	27	67-87	0.1	1-15	--
2013-09-29	Sunny	26	74-97	2.9	1-10	--
2013-09-30	Fine	26	84-97	10.0	1-14	--

		Kai Tak Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	28	70-94	1.0	0-22	SE/NW
2013-09-03	-	27	82-98	5.0	1-18	SE
2013-09-04	Sunny	25	90-99	88.9	1-25	SE
2013-09-08	-	28	63-88	0.0	1-24	E/SE
2013-09-10	Sunny	29	66-88	0.0	4-22	E/SE
2013-09-15	Sunny	28	66-94	15.2	1-23	SE
2013-09-16	Sunny	25	68-95	0.8	8-31	E
2013-09-17	-	28	61-82	0.0	11-32	E
2013-09-19	Cloudy	29	62-86	0.0	2-31	E
2013-09-20	-	30	58-87	0.0	1-16	SE/SW
2013-09-21	Fine	31	51-88	0.0	3-25	NW
2013-09-22	Cloudy	28	58-93	30.6	3-52	NW
2013-09-23	-	28	79-98	56.9	2-39	S/SE
2013-09-24	Sunny	29	78-94	1.3	12-28	E
2013-09-26	Sunny	27	66-84	0.1	5-22	NE
2013-09-27	Sunny	26	67-87	0.1	3-24	E

		Green Island Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	28	70-94	1.0	1-39	SW
2013-09-03	-	27	82-98	5.0	1-21	S
2013-09-04	Sunny	25	90-99	88.9	5-45	SW/NE
2013-09-08	-	28	63-88	0.0	9-32	NE
2013-09-10	Sunny	29	66-88	0.0	17-38	NE
2013-09-15	Sunny	28	66-94	15.2	1-36	NW/NE
2013-09-16	Sunny	25	68-95	0.8	12-48	NE
2013-09-17	-	28	61-82	0.0	30-57	NE
2013-09-19	Cloudy	29	62-86	0.0	18-57	NE
2013-09-20	-	30	58-87	0.0	1-31	N/S
2013-09-21	Fine	31	51-88	0.0	8-38	N
2013-09-22	Cloudy	28	58-93	30.6	19-77	N
2013-09-23	-	28	79-98	56.9	19-79	S
2013-09-24	Sunny	29	78-94	1.3	10-40	E/NE
2013-09-26	Sunny	27	66-84	0.1	14-43	NE
2013-09-27	Sunny	26	67-87	0.1	14-35	NE

Meteorological Data Extracted from the Hong Kong Observatory

		King's Park Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	0-15	NE
2013-10-03	Sunny	27	51 - 86	0.0	0-12	NE
2013-10-06	Sunny	28	38 - 57	0.0	0-19	N
2013-10-07	Sunny	29	48 - 61	0.0	0-21	N
2013-10-08	Fine	27	58 - 73	0.0	0-16	NE
2013-10-09	Sunny	28	65 - 85	0.0	0-19	SE
2013-10-12	Sunny	28	50 - 79	Trace	0-19	SE
2013-10-13	Sunny	28	57 - 77	0.0	3-26	SE
2013-10-15	Sunny	28	61 - 84	0.0	0-18	SE
2013-10-18	Sunny	26	53 - 75	Trace	2-18	E
2013-10-20	Sunny	26	56 - 82	0.0	0-16	SE
2013-10-21	Sunny	25	63 - 82	0.1	0-11	NE
2013-10-22	Fine	26	50 - 79	0.0	0-16	NE
2013-10-24	Sunny	25	29 - 51	0.0	0-20	NE
2013-10-26	Sunny	23	40 - 66	0.0	0-17	SE/NE
2013-10-27	Sunny	22	54 - 76	0.0	0-17	SE
2013-10-29	Sunny	24	56 - 83	0.0	1-17	SE
2013-10-30	Sunny	25	62 - 83	0.0	0-19	SE

		Tsing Yi Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%) *	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	1-13	--
2013-10-03	Sunny	27	51 - 86	0.0	1-14	--
2013-10-06	Sunny	27	38 - 57	0.0	1-21	--
2013-10-07	Sunny	29	48 - 61	0.0	2-22	--
2013-10-08	Fine	27	58 - 73	0.0	1-19	--
2013-10-09	Sunny	28	65 - 85	0.0	1-16	--
2013-10-12	Sunny	28	50 - 79	Trace	1-23	--
2013-10-13	Sunny	28	57 - 77	0.0	3-20	--
2013-10-15	Sunny	28	61 - 84	0.0	2-21	--
2013-10-18	Sunny	27	53 - 75	Trace	1-15	--
2013-10-20	Sunny	25	56 - 82	0.0	1-12	--
2013-10-21	Sunny	26	63 - 82	0.1	1-14	--
2013-10-22	Fine	26	50 - 79	0.0	1-16	--
2013-10-24	Sunny	24	29 - 51	0.0	1-19	--
2013-10-26	Sunny	23	40 - 66	0.0	1-17	--
2013-10-27	Sunny	22	54 - 76	0.0	1-15	--
2013-10-29	Sunny	25	56 - 83	0.0	1-19	--
2013-10-30	Sunny	25	62 - 83	0.0	1-21	--

		Kai Tak Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	1-16	NE
2013-10-03	Sunny	27	51 - 86	0.0	1-19	SE/N
2013-10-06	Sunny	28	38 - 57	0.0	1-23	NW
2013-10-07	Sunny	29	48 - 61	0.0	2-27	NW
2013-10-08	Fine	27	58 - 73	0.0	1-22	NW/N
2013-10-09	Sunny	28	65 - 85	0.0	1-25	SE
2013-10-12	Sunny	28	50 - 79	Trace	1-27	E
2013-10-13	Sunny	28	57 - 77	0.0	6-29	E
2013-10-15	Sunny	28	61 - 84	0.0	4-23	E
2013-10-18	Sunny	26	53 - 75	Trace	5-24	NE/SE
2013-10-20	Sunny	26	56 - 82	0.0	1-16	SE
2013-10-21	Sunny	25	63 - 82	0.1	1-19	SE/NE
2013-10-22	Fine	26	50 - 79	0.0	1-15	N/NE
2013-10-24	Sunny	25	29 - 51	0.0	1-19	N
2013-10-26	Sunny	23	40 - 66	0.0	2-19	N
2013-10-27	Sunny	22	54 - 76	0.0	2-24	E

		Green Island Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	1-22	NE/SW
2013-10-03	Sunny	27	51 - 86	0.0	2-28	NE/SW
2013-10-06	Sunny	28	38 - 57	0.0	4-39	N
2013-10-07	Sunny	29	48 - 61	0.0	19-42	N
2013-10-08	Fine	27	58 - 73	0.0	12-34	N
2013-10-09	Sunny	28	65 - 85	0.0	5-33	NE/N
2013-10-12	Sunny	28	50 - 79	Trace	4-46	NE/N
2013-10-13	Sunny	28	57 - 77	0.0	10-50	NE
2013-10-15	Sunny	28	61 - 84	0.0	11-37	NE
2013-10-18	Sunny	26	53 - 75	Trace	3-41	NE
2013-10-20	Sunny	26	56 - 82	0.0	3-24	NE/S
2013-10-21	Sunny	25	63 - 82	0.1	1-24	N
2013-10-22	Fine	26	50 - 79	0.0	1-37	N
2013-10-24	Sunny	25	29 - 51	0.0	2-34	NE
2013-10-26	Sunny	23	40 - 66	0.0	7-34	NE
2013-10-27	Sunny	22	54 - 76	0.0	8-34	NE

Meteorological Data Extracted from the Hong Kong Observatory

		King's Park Station				
Date	Weather	Average Air Temperature (℃)	Average Relative Humiditiy (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	0-16	NE/SE
2013-11-03	Sunny	26	65 - 66	0.4	5-25	NE
2013-11-05	Sunny	23	79 - 98	3.6	0-18	E
2013-11-07	Sunny	25	65 - 90	0.0	0-19	SE
2013-11-10	Fine	25	77 - 96	7.6	2-25	SE/E
2013-11-11	Sunny	24	82 - 87	Trace	12-28	SE
2013-11-13	Cloudy	21	84 - 100	3.9	0-12	NE/E
2013-11-15	Sunny	22	62 - 83	0.0	0-15	SE
2013-11-17	Sunny	21	50 - 66	0.0	0-15	NE/SE
2013-11-19	Fine	20	56 - 77	0.0	1-15	NE/E
2013-11-21	Sunny	20	55 - 79	0.5	0-17	SE/E
2013-11-24	Sunny	26	72 - 96	15.2	0-21	NE/SE
2013-11-25	Sunny	20	40 - 80	0.0	0-17	NE/N
2013-11-26	Cloudy	20	59 - 80	0.0	0-17	SE/E
2013-11-27	Sunny	20	68 - 88	0.5	-	SE/NE
2013-11-30	Sunny	16	43 - 66	0.0	0-14	NE/SE

		Tsing Yi Station				
Date	Weather	Average Air Temperature (℃)	Average Relative Humiditiy (%) *	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	1-18	--
2013-11-03	Sunny	26	65 - 66	0.4	0-18	--
2013-11-05	Sunny	23	79 - 98	3.6	1-10	--
2013-11-07	Sunny	25	65 - 90	0.0	1-15	--
2013-11-10	Fine	26	77 - 96	7.6	9-21	--
2013-11-11	Sunny	--	82 - 87	Trace	10-31	--
2013-11-13	Cloudy	22	84 - 100	3.9	1-13	--
2013-11-15	Sunny	22	62 - 83	0.0	1-12	--
2013-11-17	Sunny	22	50 - 66	0.0	1-15	--
2013-11-19	Fine	20	56 - 77	0.0	0-12	--
2013-11-21	Sunny	20	55 - 79	0.5	1-16	--
2013-11-24	Sunny	24	72 - 96	15.2	1-21	--
2013-11-25	Sunny	20	40 - 80	0.0	0-25	--
2013-11-26	Cloudy	20	59 - 80	0.0	0-19	--
2013-11-27	Sunny	20	68 - 88	0.5	3-18	--
2013-11-30	Sunny	17	43 - 66	0.0	1-16	--

		Kai Tak Station				
Date	Weather	Average Air Temperature (℃) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	0-22	E/NE
2013-11-03	Sunny	26	65 - 66	0.4	3-26	NE
2013-11-05	Sunny	23	79 - 98	3.6	1-19	E/NE
2013-11-07	Sunny	25	65 - 90	0.0	5-23	E
2013-11-10	Fine	25	77 - 96	7.6	16 -30	E
2013-11-11	Sunny	24	82 - 87	Trace	20 - 42	E
2013-11-13	Cloudy	21	84 - 100	3.9	3-17	NE/N
2013-11-15	Sunny	22	62 - 83	0.0	1-20	NW/NE
2013-11-17	Sunny	21	50 - 66	0.0	1-19	NW/NE
2013-11-19	Fine	20	56 - 77	0.0	3-22	NE/E
2013-11-21	Sunny	20	55 - 79	0.5	3-21	NE/E
2013-11-24	Sunny	26	72 - 96	15.2	1-22	NW/SE
2013-11-25	Sunny	20	40 - 80	0.0	3-30	NW/NE
2013-11-26	Cloudy	20	59 - 80	0.0	3-21	NE/E
2013-11-27	Sunny	20	68 - 88	0.5	3-24	NW/E

		Green Island Station				
Date	Weather	Average Air Temperature (℃) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	1-36	NE/S
2013-11-03	Sunny	26	65 - 66	0.4	29-52	NE
2013-11-05	Sunny	23	79 - 98	3.6	13-45	NE
2013-11-07	Sunny	25	65 - 90	0.0	15-41	NE
2013-11-10	Fine	25	77 - 96	7.6	29-57	NE
2013-11-11	Sunny	24	82 - 87	Trace	35 - 65	NE
2013-11-13	Cloudy	21	84 - 100	3.9	6 - 45	NE/N
2013-11-15	Sunny	22	62 - 83	0.0	3-28	NE/NW
2013-11-17	Sunny	21	50 - 66	0.0	1-25	NE/N
2013-11-19	Fine	20	56 - 77	0.0	12-36	NE/N
2013-11-21	Sunny	20	55 - 79	0.5	3-40	NE
2013-11-24	Sunny	26	72 - 96	15.2	4-52	NW
2013-11-25	Sunny	20	40 - 80	0.0	2-48	N
2013-11-26	Cloudy	20	59 - 80	0.0	13-47	NE/N
2013-11-27	Sunny	20	68 - 88	0.5	5-42	NE/N

Annex D6 Noise Monitoring Results

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							
04-Sep-13	14:10	14:40	Sunny	74	75	72	Lifting	Traffic Noise	-	30	0.5	RION-NL31 (S/N 00410224)	RION-NC73 (S/N 10997142)
10-Sep-13	14:10	14:40	Sunny	73	75	72	Lifting	Traffic Noise	-	30	0.3	RION-NL31 (S/N 00410224)	RION-NC73 (S/N 10997142)
16-Sep-13	8:15	8:45	Sunny	73	74	71	Lifting	Traffic Noise	-	30	0.5	RION-NL31 (S/N 00410224)	RION-NC73 (S/N 10997142)
27-Sep-13	9:17	9:47	Sunny	73	74	72	Lifting	Traffic Noise	-	29	0.8	RION-NL31 (S/N 00410224)	RION-NC73 (S/N 10997142)
			Min.	**73**									
			Max.	**74**									

Annex D6 Noise Monitoring Results

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							
03-Oct-13	10:20	10:50	Sunny	73	74	72	Lifting	Traffic noise	-	30	0.3	RION-NL31 (S/N 00410224)	RION-NC73 (S/N 10997142)
09-Oct-13	8:15	8:45	Sunny	73	74	72	Lifting	Traffic noise	-	28	0.5	RION-NL31 (S/N 00410224)	RION-NC73 (S/N 10997142)
15-Oct-13	14:00	14:30	Sunny	73	74	72	Lifting	Traffic noise	-	28	0.7	RION-NL31 (S/N 00410224)	RION-NC73 (S/N 10997142)
21-Oct-13	14:00	14:30	Sunny	73	75	72	Lifting	Traffic noise	-	28	0.3	RION-NL31 (S/N 00410224)	RION-NC73 (S/N 10997142)
			Min.	**73**									
			Max.	**73**									

Annex D6 Noise Monitoring Results

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							
01-Nov-13	9:17	9:47	Sunny	74	75	72	Lifting	Traffic noise	-	26	0.5	RION-NL31 (S/N 00410224)	RION-NC73 (S/N 10997142)
07-Nov-13	14:10	14:40	Sunny	73	74	72	Lifting	Traffic noise	-	27	0.5	RION-NL31 (S/N 00410224)	RION-NC73 (S/N 10997142)
13-Nov-13	10:20	10:50	Cloudy	74	75	73	Lifting	Traffic noise and breaker noise	-	23	0.8	RION-NL31 (S/N 00410224)	RION-NC73 (S/N 10997142)
19-Nov-13	14:10	14:40	Fine	73	75	72	Lifting	Traffic Noise	-	22	0.5	RION-NL31 (S/N 00410224)	RION-NC73 (S/N 10997142)
25-Nov-13	9:18	9:48	Sunny	74	75	73	Lifting	Traffic Noise	-	22	0.5	RION-NL31 (S/N 00410224)	RION-NC73 (S/N 10997142)
			Min.	**73**									
			Max.	**74**									

Annex D6 Noise Monitoring Results

Restricted Hours Noise Monitoring Results

Station NM2

Date	Start Time	End Time	Weather	Noise level (dB(A)), 5 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							
01-Sep-13	14:33	14:38	Cloudy	71	72	69	No outdoor construction noise	Traffic noise	-	31	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	14:38	14:43	Cloudy	71	72	70			-				
	14:43	14:48	Cloudy	71	72	69			-				
	14:33	14:48	Cloudy	71	72	70			-				
10-Sep-13	19:13	19:18	Fine	70	71	69	No outdoor construction noise	Traffic noise	-	29	0.3	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	19:18	19:23	Fine	70	72	69			-				
	19:23	19:28	Fine	71	72	69			-				
	19:13	19:28	Fine	70	72	69			-				
15-Sep-13	16:19	16:24	Sunny	70	71	69	No outdoor construction noise	Traffic noise	-	28	0.3	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	16:24	16:29	Sunny	71	72	69			-				
	16:29	16:34	Sunny	70	71	69			-				
	16:19	16:34	Sunny	70	71	69			-				
24-Sep-13	20:36	20:41	Fine	71	72	69	No outdoor construction noise	Mainly traffic noise	-	29	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	20:41	20:46	Fine	71	72	70			-				
	20:46	20:51	Fine	71	72	69			-				
	20:36	20:51	Fine	71	72	69			-				
29-Sep-13	14:26	14:31	Sunny	71	72	70	No outdoor construction noise	Mainly traffic noise	-	27	0.3	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	14:31	14:36	Sunny	71	72	69			-				
	14:36	14:41	Sunny	71	72	70			-				
	14:26	14:41	Sunny	71	72	70			-				
			Min.	**70**									
			Max.	**71**									

Annex D6 Noise Monitoring Results

Restricted Hours Noise Monitoring Results

Station NM2

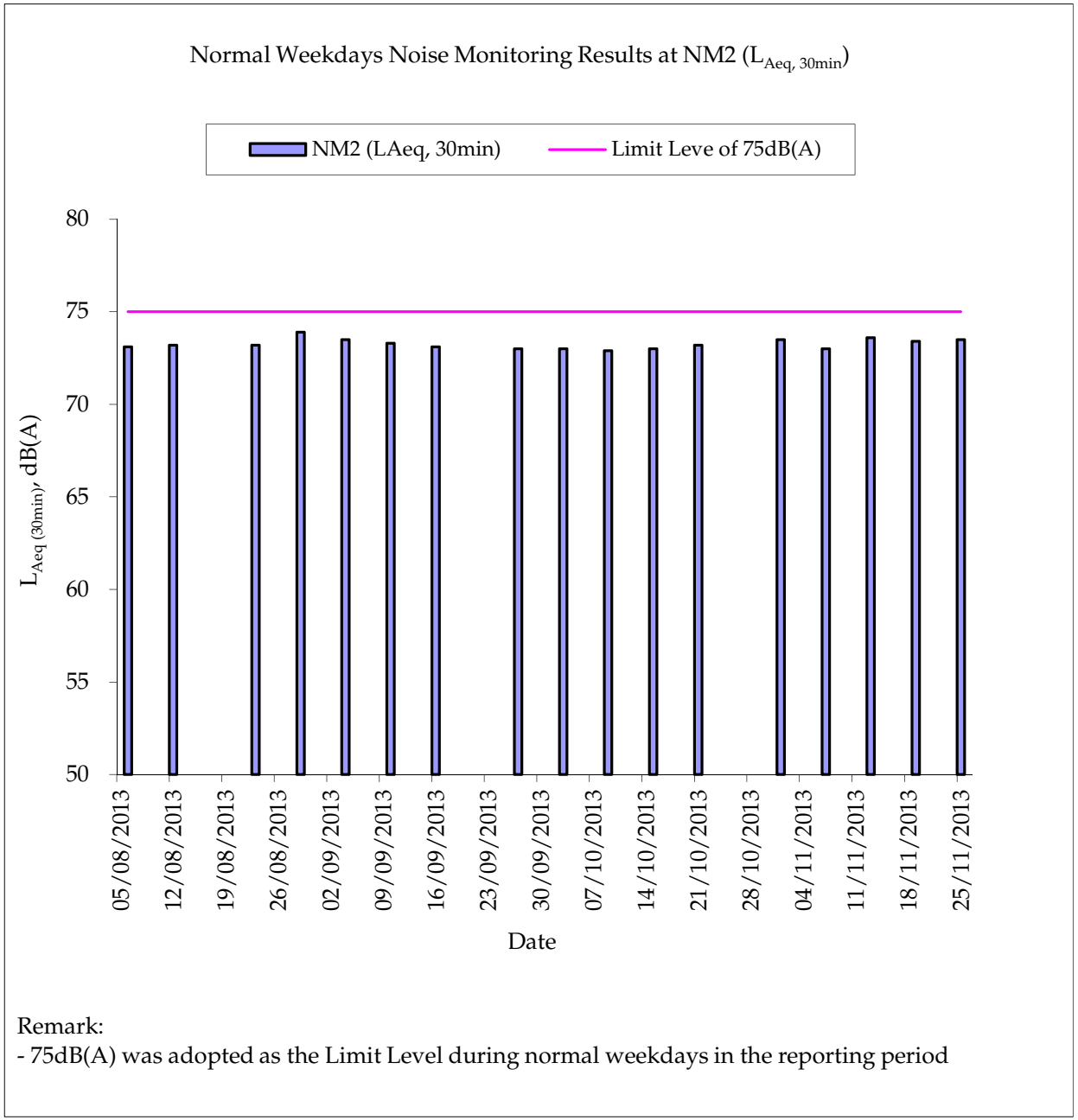
Date	Start Time	End Time	Weather	Noise level (dB(A)), 5 min			Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
08-Oct-13	21:04	21:09	Fine	71	72	70	-	Traffic noise	-	27	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	21:09	21:14	Fine	71	72	70			-				
	21:14	21:19	Fine	71	72	70			-				
	21:04	21:19	Fine	71	72	70			-				
13-Oct-13	15:00	15:05	Sunny	71	72	70	-	Traffic noise	-	27	0.3	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	15:05	15:10	Sunny	71	72	69			-				
	15:10	15:15	Sunny	71	72	69			-				
	15:00	15:15	Sunny	71	72	70			-				
22-Oct-13	19:13	19:18	Fine	70	71	69	-	Traffic noise	-	27	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	19:18	19:23	Fine	70	71	69			-				
	19:23	19:28	Fine	70	72	69			-				
	19:13	19:28	Fine	70	71	69			-				
27-Oct-13	14:28	14:33	Sunny	71	73	70	-	Traffic noise	-	25	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	14:33	14:38	Sunny	72	73	70			-				
	14:38	14:43	Sunny	71	72	70			-				
	14:28	14:43	Sunny	71	73	70			-				
			Min.	**70**									
			Max.	**72**									

Annex D6 Noise Monitoring Results

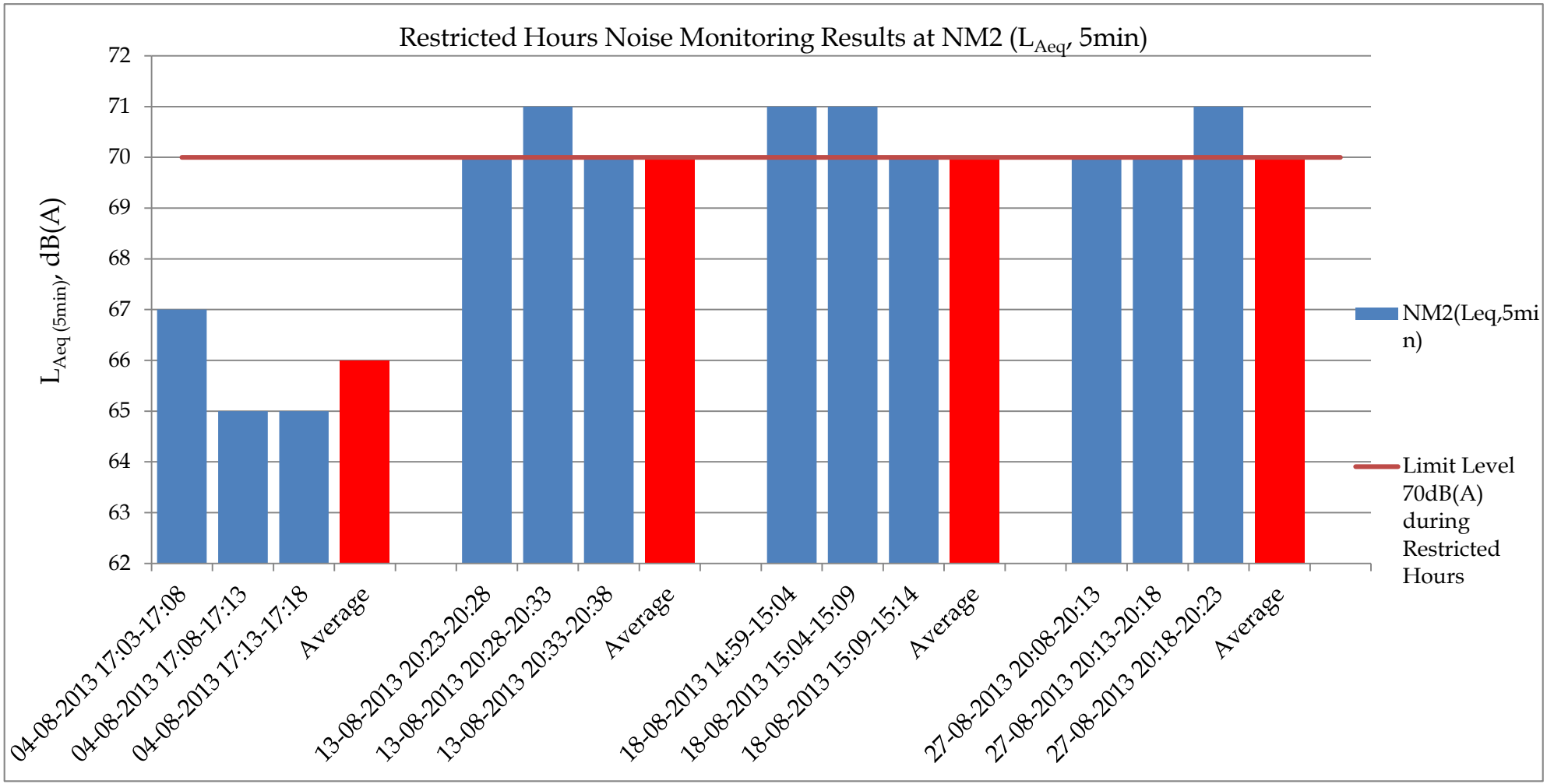
Restricted Hours Noise Monitoring Results

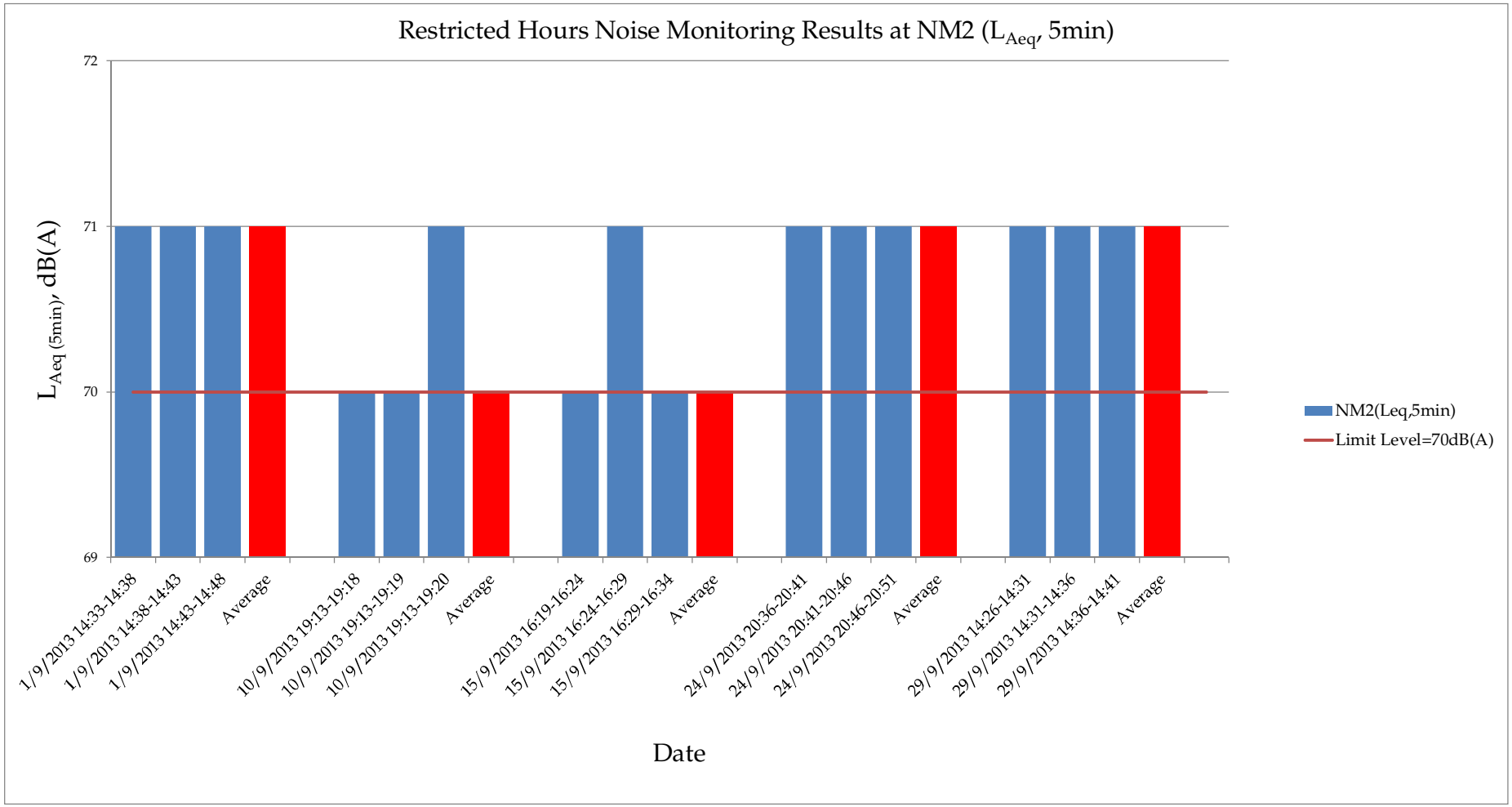
Station NM2

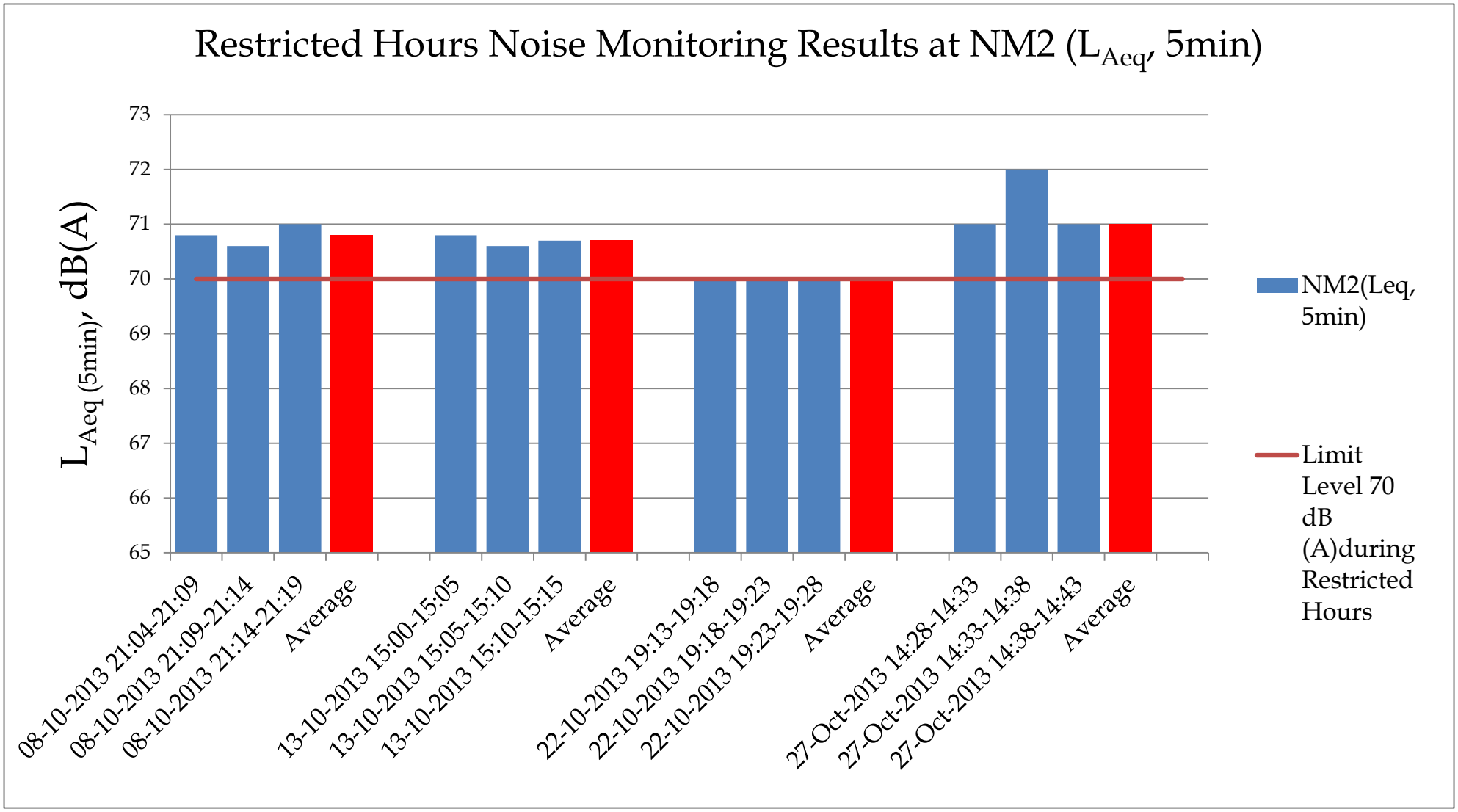
Date	Start Time	End Time	Weather	Noise level (dB(A)), 5 min			Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
05-Nov-13	20:15	20:20	Fine	71	72	70	-	Traffic noise	-	26	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	20:20	20:25	Fine	71	72	70			-				
	20:25	20:30	Fine	72	73	71			-				
	20:15	20:30	Fine	71	72	70			-				
10-Nov-13	13:42	13:47	Fine	71	72	70	-	Traffic noise	-	22	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	13:47	13:52	Fine	71	72	70			-				
	13:52	13:57	Fine	71	72	70			-				
	13:42	13:57	Fine	71	72	70			-				
19-Nov-13	20:10	20:15	Fine	72	73	70	-	Traffic noise	-	22	0.8	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	20:15	20:20	Fine	71	72	70			-				
	20:20	20:25	Fine	71	73	70			-				
	20:10	20:25	Fine	72	73	70			-				
24-Nov-13	15:23	15:28	Sunny	71	72	70	-	Traffic noise	-	24	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	15:28	15:33	Sunny	72	73	70			-				
	15:33	15:38	Sunny	72	73	70			-				
	15:23	15:38	Sunny	71	72	70			-				
			Min.	**71**									
			Max.	**72**									

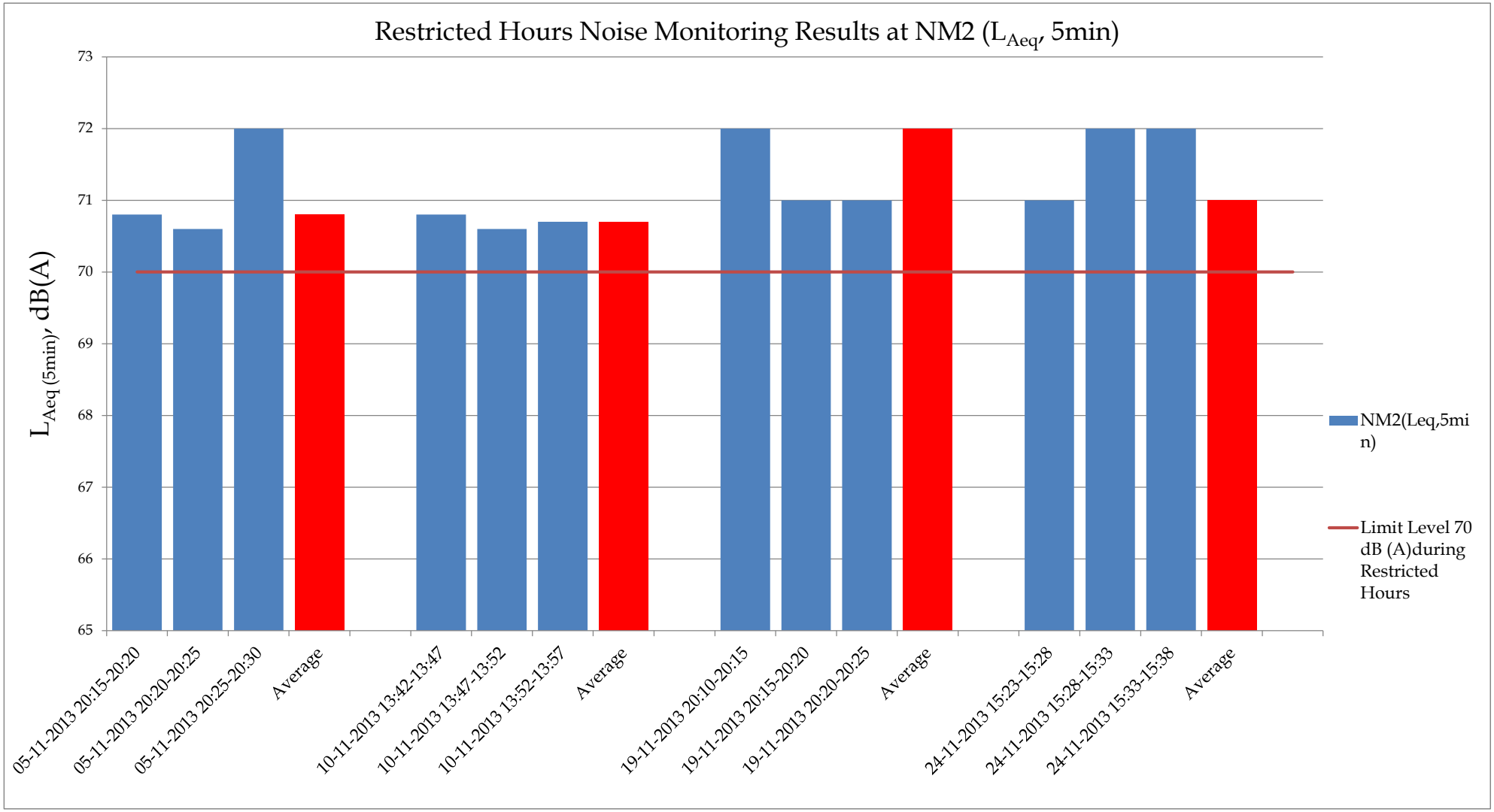


Remark:
- 75dB(A) was adopted as the Limit Level during normal weekdays in the reporting period


Restricted Hours Noise Monitoring Results at NM2 (L_{Aeq}, 5min)
$L_{Aeq\ (5min)}$, dB(A)
72
71
70
69
68
67
66
65
64
63
62
04-08-2013 17:03-17:08
04-08-2013 17:08-17:13
04-08-2013 17:13-17:18
Average
13-08-2013 20:23-20:28
13-08-2013 20:28-20:33
13-08-2013 20:33-20:38
Average
18-08-2013 14:59-15:04
18-08-2013 15:04-15:09
18-08-2013 15:09-15:14
Average
27-08-2013 20:08-20:13
27-08-2013 20:13-20:18
27-08-2013 20:18-20:23
Average
NM2(Leq,5min)
Limit Level 70dB(A) during Restricted Hours


Restricted Hours Noise Monitoring Results at NM2 (L_{Aeq}, 5min)
72
71
70
69
$L_{Aeq\ (5min)}$, dB(A)
1/9/2013 14:33-14:38
1/9/2013 14:38-14:43
1/9/2013 14:43-14:48
Average
10/9/2013 19:13-19:18
10/9/2013 19:13-19:19
10/9/2013 19:13-19:20
Average
15/9/2013 16:19-16:24
15/9/2013 16:24-16:29
15/9/2013 16:29-16:34
Average
24/9/2013 20:36-20:41
24/9/2013 20:41-20:46
24/9/2013 20:46-20:51
Average
29/9/2013 14:26-14:31
29/9/2013 14:31-14:36
29/9/2013 14:36-14:41
Average
Date
NM2(Leq,5min)
Limit Level=70dB(A)


Restricted Hours Noise Monitoring Results at NM2 (L_{Aeq}, 5min)
$L_{Aeq\ (5min)}$, dB(A)
73
72
71
70
69
68
67
66
65
08-10-2013 21:04-21:09
08-10-2013 21:09-21:14
08-10-2013 21:14-21:19
Average
13-10-2013 15:00-15:05
13-10-2013 15:05-15:10
13-10-2013 15:10-15:15
Average
22-10-2013 19:13-19:18
22-10-2013 19:18-19:23
22-10-2013 19:23-19:28
Average
27-Oct-2013 14:28-14:33
27-Oct-2013 14:33-14:38
27-Oct-2013 14:38-14:43
Average
NM2(Leq, 5min)
Limit Level 70 dB (A)during Restricted Hours


Restricted Hours Noise Monitoring Results at NM2 (L_{Aeq}, 5min)
$L_{Aeq\ (5min)}$, dB(A)
73
72
71
70
69
68
67
66
65
05-11-2013 20:15-20:20
05-11-2013 20:20-20:25
05-11-2013 20:25-20:30
Average
10-11-2013 13:42-13:47
10-11-2013 13:47-13:52
10-11-2013 13:52-13:57
Average
19-11-2013 20:10-20:15
19-11-2013 20:15-20:20
19-11-2013 20:20-20:25
Average
24-11-2013 15:23-15:28
24-11-2013 15:28-15:33
24-11-2013 15:33-15:38
Average
NM2(Leq,5min)
Limit Level 70 dB (A)during Restricted Hours

Annex D7

Summary of Exceedance Investigation

Harbour Area Treatment Scheme (HATS) Stage 2A
Contract No. DC/2007/23
Construction of Sewage Conveyance from North Point to Stonecutters Island

NOTIFICATION OF EXCEEDANCE and INVESTIGATION REPORT

Log No.	**2007/23/Noise/197**
Date	1 September 2013 (Sunday) (14:33 – 14:38); (14: 38 – 14:43); (14:43 – 14:48)
Monitoring Station	NM2 (Rooftop of Hyde Building in Wanchai)
Worksite	Wan Chai East Production and Drop Shafts
Parameter	$L_{Aeq\ (5min)}$
Action Level	Not applicable for construction works during restricted hours
Limit Level	70 dB (A)
Maximum Measured Levels	70.6 dB (A) – (14:33 – 14:38) - exceeded limit level; 70.7 dB (A) – (14:38 – 14:43) - exceeded limit level; and 70.5 dB (A) – (14:43 – 14:48) - exceeded limit level.
Possible Reason for Action or Limit Level Non-compliance	According to the works summary provided by the Contractor, no works had been performed outside the noise enclosure. Other activities that took place during the noise monitoring session included cleaning and housekeeping; clearing bags of broken cement; moving to the shaft bottom and lifting to the surface; cleaning of grout plant; drilling of primary grout holes; operation of tally control room, alimak operation, electrical systems, kibble winder, gantry crane, and lift; and equipment repairing, cleaning and maintenance. These activities were carried out inside the noise enclosure. It was observed no outdoor construction activities at the Wan Chai East Production and Drop Shafts during the noise monitoring session. This is consistent with the works summary provided by the Contractor showing no outdoor construction activities that have taken place during the same period. Other potential noise source was also identified in the vicinity (i.e., traffic) to contribute to the measured noise level. In view of no outdoor construction works was carried out and contribution from other potential noise source in vicinity (ie, traffic), it is considered that the exceedance was not due to the Contract 23 construction works.
Actions Taken / To Be Taken	Since the exceedance was not attributable to the Contract 23 construction works, no action is therefore required. However, a number of residential buildings and other noise sensitive receivers are located near the Site, the Contractor is reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels or causing noise nuisance. The Contractor is also reminded to ensure that the construction plant deployed for the works during restricted hours is in strict compliance with the relevant Construction Noise Permit (CNP) granted.
Remarks	-

Harbour Area Treatment Scheme (HATS) Stage 2A
Contract No. DC/2007/23
Construction of Sewage Conveyance from North Point to Stonecutters Island

NOTIFICATION OF EXCEEDANCE and INVESTIGATION REPORT

Log No.	**2007/23/Noise/198**
Date	10 September 2013 (Tuesday) (19:43 – 19:48)
Monitoring Station	NM2 (Rooftop of Hyde Building in Wanchai)
Worksite	Wan Chai East Production and Drop Shafts
Parameter	$L_{Aeq\ (5min)}$
Action Level	Not applicable for construction works during restricted hours
Limit Level	70 dB (A)
Maximum Measured Levels	70.7 dB (A) - exceeded limit level
Possible Reason for Action or Limit Level Non-compliance	According to the works summary provided by the Contractor, no works had been performed outside the noise enclosure. Other activities that took place during the noise monitoring session included cleaning and housekeeping; drilling of primary grout holes; setting of packers; measuring of water inflows; drilling of blast holes manually; operation of tally control room, alimak operation, electrical systems, kibble winder, gantry crane, and lift; and equipment repairing, cleaning and maintenance. These activities were carried out inside the noise enclosure. It was observed no outdoor construction activities at the Wan Chai East Production and Drop Shafts during the noise monitoring session. This is consistent with the works summary provided by the Contractor showing no outdoor construction activities that have taken place during the same period. Other potential noise source was also identified in the vicinity (i.e., traffic) to contribute to the measured noise level. In view of no outdoor construction works was carried out and contribution from other potential noise source in vicinity (ie, traffic), it is considered that the exceedance was not due to the Contract 23 construction works.
Actions Taken / To Be Taken	Since the exceedance was not attributable to the Contract 23 construction works, no action is therefore required. However, a number of residential buildings and other noise sensitive receivers are located near the Site, the Contractor is reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels or causing noise nuisance. The Contractor is also reminded to ensure that the construction plant deployed for the works during restricted hours is in strict compliance with the relevant Construction Noise Permit (CNP) granted.
Remarks	-

Harbour Area Treatment Scheme (HATS) Stage 2A
Contract No. DC/2007/23
Construction of Sewage Conveyance from North Point to Stonecutters Island

NOTIFICATION OF EXCEEDANCE and INVESTIGATION REPORT

Log No.	**2007/23/Noise/199**
Date	15 September 2013 (Sunday) (16:24 – 16:29)
Monitoring Station	NM2 (Rooftop of Hyde Building in Wanchai)
Worksite	Wan Chai East Production and Drop Shafts
Parameter	$L_{Aeq\ (5min)}$
Action Level	Not applicable for construction works during restricted hours
Limit Level	70 dB (A)
Maximum Measured Levels	70.6 dB (A) – (16:24 – 16:29) - exceeded limit level
Possible Reason for Action or Limit Level Non-compliance	According to the works summary provided by the Contractor, no works had been performed outside the noise enclosure. Other activities that took place during the noise monitoring session included cleaning and housekeeping; grouting; drilling, installation of packers and measuring of water inflow; cleaning; preparation for drilling face blast holes; operation of tally control room, alimak operation, electrical systems, kibble winder, gantry crane, and lift; and equipment repairing, cleaning and maintenance. These activities were carried out inside the noise enclosure. It was observed no outdoor construction activities at the Wan Chai East Production and Drop Shafts during the noise monitoring session. This is consistent with the works summary provided by the Contractor showing no outdoor construction activities that have taken place during the same period. Other potential noise source was also identified in the vicinity (i.e., traffic) to contribute to the measured noise level. In view of no outdoor construction works was carried out and contribution from other potential noise source in vicinity (ie, traffic), it is considered that the exceedance was not due to the Contract 23 construction works.
Actions Taken / To Be Taken	Since the exceedance was not attributable to the Contract 23 construction works, no action is therefore required. However, a number of residential buildings and other noise sensitive receivers are located near the Site, the Contractor is reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels or causing noise nuisance. The Contractor is also reminded to ensure that the construction plant deployed for the works during restricted hours is in strict compliance with the relevant Construction Noise Permit (CNP) granted.
Remarks	-

Harbour Area Treatment Scheme (HATS) Stage 2A
Contract No. DC/2007/23
Construction of Sewage Conveyance from North Point to Stonecutters Island

NOTIFICATION OF EXCEEDANCE and INVESTIGATION REPORT

Log No.	**2007/23/Noise/200**
Date	24 September 2013 (Tuesday) (20:36 – 20:41); (20:41 – 20:46) and (20:46 – 20:51)
Monitoring Station	NM2 (Rooftop of Hyde Building in Wanchai)
Worksite	Wan Chai East Production and Drop Shafts
Parameter	$L_{Aeq\ (5min)}$
Action Level	Not applicable for construction works during restricted hours
Limit Level	70 dB (A)
Maximum Measured Levels	70.5 dB (A) – (20:36 – 20:41) - exceeded limit level; 70.7 dB (A) – (20:41 – 20:46) - exceeded limit level; and 70.7 dB (A) – (20:46 – 20:51) - exceeded limit level.
Possible Reason for Action or Limit Level Non-compliance	According to the works summary provided by the Contractor, no works had been performed outside the noise enclosure. Other activities that took place during the noise monitoring session included cleaning and housekeeping; defuming; destroying of spare detonator; grouting of secondary holes; operation of tally control room, alimak operation, electrical systems, kibble winder, gantry crane, and lift; and equipment repairing, cleaning and underground maintenance. These activities were carried out inside the noise enclosure. It was observed no outdoor construction activities at the Wan Chai East Production and Drop Shafts during the noise monitoring session. This is consistent with the works summary provided by the Contractor showing no outdoor construction activities that have taken place during the same period. Other potential noise source was also identified in the vicinity (i.e., traffic) to contribute to the measured noise level. In view of no outdoor construction works was carried out and contribution from other potential noise source in vicinity (ie, traffic), it is considered that the exceedances were not due to the Contract 23 construction works.
Actions Taken / To Be Taken	Since the exceedances were not attributable to the Contract 23 construction works, no action is therefore required. However, a number of residential buildings and other noise sensitive receivers are located near the Site, the Contractor is reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels or causing noise nuisance. The Contractor is also reminded to ensure that the construction plant deployed for the works during restricted hours is in strict compliance with the relevant Construction Noise Permit (CNP) granted.
Remarks	-

NOTIFICATION OF EXCEEDANCE and INVESTIGATION REPORT

Log No.	**2007/23/Noise/201**
Date	29 September 2013 (Sunday) (14:26 – 14:31); (14:31 – 14:36) and (14:36 – 14:41)
Monitoring Station	NM2 (Rooftop of Hyde Building in Wanchai)
Worksite	Wan Chai East Production and Drop Shafts
Parameter	$L_{Aeq\ (5min)}$
Action Level	Not applicable for construction works during restricted hours
Limit Level	70 dB (A)
Maximum Measured Levels	70.6 dB (A) –(14:26 – 14:31) - exceeded limit level; 70.6 dB (A) –(14:31 – 14:36) - exceeded limit level; and 70.8 dB (A) – (14:36 – 14:41) - exceeded limit level.
Possible Reason for Action or Limit Level Non-compliance	According to the works summary provided by the Contractor, no works had been performed outside the noise enclosure. Other activities that took place during the noise monitoring session included cleaning and housekeeping; grouting of face grout holes; removal and cleaning of packers; cleaning and housekeeping from shaft station to double track and pumping out of impounded water along the tunnel; operation of tally control room, alimak operation, electrical systems, kibble winder, gantry crane, and lift; and equipment repairing, cleaning and maintenance. These activities were carried out inside the noise enclosure. It was observed no outdoor construction activities at the Wan Chai East Production and Drop Shafts during the noise monitoring session. This is consistent with the works summary provided by the Contractor showing no outdoor construction activities that have taken place during the same period. Other potential noise source was also identified in the vicinity (i.e., traffic) to contribute to the measured noise level. In view of no outdoor construction works was carried out and contribution from other potential noise source in vicinity (ie, traffic), it is considered that the exceedances were not due to the Contract 23 construction works.
Actions Taken / To Be Taken	Since the exceedances were not attributable to the Contract 23 construction works, no action is therefore required. However, a number of residential buildings and other noise sensitive receivers are located near the Site, the Contractor is reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels or causing noise nuisance. The Contractor is also reminded to ensure that the construction plant deployed for the works during restricted hours is in strict compliance with the relevant Construction Noise Permit (CNP) granted.
Remarks	-

Harbour Area Treatment Scheme (HATS) Stage 2A
Contract No. DC/2007/23
Construction of Sewage Conveyance from North Point to Stonecutters Island

NOTIFICATION OF EXCEEDANCE and INVESTIGATION REPORT

Log No.	**2007/23/Noise/202**
Date	8 October 2013 (Tuesday) (21:04 – 21:09); (21:09 – 21:14) and (21:14 – 21:19)
Monitoring Station	NM2 (Rooftop of Hyde Building in Wanchai)
Worksite	Wan Chai East Production and Drop Shafts
Parameter	$L_{Aeq\ (5min)}$
Action Level	Not applicable for construction works during restricted hours
Limit Level	70 dB (A)
Maximum Measured Levels	70.8 dB (A) – (21:04 – 21:09) - exceeded limit level; 70.6 dB (A) – (21:09 – 21:14) - exceeded limit level; and 71.0 dB (A) – (21:14 – 21:19) - exceeded limit level.
Possible Reason for Action or Limit Level Non-compliance	According to the works summary provided by the Contractor, no works had been performed outside the noise enclosure. Other activities that took place during the noise monitoring session included cleaning and housekeeping; drilling of control holes; operation of tally control room, alimak operation, electrical systems, kibble winder, gantry crane, and lift; and equipment repairing, cleaning and maintenance. These activities were carried out inside the noise enclosure. It was observed no outdoor construction activities at the Wan Chai East Production and Drop Shafts during the noise monitoring session. This is consistent with the works summary provided by the Contractor showing no outdoor construction activities that have taken place during the same period. Other potential noise source was also identified in the vicinity (i.e., traffic) to contribute to the measured noise level. In view of no outdoor construction works was carried out and contribution from other potential noise source in vicinity (ie, traffic), it is considered that the exceedances were not due to the Contract 23 construction works.
Actions Taken / To Be Taken	Since the exceedances were not attributable to the Contract 23 construction works, no action is therefore required. However, a number of residential buildings and other noise sensitive receivers are located near the Site, the Contractor is reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels or causing noise nuisance. The Contractor is also reminded to ensure that the construction plant deployed for the works during restricted hours is in strict compliance with the relevant Construction Noise Permit (CNP) granted.
Remarks	-

Harbour Area Treatment Scheme (HATS) Stage 2A
Contract No. DC/2007/23
Construction of Sewage Conveyance from North Point to Stonecutters Island

NOTIFICATION OF EXCEEDANCE and INVESTIGATION REPORT

Log No.	**2007/23/Noise/203**
Date	13 October 2013 (Sunday) (15:00 – 15:05); (15:05 – 15:10) and (15:10 – 15:15)
Monitoring Station	NM2 (Rooftop of Hyde Building in Wanchai)
Worksite	Wan Chai East Production and Drop Shafts
Parameter	$L_{Aeq\ (5min)}$
Action Level	Not applicable for construction works during restricted hours
Limit Level	70 dB (A)
Maximum Measured Levels	70.8 dB (A) –(15:00 – 15:05) - exceeded limit level; 70.6 dB (A) –(15:05 – 15:10) - exceeded limit level; and 70.7 dB (A) – (15:10 – 15:15) - exceeded limit level.
Possible Reason for Action or Limit Level Non-compliance	According to the works summary provided by the Contractor, no works had been performed outside the noise enclosure. Other activities that took place during the noise monitoring session included cleaning and housekeeping; cleaning of grout plant; removal of packer lances; preparation for drilling of balstholes manually; concrete breaking; muck tipping from the Broken Down Shuttle Car at bottom shaft manually; cleaning of grout pump; dismantling hydraulic rod clamp holders and installation of boom centralisers; operation of tally control room, alimak operation, electrical systems, kibble winder, gantry crane, and lift; and equipment repairing, cleaning and maintenance. These activities were carried out inside the noise enclosure. It was observed no outdoor construction activities at the Wan Chai East Production and Drop Shafts during the noise monitoring session. This is consistent with the works summary provided by the Contractor showing no outdoor construction activities that have taken place during the same period. Other potential noise source was also identified in the vicinity (i.e., traffic) to contribute to the measured noise level. In view of no outdoor construction works was carried out and contribution from other potential noise source in vicinity (ie, traffic), it is considered that the exceedances were not due to the Contract 23 construction works.
Actions Taken / To Be Taken	Since the exceedances were not attributable to the Contract 23 construction works, no action is therefore required. However, a number of residential buildings and other noise sensitive receivers are located near the Site, the Contractor is reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels or causing noise nuisance. The Contractor is also reminded to ensure that the construction plant deployed for the works during restricted hours is in strict compliance with the relevant Construction Noise Permit (CNP) granted.
Remarks	-

NOTIFICATION OF EXCEEDANCE and INVESTIGATION REPORT

Log No.	**2007/23/Noise/204**
Date	27 October 2013 (Sunday) (14:28 – 14:33); (14:33 – 14:38) and (14:38 – 14:43)
Monitoring Station	NM2 (Rooftop of Hyde Building in Wanchai)
Worksite	Wan Chai East Production and Drop Shafts
Parameter	$L_{Aeq\ (5min)}$
Action Level	Not applicable for construction works during restricted hours
Limit Level	70 dB (A)
Maximum Measured Levels	71.4 dB (A) –(14:28 – 14:33); 71.7 dB (A) –(14:33 – 14:38); and 71.2 dB (A) – (14:38 – 14:43).
Possible Reason for Action or Limit Level Non-compliance	According to the works summary provided by the Contractor, no works had been performed outside the noise enclosure. Other activities that took place during the noise monitoring session included cleaning and housekeeping; removal of drain/waste pipeline; moving of equipment; operation of tally control room, alimak operation, electrical systems, kibble winder, gantry crane, and lift; and equipment repairing, cleaning and maintenance. These activities were carried out inside the noise enclosure. It was observed no outdoor construction activities at the Wan Chai East Production and Drop Shafts during the noise monitoring session. This is consistent with the works summary provided by the Contractor showing no outdoor construction activities that have taken place during the same period. Other potential noise source was also identified in the vicinity (i.e., traffic) to contribute to the measured noise level. In view of no outdoor construction works was carried out and contribution from other potential noise source in vicinity (ie, traffic), it is considered that the exceedances were not due to the Contract 23 construction works.
Actions Taken / To Be Taken	Since the exceedances were not attributable to the Contract 23 construction works, no action is therefore required. However, a number of residential buildings and other noise sensitive receivers are located near the Site, the Contractor is reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels or causing noise nuisance. The Contractor is also reminded to ensure that the construction plant deployed for the works during restricted hours is in strict compliance with the relevant Construction Noise Permit (CNP) granted.
Remarks	-

NOTIFICATION OF EXCEEDANCE and INVESTIGATION REPORT

Log No.	**2007/23/Noise/205**
Date	5 November 2013 (Tuesday) (20:15 – 20:20); (20:20 – 20:25); and (20:25 – 20:30)
Monitoring Station	NM2 (Rooftop of Hyde Building in Wanchai)
Worksite	Wan Chai East Production and Drop Shafts
Parameter	$L_{Aeq\ (5min)}$
Action Level	Not applicable for construction works during restricted hours
Limit Level	70 dB (A)
Maximum Measured Levels	70.9 dB (A) – (20:15 – 20:20); 71.3 dB (A) – (20:20 – 20:25); and 71.8 dB (A) –(20:25 – 20:30)
Possible Reason for Action or Limit Level Non-compliance	According to the works summary provided by the Contractor, no works had been performed outside the noise enclosure. Other activities that took place during the noise monitoring session included cleaning and housekeeping; preparation and moving of jumbo box cable; mucking out of blastmuck; geological mapping; operation of tally control room, alimak operation, electrical systems, kibble winder, gantry crane, and lift; and equipment repairing, cleaning and maintenance. These activities were carried out inside the noise enclosure. It was observed no outdoor construction activities at the Wan Chai East Production and Drop Shafts during the noise monitoring session. This is consistent with the works summary provided by the Contractor showing no outdoor construction activities that have taken place during the same period. Other potential noise source was also identified in the vicinity (i.e., traffic) to contribute to the measured noise level. In view of no outdoor construction works was carried out and contribution from other potential noise source in vicinity (ie, traffic), it is considered that the exceedances were not due to the Contract 23 construction works.
Actions Taken / To Be Taken	Since the exceedances were not attributable to the Contract 23 construction works, no action is therefore required. However, a number of residential buildings and other noise sensitive receivers are located near the Site, the Contractor is reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels or causing noise nuisance. The Contractor is also reminded to ensure that the construction plant deployed for the works during restricted hours is in strict compliance with the relevant Construction Noise Permit (CNP) granted.
Remarks	-

Harbour Area Treatment Scheme (HATS) Stage 2A
Contract No. DC/2007/23
Construction of Sewage Conveyance from North Point to Stonecutters Island

NOTIFICATION OF EXCEEDANCE and INVESTIGATION REPORT

Log No.	**2007/23/Noise/206**
Date	10 November 2013 (Sunday) (13:42 – 13:47); (13:47 – 13:52); and (13:52 – 13:57)
Monitoring Station	NM2 (Rooftop of Hyde Building in Wanchai)
Worksite	Wan Chai East Production and Drop Shafts
Parameter	$L_{Aeq\ (5min)}$
Action Level	Not applicable for construction works during restricted hours
Limit Level	70 dB (A)
Maximum Measured Levels	70.7 dB (A) –(13:42 – 13:47); 71.3 dB (A) –(13:47 – 13:52); and 70.6 dB (A) – (13:52 – 13:57)
Possible Reason for Action or Limit Level Non-compliance	According to the works summary provided by the Contractor, no works had been performed outside the noise enclosure. Other activities that took place during the noise monitoring session included cleaning and housekeeping; preparation and pumping out of water pounding invert; manual clearing of spoil from the shuttle; pulling back of the jumbo cable; preparation and laying out of telephone cable; underground and mechanical and electrical equipment maintenance, tunnel lightings, repair, installation services, material handling and housekeeping, winder operation, material handling, loading and unloading of shuttle cars, general lifting works; drilling of probe holes; fixing of shuttle cars and track rail; operation of tally control room, alimak operation, electrical systems, kibble winder, gantry crane, and lift; and equipment repairing, cleaning and maintenance. These activities were carried out inside the noise enclosure. It was observed no outdoor construction activities at the Wan Chai East Production and Drop Shafts during the noise monitoring session. This is consistent with the works summary provided by the Contractor showing no outdoor construction activities that have taken place during the same period. Other potential noise source was also identified in the vicinity (i.e., traffic) to contribute to the measured noise level. In view of no outdoor construction works was carried out and contribution from other potential noise source in vicinity (ie, traffic), it is considered that the exceedances were not due to the Contract 23 construction works.
Actions Taken / To Be Taken	Since the exceedances were not attributable to the Contract 23 construction works, no action is therefore required. However, a number of residential buildings and other noise sensitive receivers are located near the Site, the Contractor is reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels or causing noise nuisance. The Contractor is also reminded to ensure that the construction plant deployed for the works during restricted hours is in strict compliance with the relevant Construction Noise Permit (CNP) granted.

Remarks	-

Harbour Area Treatment Scheme (HATS) Stage 2A
Contract No. DC/2007/23
Construction of Sewage Conveyance from North Point to Stonecutters Island

NOTIFICATION OF EXCEEDANCE and INVESTIGATION REPORT

Log No.	**2007/23/Noise/207**
Date	19 November 2013 (Tuesday) (20:10 – 20:15); (20:15 – 20:20); and (20:20 – 20:25)
Monitoring Station	NM2 (Rooftop of Hyde Building in Wanchai)
Worksite	Wan Chai East Production and Drop Shafts
Parameter	$L_{Aeq\ (5min)}$
Action Level	Not applicable for construction works during restricted hours
Limit Level	70 dB (A)
Maximum Measured Levels	72.1 dB (A) – (20:10 – 20:15); 71.3 dB (A) – (20:15 – 20:20); and 71.4 dB (A) – (20:20 – 20:25)
Possible Reason for Action or Limit Level Non-compliance	According to the works summary provided by the Contractor, no works had been performed outside the noise enclosure. Other activities that took place during the noise monitoring session included cleaning and housekeeping; pumping out of water from ponding sections; mixing of concrete; face blast holes drilling; removal of damaged ventilation tube; perimeter charging preparation and cleaning of lifter holes; arranging of machineries at Double Track Area and preparation of shuttle cars / refilling bullets; tipping of remaining tunnel muck at shuttle cars; operation of tally control room, alimak operation, electrical systems, kibble winder, gantry crane, and lift; and equipment repairing, cleaning and maintenance. These activities were carried out inside the noise enclosure. It was observed no outdoor construction activities at the Wan Chai East Production and Drop Shafts during the noise monitoring session. This is consistent with the works summary provided by the Contractor showing no outdoor construction activities that have taken place during the same period. Other potential noise source was also identified in the vicinity (i.e., traffic) to contribute to the measured noise level. In view of no outdoor construction works was carried out and contribution from other potential noise source in vicinity (ie, traffic), it is considered that the exceedances were not due to the Contract 23 construction works.
Actions Taken / To Be Taken	Since the exceedances were not attributable to the Contract 23 construction works, no action is therefore required. However, a number of residential buildings and other noise sensitive receivers are located near the Site, the Contractor is reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels or causing noise nuisance. The Contractor is also reminded to ensure that the construction plant deployed for the works during restricted hours is in strict compliance with the relevant Construction Noise Permit (CNP) granted.
Remarks	-

Harbour Area Treatment Scheme (HATS) Stage 2A
Contract No. DC/2007/23
Construction of Sewage Conveyance from North Point to Stonecutters Island

NOTIFICATION OF EXCEEDANCE and INVESTIGATION REPORT

Log No.	**2007/23/Noise/208**
Date	24 November 2013 (Sunday) (15:23 – 15:28); (15:28 – 15:33); and (15:33 – 15:38)
Monitoring Station	NM2 (Rooftop of Hyde Building in Wanchai)
Worksite	Wan Chai East Production and Drop Shafts
Parameter	$L_{Aeq\ (5min)}$
Action Level	Not applicable for construction works during restricted hours
Limit Level	70 dB (A)
Maximum Measured Levels	71.0 dB (A) – (15:23 – 15:28); 71.5 dB (A) – (15:28 – 15:33); and 71.5 dB (A) – (15:33 – 15:38)
Possible Reason for Action or Limit Level Non-compliance	According to the works summary provided by the Contractor, no works had been performed outside the noise enclosure. Other activities that took place during the noise monitoring session included cleaning and housekeeping; pouring of blinding concrete at invert; face blast holes drilling; laying of cable wire for lightings from Chainage; operation of tally control room, alimak operation, electrical systems, kibble winder, gantry crane, and lift; and equipment repairing, cleaning and maintenance. These activities were carried out inside the noise enclosure. It was observed no outdoor construction activities at the Wan Chai East Production and Drop Shafts during the noise monitoring session. This is consistent with the works summary provided by the Contractor showing no outdoor construction activities that have taken place during the same period. Other potential noise source was also identified in the vicinity (i.e., traffic) to contribute to the measured noise level. In view of no outdoor construction works was carried out and contribution from other potential noise source in vicinity (ie, traffic), it is considered that the exceedances were not due to the Contract 23 construction works.
Actions Taken / To Be Taken	Since the exceedances were not attributable to the Contract 23 construction works, no action is therefore required. However, a number of residential buildings and other noise sensitive receivers are located near the Site, the Contractor is reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid exceedance of noise limit levels or causing noise nuisance. The Contractor is also reminded to ensure that the construction plant deployed for the works during restricted hours is in strict compliance with the relevant Construction Noise Permit (CNP) granted.
Remarks	-

Annex D8 Cumulative Complaint and Summons/Prosecutions Log

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
December 2009	0	0
January 2010	0	0
February 2010	0	0
March 2010	0	0
April 2010	0	0
May 2010	0	0
June 2010	0	0
July 2010	0	0
August 2010	0	0
September 2010	0	0
October 2010	0	0
November 2010	0	0
December 2010	0	0
January 2011	0	0
February 2011	0	0
March 2011	0	0
April 2011	0	0
May 2011	0	0

Annex D8 Cumulative Complaint and Summons/Prosecutions Log

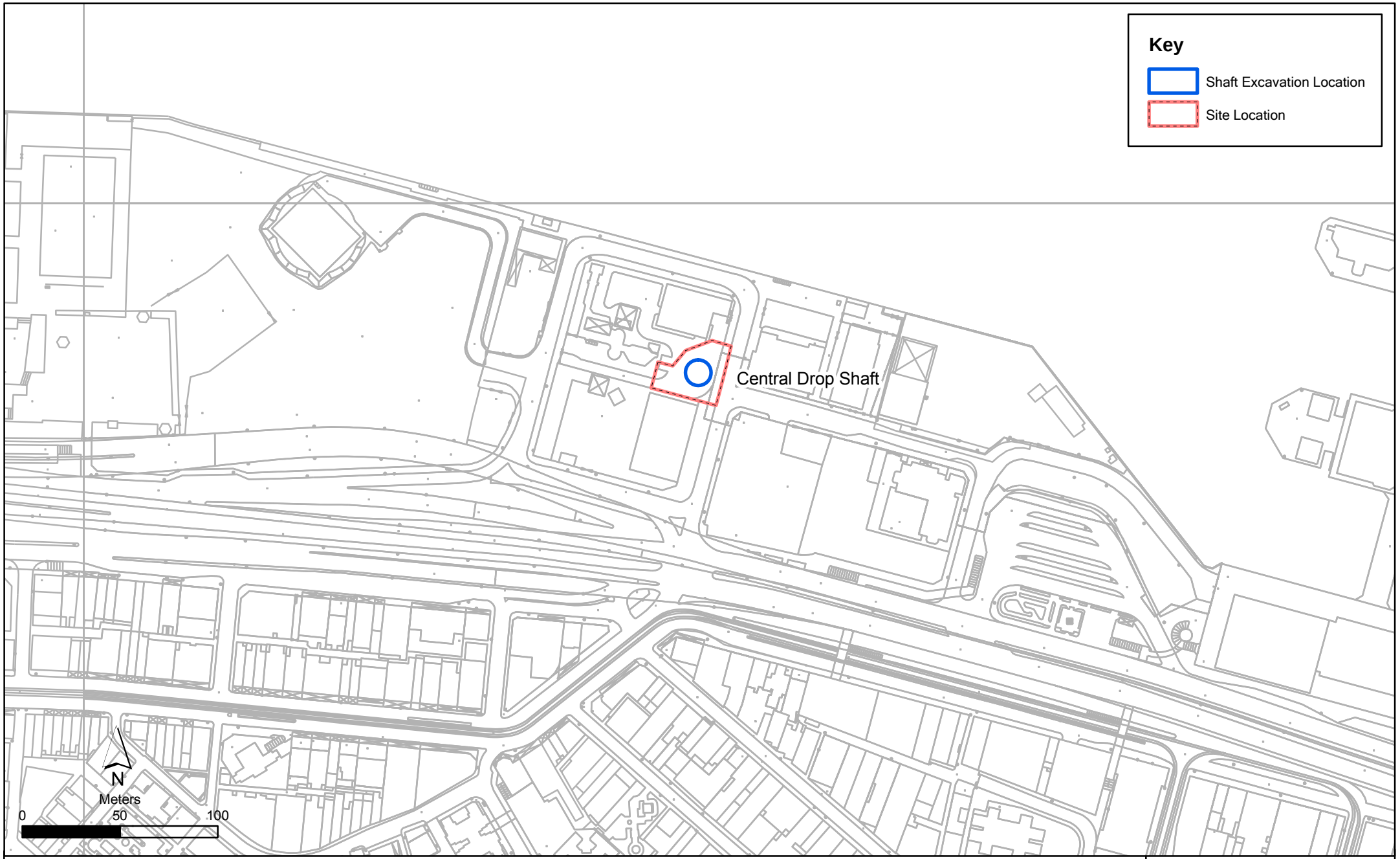
Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
June 2011	0	0
July 2011	0	0
August 2011	0	0
September 2011	0	0
October 2011	0	0
November 2011	1	0
December 2011	0	0
January 2012	0	0
February 2012	0	0
March 2012	0	0
April 2012	0	0
May 2012	0	0
June 2012	0	0
July 2012	0	0
August 2012	0	0
September 2012	0	0
October 2012	0	0
November 2012	0	0

Annex D8 Cumulative Complaint and Summons/Prosecutions Log

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
December 2012	0	0
January 2013	0	0
February 2013	0	0
March 2013	0	0
April 2013	0	0
May 2013	0	0
June 2013	0	0
July 2013	0	0
August 2013	0	0
September 2013	0	0
October 2013	0	0
November 2013	0	0
Overall Total	1	0

Annex E

Central Drop Shaft



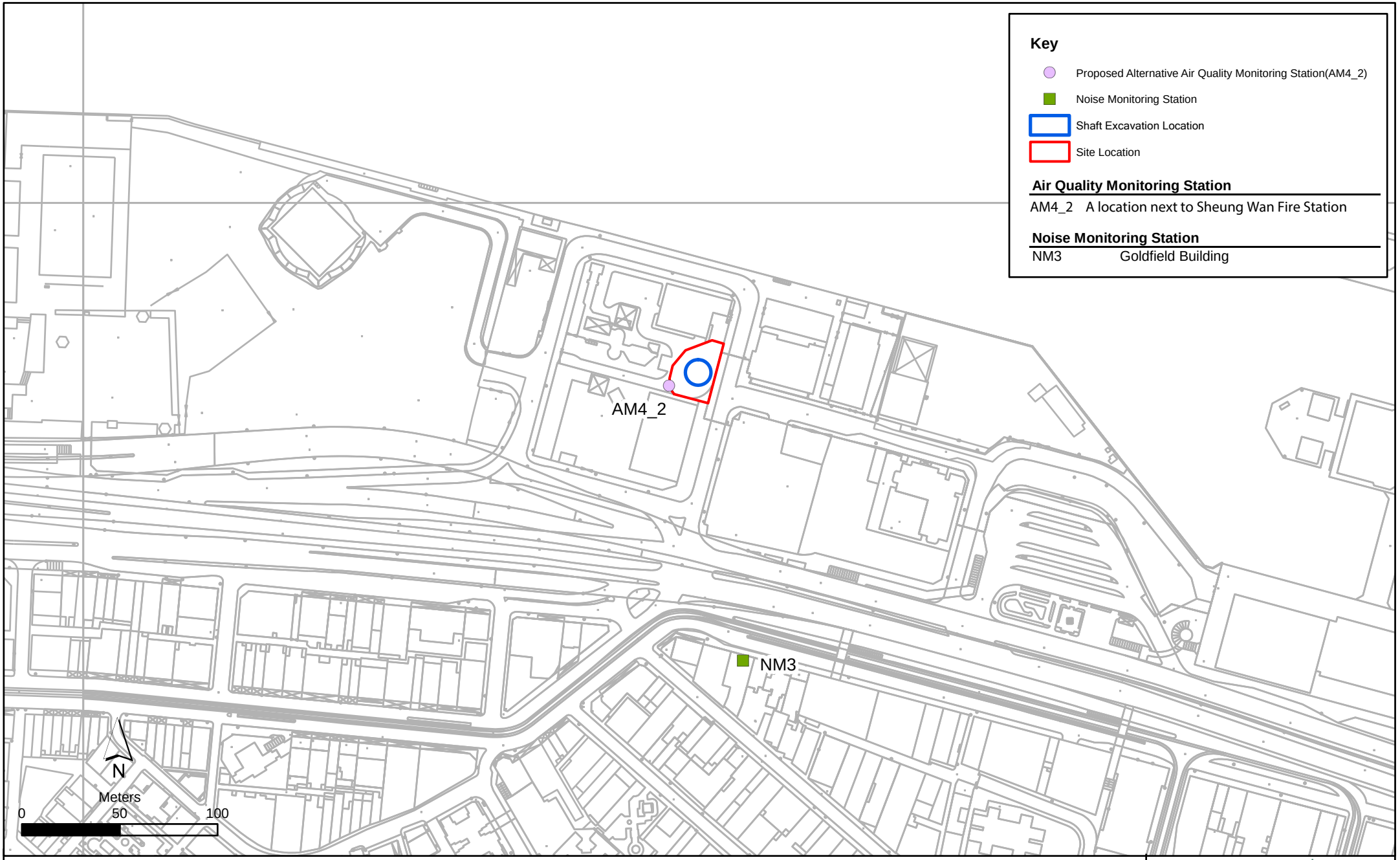
Annex E1

Contract No. DC/2007/23
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Construction Site Locations at Central

File: EM&A and proposed station\0104887_Central.mxd
Date: 03/03/2010

Environmental Resources Management

ERM



Annex E2

Contract No. DC/2007/23
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Impact Air Quality & Noise Monitoring Stations (Central)

File: EM&A and proposed stations\
0104887_Centra_NMAM_Annex_Oct2012.mxd
Date: 10-Oct-12

Environmental Resources Management

ERM

Annex E3 Not Used

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase			
Air Quality	The Air Pollution Control (Construction Dust) Regulation shall be implemented and good site practices shall be incorporated in the contract clauses to minimise construction dust impact. Control measures relevant to this Project are listed below: • skip hoist for material transport should be totally enclosed by impervious sheeting; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site; • 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 hardcores; • where a site boundary adjoins a road, streets or other 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; • 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; • regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather; • site enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines; • open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible; • tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and • instigation of an environmental monitoring auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All work sites / during construction	√
Air Quality	The following watering measures for specific site would be required to control the fugitive dust impacts: • watering four times per day within worksites at the Central PTW.	All work sites / during construction	√
Operational Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	Good housekeeping for SCISTW and PTWs listed below should be followed to ameliorate any odour impact from the plant and these standard practices should be included in the plant operator manual. • Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers to minimise odour escape • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality	Commissioning tests for all deodorisation system should be included in the Design and Construction Contract Document.	All PTW and SCISTW/ during operational phase	NA. Measures not required until commencement of operational phase
Construction Phase			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Good Site Practice: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction program; • mobile plant, if any, should be sited as far from NSRs as possible; • machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities; Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.	All work sites / during construction	√
Construction Phase			
Water Quality	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 work sites / during construction	√
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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) Regulation should be observed and complied with for control of chemical wastes.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront To minimise 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 the storm culvert or sea	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Operational Phase			
Water Quality	Dual power supply, standby facilities for the main treatment units and standby equipment parts / accessories should be provided as far as possible at the SCISTW to minimise the chance of emergency discharge.	SCISTW and all the Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Waste	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 minimise the use of timber formwork.	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Recommendations to achieve waste reduction include: • 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; and • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All work sites / during the construction period	√
Waste	Recommendations for good site practices during construction activities include:- • 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 • 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. • Provision of sufficient waste disposal points and regular collection of waste • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	NA
Waste	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.	All work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Waste	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, oxidising, 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.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Landscape & Visual	• Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. • 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. • Erection of decorative screen hoarding compatible with the surrounding setting.	All the works areas, PTWs and SCISTW/ during the construction period	√
Operational Phase	•		
Landscape & Visual	• Aesthetic design of the façade of PTW and associated structures to harmonise with the surrounding settings. • Shrub and Climbing Plants to soften proposed structures / Roof Greening. • Buffer Tree and Shrub Planting to screen proposed associated structures. • Reinstated of disturbed area	All the works areas, PTWs and SCISTW/ during the construction period	NA. Measures not required until commencement of operational phase
Construction Phase			
Cultural Heritage	The construction vibration control limit (ppv of 25mm/s) shall be strictly followed.	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.

Remark:

√ Compliance of Mitigation Measures
<> Compliance of Mitigation but need improvement
x Non-compliance of Mitigation Measures
Δ Deficiency of Mitigation Measures but rectified by Gammon Construction Limited
NA Not Applicable

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase			
Air Quality	The Air Pollution Control (Construction Dust) Regulation shall be implemented and good site practices shall be incorporated in the contract clauses to minimise construction dust impact. Control measures relevant to this Project are listed below: • skip hoist for material transport should be totally enclosed by impervious sheeting; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site; • 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 hardcores; • where a site boundary adjoins a road, streets or other 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; • 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; • regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather; • site enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines; • open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible; • tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and • instigation of an environmental monitoring auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All work sites / during construction	√
Air Quality	The following watering measures for specific site would be required to control the fugitive dust impacts: • watering four times per day within worksites at the Central PTW.	All work sites / during construction	√
Operational Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	Good housekeeping for SCISTW and PTWs listed below should be followed to ameliorate any odour impact from the plant and these standard practices should be included in the plant operator manual. • Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers to minimise odour escape • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality	Commissioning tests for all deodorisation system should be included in the Design and Construction Contract Document.	All PTW and SCISTW/ during operational phase	NA. Measures not required until commencement of operational phase
Construction Phase			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Good Site Practice: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction program; • mobile plant, if any, should be sited as far from NSRs as possible; • machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities; Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.	All work sites / during construction	√
Construction Phase			
Water Quality	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 work sites / during construction	√
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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) Regulation should be observed and complied with for control of chemical wastes.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront To minimise 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 the storm culvert or sea	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Operational Phase			
Water Quality	Dual power supply, standby facilities for the main treatment units and standby equipment parts / accessories should be provided as far as possible at the SCISTW to minimise the chance of emergency discharge.	SCISTW and all the Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Waste	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 minimise the use of timber formwork.	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Recommendations to achieve waste reduction include: • 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; and • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All work sites / during the construction period	√
Waste	Recommendations for good site practices during construction activities include:- • 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 • 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. • Provision of sufficient waste disposal points and regular collection of waste • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	NA
Waste	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.	All work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Waste	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, oxidising, 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.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Landscape & Visual	• Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. • 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. • Erection of decorative screen hoarding compatible with the surrounding setting.	All the works areas, PTWs and SCISTW/ during the construction period	√
Operational Phase	•		
Landscape & Visual	• Aesthetic design of the façade of PTW and associated structures to harmonise with the surrounding settings. • Shrub and Climbing Plants to soften proposed structures / Roof Greening. • Buffer Tree and Shrub Planting to screen proposed associated structures. • Reinstated of disturbed area	All the works areas, PTWs and SCISTW/ during the construction period	NA. Measures not required until commencement of operational phase
Construction Phase			
Cultural Heritage	The construction vibration control limit (ppv of 25mm/s) shall be strictly followed.	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.

Remark:

√ Compliance of Mitigation Measures

<> Compliance of Mitigation but need improvement

x Non-compliance of Mitigation Measures

Δ Deficiency of Mitigation Measures but rectified by Gammon Construction Limited

NA Not Applicable

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase			
Air Quality	The Air Pollution Control (Construction Dust) Regulation shall be implemented and good site practices shall be incorporated in the contract clauses to minimise construction dust impact. Control measures relevant to this Project are listed below: • skip hoist for material transport should be totally enclosed by impervious sheeting; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site; • 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 hardcores; • where a site boundary adjoins a road, streets or other 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; • 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; • regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather; • site enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines; • open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible; • tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and • instigation of an environmental monitoring auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All work sites / during construction	√
Air Quality	The following watering measures for specific site would be required to control the fugitive dust impacts: • watering four times per day within worksites at the Central PTW.	All work sites / during construction	√
Operational Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	Good housekeeping for SCISTW and PTWs listed below should be followed to ameliorate any odour impact from the plant and these standard practices should be included in the plant operator manual. • Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers to minimise odour escape • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality	Commissioning tests for all deodorisation system should be included in the Design and Construction Contract Document.	All PTW and SCISTW/ during operational phase	NA. Measures not required until commencement of operational phase
Construction Phase			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Good Site Practice: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction program; • mobile plant, if any, should be sited as far from NSRs as possible; • machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities; Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.	All work sites / during construction	√
Construction Phase			
Water Quality	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 work sites / during construction	√
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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) Regulation should be observed and complied with for control of chemical wastes.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront To minimise 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 the storm culvert or sea	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Operational Phase			
Water Quality	Dual power supply, standby facilities for the main treatment units and standby equipment parts / accessories should be provided as far as possible at the SCISTW to minimise the chance of emergency discharge.	SCISTW and all the Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Waste	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 minimise the use of timber formwork.	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Recommendations to achieve waste reduction include: • 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; and • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All work sites / during the construction period	√
Waste	Recommendations for good site practices during construction activities include:- • 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 • 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. • Provision of sufficient waste disposal points and regular collection of waste • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	NA
Waste	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.	All work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Waste	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, oxidising, 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.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Landscape & Visual	• Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. • 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. • Erection of decorative screen hoarding compatible with the surrounding setting.	All the works areas, PTWs and SCISTW/ during the construction period	√
Operational Phase	•		
Landscape & Visual	• Aesthetic design of the façade of PTW and associated structures to harmonise with the surrounding settings. • Shrub and Climbing Plants to soften proposed structures / Roof Greening. • Buffer Tree and Shrub Planting to screen proposed associated structures. • Reinstated of disturbed area	All the works areas, PTWs and SCISTW/ during the construction period	NA. Measures not required until commencement of operational phase
Construction Phase			
Cultural Heritage	The construction vibration control limit (ppv of 25mm/s) shall be strictly followed.	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.

Remark:

√ Compliance of Mitigation Measures
<> Compliance of Mitigation but need improvement
x Non-compliance of Mitigation Measures
Δ Deficiency of Mitigation Measures but rectified by Gammon Construction Limited
NA Not Applicable

Annex E5 24-hour and 1-hour TSP Monitoring Results

1-hour TSP Monitoring Results

Station AM4_2

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
04-Sep-13	14:40	15:40	Rainy	153	393	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 9315)	2115
	15:42	16:42	Rainy	175	393	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 9315)	2117
	16:50	17:50	Rainy	172	393	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 9315)	2118
10-Sep-13	8:00	9:00	Sunny	220	393	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 9315)	2120
	9:02	10:02	Sunny	213	393	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 9315)	2131
	10:04	11:04	Sunny	198	393	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 9315)	2132
16-Sep-13	11:40	12:40	Sunny	186	393	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 9315)	2133
	12:42	17:42	Sunny	217	393	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 9315)	2134
	13:45	14:45	Sunny	224	393	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 9315)	2136
21-Sep-13	11:40	12:40	Fine	149	393	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 9315)	2137
	12:42	13:42	Fine	205	393	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 9315)	2139
	13:44	14:44	Fine	206	393	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 9315)	2140
27-Sep-13	11:40	12:40	Sunny	208	393	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 9315)	2141
	12:42	13:42	Sunny	253	393	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 9315)	2142
	13:42	14:42	Sunny	298	393	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 9315)	2144
			Min.	**149**							
			Max.	**298**							
			Average	**205**							

* Wind Speed data is presented in the Meteorological Data table

Annex E5 24-hour and 1-hour TSP Monitoring Results

1-hour TSP Monitoring Results

Station AM4_2

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
03-Oct-13	11:42	12:42	Sunny	212	393	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 9315)	2145
	12:44	13:44	Sunny	287	393	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 9315)	2148
	13:46	14:46	Sunny	206	393	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 9315)	2149
09-Oct-13	11:40	12:40	Sunny	164	393	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 9315)	2146
	12:42	13:42	Sunny	206	393	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 9315)	2150
	13:50	14:50	Sunny	275	393	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 9315)	2162
15-Oct-13	8:00	9:00	Sunny	220	393	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 9315)	2163
	9:02	10:02	Sunny	175	393	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 9315)	2164
	10:10	11:10	Sunny	224	393	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 9315)	2166
21-Oct-13	8:00	9:00	Sunny	146	393	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 9315)	2167
	9:02	10:02	Sunny	167	393	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 9315)	2169
	10:10	11:10	Sunny	161	393	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 9315)	2170
26-Oct-13	8:00	9:00	Sunny	292	393	500	Construction work in progress	25	<5	GMW GS-2310 (S/N 9315)	2192
	9:02	10:02	Sunny	316	393	500	Construction work in progress	25	<5	GMW GS-2310 (S/N 9315)	2193
	10:04	11:04	Sunny	221	393	500	Construction work in progress	25	<5	GMW GS-2310 (S/N 9315)	2194
			Min.	**146**							
			Max.	**316**							
			Average	**218**							

* Wind Speed data is presented in the Meteorological Data table

Annex E5 24-hour and 1-hour TSP Monitoring Results

1-hour TSP Monitoring Results

Station AM4_2

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
01-Nov-13	11:40	12:40	Sunny	238	393	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 9315)	2195
	12:42	13:42	Sunny	303	393	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 9315)	2197
	13:50	14:50	Sunny	173	393	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 9315)	2198
07-Nov-13	8:00	9:00	Sunny	221	393	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 9315)	2199
	9:02	10:02	Sunny	277	393	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 9315)	2201
	10:10	11:10	Sunny	290	393	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 9315)	2202
13-Nov-13	11:40	12:40	Cloudy	148	393	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 9315)	2204
	12:42	13:42	Cloudy	146	393	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 9315)	2205
	13:50	14:50	Cloudy	149	393	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 9315)	2206
19-Nov-13	8:00	9:00	Fine	148	393	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 9315)	2208
	9:02	10:02	Fine	142	393	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 9315)	2209
	10:10	11:10	Fine	165	393	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 9315)	2210
25-Nov-13	11:40	12:40	Sunny	287	393	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 9315)	2232
	12:42	13:42	Sunny	178	393	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 9315)	2233
	14:02	15:02	Sunny	236	393	500	Construction work in progress	22	<5	GMW GS-2310 (S/N 9315)	2234
30-Nov-13	11:35	12:35	Sunny	142	393	500	Construction work in progress	21	<5	GMW GS 2310 (S/N 1808)	2236
	13:37	14:37	Sunny	171	393	500	Construction work in progress	21	<5	GMW GS 2310 (S/N 1818)	2237
	13:39	14:39	Sunny	183	393	500	Construction work in progress	21	<5	GMW GS 2310 (S/N 1808)	2238
			Min.	**142**							
			Max.	**303**							
			Average	**200**							

* Wind Speed data is presented in the Meteorological Data table

Annex E5 24-hour and 1-hour TSP Monitoring Results

24-hour TSP Monitoring Results

Station AM4_2

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	(μg/m^3)	(μg/m^3)	(μg/m^3)		ID	ID
04-Sep-13	17:55	05-Sep-13	17:55	Rainy	2.8673	3.0182	17715.85	17739.85	24.00	1.22	1.22	1.22	86	211	260	construction work in progress	GMW GS 2310 (S/N 9315)	2116
10-Sep-13	11:10	11-Sep-13	11:10	Sunny	2.8568	3.0124	17742.85	17766.85	24.00	1.22	1.22	1.22	89	211	260	construction work in progress	GMW GS 2310 (S/N 9315)	2119
16-Sep-13	14:55	17-Sep-13	14:55	Sunny	2.8543	3.0300	17769.85	17793.85	24.00	1.22	1.22	1.22	100	211	260	construction work in progress	GMW GS 2310 (S/N 9315)	2135
21-Sep-13	14:46	22-Sep-13	14:46	Fine	2.8472	2.9911	17796.85	17820.85	24.00	1.22	1.22	1.22	82	211	260	construction work in progress	GMW GS 2310 (S/N 9315)	2138
27-Sep-13	14:50	28-Sep-13	14:50	Sunny	2.8418	3.0290	17799.85	17823.85	24.00	1.22	1.22	1.22	107	211	260	construction work in progress	GMW GS 2310 (S/N 9315)	2143
												Min.	**82**					
												Max.	**107**					
												Average	**93**					

Annex E5 24-hour and 1-hour TSP Monitoring Results

24-hour TSP Monitoring Results

Station AM4_2

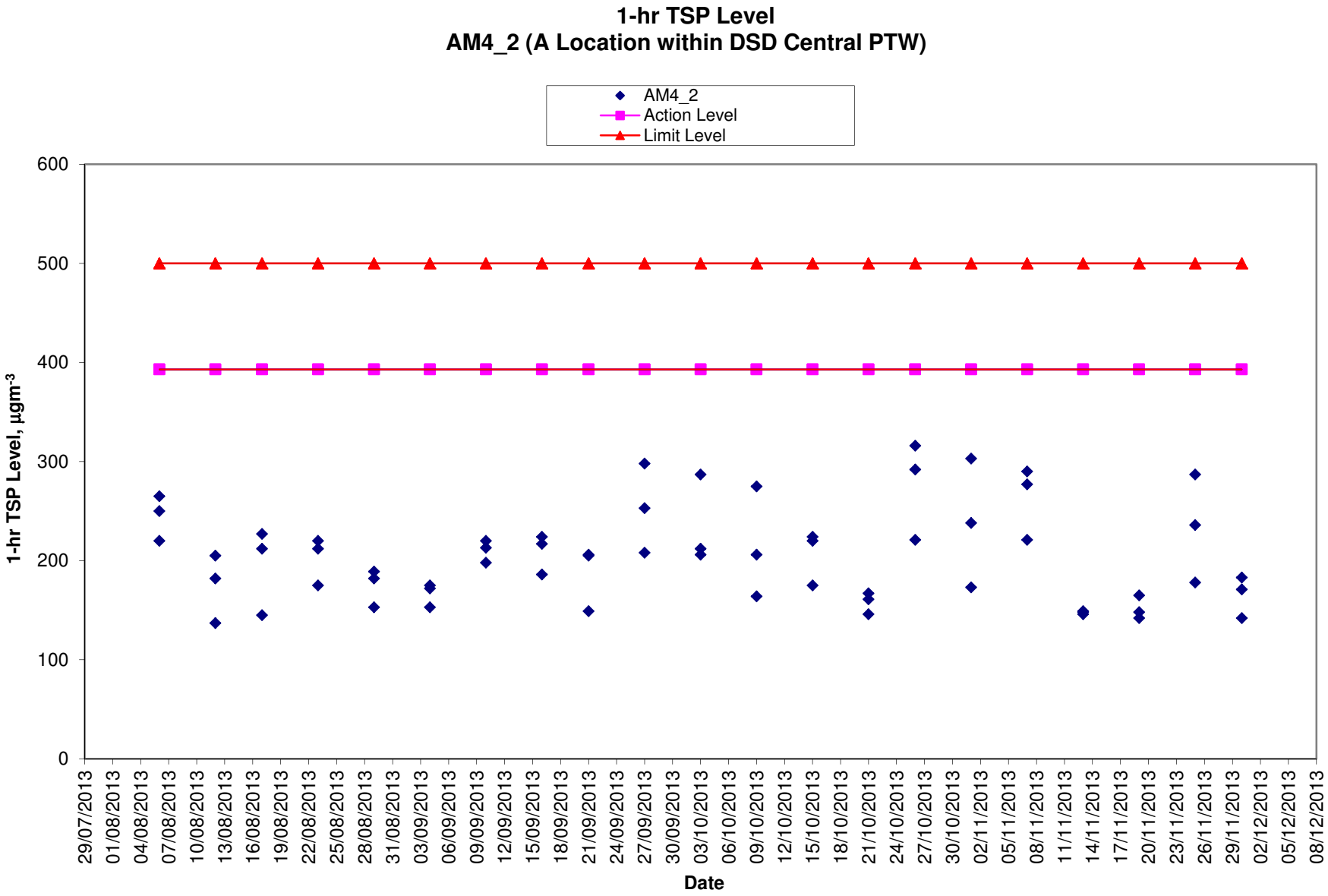
Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time	Flow Rate (m^3/min)			TSP Conc.	Action Level	Limit Level	Observations / Remarks	Sampler	Filter
Date	Time	Date	Time		Initial	Final	Initial	Final	(hrs)	Initial	Final	Average	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)		ID	ID
03-Oct-13	15:00	04-Oct-13	15:00	Sunny	2.8457	3.0219	17826.8500	17850.8500	24.00	1.22	1.22	1.22	100	211	260	construction work in progress	GMW GS 2310 (S/N 9315)	2147
09-Oct-13	14:55	10-Oct-13	14:55	Sunny	2.8762	3.0364	17853.8500	17877.8500	24.00	1.22	1.22	1.22	91	211	260	construction work in progress	GMW GS 2310 (S/N 9315)	2161
15-Oct-13	11:12	16-Oct-13	11:12	Sunny	2.8663	3.0229	17880.8500	17904.8500	24.00	1.22	1.22	1.22	89	211	260	construction work in progress	GMW GS 2310 (S/N 9315)	2165
21-Oct-13	11:12	22-Oct-13	11:12	Sunny	2.8483	2.9911	17907.8500	17931.8500	24.00	1.22	1.22	1.22	81	211	260	construction work in progress	GMW GS 2310 (S/N 9315)	2168
26-Oct-13	11:06	27-Oct-13	11:06	Sunny	2.8487	3.0541	17934.8500	17958.8500	24.00	1.22	1.22	1.22	117	211	260	construction work in progress	GMW GS 2310 (S/N 0481)	2191
												Min.	**81**					
												Max.	**117**					
												Average	**96**					

Annex E5 24-hour and 1-hour TSP Monitoring Results

24-hour TSP Monitoring Results

Station AM4_2

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
01-Nov-13	14:52	02-Nov-13	14:52	Sunny	2.8346	3.0584	17961.8500	17985.8500	24.00	1.22	1.22	1.22	127	211	260	construction work in progress	GMW GS 2310 (S/N 9315)	2196
07-Nov-13	11:15	08-Nov-13	11:15	Sunny	2.8332	3.0222	17988.8500	18012.8500	24.00	1.22	1.22	1.22	108	211	260	construction work in progress	GMW GS 2310 (S/N 9315)	2200
13-Nov-13	14:55	14-Nov-13	14:55	Cloudy	2.7627	2.9245	18015.8500	18039.8500	24.00	1.22	1.22	1.22	92	211	260	construction work in progress	GMW GS 2310 (S/N 9315)	2203
19-Nov-13	11:15	20-Nov-13	11:15	Fine	2.7984	2.9474	18042.8500	18066.8500	24.00	1.22	1.22	1.22	85	211	260	construction work in progress	GMW GS 2310 (S/N 9315)	2207
25-Nov-13	15:10	26-Nov-13	15:10	Sunny	2.7543	2.8998	18069.8500	18093.8500	24.00	1.22	1.22	1.22	83	211	260	construction work in progress	GMW GS 2310 (S/N 0481)	2231
30-Nov-13	14:41	01-Dec-13	14:41	Sunny	2.7765	2.9983	18096.8500	18120.8500	24.00	1.22	1.22	1.22	126	211	260	construction work in progress	GMW GS 2310 (S/N 0481)	2235
												Min.	**83**					
												Max.	**127**					
												Average	**99**					


1-hr TSP Level
AM4_2 (A Location within DSD Central PTW)
AM4_2
Action Level
Limit Level
1-hr TSP Level, µgm-3
600
500
400
300
200
100
0
29/07/2013
01/08/2013
04/08/2013
07/08/2013
10/08/2013
13/08/2013
16/08/2013
19/08/2013
22/08/2013
25/08/2013
28/08/2013
31/08/2013
03/09/2013
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09/09/2013
12/09/2013
15/09/2013
18/09/2013
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15/10/2013
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30/10/2013
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05/11/2013
08/11/2013
11/11/2013
14/11/2013
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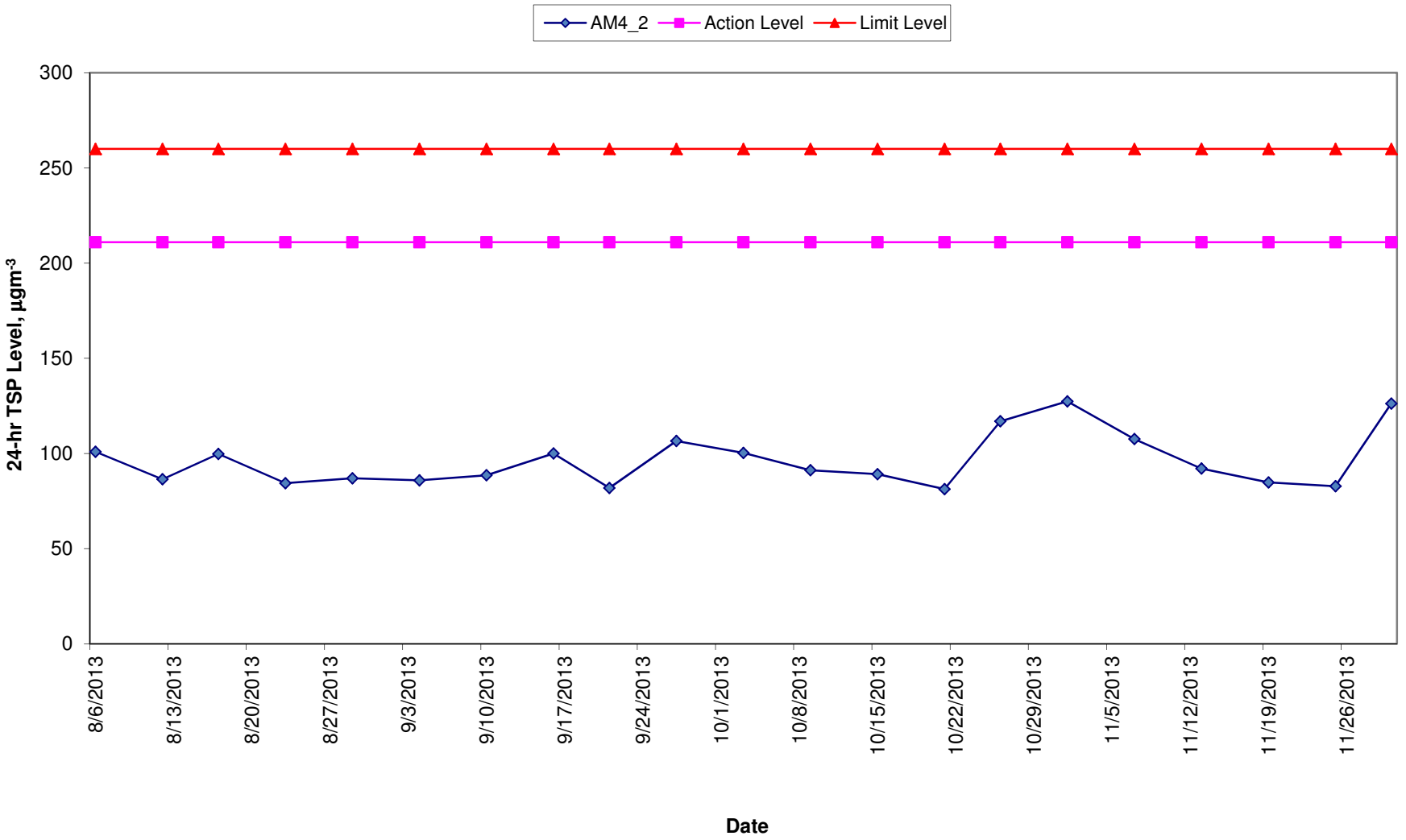
26/11/2013
29/11/2013
02/12/2013
05/12/2013
08/12/2013
Date


24-hr TSP Level
AM4_2 (A Location within DSD Central PTW)
AM4_2
Action Level
Limit Level
300
250
200
150
100
50
0
24-hr TSP Level, µgm-3
8/6/2013
8/13/2013
8/20/2013
8/27/2013
9/3/2013
9/10/2013
9/17/2013
9/24/2013
10/1/2013
10/8/2013
10/15/2013
10/22/2013
10/29/2013
11/5/2013
11/12/2013
11/19/2013
11/26/2013
Date

Meteorological Data Extracted from the Hong Kong Observatory

		King's Park Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	28	70-94	1.0	0-15	NW
2013-09-03	-	27	82-98	5.0	0-14	SE
2013-09-04	Sunny	25	90-99	88.9	0-21	SE
2013-09-08	-	28	63-88	0.0	2-17	SE
2013-09-10	Sunny	29	66-88	0.0	2-16	SE
2013-09-15	Sunny	28	66-94	15.2	0-20	SE/NW
2013-09-16	Sunny	25	68-95	0.8	1-24	SE
2013-09-17	-	28	61-82	0.0	7-23	SE
2013-09-19	Cloudy	29	62-86	0.0	0-27	SE
2013-09-20	-	30	58-87	0.0	0-12	SE/W
2013-09-21	Fine	31	51-88	0.0	0-21	N
2013-09-22	Cloudy	28	58-93	30.6	3-40	N/NW
2013-09-23	-	28	79-98	56.9	0-37	SW
2013-09-24	Sunny	29	78-94	1.3	7-20	SE
2013-09-26	Sunny	27	66-84	0.1	1-18	E
2013-09-27	Sunny	26	67-87	0.1	1-18	SE/NE
2013-09-29	Sunny	26	74-97	2.9	2-16	NE/E
2013-09-30	Fine	25	84-97	10.0	3-21	E

		Tsing Yi Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%) *	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	27	70-94	1.0	1-18	S/NW
2013-09-03	-	26	82-98	5.0	1-16	S
2013-09-04	Rainy	25	90-99	88.9	1-21	E
2013-09-08	-	29	63-88	0.0	3-19	SE
2013-09-10	Sunny	30	66-88	0.0	1-20	N
2013-09-15	Sunny	28	66-94	15.2	1-14	--
2013-09-16	Sunny	29	68-95	0.8	1-22	--
2013-09-17	-	29	61-82	0.0	4-23	--
2013-09-19	Cloudy	29	62-86	0.0	1-26	--
2013-09-20	-	30	58-87	0.0	1-13	--
2013-09-21	Fine	31	51-88	0.0	1-22	--
2013-09-22	Cloudy	29	58-93	30.6	8-50	--
2013-09-23	-	27	79-98	56.9	8-48	--
2013-09-24	Sunny	29	78-94	1.3	6-22	--
2013-09-26	Sunny	28	66-84	0.1	1-15	--
2013-09-27	Sunny	27	67-87	0.1	1-15	--
2013-09-29	Sunny	26	74-97	2.9	1-10	--
2013-09-30	Fine	26	84-97	10.0	1-14	--

		Kai Tak Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	28	70-94	1.0	0-22	SE/NW
2013-09-03	-	27	82-98	5.0	1-18	SE
2013-09-04	Sunny	25	90-99	88.9	1-25	SE
2013-09-08	-	28	63-88	0.0	1-24	E/SE
2013-09-10	Sunny	29	66-88	0.0	4-22	E/SE
2013-09-15	Sunny	28	66-94	15.2	1-23	SE
2013-09-16	Sunny	25	68-95	0.8	8-31	E
2013-09-17	-	28	61-82	0.0	11-32	E
2013-09-19	Cloudy	29	62-86	0.0	2-31	E
2013-09-20	-	30	58-87	0.0	1-16	SE/SW
2013-09-21	Fine	31	51-88	0.0	3-25	NW
2013-09-22	Cloudy	28	58-93	30.6	3-52	NW
2013-09-23	-	28	79-98	56.9	2-39	S/SE
2013-09-24	Sunny	29	78-94	1.3	12-28	E
2013-09-26	Sunny	27	66-84	0.1	5-22	NE
2013-09-27	Sunny	26	67-87	0.1	3-24	E

		Green Island Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	28	70-94	1.0	1-39	SW
2013-09-03	-	27	82-98	5.0	1-21	S
2013-09-04	Sunny	25	90-99	88.9	5-45	SW/NE
2013-09-08	-	28	63-88	0.0	9-32	NE
2013-09-10	Sunny	29	66-88	0.0	17-38	NE
2013-09-15	Sunny	28	66-94	15.2	1-36	NW/NE
2013-09-16	Sunny	25	68-95	0.8	12-48	NE
2013-09-17	-	28	61-82	0.0	30-57	NE
2013-09-19	Cloudy	29	62-86	0.0	18-57	NE
2013-09-20	-	30	58-87	0.0	1-31	N/S
2013-09-21	Fine	31	51-88	0.0	8-38	N
2013-09-22	Cloudy	28	58-93	30.6	19-77	N
2013-09-23	-	28	79-98	56.9	19-79	S
2013-09-24	Sunny	29	78-94	1.3	10-40	E/NE
2013-09-26	Sunny	27	66-84	0.1	14-43	NE
2013-09-27	Sunny	26	67-87	0.1	14-35	NE

Meteorological Data Extracted from the Hong Kong Observatory

		King's Park Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	0-15	NE
2013-10-03	Sunny	27	51 - 86	0.0	0-12	NE
2013-10-06	Sunny	28	38 - 57	0.0	0-19	N
2013-10-07	Sunny	29	48 - 61	0.0	0-21	N
2013-10-08	Fine	27	58 - 73	0.0	0-16	NE
2013-10-09	Sunny	28	65 - 85	0.0	0-19	SE
2013-10-12	Sunny	28	50 - 79	Trace	0-19	SE
2013-10-13	Sunny	28	57 - 77	0.0	3-26	SE
2013-10-15	Sunny	28	61 - 84	0.0	0-18	SE
2013-10-18	Sunny	26	53 - 75	Trace	2-18	E
2013-10-20	Sunny	26	56 - 82	0.0	0-16	SE
2013-10-21	Sunny	25	63 - 82	0.1	0-11	NE
2013-10-22	Fine	26	50 - 79	0.0	0-16	NE
2013-10-24	Sunny	25	29 - 51	0.0	0-20	NE
2013-10-26	Sunny	23	40 - 66	0.0	0-17	SE/NE
2013-10-27	Sunny	22	54 - 76	0.0	0-17	SE
2013-10-29	Sunny	24	56 - 83	0.0	1-17	SE
2013-10-30	Sunny	25	62 - 83	0.0	0-19	SE

		Tsing Yi Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%) *	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	1-13	--
2013-10-03	Sunny	27	51 - 86	0.0	1-14	--
2013-10-06	Sunny	27	38 - 57	0.0	1-21	--
2013-10-07	Sunny	29	48 - 61	0.0	2-22	--
2013-10-08	Fine	27	58 - 73	0.0	1-19	--
2013-10-09	Sunny	28	65 - 85	0.0	1-16	--
2013-10-12	Sunny	28	50 - 79	Trace	1-23	--
2013-10-13	Sunny	28	57 - 77	0.0	3-20	--
2013-10-15	Sunny	28	61 - 84	0.0	2-21	--
2013-10-18	Sunny	27	53 - 75	Trace	1-15	--
2013-10-20	Sunny	25	56 - 82	0.0	1-12	--
2013-10-21	Sunny	26	63 - 82	0.1	1-14	--
2013-10-22	Fine	26	50 - 79	0.0	1-16	--
2013-10-24	Sunny	24	29 - 51	0.0	1-19	--
2013-10-26	Sunny	23	40 - 66	0.0	1-17	--
2013-10-27	Sunny	22	54 - 76	0.0	1-15	--
2013-10-29	Sunny	25	56 - 83	0.0	1-19	--
2013-10-30	Sunny	25	62 - 83	0.0	1-21	--

		Kai Tak Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	1-16	NE
2013-10-03	Sunny	27	51 - 86	0.0	1-19	SE/N
2013-10-06	Sunny	28	38 - 57	0.0	1-23	NW
2013-10-07	Sunny	29	48 - 61	0.0	2-27	NW
2013-10-08	Fine	27	58 - 73	0.0	1-22	NW/N
2013-10-09	Sunny	28	65 - 85	0.0	1-25	SE
2013-10-12	Sunny	28	50 - 79	Trace	1-27	E
2013-10-13	Sunny	28	57 - 77	0.0	6-29	E
2013-10-15	Sunny	28	61 - 84	0.0	4-23	E
2013-10-18	Sunny	26	53 - 75	Trace	5-24	NE/SE
2013-10-20	Sunny	26	56 - 82	0.0	1-16	SE
2013-10-21	Sunny	25	63 - 82	0.1	1-19	SE/NE
2013-10-22	Fine	26	50 - 79	0.0	1-15	N/NE
2013-10-24	Sunny	25	29 - 51	0.0	1-19	N
2013-10-26	Sunny	23	40 - 66	0.0	2-19	N
2013-10-27	Sunny	22	54 - 76	0.0	2-24	E

		Green Island Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	1-22	NE/SW
2013-10-03	Sunny	27	51 - 86	0.0	2-28	NE/SW
2013-10-06	Sunny	28	38 - 57	0.0	4-39	N
2013-10-07	Sunny	29	48 - 61	0.0	19-42	N
2013-10-08	Fine	27	58 - 73	0.0	12-34	N
2013-10-09	Sunny	28	65 - 85	0.0	5-33	NE/N
2013-10-12	Sunny	28	50 - 79	Trace	4-46	NE/N
2013-10-13	Sunny	28	57 - 77	0.0	10-50	NE
2013-10-15	Sunny	28	61 - 84	0.0	11-37	NE
2013-10-18	Sunny	26	53 - 75	Trace	3-41	NE
2013-10-20	Sunny	26	56 - 82	0.0	3-24	NE/S
2013-10-21	Sunny	25	63 - 82	0.1	1-24	N
2013-10-22	Fine	26	50 - 79	0.0	1-37	N
2013-10-24	Sunny	25	29 - 51	0.0	2-34	NE
2013-10-26	Sunny	23	40 - 66	0.0	7-34	NE
2013-10-27	Sunny	22	54 - 76	0.0	8-34	NE

Meteorological Data Extracted from the Hong Kong Observatory

		King's Park Station				
Date	Weather	Average Air Temperature (℃)	Average Relative Humiditiy (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	0-16	NE/SE
2013-11-03	Sunny	26	65 - 66	0.4	5-25	NE
2013-11-05	Sunny	23	79 - 98	3.6	0-18	E
2013-11-07	Sunny	25	65 - 90	0.0	0-19	SE
2013-11-10	Fine	25	77 - 96	7.6	2-25	SE/E
2013-11-11	Sunny	24	82 - 87	Trace	12-28	SE
2013-11-13	Cloudy	21	84 - 100	3.9	0-12	NE/E
2013-11-15	Sunny	22	62 - 83	0.0	0-15	SE
2013-11-17	Sunny	21	50 - 66	0.0	0-15	NE/SE
2013-11-19	Fine	20	56 - 77	0.0	1-15	NE/E
2013-11-21	Sunny	20	55 - 79	0.5	0-17	SE/E
2013-11-24	Sunny	26	72 - 96	15.2	0-21	NE/SE
2013-11-25	Sunny	20	40 - 80	0.0	0-17	NE/N
2013-11-26	Cloudy	20	59 - 80	0.0	0-17	SE/E
2013-11-27	Sunny	20	68 - 88	0.5	-	SE/NE
2013-11-30	Sunny	16	43 - 66	0.0	0-14	NE/SE

		Tsing Yi Station				
Date	Weather	Average Air Temperature (℃)	Average Relative Humiditiy (%) *	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	1-18	--
2013-11-03	Sunny	26	65 - 66	0.4	0-18	--
2013-11-05	Sunny	23	79 - 98	3.6	1-10	--
2013-11-07	Sunny	25	65 - 90	0.0	1-15	--
2013-11-10	Fine	26	77 - 96	7.6	9-21	--
2013-11-11	Sunny	--	82 - 87	Trace	10-31	--
2013-11-13	Cloudy	22	84 - 100	3.9	1-13	--
2013-11-15	Sunny	22	62 - 83	0.0	1-12	--
2013-11-17	Sunny	22	50 - 66	0.0	1-15	--
2013-11-19	Fine	20	56 - 77	0.0	0-12	--
2013-11-21	Sunny	20	55 - 79	0.5	1-16	--
2013-11-24	Sunny	24	72 - 96	15.2	1-21	--
2013-11-25	Sunny	20	40 - 80	0.0	0-25	--
2013-11-26	Cloudy	20	59 - 80	0.0	0-19	--
2013-11-27	Sunny	20	68 - 88	0.5	3-18	--
2013-11-30	Sunny	17	43 - 66	0.0	1-16	--

		Kai Tak Station				
Date	Weather	Average Air Temperature (℃) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	0-22	E/NE
2013-11-03	Sunny	26	65 - 66	0.4	3-26	NE
2013-11-05	Sunny	23	79 - 98	3.6	1-19	E/NE
2013-11-07	Sunny	25	65 - 90	0.0	5-23	E
2013-11-10	Fine	25	77 - 96	7.6	16 -30	E
2013-11-11	Sunny	24	82 - 87	Trace	20 - 42	E
2013-11-13	Cloudy	21	84 - 100	3.9	3-17	NE/N
2013-11-15	Sunny	22	62 - 83	0.0	1-20	NW/NE
2013-11-17	Sunny	21	50 - 66	0.0	1-19	NW/NE
2013-11-19	Fine	20	56 - 77	0.0	3-22	NE/E
2013-11-21	Sunny	20	55 - 79	0.5	3-21	NE/E
2013-11-24	Sunny	26	72 - 96	15.2	1-22	NW/SE
2013-11-25	Sunny	20	40 - 80	0.0	3-30	NW/NE
2013-11-26	Cloudy	20	59 - 80	0.0	3-21	NE/E
2013-11-27	Sunny	20	68 - 88	0.5	3-24	NW/E

		Green Island Station				
Date	Weather	Average Air Temperature (℃) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	1-36	NE/S
2013-11-03	Sunny	26	65 - 66	0.4	29-52	NE
2013-11-05	Sunny	23	79 - 98	3.6	13-45	NE
2013-11-07	Sunny	25	65 - 90	0.0	15-41	NE
2013-11-10	Fine	25	77 - 96	7.6	29-57	NE
2013-11-11	Sunny	24	82 - 87	Trace	35 - 65	NE
2013-11-13	Cloudy	21	84 - 100	3.9	6 - 45	NE/N
2013-11-15	Sunny	22	62 - 83	0.0	3-28	NE/NW
2013-11-17	Sunny	21	50 - 66	0.0	1-25	NE/N
2013-11-19	Fine	20	56 - 77	0.0	12-36	NE/N
2013-11-21	Sunny	20	55 - 79	0.5	3-40	NE
2013-11-24	Sunny	26	72 - 96	15.2	4-52	NW
2013-11-25	Sunny	20	40 - 80	0.0	2-48	N
2013-11-26	Cloudy	20	59 - 80	0.0	13-47	NE/N
2013-11-27	Sunny	20	68 - 88	0.5	5-42	NE/N

Annex E6 Noise Monitoring Results

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							
04-Sep-13	14:55	15:25	Cloudy	75	76	74	Lifting	Traffic Noise	-	31	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
10-Sep-13	9:15	9:45	Sunny	75	76	74	Lifting	Traffic Noise	-	31	0.4	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
16-Sep-13	13:00	13:30	Sunny	75	76	74	Lifting	Traffic Noise	-	29	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
27-Sep-13	14:00	14:30	Sunny	75	76	74	Crane	Traffic Noise	-	29	0.8	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
			Min.	**75**									
			Max.	**75**									

Annex E6 Noise Monitoring Results

Daytime Noise Monitoring Results

Station NM3

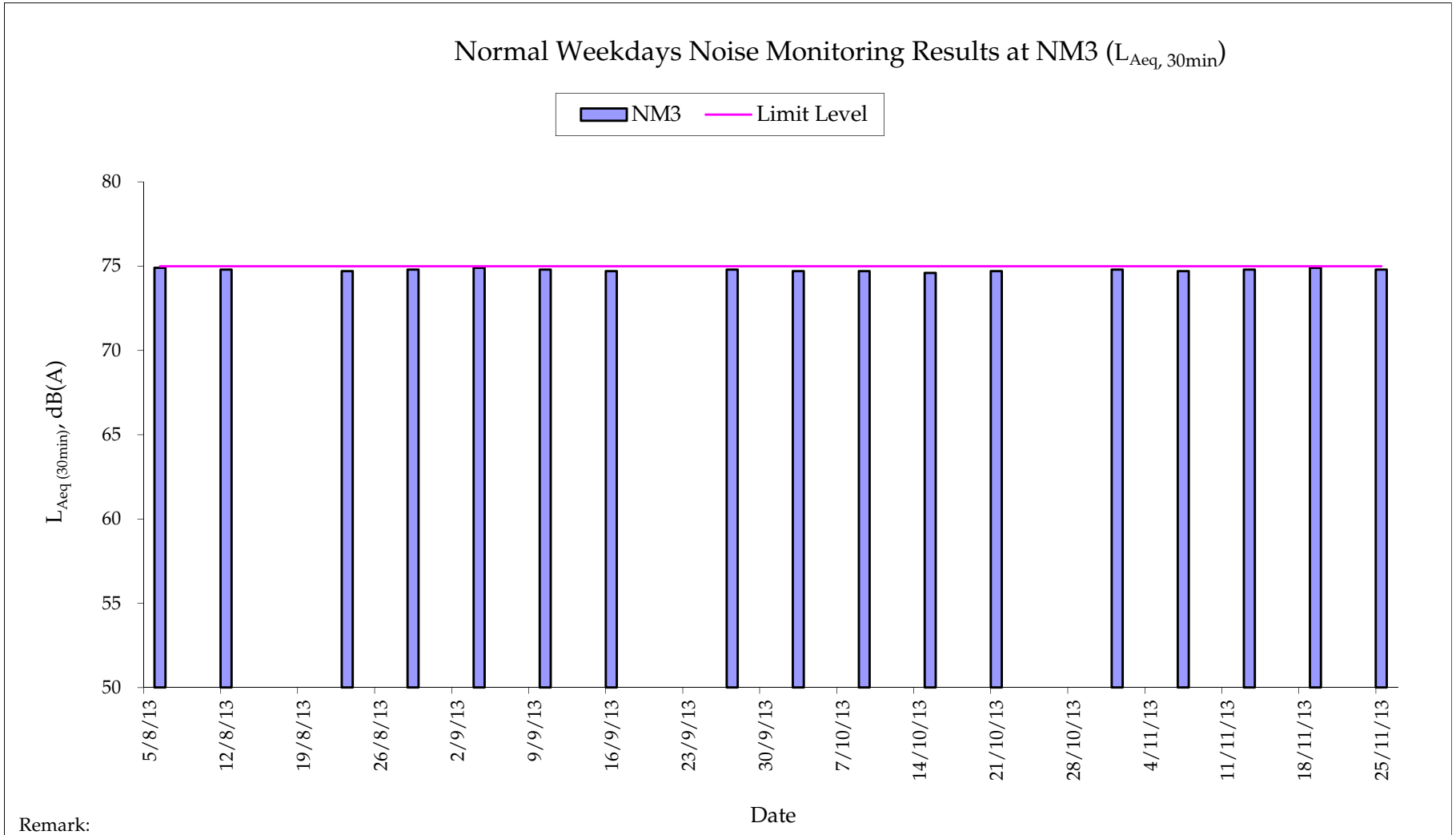
Date	Start Time	End Time	Weather	Noise level (dB(A)), 30 min			Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
03-Oct-13	13:00	13:30	Sunny	75	76	74	Crumber Crane	Traffic noise	-	30	0.3	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
09-Oct-13	14:05	14:35	Sunny	75	76	74	Crumber Crane	Traffic noise	-	28	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
15-Oct-13	10:25	10:55	Sunny	75	76	74	Crumber Crane	Traffic noise	-	28	0.8	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
21-Oct-13	10:25	10:55	Sunny	75	76	74	Lifting	Traffic noise	-	28	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
			Min.	**75**									
			Max.	**75**									

Annex E6 Noise Monitoring Results

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							
01-Nov-13	14:05	14:35	Sunny	75	77	74	Lifting	Traffic noise	-	26	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
07-Nov-13	10:25	10:55	Sunny	75	76	74	Lifting	Traffic noise	-	27	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
13-Nov-13	14:05	14:35	Cloudy	75	76	74	Lifting	Traffic noise	-	23	0.8	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
19-Nov-13	10:25	10:55	Fine	75	76	74	Lifting	Traffic noise	-	22	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
25-Nov-13	14:20	14:50	Sunny	75	78	74	Lifting	Traffic noise	-	22	0..5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
			Min.	**75**									
			Max.	**75**									



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

Annex E7 Cumulative Complaint and Summons/Prosecutions Log

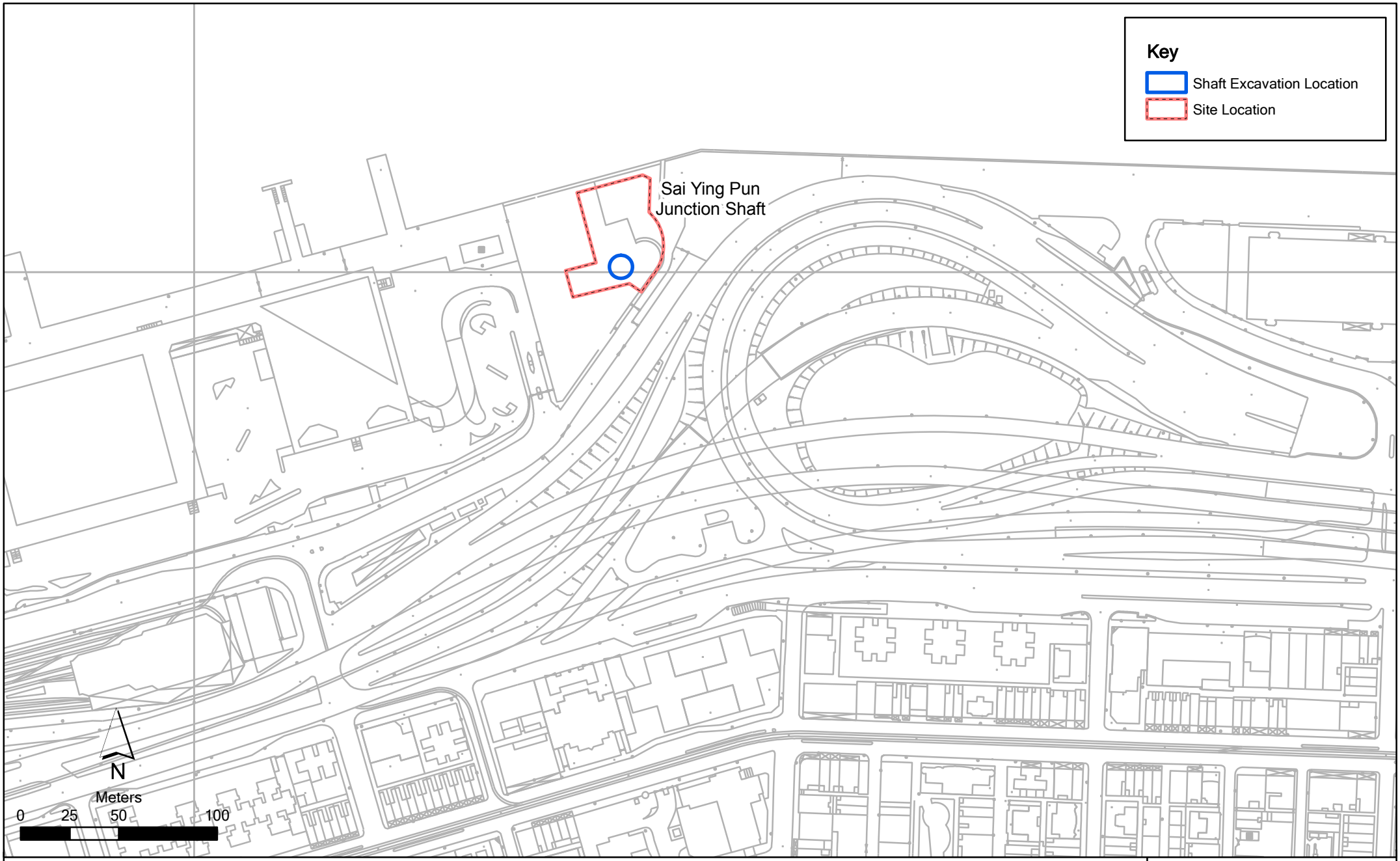
Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
December 2009	0	0
January 2010	0	0
February 2010	0	0
March 2010	0	0
April 2010	0	0
May 2010	0	0
June 2010	0	0
July 2010	0	0
August 2010	0	0
September 2010	0	0
October 2010	0	0
November 2010	0	0
December 2010	0	0
January 2011	0	0
February 2011	0	0
March 2011	0	0
April 2011	0	0
May 2011	0	0

Annex E7 Cumulative Complaint and Summons/Prosecutions Log

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
June 2011	0	0
July 2011	0	0
August 2011	0	0
September 2011	0	0
October 2011	0	0
November 2011	0	0
December 2011	0	0
January 2012	0	0
February 2012	0	0
March 2012	0	0
April 2012	0	0
May 2012	0	0
June 2012	0	0
July 2012	0	0
August 2012	0	0
September 2012	0	0
October 2012	0	0
November 2012	0	0

Annex F

Sai Ying Pun Junction Shaft



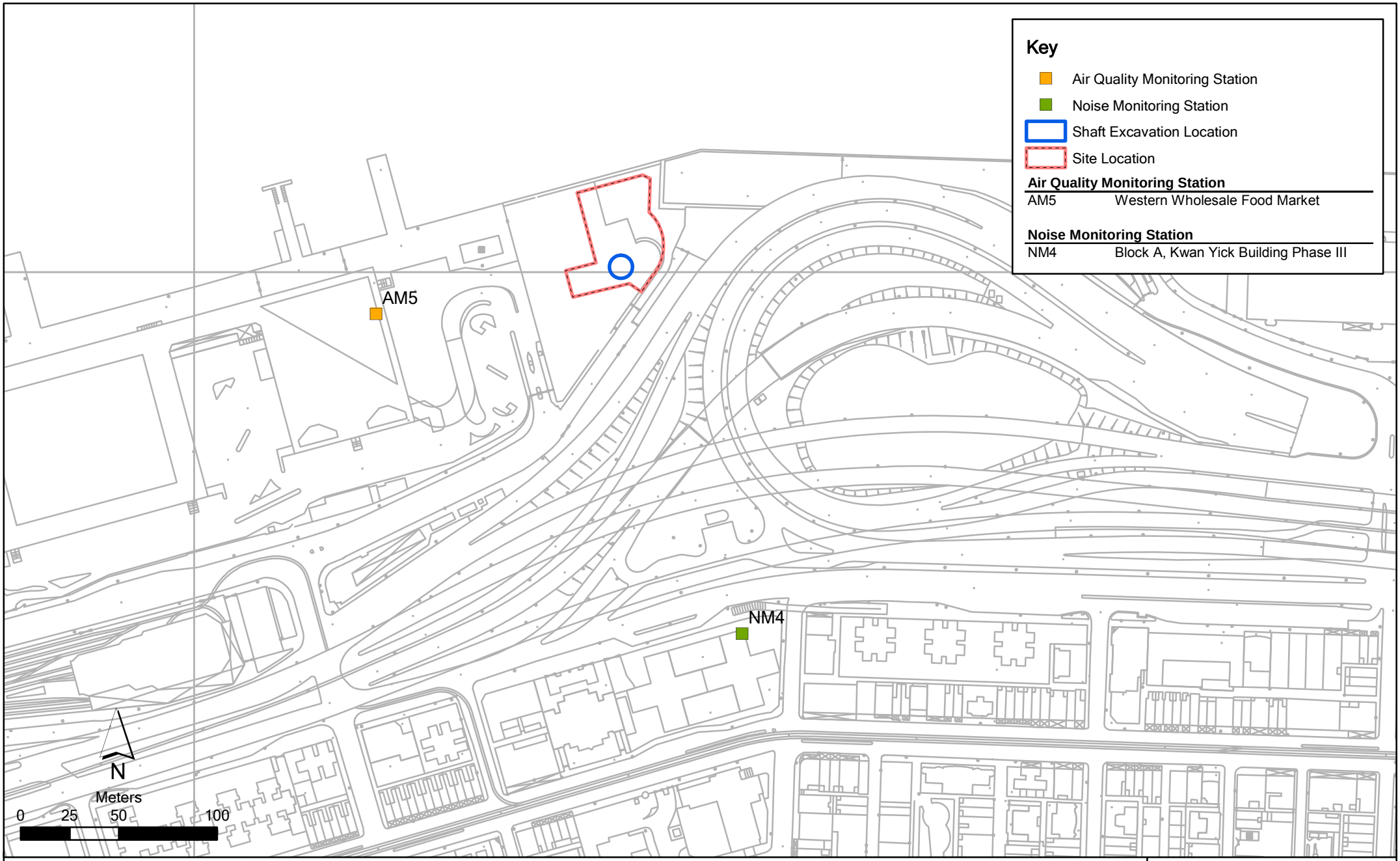
Annex F1

Contract No. DC/2007/23
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Construction Site Locations at Sai Ying Pun

File: EM&A and proposed station\0104887_Sai Ying Pun.mxd
Date: 03/03/2010

Environmental Resources Management

ERM



Annex F2

Contract No. DC/2007/23
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Impact Air Quality & Noise Monitoring Stations (Fung Mat Road)

File: EM&A and proposed station\
0104887_Sai Ting Pun_NMAM.mxd
Date: 03/03/2010

Environmental Resources Management

ERM

Annex F3 Not Used

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase			
Air Quality	The Air Pollution Control (Construction Dust) Regulation shall be implemented and good site practices shall be incorporated in the contract clauses to minimise construction dust impact. Control measures relevant to this Project are listed below: • skip hoist for material transport should be totally enclosed by impervious sheeting; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site; • 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 hardcores; • where a site boundary adjoins a road, streets or other 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; • 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; • regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather; • site enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines; • open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible; • tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and • instigation of an environmental monitoring auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	The following watering measures for specific site would be required to control the fugitive dust impacts: • watering twice per day within the worksites at Fung Mat Road Site; • the barging points should be continuous watering throughout the whole unloading process.	All work sites / during construction	√
Operational Phase			
Air Quality	Good housekeeping for SCISTW and PTWs listed below should be followed to ameliorate any odour impact from the plant and these standard practices should be included in the plant operator manual. • Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers to minimise odour escape • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality	Commissioning tests for all deodorisation system should be included in the Design and Construction Contract Document.	All PTW and SCISTW/ during operational phase	NA. Measures not required until commencement of operational phase
Construction Phase			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Good Site Practice: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction program; • mobile plant, if any, should be sited as far from NSRs as possible; • machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities; Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.	All work sites / during construction	√
Construction Phase			
Water Quality	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 work sites / during construction	√
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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) Regulation should be observed and complied with for control of chemical wastes.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront To minimise 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 the storm culvert or sea	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Operational Phase			
Water Quality	Dual power supply, standby facilities for the main treatment units and standby equipment parts / accessories should be provided as far as possible at the SCISTW to minimise the chance of emergency discharge.	SCISTW and all the Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Waste	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 minimise the use of timber formwork.	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Recommendations to achieve waste reduction include: • 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; and • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All work sites / during the construction period	√
Waste	Recommendations for good site practices during construction activities include:- • 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 • 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. • Provision of sufficient waste disposal points and regular collection of waste • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	NA
Waste	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.	All work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	<>
Waste	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, oxidising, 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.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Landscape & Visual	• Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. • 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. • Erection of decorative screen hoarding compatible with the surrounding setting.	All the works areas, PTWs and SCISTW/ during the construction period	√
Operational Phase	•		
Landscape & Visual	• Aesthetic design of the façade of PTW and associated structures to harmonise with the surrounding settings. • Shrub and Climbing Plants to soften proposed structures / Roof Greening. • Buffer Tree and Shrub Planting to screen proposed associated structures. • Reinstated of disturbed area	All the works areas, PTWs and SCISTW/ during the construction period	NA. Measures not required until commencement of operational phase
Construction Phase			
Cultural Heritage	The construction vibration control limit (ppv of 25mm/s) shall be strictly followed.	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	√

Remark:

√ Compliance of Mitigation Measures
<> Compliance of Mitigation but need improvement
x Non-compliance of Mitigation Measures
Δ Deficiency of Mitigation Measures but rectified by Gammon Construction Limited
NA Not Applicable

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase			
Air Quality	The Air Pollution Control (Construction Dust) Regulation shall be implemented and good site practices shall be incorporated in the contract clauses to minimise construction dust impact. Control measures relevant to this Project are listed below: • skip hoist for material transport should be totally enclosed by impervious sheeting; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site; • 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 hardcores; • where a site boundary adjoins a road, streets or other 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; • 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; • regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather; • site enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines; • open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible; • tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and • instigation of an environmental monitoring auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	The following watering measures for specific site would be required to control the fugitive dust impacts: • watering twice per day within the worksites at Fung Mat Road Site; • the barging points should be continuous watering throughout the whole unloading process.	All work sites / during construction	√
Operational Phase			
Air Quality	Good housekeeping for SCISTW and PTWs listed below should be followed to ameliorate any odour impact from the plant and these standard practices should be included in the plant operator manual. • Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers to minimise odour escape • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality	Commissioning tests for all deodorisation system should be included in the Design and Construction Contract Document.	All PTW and SCISTW/ during operational phase	NA. Measures not required until commencement of operational phase
Construction Phase			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Good Site Practice: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction program; • mobile plant, if any, should be sited as far from NSRs as possible; • machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities; Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.	All work sites / during construction	√
Construction Phase			
Water Quality	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 work sites / during construction	√
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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) Regulation should be observed and complied with for control of chemical wastes.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	<>

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront To minimise 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 the construction works. • Stockpiles 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 a 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 the storm culvert or sea	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Operational Phase			
Water Quality	Dual power supply, standby facilities for the main treatment units and standby equipment parts / accessories should be provided as far as possible at the SCISTW to minimise the chance of emergency discharge.	SCISTW and all the Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Waste	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 minimise the use of timber formwork.	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Recommendations to achieve waste reduction include: • 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; and • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All work sites / during the construction period	√
Waste	Recommendations for good site practices during construction activities include:- • 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 • 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. • Provision of sufficient waste disposal points and regular collection of waste • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors	All work sites / during the construction period	<>
Waste	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 work sites / during the construction period	NA
Waste	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.	All work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Waste	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, oxidising, 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.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Landscape & Visual	• Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. • 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. • Erection of decorative screen hoarding compatible with the surrounding setting.	All the works areas, PTWs and SCISTW/ during the construction period	√
Operational Phase	•		
Landscape & Visual	• Aesthetic design of the façade of PTW and associated structures to harmonise with the surrounding settings. • Shrub and Climbing Plants to soften proposed structures / Roof Greening. • Buffer Tree and Shrub Planting to screen proposed associated structures. • Reinstated of disturbed area	All the works areas, PTWs and SCISTW/ during the construction period	NA. Measures not required until commencement of operational phase
Construction Phase			
Cultural Heritage	The construction vibration control limit (ppv of 25mm/s) shall be strictly followed.	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	√

Remark:

√ Compliance of Mitigation Measures
<> Compliance of Mitigation but need improvement
x Non-compliance of Mitigation Measures
Δ Deficiency of Mitigation Measures but rectified by Gammon Construction Limited
NA Not Applicable

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase			
Air Quality	The Air Pollution Control (Construction Dust) Regulation shall be implemented and good site practices shall be incorporated in the contract clauses to minimise construction dust impact. Control measures relevant to this Project are listed below: • skip hoist for material transport should be totally enclosed by impervious sheeting; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site; • 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 hardcores; • where a site boundary adjoins a road, streets or other 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; • 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; • regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather; • site enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines; • open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible; • tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and • instigation of an environmental monitoring auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	The following watering measures for specific site would be required to control the fugitive dust impacts: • watering twice per day within the worksites at Fung Mat Road Site; • the barging points should be continuous watering throughout the whole unloading process.	All work sites / during construction	√
Operational Phase			
Air Quality	Good housekeeping for SCISTW and PTWs listed below should be followed to ameliorate any odour impact from the plant and these standard practices should be included in the plant operator manual. • Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers to minimise odour escape • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality	Commissioning tests for all deodorisation system should be included in the Design and Construction Contract Document.	All PTW and SCISTW/ during operational phase	NA. Measures not required until commencement of operational phase
Construction Phase			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Good Site Practice: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction program; • mobile plant, if any, should be sited as far from NSRs as possible; • machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities; Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.	All work sites / during construction	√
Construction Phase			
Water Quality	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 work sites / during construction	√
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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) Regulation should be observed and complied with for control of chemical wastes.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	<>

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront To minimise 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 the construction works. • Stockpiles 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 a 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 the storm culvert or sea	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Operational Phase			
Water Quality	Dual power supply, standby facilities for the main treatment units and standby equipment parts / accessories should be provided as far as possible at the SCISTW to minimise the chance of emergency discharge.	SCISTW and all the Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Waste	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 minimise the use of timber formwork.	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Recommendations to achieve waste reduction include: • 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; and • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All work sites / during the construction period	√
Waste	Recommendations for good site practices during construction activities include:- • 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 • 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. • Provision of sufficient waste disposal points and regular collection of waste • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors	All work sites / during the construction period	<>
Waste	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 work sites / during the construction period	NA
Waste	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.	All work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Waste	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, oxidising, 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.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Landscape & Visual	• Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. • 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. • Erection of decorative screen hoarding compatible with the surrounding setting.	All the works areas, PTWs and SCISTW/ during the construction period	√
Operational Phase	•		
Landscape & Visual	• Aesthetic design of the façade of PTW and associated structures to harmonise with the surrounding settings. • Shrub and Climbing Plants to soften proposed structures / Roof Greening. • Buffer Tree and Shrub Planting to screen proposed associated structures. • Reinstated of disturbed area	All the works areas, PTWs and SCISTW/ during the construction period	NA. Measures not required until commencement of operational phase
Construction Phase			
Cultural Heritage	The construction vibration control limit (ppv of 25mm/s) shall be strictly followed.	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	√

Remark:

√ Compliance of Mitigation Measures
<> Compliance of Mitigation but need improvement
x Non-compliance of Mitigation Measures
Δ Deficiency of Mitigation Measures but rectified by Gammon Construction Limited
NA Not Applicable

Annex F5 24-hour and 1-hour TSP Monitoring Results

1-hour TSP Monitoring Results

Station AM5

Date	Start Time	Finish Time	Weather	TSP Concentration (µg/m3)	Action Level (µg/m3)	Limit Level (µg/m3)	Site Conditions / Observations / Remarks	Temperature (°C)	Wind Speed (m/s)	Sampler ID	Filter ID
04-Sep-13	8:00	9:00	Fine	141	332	500	operation of excatavor and loading	25	<5	Western Wholesale Food Market	1604
	9:08	10:08	Fine	34	332	500	operation of excatavor and loading	25	<5	Western Wholesale Food Market	1605
	10:13	11:13	Fine	47	332	500	operation of excatavor and loading	25	<5	Western Wholesale Food Market	1606
10-Sep-13	8:00	9:00	Fine	211	332	500	operation of excatavor and loading	29	<5	Western Wholesale Food Market	1610
	14:06	15:06	Fine	67	332	500	operation of excatavor and loading	29	<5	Western Wholesale Food Market	1612
	15:11	16:11	Fine	64	332	500	operation of excatavor and loading	29	<5	Western Wholesale Food Market	1613
16-Sep-13	14:11	15:11	Fine	121	332	500	operation of excatavor and loading	28	<5	Western Wholesale Food Market	1618
	15:17	16:17	Fine	97	332	500	operation of excatavor and loading	28	<5	Western Wholesale Food Market	1619
	16:23	17:23	Fine	114	332	500	operation of excatavor and loading	28	<5	Western Wholesale Food Market	1620
19-Sep-13	8:50	9:50	Sunny	93	332	500	Tunnel Works	29	<5	Western Wholesale Food Market	1625
	9:56	10:56	Sunny	67	332	500	Tunnel Works	29	<5	Western Wholesale Food Market	1626
	11:00	12:00	Sunny	67	332	500	Tunnel Works	29	<5	Western Wholesale Food Market	1627
25-Sep-13	9:02	10:02	Sunny	56	332	500	Tunnel Works	28	<5	Western Wholesale Food Market	1632
	10:06	11:06	Sunny	57	332	500	Tunnel Works	28	<5	Western Wholesale Food Market	1633
	11:12	12:12	Sunny	71	332	500	Tunnel Works	28	<5	Western Wholesale Food Market	1634
27-Sep-13	13:00	14:00	Sunny	79	332	500	Tunnel Works	27	<5	Western Wholesale Food Market	1639
	14:07	15:07	Sunny	82	332	500	Tunnel Works	26.5	<5	Western Wholesale Food Market	1640
	15:13	16:13	Sunny	91	332	500	Tunnel Works	26.5	<5	Western Wholesale Food Market	1641
			Min.	**34**							
			Max.	**211**							
			Average	**87**							

* Wind Speed data is presented in the Meteorological Data table

Annex F5 24-hour and 1-hour TSP Monitoring Results

1-hour TSP Monitoring Results

Station AM5

Date	Start Time	Finish Time	Weather	TSP Concentration (μg/m3)	Action Level (μg/m3)	Limit Level (μg/m3)	Site Conditions / Observations / Remarks	Temperature (°C)	Wind Speed (m/s)	Sampler ID	Filter ID
03-Oct-13	13:26	14:26	Sunny	167	332	500	Mucking	27	<5	Western Wholesale Food Market	1643
	14:43	15:43	Sunny	137	332	500	Mucking	27	<5	Western Wholesale Food Market	1644
	15:51	16:51	Sunny	133	332	500	Mucking	27	<5	Western Wholesale Food Market	1645
09-Oct-13	8:00	9:00	Sunny	246	332	500	Tunnel Works	27	<5	Western Wholesale Food Market	1650
	13:09	14:09	Sunny	98	332	500	Tunnel Works	27	<5	Western Wholesale Food Market	1654
	14:16	15:16	Sunny	81	332	500	Tunnel Works	27	<5	Western Wholesale Food Market	1655
15-Oct-13	13:00	14:00	Sunny	77	332	500	Mucking	27	<5	Western Wholesale Food Market	1660
	14:18	15:18	Sunny	134	332	500	Mucking	27	<5	Western Wholesale Food Market	1661
	15:32	16:32	Sunny	91	332	500	Mucking	27	<5	Western Wholesale Food Market	1662
21-Oct-13	13:26	14:26	Sunny	174	332	500	Tunnel Works	27	<5	Western Wholesale Food Market	1665
	14:35	15:35	Sunny	182	332	500	Tunnel Works	27	<5	Western Wholesale Food Market	1666
	15:45	16:45	Sunny	158	332	500	Tunnel Works	27	<5	Western Wholesale Food Market	1667
24-Oct-13	8:45	9:45	Fine	204	332	500	Mucking	24	<5	Western Wholesale Food Market	1671
	9:53	10:53	Fine	229	332	500	Mucking	24	<5	Western Wholesale Food Market	1672
	11:00	12:00	Fine	190	332	500	Mucking	24	<5	Western Wholesale Food Market	1673
30-Oct-13	8:00	9:00	Fine	154	332	500	Tunnel Works	24	<5	Western Wholesale Food Market	1679
	14:24	15:24	Fine	94	332	500	Tunnel Works	24	<5	Western Wholesale Food Market	1680
	15:33	16:33	Fine	75	332	500	Tunnel Works	24	<5	Western Wholesale Food Market	1681
			Min.	**77**							
			Max.	**246**							
			Average	**153**							

* Wind Speed data is presented in the Meteorological Data table

Annex F5 24-hour and 1-hour TSP Monitoring Results

1-hour TSP Monitoring Results

Station AM5

Date	Start Time	Finish Time	Weather	TSP Concentration (μg/m3)	Action Level (μg/m3)	Limit Level (μg/m3)	Site Conditions / Observations / Remarks	Temperature (°C)	Wind Speed (m/s)	Sampler ID	Filter ID
05-Nov-13	13:26	14:26	Fine	192	332	500	Tunnel Works	23	<5	Western Wholesale Food Market	1688
	14:30	15:30	Fine	94	332	500	Tunnel Works	23	<5	Western Wholesale Food Market	1689
	15:50	16:50	Fine	121	332	500	Tunnel Works	23	<5	Western Wholesale Food Market	1690
11-Nov-13	8:00	9:00	Fine	157	332	500	Tunnel Works	24	<5	Western Wholesale Food Market	1693
	13:36	14:36	Fine	176	332	500	Tunnel Works	24	<5	Western Wholesale Food Market	1694
	14:50	15:50	Fine	60	332	500	Tunnel Works	24	<5	Western Wholesale Food Market	1695
15-Nov-13	8:00	9:00	Fine	53	332	500	Tunnel Works	22	<5	Western Wholesale Food Market	1702
	13:00	14:00	Fine	154	332	500	Tunnel Works	22	<5	Western Wholesale Food Market	1703
	14:22	15:22	Fine	232	332	500	Tunnel Works	22	<5	Western Wholesale Food Market	1704
22-Nov-13	13:20	14:20	Fine	182	332	500	Tunnel Works	21	<5	Western Wholesale Food Market	1711
	14:30	15:30	Fine	99	332	500	Tunnel Works	21	<5	Western Wholesale Food Market	1712
	15:45	16:45	Fine	105	332	500	Tunnel Works	21	<5	Western Wholesale Food Market	1713
27-Nov-13	13:27	14:27	Fine	190	332	500	Tunnel Works	20	<5	Western Wholesale Food Market	1717
	14:50	15:50	Fine	210	332	500	Tunnel Works	20	<5	Western Wholesale Food Market	1718
	16:05	17:05	Fine	266	332	500	Tunnel Works	20	<5	Western Wholesale Food Market	1719
			Min.	**53**							
			Max.	**266**							
			Average	**153**							

* Wind Speed data is presented in the Meteorological Data table

Annex F5 24-hour and 1-hour TSP Monitoring Results

24-hour TSP Monitoring Results

Station AM5

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	(μg/m^3)	(μg/m^3)	(μg/m^3)		ID	ID
04-Sep-13	13:00	05-Sep-13	13:00	Fine	2.8644	2.9348	135.15	159.15	24.00	1.2360	1.2360	1.2360	40	189	260	Rock out	Western Wholesale Food Market	1607
10-Sep-13	16:16	11-Sep-13	16:16	Fine	2.8801	3.0109	162.15	186.15	24.00	1.2300	1.2300	1.2300	74	189	260	Rock out	Western Wholesale Food Market	1614
16-Sep-13	17:26	17-Sep-13	17:26	Fine	2.8711	3.0307	189.15	213.15	24.00	1.2292	1.2292	1.2292	90	189	260	Rock out	Western Wholesale Food Market	1621
19-Sep-13	12:07	20-Sep-13	12:07	Sunny	2.8764	3.0475	216.15	240.15	24.00	1.2541	1.2541	1.2541	95	189	260	Rock out	Western Wholesale Food Market	1628
25-Sep-13	13:00	26-Sep-13	13:00	Sunny	2.8733	2.9885	243.16	267.16	24.00	1.2558	1.2558	1.2558	64	189	260	Rock out	Western Wholesale Food Market	1635
27-Sep-13	13:00	28-Sep-13	13:00	Sunny	2.8572	3.0435	270.16	294.16	24.00	1.2345	1.2345	1.2345	105	188.5	260	Rock out	Western Wholesale Food Market	1642
												Min.	**40**					
												Max.	**95**					
												Average	**72**					

Annex F5 24-hour and 1-hour TSP Monitoring Results

24-hour TSP Monitoring Results

Station AM5

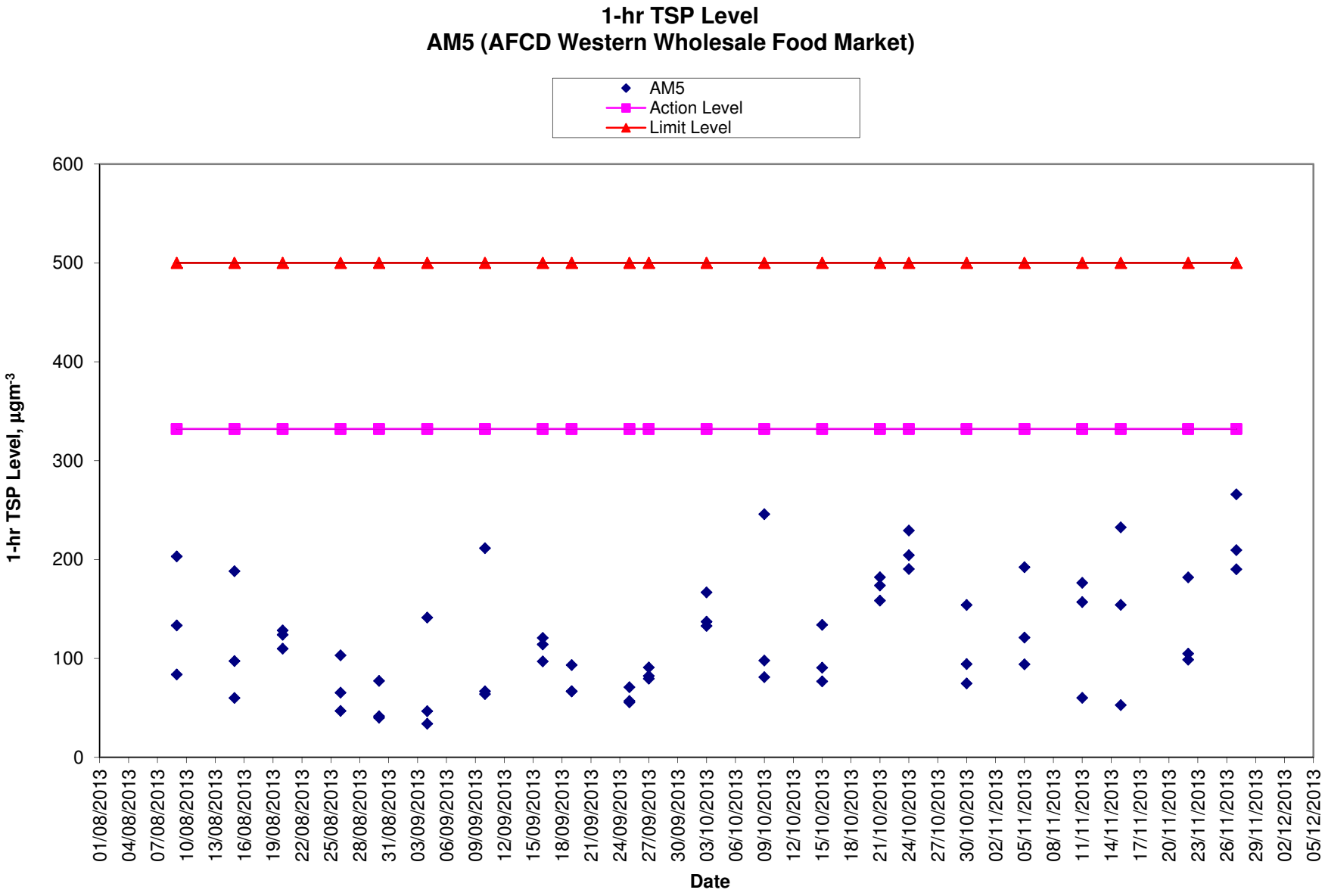
Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time	Flow Rate (m^3/min)			TSP Conc.	Action Level	Limit Level	Observations / Remarks	Sampler	Filter
Date	Time	Date	Time		Initial	Final	Initial	Final	(hrs)	Initial	Final	Average	(μg/m^3)	(μg/m^3)	(μg/m^3)		ID	ID
03-Oct-13	16:58	04-Oct-13	16:58	Sunny	2.8576	3.0924	297.16	321.16	24.00	0.9821	0.9821	0.9821	166	189	260	Tunnel Works	Western Wholesale Food Market	1646
09-Oct-13	15:32	10-Oct-13	15:32	Sunny	2.7519	2.8803	321.16	345.16	24.00	1.1929	1.1929	1.1929	75	189	260	Tunnel Works	Western Wholesale Food Market	1656
15-Oct-13	16:40	16-Oct-13	16:40	Sunny	2.7646	2.9743	351.22	375.22	24.00	1.1948	1.1948	1.1948	122	189	260	Mucking	Western Wholesale Food Market	1663
21-Oct-13	16:56	22-Oct-13	16:56	Sunny	2.7551	2.9932	378.22	402.22	24.00	1.1993	1.1993	1.1993	138	189	260	Tunnel Works	Western Wholesale Food Market	1668
24-Oct-13	15:32	25-Oct-13	15:32	Fine	2.7971	3.1114	405.21	429.21	24.00	1.1990	1.1990	1.1990	**182**	189	260	Tunnel Works	Western Wholesale Food Market	1674
30-Oct-13	16:45	31-Oct-13	16:45	Fine	2.7795	2.9155	432.21	456.21	24.00	1.1538	1.1538	1.1538	82	188.5	260	Tunnel Works	Western Wholesale Food Market	1682
												Min.	**75**					
												Max.	**182**					
												Average	**137**					

Annex F5 24-hour and 1-hour TSP Monitoring Results

24-hour TSP Monitoring Results

Station AM5

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
05-Nov-13	17:03	06-Nov-13	17:03	Fine	2.749	2.9568	459.20	483.20	24.00	1.2052	1.2052	1.2052	120	189	260	Tunnel Works	Western Wholesale Food Market	1691
11-Nov-13	16:06	12-Nov-13	16:06	Fine	2.7734	2.9122	486.20	510.20	24.00	1.2000	1.2000	1.2000	80	189	260	Tunnel Works	Western Wholesale Food Market	1697
15-Nov-13	15:40	16-Nov-13	15:40	Fine	2.7907	2.8456	513.2	537.2	24.00	1.2068	1.2068	1.20683	32	189	260	Tunnel Works	Western Wholesale Food Market	1705
22-Nov-13	17:00	23-Nov-13	17:00	Fine	2.7862	2.9261	541.25	565.25	24.00	1.2566	1.2566	1.2566	77	189	260	Tunnel Works	Western Wholesale Food Market	1710
27-Nov-13	17:17	28-Nov-13	17:17	Fine	2.7957	2.9595	568.25	592.25	24.00	1.2332	1.2332	1.2332	92	189	260	Tunnel Works	Western Wholesale Food Market	1720
												Miin.	**32**					
												Max.	**120**					
												Average	**80**					


1-hr TSP Level
AM5 (AFCD Western Wholesale Food Market)
AM5
Action Level
Limit Level
1-hr TSP Level, µgm-3
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500
400
300
200
100
0
01/08/2013
04/08/2013
07/08/2013
10/08/2013
13/08/2013
16/08/2013
19/08/2013
22/08/2013
25/08/2013
28/08/2013
31/08/2013
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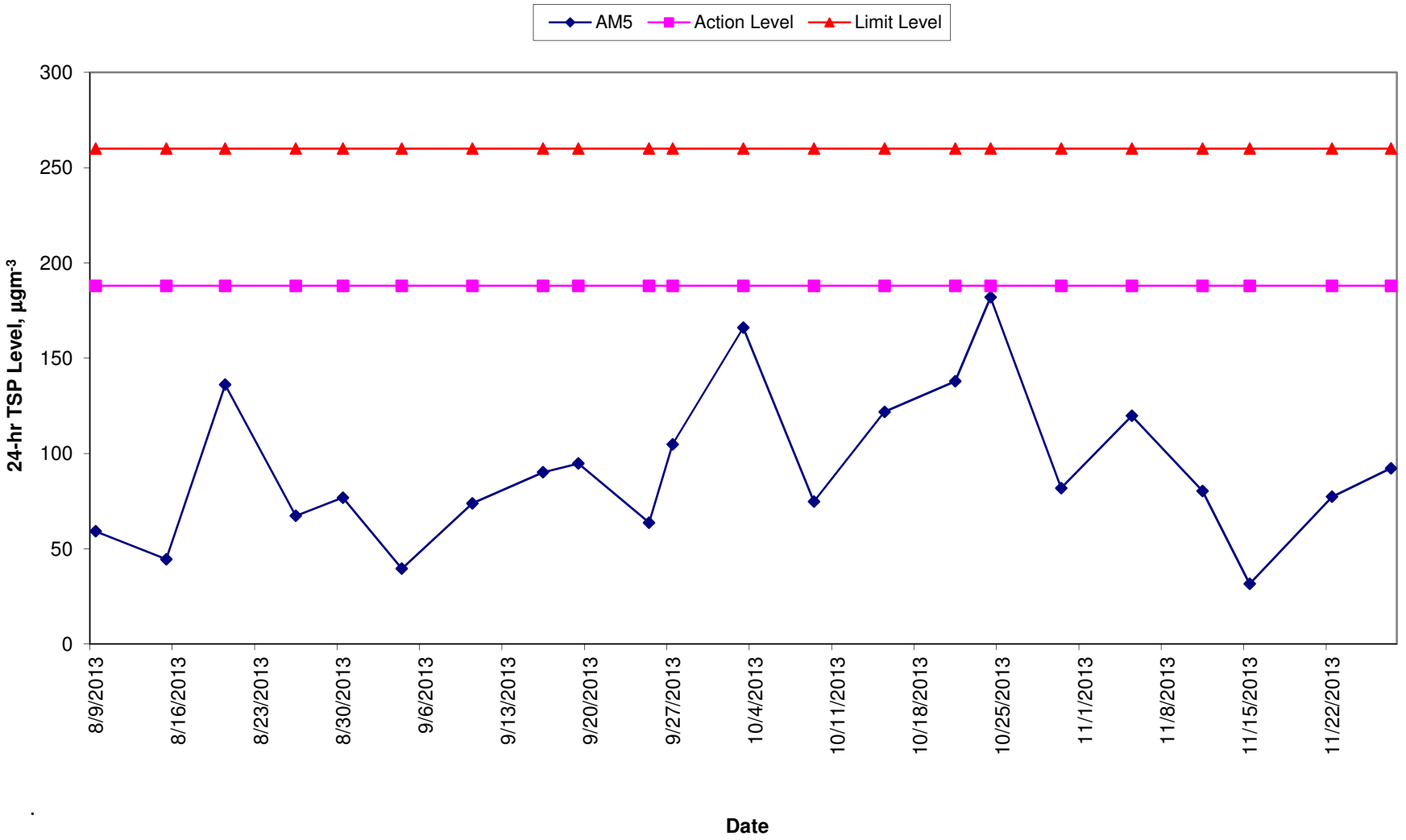
11/11/2013
14/11/2013
17/11/2013
20/11/2013
23/11/2013
26/11/2013
29/11/2013
02/12/2013
05/12/2013
Date

24-hr TSP Level
AM5 (AFCD Western Wholesale Food Market)



Meteorological Data Extracted from the Hong Kong Observatory

		King's Park Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	28	70-94	1.0	0-15	NW
2013-09-03	-	27	82-98	5.0	0-14	SE
2013-09-04	Sunny	25	90-99	88.9	0-21	SE
2013-09-08	-	28	63-88	0.0	2-17	SE
2013-09-10	Sunny	29	66-88	0.0	2-16	SE
2013-09-15	Sunny	28	66-94	15.2	0-20	SE/NW
2013-09-16	Sunny	25	68-95	0.8	1-24	SE
2013-09-17	-	28	61-82	0.0	7-23	SE
2013-09-19	Cloudy	29	62-86	0.0	0-27	SE
2013-09-20	-	30	58-87	0.0	0-12	SE/W
2013-09-21	Fine	31	51-88	0.0	0-21	N
2013-09-22	Cloudy	28	58-93	30.6	3-40	N/NW
2013-09-23	-	28	79-98	56.9	0-37	SW
2013-09-24	Sunny	29	78-94	1.3	7-20	SE
2013-09-26	Sunny	27	66-84	0.1	1-18	E
2013-09-27	Sunny	26	67-87	0.1	1-18	SE/NE
2013-09-29	Sunny	26	74-97	2.9	2-16	NE/E
2013-09-30	Fine	25	84-97	10.0	3-21	E

		Tsing Yi Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%) *	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	27	70-94	1.0	1-18	S/NW
2013-09-03	-	26	82-98	5.0	1-16	S
2013-09-04	Rainy	25	90-99	88.9	1-21	E
2013-09-08	-	29	63-88	0.0	3-19	SE
2013-09-10	Sunny	30	66-88	0.0	1-20	N
2013-09-15	Sunny	28	66-94	15.2	1-14	--
2013-09-16	Sunny	29	68-95	0.8	1-22	--
2013-09-17	-	29	61-82	0.0	4-23	--
2013-09-19	Cloudy	29	62-86	0.0	1-26	--
2013-09-20	-	30	58-87	0.0	1-13	--
2013-09-21	Fine	31	51-88	0.0	1-22	--
2013-09-22	Cloudy	29	58-93	30.6	8-50	--
2013-09-23	-	27	79-98	56.9	8-48	--
2013-09-24	Sunny	29	78-94	1.3	6-22	--
2013-09-26	Sunny	28	66-84	0.1	1-15	--
2013-09-27	Sunny	27	67-87	0.1	1-15	--
2013-09-29	Sunny	26	74-97	2.9	1-10	--
2013-09-30	Fine	26	84-97	10.0	1-14	--

		Kai Tak Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	28	70-94	1.0	0-22	SE/NW
2013-09-03	-	27	82-98	5.0	1-18	SE
2013-09-04	Sunny	25	90-99	88.9	1-25	SE
2013-09-08	-	28	63-88	0.0	1-24	E/SE
2013-09-10	Sunny	29	66-88	0.0	4-22	E/SE
2013-09-15	Sunny	28	66-94	15.2	1-23	SE
2013-09-16	Sunny	25	68-95	0.8	8-31	E
2013-09-17	-	28	61-82	0.0	11-32	E
2013-09-19	Cloudy	29	62-86	0.0	2-31	E
2013-09-20	-	30	58-87	0.0	1-16	SE/SW
2013-09-21	Fine	31	51-88	0.0	3-25	NW
2013-09-22	Cloudy	28	58-93	30.6	3-52	NW
2013-09-23	-	28	79-98	56.9	2-39	S/SE
2013-09-24	Sunny	29	78-94	1.3	12-28	E
2013-09-26	Sunny	27	66-84	0.1	5-22	NE
2013-09-27	Sunny	26	67-87	0.1	3-24	E

		Green Island Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	28	70-94	1.0	1-39	SW
2013-09-03	-	27	82-98	5.0	1-21	S
2013-09-04	Sunny	25	90-99	88.9	5-45	SW/NE
2013-09-08	-	28	63-88	0.0	9-32	NE
2013-09-10	Sunny	29	66-88	0.0	17-38	NE
2013-09-15	Sunny	28	66-94	15.2	1-36	NW/NE
2013-09-16	Sunny	25	68-95	0.8	12-48	NE
2013-09-17	-	28	61-82	0.0	30-57	NE
2013-09-19	Cloudy	29	62-86	0.0	18-57	NE
2013-09-20	-	30	58-87	0.0	1-31	N/S
2013-09-21	Fine	31	51-88	0.0	8-38	N
2013-09-22	Cloudy	28	58-93	30.6	19-77	N
2013-09-23	-	28	79-98	56.9	19-79	S
2013-09-24	Sunny	29	78-94	1.3	10-40	E/NE
2013-09-26	Sunny	27	66-84	0.1	14-43	NE
2013-09-27	Sunny	26	67-87	0.1	14-35	NE

Meteorological Data Extracted from the Hong Kong Observatory

		King's Park Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	0-15	NE
2013-10-03	Sunny	27	51 - 86	0.0	0-12	NE
2013-10-06	Sunny	28	38 - 57	0.0	0-19	N
2013-10-07	Sunny	29	48 - 61	0.0	0-21	N
2013-10-08	Fine	27	58 - 73	0.0	0-16	NE
2013-10-09	Sunny	28	65 - 85	0.0	0-19	SE
2013-10-12	Sunny	28	50 - 79	Trace	0-19	SE
2013-10-13	Sunny	28	57 - 77	0.0	3-26	SE
2013-10-15	Sunny	28	61 - 84	0.0	0-18	SE
2013-10-18	Sunny	26	53 - 75	Trace	2-18	E
2013-10-20	Sunny	26	56 - 82	0.0	0-16	SE
2013-10-21	Sunny	25	63 - 82	0.1	0-11	NE
2013-10-22	Fine	26	50 - 79	0.0	0-16	NE
2013-10-24	Sunny	25	29 - 51	0.0	0-20	NE
2013-10-26	Sunny	23	40 - 66	0.0	0-17	SE/NE
2013-10-27	Sunny	22	54 - 76	0.0	0-17	SE
2013-10-29	Sunny	24	56 - 83	0.0	1-17	SE
2013-10-30	Sunny	25	62 - 83	0.0	0-19	SE

		Tsing Yi Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%) *	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	1-13	--
2013-10-03	Sunny	27	51 - 86	0.0	1-14	--
2013-10-06	Sunny	27	38 - 57	0.0	1-21	--
2013-10-07	Sunny	29	48 - 61	0.0	2-22	--
2013-10-08	Fine	27	58 - 73	0.0	1-19	--
2013-10-09	Sunny	28	65 - 85	0.0	1-16	--
2013-10-12	Sunny	28	50 - 79	Trace	1-23	--
2013-10-13	Sunny	28	57 - 77	0.0	3-20	--
2013-10-15	Sunny	28	61 - 84	0.0	2-21	--
2013-10-18	Sunny	27	53 - 75	Trace	1-15	--
2013-10-20	Sunny	25	56 - 82	0.0	1-12	--
2013-10-21	Sunny	26	63 - 82	0.1	1-14	--
2013-10-22	Fine	26	50 - 79	0.0	1-16	--
2013-10-24	Sunny	24	29 - 51	0.0	1-19	--
2013-10-26	Sunny	23	40 - 66	0.0	1-17	--
2013-10-27	Sunny	22	54 - 76	0.0	1-15	--
2013-10-29	Sunny	25	56 - 83	0.0	1-19	--
2013-10-30	Sunny	25	62 - 83	0.0	1-21	--

		Kai Tak Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	1-16	NE
2013-10-03	Sunny	27	51 - 86	0.0	1-19	SE/N
2013-10-06	Sunny	28	38 - 57	0.0	1-23	NW
2013-10-07	Sunny	29	48 - 61	0.0	2-27	NW
2013-10-08	Fine	27	58 - 73	0.0	1-22	NW/N
2013-10-09	Sunny	28	65 - 85	0.0	1-25	SE
2013-10-12	Sunny	28	50 - 79	Trace	1-27	E
2013-10-13	Sunny	28	57 - 77	0.0	6-29	E
2013-10-15	Sunny	28	61 - 84	0.0	4-23	E
2013-10-18	Sunny	26	53 - 75	Trace	5-24	NE/SE
2013-10-20	Sunny	26	56 - 82	0.0	1-16	SE
2013-10-21	Sunny	25	63 - 82	0.1	1-19	SE/NE
2013-10-22	Fine	26	50 - 79	0.0	1-15	N/NE
2013-10-24	Sunny	25	29 - 51	0.0	1-19	N
2013-10-26	Sunny	23	40 - 66	0.0	2-19	N
2013-10-27	Sunny	22	54 - 76	0.0	2-24	E

		Green Island Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	1-22	NE/SW
2013-10-03	Sunny	27	51 - 86	0.0	2-28	NE/SW
2013-10-06	Sunny	28	38 - 57	0.0	4-39	N
2013-10-07	Sunny	29	48 - 61	0.0	19-42	N
2013-10-08	Fine	27	58 - 73	0.0	12-34	N
2013-10-09	Sunny	28	65 - 85	0.0	5-33	NE/N
2013-10-12	Sunny	28	50 - 79	Trace	4-46	NE/N
2013-10-13	Sunny	28	57 - 77	0.0	10-50	NE
2013-10-15	Sunny	28	61 - 84	0.0	11-37	NE
2013-10-18	Sunny	26	53 - 75	Trace	3-41	NE
2013-10-20	Sunny	26	56 - 82	0.0	3-24	NE/S
2013-10-21	Sunny	25	63 - 82	0.1	1-24	N
2013-10-22	Fine	26	50 - 79	0.0	1-37	N
2013-10-24	Sunny	25	29 - 51	0.0	2-34	NE
2013-10-26	Sunny	23	40 - 66	0.0	7-34	NE
2013-10-27	Sunny	22	54 - 76	0.0	8-34	NE

Meteorological Data Extracted from the Hong Kong Observatory

		King's Park Station				
Date	Weather	Average Air Temperature (℃)	Average Relative Humiditiy (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	0-16	NE/SE
2013-11-03	Sunny	26	65 - 66	0.4	5-25	NE
2013-11-05	Sunny	23	79 - 98	3.6	0-18	E
2013-11-07	Sunny	25	65 - 90	0.0	0-19	SE
2013-11-10	Fine	25	77 - 96	7.6	2-25	SE/E
2013-11-11	Sunny	24	82 - 87	Trace	12-28	SE
2013-11-13	Cloudy	21	84 - 100	3.9	0-12	NE/E
2013-11-15	Sunny	22	62 - 83	0.0	0-15	SE
2013-11-17	Sunny	21	50 - 66	0.0	0-15	NE/SE
2013-11-19	Fine	20	56 - 77	0.0	1-15	NE/E
2013-11-21	Sunny	20	55 - 79	0.5	0-17	SE/E
2013-11-24	Sunny	26	72 - 96	15.2	0-21	NE/SE
2013-11-25	Sunny	20	40 - 80	0.0	0-17	NE/N
2013-11-26	Cloudy	20	59 - 80	0.0	0-17	SE/E
2013-11-27	Sunny	20	68 - 88	0.5	-	SE/NE
2013-11-30	Sunny	16	43 - 66	0.0	0-14	NE/SE

		Tsing Yi Station				
Date	Weather	Average Air Temperature (℃)	Average Relative Humiditiy (%) *	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	1-18	--
2013-11-03	Sunny	26	65 - 66	0.4	0-18	--
2013-11-05	Sunny	23	79 - 98	3.6	1-10	--
2013-11-07	Sunny	25	65 - 90	0.0	1-15	--
2013-11-10	Fine	26	77 - 96	7.6	9-21	--
2013-11-11	Sunny	--	82 - 87	Trace	10-31	--
2013-11-13	Cloudy	22	84 - 100	3.9	1-13	--
2013-11-15	Sunny	22	62 - 83	0.0	1-12	--
2013-11-17	Sunny	22	50 - 66	0.0	1-15	--
2013-11-19	Fine	20	56 - 77	0.0	0-12	--
2013-11-21	Sunny	20	55 - 79	0.5	1-16	--
2013-11-24	Sunny	24	72 - 96	15.2	1-21	--
2013-11-25	Sunny	20	40 - 80	0.0	0-25	--
2013-11-26	Cloudy	20	59 - 80	0.0	0-19	--
2013-11-27	Sunny	20	68 - 88	0.5	3-18	--
2013-11-30	Sunny	17	43 - 66	0.0	1-16	--

		Kai Tak Station				
Date	Weather	Average Air Temperature (℃) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	0-22	E/NE
2013-11-03	Sunny	26	65 - 66	0.4	3-26	NE
2013-11-05	Sunny	23	79 - 98	3.6	1-19	E/NE
2013-11-07	Sunny	25	65 - 90	0.0	5-23	E
2013-11-10	Fine	25	77 - 96	7.6	16 -30	E
2013-11-11	Sunny	24	82 - 87	Trace	20 - 42	E
2013-11-13	Cloudy	21	84 - 100	3.9	3-17	NE/N
2013-11-15	Sunny	22	62 - 83	0.0	1-20	NW/NE
2013-11-17	Sunny	21	50 - 66	0.0	1-19	NW/NE
2013-11-19	Fine	20	56 - 77	0.0	3-22	NE/E
2013-11-21	Sunny	20	55 - 79	0.5	3-21	NE/E
2013-11-24	Sunny	26	72 - 96	15.2	1-22	NW/SE
2013-11-25	Sunny	20	40 - 80	0.0	3-30	NW/NE
2013-11-26	Cloudy	20	59 - 80	0.0	3-21	NE/E
2013-11-27	Sunny	20	68 - 88	0.5	3-24	NW/E

		Green Island Station				
Date	Weather	Average Air Temperature (℃) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	1-36	NE/S
2013-11-03	Sunny	26	65 - 66	0.4	29-52	NE
2013-11-05	Sunny	23	79 - 98	3.6	13-45	NE
2013-11-07	Sunny	25	65 - 90	0.0	15-41	NE
2013-11-10	Fine	25	77 - 96	7.6	29-57	NE
2013-11-11	Sunny	24	82 - 87	Trace	35 - 65	NE
2013-11-13	Cloudy	21	84 - 100	3.9	6 - 45	NE/N
2013-11-15	Sunny	22	62 - 83	0.0	3-28	NE/NW
2013-11-17	Sunny	21	50 - 66	0.0	1-25	NE/N
2013-11-19	Fine	20	56 - 77	0.0	12-36	NE/N
2013-11-21	Sunny	20	55 - 79	0.5	3-40	NE
2013-11-24	Sunny	26	72 - 96	15.2	4-52	NW
2013-11-25	Sunny	20	40 - 80	0.0	2-48	N
2013-11-26	Cloudy	20	59 - 80	0.0	13-47	NE/N
2013-11-27	Sunny	20	68 - 88	0.5	5-42	NE/N

Annex F6 Noise Monitoring Results

Daytime Noise Monitoring Results

Station NM4

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							
04-Sep-13	16:00	16:30	Cloudy	67	69	66	-	Traffic Noise	-	30	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
10-Sep-13	10:22	10:52	Sunny	67	68	66	-	Traffic Noise	-	30	0.3	RION-NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
16-Sep-13	14:05	14:35	Sunny	67	68	66	-	Traffic Noise	-	29	0.3	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
27-Sep-13	13:05	13:35	Sunny	67	69	66	-	Traffic Noise	-	29	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
			Min.	**67**									
			Max.	**67**									

Annex F6 Noise Monitoring Results

Daytime Noise Monitoring Results

Station NM4

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							
03-Oct-13	14:05	14:35	Sunny	67	69	66	-	Traffic Noise	-	30	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
09-Oct-13	13:00	13:30	Sunny	67	68	66	-	Traffic Noise	-	27	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
15-Oct-13	9:20	9:50	Sunny	67	68	66	Excavation work	Traffic Noise	-	28	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
21-Oct-13	9:20	9:50	Sunny	68	69	66	-	Traffic Noise	-		0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
			Min.	**67**									
			Max.	**68**									

Annex F6 Noise Monitoring Results

Daytime Noise Monitoring Results

Station NM4

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							
01-Nov-13	13:00	13:30	Sunny	68	69	66	-	Traffic Noise	-	23	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
07-Nov-13	9:20	9:50	Sunny	67	68	66	-	Traffic Noise	-	22	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
13-Nov-13	13:00	13:30	Cloudy	67	68	66	-	Traffic Noise	-	23	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
19-Nov-13	9:20	9:50	Fine	67	69	66	-	Traffic Noise	-	22	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
25-Nov-13	13:00	13:30	Fine	67	69	66	-	Traffic Noise	-	22	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
			Min.	**67**									
			Max.	**68**									

Annex F6 Noise Monitoring Results

Restricted Hours Noise Monitoring Results

Station NM4

Date	Start Time	End Time	Weather	Noise level (dB(A)), 5 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							
01-Sep-13	11:33	11:38	Cloudy	66	68	65	No outdoor construction noise	traffic noise	-	31	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	11:38	11:43	Cloudy	66	67	64			-				
	11:43	11:48	Cloudy	66	68	64			-				
	11:33	11:48	Cloudy	66	68	64			-				
10-Sep-13	21:46	21:51	Fine	64	66	62	No outdoor construction noise	Traffic noise	-	29	0.3	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	21:51	21:56	Fine	65	67	63			-				
	21:56	22:01	Fine	64	66	62			-				
	21:46	22:01	Fine	65	66	63			-				
15-Sep-13	13:10	13:15	Sunny	66	67	64	No outdoor construction noise	Traffic noise	-	28	0.4	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	13:15	13:20	Sunny	65	67	63			-				
	13:20	13:25	Sunny	65	66	63			-				
	13:10	13:25	Sunny	65	67	63			-				
24-Sep-13	19:18	19:23	Sunny	68	69	66	No outdoor construction noise	Traffic noise	-	29	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	19:23	19:28	Sunny	68	68	65			-				
	19:28	19:33	Sunny	67	68	65			-				
	19:18	19:33	Sunny	67	68	66			-				
29-Sep-13	11:33	11:38	Sunny	66	67	63	No outdoor construction noise	Traffic noise	-	29	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	11:38	11:43	Sunny	65	67	63			-				
	11:43	11:48	Sunny	66	68	63			-				
	11:33	11:48	Sunny	66	67	63			-				
			Min.	**64**									
			Max.	**68**									

Annex F6 Noise Monitoring Results

Restricted Hours Noise Monitoring Results

Station NM4

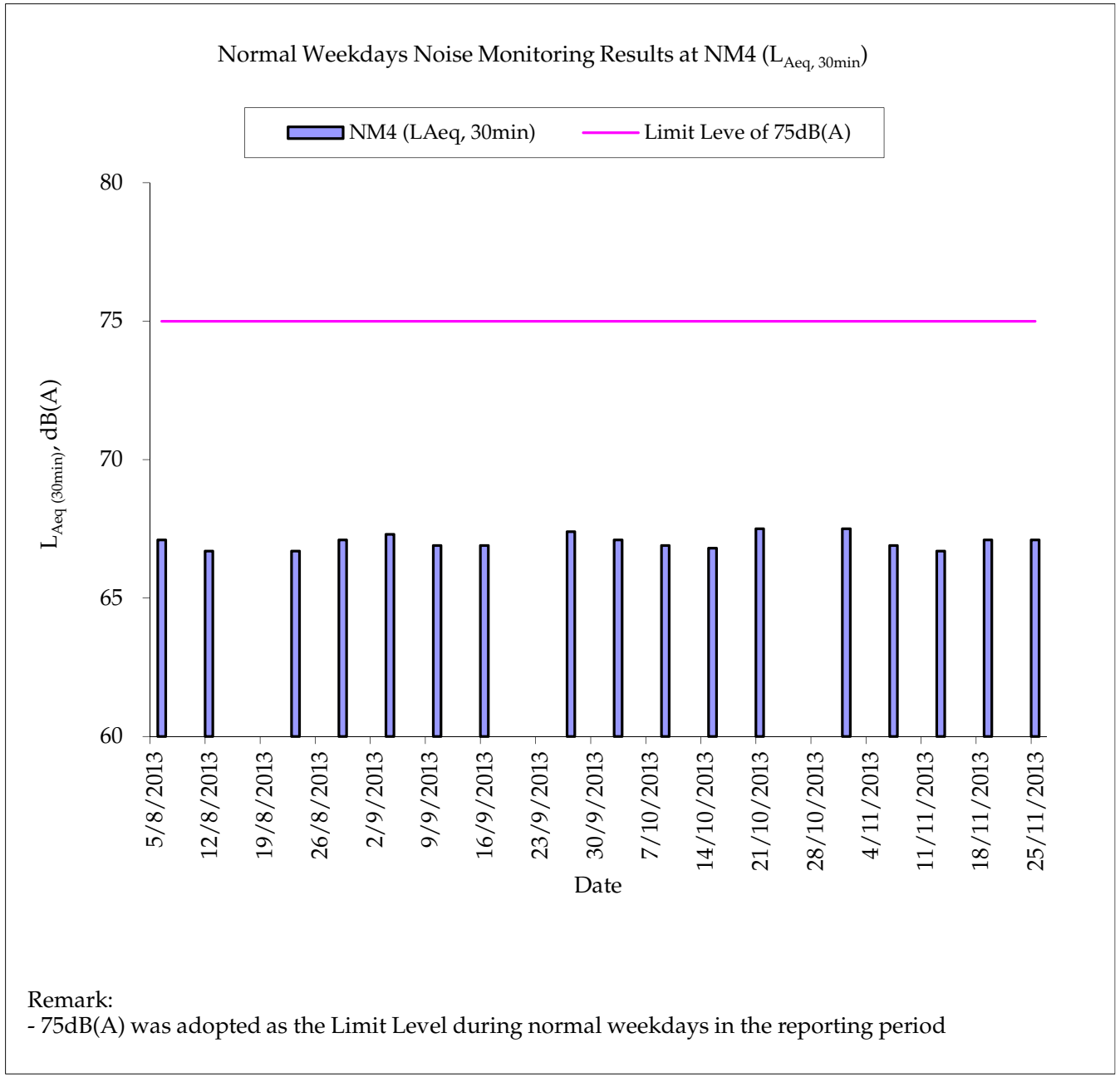
Date	Start Time	End Time	Weather	Noise level (dB(A)), 5 min			Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
08-Oct-13	20:11	20:16	Fine	66	68	65	-	Traffic noise	-	27	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	20:16	20:21	Fine	65	67	64			-				
	20:21	20:26	Fine	66	64	64			-				
	20:11	20:26	Fine	66	67	65			-				
13-Oct-13	11:34	11:39	Sunny	67	69	64	-	Traffic noise	-	26	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	11:39	11:44	Sunny	66	67	64			-				
	11:44	11:49	Sunny	66	68	65			-				
	11:34	11:49	Sunny	66	68	64			-				
22-Oct-13	20:19	20:24	Fine	66	68	64	-	Traffic noise	-	28	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	20:24	20:29	Fine	66	67	64			-				
	20:29	20:34	Fine	66	67	64			-				
	20:19	20:34	Fine	66	67	64			-				
27-Oct-13	11:22	11:27	Sunny	66	67	63	-	Traffic noise	-	25	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	11:27	11:32	Sunny	67	69	64			-				
	11:32	11:37	Sunny	66	68	64			-				
	11:22	11:37	Sunny	66	68	64			-				
			Min.	**65**									
			Max.	**67**									

Annex F6 Noise Monitoring Results

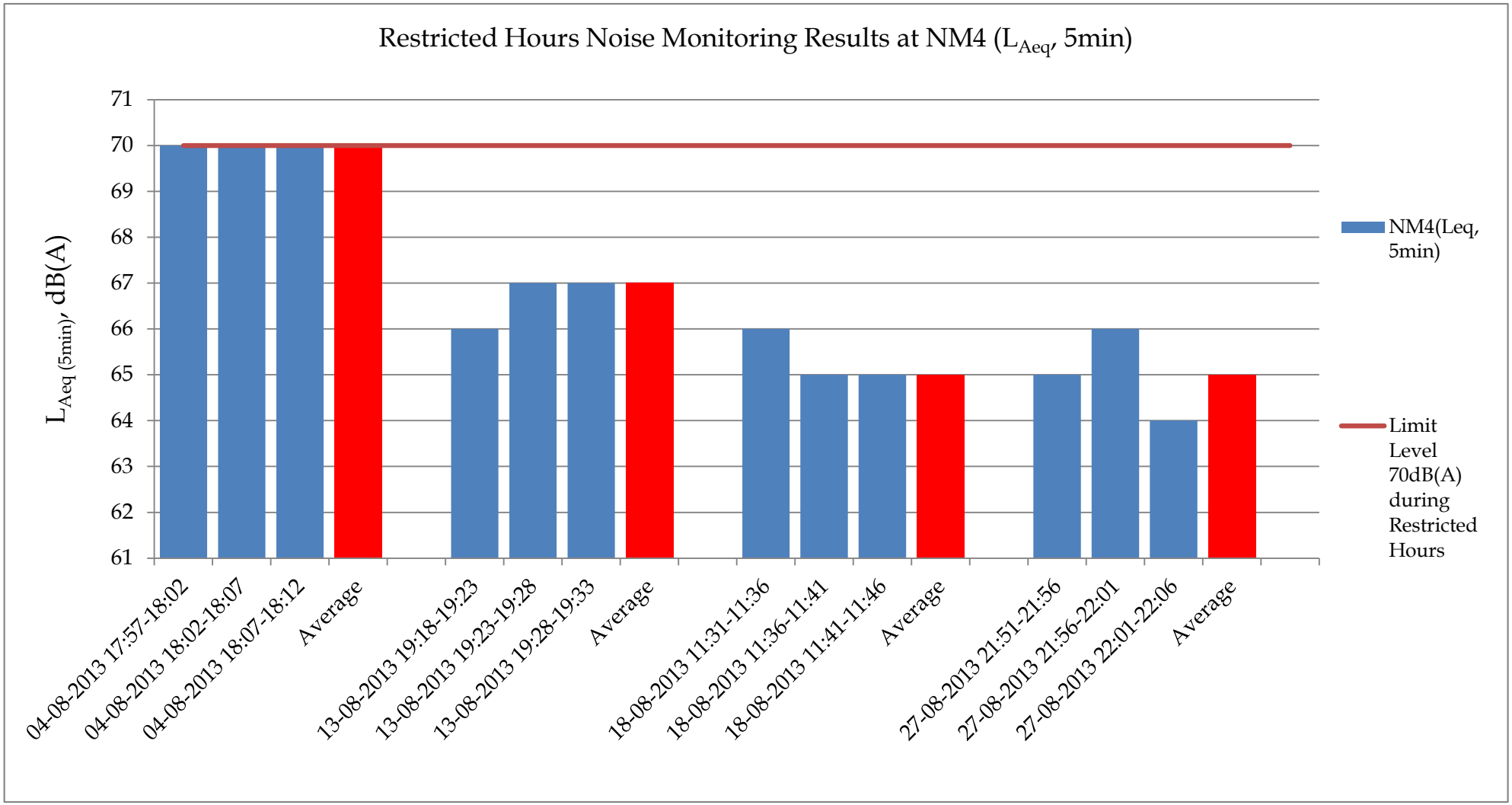
Restricted Hours Noise Monitoring Results

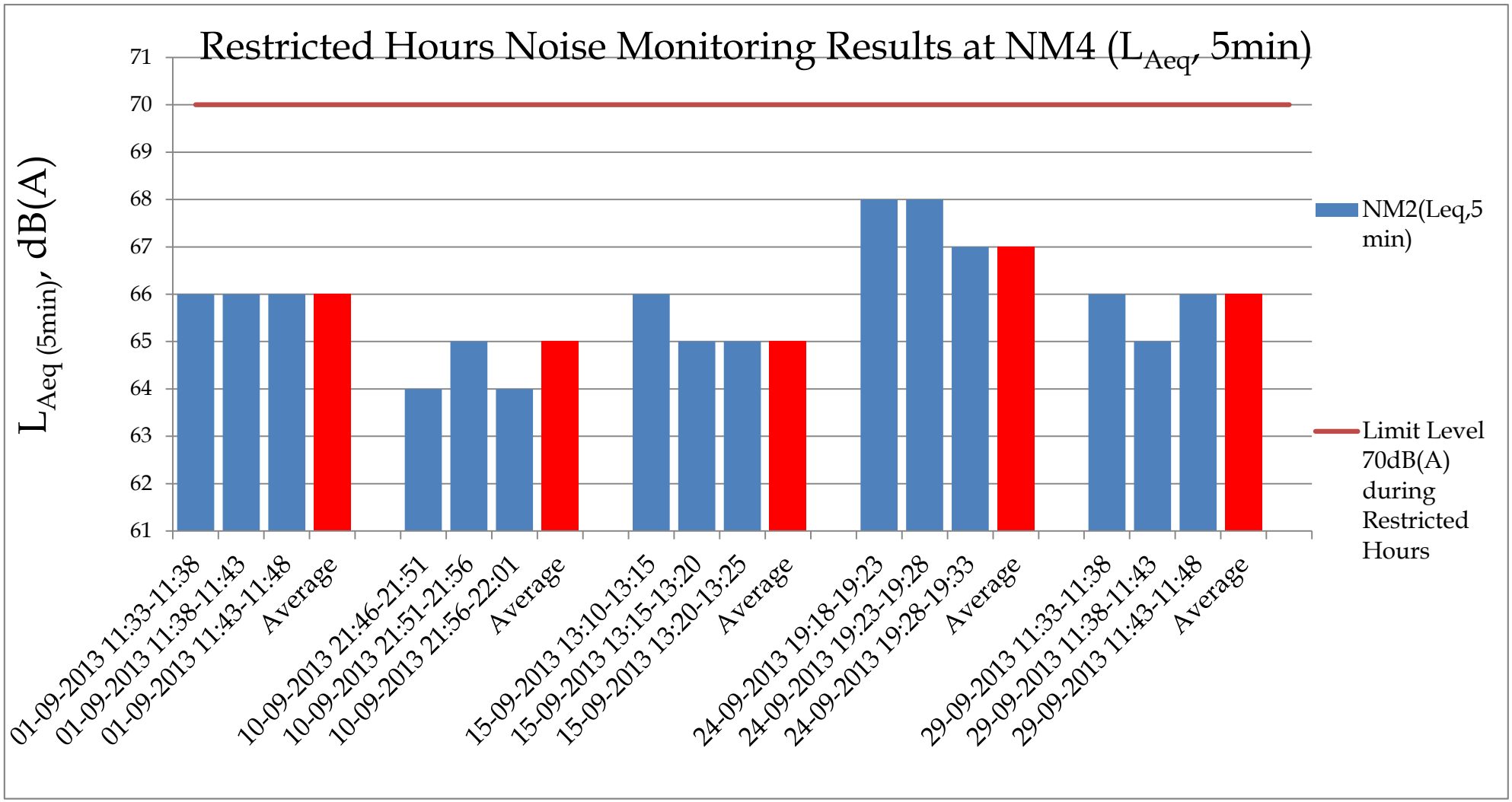
Station NM4

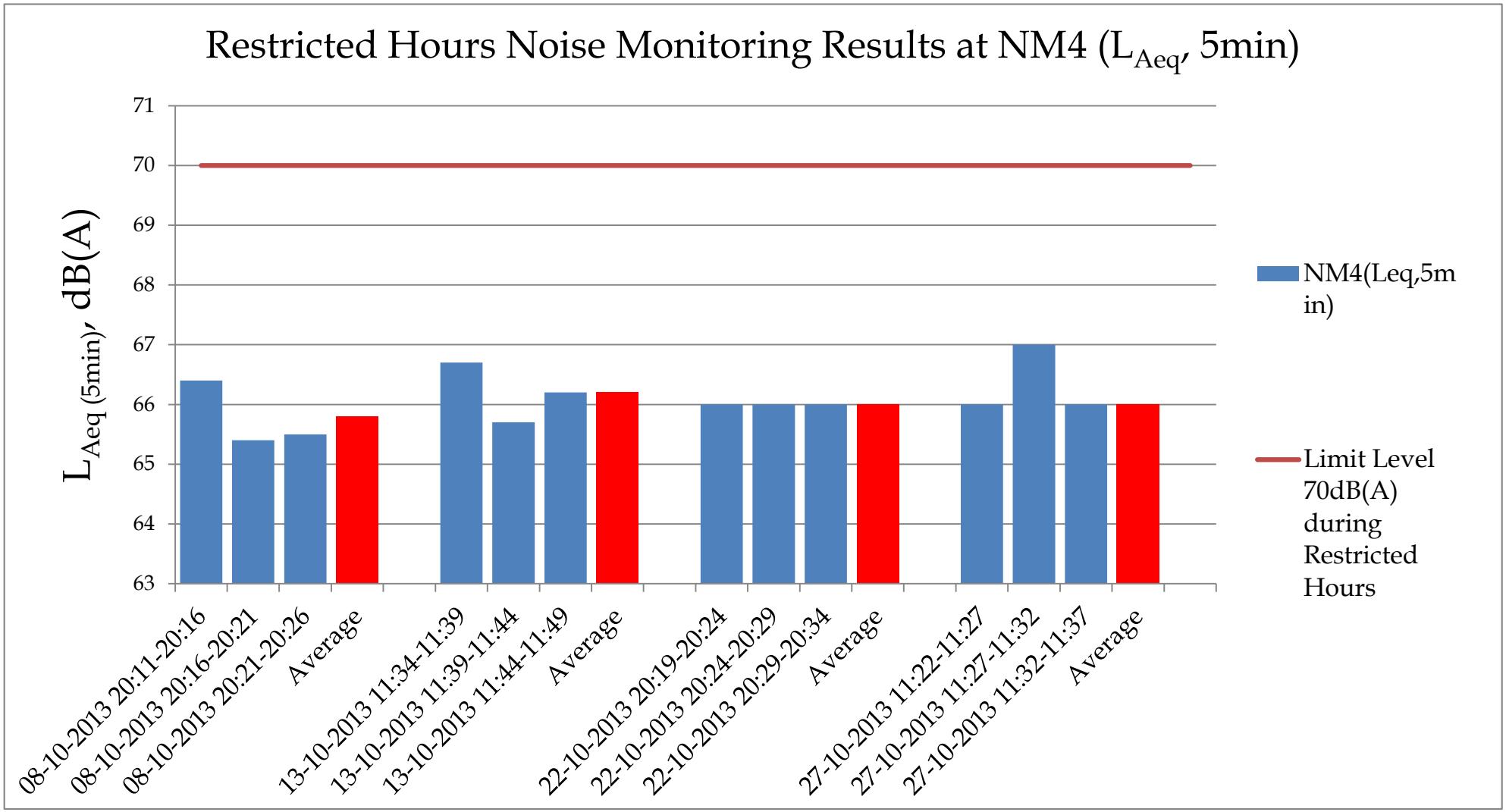
Date	Start Time	End Time	Weather	Noise level (dB(A)), 5 min			Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
05-Nov-13	19:17	19:22	Fine	67	68	65	-	Traffic noise	-	26	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	19:22	19:27	Fine	67	69	65			-				
	19:27	19:32	Fine	66	68	63			-				
	19:17	19:32	Fine	67	68	65			-				
10-Nov-13	14:49	14:54	Fine	67	69	64	-	Traffic noise	-	22	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	14:54	14:59	Fine	67	68	65			-				
	14:59	15:04	Fine	67	68	64			-				
	14:49	15:04	Fine	67	68	65			-				
19-Nov-13	19:19	19:24	Fine	66	68	64	-	Traffic noise	-	22	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	19:24	19:29	Fine	66	67	64			-				
	19:29	19:34	Fine	67	68	65			-				
	19:19	19:34	Fine	66	68	65			-				
24-Nov-13	17:29	17:34	Sunny	66	68	65	-	Traffic noise	-	24	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	17:34	17:39	Sunny	66	68	65			-				
	17:39	17:44	Sunny	67	68	65			-				
	17:29	17:44	Sunny	66	68	65			-				
			Min.	**66**									
			Max.	**67**									

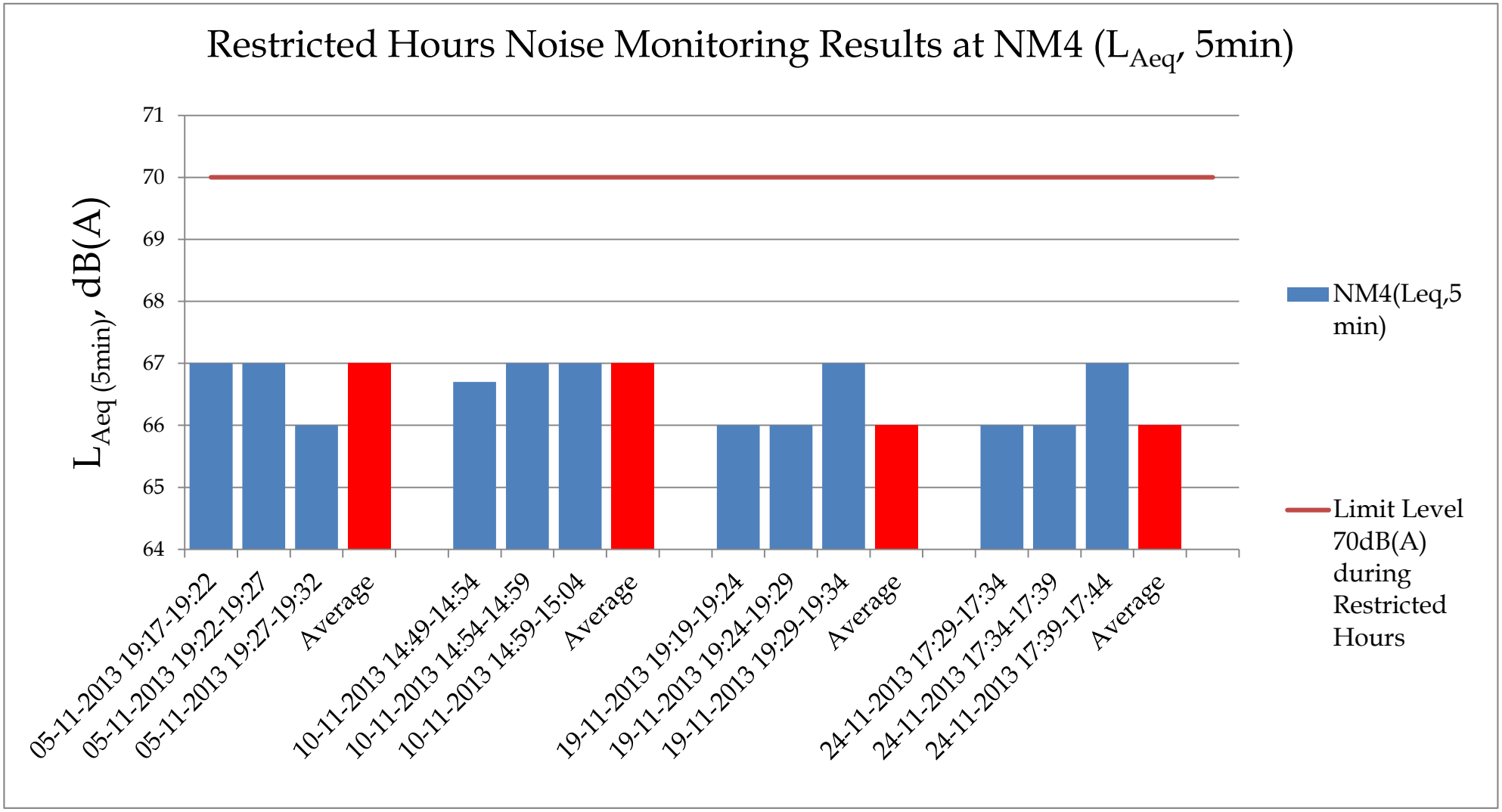


Remark:
- 75dB(A) was adopted as the Limit Level during normal weekdays in the reporting period


Restricted Hours Noise Monitoring Results at NM4 (L_{Aeq}, 5min)
$L_{Aeq\ (5min)}$, dB(A)
71
70
69
68
67
66
65
64
63
62
61
04-08-2013 17:57-18:02
04-08-2013 18:02-18:07
04-08-2013 18:07-18:12
Average
13-08-2013 19:18-19:23
13-08-2013 19:23-19:28
13-08-2013 19:28-19:33
Average
18-08-2013 11:31-11:36
18-08-2013 11:36-11:41
18-08-2013 11:41-11:46
Average
27-08-2013 21:51-21:56
27-08-2013 21:56-22:01
27-08-2013 22:01-22:06
Average
NM4(Leq, 5min)
Limit Level 70dB(A) during Restricted Hours


Restricted Hours Noise Monitoring Results at NM4 (L_{Aeq}, 5min)
$L_{Aeq\ (5min)}$, dB(A)
71
70
69
68
67
66
65
64
63
62
61
01-09-2013 11:33-11:38
01-09-2013 11:38-11:43
01-09-2013 11:43-11:48
Average
10-09-2013 21:46-21:51
10-09-2013 21:51-21:56
10-09-2013 21:56-22:01
Average
15-09-2013 13:10-13:15
15-09-2013 13:15-13:20
15-09-2013 13:20-13:25
Average
24-09-2013 19:18-19:23
24-09-2013 19:23-19:28
24-09-2013 19:28-19:33
Average
29-09-2013 11:33-11:38
29-09-2013 11:38-11:43
29-09-2013 11:43-11:48
Average
NM2(Leq,5 min)
Limit Level 70dB(A) during Restricted Hours


Restricted Hours Noise Monitoring Results at NM4 (L_{Aeq}, 5min)
$L_{Aeq\ (5min)}$, dB(A)
71
70
69
68
67
66
65
64
63
08-10-2013 20:11-20:16
08-10-2013 20:16-20:21
08-10-2013 20:21-20:26
Average
13-10-2013 11:34-11:39
13-10-2013 11:39-11:44
13-10-2013 11:44-11:49
Average
22-10-2013 20:19-20:24
22-10-2013 20:24-20:29
22-10-2013 20:29-20:34
Average
27-10-2013 11:22-11:27
27-10-2013 11:27-11:32
27-10-2013 11:32-11:37
Average
NM4(Leq,5min)
Limit Level 70dB(A) during Restricted Hours


Restricted Hours Noise Monitoring Results at NM4 (L_{Aeq}, 5min)
$L_{Aeq\ (5min)}$, dB(A)
71
70
69
68
67
66
65
64
05-11-2013 19:17-19:22
05-11-2013 19:22-19:27
05-11-2013 19:27-19:32
Average
10-11-2013 14:49-14:54
10-11-2013 14:54-14:59
10-11-2013 14:59-15:04
Average
19-11-2013 19:19-19:24
19-11-2013 19:24-19:29
19-11-2013 19:29-19:34
Average
24-11-2013 17:29-17:34
24-11-2013 17:34-17:39
24-11-2013 17:39-17:44
Average
NM4(Leq,5 min)
Limit Level 70dB(A) during Restricted Hours

Annex F7 Cumulative Complaint and Summons/Prosecutions Log

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
December 2009	0	0
January 2010	0	0
February 2010	1	0
March 2010	0	0
April 2010	1	0
May 2010	2	0
June 2010	0	0
July 2010	1	0
August 2010	0	0
September 2010	0	0
October 2010	0	0
November 2010	0	0
December 2010	0	0
January 2011	0	0
February 2011	0	0
March 2011	0	0
April 2011	0	0
May 2011	0	0

Annex F7 Cumulative Complaint and Summons/Prosecutions Log

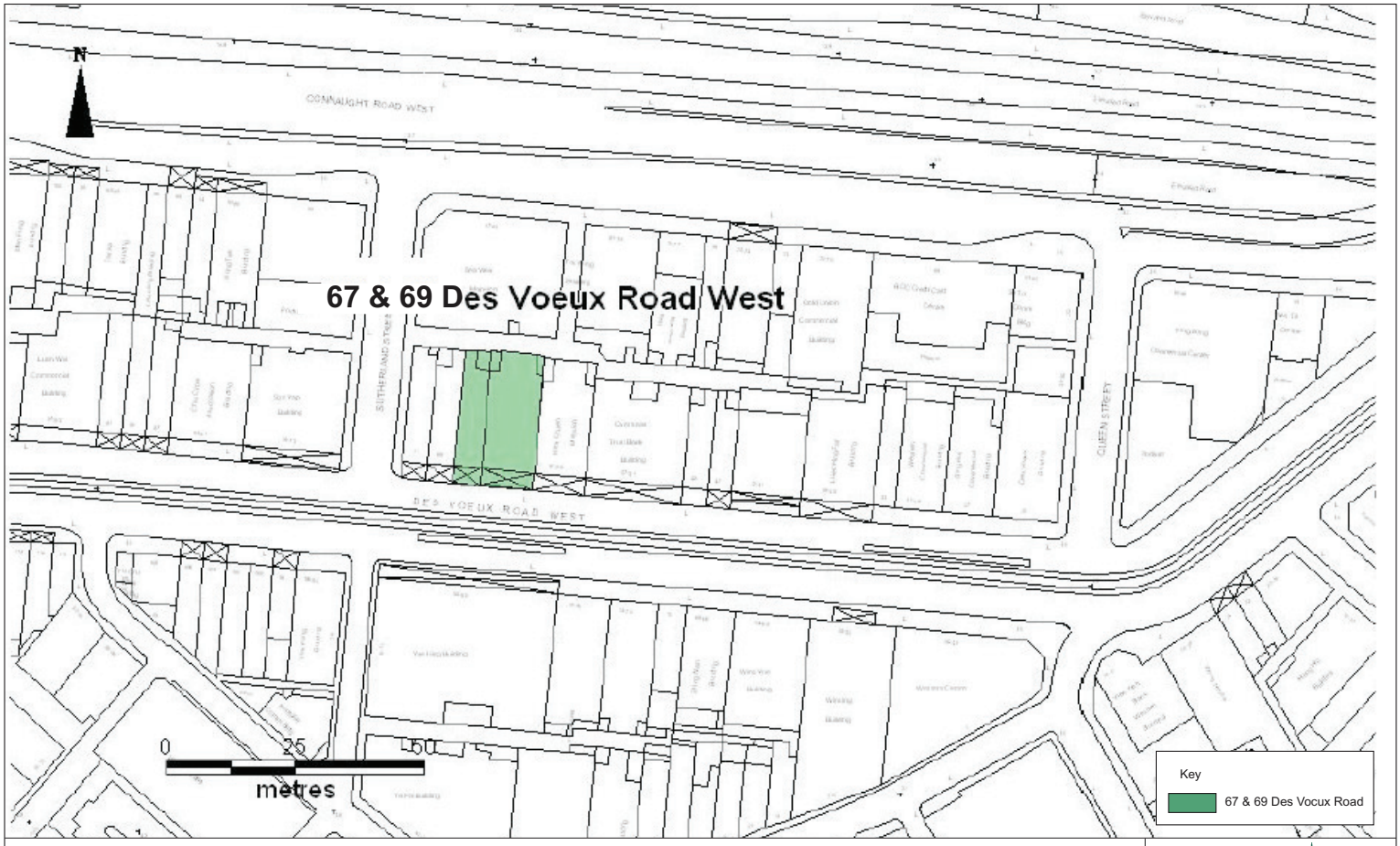
Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
June 2011	0	0
July 2011	0	0
August 2011	0	0
September 2011	0	0
October 2011	0	0
November 2011	0	0
December 2011	0	0
January 2012	0	0
February 2012	0	0
March 2012	0	0
April 2012	1	0
May 2012	0	0
June 2012	0	0
July 2012	0	0
August 2012	0	0
September 2012	0	0
October 2012	0	0
November 2012	0	0

Annex F7 Cumulative Complaint and Summons/Prosecutions Log

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
December 2012	1	0
January 2013	0	0
February 2013	0	0
March 2013	0	0
April 2013	0	0
May 2013	0	0
June 2013	0	0
July 2013	0	0
August 2013	0	0
September 2013	0	0
October 2013	0	0
November 2013	0	0
Overall Total	7	0

Annex F8

Vibration Monitoring Reports



Appendix 15.1(10)

Two old shophouses at 67 and 69 Des Voeux Road

FILE: 0104887b
DATE: 05/06/2013

Environmental Resources Management

ERM

Vibration monitoring data summary sheet for tunnel blasting
Tunnel K Drive 3

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1a **Summary of Blasting Parameters**

Blast No.	Date	Time	Centre of blast location			Total no. of blastholes	No. of rows of blastholes	Hole dia (m)	Hole depth (m)	Subdrill (m)	Stemming/ (Inter-stemming for deck loading) (m)	Burden (m)	Blasthole spacing (m)	MIC (kg)	Type of rock blasted (m)	Total vol. of rock blasted (m3)	Types of initiation system	Type(s) of explosives used	Total amount of explosives (kg)	Powder factor
			Northing	Easting	Level (mPD)															
TK3-274	09-Nov-2013	18:39:30	816681.556	833416.955	-144.4	66		0.045	4.1 - 4.3		0.6 - 1.3		0.2 - 0.75	5.07	Granite	68	Electric	Cartridge & Emulsion	251.5	3.7

Note:
1. MIC - Maximum Instantaneous Charge

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1b **Summary of Monitoring Data**

Date	Blast No.	Sensitive Receiver & reference no.	Monitoring Station			Distance from blast (m)	Seismograph serial no.	Bearing of longitudinal direction of seismograph	Trigger level PPV (mm/s)	Permissible PPV (mm/s)			Predicted PPV (mm/s)	Measured PPV (mm/s)				Frequency (Hz)			Remarks (misfire / signs of distress / exceedance of AAA levels, actions taken)
			Northing	Easting	Level (mPD)					Alert	Action	Alarm		Trans.	Vert.	Long.	Resultant	Trans.	Vert.	Long.	
09-Nov-2013	TK3-274	K-V34	816663.301	833449.237	3.82	152.8	BE16034	299.5	1	11.7	12.74	12.35	3.8	nil	nil	nil	nil	nil	nil	nil	nil
09-Nov-2013	TK3-274	K-V35	816692.327	833397.103	3.78	149.9	BE16046	118.5	1	11.7	12.74	12.35	3.8	nil	nil	nil	nil	nil	nil	nil	nil
09-Nov-2013	TK3-274	VMP-K3	816496.000	833546.000	4.00	270.4	BE16030	325.2	1	4.5	4.9	4.75	1.9	nil	nil	nil	nil	nil	nil	nil	nil

Vibration monitoring data summary sheet for tunnel blasting
Tunnel K Drive 3

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1a **Summary of Blasting Parameters**

Blast No.	Date	Time	Centre of blast location			Total no. of blastholes	No. of rows of blastholes	Hole dia (m)	Hole depth (m)	Subdrill (m)	Stemming/ (Inter-stemming for deck loading) (m)	Burden (m)	Blasthole spacing (m)	MIC (kg)	Type of rock blasted (m)	Total vol. of rock blasted (m3)	Types of initiation system	Type(s) of explosives used	Total amount of explosives (kg)	Powder factor
			Northing	Easting	Level (mPD)															
TK3-275	11-Nov-2013	19:15:57	816680.886	833421.199	-144.4	66		0.045	4.1 - 4.3		0.6 - 1.3		0.2 - 0.75	5.07	Granite	68	Electric	Cartridge & Emulsion	251.5	3.7

Note:
1. MIC - Maximum Instantaneous Charge

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1b **Summary of Monitoring Data**

Date	Blast No.	Sensitive Receiver & reference no.	Monitoring Station			Distance from blast (m)	Seismograph serial no.	Bearing of longitudinal direction of seismograph	Trigger level PPV (mm/s)	Permissible PPV (mm/s)			Predicted PPV (mm/s)	Measured PPV (mm/s)				Frequency (Hz)			Remarks (misfire / signs of distress / exceedance of AAA levels, actions taken)	
			Northing	Easting	Level (mPD)					Alert	Action	Alarm		Trans.	Vert.	Long.	Resultant	Trans.	Vert.	Long.		
11-Nov-2013	TK3-275	K-V34	816663.301	833449.237	3.82	151.9	BE16034	302.1	1	11.7	12.74	12.35	3.8	nil	nil	nil	nil	nil	nil	nil	nil	
11-Nov-2013	TK3-275	K-V35	816692.327	833397.103	3.78	150.6	BE16046	115.4	1	11.7	12.74	12.35	3.8	nil	nil	nil	nil	nil	nil	nil	nil	
11-Nov-2013	TK3-275	VMP-K3	816496.000	833546.000	4.00	267.9	BE16030	326.0	1	4.5	4.9	4.75	1.9	nil	nil	nil	nil	nil	nil	nil	nil	

Vibration monitoring data summary sheet for tunnel blasting
Tunnel K Drive 3

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1a **Summary of Blasting Parameters**

Blast No.	Date	Time	Centre of blast location			Total no. of blastholes	No. of rows of blastholes	Hole dia (m)	Hole depth (m)	Subdrill (m)	Stemming/ (Inter-stemming for deck loading) (m)	Burden (m)	Blasthole spacing (m)	MIC (kg)	Type of rock blasted (m)	Total vol. of rock blasted (m3)	Types of initiation system	Type(s) of explosives used	Total amount of explosives (kg)	Powder factor
			Northing	Easting	Level (mPD)															
TK3-276	12-Nov-2013	9:12:13	816680.162	833425.765	-144.4	66		0.045	4.1 - 4.3		0.6 - 1.3		0.2 - 0.75	5.07	Granite	68	Electric	Cartridge & Emulsion	251.5	3.7

Note:
1. MIC - Maximum Instantaneous Charge

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1b **Summary of Monitoring Data**

Date	Blast No.	Sensitive Receiver & reference no.	Monitoring Station			Distance from blast (m)	Seismograph serial no.	Bearing of longitudinal direction of seismograph	Trigger level PPV (mm/s)	Permissible PPV (mm/s)			Predicted PPV (mm/s)	Measured PPV (mm/s)				Frequency (Hz)			Remarks (misfire / signs of distress / exceedance of AAA levels, actions taken)
			Northing	Easting	Level (mPD)					Alert	Action	Alarm		Trans.	Vert.	Long.	Resultant	Trans.	Vert.	Long.	
12-Nov-2013	TK3-276	K-V34	816663.301	833449.237	3.82	151.0	BE16034	305.7	1	11.7	12.74	12.35	3.8	nil	nil	nil	nil	nil	nil	nil	nil
12-Nov-2013	TK3-276	K-V35	816692.327	833397.103	3.78	151.4	BE16046	113.0	1	11.7	12.74	12.35	3.8	nil	nil	nil	nil	nil	nil	nil	nil
12-Nov-2013	TK3-276	VMP-K3	816496.000	833546.000	4.00	265.3	BE16030	326.9	1	4.5	4.9	4.75	1.9	nil	nil	nil	nil	nil	nil	nil	nil

Vibration monitoring data summary sheet for tunnel blasting
Tunnel K Drive 3

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1a **Summary of Blasting Parameters**

Blast No.	Date	Time	Centre of blast location			Total no. of blastholes	No. of rows of blastholes	Hole dia (m)	Hole depth (m)	Subdrill (m)	Stemming/ (Inter-stemming for deck loading) (m)	Burden (m)	Blasthole spacing (m)	MIC (kg)	Type of rock blasted (m)	Total vol. of rock blasted (m3)	Types of initiation system	Type(s) of explosives used	Total amount of explosives (kg)	Powder factor
			Northing	Easting	Level (mPD)															
TK3-278	13-Nov-2013	9:04:53	816679.023	833432.961	-144.4	66		0.045	4.1 - 4.3		0.6 - 1.3		0.2 - 0.75	5.07	Granite	68	Electric	Cartridge & Emulsion	251.5	3.7

Note:
1. MIC - Maximum Instantaneous Charge

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1b **Summary of Monitoring Data**

Date	Blast No.	Sensitive Receiver & reference no.	Monitoring Station			Distance from blast (m)	Seismograph serial no.	Bearing of longitudinal direction of seismograph	Trigger level PPV (mm/s)	Permissible PPV (mm/s)			Predicted PPV (mm/s)	Measured PPV (mm/s)				Frequency (Hz)			Remarks (misfire / signs of distress / exceedance of AAA levels, actions taken)	
			Northing	Easting	Level (mPD)					Alert	Action	Alarm		Trans.	Vert.	Long.	Resultant	Trans.	Vert.	Long.		
13-Nov-2013	TK3-278	K-V34	816663.301	833449.237	3.82	149.9	BE16034	314.0	1	11.7	12.74	12.35	3.8	nil	nil	nil	nil	nil	nil	nil	nil	
13-Nov-2013	TK3-278	K-V35	816692.327	833397.103	3.78	153	BE16046	110.4	1	11.7	12.74	12.35	3.7	nil	nil	nil	nil	nil	nil	nil	nil	
13-Nov-2013	TK3-278	VMP-K3	816496.000	833546.000	4.00	261.3	BE16030	328.3	1	4.5	4.9	4.75	1.9	nil	nil	nil	nil	nil	nil	nil	nil	

Vibration monitoring data summary sheet for tunnel blasting
Tunnel K Drive 3

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1a **Summary of Blasting Parameters**

Blast No.	Date	Time	Centre of blast location			Total no. of blastholes	No. of rows of blastholes	Hole dia (m)	Hole depth (m)	Subdrill (m)	Stemming/ (Inter-stemming for deck loading) (m)	Burden (m)	Blasthole spacing (m)	MIC (kg)	Type of rock blasted (m)	Total vol. of rock blasted (m3)	Types of initiation system	Type(s) of explosives used	Total amount of explosives (kg)	Powder factor
			Northing	Easting	Level (mPD)															
TK3-280	14-Nov-2013	9:10:49	816677.655	833440.628	-144.4	66		0.045	4.1 - 4.3		0.6 - 1.3		0.2 - 0.75	5.07	Granite	68	Electric	Cartridge & Emulsion	251.5	3.7

Note:
1. MIC - Maximum Instantaneous Charge

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1b **Summary of Monitoring Data**

Date	Blast No.	Sensitive Receiver & reference no.	Monitoring Station			Distance from blast (m)	Seismograph serial no.	Bearing of longitudinal direction of seismograph	Trigger level PPV (mm/s)	Permissible PPV (mm/s)			Predicted PPV (mm/s)	Measured PPV (mm/s)				Frequency (Hz)			Remarks (misfire / signs of distress / exceedance of AAA levels, actions taken)
			Northing	Easting	Level (mPD)					Alert	Action	Alarm		Trans.	Vert.	Long.	Resultant	Trans.	Vert.	Long.	
14-Nov-2013	TK3-280	K-V34	816663.301	833449.237	3.82	149.2	BE16034	329.0	1	11.7	12.74	12.35	3.9	nil	nil	nil	nil	nil	nil	nil	nil
14-Nov-2013	TK3-280	K-V35	816692.327	833397.103	3.78	155.1	BE16046	108.6	1	11.7	12.74	12.35	3.7	nil	nil	nil	nil	nil	nil	nil	nil
14-Nov-2013	TK3-280	VMP-K3	816496.000	833546.000	4.00	257.1	BE16030	329.9	1	4.5	4.9	4.75	2.0	nil	nil	nil	nil	nil	nil	nil	nil

Vibration monitoring data summary sheet for tunnel blasting
Tunnel K Drive 3

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1a **Summary of Blasting Parameters**

Blast No.	Date	Time	Centre of blast location			Total no. of blastholes	No. of rows of blastholes	Hole dia (m)	Hole depth (m)	Subdrill (m)	Stemming/ (Inter-stemming for deck loading) (m)	Burden (m)	Blasthole spacing (m)	MIC (kg)	Type of rock blasted (m)	Total vol. of rock blasted (m3)	Types of initiation system	Type(s) of explosives used	Total amount of explosives (kg)	Powder factor
			Northing	Easting	Level (mPD)															
TK3-281	15-Nov-2013	19:15:52	816677.291	833442.597	-144.4	68		0.045	4.1 - 4.3		0.6 - 1.3		0.2 - 0.75	5.07	Granite	68	Electric	Cartridge & Emulsion	251.5	3.7

Note:
1. MIC - Maximum Instantaneous Charge

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1b **Summary of Monitoring Data**

Date	Blast No.	Sensitive Receiver & reference no.	Monitoring Station			Distance from blast (m)	Seismograph serial no.	Bearing of longitudinal direction of seismograph	Trigger level PPV (mm/s)	Permissible PPV (mm/s)			Predicted PPV (mm/s)	Measured PPV (mm/s)				Frequency (Hz)			Remarks (misfire / signs of distress / exceedance of AAA levels, actions taken)
			Northing	Easting	Level (mPD)					Alert	Action	Alarm		Trans.	Vert.	Long.	Resultant	Trans.	Vert.	Long.	
15-Nov-2013	TK3-281	K-V34	816663.301	833449.237	3.82	149.0	BE16034	334.6	1	11.7	12.74	12.35	3.9	nil	nil	nil	nil	nil	nil	nil	nil
15-Nov-2013	TK3-281	K-V35	816692.327	833397.103	3.78	155.7	BE16046	108.3	1	11.7	12.74	12.35	3.7	nil	nil	nil	nil	nil	nil	nil	nil
15-Nov-2013	TK3-281	VMP-K3	816496.000	833546.000	4.00	256.1	BE16030	330.3	1	4.5	4.9	4.75	2.0	nil	nil	nil	nil	nil	nil	nil	nil

Vibration monitoring data summary sheet for tunnel blasting
Tunnel K Drive 3

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1a **Summary of Blasting Parameters**

Blast No.	Date	Time	Centre of blast location			Total no. of blastholes	No. of rows of blastholes	Hole dia (m)	Hole depth (m)	Subdrill (m)	Stemming/ (Inter-stemming for deck loading) (m)	Burden (m)	Blasthole spacing (m)	MIC (kg)	Type of rock blasted (m)	Total vol. of rock blasted (m3)	Types of initiation system	Type(s) of explosives used	Total amount of explosives (kg)	Powder factor
			Northing	Easting	Level (mPD)															
TK3-282	16-Nov-2013	9:10:07	816676.461	833447.116	-144.4	66		0.045	4.1 - 4.3		0.6 - 1.3		0.2 - 0.75	5.07	Granite	68	Electric	Cartridge & Emulsion	251.5	3.7

Note:
1. MIC - Maximum Instantaneous Charge

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1b **Summary of Monitoring Data**

Date	Blast No.	Sensitive Receiver & reference no.	Monitoring Station			Distance from blast (m)	Seismograph serial no.	Bearing of longitudinal direction of seismograph	Trigger level PPV (mm/s)	Permissible PPV (mm/s)			Predicted PPV (mm/s)	Measured PPV (mm/s)				Frequency (Hz)			Remarks (misfire / signs of distress / exceedance of AAA levels, actions taken)	
			Northing	Easting	Level (mPD)					Alert	Action	Alarm		Trans.	Vert.	Long.	Resultant	Trans.	Vert.	Long.		
16-Nov-2013	TK3-282	K-V34	816663.301	833449.237	3.82	148.8	BE16034	350.8	1	11.7	12.74	12.35	3.9	nil	nil	nil	nil	nil	nil	nil	nil	
16-Nov-2013	TK3-282	K-V35	816692.327	833397.103	3.78	157.2	BE16046	107.6	1	11.7	12.74	12.35	3.6	nil	nil	nil	nil	nil	nil	nil	nil	
16-Nov-2013	TK3-282	VMP-K3	816496.000	833546.000	4.00	253.7	BE16030	331.3	1	4.5	4.9	4.75	2.0	nil	nil	nil	nil	nil	nil	nil	nil	

Vibration monitoring data summary sheet for tunnel blasting
Tunnel K Drive 3

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1a **Summary of Blasting Parameters**

Blast No.	Date	Time	Centre of blast location			Total no. of blastholes	No. of rows of blastholes	Hole dia (m)	Hole depth (m)	Subdrill (m)	Stemming/ (Inter-stemming for deck loading) (m)	Burden (m)	Blasthole spacing (m)	MIC (kg)	Type of rock blasted (m)	Total vol. of rock blasted (m3)	Types of initiation system	Type(s) of explosives used	Total amount of explosives (kg)	Powder factor
			Northing	Easting	Level (mPD)															
TK3-284	18-Nov-2013	20:07:45	816675.164	833454.305	-144.4	66		0.045	4.1 - 4.3		0.6 - 1.3		0.2 - 0.75	5.07	Granite	68	Electric	Cartridge & Emulsion	251.5	3.7

Note:
1. MIC - Maximum Instantaneous Charge

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1b **Summary of Monitoring Data**

Date	Blast No.	Sensitive Receiver & reference no.	Monitoring Station			Distance from blast (m)	Seismograph serial no.	Bearing of longitudinal direction of seismograph	Trigger level PPV (mm/s)	Permissible PPV (mm/s)			Predicted PPV (mm/s)	Measured PPV (mm/s)				Frequency (Hz)			Remarks (misfire / signs of distress / exceedance of AAA levels, actions taken)
			Northing	Easting	Level (mPD)					Alert	Action	Alarm		Trans.	Vert.	Long.	Resultant	Trans.	Vert.	Long.	
18-Nov-2013	TK3-284	K-V34	816663.301	833449.237	3.82	148.8	BE16034	23.1	1	11.7	12.74	12.35	3.9	nil	nil	nil	nil	nil	nil	nil	nil
18-Nov-2013	TK3-284	K-V35	816692.327	833397.103	3.78	159.8	BE16046	106.7	1	11.7	12.74	12.35	3.6	nil	nil	nil	nil	nil	nil	nil	nil
18-Nov-2013	TK3-284	VMP-K3	816496.000	833546.000	4.00	250.1	BE16030	332.9	1	4.5	4.9	4.75	2.1	nil	nil	nil	nil	nil	nil	nil	nil

Vibration monitoring data summary sheet for tunnel blasting
Tunnel K Drive 3

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1a **Summary of Blasting Parameters**

Blast No.	Date	Time	Centre of blast location			Total no. of blastholes	No. of rows of blastholes	Hole dia (m)	Hole depth (m)	Subdrill (m)	Stemming/ (Inter-stemming for deck loading) (m)	Burden (m)	Blasthole spacing (m)	MIC (kg)	Type of rock blasted (m)	Total vol. of rock blasted (m3)	Types of initiation system	Type(s) of explosives used	Total amount of explosives (kg)	Powder factor
			Northing	Easting	Level (mPD)															
TK3-285	19-Nov-2013	9:06:55	816674.500	833457.542	-144.4	66		0.045	4.1 - 4.3		0.6 - 1.3		0.2 - 0.75	5.07	Granite	68	Electric	Cartridge & Emulsion	251.5	3.7

Note:
1. MIC - Maximum Instantaneous Charge

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1b **Summary of Monitoring Data**

Date	Blast No.	Sensitive Receiver & reference no.	Monitoring Station			Distance from blast (m)	Seismograph serial no.	Bearing of longitudinal direction of seismograph	Trigger level PPV (mm/s)	Permissible PPV (mm/s)			Predicted PPV (mm/s)	Measured PPV (mm/s)				Frequency (Hz)			Remarks (misfire / signs of distress / exceedance of AAA levels, actions taken)	
			Northing	Easting	Level (mPD)					Alert	Action	Alarm		Trans.	Vert.	Long.	Resultant	Trans.	Vert.	Long.		
19-Nov-2013	TK3-285	K-V34	816663.301	833449.237	3.82	148.9	BE16034	36.6	1	11.7	12.74	12.35	3.9	nil	nil	nil	nil	nil	nil	nil	nil	
19-Nov-2013	TK3-285	K-V35	816692.327	833397.103	3.78	161.0	BE16046	106.4	1	11.7	12.74	12.35	3.5	nil	nil	nil	nil	nil	nil	nil	nil	
19-Nov-2013	TK3-285	VMP-K3	816496.000	833546.000	4.00	248.4	BE16030	333.6	1	4.5	4.9	4.75	2.1	nil	nil	nil	nil	nil	nil	nil	nil	

Vibration monitoring data summary sheet for tunnel blasting
Tunnel K Drive 3

Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1a **Summary of Blasting Parameters**

Blast No.	Date	Time	Centre of blast location			Total no. of blastholes	No. of rows of blastholes	Hole dia (m)	Hole depth (m)	Subdrill (m)	Stemming/ (Inter-stemming for deck loading) (m)	Burden (m)	Blasthole spacing (m)	MIC (kg)	Type of rock blasted (m)	Total vol. of rock blasted (m3)	Types of initiation system	Type(s) of explosives used	Total amount of explosives (kg)	Powder factor
			Northing	Easting	Level (mPD)															
TK3-288	20-Nov-2013	19:04:50	816672.958	833464.980	-144.4	66		0.045	4.1 - 4.3		0.6 - 1.3		0.2 - 0.75	5.07	Granite	68	Electric	Cartridge & Emulsion	255.4	3.76

Note:
1. MIC - Maximum Instantaneous Charge

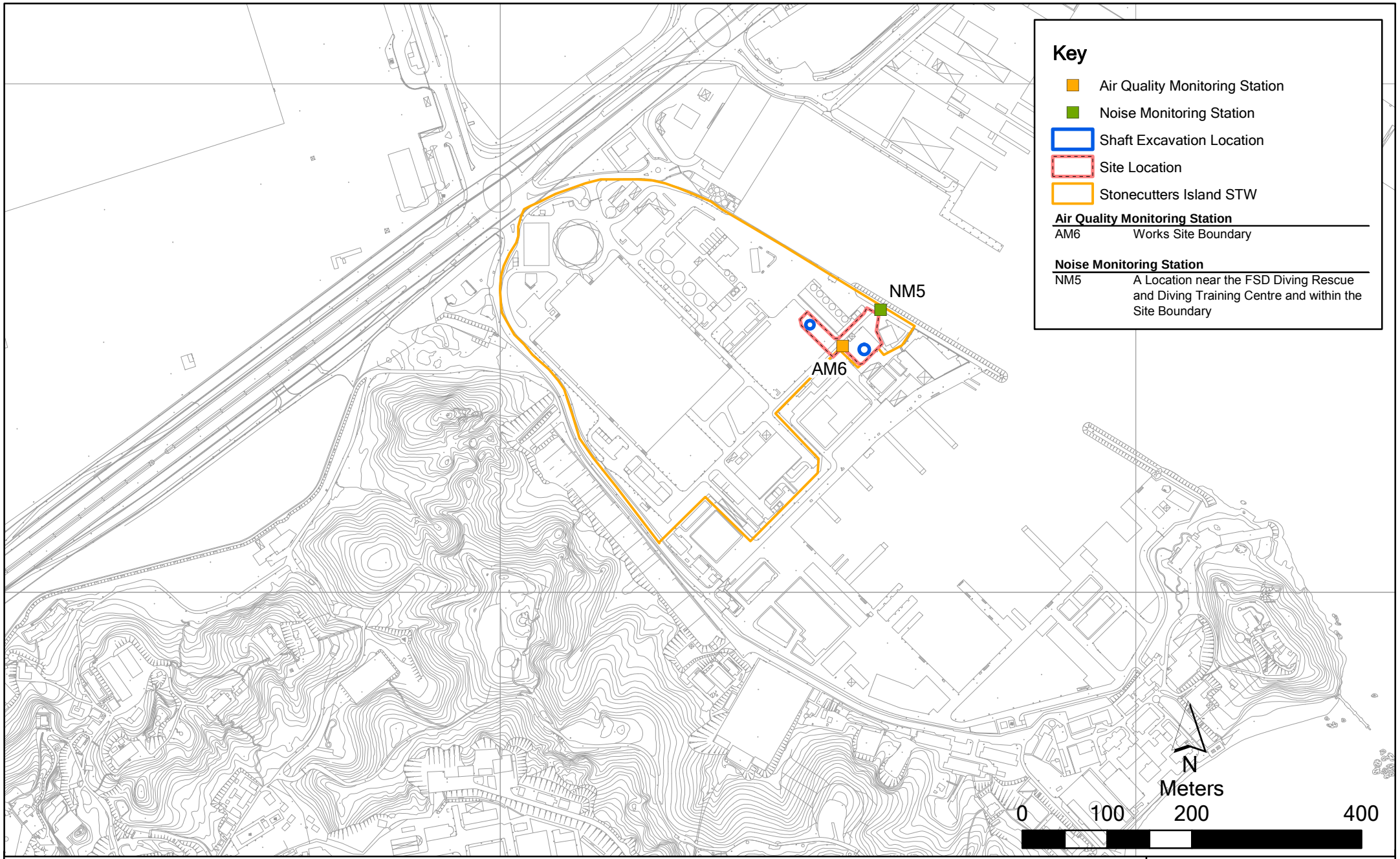
Consultants: **AECOM Asia CO. Ltd.** **Contractor:** **Gammon Construction Ltd.**

Table 1b **Summary of Monitoring Data**

Date	Blast No.	Sensitive Receiver & reference no.	Monitoring Station			Distance from blast (m)	Seismograph serial no.	Bearing of longitudinal direction of seismograph	Trigger level PPV (mm/s)	Permissible PPV (mm/s)			Predicted PPV (mm/s)	Measured PPV (mm/s)				Frequency (Hz)			Remarks (misfire / signs of distress / exceedance of AAA levels, actions taken)
			Northing	Easting	Level (mPD)					Alert	Action	Alarm		Trans.	Vert.	Long.	Resultant	Trans.	Vert.	Long.	
20-Nov-2013	TK3-288	K-V34	816663.301	833449.237	3.82	149.4	BE16034	58.5	1	11.7	12.74	12.35	3.9	nil	nil	nil	nil	nil	nil	nil	nil
20-Nov-2013	TK3-288	K-V35	816692.327	833397.103	3.78	164.1	BE16046	105.9	1	11.7	12.74	12.35	3.4	nil	nil	nil	nil	nil	nil	nil	nil
20-Nov-2013	TK3-288	VMP-K3	816496.000	833546.000	4	244.7	BE16030	335.4	1	4.5	4.9	4.75	2.1	nil	nil	nil	nil	nil	nil	nil	nil

Annex G

Stonecutters Island Production and Riser Shafts



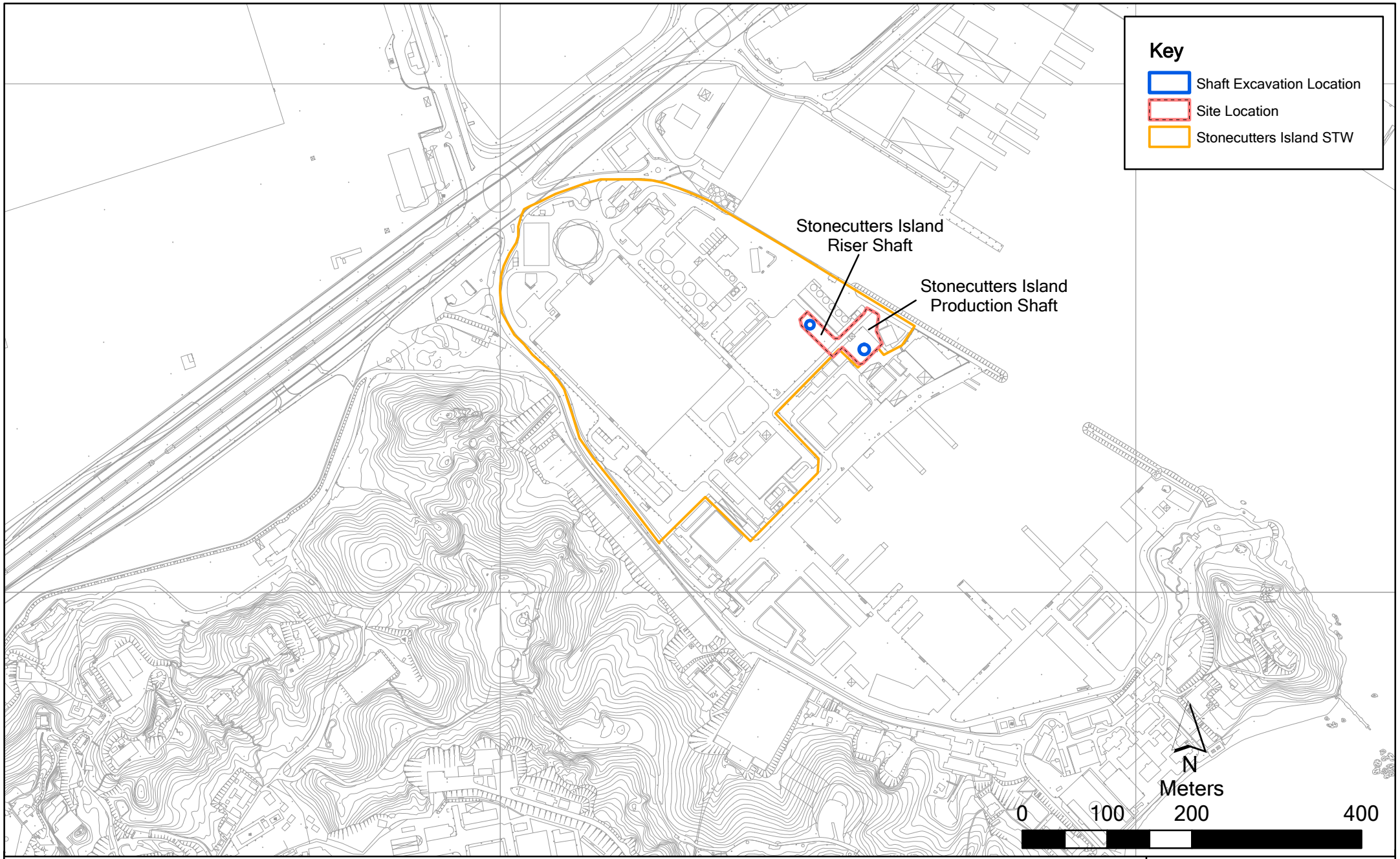
Annex G2

Contract No. DC/2007/23
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Impact Air Quality & Noise Monitoring Station (Stonecutters Island STW)

File: EM&A and proposed station\
0104887_Stonecutters Island_NMAM.mxd
Date: 03/03/2010

Environmental Resources Management

ERM



Annex G1

Contract No. DC/2007/23
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from North Point to Stonecutters Island
Construction Site Locations at Stonecutters Island STW

File: EM&A and proposed station\
0104887_Stonecutters Island.mxd
Date: 03/03/2010

Environmental Resources Management

ERM

Annex G3 Not Used

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase			
Air Quality	The Air Pollution Control (Construction Dust) Regulation shall be implemented and good site practices shall be incorporated in the contract clauses to minimise construction dust impact. Control measures relevant to this Project are listed below: • skip hoist for material transport should be totally enclosed by impervious sheeting; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site; • 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 hardcores; • where a site boundary adjoins a road, streets or other 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; • 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; • regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather; • site enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines; • open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible; • tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and • instigation of an environmental monitoring auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	The following watering measures for specific site would be required to control the fugitive dust impacts: • watering twice per day within the worksites at North Point PTW; and • watering 8 times per day within worksites at the SCS works area at North Point.	All work sites / during construction	√
Operational Phase			
Air Quality	Good housekeeping for SCISTW and PTWs listed below should be followed to ameliorate any odour impact from the plant and these standard practices should be included in the plant operator manual. • Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers to minimise odour escape • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality	Commissioning tests for all deodorisation system should be included in the Design and Construction Contract Document.	All PTW and SCISTW/ during operational phase	NA. Measures not required until commencement of operational phase
Construction Phase			
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Good Site Practice: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction program; • mobile plant, if any, should be sited as far from NSRs as possible; • machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities; Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.	All work sites / during construction	√
Construction Phase			
Water Quality	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 work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Effluent Discharge There is a need to apply to EPD for a discharge license for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge license. 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.	All work sites / during construction	√
Water Quality	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) Regulation should be observed and complied with for control of chemical wastes.	All work sites / during construction	<>
Water Quality	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.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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.	All work sites / during construction	<>

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront To minimise 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 the storm culvert or sea	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Operational Phase			
Water Quality	Dual power supply, standby facilities for the main treatment units and standby equipment parts / accessories should be provided as far as possible at the SCISTW to minimise the chance of emergency discharge.	SCISTW and all the Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	Standby unit(s) and dual (backup) power supply would be provided at all the Stage 2 PTWs to reduce the risk of equipment breakdown at the PTWs.	Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Waste	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 minimise the use of timber formwork.	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Recommendations to achieve waste reduction include: • 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; and • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All work sites / during the construction period	√
Waste	Recommendations for good site practices during construction activities include:- • 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 • 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. • Provision of sufficient waste disposal points and regular collection of waste • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	NA

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.	All work sites / during the construction period	√
Waste	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Waste	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, oxidising, 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.	All work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	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.	All work sites / during the construction period	√
Construction Phase			
Landscape & Visual	• Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. • 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. • Erection of decorative screen hoarding compatible with the surrounding setting.	All the works areas, PTWs and SCISTW/ during the construction period	√
Operational Phase	•		
Landscape & Visual	• Aesthetic design of the façade of PTW and associated structures to harmonise with the surrounding settings. • Shrub and Climbing Plants to soften proposed structures / Roof Greening. • Buffer Tree and Shrub Planting to screen proposed associated structures. • Reinstated of disturbed area	All the works areas, PTWs and SCISTW/ during the construction period	NA. Measures not required until commencement of operational phase
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Cultural Heritage	The construction vibration control limit (ppv of 25mm/s) shall be strictly followed.	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.
	Monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme	Identified historical buildings/structures as mentioned in Tables 15.8 and 15.9. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.

Remark:
√ Compliance of Mitigation Measures
<> Compliance of Mitigation but need improvement
x Non-compliance of Mitigation Measures
Δ Deficiency of Mitigation Measures but rectified by the Contractor
NA Not Applicable

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase			
Air Quality	The Air Pollution Control (Construction Dust) Regulation shall be implemented and good site practices shall be incorporated in the contract clauses to minimise construction dust impact. Control measures relevant to this Project are listed below: • skip hoist for material transport should be totally enclosed by impervious sheeting; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site; • 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 hardcores; • where a site boundary adjoins a road, streets or other 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; • 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; • regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather; • site enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines; • open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible; • tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and • instigation of an environmental monitoring auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	The following watering measures for specific site would be required to control the fugitive dust impacts: • the barging points should be continuous watering throughout the whole unloading process; and • watering 8 times per day within worksites at the SCS works area at SCISTW and the Disinfection Facilities of SCISTW.	All work sites / during construction	√
Operational Phase			
Air Quality	Good housekeeping for SCISTW and PTWs listed below should be followed to ameliorate any odour impact from the plant and these standard practices should be included in the plant operator manual. • Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers to minimise odour escape • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality	To avoid excessive extraction of the foul air from the drop shafts of the sedimentation tanks and also from the effluent flume structure of SCISTW to deodorisation system, the extraction vent(s) of the deodorisation system should be located away from the top openings of the drop shafts.	SCISTW /during operational phase	NA. Measures not required until commencement of operational phase
Air Quality	Commissioning tests for all deodorisation system should be included in the Design and Construction Contract Document.	All PTW and SCISTW/ during operational phase	NA. Measures not required until commencement of operational phase
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√
Noise	Good Site Practice: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction program; • mobile plant, if any, should be sited as far from NSRs as possible; • machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities; Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.	All work sites / during construction	√
Construction Phase			
Water Quality	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 work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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.	All work sites / during construction	√
Water Quality	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) Regulation should be observed and complied with for control of chemical wastes.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	<>

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront To minimise 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 the storm culvert or sea	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Temporary Sewage Bypass It is recommended that the temporary sewage bypass required for (i) the modification to the existing pumping station at SCISTW and (ii) the interconnection between the existing main pumping station and the new pumping station on Stonecutters Island, if needed, should be scheduled at the same time as far as practicable in order to minimise the temporary discharge duration. It is also recommended that all the modification and interconnection to the existing facilities (including the modification to the existing NWKPS) should be programmed to avoid temporary sewage bypass in wet or bathing season (March to October) to minimise the potential impacts. Relevant government departments including EPD and LCSD should be informed of the planned sewage bypass prior to any discharge. During the sewage bypass period, water quality monitoring should be carried out at the water sensitive receivers to quantify the water quality impacts and to determine when the baseline water quality conditions are restored. Also, a framework of the response procedures has been formulated to minimise the impact of temporary discharges. Details are provided in the standalone EM&A Manual.	SCISTW/ construction period	√
Operational Phase			
Water Quality	Dual power supply, standby facilities for the main treatment units and standby equipment parts / accessories should be provided as far as possible at the SCISTW to minimise the chance of emergency discharge.	SCISTW and all the Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	The response procedure and monitoring requirements for emergency discharge as stated in EM&A Manual should be followed.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	In case of total power outage of the dechlorination plant, the uninterruptible power supply (UPS) system to be provided would switch the power supply of the sodium bisulphite dosing pump to a backup battery almost instantaneously, allowing continuous dosage of sodium bisulphite for at least half an hour so that sufficient time can be provided for shutting down the chlorination plant to avoid the possibility of discharge of chlorinated effluent.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	The model predicted that if Stage 2B is not implemented for HATS in 2021 as scheduled, the nutrient contents (both P and N) in the marine water would ultimately increase to exceed the baseline Stage 1 level when the HATS flow is reaching its design capacity of 2.45M m3/day. It is recommended that the future review study for Stage 2B should review the validity of the model predictions provided in this EIA and confirm the need of enhanced nutrient removal for HATS after 2021.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	It should be noted that the mixing zone for TIN predicted for Stage 2B was large with an area of about 30 km2 and the area of exceedance would encroach on the nearby water sensitive receivers (e.g. Ma Wan Fish Culture Zone). This is due to the elevated oxidised nitrogen assumed for the proposed nitrification process at Stage 2B as well as the increased HATS effluent flow assumed for Stage 2B. It is recommended that these water quality issues should be further investigated / assessed under the future EIA for Stage 2B. Further mitigation measures / alternative treatment designs should also be considered under the future EIA for Stage 2B to mitigate / minimise the potential TIN exceedances.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Waste	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 minimise the use of timber formwork.	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Recommendations to achieve waste reduction include: • 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; and • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All work sites / during the construction period	√
Waste	Recommendations for good site practices during construction activities include:- • 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. • 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. • Provision of sufficient waste disposal points and regular collection of waste. • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.	All work sites / during the construction period	<>
Waste	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 work sites / during the construction period	NA
Waste	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.	All work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Waste	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, oxidising, 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.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Operation Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	The sludge tanks should be air-tighten. Rotating brushes or other alternative devises should be installed at the upper frame of the sludge tank washing facilities to provide better cleaning of the surface around the top loading opening of the sludge tanks. Prior to making such provision, the top covers of the sludge transfer tanks should be water cleaned manually after unloading.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase
Waste	Since the air tightness of tankers highly relies on the effectiveness of rubber seals at the loading openings and unloading doors, odour leakage from tankers are commonly resulted from the aging rubber seals. It is recommended to develop a preventive maintenance programme for rubber seals of loading openings and unloading doors of sludge transfer tanks to ensure the tightness of covers and doors. Rubber seals should be regularly replaced within its design life as specified by suppliers.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Landscape & Visual	• Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. • 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. • Erection of decorative screen hoarding compatible with the surrounding setting.	All the works areas, PTWs and SCISTW/ during the construction period	√
Operational Phase	•		
Landscape & Visual	• Aesthetic design of the façade of PTW and associated structures to harmonise with the surrounding settings. • Shrub and Climbing Plants to soften proposed structures / Roof Greening. • Buffer Tree and Shrub Planting to screen proposed associated structures. • Reinstated of disturbed area	All the works areas, PTWs and SCISTW/ during the construction period	NA. Measures not required until commencement of operational phase

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase	•		
Cultural Heritage	The construction vibration control limit (ppv of 25mm/s) shall be strictly followed.	Identified historical buildings/structures as mentioned in Tables 15.10 and 15.11. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.

Remark:
√ Compliance of Mitigation Measures
<> Compliance of Mitigation but need improvement
x Non-compliance of Mitigation Measures
Δ Deficiency of Mitigation Measures but rectified by Gammon Construction Limited
NA Not Applicable

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase			
Air Quality	The Air Pollution Control (Construction Dust) Regulation shall be implemented and good site practices shall be incorporated in the contract clauses to minimise construction dust impact. Control measures relevant to this Project are listed below: • skip hoist for material transport should be totally enclosed by impervious sheeting; • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site; • 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 hardcores; • where a site boundary adjoins a road, streets or other 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; • 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; • regular watering, with complete coverage, to reduce dust emission from exposed site surfaces and unpaved roads, particularly during dry weather; • site enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines; • open stock piles should be avoided or covered and prevent placing dusty material storage piles near ASRs if possible; • tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; and • instigation of an environmental monitoring auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Air Quality	The following watering measures for specific site would be required to control the fugitive dust impacts: • the barging points should be continuous watering throughout the whole unloading process; and • watering 8 times per day within worksites at the SCS works area at SCISTW and the Disinfection Facilities of SCISTW.	All work sites / during construction	√
Operational Phase			
Air Quality	Good housekeeping for SCISTW and PTWs listed below should be followed to ameliorate any odour impact from the plant and these standard practices should be included in the plant operator manual. • Screens should be cleaned regularly to remove any accumulated organic debris • Grit and screening transfer systems should be flushed regularly with water to remove organic debris and grit • Grit and screened materials should be transferred to closed containers to minimise odour escape • Scum and grease collection wells and troughs should be emptied and flushed regularly to prevent putrefaction of accumulated organics • Skim and remove floating solids and grease from primary clarifiers regularly • Frequent sludge withdrawal from tanks is necessary to prevent the production of gases • Sludge cake should be transferred to closed containers • Sludge containers should be flushed with water regularly	All work sites / during construction	NA. Measures not required until commencement of operational phase
Air Quality	To avoid excessive extraction of the foul air from the drop shafts of the sedimentation tanks and also from the effluent flume structure of SCISTW to deodorisation system, the extraction vent(s) of the deodorisation system should be located away from the top openings of the drop shafts.	SCISTW /during operational phase	NA. Measures not required until commencement of operational phase
Air Quality	Commissioning tests for all deodorisation system should be included in the Design and Construction Contract Document.	All PTW and SCISTW/ during operational phase	NA. Measures not required until commencement of operational phase
Construction Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Noise	Use of quiet PME, movable barriers and acoustic mats	All work sites / during construction	√
Noise	Good Site Practice: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction program; • mobile plant, if any, should be sited as far from NSRs as possible; • machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities; Environmental audit shall be carried out to ensure that appropriate noise control measures would be properly implemented.	All work sites / during construction	√
Construction Phase			
Water Quality	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 work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	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.	All work sites / during construction	√
Water Quality	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) Regulation should be observed and complied with for control of chemical wastes.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	√
Water Quality	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.	All work sites / during construction	<>

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Construction Works in Close Proximity of Storm Drains or Seafront To minimise 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 the storm culvert or sea	All work sites / during construction	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	Temporary Sewage Bypass It is recommended that the temporary sewage bypass required for (i) the modification to the existing pumping station at SCISTW and (ii) the interconnection between the existing main pumping station and the new pumping station on Stonecutters Island, if needed, should be scheduled at the same time as far as practicable in order to minimise the temporary discharge duration. It is also recommended that all the modification and interconnection to the existing facilities (including the modification to the existing NWKPS) should be programmed to avoid temporary sewage bypass in wet or bathing season (March to October) to minimise the potential impacts. Relevant government departments including EPD and LCSD should be informed of the planned sewage bypass prior to any discharge. During the sewage bypass period, water quality monitoring should be carried out at the water sensitive receivers to quantify the water quality impacts and to determine when the baseline water quality conditions are restored. Also, a framework of the response procedures has been formulated to minimise the impact of temporary discharges. Details are provided in the standalone EM&A Manual.	SCISTW/ construction period	√
Operational Phase			
Water Quality	Dual power supply, standby facilities for the main treatment units and standby equipment parts / accessories should be provided as far as possible at the SCISTW to minimise the chance of emergency discharge.	SCISTW and all the Stage 2 PTWs / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	The response procedure and monitoring requirements for emergency discharge as stated in EM&A Manual should be followed.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	In case of total power outage of the dechlorination plant, the uninterruptible power supply (UPS) system to be provided would switch the power supply of the sodium bisulphite dosing pump to a backup battery almost instantaneously, allowing continuous dosage of sodium bisulphite for at least half an hour so that sufficient time can be provided for shutting down the chlorination plant to avoid the possibility of discharge of chlorinated effluent.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Water Quality	The model predicted that if Stage 2B is not implemented for HATS in 2021 as scheduled, the nutrient contents (both P and N) in the marine water would ultimately increase to exceed the baseline Stage 1 level when the HATS flow is reaching its design capacity of 2.45M m3/day. It is recommended that the future review study for Stage 2B should review the validity of the model predictions provided in this EIA and confirm the need of enhanced nutrient removal for HATS after 2021.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase
Water Quality	It should be noted that the mixing zone for TIN predicted for Stage 2B was large with an area of about 30 km2 and the area of exceedance would encroach on the nearby water sensitive receivers (e.g. Ma Wan Fish Culture Zone). This is due to the elevated oxidised nitrogen assumed for the proposed nitrification process at Stage 2B as well as the increased HATS effluent flow assumed for Stage 2B. It is recommended that these water quality issues should be further investigated / assessed under the future EIA for Stage 2B. Further mitigation measures / alternative treatment designs should also be considered under the future EIA for Stage 2B to mitigate / minimise the potential TIN exceedances.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Waste	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 minimise the use of timber formwork.	All work sites / during the construction period	√
Waste	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 work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	Recommendations to achieve waste reduction include: • 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; and • Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All work sites / during the construction period	√
Waste	Recommendations for good site practices during construction activities include:- • 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. • 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. • Provision of sufficient waste disposal points and regular collection of waste. • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.	All work sites / during the construction period	<>
Waste	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 work sites / during the construction period	NA
Waste	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.	All work sites / during the construction period	√

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Waste	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, oxidising, 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.	All work sites / during the construction period	√
Waste	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.	All work sites / during the construction period	√
Operation Phase			

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Waste	The sludge tanks should be air-tighten. Rotating brushes or other alternative devises should be installed at the upper frame of the sludge tank washing facilities to provide better cleaning of the surface around the top loading opening of the sludge tanks. Prior to making such provision, the top covers of the sludge transfer tanks should be water cleaned manually after unloading.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase
Waste	Since the air tightness of tankers highly relies on the effectiveness of rubber seals at the loading openings and unloading doors, odour leakage from tankers are commonly resulted from the aging rubber seals. It is recommended to develop a preventive maintenance programme for rubber seals of loading openings and unloading doors of sludge transfer tanks to ensure the tightness of covers and doors. Rubber seals should be regularly replaced within its design life as specified by suppliers.	SCISTW / Operation Stage	NA. Measures not required until commencement of operational phase
Construction Phase			
Landscape & Visual	• Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. • 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. • Erection of decorative screen hoarding compatible with the surrounding setting.	All the works areas, PTWs and SCISTW/ during the construction period	√
Operational Phase	•		
Landscape & Visual	• Aesthetic design of the façade of PTW and associated structures to harmonise with the surrounding settings. • Shrub and Climbing Plants to soften proposed structures / Roof Greening. • Buffer Tree and Shrub Planting to screen proposed associated structures. • Reinstated of disturbed area	All the works areas, PTWs and SCISTW/ during the construction period	NA. Measures not required until commencement of operational phase

Type of Impact	Environmental Protection Measures	Location/ Timing	Status
Construction Phase	•		
Cultural Heritage	The construction vibration control limit (ppv of 25mm/s) shall be strictly followed.	Identified historical buildings/structures as mentioned in Tables 15.10 and 15.11. During blasting for tunnel, shafts, effluent conveyance system and disinfection facilities in the vicinity of the buildings/ structures	NA. Vibration monitoring has not been launched during the reporting period.

Remark:
√ Compliance of Mitigation Measures
<> Compliance of Mitigation but need improvement
x Non-compliance of Mitigation Measures
Δ Deficiency of Mitigation Measures but rectified by Gammon Construction Limited
NA Not Applicable

Annex G5 24-hour and 1-hour TSP Monitoring Results

1-hour TSP Monitoring Results

Station AM6

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
04-Sep-13	15:14	16:14	Cloudy	212	346	500	Construction work in progress	25	<5	GMW GS-2310 (S/N 1254)	7916
	14:12	15:12	Cloudy	222	346	500	Construction work in progress	25	<5	GMW GS-2310 (S/N 1254)	7915
	13:10	14:10	Cloudy	218	346	500	Construction work in progress	25	<5	GMW GS-2310 (S/N 1254)	7914
10-Sep-13	9:20	10:20	Sunny	231	346	500	Construction work in progress	31	<5	GMW GS-2310 (S/N 1254)	7918
	10:22	11:22	Sunny	219	346	500	Construction work in progress	31	<5	GMW GS-2310 (S/N 1254)	7919
	11:24	12:24	Sunny	207	346	500	Construction work in progress	31	<5	GMW GS-2310 (S/N 1254)	7920
16-Sep-13	9:00	10:00	Sunny	190	346	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 1254)	8325
	10:02	11:02	Sunny	204	346	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 1254)	8326
	11:04	12:04	Sunny	196	346	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 1254)	8327
21-Sep-13	13:13	14:13	Sunny	180	346	500	Construction work in progress	31	<5	GMW GS-2310 (S/N 1254)	8328
	14:15	15:15	Sunny	173	346	500	Construction work in progress	31	<5	GMW GS-2310 (S/N 1254)	8329
	15:17	16:17	Sunny	176	346	500	Construction work in progress	31	<5	GMW GS-2310 (S/N 1254)	8330
26-Sep-13	13:07	14:07	Sunny	168	346	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 1254)	8332
	14:09	15:09	Sunny	183	346	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 1254)	8333
	15:11	16:11	Sunny	172	346	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 1254)	8334
			Min.	**168**							
			Max.	**231**							
			Average	**197**							

* Wind Speed data is presented in the Meteorological Data table

Annex G5 24-hour and 1-hour TSP Monitoring Results

1-hour TSP Monitoring Results

Station AM6

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
02-Oct-13	13:10	14:10	Sunny	153	346	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 1254)	8336
	14:12	15:12	Sunny	172	346	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 1254)	8337
	15:14	16:14	Sunny	178	346	500	Construction work in progress	29	<5	GMW GS-2310 (S/N 1254)	8338
07-Oct-13	13:20	14:20	Sunny	176	346	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 1254)	8340
	14:22	15:22	Sunny	180	346	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 1254)	8341
	15:24	16:24	Sunny	186	346	500	Construction work in progress	30	<5	GMW GS-2310 (S/N 1254)	8342
12-Oct-13	13:00	14:00	Sunny	198	346	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 1254)	8344
	14:02	15:02	Sunny	191	346	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 1254)	8345
	15:04	16:04	Sunny	189	346	500	Construction work in progress	28	<5	GMW GS-2310 (S/N 1254)	8346
18-Oct-13	13:00	14:00	Sunny	176	346	500	Construction work in progress	27	<5	GMW GS-2310 (S/N 1254)	8401
	14:02	15:02	Sunny	190	346	500	Construction work in progress	27	<5	GMW GS-2310 (S/N 1254)	8402
	15:04	16:04	Sunny	183	346	500	Construction work in progress	27	<5	GMW GS-2310 (S/N 1254)	8403
24-Oct-13	13:10	14:10	Sunny	202	346	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 1254)	8405
	14:12	15:12	Sunny	205	346	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 1254)	8406
	15:14	16:14	Sunny	227	346	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 1254)	8407
30-Oct-13	13:00	14:00	Sunny	178	346	500	Construction work in progress	26	<5	GMW GS-2310 (S/N 1254)	8409
	14:02	15:02	Sunny	206	346	500	Construction work in progress	26	<5	GMW GS-2310 (S/N 1254)	8410
	15:04	16:04	Sunny	183	346	500	Construction work in progress	26	<5	GMW GS-2310 (S/N 1254)	8411
			Min.	**153**							
			Max.	**227**							
			Average	**187**							

* Wind Speed data is presented in the Meteorological Data table

Annex G5 24-hour and 1-hour TSP Monitoring Results

1-hour TSP Monitoring Results

Station AM6

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
05-Nov-13	13:00	14:00	Sunny	197	346	500	Construction work in progress	26	<5	GMW GS-2310 (S/N 1254)	8413
	14:02	15:02	Sunny	224	346	500	Construction work in progress	26	<5	GMW GS-2310 (S/N 1254)	8414
	15:04	16:04	Sunny	246	346	500	Construction work in progress	26	<5	GMW GS-2310 (S/N 1254)	8415
11-Nov-13	13:40	14:40	Sunny	191	346	500	Construction work in progress	25	<5	GMW GS-2310 (S/N 1254)	8417
	14:42	15:42	Sunny	208	346	500	Construction work in progress	25	<5	GMW GS-2310 (S/N 1254)	8418
	15:44	16:44	Sunny	208	346	500	Construction work in progress	25	<5	GMW GS-2310 (S/N 1254)	8419
15-Nov-13	13:40	14:40	Sunny	221	346	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 1254)	8421
	14:42	15:42	Sunny	223	346	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 1254)	8422
	15:44	16:44	Sunny	231	346	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 1254)	8423
21-Nov-13	13:05	14:05	Sunny	195	346	500	Construction work in progress	19	<5	GMW GS-2310 (S/N 1254)	8825
	14:07	15:07	Sunny	211	346	500	Construction work in progress	19	<5	GMW GS-2310 (S/N 1254)	8826
	15:09	16:09	Sunny	185	346	500	Construction work in progress	19	<5	GMW GS-2310 (S/N 1254)	8827
27-Nov-13	13:15	14:15	Sunny	161	346	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 1254)	8877
	14:17	15:17	Sunny	187	346	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 1254)	8878
	15:19	16:19	Sunny	175	346	500	Construction work in progress	23	<5	GMW GS-2310 (S/N 1254)	8879
			Min.	**161**							
			Max.	**246**							
			Average	**204**							

* Wind Speed data is presented in the Meteorological Data table

Annex G5 24-hour and 1-hour TSP Monitoring Results

24-hour TSP Monitoring Results

Station AM6

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	(μg/m^3)	(μg/m^3)	(μg/m^3)		ID	ID
04-Sep-13	16:16	05-Sep-13	16:16	Cloudy	2.7648	2.9551	12192.03	12216.03	24.00	1.21	1.21	1.21	109	196	260	Construction work in progress	GMW GS 2310 (S/N 1254)	7917
10-Sep-13	12:26	11-Sep-13	12:26	Sunny	2.7818	2.9797	12219.03	12243.03	24.00	1.21	1.21	1.21	114	196	260	Construction work in progress	GMW GS 2310 (S/N 1254)	7921
16-Sep-13	12:06	17-Sep-13	12:06	Sunny	2.7787	2.9311	12246.03	12270.03	24.00	1.21	1.21	1.21	87	196	260	Construction work in progress	GMW GS 2310 (S/N 1254)	7922
21-Sep-13	16:19	22-Sep-13	16:19	Sunny	2.8129	2.9869	12273.03	12297.03	24.00	1.21	1.21	1.21	100	196	260	Construction work in progress	GMW GS 2310 (S/N 1254)	8331
26-Sep-13	16:13	27-Sep-13	16:13	Sunny	2.7979	2.9513	12300.03	12324.03	24.00	1.22	1.22	1.22	87	196	260	Construction work in progress	GMW GS 2310 (S/N 1254)	8335
												Min.	**87**					
												Max.	**114**					
												Average	**100**					

Annex G5 24-hour and 1-hour TSP Monitoring Results

24-hour TSP Monitoring Results

Station AM6

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	(μg/m^3)	(μg/m^3)	(μg/m^3)		ID	ID
02-Oct-13	16:16	03-Oct-13	16:16	Sunny	2.7944	2.9669	12327.03	12351.03	24.00	1.22	1.22	1.22	98	196	260	Construction work in progress	GMW GS 2310 (S/N 1254)	8339
07-Oct-13	16:26	08-Oct-13	16:26	Sunny	2.8115	2.9842	12354.03	12378.03	24.00	1.22	1.22	1.22	98	196	260	Construction work in progress	GMW GS 2310 (S/N 1254)	8343
12-Oct-13	16:06	13-Oct-13	16:06	Sunny	2.8108	2.9779	12381.03	12405.03	24.00	1.22	1.22	1.22	95	196	260	Construction work in progress	GMW GS 2310 (S/N 1254)	8347
18-Oct-13	16:06	19-Oct-13	16:06	Sunny	2.8329	3.0012	12408.03	12432.03	24.00	1.22	1.22	1.22	96	196	260	Construction work in progress	GMW GS 2310 (S/N 1254)	8404
24-Oct-13	15:16	25-Oct-13	15:16	Sunny	2.8097	3.0112	12435.03	12459.03	24.00	1.22	1.22	1.22	115	196	260	Construction work in progress	GMW GS 2310 (S/N 1254)	8408
30-Oct-13	16:06	31-Oct-13	16:06	Sunny	2.8098	3.0021	12462.03	12486.03	24.00	1.22	1.22	1.22	109	196	260	Construction work in progress	GMW GS 2310 (S/N 1254)	8412
												Min.	**95**					
												Max.	**115**					
												Average	**102**					

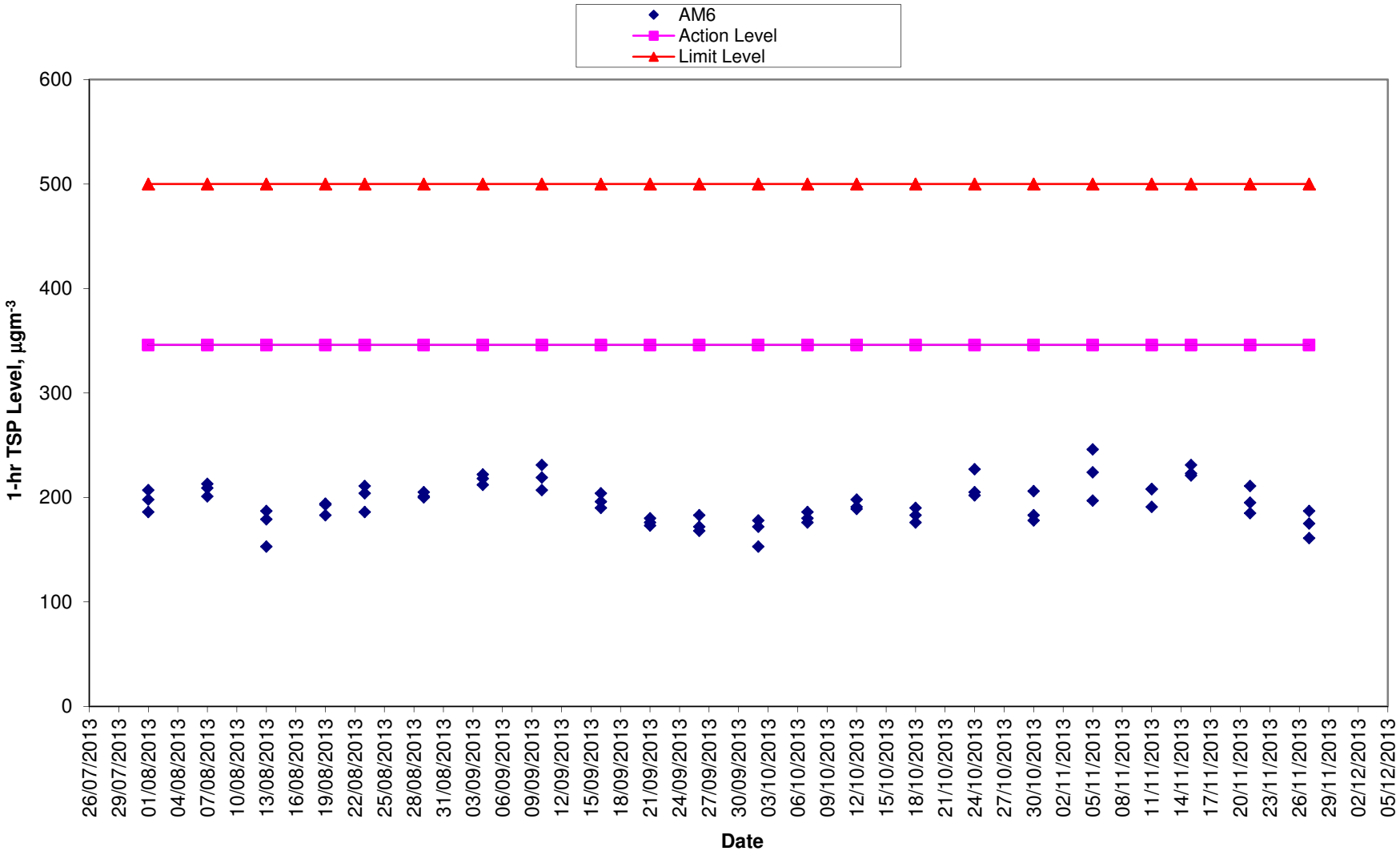
Annex G5 24-hour and 1-hour TSP Monitoring Results

24-hour TSP Monitoring Results

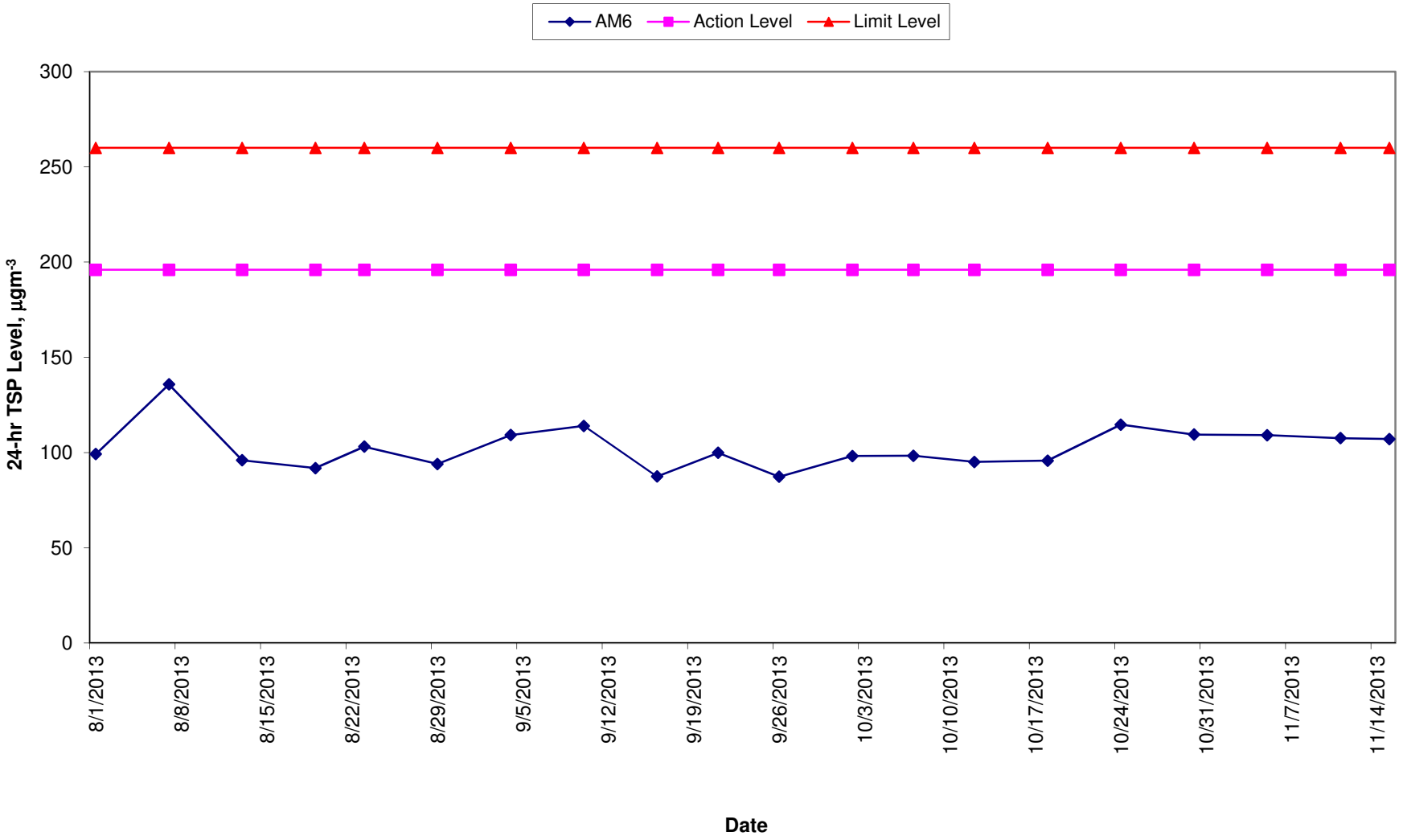
Station AM6

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
05-Nov-13	16:06	06-Nov-13	16:06	Sunny	2.8300	3.0217	12489.03	12513.03	24.00	1.22	1.22	1.22	109	196	260	Construction work in progress	GMW GS 2310 (S/N 1254)	8416
11-Nov-13	16:46	12-Nov-13	16:46	Sunny	2.8188	3.0078	12516.03	12540.03	24.00	1.22	1.22	1.22	108	196	260	Construction work in progress	GMW GS 2310 (S/N 1254)	8420
15-Nov-13	16:46	16-Nov-13	16:46	Sunny	2.8090	2.9972	12543.03	12567.03	24.00	1.22	1.22	1.22	107	196	260	Construction work in progress	GMW GS 2310 (S/N 1254)	8424
21-Nov-13	16:11	22-Nov-13	16:11	Sunny	2.8019	2.9944	12570.03	12594.03	24.00	1.25	1.25	1.25	107	196	260	Construction work in progress	GMW GS 2310 (S/N 1254)	8828
27-Nov-13	16:21	28-Nov-13	16:21	Sunny	2.7835	2.9900	12597.03	12621.03	24.00	1.25	1.25	1.25	115	196	260	Construction work in progress	GMW GS 2310 (S/N 1254)	8880
												Min.	**107**					
												Max.	**115**					
												Average	**109**					

1-hr TSP Level
AM6 (Stonecutters Island Sewage Treatment Works)



24-hr TSP Level
AM6 (Stonecutters Island Sewage Treatment Works)



Meteorological Data Extracted from the Hong Kong Observatory

		King's Park Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	28	70-94	1.0	0-15	NW
2013-09-03	-	27	82-98	5.0	0-14	SE
2013-09-04	Sunny	25	90-99	88.9	0-21	SE
2013-09-08	-	28	63-88	0.0	2-17	SE
2013-09-10	Sunny	29	66-88	0.0	2-16	SE
2013-09-15	Sunny	28	66-94	15.2	0-20	SE/NW
2013-09-16	Sunny	25	68-95	0.8	1-24	SE
2013-09-17	-	28	61-82	0.0	7-23	SE
2013-09-19	Cloudy	29	62-86	0.0	0-27	SE
2013-09-20	-	30	58-87	0.0	0-12	SE/W
2013-09-21	Fine	31	51-88	0.0	0-21	N
2013-09-22	Cloudy	28	58-93	30.6	3-40	N/NW
2013-09-23	-	28	79-98	56.9	0-37	SW
2013-09-24	Sunny	29	78-94	1.3	7-20	SE
2013-09-26	Sunny	27	66-84	0.1	1-18	E
2013-09-27	Sunny	26	67-87	0.1	1-18	SE/NE
2013-09-29	Sunny	26	74-97	2.9	2-16	NE/E
2013-09-30	Fine	25	84-97	10.0	3-21	E

		Tsing Yi Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%) *	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	27	70-94	1.0	1-18	S/NW
2013-09-03	-	26	82-98	5.0	1-16	S
2013-09-04	Rainy	25	90-99	88.9	1-21	E
2013-09-08	-	29	63-88	0.0	3-19	SE
2013-09-10	Sunny	30	66-88	0.0	1-20	N
2013-09-15	Sunny	28	66-94	15.2	1-14	--
2013-09-16	Sunny	29	68-95	0.8	1-22	--
2013-09-17	-	29	61-82	0.0	4-23	--
2013-09-19	Cloudy	29	62-86	0.0	1-26	--
2013-09-20	-	30	58-87	0.0	1-13	--
2013-09-21	Fine	31	51-88	0.0	1-22	--
2013-09-22	Cloudy	29	58-93	30.6	8-50	--
2013-09-23	-	27	79-98	56.9	8-48	--
2013-09-24	Sunny	29	78-94	1.3	6-22	--
2013-09-26	Sunny	28	66-84	0.1	1-15	--
2013-09-27	Sunny	27	67-87	0.1	1-15	--
2013-09-29	Sunny	26	74-97	2.9	1-10	--
2013-09-30	Fine	26	84-97	10.0	1-14	--

		Kai Tak Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	28	70-94	1.0	0-22	SE/NW
2013-09-03	-	27	82-98	5.0	1-18	SE
2013-09-04	Sunny	25	90-99	88.9	1-25	SE
2013-09-08	-	28	63-88	0.0	1-24	E/SE
2013-09-10	Sunny	29	66-88	0.0	4-22	E/SE
2013-09-15	Sunny	28	66-94	15.2	1-23	SE
2013-09-16	Sunny	25	68-95	0.8	8-31	E
2013-09-17	-	28	61-82	0.0	11-32	E
2013-09-19	Cloudy	29	62-86	0.0	2-31	E
2013-09-20	-	30	58-87	0.0	1-16	SE/SW
2013-09-21	Fine	31	51-88	0.0	3-25	NW
2013-09-22	Cloudy	28	58-93	30.6	3-52	NW
2013-09-23	-	28	79-98	56.9	2-39	S/SE
2013-09-24	Sunny	29	78-94	1.3	12-28	E
2013-09-26	Sunny	27	66-84	0.1	5-22	NE
2013-09-27	Sunny	26	67-87	0.1	3-24	E

		Green Island Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-09-01	Cloudy	28	70-94	1.0	1-39	SW
2013-09-03	-	27	82-98	5.0	1-21	S
2013-09-04	Sunny	25	90-99	88.9	5-45	SW/NE
2013-09-08	-	28	63-88	0.0	9-32	NE
2013-09-10	Sunny	29	66-88	0.0	17-38	NE
2013-09-15	Sunny	28	66-94	15.2	1-36	NW/NE
2013-09-16	Sunny	25	68-95	0.8	12-48	NE
2013-09-17	-	28	61-82	0.0	30-57	NE
2013-09-19	Cloudy	29	62-86	0.0	18-57	NE
2013-09-20	-	30	58-87	0.0	1-31	N/S
2013-09-21	Fine	31	51-88	0.0	8-38	N
2013-09-22	Cloudy	28	58-93	30.6	19-77	N
2013-09-23	-	28	79-98	56.9	19-79	S
2013-09-24	Sunny	29	78-94	1.3	10-40	E/NE
2013-09-26	Sunny	27	66-84	0.1	14-43	NE
2013-09-27	Sunny	26	67-87	0.1	14-35	NE

Meteorological Data Extracted from the Hong Kong Observatory

		King's Park Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	0-15	NE
2013-10-03	Sunny	27	51 - 86	0.0	0-12	NE
2013-10-06	Sunny	28	38 - 57	0.0	0-19	N
2013-10-07	Sunny	29	48 - 61	0.0	0-21	N
2013-10-08	Fine	27	58 - 73	0.0	0-16	NE
2013-10-09	Sunny	28	65 - 85	0.0	0-19	SE
2013-10-12	Sunny	28	50 - 79	Trace	0-19	SE
2013-10-13	Sunny	28	57 - 77	0.0	3-26	SE
2013-10-15	Sunny	28	61 - 84	0.0	0-18	SE
2013-10-18	Sunny	26	53 - 75	Trace	2-18	E
2013-10-20	Sunny	26	56 - 82	0.0	0-16	SE
2013-10-21	Sunny	25	63 - 82	0.1	0-11	NE
2013-10-22	Fine	26	50 - 79	0.0	0-16	NE
2013-10-24	Sunny	25	29 - 51	0.0	0-20	NE
2013-10-26	Sunny	23	40 - 66	0.0	0-17	SE/NE
2013-10-27	Sunny	22	54 - 76	0.0	0-17	SE
2013-10-29	Sunny	24	56 - 83	0.0	1-17	SE
2013-10-30	Sunny	25	62 - 83	0.0	0-19	SE

		Tsing Yi Station				
Date	Weather	Average Air Temperature (°C)	Average Relative Humiditiy (%) *	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	1-13	--
2013-10-03	Sunny	27	51 - 86	0.0	1-14	--
2013-10-06	Sunny	27	38 - 57	0.0	1-21	--
2013-10-07	Sunny	29	48 - 61	0.0	2-22	--
2013-10-08	Fine	27	58 - 73	0.0	1-19	--
2013-10-09	Sunny	28	65 - 85	0.0	1-16	--
2013-10-12	Sunny	28	50 - 79	Trace	1-23	--
2013-10-13	Sunny	28	57 - 77	0.0	3-20	--
2013-10-15	Sunny	28	61 - 84	0.0	2-21	--
2013-10-18	Sunny	27	53 - 75	Trace	1-15	--
2013-10-20	Sunny	25	56 - 82	0.0	1-12	--
2013-10-21	Sunny	26	63 - 82	0.1	1-14	--
2013-10-22	Fine	26	50 - 79	0.0	1-16	--
2013-10-24	Sunny	24	29 - 51	0.0	1-19	--
2013-10-26	Sunny	23	40 - 66	0.0	1-17	--
2013-10-27	Sunny	22	54 - 76	0.0	1-15	--
2013-10-29	Sunny	25	56 - 83	0.0	1-19	--
2013-10-30	Sunny	25	62 - 83	0.0	1-21	--

		Kai Tak Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	1-16	NE
2013-10-03	Sunny	27	51 - 86	0.0	1-19	SE/N
2013-10-06	Sunny	28	38 - 57	0.0	1-23	NW
2013-10-07	Sunny	29	48 - 61	0.0	2-27	NW
2013-10-08	Fine	27	58 - 73	0.0	1-22	NW/N
2013-10-09	Sunny	28	65 - 85	0.0	1-25	SE
2013-10-12	Sunny	28	50 - 79	Trace	1-27	E
2013-10-13	Sunny	28	57 - 77	0.0	6-29	E
2013-10-15	Sunny	28	61 - 84	0.0	4-23	E
2013-10-18	Sunny	26	53 - 75	Trace	5-24	NE/SE
2013-10-20	Sunny	26	56 - 82	0.0	1-16	SE
2013-10-21	Sunny	25	63 - 82	0.1	1-19	SE/NE
2013-10-22	Fine	26	50 - 79	0.0	1-15	N/NE
2013-10-24	Sunny	25	29 - 51	0.0	1-19	N
2013-10-26	Sunny	23	40 - 66	0.0	2-19	N
2013-10-27	Sunny	22	54 - 76	0.0	2-24	E

		Green Island Station				
Date	Weather	Average Air Temperature (°C) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-10-02	Sunny	28	46 - 89	0.0	1-22	NE/SW
2013-10-03	Sunny	27	51 - 86	0.0	2-28	NE/SW
2013-10-06	Sunny	28	38 - 57	0.0	4-39	N
2013-10-07	Sunny	29	48 - 61	0.0	19-42	N
2013-10-08	Fine	27	58 - 73	0.0	12-34	N
2013-10-09	Sunny	28	65 - 85	0.0	5-33	NE/N
2013-10-12	Sunny	28	50 - 79	Trace	4-46	NE/N
2013-10-13	Sunny	28	57 - 77	0.0	10-50	NE
2013-10-15	Sunny	28	61 - 84	0.0	11-37	NE
2013-10-18	Sunny	26	53 - 75	Trace	3-41	NE
2013-10-20	Sunny	26	56 - 82	0.0	3-24	NE/S
2013-10-21	Sunny	25	63 - 82	0.1	1-24	N
2013-10-22	Fine	26	50 - 79	0.0	1-37	N
2013-10-24	Sunny	25	29 - 51	0.0	2-34	NE
2013-10-26	Sunny	23	40 - 66	0.0	7-34	NE
2013-10-27	Sunny	22	54 - 76	0.0	8-34	NE

Meteorological Data Extracted from the Hong Kong Observatory

		King's Park Station				
Date	Weather	Average Air Temperature (℃)	Average Relative Humiditiy (%)	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	0-16	NE/SE
2013-11-03	Sunny	26	65 - 66	0.4	5-25	NE
2013-11-05	Sunny	23	79 - 98	3.6	0-18	E
2013-11-07	Sunny	25	65 - 90	0.0	0-19	SE
2013-11-10	Fine	25	77 - 96	7.6	2-25	SE/E
2013-11-11	Sunny	24	82 - 87	Trace	12-28	SE
2013-11-13	Cloudy	21	84 - 100	3.9	0-12	NE/E
2013-11-15	Sunny	22	62 - 83	0.0	0-15	SE
2013-11-17	Sunny	21	50 - 66	0.0	0-15	NE/SE
2013-11-19	Fine	20	56 - 77	0.0	1-15	NE/E
2013-11-21	Sunny	20	55 - 79	0.5	0-17	SE/E
2013-11-24	Sunny	26	72 - 96	15.2	0-21	NE/SE
2013-11-25	Sunny	20	40 - 80	0.0	0-17	NE/N
2013-11-26	Cloudy	20	59 - 80	0.0	0-17	SE/E
2013-11-27	Sunny	20	68 - 88	0.5	-	SE/NE
2013-11-30	Sunny	16	43 - 66	0.0	0-14	NE/SE

		Tsing Yi Station				
Date	Weather	Average Air Temperature (℃)	Average Relative Humiditiy (%) *	Total Rainfall (mm)	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	1-18	--
2013-11-03	Sunny	26	65 - 66	0.4	0-18	--
2013-11-05	Sunny	23	79 - 98	3.6	1-10	--
2013-11-07	Sunny	25	65 - 90	0.0	1-15	--
2013-11-10	Fine	26	77 - 96	7.6	9-21	--
2013-11-11	Sunny	--	82 - 87	Trace	10-31	--
2013-11-13	Cloudy	22	84 - 100	3.9	1-13	--
2013-11-15	Sunny	22	62 - 83	0.0	1-12	--
2013-11-17	Sunny	22	50 - 66	0.0	1-15	--
2013-11-19	Fine	20	56 - 77	0.0	0-12	--
2013-11-21	Sunny	20	55 - 79	0.5	1-16	--
2013-11-24	Sunny	24	72 - 96	15.2	1-21	--
2013-11-25	Sunny	20	40 - 80	0.0	0-25	--
2013-11-26	Cloudy	20	59 - 80	0.0	0-19	--
2013-11-27	Sunny	20	68 - 88	0.5	3-18	--
2013-11-30	Sunny	17	43 - 66	0.0	1-16	--

		Kai Tak Station				
Date	Weather	Average Air Temperature (℃) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	0-22	E/NE
2013-11-03	Sunny	26	65 - 66	0.4	3-26	NE
2013-11-05	Sunny	23	79 - 98	3.6	1-19	E/NE
2013-11-07	Sunny	25	65 - 90	0.0	5-23	E
2013-11-10	Fine	25	77 - 96	7.6	16 -30	E
2013-11-11	Sunny	24	82 - 87	Trace	20 - 42	E
2013-11-13	Cloudy	21	84 - 100	3.9	3-17	NE/N
2013-11-15	Sunny	22	62 - 83	0.0	1-20	NW/NE
2013-11-17	Sunny	21	50 - 66	0.0	1-19	NW/NE
2013-11-19	Fine	20	56 - 77	0.0	3-22	NE/E
2013-11-21	Sunny	20	55 - 79	0.5	3-21	NE/E
2013-11-24	Sunny	26	72 - 96	15.2	1-22	NW/SE
2013-11-25	Sunny	20	40 - 80	0.0	3-30	NW/NE
2013-11-26	Cloudy	20	59 - 80	0.0	3-21	NE/E
2013-11-27	Sunny	20	68 - 88	0.5	3-24	NW/E

		Green Island Station				
Date	Weather	Average Air Temperature (℃) *	Average Relative Humiditiy (%) *	Total Rainfall (mm) *	Average Wind Speed (km/h)	Wind Direction
2013-11-01	Sunny	26	46 - 80	0.0	1-36	NE/S
2013-11-03	Sunny	26	65 - 66	0.4	29-52	NE
2013-11-05	Sunny	23	79 - 98	3.6	13-45	NE
2013-11-07	Sunny	25	65 - 90	0.0	15-41	NE
2013-11-10	Fine	25	77 - 96	7.6	29-57	NE
2013-11-11	Sunny	24	82 - 87	Trace	35 - 65	NE
2013-11-13	Cloudy	21	84 - 100	3.9	6 - 45	NE/N
2013-11-15	Sunny	22	62 - 83	0.0	3-28	NE/NW
2013-11-17	Sunny	21	50 - 66	0.0	1-25	NE/N
2013-11-19	Fine	20	56 - 77	0.0	12-36	NE/N
2013-11-21	Sunny	20	55 - 79	0.5	3-40	NE
2013-11-24	Sunny	26	72 - 96	15.2	4-52	NW
2013-11-25	Sunny	20	40 - 80	0.0	2-48	N
2013-11-26	Cloudy	20	59 - 80	0.0	13-47	NE/N
2013-11-27	Sunny	20	68 - 88	0.5	5-42	NE/N

Annex G6 Noise Monitoring Results

Daytime Noise Monitoring Results

Station NM5

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							
04-Sep-13	15:48	16:18	Cloudy	61	63	58	Drill Rig, Welding Machine and Dump Truck	Traffic noise	-	25	0.7	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
10-Sep-13	10:55	11:25	Sunny	60	62	58	Drill Rig and Welding Machine	Traffic noise	-	31	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
16-Sep-13	11:10	11:40	Sunny	63	65	60	Drill rig, Welding machine, Excavator and Dump Truck	Traffic noise	-	29	0.6	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
26-Sep-13	13:15	13:45	Sunny	60	62	58	Drill rig, Welding machine, Excavator and Dump Truck	Traffic noise	-	29	0.7	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
			Min.	**60**									
			Max.	**63**									

Annex G6 Noise Monitoring Results

Daytime Noise Monitoring Results

Station NM5

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							
02-Oct-13	13:15	13:45	Sunny	62	64	60	Drill rig, Welding machine, excavator, dump truck	Traffic Noise	-	29	0.9	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
07-Oct-13	13:28	13:58	Sunny	62	64	58	Drill rig, welding machine, excavator and dump truck	Traffic Noise	-	30	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
18-Oct-13	13:15	13:45	Sunny	61	63	59	Drill rig, welding machine	Traffic Noise	-	27	0.7	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
24-Oct-13	13:12	13:42	Sunny	62	64	60	Drill rig, welding machine	Traffic Noise	-	23	2.6	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
30-Oct-13	13:10	13:40	Sunny	60	62	58	Drill rig, welding machine	Traffic noise	-	26	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
			Min.	**60**									
			Max.	**62**									

Annex G6 Noise Monitoring Results

Daytime Noise Monitoring Results

Station NM5

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							
05-Nov-13	13:10	13:40	Sunny	62	63	59	Drill rig, Welding Machine	Traffic Noise	-	26	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
11-Nov-13	13:48	14:18	Sunny	63	65	61	Drill rig, Welding Machine, Excavator, Dump Truck	Traffic Noise	-	25	0.8	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
21-Nov-13	15:35	16:05	Sunny	62	65	59	Drill rig, Welding Machine, Excavator, Dump Truck	Traffic Noise	-	19	0.7	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
27-Nov-13	13:26	13:56	Sunny	62	64	59	Drill rig, Welding Machine, Excavator	Traffic Noise	-	23	0.5	RION-NL31 (S/N 00410224)	RION-NL73 (S/N 10997142)
			Min.	**62**									
			Max.	**63**									

Annex G6 Noise Monitoring Results

Restricted Hours Noise Monitoring Results

Station NM5

Date	Start Time	End Time	Weather	Noise level (dB(A)), 5 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							
03-Sep-13	19:05	19:10	Cloudy	58	62	60	Drill Rig	Traffic noise	-	27	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	19:10	19:15	Cloudy	60	61	57			-				
	19:15	19:20	Cloudy	61	62	57			-				
	19:05	19:20	Fine	59	62	58			-				
08-Sep-13	10:00	10:05	Sunny	59	61	57	Drill Rig	Traffic noise	-	30	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	10:05	10:10	Sunny	59	60	57			-				
	10:10	10:15	Sunny	60	61	57			-				
	10:00	10:15	Sunny	59	60	57							
17-Sep-13	19:03	19:08	Fine	60	62	58	Drill Rig	Traffic noise	-	29	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	19:08	19:13	Fine	61	62	58			-				
	19:13	19:18	Fine	60	62	58			-				
	19:03	19:18	Fine	60	62	58			-				
22-Sep-13	9:05	9:10	Cloudy	62	63	60	Drill Rig	Traffic noise	-	27	1.3	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	9:10	9:15	Cloudy	61	63	59			-				
	9:15	9:20	Cloudy	61	63	59			-				
	9:05	9:20	Cloudy	61	63	59			-				
30-Sep-13	19:02	19:07	Fine	61	63	59	Drill rig	Traffic noise	-	27	0.8	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	19:07	19:12	Fine	61	62	59			-				
	19:12	19:17	Fine	61	62	58			-				
	19:02	19:17	Fine	61	62	59			-				
			Min.	**58**									
			Max.	**62**									

Annex G6 Noise Monitoring Results

Restricted Hours Noise Monitoring Results

Station NM5

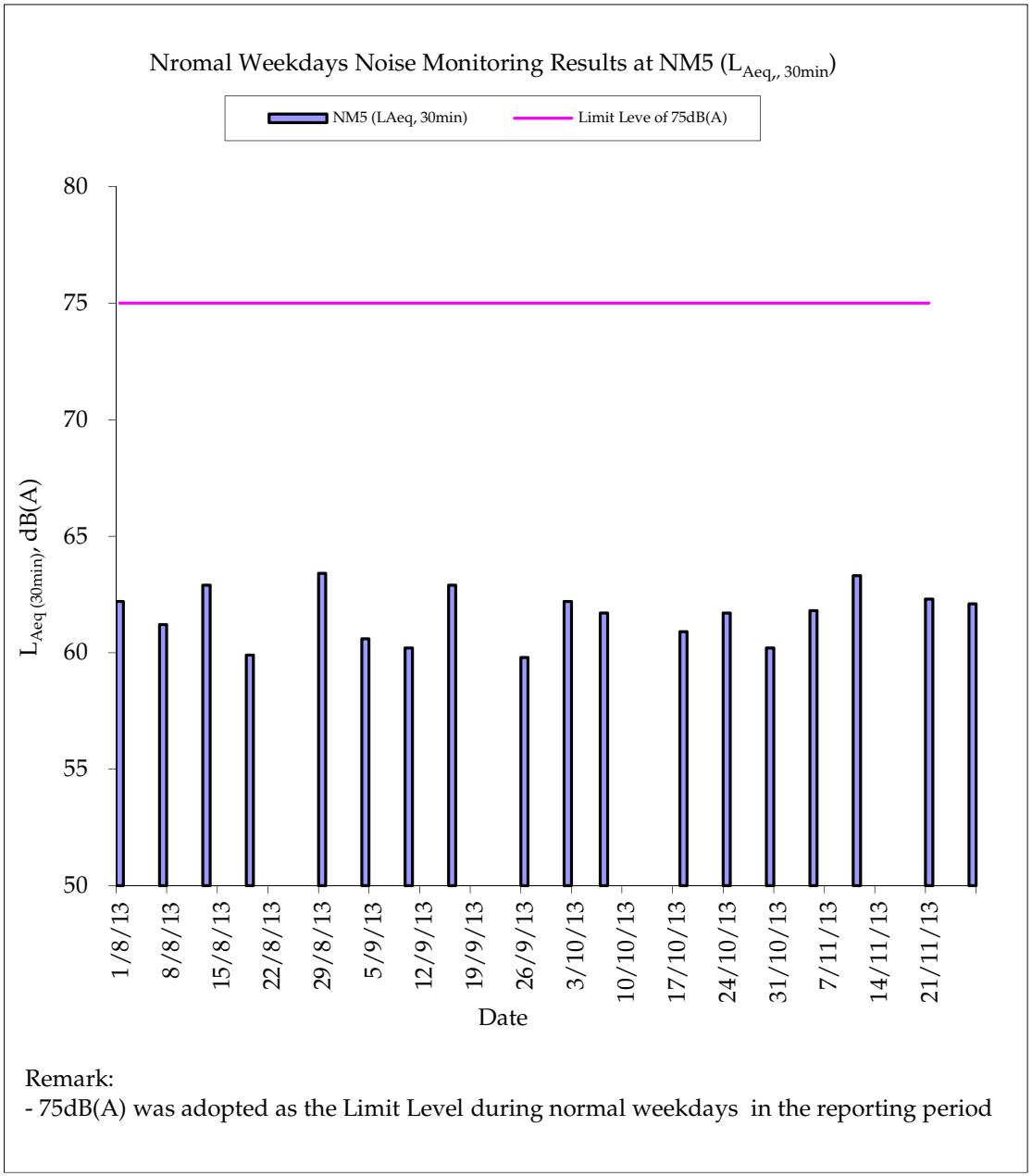
Date	Start Time	End Time	Weather	Noise level (dB(A)), 5 min			Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
06-Oct-13	9:10	9:15	Sunny	59	60	58	Drill rig	Traffic noise	-	30	0.7	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	9:15	9:20	Sunny	59	61	58			-				
	9:20	9:25	Sunny	60	62	58			-				
	9:10	9:25	Sunny	59	61	58			-				
15-Oct-13	19:03	19:08	Cloudy	60	61	57	Drill rig	Traffic noise	-	26	0.7	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	19:08	19:13	Cloudy	60	61	57			-				
	19:13	19:18	Cloudy	59	61	57			-				
	19:03	19:18	Cloudy	60	61	57			-				
20-Oct-13	10:00	10:05	Sunny	60	61	58	Drill rig	Traffic noise	-	27	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	10:05	10:10	Sunny	59	61	57			-				
	10:10	10:15	Sunny	59	61	57			-				
	10:00	10:15	Sunny	59	61	57			-				
29-Oct-13	19:10	19:15	Sunny	59	61	57	Drill rig	Traffic noise	-	25	0.5	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	19:15	19:20	Sunny	58	59	56			-				
	19:20	19:25	Sunny	59	60	57			-				
	19:10	19:25	Sunny	58	60	57			-				
			Min.	**58**									
			Max.	**60**									

Annex G6 Noise Monitoring Results

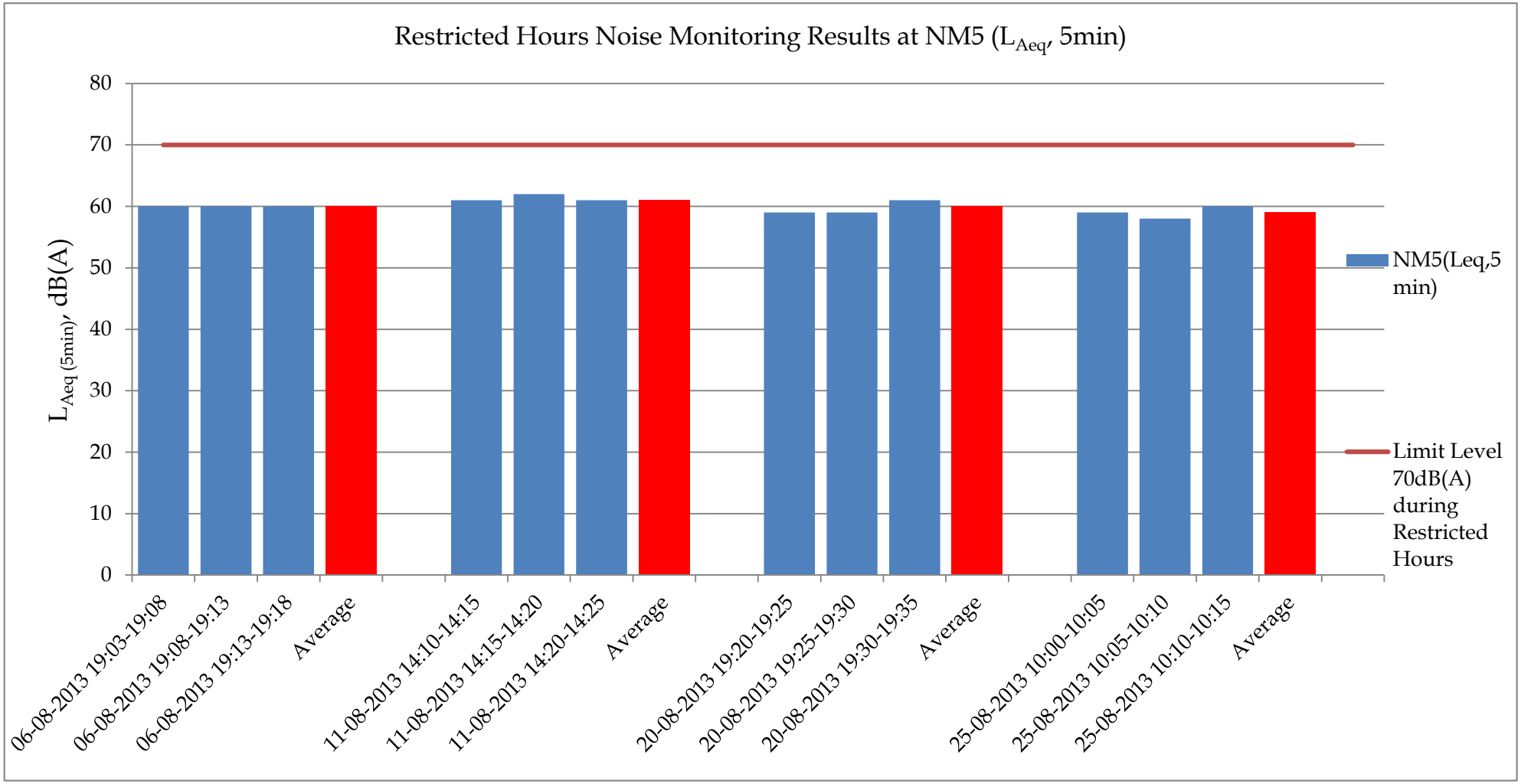
Restricted Hours Noise Monitoring Results

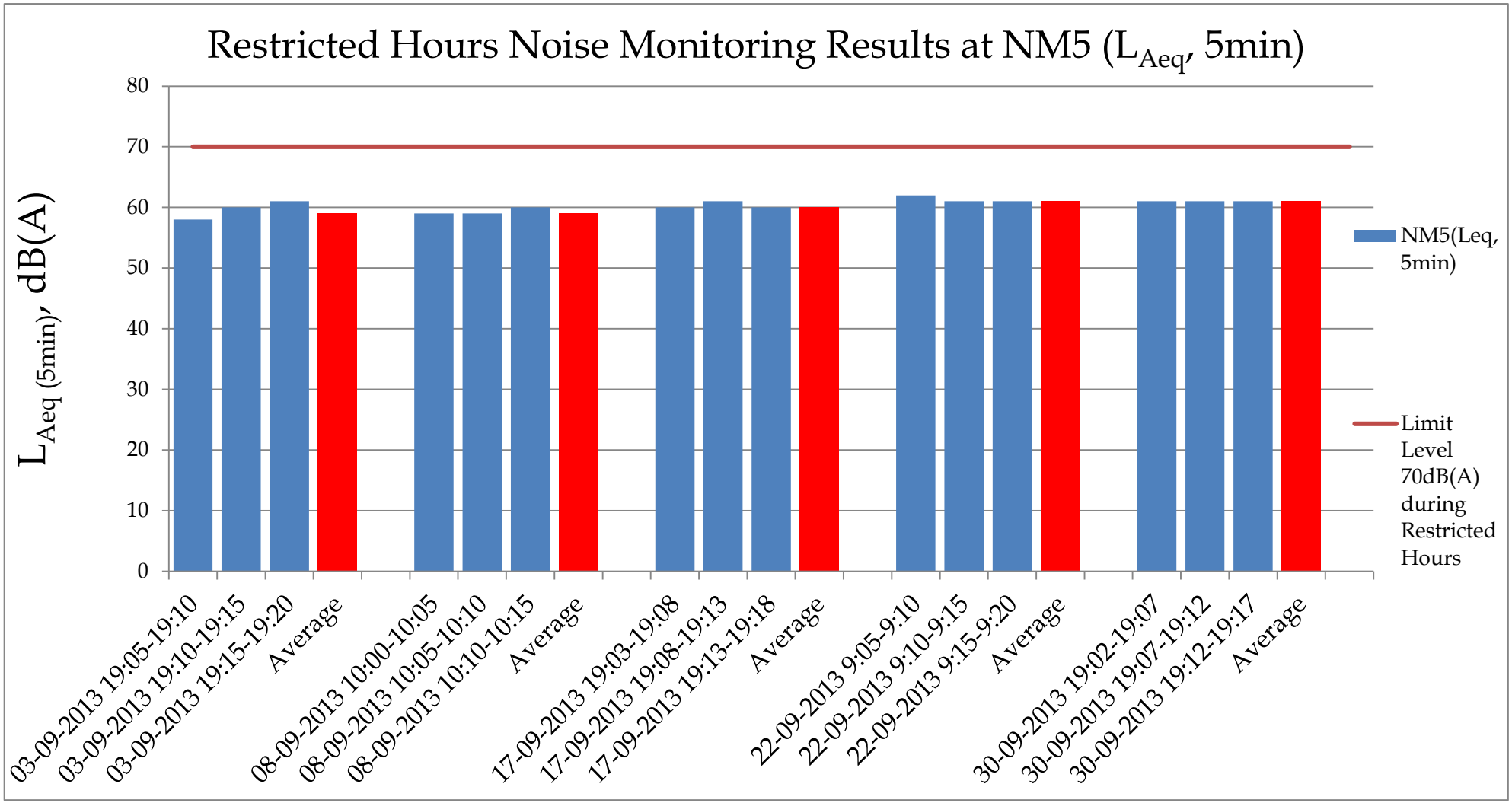
Station NM5

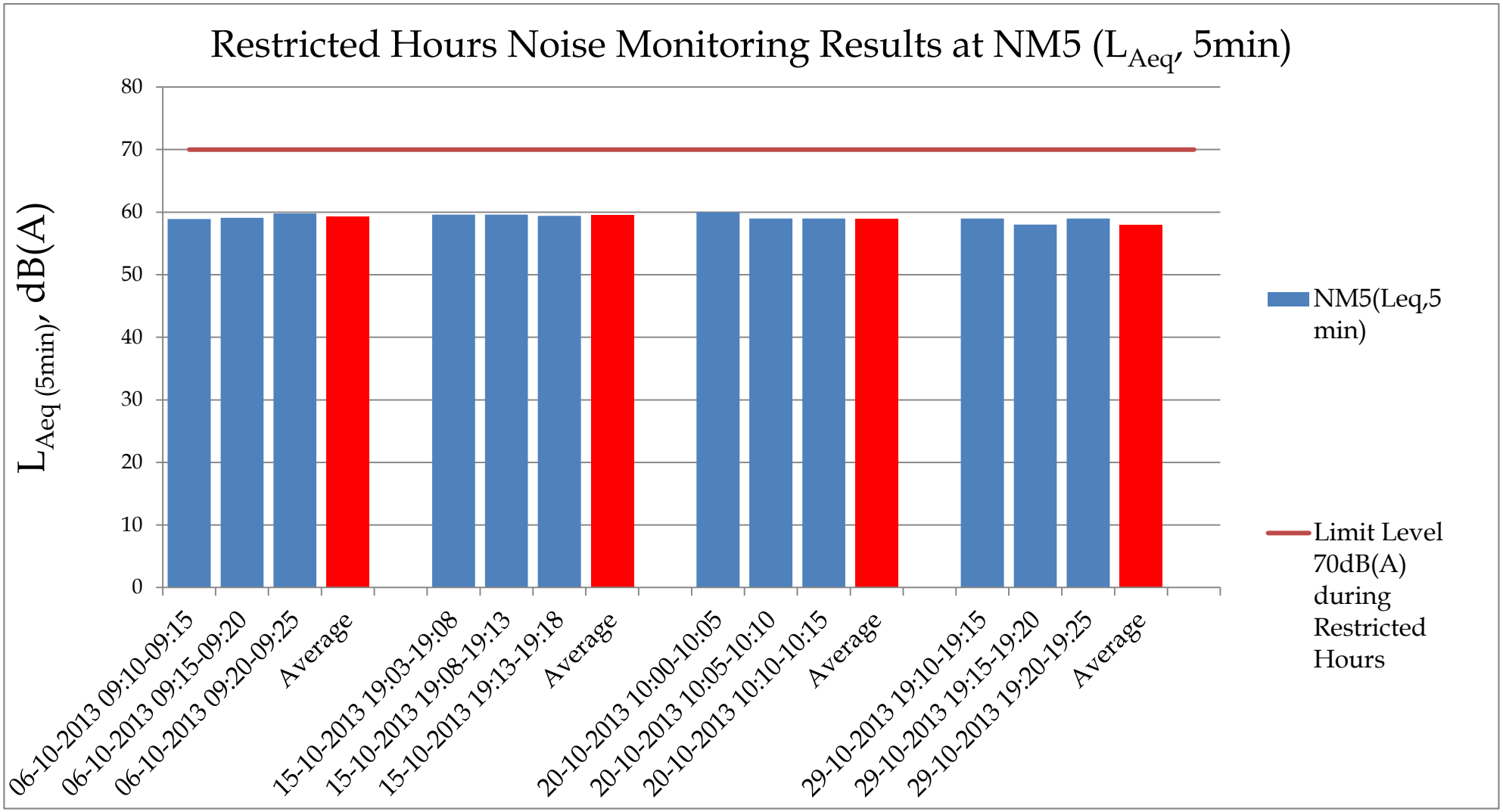
Date	Start Time	End Time	Weather	Noise level (dB(A)), 5 min			Major Construction Noise Source(s) Observed	Other Noise Source(s) Observed	Remarks	Temp. (°C)	Wind Speed (m/s)	Noise Meter Model / ID	Calibrator Model / ID
				Leq	L10	L90							
03-Nov-13	11:00	11:05	Sunny	59	61	58	Drill Rig	Traffic Noise	-	26	0.7	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	11:05	11:10	Sunny	60	62	58			-				
	11:10	11:15	Sunny	60	61	58			-				
	11:00	11:15	Sunny	60	61	58			-				
12-Nov-13	19:05	19:10	Cloudy	58	59	56	Drill Rig	Traffic Noise	-	22	0.7	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	19:10	19:15	Cloudy	59	62	57			-				
	19:15	19:20	Cloudy	58	60	57			-				
	19:05	19:20	Cloudy	59	60	57			-				
17-Nov-13	14:33	14:38	Sunny	59	61	57	Drill Rig	Traffic Noise	-	22	0.6	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	14:38	14:43	Sunny	61	62	58			-				
	14:43	14:48	Sunny	61	63	58			-				
	14:33	14:48	Sunny	60	62	58			-				
26-Nov-13	19:10	19:15	Cloudy	61	62	58	Drill Rig	Traffic Noise	-	24	0.3	RION- NL31 (S/N 00410224)	RION - NC73 (S/N 10997142)
	19:15	19:20	Cloudy	59	61	57			-				
	19:20	19:25	Cloudy	57	60	57			-				
	19:10	19:25	Cloudy	59	61	57			-				
			Min.	**57**									
			Max.	**61**									

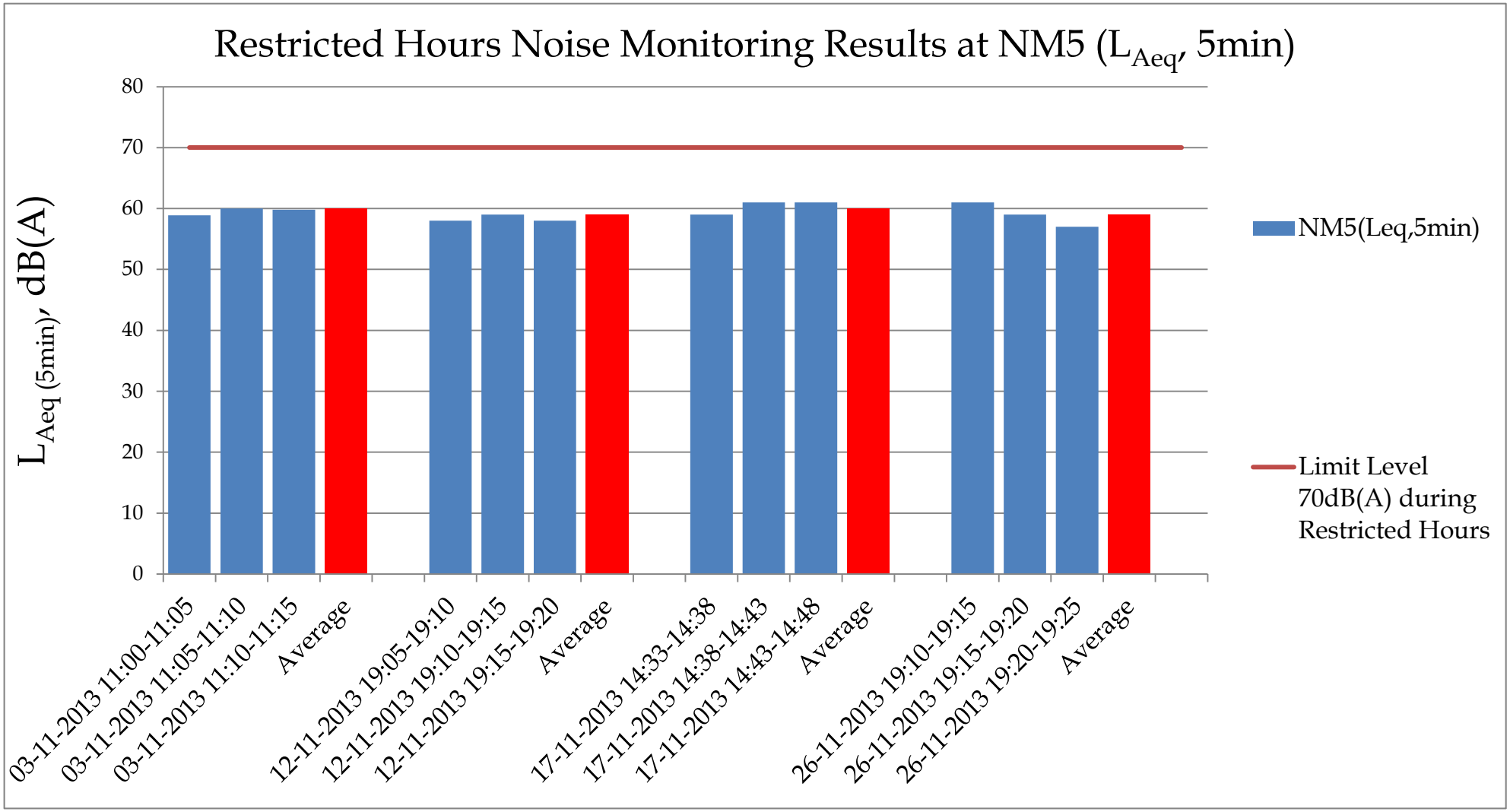


Remark:
- 75dB(A) was adopted as the Limit Level during normal weekdays in the reporting period


Restricted Hours Noise Monitoring Results at NM5 (L_{Aeq}, 5min)
$L_{Aeq\ (5min)}$, dB(A)
80
70
60
50
40
30
20
10
0
06-08-2013 19:03-19:08
06-08-2013 19:08-19:13
06-08-2013 19:13-19:18
Average
11-08-2013 14:10-14:15
11-08-2013 14:15-14:20
11-08-2013 14:20-14:25
Average
20-08-2013 19:20-19:25
20-08-2013 19:25-19:30
20-08-2013 19:30-19:35
Average
25-08-2013 10:00-10:05
25-08-2013 10:05-10:10
25-08-2013 10:10-10:15
Average
NM5(Leq,5 min)
Limit Level 70dB(A) during Restricted Hours


Restricted Hours Noise Monitoring Results at NM5 (L_{Aeq}, 5min)
$L_{Aeq\ (5min)}$, dB(A)
80
70
60
50
40
30
20
10
0
03-09-2013 19:05-19:10
03-09-2013 19:10-19:15
03-09-2013 19:15-19:20
Average
08-09-2013 10:00-10:05
08-09-2013 10:05-10:10
08-09-2013 10:10-10:15
Average
17-09-2013 19:03-19:08
17-09-2013 19:08-19:13
17-09-2013 19:13-19:18
Average
22-09-2013 9:05-9:10
22-09-2013 9:10-9:15
22-09-2013 9:15-9:20
Average
30-09-2013 19:02-19:07
30-09-2013 19:07-19:12
30-09-2013 19:12-19:17
Average
NM5(Leq, 5min)
Limit Level 70dB(A) during Restricted Hours


Restricted Hours Noise Monitoring Results at NM5 (L_{Aeq}, 5min)
$L_{Aeq\ (5min)}$, dB(A)
80
70
60
50
40
30
20
10
0
06-10-2013 09:10-09:15
06-10-2013 09:15-09:20
06-10-2013 09:20-09:25
Average
15-10-2013 19:03-19:08
15-10-2013 19:08-19:13
15-10-2013 19:13-19:18
Average
20-10-2013 10:00-10:05
20-10-2013 10:05-10:10
20-10-2013 10:10-10:15
Average
29-10-2013 19:10-19:15
29-10-2013 19:15-19:20
29-10-2013 19:20-19:25
Average
NM5(Leq,5 min)
Limit Level 70dB(A) during Restricted Hours


Restricted Hours Noise Monitoring Results at NM5 (L_{Aeq}, 5min)
$L_{Aeq\ (5min)}$, dB(A)
80
70
60
50
40
30
20
10
0
03-11-2013 11:00-11:05
03-11-2013 11:05-11:10
03-11-2013 11:10-11:15
Average
12-11-2013 19:05-19:10
12-11-2013 19:10-19:15
12-11-2013 19:15-19:20
Average
17-11-2013 14:33-14:38
17-11-2013 14:38-14:43
17-11-2013 14:43-14:48
Average
26-11-2013 19:10-19:15
26-11-2013 19:15-19:20
26-11-2013 19:20-19:25
Average
NM5(Leq,5min)
Limit Level 70dB(A) during Restricted Hours

Annex G7 Cumulative Complaint and Summons/Prosecutions Log

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
December 2009	0	0
January 2010	0	0
February 2010	0	0
March 2010	0	0
April 2010	0	0
May 2010	0	0
June 2010	0	0
July 2010	0	0
August 2010	0	0
September 2010	0	0
October 2010	0	0
November 2010	0	0
December 2010	0	0
January 2011	0	0
February 2011	0	0
March 2011	0	0
April 2011	0	0
May 2011	0	0

Annex G7 Cumulative Complaint and Summons/Prosecutions Log

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
June 2011	0	0
July 2011	0	0
August 2011	0	0
September 2011	0	0
October 2011	0	0
November 2011	0	0
December 2011	0	0
January 2012	0	0
February 2012	0	0
March 2012	0	0
April 2012	0	0
May 2012	0	0
June 2012	0	0
July 2012	0	0
August 2012	0	0
September 2012	0	0
October 2012	0	0
November 2012	0	0

Annex G7 Cumulative Complaint and Summons/Prosecutions Log

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
December 2012	0	0
January 2013	0	0
February 2013	0	0
March 2013	0	0
April 2013	0	0
May 2013	0	0
June 2013	0	0
July 2013	1	0
August 2013	0	0
September 2013	0	0
October 2013	0	0
November 2013	0	0
Overall Total	1	0

Annex G8

Complaint Investigation Report

Harbour Area Treatment Scheme (HATS) Stage 2A
Contract No. DC/2007/23
Construction of Sewage Conveyance from North Point to Stonecutters Island

COMPLAINT INVESTIGATION FORM

Basic Information of Complaint

Log Number:	**2007/23/008**
Date of Complaint Received	22 July 2013
Location of Complaint	Hoi Lai Estate, Shum Shui Po
Nature of Complaint	Noise generated from Stonecutters Island Sewage Treatment Works Area.
Complaint Received by	Drainage Services Department
Complainant	A local resident living in Hoi Lai Estate, Shum Shui Po

Details of Complaint

On 19 July, a complaint regarding the noise generated from Stonecutters Island Sewage Treatment Works area was received by Drainage Services Department (DSD). The Contractor received the complaint notification on 22 July 2013. According to the complainant, noise was generated from Stonecutters Island work sites at about 3:00 a.m. of 19 July 2013.

Investigation Report

According to the works summary provided by the Contractor, construction activities that took place during the concerned period of time (3:00a.m. on 19 July 2013) included dewatering at shaft and tunnel; operating man cage; charging and blasting works; and equipment repairing, servicing, maintenance and fabrication. These activities were carried out inside the noise enclosure. Before blasting works, the Contractor beat the gong outside the noise enclosure prior to the initiation of the blasting works for safety purpose.

Based on the works summary, activities conducted in this Contract's work strictly follow the conditions stated in the approve Construction Noise Permit (CNP). Also the blasting works at night-time were carried out as stated in the approved Harbour Area Treatment Scheme Stage 2A Environmental Impact Assessment Report. In addition, the distance between the Project work site and the location of the complainant is about 800 m as shown in *Figure 1*, the noise from Project work site would be insignificant after distance attenuation in normal situation. However, some individuals are more noise sensitive than others in some cases. If that is the case, the concerned noise was suspected to be generated by the beating of warning gongs before initiation of blasting which was carried out outside of the noise enclosure. Due to safety purposes, beating of gong before blasting could not be avoided.

Based on the above, the compliant is likely due to the noise generated from beating gong before blasting. In order to further control night-time noise, the Contractor has deactivated the warning siren and beat the gong softly prior to the initiation of the blasting work immediately.

Mitigation Measures and Follow-Up Actions Recommended to Contractor

The following mitigation measures were implemented immediately to further control night-time noise:

- No warning siren prior to the initiation of the blasting work; and
- Beat the gong softly prior to the initiation of the blasting work.

The Contractor was also reminded to adhere strictly to the Construction Noise Mitigation Plan and to implement all relevant noise mitigation measures recommended or specified in the EIA, EM&A Manual, EMP, Method Statements, General and Particular Specifications of this Project to avoid causing noise nuisance.

The Contractor is also reminded to ensure that the construction plant deployed for the works during restricted hours is in strict compliance with the relevant CNP granted.

Date of File Closed : 6 September 2013

Approved and Filed by:

(Winnie Ko, ET Leader)
Date: 6 September 2013

Annex H

Calibration Reports for HVSs and Sound Level Meters for All Sites

TSP Monitoring Equipment

Monitoring Station ID	Location	Monitoring Equipment		Last Calibration Date	Next Calibration Date
24-hr and 1-hr TSP		**HVS**	**Calibrator**		
AM1	Chan's Creative School (formerly known as Madam Chan Wai Chow Memorial School)	GMW GS-2310 (S/N 1808)	CM-AIR-43 (S/N 0438320)	18 July 2013	18 September 2013
AM1	Chan's Creative School (formerly known as Madam Chan Wai Chow Memorial School)	GMW GS-2310 (S/N 1808)	CM-AIR-43 (S/N 0438320)	18 September 2013	18 November 2013
AM1	Chan's Creative School (formerly known as Madam Chan Wai Chow Memorial School)	GMW GS-2310 (S/N 1808)	CM-AIR-43 (S/N 0438320)	18 November 2013	18 January 2014
AM2	Rooftop of Hong Kong & Islands Regional Office, WSD	GMW GS-2310 (S/N 0145)	CM-AIR-43 (S/N 0438320)	18 July 2013	18 September 2013
AM2	Rooftop of Hong Kong & Islands Regional Office, WSD	GMW GS-2310 (S/N 0145)	CM-AIR-43 (S/N 0438320)	18 September 2013	18 November 2013
AM2	Rooftop of Hong Kong & Islands Regional Office, WSD	GMW GS-2310 (S/N 0145)	CM-AIR-43 (S/N 0438320)	18 November 2013	18 January 2014
AM3	Rooftop of Wan Chai East PTW	GMW GS-2310 (S/N 0481)	CM-AIR-43 (S/N 0438320)	18 July 2013	18 September 2013
AM3	Rooftop of Wan Chai East PTW	GMW GS-2310 (S/N 0481)	CM-AIR-43 (S/N 0438320)	18 September 2013	18 November 2013
AM3	Rooftop of Wan Chai East PTW	GMW GS-2310 (S/N 0481)	CM-AIR-43 (S/N 0438320)	18 November 2013	18 January 2014
AM4_2	A location next to Sheung Wan Fire Station	GMW GS-2310 (S/N 9315)	CM-AIR-43 (S/N 0438320)	18 July 2013	18 September 2013
AM4_2	A location next to Sheung Wan Fire Station	GMW GS-2310 (S/N 9315)	CM-AIR-43 (S/N 0438320)	18 September 2013	18 November 2013

Monitoring Station ID	Location	Monitoring Equipment		Last Calibration Date	Next Calibration Date
AM4_2	A location next to Sheung Wan Fire Station	GMW GS-2310 (S/N 9315)	CM-AIR-43 (S/N 0438320)	18 November 2013	18 January 2014
AM5	Western Wholesale Food Market	GMW GS-2310 (S/N 2146)	CM-AIR-43 (S/N 0438320)	9 August 2013	9 October 2013
AM5	Western Wholesale Food Market	GMW GS-2310 (S/N 2146)	CM-AIR-43 (S/N 0438320)	8 October 2013	8 December 2013
AM6	Works Site Boundary	GMW GS-2310 (S/N 1254)	CM-AIR-43 (S/N 0438320)	18 July 2013	18 September 2013
AM6	Works Site Boundary	GMW GS-2310 (S/N 1254)	CM-AIR-43 (S/N 0438320)	18 September 2013	18 November 2013
AM6	Works Site Boundary	GMW GS-2310 (S/N 1254)	CM-AIR-43 (S/N 0438320)	18 November 2013	18 January 2014

Monitoring Equipment

Monitoring Station ID	Monitoring Equipment	Model & Serial No.	Last Calibration Date	Next Calibration Date
NM1 – NM5 [(a)]	Calibrator	Rion NC-73 (S/N 10997142)	12 July 2013	12 July 2014
	Sound Level Meter	Rion NL–31 (S/N 00410224)	14 June 2013	14 June 2014

Remarks

Monitoring Station ID	Location
NM1	Rooftop of Chan's Creative School (formerly known as Madam Chan Wai Chow Memorial School)
NM2	Rooftop of Hyde Building
NM3	Rooftop of Goldfield Building
NM4	Rooftop of Block A, Kwan Yick Building Phase III
NM5	A Location near the FSD Diving Rescue and Diving Training Centre near the Site Boundary

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AM1
Calibrated by	:	K.T.Ho
Date	:	18/07/2013

Sampler

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

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2323
Service Date	:	26 Dec 2012
Slope (m)	:	2.09107
Intercept (b)	:	-0.02838
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1008
Ta(K)	:	301

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	11.0	3.292	1.588	63	62.5
2	13 holes	8.4	2.877	1.389	54	53.6
3	10 holes	6.0	2.431	1.176	45	44.7
4	7 holes	4.2	2.034	0.986	36	35.7
5	5 holes	2.5	1.569	0.764	25	24.8

Sampler Calibration Relationship

Slope(m):45.511 Intercept(b): -9.470 Correlation Coefficient(r): 0.9995

Checked by: Magnum Fan Date: 23/07/2013

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AM1
Calibrated by	:	K.T.Ho
Date	:	18/09/2013

Sampler

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

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2323
Service Date	:	26 Dec 2012
Slope (m)	:	2.09107
Intercept (b)	:	-0.02838
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1010
Ta(K)	:	303

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	11.2	3.314	1.598	63	62.4
2	13 holes	9.0	2.971	1.434	55	54.5
3	10 holes	6.5	2.525	1.221	45	44.6
4	7 holes	4.7	2.147	1.040	38	37.6
5	5 holes	2.7	1.627	0.792	25	24.8

Sampler Calibration Relationship

Slope(m): 45.943 Intercept(b): -11.158 Correlation Coefficient(r): 0.9991

Checked by: Magnum Fan Date: 22/09/2013

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AM1
Calibrated by	:	K.T.Ho
Date	:	18/11/2013

Sampler

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

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2323
Service Date	:	26 Dec 2012
Slope (m)	:	2.09107
Intercept (b)	:	-0.02838
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1018
Ta(K)	:	295

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	11.6	3.403	1.642	62	61.95
2	13 holes	9.4	3.063	1.478	55	54.95
3	10 holes	6.3	2.508	1.213	45	44.96
4	7 holes	4.9	2.212	1.071	39	38.97
5	5 holes	2.7	1.642	0.799	27	26.98

Sampler Calibration Relationship

Slope(m):41.078 Intercept(b): -5.395 Correlation Coefficient(r): 0.9995

Checked by: Magnum Fan Date: 22/11/2013

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AM2
Calibrated by	:	K.T.Ho
Date	:	18/07/2013

Sampler

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

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2323
Service Date	:	26 Dec 2012
Slope (m)	:	2.09107
Intercept (b)	:	-0.02838
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1008
Ta(K)	:	301

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	11.3	3.336	1.609	62	61.5
2	13 holes	9.0	2.978	1.438	54	53.6
3	10 holes	7.0	2.626	1.269	47	46.6
4	7 holes	4.4	2.082	1.009	36	35.7
5	5 holes	2.7	1.631	0.794	26	25.8

Sampler Calibration Relationship

Slope(m):43.357 Intercept(b): -8.345 Correlation Coefficient(r): 0.9998

Checked by: Magnum Fan Date: 23/07/2013

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AM2
Calibrated by	:	K.T.Ho
Date	:	18/09/2013

Sampler

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

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2323
Service Date	:	26 Dec 2012
Slope (m)	:	2.09107
Intercept (b)	:	-0.02838
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1010
Ta(K)	:	303

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	11.4	3.343	1.612	62	61.4
2	13 holes	9.0	2.971	1.434	55	54.5
3	10 holes	7.1	2.639	1.275	48	47.5
4	7 holes	4.5	2.101	1.018	38	37.6
5	5 holes	2.8	1.657	0.806	28	27.7

Sampler Calibration Relationship

Slope(m):41.489 Intercept(b): -5.251 Correlation Coefficient(r): 0.9995

Checked by: Magnum Fan Date: 22/09/2013

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AM2
Calibrated by	:	K.T.Ho
Date	:	18/11/2013

Sampler

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

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2323
Service Date	:	26 Dec 2012
Slope (m)	:	2.09107
Intercept (b)	:	-0.02838
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1018
Ta(K)	:	295

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	10.3	3.1907	1.539	57	56.67
2	13 holes	8.5	2.899	1.400	52	51.70
3	10 holes	6.6	2.554	1.235	45	44.74
4	7 holes	4.4	2.085	1.011	35	34.80
5	5 holes	2.3	1.508	0.735	24	23.86

Sampler Calibration Relationship

Slope(m):41.347 Intercept(b): -6.559 Correlation Coefficient(r): 0.9996

Checked by: Magnum Fan Date: 22/11/2013

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AM3
Calibrated by	:	K.T.Ho
Date	:	18/07/2013

Sampler

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

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2323
Service Date	:	26 Dec 2012
Slope (m)	:	2.09107
Intercept (b)	:	-0.02838
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1008
Ta(K)	:	301

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	11.5	3.366	1.623	63	62.5
2	13 holes	8.5	2.894	1.397	54	53.6
3	10 holes	6.7	2.569	1.242	46	45.7
4	7 holes	4.5	2.106	1.020	36	35.7
5	5 holes	2.6	1.600	0.779	25	24.8

Sampler Calibration Relationship

Slope(m):45.124 Intercept(b): -10.245 Correlation Coefficient(r): 0.9995

Checked by: Magnum Fan Date: 23/07/2013

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AM3
Calibrated by	:	K.T.Ho
Date	:	18/09/2013

Sampler

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

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2323
Service Date	:	26 Dec 2012
Slope (m)	:	2.09107
Intercept (b)	:	-0.02838
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1010
Ta(K)	:	303

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	11.4	3.343	1.612	62	61.4
2	13 holes	9.0	2.971	1.434	55	54.5
3	10 holes	7.1	2.639	1.275	48	47.5
4	7 holes	4.5	2.101	1.018	38	37.6
5	5 holes	2.8	1.657	0.806	28	27.7

Sampler Calibration Relationship

Slope(m):49.416 Intercept(b): -12.549 Correlation Coefficient(r): 0.9992

Checked by: Magnum Fan Date: 22/09/2013

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AM3
Calibrated by	:	K.T.Ho
Date	:	18/11/2013

Sampler

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

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2323
Service Date	:	26 Dec 2012
Slope (m)	:	2.09107
Intercept (b)	:	-0.02838
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1018
Ta(K)	:	295

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	11.5	3.371	1.626	63	62.63
2	13 holes	8.9	2.966	1.432	55	54.68
3	10 holes	7.1	2.649	1.280	48	47.72
4	7 holes	4.7	2.155	1.044	36	35.79
5	5 holes	2.9	1.693	0.823	27	26.84

Sampler Calibration Relationship

Slope(m):45.419 Intercept(b): -10.838 Correlation Coefficient(r): 0.9993

Checked by: Magnum Fan Date: 22/11/2013

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AM4_2
Calibrated by	:	K.T.Ho
Date	:	18/07/2013

Sampler

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

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2323
Service Date	:	26 Dec 2012
Slope (m)	:	2.09107
Intercept (b)	:	-0.02838
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1008
Ta(K)	:	301

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	10.2	3.170	1.530	62	61.5
2	13 holes	8.2	2.842	1.373	56	55.6
3	10 holes	6.5	2.531	1.224	50	49.6
4	7 holes	4.2	2.034	0.986	42	41.7
5	5 holes	2.5	1.569	0.764	33	32.8

Sampler Calibration Relationship

Slope(m):37.226 Intercept(b): 4.487 Correlation Coefficient(r): 0.9996

Checked by: Magnum Fan Date: 23/07/2013

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AM4_2
Calibrated by	:	K.T.Ho
Date	:	18/09/2013

Sampler

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

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2323
Service Date	:	26 Dec 2012
Slope (m)	:	2.09107
Intercept (b)	:	-0.02838
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1010
Ta(K)	:	303

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	10.2	3.163	1.526	62	61.4
2	13 holes	8.1	2.818	1.361	55	54.5
3	10 holes	6.2	2.466	1.193	47	46.5
4	7 holes	4.2	2.029	0.984	38	37.6
5	5 holes	2.4	1.534	0.747	26	25.7

Sampler Calibration Relationship

Slope(m):45.635 Intercept(b): -7.885 Correlation Coefficient(r): 0.9995

Checked by: Magnum Fan Date: 22/09/2013

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AM4_2
Calibrated by	:	K.T.Ho
Date	:	18/11/2013

Sampler

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

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2323
Service Date	:	26 Dec 2012
Slope (m)	:	2.09107
Intercept (b)	:	-0.02838
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1018
Ta(K)	:	295

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	10.5	3.209	1.548	61	60.40
2	13 holes	8.5	2.887	1.394	54	53.47
3	10 holes	6.8	2.582	1.248	47	46.54
4	7 holes	4.6	2.124	1.029	39	38.62
5	5 holes	2.6	1.596	0.777	27	26.74

Sampler Calibration Relationship

Slope(m):43.055 Intercept(b): -6.486 Correlation Coefficient(r): 0.9991

Checked by: Magnum Fan Date: 22/11/2013

High-Volume TSP Sampler
5-Point Calibration Record

Location	**:**	**Sai Ying Pun**
Calibrated by	**:**	**K.T.Ho**
Date	**:**	**09/08/2013**

Sampler

Model	**:**	**TE-5170**
Serial Number	**:**	**S/N 2146**

Calibration Orfice and Standard Calibration Relationship

Serial Number	**:**	**2323**
Service Date	**:**	**26 Dec 2012**
Slope (m)	**:**	**2.09107**
Intercept (b)	**:**	**-0.02838**
Correlation Coefficient(r)	**:**	**0.99996**

Standard Condition

Pstd (hpa)	**:**	**1013**
Tstd (K)	**:**	**298.18**

Calibration Condition

Pa (hpa)	**:**	**1009**
Ta(K)	**:**	**304**

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	10.9	3.262	1.574	61	60.3
2	13 holes	9.5	3.046	1.470	56	55.3
3	10 holes	7.7	2.742	1.325	50	49.4
4	7 holes	4.9	2.187	1.060	40	39.5
5	5 holes	3.0	1.711	0.832	30	29.6

Sampler Calibration Relationship

Slope(m):40.546 Intercept(b): -3.928 Correlation Coefficient(r): 0.9994

Checked by: Magnum Fan Date: 11/08/2013

High-Volume TSP Sampler
5-Point Calibration Record

Location	**:**	**Sai Ying Pun**
Calibrated by	**:**	**K.T.Ho**
Date	**:**	**08/10/2013**

Sampler

Model	**:**	**TE-5170**
Serial Number	**:**	**S/N 2146**

Calibration Orfice and Standard Calibration Relationship

Serial Number	**:**	**2323**
Service Date	**:**	**26 Dec 2012**
Slope (m)	**:**	**2.09107**
Intercept (b)	**:**	**-0.02838**
Correlation Coefficient(r)	**:**	**0.99996**

Standard Condition

Pstd (hpa)	**:**	**1013**
Tstd (K)	**:**	**298.18**

Calibration Condition

Pa (hpa)	**:**	**1008**
Ta(K)	**:**	**303**

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	11.2	3.311	1.597	62	61.3
2	13 holes	9.6	3.065	1.479	56	55.4
3	10 holes	7.8	2.763	1.335	50	49.5
4	7 holes	4.9	2.190	1.061	39	38.6
5	5 holes	3.2	1.770	0.860	30	29.7

Sampler Calibration Relationship

Slope(m):42.170 Intercept(b): -6.519 Correlation Coefficient(r): 0.9994

Checked by: Magnum Fan Date: 11/10/2013

High-Volume TSP Sampler
5-Point Calibration Record9

Location	:	AM6
Calibrated by	:	P.F.Yeung
Date	:	18/07/2013

Sampler

Model	:	GMWS-2310 ACCU-VOL
Serial Number	:	S/N 1254

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2323
Service Date	:	26 Dec 2012
Slope (m)	:	2.09107
Intercept (b)	:	-0.02838
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1008
Ta(K)	:	301

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	10.2	3.170	1.530	63	62.5
2	13 holes	8.2	2.842	1.373	56	55.6
3	10 holes	6.3	2.4913	1.205	50	49.6
4	7 holes	4.2	2.034	0.986	42	41.7
5	5 holes	2.5	1.569	0.764	33	32.8

Sampler Calibration Relationship

Slope(m):38.270 Intercept(b): 3.602 Correlation Coefficient(r): 0.9994

Checked by: Magnum Fan Date: 23/07/2013

High-Volume TSP Sampler
5-Point Calibration Record9

Location	:	AM6
Calibrated by	:	P.F.Yeung
Date	:	18/09/2013

Sampler

Model	:	GMWS-2310 ACCU-VOL
Serial Number	:	S/N 1254

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2323
Service Date	:	26 Dec 2012
Slope (m)	:	2.09107
Intercept (b)	:	-0.02838
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1010
Ta(K)	:	303

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	10.2	3.163	1.526	55	54.5
2	13 holes	8.4	2.870	1.386	50	49.5
3	10 holes	6.7	2.563	1.239	45	44.6
4	7 holes	4.5	2.101	1.018	38	37.6
5	5 holes	2.8	1.657	0.806	30	29.7

Sampler Calibration Relationship

Slope(m):33.960 Intercept(b): 2.589 Correlation Coefficient(r): 0.9996

Checked by: Magnum Fan Date: 22/09/2013

High-Volume TSP Sampler
5-Point Calibration Record9

Location	:	AM6
Calibrated by	:	P.F.Yeung
Date	:	18/11/2013

Sampler

Model	:	GMWS-2310 ACCU-VOL
Serial Number	:	S/N 1254

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2323
Service Date	:	26 Dec 2012
Slope (m)	:	2.09107
Intercept (b)	:	-0.02838
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1018
Ta(K)	:	295

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	10.2	3.191	1.540	57	56.95
2	13 holes	8.5	2.913	1.407	51	50.96
3	10 holes	6.5	2.547	1.232	45	44.96
4	7 holes	4.5	2.119	1.027	38	37.97
5	5 holes	2.8	1.672	0.813	30	29.97

Sampler Calibration Relationship

Slope(m):36.430 Intercept(b): 0.313 Correlation Coefficient(r): 0.9992

Checked by: Magnum Fan Date: 22/11/2013

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 - Dec 26, 2012 Rootsmeter S/N 0438320 Ta (K) - 295
Operator Tisch Orifice I.D. - 2323 Pa (mm) - 753.11

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	1.4440	3.2	2.00
2	NA	NA	1.00	1.0240	6.4	4.00
3	NA	NA	1.00	0.9120	8.0	5.00
4	NA	NA	1.00	0.8720	8.8	5.50
5	NA	NA	1.00	0.7200	12.8	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)
0.9967	0.6902	1.4149
0.9925	0.9693	2.0010
0.9903	1.0858	2.2372
0.9893	1.1345	2.3464
0.9840	1.3666	2.8299

Qstd slope (m) = 2.09107
intercept (b) = -0.02838
coefficient (r) = 0.99996

y axis = SQRT[H2O(Pa/760)(298/Ta)]

Va	(x axis) Qa	(y axis)
0.9957	0.6896	0.8851
0.9915	0.9683	1.2517
0.9893	1.0847	1.3995
0.9883	1.1334	1.4678
0.9830	1.3652	1.7702

Qa slope (m) = 1.30939
intercept (b) = -0.01775
coefficient (r) = 0.99996

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}

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

Certificate of Calibration
校正證書

Certificate No. : C133573
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC13-1422)

Description / 儀器名稱	:	Sound Level Meter
Manufacturer / 製造商	:	Rion
Model No. / 型號	:	NL-31
Serial No. / 編號	:	00410224
Supplied By / 委託者	:	Envirotech Services Co. Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 14 June 2013

TEST RESULTS / 測試結果

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 測試 : K C Lee

Certified By 核證 : K K Wong

Date of Issue 簽發日期 : 17 June 2013

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C133573
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 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	C130019
CL281	Multifunction Acoustic Calibrator	DC110233

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	93.6	± 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	93.6 (Ref.)
				104.00		103.6
				114.00		113.6

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	93.6	Ref.
			Slow			93.5	± 0.3

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輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C133573
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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	67.3	-26.2 ± 1.5
					125 Hz	77.3	-16.1 ± 1.5
					250 Hz	84.9	-8.6 ± 1.4
					500 Hz	90.3	-3.2 ± 1.4
					1 kHz	93.6	Ref.
					2 kHz	94.9	+1.2 ± 1.6
					4 kHz	94.8	+1.0 ± 1.6
					8 kHz	92.6	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.7	-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	92.7	-0.8 ± 1.5
					125 Hz	93.4	-0.2 ± 1.5
					250 Hz	93.6	0.0 ± 1.4
					500 Hz	93.7	0.0 ± 1.4
					1 kHz	93.7	Ref.
					2 kHz	93.5	-0.2 ± 1.6
					4 kHz	93.0	-0.8 ± 1.6
					8 kHz	90.7	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.9	-6.2 (+3.0 ; -6.0)

Remarks : - UUT Microphone Model No. : UC-53A & S/N : 307154

- 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 Certificate 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.

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
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c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel 電話: 2927 2606 Fax 傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website 網址: www.suncreation.com

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

Certificate of Calibration
校正證書

Certificate No. : C134307
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC13-1709)

Description / 儀器名稱 : Sound Level Calibrator
Manufacturer / 製造商 : Rion
Model No. / 型號 : NC-73
Serial No. / 編號 : 10997142
Supplied By / 委託者 : Envirotech Services Co.
Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road,
Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 12 July 2013

TEST RESULTS / 測試結果

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 測試 : K C Lee

Certified By 核證 : K M Wu

Date of Issue 簽發日期 : 15 July 2013

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c o 4 F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c o 香港新界屯門興安里一號青山灣機樓四樓
Tel 電話: 2927 2606 Fax 傳真: 2744 8986 E-mail 電郵: callab@suncreation.com Website 網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C134307
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

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

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C133632
CL281	Multifunction Acoustic Calibrator	DC130171
TST150A	Measuring Amplifier	C120886

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	93.7	± 0.5	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	0.988	1 kHz ± 2 %	± 1

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

Note :
The values given in this Certificate 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.

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel 電話: 2927 2606 Fax 傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Annex I

Event /Action Plans for Air Quality, Noise and Landscape and Visual Monitoring for All Sites

Table I1 Event Action Plan for Air Quality Monitoring

Action Level/Limit Level	Environmental Team Leader (ETL)	Independent Environmental Checker (IEC)	Engineer's Representative (ER)	Contractor
Action Level				
Exceedance for one sample	• Identify source, investigate the causes of exceedance and propose remedial measures; • Inform IEC and ER; • Repeat measurement to confirm finding; and, • Increase monitoring frequency to daily.	• Check monitoring data submitted by ET; and, • Check Contractor's working method.	• Notify Contractor	• Rectify any unacceptable practice; and, • Amend working methods if appropriate.
Exceedance for two or more consecutive samples	• Identify source; • Inform IEC and ER; • Advise the ER on the effectiveness of the proposed remedial measures; • Repeat measurements to confirm findings; • Increase monitoring frequency to daily; and, • Discuss with IEC and Contractor on remedial actions required;	• Check monitoring data submitted by ET; • Check Contractor's working method; • Discuss with ET and Contractor on possible remedial measures; • Advise the ET on the effectiveness of the proposed remedial measures; and, • Supervise Implementation of remedial measures.	• Confirm receipt of notification of failure in writing; • Notify Contractor, and, • Ensure remedial measures properly implemented.	• Submit proposals for remedial to ER within 3 working days of notification; • Implement the agreed proposals; • Amend proposal if appropriate.

Action Level/Limit Level	Environmental Team Leader (ETL)	Independent Environmental Checker (IEC)	Engineer's Representative (ER)	Contractor
Limit Level				
Exceedance for one sample	• Identify source, investigate the causes of exceedance and propose remedial measures; • Inform ER, Contractor and EPD; • Repeat measurement to confirm finding; • Increase monitoring frequency to daily; and, • Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	• Check monitoring data submitted by ET; • Check Contractor's working method; • Discuss with ET and Contractor on possible remedial measures; • Advise the ER on the effectiveness of the proposed remedial measures; and, • Supervise implementation of remedial measures.	• Confirm receipt of notification of failure in writing; • Notify Contractor; and, • Ensure remedial measures properly implemented.	• Take immediate action to avoid further exceedance; • Submit proposals for remedial actions to IEC within 3 working days of notification; • Implement the agreed proposals; and, • Amend proposal if appropriate.
Exceedance for two or more consecutive samples	• Notify IEC, ER, Contractor and EPD; • Identify source; • Repeat measurement to confirm findings; • Increase monitoring frequency to daily; • Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; • Arrange meeting with IEC and ER to discuss the remedial actions to be taken; • Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; and, • If exceedance stops, cease additional monitoring.	• Check monitoring data submitted by ET; • Check Contractor's working method; • Discuss amongst ER, ET, and Contractor on the potential remedial actions; • Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; and, • Supervise the implementation of remedial measures.	• Confirm receipt of notification of failure in writing; • Notify Contractor; • In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; • Ensure remedial measures properly implemented; and, • 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.	• Take immediate action to avoid further exceedance; • Submit proposals for remedial actions to IEC within 3 working days of notification; • Implement the agreed proposals; • Resubmit proposals if problem still not under control; and, • Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Table I2 Event Action Plan for Noise Monitoring

Action Level/Limit Level	Environmental Team Leader (ETL)	Independent Environmental Checker (IEC)	Engineer's Representative (ER)	Contractor
Action Level being exceeded	• Notify ER, IEC and Contractor; • Carry out investigation; • Report the results of investigation to the IEC, ER and Contractor; • Discuss with the IEC and Contractor on remedial measures required; and, • Increase monitoring frequency to check mitigation effectiveness.	• Review the investigation results submitted by the ET; • Review the proposed remedial measures by the Contractor and advise the ER accordingly; and, • Advise the ER on the effectiveness of the proposed remedial measures.	• Confirm receipt of notification of failure in writing; • Notify Contractor; • In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; and, • Supervise the implementation of remedial measures.	• Submit noise mitigation proposals to IEC and ER; and, • Implement noise mitigation proposals.

Action Level/Limit Level	Environmental Team Leader (ETL)	Independent Environmental Checker (IEC)	Engineer's Representative (ER)	Contractor
Limit Level being exceeded	• Inform IEC, ER, Contractor and EPD; • Repeat measurements to confirm findings; • Increase monitoring frequency; • Identify source and investigate the cause of exceedance; • Carry out analysis of Contractor's working procedures; • Discuss with the IEC, Contractor and ER on remedial measures required; • Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; and, • If exceedance stops, cease additional monitoring.	• Discuss amongst ER, ET, and Contractor on the potential remedial actions; and, • Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.	• Confirm receipt of notification of failure in writing; • Notify Contractor; • In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; • Supervise the implementation of remedial measures; and, • If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated.	• Take immediate action to avoid further exceedance; • Submit proposals for remedial actions to IEC and ER within 3 working days of notification; • Implement the agreed proposals; • Submit further proposal if problem still not under control; and, • Stop the relevant portion of works as instructed by the ER until the exceedance is abated.

Table I3 Event and Action Plan for Landscape and Visual Impact - Construction Phase

Action Level	Environmental Team Leader (ETL)	Independent Environmental Checker (IEC)	Engineer's Representative (ER)	Contractor
Non-conformity on one occasion	Identify source Inform the IEC and the ER Discuss remedial actions with the IEC, the ER and the Contractor Monitor remedial action until rectification has been completed	Check report Check the Contractor's working method Discuss with the ER and the Contractor on possible remedial measures Advise the ER on effectiveness of proposed remedial measures	Notify the Contractor Ensure remedial measures are properly implemented	Amend working methods Rectify damage and undertake remedial measures or any necessary replacement
Repeated Non-conformity	Identify source Inform the IEC and the ER Increase monitoring (site audit) frequency Discuss remedial actions with the IEC, the ER and the Contractor Monitor remedial actions until rectification has been completed If exceedance stops, cease additional monitoring (site audit)	Check report Check the Contractor's working method Discuss with the ER and the Contractor on possible remedial measures Advise the ER on effectiveness of proposed remedial measures Supervise implementation of remedial measures	Notify the Contractor Ensure remedial measures are properly implemented	Amend working methods Rectify damage and undertake remedial measures or any necessary replacement

Annex J

Waste Flow Table

Harbour Area Treatment Scheme Stage 2A – Construction of Sewage Conveyance System from North Point to Stonecutters Island

Contract No. : DC/2007/23

Monthly Summary Waste Flow Table for 2009 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete (see Note 4)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill		Metals (see Note 2)	Paper/ cardboard packaging (see Note 2)	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)		(in '000kg)	(in '000kg)	(in '000kg)	(in'000kg / '000L)	(in '000m³)
Jan											
Feb											
Mar											
Apr											
May											
June											
Sub-total											
July	0	0	0	0	0		0	0	0	0	0
Aug	0	0	0	0	0		0	0	0	0	0
Sept	0.016	0	0	0	Dry	Wet	0	0	0	0	0.068
					0.016	0					
Oct	0.523	0	0	0	0.523	0	0	0	0	0	0.086
Nov	2.331	0	0	0	2.275	0.056	99.2	0.036	0	0	0.129
Dec	3.803	0	0	0	3.004	0.799	1	0	0	0	0.120
Total	6.673	0	0	0	5.818	0.855	100.2	0.036	0	0	0.403

Notes:
(1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(2) Metal and paper/cardboard packaging will be collected by recycler for recycling.
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material and the wastes are collected by recycler for recycling.
(4) Broken concrete for recycling into aggregates
(5) If necessary, use the conversion factor: 1 full load of dumping truck being equivalent to 6.5 m^3 by volume.
(6) For chemical waste, the actual quantities of empty paint cans will be in kilogram (kg) and spent lubrication oil will be in litre (L).

Harbour Area Treatment Scheme Stage 2A – Construction of Sewage Conveyance System from North Point to Stonecutters Island

Contract No. : DC/2007/23

Monthly Summary Waste Flow Table for 2010 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete (see Note 4)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill		Metals (see Note 2)	Paper/ cardboard packaging (see Note 2)	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)		(in '000kg)	(in '000kg)	(in '000kg)	(in'000kg / '000L)	(in '000m³)
Jan	5.341	0	0	0	Dry	Wet	0	0.144	0	0.8	0.178
					3.066	2.275					
Feb	3.328	0	0	0	1.541	1.787	0	0	0	0	0.167
Mar	4.486	0	0	0	2.019	2.467	0	0.09	0	0	0.148
Apr	4.864	0	0	0	1.756	3.108	0	0.054	0	0	0.160
May	7.092	0	0	0	3.383	3.709	0	0.144	0	0.3	0.157
June	6.190	0	0	0	1.083	5.107	0	0.09	0	0.4	0.455
Sub-total	31.301	0	0	0	12.848	18.453	0	0.522	0	1.5	1.265
July	5.031	0	0	0	1.006	4.025	0	0.162	0	0	0.212
Aug	5.140	0	0	0.23	1.970	2.940	0	0.09	0	0.4	0.312
Sept	3.593	0.15	0	0.35	1.771	1.322	0	0.09	0	1	0.146
Oct	2.324	0	0	0	1.429	0.895	0	0.144	0	0	0.078
Nov	5.927	0	0	0	4.383	1.544	0	0	0	0.8	0.078
Dec	4.963	0	0	0	4.840	0.123	0	0.072	0	0	0.078
Total	58.279	0.15	0	0.58	28.247	29.302	0	1.080	0	3.7	2.169

Notes:
(1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(2) Metal and paper/cardboard packaging will be collected by recycler for recycling.
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material and the wastes are collected by recycler for recycling.
(4) Broken concrete for recycling into aggregates
(5) If necessary, use the conversion factor: 1 full load of dumping truck being equivalent to 6.5 m^3 by volume.
(6) For chemical waste, the actual quantities of empty paint cans will be in kilogram (kg) and spent lubrication oil will be in litre (L).

Harbour Area Treatment Scheme Stage 2A – Construction of Sewage Conveyance System from North Point to Stonecutters Island

Contract No. : DC/2007/23

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	Broken Concrete (see Note 4)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill		Metals (see Note 2)	Paper/ cardboard packaging (see Note 2)	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)		(in '000kg)	(in '000kg)	(in '000kg)	(in'000kg / '000L)	(in '000m³)
Jan	8.423	0	0	0	Dry	Wet	0	0.09	0	1.2	0.124
					8.236	0.187					
Feb	7.794	0	0	0.799	6.814	0.181	0	0.09	0	0	0.138
Mar	9.641	0	0	0.576	9.007	0.058	0	0.19	0	0	0.059
Apr	8.841	0	0	2.014	6.730	0.097	0	0.09	0	0.2	0.069
May	5.416	0	0	0.887	4.280	0.249	0	0.09	0	0	0.077
June	7.507	0	0	0.665	6.245	0.597	0	0.337	0.028	1.0	0.072
Sub-total	47.622	0	0	4.941	41.312	1.369	0	0.887	0.028	2.4	0.539
July	5.31	0	0	2.372	2.795	0.143	0	0.162	0	0	0.109
Aug	5.381	0	0	2.553	2.530	0.298	0	0.248	0.035	0.4	0.097
Sept	6.963	0	0	2.814	3.974	0.175	0	0.289	0.032	0	0.155
Oct	5.330	0	0	0.794	4.385	0.151	0	0.254	0.015	0	0.128
Nov	5.009	0	0	0.995	3.760	0.254	0	0.270	0	0.6	0.116
Dec	5.429	0	0.159	1.430	3.522	0.318	0	0.216	0	0	0.117
Total	81.044	0	0.159	15.899	62.278	2.708	0	2.326	0.11	3.4	1.261

Notes:
(1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(2) Metal and paper/cardboard packaging will be collected by recycler for recycling.
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material and the wastes are collected by recycler for recycling.
(4) Broken concrete for recycling into aggregates
(5) If necessary, use the conversion factor: 1 full load of dumping truck being equivalent to 6.5 m^3 by volume.
(6) For chemical waste, the actual quantities of empty paint cans will be in kilogram (kg) and spent lubrication oil will be in litre (L).

Harbour Area Treatment Scheme Stage 2A – Construction of Sewage Conveyance System from North Point to Stonecutters Island

Contract No. : DC/2007/23

Monthly Summary Waste Flow Table for 2012 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete (see Note 4)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill		Metals (see Note 2)	Paper/ cardboard packaging (see Note 2)	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)		(in '000kg)	(in '000kg)	(in '000kg)	(in'000kg / "000L)	(in '000m³)
Jan	6.208	0	0	1.615	Dry	Wet	0	0.108	0	0.4	0.117
					4.277	0.316					
Feb	6.006	0	0	0.443	5.148	0.415	0	0.108	0	0	0.063
Mar	8.370	0	0	1.226	6.871	0.273	0	0.108	0	0	0.181
Apr	8.899	0	0	1.101	7.581	0.217	0	0.036	0	0	0.685
May	6.789	0	0	0.716	5.931	0.142	0	0.108	0	0.4	0.103
June	7.585	0	0.021	5.565	1.786	0.213	0.014	0.256	0	0.0	0.197
Sub-total	43.857	0	0.021	10.666	31.594	1.576	0.014	0.724	0	0.8	1.346
July	9.128	0	0	5.240	3.730	0.158	8.356	0.055	0	0.8	0.171
Aug	5.756	0	0	3.836	1.640	0.280	0.008	0.062	0	0.2	0.126
Sept	7.809	0	0.172	2.103	5.062	0.472	0.007	0.172	0	0.4	0.105
Oct	12.073	0	0	7.279	4.427	0.367	0.007	0.028	0	0	0.123
Nov	16.713	0	0	15.626	0.853	0.234	0.005	0.303	0	1.6	0.088
Dec	16.760	0	0	16.362	0.192	0.206	0.005	0.102	0	0.8	0.111
Total	112.096	0	0.193	61.112	47.498	3.293	8.402	1.446	0	4.6	2.070

Notes:
(1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(2) Metal and paper/cardboard packaging will be collected by recycler for recycling.
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material and the wastes are collected by recycler for recycling.
(4) Broken concrete for recycling into aggregates
(5) If necessary, use the conversion factor: 1 full load of dumping truck being equivalent to 6.5 m^3 by volume.
(6) For chemical waste, the actual quantities of empty paint cans will be in kilogram (kg) and spent lubrication oil will be in litre (L) and will be collected by licensed collector.
(7) Inert C&D Materials shall be dumped at Chai Wan Barging Point, TKO Area 137 and Tuen Mun Area 38 and General refuses shall be dumped at SENT.

Harbour Area Treatment Scheme Stage 2A – Construction of Sewage Conveyance System from North Point to Stonecutters Island

Contract No. : DC/2007/23

Monthly Summary Waste Flow Table for 2013 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete (see Note 4)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill		Metals (see Note 2)	Paper/ cardboard packaging (see Note 2)	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)		(in '000kg)	(in '000kg)	(in '000kg)	(in'000kg / "000L)	(in '000m³)
Jan	13.689	0	0	12.331	Dry	Wet	0.005	0.030	0	0.4	0.129
					1.141	0.217					
Feb	15.098	0	0	5.320	9.521	0.257	0.005	0.181	0	0.4	0.078
Mar	17.449	0	0	9.229	8.005	0.215	0	0.111	0	0	0.110
Apr	17.440	0	0	9.884	7.097	0.459	0.003	0.155	0	0	0.142
May	15.293	0	0	7.911	7.006	0.376	0.001	0.101	0	1.8	0.120
June	19.809	0	0	9.620	9.872	0.317	0.001	0.100	0	0.4	0.198
Sub-total	98.778	0	0	54.295	42.642	1.841	0.015	0.678	0	3	0.777
July	19.977	0	0	14.009	5.613	0.355	0.004	0.145	0	0.4	0.178
Aug	18.468	0	0	12.644	5.365	0.459	0.002	0.074	0	0	0.206
Sept	21.668	0	0	14.693	6.690	0.285	0.005	0.155	0	0.2	0.224
Oct	18.939	0	0	13.895	4.623	0.421	0.003	0.108	0	0	0.182
Nov	19.797	0	0	17.751	1.688	0.358	0.004	0.072	0	1	0.150
Dec											
Total	197.627 (Actual)	0 (Actual)	0(Actual)	127.287 (Actual)	66.621 (Actual)	3.719 (Actual)	0.033 (Actual)	1.232 (Actual)	0 (Actual)	4.6 (Actual)	1.717 (Actual)

Notes:
(1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(2) Metal and paper/cardboard packaging will be collected by recycler for recycling.
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material and the wastes are collected by recycler for recycling.
(4) Broken concrete for recycling into aggregates
(5) If necessary, use the conversion factor: 1 full load of dumping truck being equivalent to 6.5 m^3 by volume.
(6) For chemical waste, the actual quantities of empty paint cans will be in kilogram (kg) and spent lubrication oil will be in litre (L) and will be collected by licensed collector.
(7) Inert C&D Materials shall be dumped at Chai Wan Barging Point, TKO Area 137 and Tuen Mun Area 38 and General refuses shall be dumped at SENT.

Annex K

Summary of Observations and Follow-up Actions of Environmental Site Inspections for All Sites

Annex K Summary of Site Inspections Observations and Follow-ups

Inspection date: 5 September 2013

Follow-up Actions Taken after Previous Site Audit

North Point Production Shaft

- Clarifloc was not observed during the site inspection.

Wan Chai East Production Shaft

- Water and chemical mixture observed accumulating within the chemical storage area has been removed.

Sai Ying Pun Production Shaft

- Cardboards and newspaper were not observed inside the waste skip.

Stonecutters Island Production Shaft

- Label was still observed missing for the chemical waste storage area. The Contractor was reminded to provide a proper label for the chemical waste storage.

Observations and Recommendations

Wan Chai East Production Shaft

- Construction materials were observed being stored in front of the chemical waste store. The Contractor was reminded to remove the materials and to keep the access to the chemical waste store clear at all times.

K1

- Oil spills were observed under the concrete mixer. The Contractor was reminded to clean up the oil spills to avoid it causing contamination to the nearby soil.

Stonecutters Island Production Shaft

- Chemical drums without drip trays were observed at the chemical waste storage area. The Contractor was reminded to provide drip trays for the chemical drums.

Inspection date: 12 September 2013

Follow-up Actions Taken after Previous Site Audit

Wan Chai East Production Shaft

- Construction materials blocking the access to the chemical waste store have been removed.

K1

- Oil spills under the concrete mixer had been removed.

Stonecutters Island Production Shaft

- Label was still observed missing for the chemical waste storage area. The Contractor was further reminded to provide a proper label for the chemical waste storage.
- Chemical drums at the chemical waste storage area had been provided with drip trays.

Observations and Recommendations

Wan Chai East Production Shaft

- Oil stains were observed in the stormwater drainage channel along the site entrance. The Contractor was reminded to remove the oil stains and dispose of as chemical waste.

Inspection date: 19 September 2013

Follow-up Actions Taken after Previous Site Audit

Wan Chai East Production Shaft

- Oil stains observed in the storm water drainage channel along the site entrance have been removed.

Observations and Recommendations

- Nil

Inspection date: 26 September 2013

Follow-up Actions Taken after Previous Site Audit

- Nil

Observations and Recommendations

North Point Production Shaft

- Chemical drums at the opposite of wastewater treatment facility were observed without drip tray. The Contractor was reminded to provide drip trays for the chemical drums to prevent leakage.
- Oil stain was observed at the opposite of the chemical storage. The Contractor was reminded to remove the oil stain.

Sai Ying Pun Production Shaft

- Paper was observed stored inside the waste skip. The Contractor was reminded to sort the waste on-site in order to enhance reuse or recycling of these materials.

Stonecutters Island Production Shaft

- Stagnant water was observed in the drip tray at the back of the noise enclosure. The Contractor was reminded to remove the stagnant water to maintain the drip tray with sufficient capacity.

Annex K Summary of Site Inspections Observations and Follow-ups

Inspection date: 3 October 2013

Follow-up Actions Taken after Previous Site Audit

North Point Production Shaft

- Chemical drums opposite of wastewater treatment facility had been removed.
- Oil stain observed at the opposite of the chemical storage had been removed.

Sai Ying Pun Production Shaft

- Paper was not found inside the waste skip.

Stonecutters Island Production Shaft

- Stagnant water in the drip tray at the back of the noise enclosure had been removed.

Observations and Recommendations

Wan Chai East Production Shaft

- Waste oil was observed in the sump near the storm water drainage channel at the site entrance. The Contractor was reminded to remove and dispose of the waste oil as chemical waste and avoid further discharge of waste oil into the sump.

Inspection date: 10 October 2013

Follow-up Actions Taken after Previous Site Audit

Wan Chai East Production Shaft

- The waste oil observed in the sump near the storm water drainage channel at the site entrance has been removed.

Observations and Recommendations

Wan Chai East Production Shaft

- More than 20 bags of cement were observed being stored inside the noise enclosure. Packaging of some bags was damaged and leakage was observed. The Contractor was reminded to remove the damaged bags and cover the stock by impervious sheet to avoid potential dust emission.

Stonecutters Island Production Shaft

- Waste skip was observed overloaded. The Contractor was reminded to ensure the waste skip is well maintained and regularly cleaned.
- Several chemical drums at the back of the waste skips were observed without drip tray. The Contractor was reminded to provide drip tray to avoid potential chemical spillage.

Inspection date: 17 October 2013

Follow-up Actions Taken after Previous Site Audit

Wan Chai East Production Shaft

- The stockpile of cement inside the noise enclosure had been covered by impervious sheet.

Stonecutters Island Production Shaft

- The waste skip had been cleaned and well maintained as observed during the site inspection.
- Several chemical drums at the back of the waste skips had been stored in the chemical storage.

Observations and Recommendations

Wan Chai East Drop Shaft

- Oil stains were observed beside the air compressor near the site office. The Contractor was reminded to remove the oil stains and provide proper drip tray for the air compressor.

North Point Drop Shaft

- Noise emission label was found missing for the air compressor near the site office. The Contractor was reminded to attach valid noise emission label to the air compressor.

Inspection date: 24 October 2013

Follow-up Actions Taken after Previous Site Audit

- Nil

Observations and Recommendations

North Point Production Shaft

- Chemical drums at the opposite of wastewater treatment facility were observed without drip tray. The Contractor was reminded to provide drip trays for the chemical drums to prevent leakage.
- Oil stain was observed at the opposite of the chemical storage. The Contractor was reminded to remove the oil stain.

Sai Ying Pun Production Shaft

- Paper was observed stored inside the waste skip. The Contractor was reminded to sort the waste on-site in order to enhance reuse or recycling of these materials.

Stonecutters Island Production Shaft

- Stagnant water was observed in the drip tray at the back of the noise enclosure. The Contractor was reminded to remove the stagnant water to maintain the drip tray with sufficient capacity.

Inspection date: 31 October 2013

Follow-up Actions Taken after Previous Site Audit

North Point Production Shaft

- The stock of more than 20 bags of cement placed near the entrance of the noise enclosure had been covered with impervious sheet.

Observations and Recommendations

North Point Production Shaft

- Waste basket was observed overloading near the waste treatment facility. The Contractor was reminded to frequently collect the waste from the waste basket.

Sai Ying Pun Production Shaft

- Chemical containers were observed without drip tray near the workshop. The Contractor was reminded to provide drip trays for the chemical containers to avoid potential chemical spillage.
- Wastewater storage tank was observed full of wastewater beside the wastewater treatment facility. The contactor was reminded to ensure a proper capacity of the wastewater storage tank so that no wastewater is overflowing without treatment.

Stonecutters Island Production Shaft

- Several chemical drums were still observed without drip tray beside the chemical storage. The Contractor was reminded to provide drip tray to the chemical drums to avoid potential chemical spillage.
- Waste oil was observed inside the drip tray at the workshop. The Contractor was reminded to remove the waste oil and well maintained the waste storage area.

Annex K Summary of Site Inspections Observations and Follow-ups

Inspection date: 7 November 2013

Follow-up Actions Taken after Previous Site Audit

North Point Production Shaft

- Waste skip was still observed overloading near the wastewater treatment facility. The Contractor was reminded to clear the waste skip frequently.

Sai Ying Pun Production Shaft

- Chemical containers near the workshop had been provided with drip tray.
- Wastewater storage tank was observed with a proper capacity and no wastewater was observed overflowing.

Stonecutters Island Production Shaft

- Several chemical drums beside the chemical storage had been provided with drip tray.
- Waste oil was still observed inside the drip tray at the workshop. The Contractor was reminded to remove the waste oil and well maintained the waste storage area.

Observations and Recommendations

Wan Chai East Production Shaft

- A chemical waste drum was observed in front of the chemical waste store. The Contractor was reminded to remove the chemical was drum to keep the access to the chemical waste store clear.

Stonecutters Island Production Shaft

- An overloaded waste skip was observed near the wastewater treatment facility. The Contractor was reminded to frequently collect the waste from the waste skip.

Inspection date: 14 November 2013

Follow-up Actions Taken after Previous Site Audit

Wan Chai East Production Shaft

- The chemical drum observed in front of the chemical waste store had been removed.

Stonecutters Island Production Shaft

- Waste oil inside the drip tray at the workshop had been removed.
- Waste skip beside the chemical waste storage had been cleared.

Observations and Recommendations

- *Nil*

Inspection date: 21 November 2013

Follow-up Actions Taken after Previous Site Audit

- *Nil*

Observations and Recommendations

Stonecutters Island Production Shaft

- Two chemical drums were observed without drip tray beside the chemical waste storage. The Contractor was reminded to provide drip tray to avoid potential chemical spillage.

Sai Ying Pun Production Shaft

- Garbage was observed storing next to chemical waste storage. The Contractor was reminded to collect garbage frequently and stored in specified enclosed bins/compaction units.

Wan Chai East Production Shaft

- Chemical mixture was observed accumulating in the chemical storage area. The Contractor was reminded to pump and remove the chemical mixture and dispose of as chemical waste.

Inspection date: 28 November 2013

Follow-up Actions Taken after Previous Site Audit

Wan Chai East Production Shaft

- Chemical mixture accumulated beside the chemical waste storage had been removed.

Stonecutters Island Production Shaft

Two chemical drums had been removed beside the chemical waste storage.

Observations and Recommendations

North Point Production Shaft

- Waste skip was observed overloaded beside the chemical waste storage. The Contractor was reminded to collect the waste frequently.

Sai Ying Pun Production Shaft

- Garbage was observed storing next to chemical waste storage. The Contractor was reminded to store the garbage at specified enclosed bins/compaction units. This will be followed up during next site audit.

Stonecutters Island Production Shaft

- Two chemical drums were observed without drip tray beside the noise enclosure. The Contractor was reminded to provide drip tray to avoid potential chemical spillage.
- General refuse was observed in the drip tray beside the wastewater treatment facility. The Contractor was reminded to clean up the drip tray and ensure regular maintenance for the drip tray.
- Grease was observed on the access road at the opposite of the wastewater treatment facility. The Contractor was reminded to immediately remove the oily liquid and dispose of as chemical waste.