

EXECUTIVE SUMMARY

This is the first Monthly Environmental Monitoring and Audit (EM&A) Report for West Island Line Project. The Report presents the results of EM&A works and the impact monitoring for the construction works undertaken during the period of 10 August 2009 to 9 September 2009. The major construction activities in the reporting period included site clearance and preparation, site mobilisation at Works Areas B, G, J and MA together with formation of temporary access within Works Area MA.

Impact monitoring for air quality and noise were conducted weekly in the reporting period, no exceedance was found and there was no breach of Action and Limit Levels for air and noise monitoring.

No environmental complaint, notification of summon and prosecution was received in the reporting period.

Site inspection was conducted on a weekly basis to monitor proper implementation of environmental pollution control and mitigation measures for the Project. No non-conformance to the environmental requirements was identified in the reporting period.

The Environmental Permit (EP-313/2008/B) was issued by EPD on 22 July 2009 regarding the shortened notification periods for Conditions 1.14, 2.7 and 2.12.1 and the inclusion of decking over for Works Area C and other noise mitigation measures at Works Areas A, A1, A2 and A3. The Environmental Permit (EP-313/2008/C) was issued by EPD on 31 August 2009 regarding the measures to mitigate landscape & visual impacts at extended Works Area I.

There was no reporting change in the reporting period.

Future key issues envisaged in the coming month include the followings:-

- Disposal of C&D waste;
- Dust generation from site activities;
- Noise impact from operating equipment;
- Site water discharge;
- Chemical wastes;
- Trees protection.

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1 INTRODUCTION

1.1 Project Background

MTR Corporation Limited (MTRCL) proposes to build a new railway line, the West Island Line (WIL) which is an extension of the Island Line to the Western District. The route length of the fully underground WIL is approximately 3 km with three new underground stations namely Sai Ying Pun Station (SYP), University Station (UNI) and Kennedy Town Station (KET).

1.2 Project Programme

The West Island Line Project commenced on 10 July 2009. Commencement of construction was on 10 August 2009. The commencement of operation of the Project is scheduled to be in mid 2014.

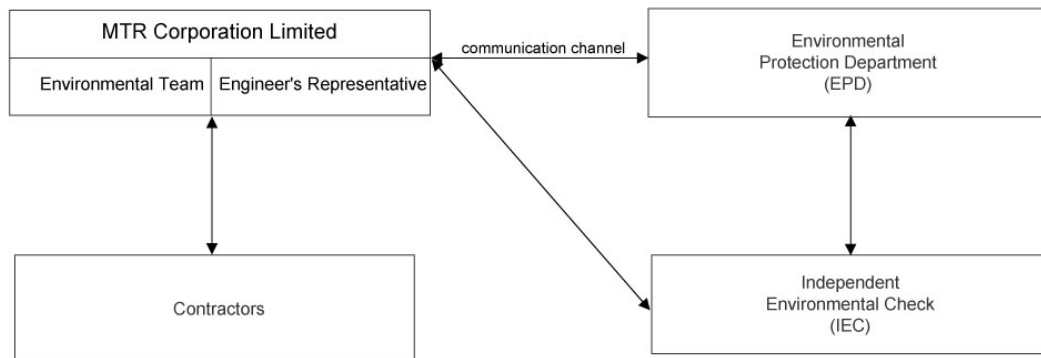
1.3 Coverage of the EM&A Report

The EM&A programme for the West Island Line Project commenced on 10 August 2009. This is the first Monthly Environmental Monitoring and Audit (EM&A) Report for the Project. The Report presents the results of EM&A works and the impact monitoring for the construction works undertaken during the period of 10 August 2009 to 9 September 2009.

2 PROJECT INFORMATION

2.1 Project Management Organization and Contact Details

The WIL Project organization chart is presented in Figure 1. Contacts of key environmental staff of the Project are shown in Table 1.



PROJECT ORGANISATION
Figure 1

Table 1 Contact List of Key Personnel

Organization	Name	Telephone
Environmental Protection Department		
Sr Env Protection Offr(Metro Assessment) 3	Victor Yeung	2835 1155
Env Protection Offr(Metro Assessment) 32	Steve Li	2835 1142
Sr Env Protection Offr(Regional S) 1	Sean Law	2516 1806
Env Protection Offr(Regional S) 11	Sunny Cheung	2516 1872
Env Protection Offr(Regional S) 14	Andrew Lau	2516 1869
Engineer's Representative		
Project Manager – WIL Civil	Julian Saunders	3921 3331
Independent Environmental Checker		
Senior Environmental Consultant	Coleman Ng	2268 3097
Environmental Team		
Environmental Team Leader	Glenn Frommer	2688 1552
Contact 706 Contractor		
Project Manager	Cheng Kam Man	9650 1739
Construction Manager	Tai Yiu Tong	9047 1830
Contact 708 Contractor		
Project Manager	Jason Cheng	9837 9323
Tunnel Engineer	John Wai	6083 9220
Environmental Engineer	M. K. Cheung	9096 7254
Contact 714 Contractor		
Project Manager	Howard Kong	9330 6897
Assistant Project Manager	Alice Leung	6123 2859
Environmental Supervisor	T. W. Leung	6856 2360

2.2 Project Works Areas and Environmental Monitoring Locations

The WIL Project works areas and the locations of environmental monitoring stations are shown in Figures 2 and 3 to 8 respectively. Table 2 shows the details of the monitoring stations as reported in Sections 3.1 and 3.2 below.

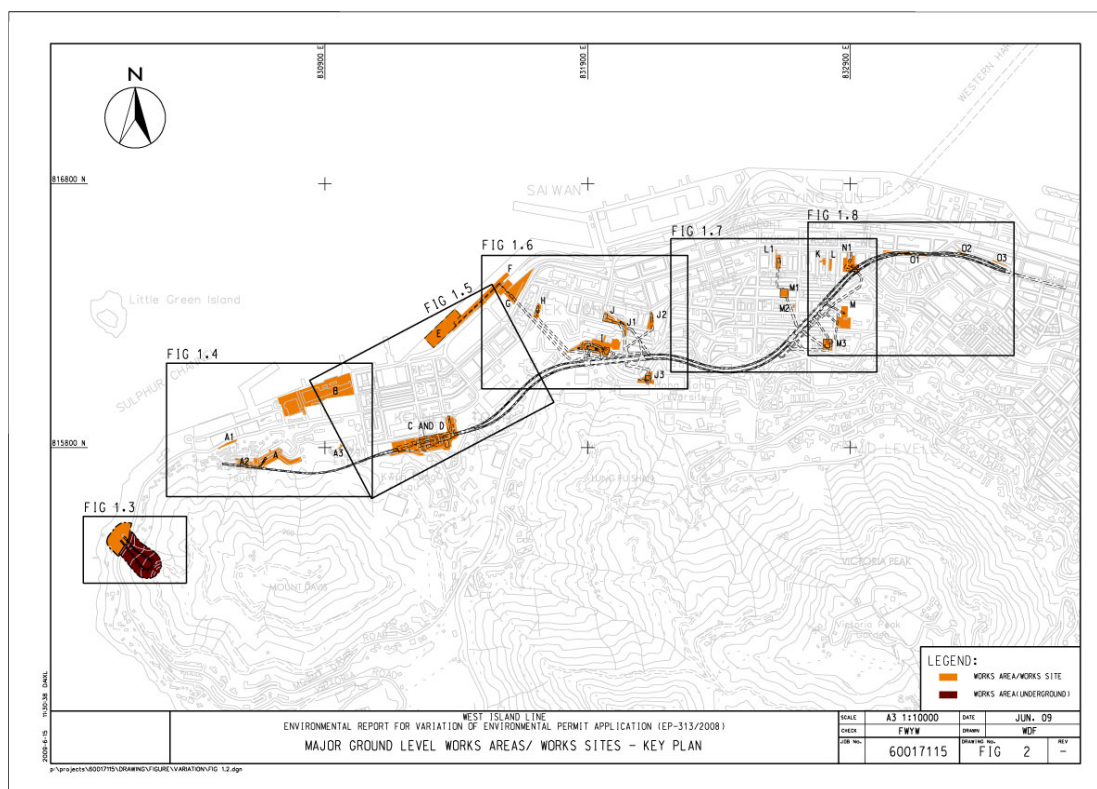
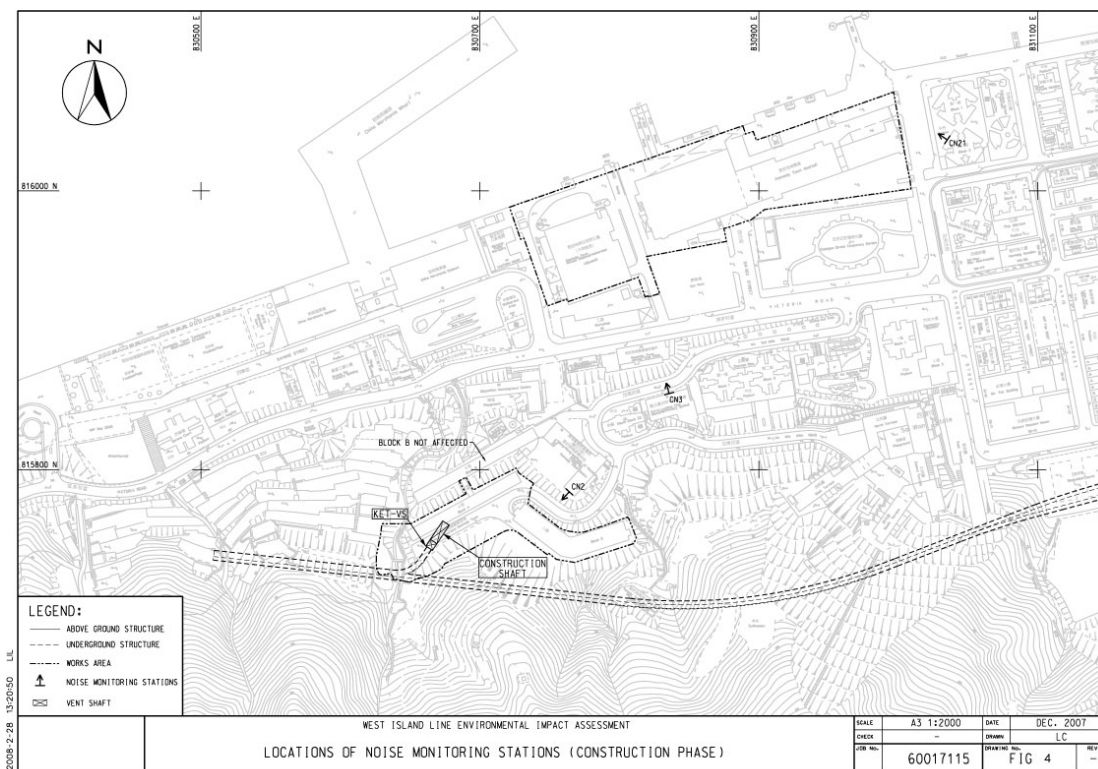
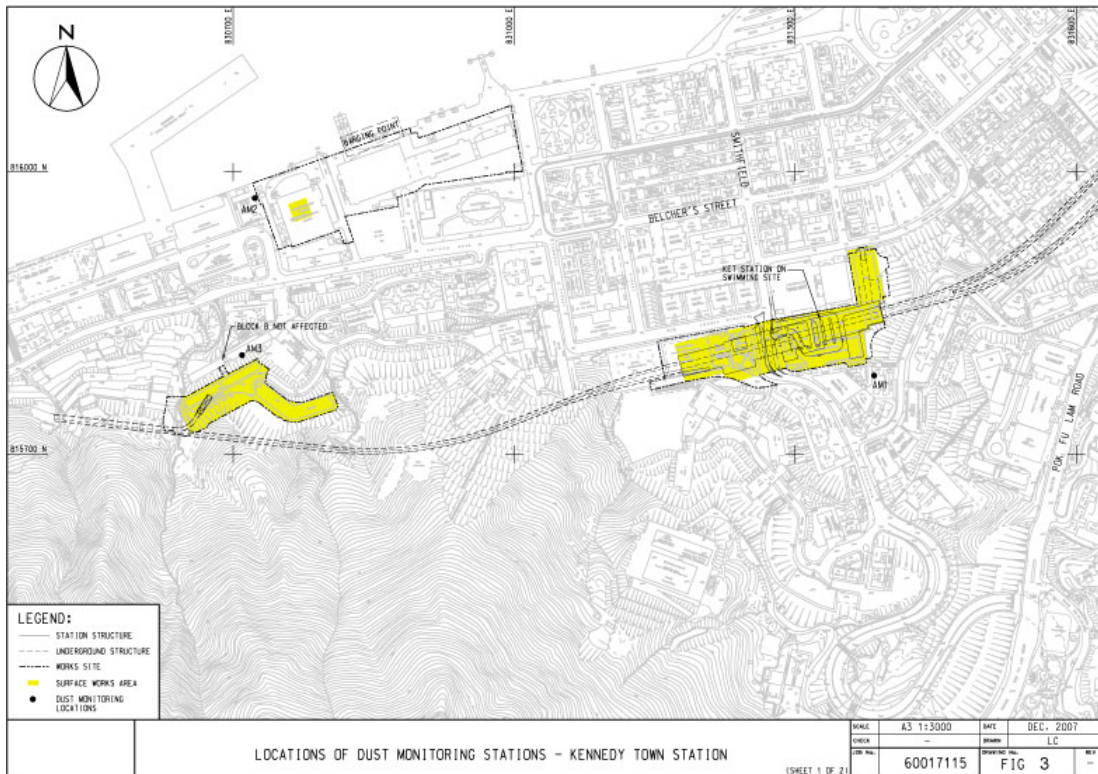
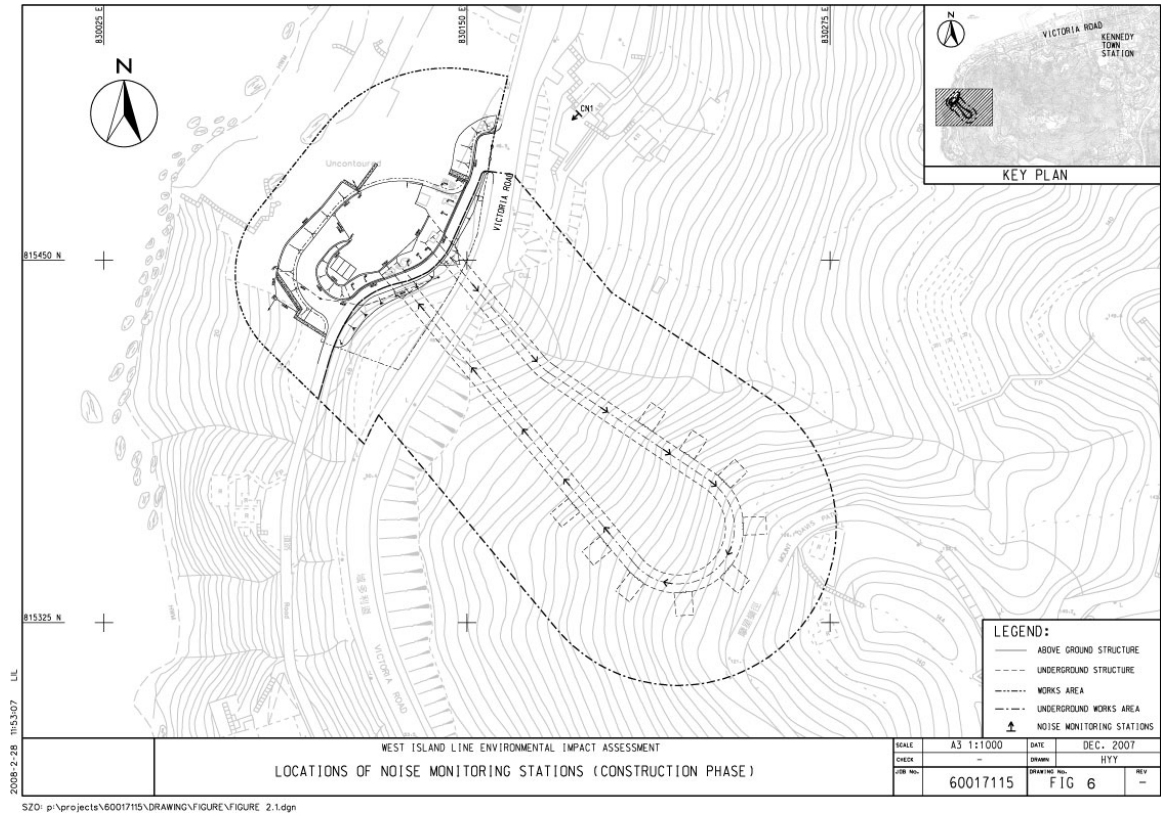
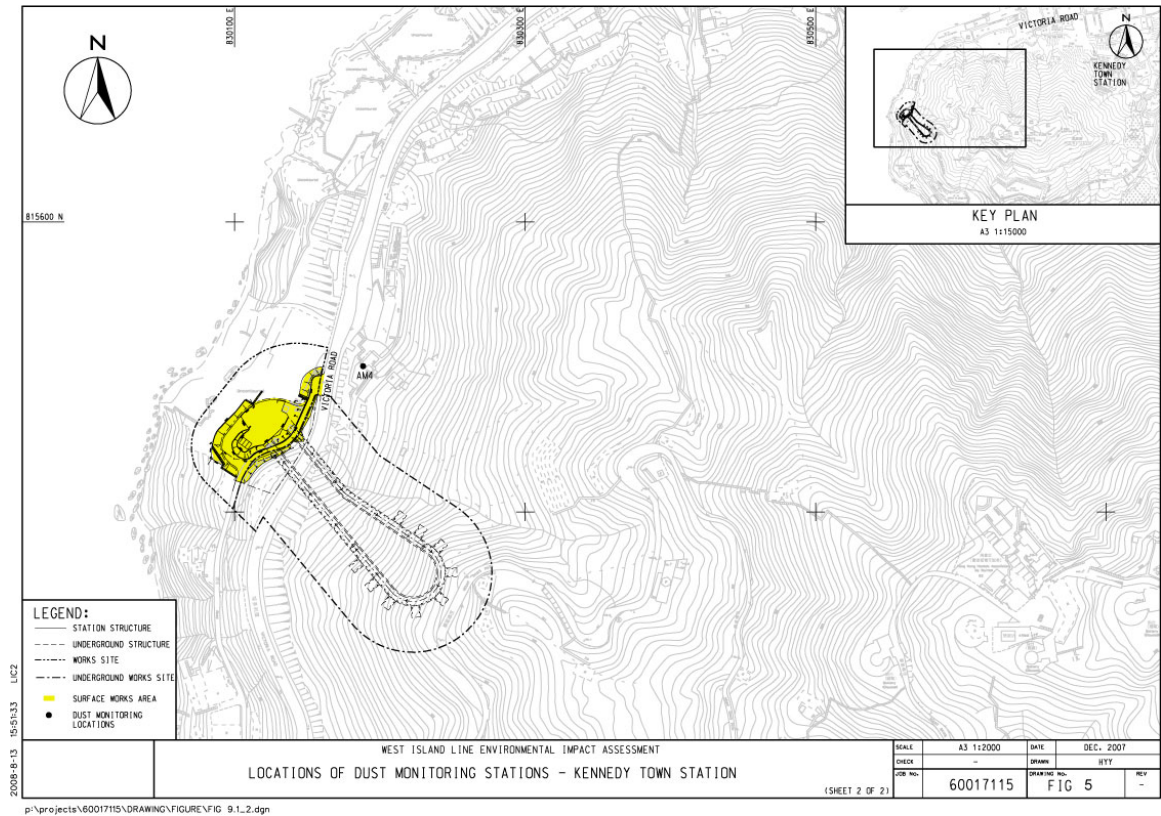


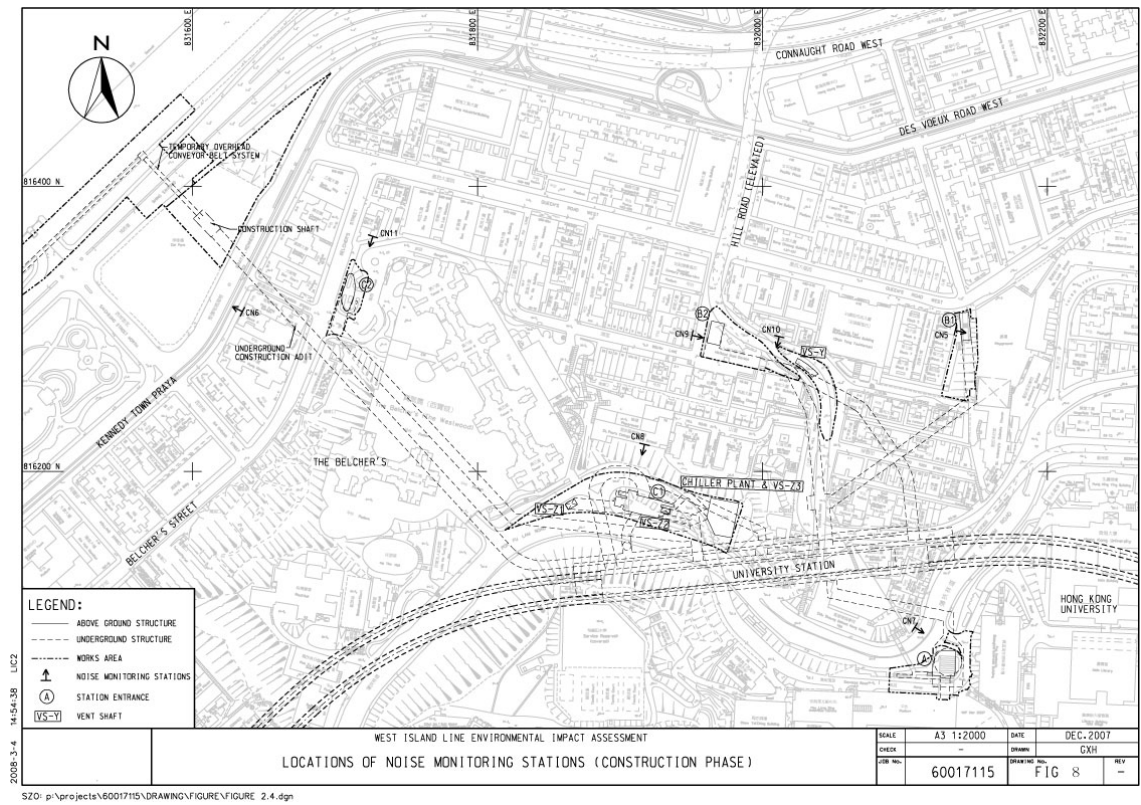
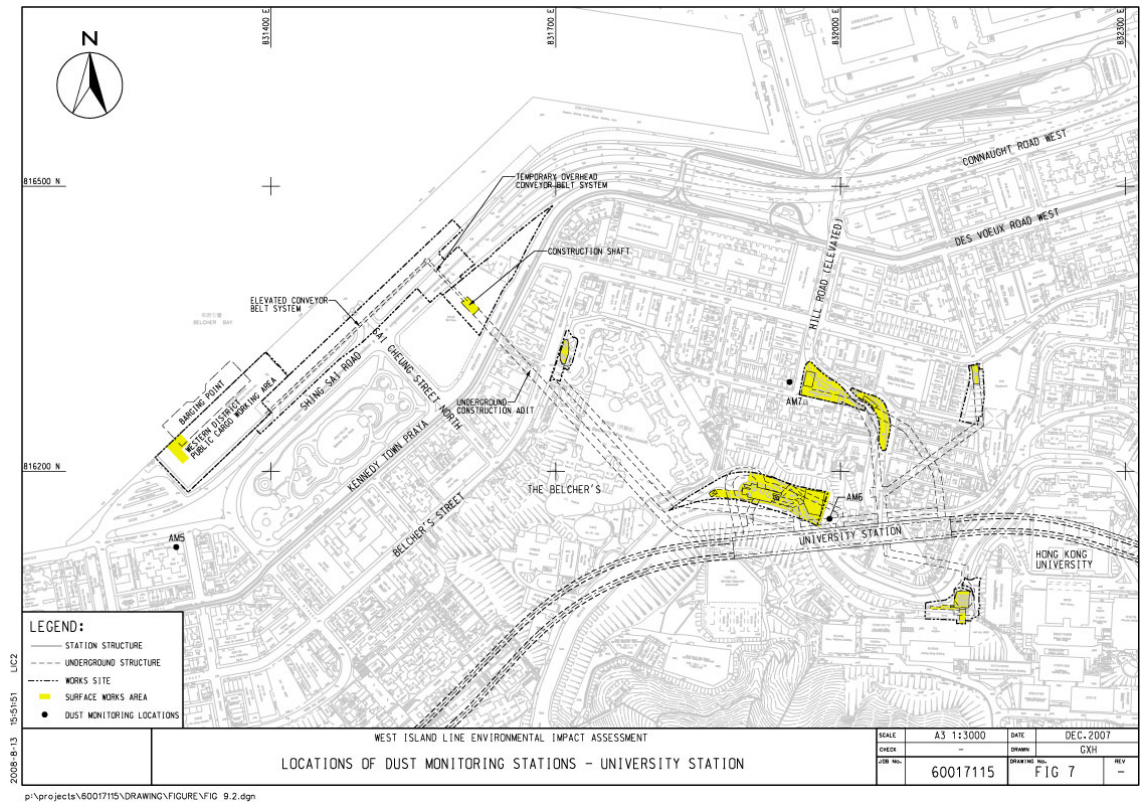
Table 2 Summary of impact air quality and noise monitoring stations

ID	Premise	Monitoring Location
Air		
AM2	Victoria Public Mortuary	Building roof facing Works Area B
AM4	Chee Sing Kok Social Centre of the Humanity Love (current name for the premise)	Adjacent to building and facing Works Area MA
AM7a*	Hill Court	Building roof facing Works Area J
Noise		
CN1	Chee Sing Kok Social Centre of the Humanity Love (current name for the premise)	Adjacent to building and facing Works Area MA
CN3	Lui Ming Choi Primary School	Building roof facing Works Area B
CN6	Yick Fung Garden (Block A)	At podium level of building facing Works Area G
CN9	Hill Court	Building roof facing Works Area J
CN21	The Merton (Block 2)	At podium level of building facing Works Area B

* The alternative air monitoring station AM7a was approved by EPD on 10 August 2009.







2.3 Summary of EM&A Requirements

The EM&A programme requires environmental monitoring for air quality, noise, water quality and waste management as specified in the EM&A Manual.

In the reporting month, 24-hour TSP levels at the air monitoring stations shown in Table 2 were monitored weekly during the construction stage.

In the reporting month, construction noise levels at the noise monitoring stations shown in Table 2 were monitored weekly during the construction stage.

A summary of impact EM&A requirements as applicable to this EM&A Report is presented in Table 3 below.

Table 3 Summary of impact EM&A Requirements

Parameters	Descriptions	Locations	Frequencies	Duration
Air Quality	24-hr TSP	Shown in Table 2	Once per week	During construction stage
Noise	Leq(30min)	Shown in Table 2	Once a week	During construction stage
Waste	On-Site Audit	Active Works Sites	Monthly	During construction stage
Wastewater	On-Site Audit	Active Works Sites	Monthly	During construction stage
General Site Conditions	Environmental Site Inspection	Active Works Sites	Weekly	During construction stage

Environmental Quality Performance Limits for air quality and noise are shown in Appendix A. The Event Action Plan for air quality and noise are shown in Appendix B.

2.4 Implementation of Environmental Mitigation Measures

The WIL Civil Works Contractors are required to implement the mitigation measures as specified in the EP, EIA Report and EM&A Manual. During the regular environmental site inspections, the Contractors' implementation of mitigation measures were inspected and reviewed. A schedule of the implementation of mitigation measures identified in the WIL EIA is given in Appendix C.

2.5 Construction Activities in the Reporting Month

Major construction activities carried out by the respective WIL Civil Works Contractors during the reporting period include:

Contract 706 - Works Area G

- Site clearance and preparation
- Hoarding erection and site office establishment
- Mobilisation
- Utilities diversion

Contract 706 - Works Area J

- Site clearance
- Hoarding erection and site office establishment
- Mobilisation
- Preparation work for the noise decking to cover the shaft excavation area
- Utilities diversion

Contract 708 - Works Area MA

- Site clearance and preparation
- Hoarding erection and site office establishment
- Mobilisation
- Formation of temporary access

Contract 714 - Works Area B

- Site clearance and preparation
- Hoarding erection and site office establishment
- Mobilisation

2.6 Construction Activities for the Coming Month

According to the construction programme for the Civil Works Contracts, the scheduled major construction activities in the next reporting month are as follows:

Contract 706 - Works Area G

- Site preparation
- Utilities diversion
- Predrilling
- Preparation work for the noise decking to cover the shaft excavation area

Contract 706 - Works Area J

- Site preparation
- Predrilling
- Utilities diversion
- Preparation work for the noise decking to cover the shaft excavation area

Contract 708 - Works Area MA

- Site Formation
- Predrilling
- Utilities diversion

Contract 714 - Works Area B

- Retaining walls construction
- Additional concrete paving construction

3 *IMPACT MONITORING*

3.1 *Air Quality*

24-Hour TSP Levels Monitoring

The sampling procedure follows that described in the App. B of Pt 50 in 40CFR Ch.1 (U.S. Environmental Protection Agency). TSP is sampled by drawing air through a conditioned, pre-weighed filter paper inside the high volume sampler at a controlled rate. After 24-hour sampling the filter paper with retained particles is collected and returned to the laboratory for drying in a desiccator followed by accurate weighing. TSP levels are calculated from the ratio of the mass of particulate retained on the filter paper to the total volume of air sampled.

The samplers should be properly maintained. Prior to dust monitoring commencing, appropriate checks should be made to ensure that all equipment and necessary power supply are in good working condition.

The flow rate of the high volume sampler with mass flow controller will be calibrated using an orifice calibrator. Initial calibration (five points) will be conducted upon installation and prior to commissioning. Calibration will be carried out every six months. Calibration certificates are attached in Appendix E.

To examine the construction dust levels, 24-hour TSP monitoring was undertaken according to the EM&A Manual. The dust monitoring locations are shown in the Section 2.2 above. Monitoring results are presented in the following table (see Appendix D for graphical plot). The 24-hour TSP levels when there were construction activities during the monitoring period were within the Action Level. No exceedance was found. This indicates that the construction activities did not have a noticeable adverse effect on the general air quality for the works areas.

AM2- Victoria Public Mortuary						
Date	Time	TSP (ug/m3)	Action Level (ug/m3)	Limit Level (ug/m3)	Compliance (Yes/No)	Weather Condition
10/08/2009	10:00	50.7	155	260	Yes	Fine
17/08/2009	10:00	41.6	155	260	Yes	Fine
24/08/2009	10:00	98.8	155	260	Yes	Fine
31/08/2009	10:00	76.1	155	260	Yes	Fine
07/09/2009	10:00	59.8	155	260	Yes	Fine
AM4- Chee Sing Kok Social Centre of the Humanity Love						
10/08/2009	10:00	56.2	158	260	Yes	Fine
17/08/2009	10:00	78.1	158	260	Yes	Fine
24/08/2009	10:00	69.3	158	260	Yes	Fine
31/08/2009	10:00	55.4	158	260	Yes	Fine
07/09/2009	10:00	72.7	158	260	Yes	Fine
AM7a- Hill Court^						
10/08/2009	10:00	44.9	151	260	Yes	Fine
17/08/2009	10:00	60.1	151	260	Yes	Fine
24/08/2009	10:00	86.7	151	260	Yes	Fine
31/08/2009	10:00	65.2	151	260	Yes	Fine
07/09/2009	10:00	87.6	151	260	Yes	Fine

^The alternative air monitoring location was approved by EPD on 10 August 2009

It is proposed to change the 24hr TSP impact monitoring frequency from the original requirement of “once every 6 days” as specified in the EM&A Manual Table 9.2 to “once per week” in order to facilitate the arrangement of air impact monitoring work. The proposed change will not have adverse impact on the air impact monitoring programme during the WIL construction stage.

3.2 Noise

B&K 2236 sound level meters which complied with the International Electrotechnical Commission Publication 651:1979 (Type 1) and 804:1985 (Type 1), specification as referred to in the Technical Memoranda to the NCO were used for the construction noise impact monitoring. The B&K sound level meters and B&K 4231 calibrator are verified by the certified laboratory or manufacturer once every two years to ensure they perform to the same level of accuracy as stated in the manufacturer’s specifications. Calibration certificates are attached in Appendix E.

Immediately prior to and following each set of measurements at any NSR, the accuracy of the sound level meter was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. If the calibration levels before and after the measurement differ by more than 1.0dB the measurement shall be repeated to obtain a reliable result (note: maximum deviation during this initial baseline monitoring period was 0.3dB). Periods of prolonged or repeated overloading of the sound level meter detector were avoided by setting the meter with adequate headroom prior to commencing measurements. Measurements were recorded to the nearest 0.1 dB, with values of 0.05 being rounded up.

Impact noise monitoring of $L_{A,eq30}$ was undertaken to measure construction noise levels in accordance with the EM&A Manual. The noise monitoring locations are shown in Section 2.2 above.

Monitoring results are presented in the following table (see Appendix D for graphical plot). No exceedance was found.

CN1- Chee Sing Kok Social Centre of the Humanity Love					
Date	Time	Leq(dBA)	Limit Level (dBA)	Compliance (Yes/No)	Weather Conditions
14/08/2009	14:00	65.6	75	Yes	Cloudy, wind <3m/s
20/08/2009	16:00	64.3	75	Yes	Fine, wind<2m/s
27/08/2009	9:00	60.3	75	Yes	Fine, wind<2m/s
02/09/2009	15:15	65.5	75	Yes	Fine, wind<2m/s
CN3- Lui Ming Choi Primary School					
12/08/2009	13:30	66.0	70	Yes	Fine, wind<2m/s
18/08/2009	15:15	67.1	70	Yes	Fine, wind<2m/s
27/08/2009	10:00	69.7	70	Yes	Fine, wind<2m/s
01/09/2009	10:20	68.5	70	Yes	Fine, wind<2m/s
CN6- Yick Fung Garden (BlockA)					
12/08/2009	15:00	72.0	75	Yes	Fine, wind<2m/s
18/08/2009	16:00	75.0	75	Yes	Fine, wind<2m/s
27/08/2009	10:00	74.5	75	Yes	Fine, wind<2m/s
02/09/2009	13:15	74.9	75	Yes	Fine, wind<2m/s
CN9- Hill Court					
14/08/2009	14:45	73.7	75	Yes	Cloudy, wind <3m/s
20/08/2009	17:00	74.6	75	Yes	Fine, wind<2m/s
27/08/2009	13:00	74.4	75	Yes	Fine, wind<2m/s
02/09/2009	14:00	72.2	75	Yes	Fine, wind<2m/s
CN21- The Merton (Block 1)					
12/08/2009	14:15	67.1	75	Yes	Fine, wind<2m/s
18/08/2009	16:50	65.8	75	Yes	Fine, wind<2m/s
27/08/2009	11:00	65.3	75	Yes	Fine, wind<2m/s
01/09/2009	11:15	69.5	75	Yes	Fine, wind<2m/s

3.3 Action taken in Event of Exceedence

There was no exceedance in air quality and noise monitoring parameters recorded in the

reporting period, therefore no action was taken.

4 LANDSCAPE AND VISUAL

4.1 Monitoring Requirements

Monitoring of the implementation of the landscape and visual mitigation measures during construction phase was conducted in accordance with the requirements as stipulated in the EM&A Manual.

The landscape and visual monitoring and audit will be conducted once a month throughout the construction stage covering the entire project site areas.

4.2 Audit Results

Monthly monitoring and audit was undertaken in accordance with the EM&A Manual.

Tree Felling at Works Area G

4 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work in the reporting period.

Tree Felling at Works Area I

16 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work in the reporting period.

Tree Felling at Works Area MA

107 nos. of trees were removed in accordance with the approved Tree Removal Application during the site clearance work in the reporting period.

Tree Transplantation

7 nos. of trees were transplanted from Works Area J to the Receptor Sites at Sheung Wan Pumping Station site (4nos.), Junction of Shing Sai Road/New Praya (2 nos.) and Shing Sai Road (1 no.) in accordance with the approved Tree Removal Application. In the approved Tree Removal Application, 5nos. of trees were approved to be transplanted, 2 nos. additional trees were transplanted in response to the request made by LCSD with a view to preserving the landscape resources as much as practicable.

In addition, 2nos. of trees from Works Area C and 6nos. of trees from Works Area J3 were transplanted to the Receptor Site at Sheung Wan Pumping Station site in accordance with the approved Tree Removal Application. The civil works contracts for Works Area C and J3 have not been awarded yet and the tree transplanting works for these works areas were carried out before the construction contracts award.

The Certified Arborist as required by the EP has conducted inspections and audits and found that the transplanting works and the tree protection works being carried out by the civil works and

transplanting contractors were in accordance with the EP/EIA, Tree Protection Plan and contract requirements. No non compliance was identified in the reporting period.

Others

In accordance with EP Condition 2.8, the two individual plants, *Pavetta hongkongensis* located at the Works Area MA shall be transplanted.

It was identified that only one of the plant as mentioned above require transplanting and the other can be retained at its original location.

With consent from AFCD on the proposed method statement for transplanting the plant and protecting the retained plant, the plant was transplanted to a nearby location with similar habitat as agreed by AFCD and supervised by the Certified Arborist. The retained plant was properly protected in accordance with the agreed method.

In addition, the existing trees and species of conservation importance (ie the two identified Silver-back *Artocarpus hypargyreus*) located near the Works Area MA were fenced off and the trunk protected with hessian sacking as far as practicable prior to the commencement of construction work.

5 WASTE MANAGEMENT

Mitigation measures on waste management have been implemented in accordance with the Waste Management Plans for the respective civil works contracts submitted under the Environmental Permit. The C&D materials are to be disposed of at the public filling reception facilities while C&D wastes are to be disposed of at the landfills. Quantities of wastes disposed in the reporting period are summarized in the following table:

Amount of Construction Wastes Disposed			
Reporting Period	Inert C&D Materials to Public Fill (ton)	Non-inert Waste to Landfill (ton)	Chemical Waste to designated treatment facility
<u>Contract 706</u> Jul – Aug 2009*	1080.4	9.1	0
<u>Contract 708</u> Jul – Aug 2009*	0	179	0
<u>Contract 714</u> Jul – Aug 2009*	0	18	0

* The wastes disposal before 10 August 2009 were generated from site clearance works

6 RECORD OF ENVIRONMENTAL COMPLAINTS

No public environmental complaint was received in the reporting period. In addition, there were two public enquiries on the construction works at Works Area J in the reporting period. In

response to these enquiries, the Contractor had strengthened the noise mitigation measures.

7 RECORD OF NON-COMPLIANCES

There was no non-compliance identified in the reporting period.

8 NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

No summon or prosecution related to environmental issue was received or made against the Project in the reporting period.

9 STATUS OF STATUTORY SUBMISSIONS

9.1 Submissions required under Environmental Permit

A summary of the status of submissions required under the WIL Environmental Permit as of 9 September 2009 is shown below:

EP-313/2008/C Clause No.	Description		Status
1.11	1	Commencement date of construction	submitted on 10 July 2009
2.1 & 2.2	2	Employment of IEC, ET Leader	submitted on 23 June 2009
2.3	3	Contractor Management Organization for Civil Works Contracts 706, 708 and 714	submitted on 24 July 2009
2.5 & 2.7	4	Certified Arborist and Tree Protection Plan	submitted on 24 July 2009 and 5 August 2009
2.6	5	Set up of Community Liaison Groups and designated complaint hotline	submitted on 20 July 2009
2.11.1	6	Archaeological Watching Brief Proposal	submitted on 31 August 2009
2.12	7	Waste Management Plans for Civil Works Contracts 706, 708 and 714	submitted on 24 July 2009
2.12	8	Revised Waste Management Plans for Civil Works Contracts 706, 708 and 714	submitted on 7 September 2009
3.1.1(a) & 2.4	9	Works Area B programme, site layout plan and drawings of mitigation measures	submitted on 23 June 2009
3.1.1(a)	10	Remediation Report for Works Area B	submitted on 10 June 2009
3.1.2(a) & 3.1.2(b)	11	Appointment of ISC and certification of additional concrete paving for the small western portion of Works Area B occupied by HyD Depot	submitted on 13 July 2009 and 25 August 2009
6.3	12	Baseline Monitoring Report (Part 1) for Works Area B	submitted on 10 July 2009
6.3	13	Baseline Monitoring Report (Part 2) for Works Area MA	submitted on 12 August 2009
6.3	14	Baseline Monitoring Report (Part 3) for Works Areas G and J	submitted on 28 August 2009

9.2 Statutory Permits and Licenses

A summary of the status of all relevant environmental permits and licenses as of 9 September 2009 is shown below:

Description	Status
Environmental Permit for West Island Line Project (EP-313/2008)	Issued on 12 January 2009 and superseded
Environmental Permit for West Island Line Project (EP-313/2008/A)	Issued on 26 June 2009 and superseded
Environmental Permit for West Island Line Project (EP-313/2008/B)	Issued on 22 July 2009 and superseded
Environmental Permit for West Island Line Project (EP-313/2008/C)	Issued on 31 August 2009
<u>Contract 706</u>	
Wastewater Discharge License	WT00004526-2009
Registration as a Chemical Waste Producer	Application submitted
Application for Disposal of Construction Waste	Billing Account no. 7009056 activated on 16 July 2009
Application for Construction Noise Permit	Application submitted
<u>Contract 708</u>	
Wastewater Discharge License	Application submitted on 7 August 2009
Registration as a Chemical Waste Producer	Application submitted on 7 August 2009 and acknowledged by EPD on 10 August 2009
Application for Disposal of Construction Waste	Billing Account no. 7009116 activated on 12 August 2009
<u>Contract 714</u>	
Wastewater Discharge License	Application submitted on 6 August 2009
Registration as a Chemical Waste Producer	Application submitted on 2 September 2009 and acknowledged by EPD on 7 September 2009
Application for Disposal of Construction Waste	Billing Account no. 7009127 activated on 27 July 2009

10 SITE INSPECTIONS

10.1 Observations

Regular site inspections were undertaken by the ET in accordance with the EM&A Manual. The contractors' performance on environmental matters were assessed. The inspection findings and the associated recommendations on improvement to the environmental protection and pollution control works were raised to the contractors for reference and/ or action.

Observations against the implementation of the mitigation measures recommended in the EP/EIA are summarized as follows:

Item	Description	Follow-up Status
	<u>Contract 706</u>	
1	The contractor was reminded to clear stagnant water inside surface channels to avoid mosquito breeding	Completed
2	The contractor was reminded to provide more movable noise barriers to minimize noise nuisance to nearby residents	Improved and the standard to be maintained
3	The contractor was reminded to improve the wheelwashing facility	Improved and the standard to be maintained
4	The contractor was reminded to prevent muddy site water egress during rainstorm periods	Completed
	<u>Contract 708</u>	
1	The contractor was reminded to properly protect all the retained trees as per EP/EIA requirements	Ongoing
2	The contractor was reminded to properly implement wastes sorting	Ongoing
3	The contractor was reminded to direct site runoff to the settlement tank for recycling and reuse	Ongoing
4	The contractor was reminded to store chemical drums inside bunded area to prevent spillage	Ongoing
	<u>Contract 714</u>	
1	The contractor was reminded to properly implement wastes sorting	Ongoing
2	The contractor was reminded to display the EP properly	Completed

10.2 Other Notable Events

EPD Site Inspection

EPD conducted a site inspection on 10 September 2009 for Works Area J. The inspection was conducted jointly with the ET, Construction Team and the Contract 706 Contractor. Upon the

improvements made to the noise mitigation measures for the breaker which was used for site clearance, the improved noise mitigation measures were found to be acceptable in general. EPD was informed during the site inspection that the site clearance and the preparation work being undertaken by the 706 Contractor at Works Area J was for the preparation of the noise decking to be provided to cover the shaft excavation area in accordance with the EP requirement.

IEC Site Inspections

The IEC conducted site inspections for Works Area B, G, J and MA on 20 August 2009 and 3 September 2009.

Irregularities were observed during the site inspections and the respective civil works contractors had followed up and satisfactorily rectified the issues as identified in the site inspections promptly.

Works Area B

The small western portion of Works Area B had been occupied by Highways Department as a depot upon the completion of the additional concrete paving and certification of the paving design by ISC in accordance with the EP requirements. Monthly inspections on the condition of the additional paving, site drainage and foul sewerage systems had been carried out in accordance with EP Condition 3.2.2. 6 nos. of surface cracks were identified and the sealing of the surface cracks had been satisfactorily completed such that the structural integrity of the additional concrete paving can be maintained.

Community Liaison Groups

The Community Liaison Groups were established on 10 July 2009 in accordance with the EP Condition 2.6. Three CLGs, namely, Sai Ying Pun, University and Kennedy Town have been set up to provide direct communication channel for the local communities to MTR during the construction stage of the Project on the project matters including enquiries and complaints handling on all environmental issues. Members of CLGs include the Central & Western District Councillors, Chairmen of Area Committees, representatives of local groups and government departments. Property management office, schools, and other local committees will be invited to participate in the CLGs. The first CLG meetings had been held in the last week of July. Briefing on the Project was conducted in these CLG meetings

In addition, the MTR hotline serves as the complaint hotline during the construction stage of the Project.

11 FUTURE KEY ISSUES

11.1 Key Issues for the Coming Month

Future key issues envisaged in the coming month include the followings:-

- Disposal of C&D waste;
- Dust generation from site activities;
- Noise impact from operating equipment;
- Site water discharge;
- Chemical wastes;

- Trees protection.

11.2 Solid and Liquid Waste Management Status

Base on on the findings of the weekly site inspections, the Contractors' performance in solid and liquid waste management were acceptable and compliance with the EIA requirements were demonstrated. Solid wastes and liquid waste were properly disposed of. The current management standard should be maintained.

11.3 Effectiveness and Efficiency of Mitigation Measures

Based on the environmental monitoring results, the effectiveness and efficiency of the mitigation measures implemented were found to be satisfactory. The current practice should be maintained.

12 CONCLUSIONS

It is concluded from the environmental monitoring and audit works for the West Island Line Project that the construction works were undertaken in an appropriately environmentally sensitive manner in the reporting period. The environmental protection and pollution control measures provided by the contractors were generally acceptable apart from some minor irregularities which were rectified timely by the respective civil works contractors.

The ET will continue the implementation of the environmental monitoring and audit programme in accordance to the EM&A Manual and to a level consistent with MTRCL's Corporate Sustainability Policy.

Appendix A

Environmental Quality Performance Limits

Action and Limit Levels for 24-hour TSP

Monitoring Station	Action Level (ug/m3)	Limit Level (ug/m3)
AM2	155	260
AM4	158	260
AM7a	151	260

Time Period	Action Level	Limit Level (dB(A)), Leq(30min)
0700-1900 hr on normal weekdays	When one documented complaint is received	75*
0700-2300 hr on holidays including Sundays and 1900-2300 hr on all other days		Subject to requirements stipulated in Construction Noise Permits
2300-0700 hr of next day		

* Limit for school is 70 dB(A) and 65 dB(A) during school examination periods.

Appendix B
Event Action Plans

Table 2.4 Event and Action Plan for Construction Noise Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level	<ol style="list-style-type: none"> 1. Notify IEC and ER 2. Carry out investigation 3. Report the results of investigation to the IEC and ER 4. Discuss jointly with the ER and Contractor and formulate remedial measures 5. Increase monitoring frequency to check mitigation effectiveness 	<ol style="list-style-type: none"> 1. Review the analysed results submitted by the ET 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly 3. Supervise the implementation of remedial measures 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures are properly implemented 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to ER with copy to IEC 2. Implement noise mitigation proposals
Limit Level	<ol style="list-style-type: none"> 1. Notify IEC, ER, EPD and Contractor 2. Identify source 3. Repeat measurement to confirm findings 4. Increase monitoring frequency 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented 6. Inform IEC, ER, EPD the causes and actions taken for the exceedances 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results 8. If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET and Contractor on the potential remedial actions 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly 3. Supervise the implementation of remedial measures 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures are properly implemented 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to ER with copy to IEC 3. Implement the agreed proposals 4. Revise and resubmit proposals if problem still not under control 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Table 9.4 Event and Action Plan for Ambient Air Quality Monitoring (Construction)

EVENT	ACTION			ER	CONTRACTOR
ACTION LEVEL					
1. Exceedance for one sample	1. Identify source, investigate the causes of complaint and propose remedial measures; Inform IEC and ER; 2. Repeat measurement to confirm finding; 3. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.	
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and ER (together with the Contractor) on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and ER (together with the Contractor) on possible remedial measures; 4. Advise the ET/ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to ER within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.	
LIMIT LEVEL					
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; Inform IEC, ER, Contractor and EPD; 2. Repeat measurement to confirm finding; 3. Increase monitoring frequency to daily; 4. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and ER (together with the Contractor) on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER with a copy to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.	
2. Exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER with a copy to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Revise and resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.	

Appendix C

Implementation of Environmental Mitigation Measures

Table C1 Project Implementation Schedule for All Works Areas (Status as of 9 September 2009)

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
Airborne Noise Impact (Construction Phase)							
S 3.55	S 2.23	<p>The following good site practices shall be implemented:</p> <ul style="list-style-type: none"> - Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program - Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program - Mobile plant, if any, shall be sited as far from NSRs as possible - Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum - Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs - Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities. 	To reduce construction noise impact	MTRC / Contractor	All works areas	Construction phase	Being implemented
S 3.56-3.57, Table 3.10	S 2.23	<p>Quieter plant shall be used for the following PME:</p> <ul style="list-style-type: none"> - Truck - Crane/ Mobile Crane - Backhoe/Excavator/Wheel Loader/ Front-end-loader - Breaker - Concrete Mixer Truck - Pokers, vibratory, hand held - Pile Extractor - Roller, vibratory - Asphalt Paver - Hydraulic Breaker 	To reduce construction noise impacts	MTRC / Contractor	All works areas	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		<ul style="list-style-type: none"> - Pile Rig - Crawler Crane - Sheet Piling Machine/ Piling, Hydraulic 					
S 3.58-3.59	S 2.23	<p>Movable noise barrier shall be used for the following PME where practicable:</p> <ul style="list-style-type: none"> - Breaker - Mini Backhoe - Generator, super silenced - Backhoe - Crane - Poker, vibratory, hand-held - Hydraulic Breaker - Wheel Loader - Crusher - Hand Held Breaker - Compressor - Grout Plant - Grout Mixer - Concrete Pump - Excavator - Lorry Crane - Mobile Crane - Crawler Crane 	To reduce construction noise impacts	MTRC / Contractor	Works areas A, C, D, H, I, J, J1, L1, M1, N1, M3, O1, O2 and O3.	Construction phase	Being implemented
S 3.60	S 2.23	<p>Noise enclosure/acoustic shed shall be used for the following PME where practicable:</p> <ul style="list-style-type: none"> - Air Compressor - Concrete Pump - Shotcrete Pump - Hand Held Breaker - Grout Pump - Concrete Corer 	To reduce construction noise impacts	MTRC / Contractor	All works areas	Construction phase	To be implemented as per construction programme
S 3.61	S 2.23	Acoustic Enclosure shall be used for enclosing the rock drill as fully as possible.	To reduce construction noise	MTRC / Contractor	Works areas H,	Construction phase	To be implemented as per construction

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
			impacts		N1 and M		programme
S 3.62	S 2.23	Noise insulating cover shall be used to cover the following PME: <ul style="list-style-type: none"> - Breaker - Backhoe - Water pump, submersible (electric) - Crawler mounted rock drill trucks - Rock drill - Air compressor - Electric Winch - Concrete pump - Poker, vibratory, hand-held - Hand Held Breaker - Crane - Shotcrete pump 	To reduce construction noise impacts	MTRC / Contractor	Works areas J1, N1, M1 and M3	Construction phase	To be implemented as per construction programme
S 3.63	S 2.23	Silencer shall be used for the ventilation fan	To reduce construction noise impacts	MTRC / Contractor	Works areas MA, A, C, D, G, H, I, J, J1, J2, J3, L1, M, M1, M3, N1, O1, O2 and O3.	Construction phase	To be implemented as per construction programme
S 3.64	S 2.23	Noise insulating fabric shall be applied where practicable to cover the following PME: <ul style="list-style-type: none"> - Pile Rig - Drill rig - Pile Extractor - Power Rammer - Piling, earth auger - Piling, hydraulic 	To reduce construction noise impacts	MTRC / Contractor	Works areas MA, C, D, G, H, I, J, J1, J2, J3, L1, M, M1, M3, N1, O1, O2 and O3.	Construction phase	To be implemented as per construction programme

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		- Sheet Piling Machine					
S 3.65	S 2.23	Use of “Noise Control Curtain” - a noise insulating fabric to be mounted on the steel scaffold erected on the buildings to be demolished to an extent such that the line of sight between the noise source and NSR would be blocked	To reduce construction noise impacts	MTRC / Contractor	Works area A	Construction Phase – during the demolition of Block A & C of Kennedy Town Ex-Police Quarter	To be implemented as per construction programme
S 3.67-3.70, Figure 3.17 and 3.18.	S 2.23	Temporary noise barriers shall be erected at the works areas of West of KET Station and SYP Entrance A1 & A2.	To reduce construction noise impacts	MTRC / Contractor	Works areas C and N1	Construction phase	To be implemented as per construction programme
S 3.71	S 2.23	Decking over would be provided to cover the excavation area.	To reduce construction noise impacts	MTRC / Contractor	Works areas J, J3, G and L1	Construction phase	Being implemented at Works Area G, J
S3.72	S 2.23	Full enclosure of entire works area	To reduce construction noise impacts	MTRC / Contractor	Works area J2	Construction Phase (after piling is completed)	To be implemented as per construction programme
S3.73 – 3.74	S 2.23	Use of concrete crusher instead of hydraulic breaker	To reduce construction noise	MTRC / Contractor	Works area J2, M1 and	Construction Phase	To be implemented as per construction

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
			impacts		M3		programme
Airborne Noise Impact (Operation Phase)							
S 3.50-3.51, Table 3.9	Appendix B	The maximum permissible sound power levels (Max SWLs) for the fixed plant shall be complied with during the selection of equipment and mitigation measures.	To comply with the noise criteria of Noise Control Ordinance	MTRC / Contractor	Vent shafts and chiller plants at KET Station, UNI Entrance C1 and SYP Entrance C, and vent shafts at KET Ex-Police Quarter, UNI Vent Shaft-Y and SYP Entrance A1&A2.	Design and operation phases	To be implemented in operation phase
S 3.77	Appendix A	<p>The following shall be considered as far as possible in the detailed design of fixed plant:</p> <ul style="list-style-type: none"> - Choose quieter plant such as those which have been effectively silenced. - Include noise levels specification when ordering new plant (including chiller and E/M equipment). 	To comply with the noise criteria of Noise Control Ordinance	MTRC / Contractor	Vent shafts and chiller plants at KET Station, UNI Entrance	Design and operation phases	To be implemented in operation phase

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		<ul style="list-style-type: none"> - Locate fixed plant/louver away from any NSRs as far as practicable. - Locate fixed plant in walled plant rooms or in specially designed enclosures. - Locate noisy machines in a basement or a completely separate building. - Install direct noise mitigation measures including silencers, acoustic louvers and acoustic enclosure where necessary. 			C1 and SYP Entrance C, and vent shafts at KET Ex-Police Quarter, UNI Vent Shaft-Y and SYP Entrance A1&A2.		
Groundborne Noise Impact							
S4.91	S3.1	Ground-borne construction noise monitoring shall be conducted. The measurement locations shall be above the cutting face of the TBM, and shall be located as close to the cutting face as practicable.	To comply with the noise criteria of Noise Control Ordinance	MTRC / Contractor	Works areas of tunneling by TBM	Construction phase	To be implemented as per construction programme
S 4.88 & Table 4.10	S 3.2	Type 1a Trackform – Resilient Baseplate with stiffness of about 25 KN/mm shall be installed at both the west- and east-bounds starting from turnout in proximity of Hongway Garden towards the Sai Ying Pun Station and also the alignment under Po Shu Lau to Sai Wan Estate. A commissioning test shall be included in the Contract document in order to ensure compliance of the operational ground-borne noise criteria.	To comply with the noise criteria of Noise Control Ordinance	MTRC	Tunnel alignment	Operation phase	To be implemented as per construction programme
Landscape and Visual Impact (Construction Phase)							
Table 5.4	Table 4.2	Re-use of Existing Soil Existing topsoil shall be re-used where possible for new planting areas within the project. The construction program shall consider	To reduce the volume of soil for disposal	MTRC / Contractor	All Works areas	Construction phase	Being Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		using the soil removed from one phase for backfilling another. Suitable storage ground, gathering ground and mixing ground may be set up on-site as necessary. ▪					
Table 5.4	Table 4.2	No-intrusion Zone To maximize protection to existing trees, ground vegetation and the associated understory habitats, construction contracts may designate "No-intrusion Zone" to various areas within the site boundary with rigid and durable fencing for each individual no-intrusion zone. The contractor should close monitor and restrict the site working staff not to enter the "no-intrusion zone", even for non-direct construction activities and storage of equipment.	To protect the existing trees, ground vegetation and the associated understory habitats.	MTRC / Contractor	All Works areas	Construction phase	Being Implemented
Table 5.4	Table 4.2	Decorative Hoarding Erection of decorative screen hoarding should be designed to be compatible with the existing urban context.	To reduce visual impact due to construction	MTRC / Contractor	All Works areas	Construction phase	Being Implemented
Table 5.4	Table 4.2	Minimize light pollution and control of night-time glare All security floodlights for construction sites shall be equipped with adjustable shield, frosted diffusers and reflective covers, and be carefully controlled to minimize light pollution and night-time glare to nearby residences and GIC users. The Contractor shall consider other security measures which shall minimize the visual impacts.	To minimize the visual impacts.	MTRC / Contractor	All Works areas	Construction phase	Being Implemented
Table 5.4	Table 4.2	Aesthetic design of the conveyor belt system The removal of excavated material requires installation of a conveyor and a barging point. The conveyor will be covered, except the portion where it meets the barging point. The aim of covering or	To minimize the visual intrusion as well as the air and noise quality issues	MTRC / Contractor	Works areas E & F	Construction phase	To be implemented as per construction programme

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		enclosing the conveyor is to avoid noise and air quality issues; however, the conveyor where above-ground should be adequately screened and /or constructed of suitable materials and in colours/tones that minimize visual intrusion.					
Table 5.4	Table 4.2	<p>Protection of Retained Trees</p> <p>All retained trees should be recorded photographically at the commencement of the Contract, and carefully protected during the construction period. Detailed tree protection specification shall be allowed and included in the Contract Specification, which specifying the tree protection requirement, submission and approval system, and the tree monitoring system.</p> <p>In addition, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas.</p> <p>All implementation of tree protection works and tree preservation measures shall be supervised by a landscape specialist on site.</p>	To protect the retained trees within the site boundary	MTRC / Contractor	All Works areas	Construction phase	Being Implemented
Table 5.4	Table 4.2	<p>Protection of Registered Old and Valuable Trees</p> <p>Detailed tree protection measures as stipulated in WBTC No. 29/2004 – Registration of Old and Valuable Trees, and Guidelines for their Preservation, shall be allowed and included in the Contract Specification. All implementation of OVT protection measures shall be supervised by a landscape specialist on site.</p>	To protect the OVT within the site boundary	MTRC / Contractor	All Works areas	Construction phase	Being Implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
Table 5.4	Table 4.2	<p>Protection of Old Stone Wall-cum-trees</p> <p>Detailed tree protection specification shall be allowed and included in the Contract Specification, which specifying the tree protection requirement, submission and approval system, and the tree monitoring system. All implementation of Old stone wall-cum-trees protection measures shall be supervised by a landscape specialist on site.</p>	To protect the existing trees-cum-wall	MTRC / Contractor	All Works areas	Construction phase	Being Implemented
Landscape and Visual Impact (Operation Phase)							
Table 5.5	Table 4.3	<p>Tree Transplanting</p> <p>Trees of high to medium survival rate after transplanting to be affected by the works shall be transplanted where possible and practicable. Tree transplanting proposal including final location for transplanted trees will be submitted separately to seek relevant government department's approval.</p>	Tree preservation	MTRC / Contractor	All Works areas	Detail design and operation phase	Being Implemented
Table 5.5	Table 4.3	<p>Compensation Tree Planting</p> <p>Compensatory tree planting should be provided to compensate for felled trees. Compensatory tree planting proposal including location of compensation will be submitted separately to seek relevant government department's approval.</p>	To reduce impact to existing trees.	MTRC / Contractor	All Works areas	Detail design and operation phase	Being Implemented
Table 5.5	Table 4.3	<p>Aesthetic landscape and architectural treatment on Station / Entrance / vent shaft</p> <p>All station entrances, vent shafts and all above ground structures shall be sensitively designed to ensure the element with colour, texture and tonal quality being compatible to the existing urban context, which shall include tree planting where space permits, to minimize the potential adverse landscape and visual impacts. For</p>	To ensure the elements are compatible to the existing urban context and minimize the landscape and	MTRC / Contractor	Stations / Entrances / Vent Shafts	Detail design and operation phase	To be implemented as per construction programme

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		example, roof greening and vertical greening would be applied where possible subject to technical operational and maintenance constraints.	visual impacts.				
Table 5.5	Table 4.3	Re-instatement of excavated Area All excavated area and disturbed area for utilities diversion, temporary road diversion, and pipeline works shall be reinstated to former conditions or even better, to the satisfaction of the relevant Government departments.	To minimize the visual impacts.	MTRC / Contractor	All Works areas	Operation phase	Being implemented
Table 5.5	Table 4.3	Re-provision of public open space Every effort should be made to so that no public open space would be unnecessarily affected by the Project and if affected, they should be reprovided as far as possible and practicable. Sensitive design and re-provision of the affected Public Open Space (Forbes Street Playground, Hill Road Rest Garden, Ki Ling Lane Children's Playground, Mui Fong Street Children Playground, Sai Woo Lane Playground, Centre Street Market Sitting-out Area, King George V Memorial Park) incorporating replacement facilities for those provided at present, using materials of quality suitable for long term use and acceptable to relevant Government authority. Relevant government departments including LCSD and PlanD should be consulted on the design of the re-provisioned public open spaces at the early stage of the design process.	Re-provision of landscape amenity area and facilities	Contractor	All Works areas	Operation phase	To be implemented as per construction programme
Cultural Heritage Impact (Construction Phase)							
S6.45, S6.51-6.55	S 5.4 – 5.11	The construction vibration control limits shall be followed. Compliance monitoring of vibration limits shall be conducted and reported as a requirement of EM&A programme The location and installation of the monitoring stations should be	To minimize vibration impacts on the identified vibration sensitive	MTRC / Contractor	All Works Areas	Detail design, construction and operational	To be implemented as per construction programme

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		discussed and agreed with AMO before installation.	historical buildings.			phase	
S6.46	S5.3	Hoardings or boundary fencing shall be designed in a manner that responds to the existing urban context.	To minimize visual impacts	MTRC / Contractor	All Works Area	Detailed design and operational phase	Being Implemented
S6.44	S5.12-5.14	Archaeological watching brief shall be conducted for the identification of any historical finds in the directly impacted works areas which might have a potential for finds and remains of archaeological interest to be found. Details of the frequency of inspection shall be provided to AMO for review and comment once the detailed construction programme has been finalized. The inspection should be carried out by the qualified archaeologist who have applied to the Antiquities Authority for a License	To identify any historical finds in the works areas	MTRC / Qualified Archaeologist	Works Area C, H, I, J, J1, J2, J3, M and M2	Construction phase	To be implemented as per construction programme
Cultural Heritage Impact (Operation Phase)							
Table 6.2	5.3	Aboveground structures shall be designed in a manner that responds to the existing urban context.	To minimize visual impacts	MTRC / Contractor	Stations / Entrances / Vent Shafts	Detail design and operation phase	To be implemented as per construction programme
S6.60	S 5.15	Recommended measures for mitigating operational phase landscape and visual impacts shall be implemented.	To minimize potential visual impact on heritage sites	MTRC / Contractor	Stations / Entrances / Vent Shafts	Detail design and operational phase	To be implemented as per construction programme
Waste Management Implications (Construction Phase)							
S7.30	S 6.5	Good site practices - 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	To reduce waste management impacts	MTRC / Contractor	All works areas	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		<p>wastes generated at the site</p> <ul style="list-style-type: none"> - Training of site personnel in proper waste management and chemical handling procedures - Provision of sufficient waste disposal points and regular collection of waste - Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers - Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors. - Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Centre. 					
S7.31 & S7.32	S 6.6 – S 6.7	<p>Waste reduction measures</p> <ul style="list-style-type: none"> - 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 by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the work force - Proper storage and site practices to minimise the potential for damage or contamination of construction materials 	To achieve waste reduction	MTRC / Contractor	All works areas	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		<ul style="list-style-type: none"> - Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste. - A recording system for the amount of wastes generated, recycled and disposed (including disposal sites) should be proposed - Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle. - A Waste Management Plan shall be prepared by the Contractor prior to the commencement of construction work to provide an overall framework for waste management and reduction. 					
S7.34 & S7.35	S 6.9 & S6.10	<p>C&D Material</p> <ul style="list-style-type: none"> - In order to minimise impacts resulting from collection and transportation of C&D material for off-site disposal, the excavated materials arising from station and tunnel construction shall be reused on-site as backfilling material and for landscaping works as far as practicable. - Surplus rock generated from the tunnelling works, shafts/adits construction and the stations cavern construction should be reused in reclamation and site formation projects either in the Mainland or Macau, or disposed of at a PFRF, as agreed with the Secretary of the Public Fill Committee, for other beneficial uses. - C&D waste generated site clearance from the proposed works areas would require disposal to the designated landfill site. 	To minimize environmental impacts during the handling, transportation and disposal of C&D material	MTRC / Contractor	All works areas	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		<ul style="list-style-type: none"> - In order to monitor the disposal of inert C&D material and C&D waste at PFRFs and landfills, respectively, and to control fly-tipping, a trip-ticket system shall be established in accordance with ETWB TCW No. 31/2004. - Material delivered to PFRFs should be of size less than 250mm or other sizes as agreed with the Secretary of the Public Fill Committee. 					
S7.36	S 6.11	<p>General refuse</p> <ul style="list-style-type: none"> - General refuse shall be stored in enclosed bins or compaction units separate from C&D material and chemical wastes. - A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D material and chemical wastes. Preferably an enclosed and covered area shall be provided to reduce the occurrence of 'wind blown' light material. 	To minimize environmental impacts during the handling, transportation and disposal of general refuse	MTRC / Contractor	All works areas	Construction phase	Being implemented
S7.37	S 6.12	<p>Chemical waste</p> <ul style="list-style-type: none"> - Contractor would be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the <i>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i>. - Good quality containers compatible with the chemical wastes shall be used, and incompatible chemicals shall be stored separately. - Appropriate labels shall be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. 	To minimize environmental impacts during the handling, transportation and disposal of chemical refuse	MTRC / Contractor	All works areas	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		<ul style="list-style-type: none"> The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, either to the approved Chemical Waste Treatment Centre, or another licensed facility, in accordance with the <i>Waste Disposal (Chemical Waste) (General) Regulation</i>. 					
Waste Management Implications (Operation Phase)							
S7.39	S 6.11	General Refuse and Industrial Waste <ul style="list-style-type: none"> A reputable waste collector should be employed to remove general refuse and industrial wastes from the stations on a daily basis to minimise odour, pest and litter impacts. 	Storage and handling of waste	MTRC	Stations and entrances	Operational stage	Being implemented
S7.40	S 6.12	Chemical Waste <ul style="list-style-type: none"> The requirements given in the <i>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i> should be followed in handling of these chemical wastes. A trip-ticket system should be operated in accordance with the <i>Waste Disposal (Chemical Waste) (General) Regulation</i> to monitor all movements of chemical wastes which would be collected by a licensed collector to a licensed facility for final treatment and disposal. The guidelines covered under the construction phase mitigation of chemical wastes should be referred. 	Storage and handling of the chemical waste to avoid environmental and health hazard	MTRC	Stations and entrances	Operational stage	Being implemented
Water Quality Impact (Construction Phase)							

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
S9.31	S 8.4	<p>Construction Site Run-off and Drainage</p> <p>The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended to protect water quality and sensitive uses of the coastal area i.e. WSD flushing water intakes along the harbour front, and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impacts:</p> <ul style="list-style-type: none"> - At the start of site establishment (including the barging facilities), perimeter cut-off drains to direct off-site water around the site shall be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers shall be provided on site to direct stormwater to silt removal facilities. The design of the temporary on-site drainage system would be undertaken by the contractor prior to the commencement of construction. - The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a site/sediment trap. The sediment/silt traps should be incorporated in the permanent drainage channels to enhance deposition rates - Sand/silt removal facilities such as sand/silt traps and sediment basins shall be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt removal facilities shall be based on the guidelines in Appendix A1 of ProPECC PN 1/94, which states that the retention time for silt/sand traps shall be 5 	To minimize water quality impacts	MTRC / Contractor	All works areas	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		<p>minutes under maximum flow conditions. Sizes may vary depending upon the flow rate, but for a flowrate of 0.1m³/s a sedimentation basin of 30m³ would be required and for a flow rate of 0.5 m³/s the basin would be 150m³. The detailed design of the sand/silt traps shall be undertaken by the contractor prior to the commencement of construction.</p> <ul style="list-style-type: none"> - All drainage facilities and erosion and sediment control structures shall be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit shall be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. - Measures shall be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations shall be discharged into storm drains via silt removal facilities. - If surface excavation works cannot be avoided during the wet season (April to September), temporarily exposed slope/soil surfaces shall be covered by a tarpaulin or other means, as far as practicable, and temporary access roads shall be protected by crushed stone or gravel, as excavation proceeds. Interception channels shall be provided (e.g. along the crest/edge of the excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements shall always be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. Other measures that need to be implemented before, during and after rainstorms are summarized in ProPECC PN 1/94. - The overall slope of the site should be kept to a minimum to 					

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		<p>reduce the erosive potential of surface water flows, and all trafficked areas and access roads protected by coarse stone ballast. An additional advantage accruing from the use of crushed stone is the positive traction gained during prolonged periods of inclement weather and the reduction of surface sheet flows</p> <ul style="list-style-type: none"> - All vehicles and plant shall be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility shall be provided at every construction site exit where practicable. Wash-water shall have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road shall be paved with sufficient backfill toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. - Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. - Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers. - Precautions be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. 					

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		<p>Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.</p> <ul style="list-style-type: none"> - Bentonite slurries used in diaphragm wall construction shall be reconditioned and reused wherever practicable. Temporary enclosed storage locations shall be provided on-site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC PN 1/94 shall be adhered to in the handling and disposal of bentonite slurries. 					
S9.32 & S9.33	S 8.5 & S 8.6	<p>General Construction Activities</p> <ul style="list-style-type: none"> - Construction solid waste, debris and refuse generated on-site shall be collected, handled and disposed of properly to avoid entering any nearby stormwater drain. Stockpiles of cement and other construction materials shall be kept covered when not being used. Requirements of the solid waste management are described in Section 7 of this EIA Report. - Oils and fuels shall only be used and stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to nearby stormwater drain, all fuel tanks and storage areas shall be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund shall be drained of rainwater after a rain event. 	To minimize water quality impacts	MTRC / Contractor	All works areas	Construction phase	Being implemented
S9.34	S 8.7	<p>Sewage from Construction Workforce</p> <ul style="list-style-type: none"> - Temporary sanitary facilities, such as portable chemical toilets, shall be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and would be responsible for appropriate disposal of waste matter and 	To minimize water quality impacts	MTRC / Contractor	All works areas with on-site sanitary facilities	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		maintenance of these facilities.					
S9.35	S 8.8	<p>Tunnelling Wastewater Discharge</p> <p>Wastewater with a high level of suspended solids should be treated before discharge by settlement in tanks with sufficient retention time. Oil interceptors would also be required to remove the oil, lubricants and grease from the wastewater. In case of very high levels of suspended solids, an on-site pre-packaged treatment plant may be required with the addition of flocculants to improve the settlement of solids. A discharge licence under the WPCO would be required for discharge to the stormwater drain. It may be a stipulation of the WPCO licence to require the Contractor to monitor the quality / quantity of the discharge to show compliance with the conditions of the licence.</p>	To minimize water quality impacts	MTRC / Contractor	All works areas with tunneling works	Construction phase	To be implemented as per construction programme
S9.36	S8.9	<p>Groundwater Monitoring</p> <p>Monitoring of groundwater table shall be conducted on a weekly basis and recharge wells will be installed.</p>	To control the potential impact on tree walls at Forbes Street due to groundwater drawdown induced by tunneling	MTRC / Contractor	Works Areas C & D	Construction phase	To be implemented as per construction programme
Water Quality Impact (Operation Phase)							
S9.27	S8.10-S8.11	<p>Runoff from Rail Track and operational tunnel drainage</p> <ul style="list-style-type: none"> - The tunnel wall would be equipped with water-tight liner and designed for no seepage. - Standard designed silt trap or grease trap (if necessary) and oil interceptor would be provided to remove the oil, lubricants, grease, silt and grit from the tunnel runoff before discharge into 	To control runoff from rail track and tunnel seepage	MTRC	Tunnels and rail tracks	Operation phase	To be implemented in operation phase

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
S9.37	S8.12-S8.14	<p>stormwater drainage.</p> <ul style="list-style-type: none"> - Track drainage channels discharge should pass through oil/grit interceptors/chambers to remove oil, grease and sediment before being pumped to the public stormwater drainage system. - The silt traps and oil interceptors should be cleaned and maintained regularly. - Oily contents of the oil interceptors should be transferred to an appropriate disposal facility, or to be collected for reuse, if possible. 					
S9.27	S8.15-S8.16	<p>Sewage from Station</p> <ul style="list-style-type: none"> - Sewage and wastewater effluents generated from the staff at stations and food and beverage outlets, if any, would be connected to the existing foul sewerage system. - Runoff from cleaning activities at the stations which would enter floor drains would also be connected to the foul sewer. 	To control sewage from stations	MTRC	WIL Stations	Operation phase	To be implemented in operation phase
Hazard to Life							
S10	S10.1	Blasting activities regarding transport, storage and use of explosives should be supervised and audited by competent site staff to ensure strict compliance with the blasting permit conditions.	To ensure that the risks from the proposed explosives storage, handling and transport would be acceptable	MTRC / Contractor	Works areas at which explosives would be stored and/or used.	Construction phase	To be implemented as per construction programme

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
S10	S10.1	Delivery vehicles shall not be permitted to remain unattended within the magazine. In addition, they shall not be allowed to park overnight, or when not in use, within the magazine and its audits	To reduce the risk of fire within the magazine	MTRC / Contractor	Explosive Magazine	Operational phase	To be implemented as per construction programme
S10	S10.1	Blast doors or heavy duty blast curtains should be installed at the access adits and shafts to prevent flyrock, and control the air over-pressure	To reduce the risk of injury due to flyrock during the WIL construction	MTRC / Contractor	At suitable locations, access adits and shafts	Construction phase	To be implemented as per construction programme
S10	S10.1	Detonators shall not be transported in the same vehicle with other Class 1 explosives	To reduce the risk of explosion during the transport of cartridge emulsion	MTRC / Contractor	-	Construction phase	To be implemented as per construction programme
Air Quality (Construction Phase)							
Table 11.6	Table 9.5	<p>Rock Crushing Plants</p> <p>The unloading process would be undertaken within enclosed rock crushing facility. Water spraying would be provided at the unloading point.</p> <p>The crushing process is the secondary crushing. The rock crushing plant is enclosed and water spraying system would be installed. Dust extraction and collection system with 80% dust removal efficiency would be provided.</p> <p>The crushed stone/rock would be screened by the screening and sorting facility before transporting to the temporary stockpile via enclosed conveyor. Water spraying system would be installed. Dust extraction and collection system with 80% dust removal efficiency would be provided.</p>	To minimize dust impacts	MTRC / Contractor	Rock crushing plants at works areas B and E	Construction phase	To be implemented as per construction programme
Table	Table	Temporary Stockpiles	To minimize dust	MTRC /	Temporary stockpiles	Construction	To be implemented as

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
11.7	9.6	<p>Kennedy Town Abattoir Site:</p> <p>Loading point – Loading of crushed materials from rock crushing facility onto stockpile</p> <ul style="list-style-type: none"> - The transportation would be via an enclosed conveyor belt system and water spraying and flexible dust curtains would be provided at the loading point to suppress the dust impact. <p>Storage of materials - Active area for loading & unloading materials</p> <ul style="list-style-type: none"> - The active area would be minimized to 20% of the total area of the stock piles. The 80% inactive area would be well covered with impervious sheeting. Water spraying system would be applied on the active area and watering with complete coverage of active area four times a day would be required. <p>Transportation of materials to Barging Point 1</p> <ul style="list-style-type: none"> - Wheel wash facilities provided at the site exit. The vehicles would be washed before leaving the stockpiles. The spoils would also be well covered before leaving the site in order to minimise generation of dusty materials. - The haul roads within the site would be all paved and water spraying would be provided to keep the wet condition. <p>Western PCWA:</p> <p>Loading point – Loading of crushed materials from rock crushing facility onto stockpile</p> <ul style="list-style-type: none"> - The transportation would be via an enclosed conveyor belt system and water spraying and flexible dust curtains would be provided at the loading point to suppress the dust impact. <p>Storage of materials - Active area for loading & unloading materials</p> <ul style="list-style-type: none"> - Water spraying system would be applied on the active area and watering with complete of active area four times a day would be 	impacts	Contractor	at works areas B and E	phase	per construction programme

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		<p>required.</p> <p>Transportation of materials to Barging Point 2</p> <ul style="list-style-type: none"> - The vehicles would be washed before leaving the stockpiles. The spoils would also be well covered before leaving the site in order to minimise generation of dusty materials. - The haul road would be paved and water spraying would be provided to keep the wet condition 					
Table 11.8	Table 9.7	<p>Barging Facilities</p> <p>Kennedy Town Abattoir Site</p> <p>Transportation of spoils to Barging Point 1</p> <ul style="list-style-type: none"> - All road surfaces within the barging facilities would be paved and water spraying would be provided to keep the wet condition. <p>Unloading of spoil materials</p> <ul style="list-style-type: none"> - The unloading process would be undertaken within enclosed tipping hall. Flexible dust curtains and water spraying would be provided at the discharge point for dust suppression. <p>Vehicles leaving the barging facility</p> <ul style="list-style-type: none"> - Vehicle wheel washing facilities provided at site exit <p>Western PCWA</p> <p>Transportation of spoils to Barging Point 2</p> <ul style="list-style-type: none"> - All road surfaces within the barging facilities would be paved and water spraying would be provided to keep the wet condition. <p>Unloading of spoil materials from trucks to Barging Point 2</p> <ul style="list-style-type: none"> - The unloading process should be undertaken within the enclosed tipping hall. Flexible dust curtains and water spraying would be provided at the discharge point for dust suppression. 	To minimize dust impacts	MTRC / Contractor	Barging points at works areas B and E	Construction phase	To be implemented as per construction programme

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		<p>Unloading of spoil materials from enclosed tipping hall to Barging Point 3</p> <ul style="list-style-type: none"> - The tipping hall would be enclosed structure. The conveyor from tipping hall to the Barging Point 3 would be enclosed. Water spraying and flexible dust curtains would be provided at the receiving point of the tipping hall. Flexible dust curtains and water spraying would be provided at the discharge point of barging facilities for dust suppression. <p>Vehicles leaving the barging facility</p> <ul style="list-style-type: none"> - Vehicle wheel washing facilities provided at site exit 					
Table 11.9	S 9.26	<p>Rock Crushing Plant at Kennedy Town Abattoir Site</p> <ul style="list-style-type: none"> - Dust extraction and collection system (80% dust removal efficiency) should be installed at the rock crushing facility and the discharge point is located at least 39m away from the west boundary of the rock crushing facility under the preliminary design 	To minimize dust impacts	MTRC / Contractor	Rock Crushing Plant at works area B - Kennedy Town Abattoir Site	Construction phase	To be implemented as per construction programme
Table 11.10	S 9.27	<p>Works areas at KET station construction site</p> <p>Active operating area of 50%</p> <p>Watering four times a day with complete coverage of active construction area</p>	To minimize dust impacts	MTRC / Contractor	Works area A, C and D	Construction phase	To be implemented as per construction programme
Table 11.10	S9.27	<p>Open work areas at temporary magazine site</p> <p>Active operating area of 50%</p> <p>Watering two times a day with complete coverage of active construction area</p>	To minimize dust impacts	MTRC / Contractor	Open works area at magazine site	Construction phase	To be implemented as per construction programme

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
S 11.42	S 9.28	For both rock crushing plants, the requirements and mitigation measures stipulated in the <i>Guidance Note on the Best Practicable Means for Mineral Works (Stone Crushing Plants) BPM 11/1</i> should be followed and implemented.	To minimize dust impacts	MTRC / Contractor	Rock crushing plants	Construction phase	To be implemented as per construction programme
S 11.42	S 9.28	<p>Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices:</p> <ul style="list-style-type: none"> - Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. - Use of frequent watering for particularly dusty construction areas and areas close to ASRs. - Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. - Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. - Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. - Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. - Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading points, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. - Imposition of speed controls for vehicles on unpaved site roads. 	To minimize dust impacts	MTRC / Contractor	All works areas	Construction phase	Being implemented

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Implementation Status
		<p>8 kilometers per hour is the recommended limit.</p> <ul style="list-style-type: none"> - Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs. - Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. - Cement or dry PFA delivered in bulk shall be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed. - Loading, unloading, transfer, handling or storage of bulk cement or dry PFA shall be carried out in a totally enclosed system or facility, and any vent or exhaust shall be fitted with an effective fabric filter or equivalent air pollution control system. 					

**Table C2 Implementation Schedule Specific for Works Area MA - Underground Magazine Site
(Status as of 9 September 2009)**

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Reference
Ecological Impact (Construction Phase)							
App.2.3 – S. 6.1		Proposed works shall be designed to avoid or minimize direct impacts to natural habitats in the works area wherever possible.	To protect the natural habitats in the works area	MTRC / Contractor	Works Area MA	Design and construction of the magazine site	Being implemented
App.2.3 – S. 6.2		Planting of vegetation shall be provided to compensate for the unavoidable loss of tall shrubland and woodland habitats. It shall be provided to re-vegetate the areas which would be 1m beyond the security fencing and temporarily affected by the construction works (e.g. slope works, erecting security fence) after the construction phase. The plant species selected for re-vegetation shall make reference to the existing habitats.	To compensate for the ecological impacts associated with the loss of vegetation	MTRC / Contractor	Works Area MA	Construction phase of the magazine site	To be implemented as per construction programme
App.2.3 – S. 6.2		Suitable plants, preferably with native species, shall be planted within the boundary of the completed magazine site to compensate for unavoidable loss of understorey vegetation resulting from the proposed works on-site after the decommissioning of the magazine site. The compensatory planting shall make use of native plant species with flowers/fruits to attract wildlife.	To compensate for the ecological impacts associated with the loss of vegetation	MTRC / Contractor	Works Area MA	After completing the construction of the magazine site	To be implemented as per construction programme
App.2.3 – S. 6.3		The two individuals of Hong Kong Pavetta (<i>Pavetta hongkongensis</i>) located within the footprint of the proposed tunnel portal and access entrance shall be transplanted to a suitable nearby tall shrubland or woodland habitats. Transplantation shall be supervised by a suitably qualified ecologist/horticulturalist	To protect the 2 species from the proposed works within the works area	MTRC / Contractor	Works Area MA	Prior to the construction phase of the magazine site	Implemented
App.2.3 – S. 6.4		The trees located within the works area shall be preserved as far as practicable. If tree felling is unavoidable, feasibility of tree transplantation and compensatory planting shall be explored shall be implemented.	To protect the existing trees within the works area	MTRC / Contractor	Works Area MA	Prior to the construction phase of the	Implemented

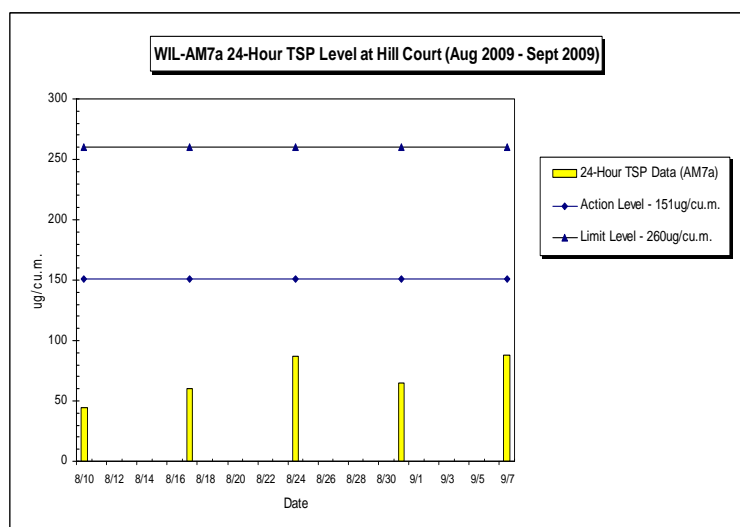
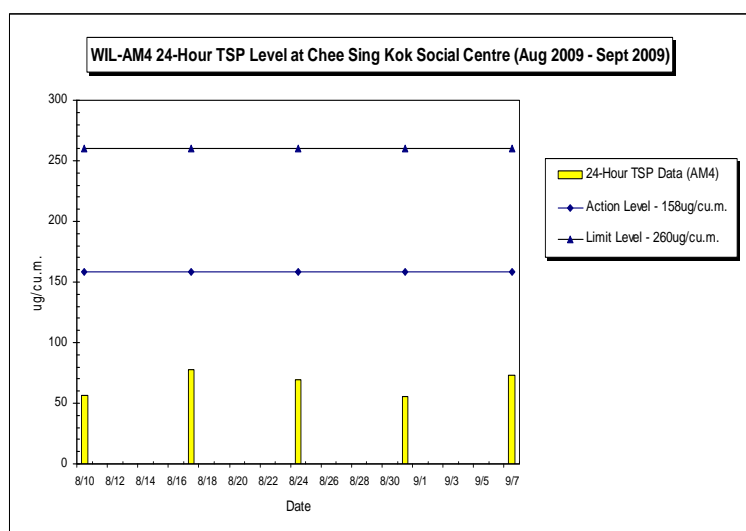
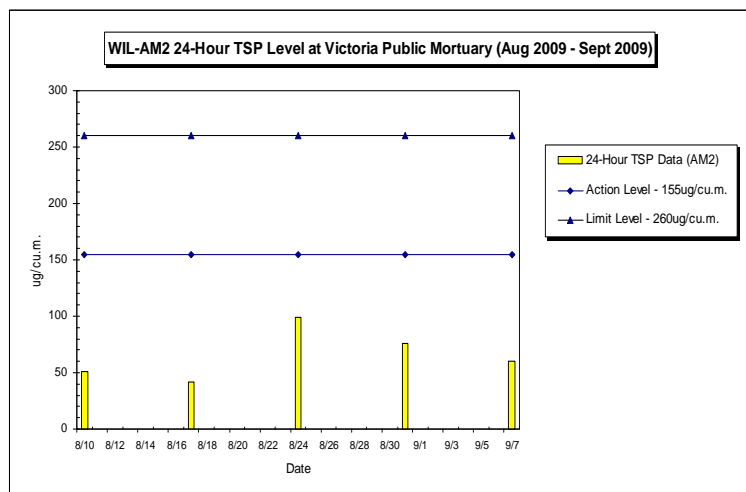
EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Reference
						magazine site	
App.2.3 – S. 6.5		All the existing trees and species of conservation importance (i.e. the two identified Silver-back <i>Artocarpus</i> , <i>Artocarpus hypargyreus</i>) located near the proposed works site shall be fenced off and the trunk shall be protected with hessian sacking as far as possible.	To protect the existing trees and the species of conservation importance near the works area	MTRC / Contractor	Works Area MA	Construction and operation phase of the magazine site	Implemented
App.2.3 – S. 6.6		Noise control measures including the use of quiet excavation methods, quiet construction plant and temporary noise barriers shall be implemented	To minimize the noise disturbance to the wildlife near the works area	MTRC / Contractor	Works Area MA	Construction and operation phase of the magazine site	Being implemented
App.2.3 – S. 6.7		Standard good site practice measures shall be implemented, including <ul style="list-style-type: none"> • Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats. • Construction activities should be restricted to work areas that would be clearly demarcated. The work areas should be reinstated after completion of the works. • Waste skips should be provided to collect general refuse and construction wastes. The wastes would be disposed of timely and properly off-site. • General drainage arrangements should include sediment and oil traps to collect and control construction site run-off. • Open burning on works sites is illegal, and should be strictly prohibited. 	To minimize ecological impacts	MTRC / Contractor	Works Area MA	Construction and operation phase of the magazine site	Being implemented

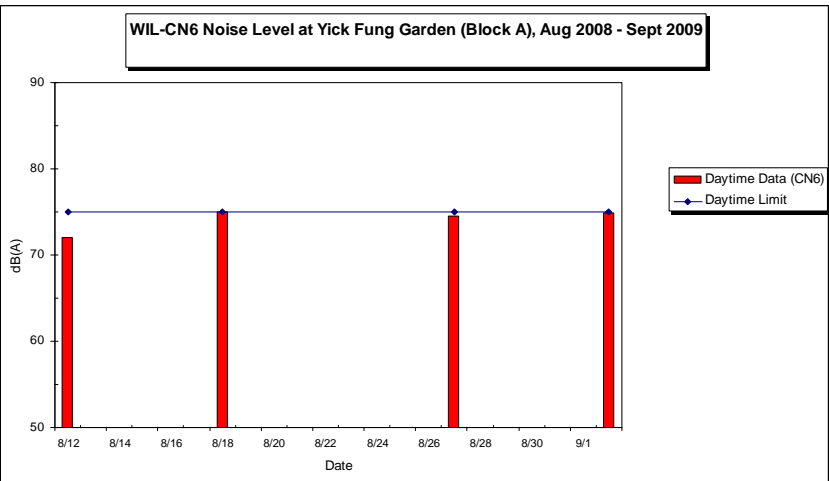
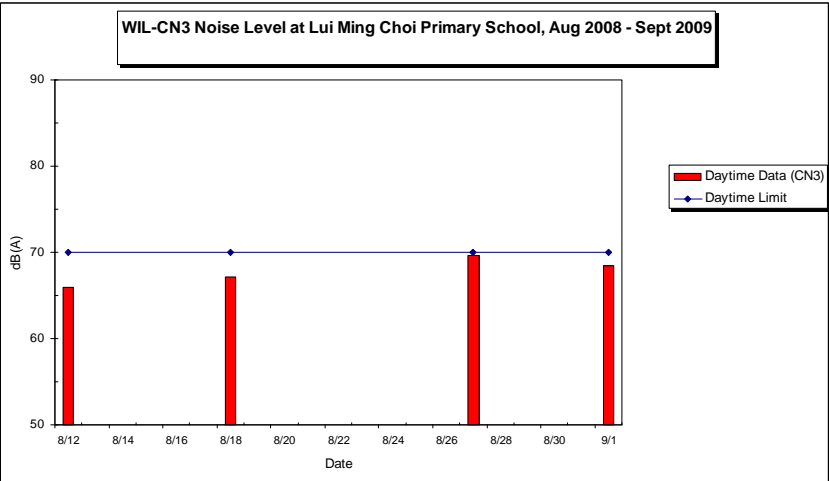
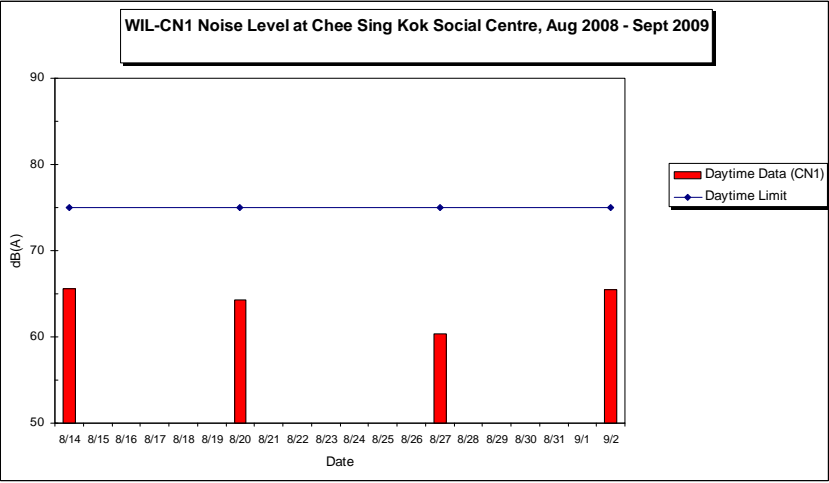
**Table C3 Implementation Schedule Specific for Works Area B – Kennedy Town Abattoir and Incinerator Area
(Status as of 9 September 2009)**

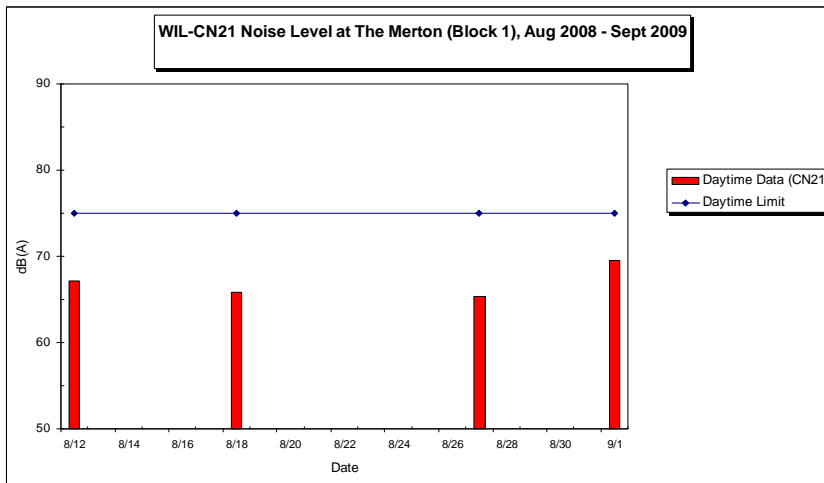
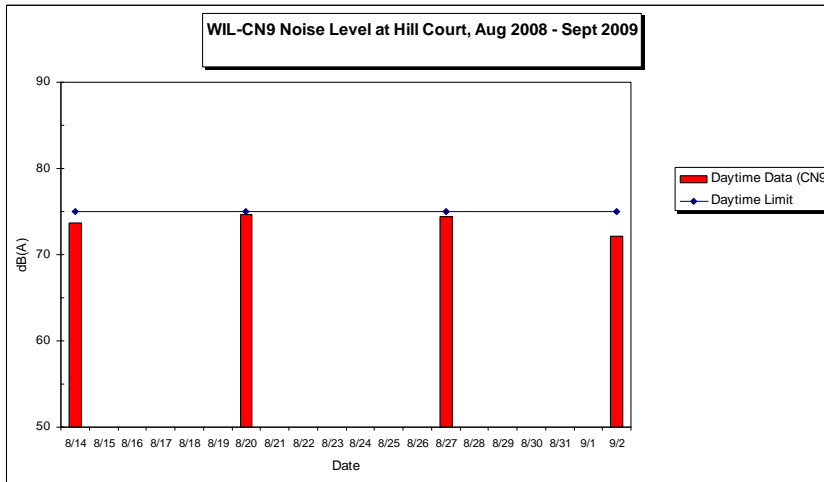
Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	Reference
The existing ground slab/pavement within the works area shall be kept intact.	To minimize human health risk associated with the contaminated soil and groundwater in the works area.	MTRC / Contractor	Works Area B	Construction phase	Implemented
A reinforced concrete paving of no less than 200mm thick for the cleared site shall be provided after the demolition and clearance works. A debonding layer shall be placed between the existing and new concrete slabs to allow the latter to be removed prior to the former.	To minimize human health risk associated with the contaminated soil and groundwater in the works area.	MTRC / Contractor	Works Area B	Construction phase	Being implemented
Monthly site inspection shall be conducted to ensure the integrity of the existing and/or the new paving layer. Any surface cracks identified shall be filled out such that underneath soil would not be exposed.	To minimize human health risk associated with the contaminated soil and groundwater in the works area.	MTRC / Contractor	Works Area B	Construction phase	Being implemented
A clear void between the structure slab of the site office and the ground surface shall be created, i.e. the site office is a raised structure.	To allow ventilation by natural air movements to dilute the contaminant vapour released from the soil and groundwater.	MTRC / Contractor	Works Area B	During the construction of the site offices	To be implemented as per construction programme
Incorporate gas-resistant membranes into the raised floor of the site office.	To prevent contaminant vapour under the floor slab from entering the site office to protect the staff working in the site office.	MTRC / Contractor	Works Area B	During the construction of the site offices	To be implemented as per construction programme
Site hoardings shall be erected around the works area, and they shall be properly maintained to restrict access of trespassers.	To protect the trespassers from the contaminated soil and groundwater in the works area.	MTRC / Contractor	Works Area B	Construction phase	Implemented

Appendix D

Impact Monitoring Graphical Plots







Appendix E

Calibration Details

ANDERSEN INSTRUMENTS INC.**GS2310 Series Sampler Calibration****(Dickson Recorder)****SITE**

Location -> Victoria Public Mortuary

Date -> 29-May-09

Sampler -> 994-0871

Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure (hpa)	1011	Sampler Elevation (feet)	30
Sea Level Pressure (in Hg)	29.85	Corrected Pressure (mm Hg)	757.49
Temperature (deg C)	22	Temperature (deg K)	295.00
Seasonal SL Pressure (in Hg)	29.85	Corrected Seasonal (mm Hg)	757.49
Seasonal Temperature (deg C)	22.00	Seasonal Temperature (deg K)	295.00

CALIBRATION ORIFICE

Make -> Andersen Instruments Inc.

Qstd Slope -> 1.99

Model -> 25A

Qstd Intercept -> -0.014012

Serial# -> 5303

Date Certified ->

CALIBRATION

Plate or	H ₂ O	Qstd	I	IC	LINEAR
Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION
1	18	12.4	1.783	63	63.215
2	13	10.2	1.617	56	56.191
3	10	7.8	1.415	48	48.164
4	7	5.1	1.146	39	39.133
5	5	3.1	0.895	28	28.096

CalculationsQstd = 1/m [Sqrt (H₂O (Pa/Pstd) (Tstd/Ta)) -

IC = I [Sqrt (Pa/Pstd) (Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

1/m ((I) [Sqrt (298/Tav) (Pav/760))] - b)

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

This is to certify that the above equipment has been calibrated in accordance with manufacturer's procedure.



ANDERSEN INSTRUMENTS INC.**GS2310 Series Sampler Calibration**

(Dickson Recorder)

SITE

Location -> Victoria Rd. Magazine Site

Date -> 16-Jun-09

Sampler -> 994-0870

Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure	(hpa)	1005	Sampler Elevation	(feet)	300
Sea Level Pressure	(in Hg)	29.68	Corrected Pressure	(mm Hg)	746.17
Temperature	(deg C)	28	Temperature	(deg K)	301.00
Seasonal SL Pressure	(in Hg)	29.68	Corrected Seasonal	(mm Hg)	746.17
Seasonal Temperature	(deg C)	28.00	Seasonal Temperature	(deg K)	301.00

CALIBRATION ORIFICE

Make -> Andersen Instruments Inc.

Qstd Slope -> 1.99

Model -> 25A

Qstd Intercept -> -0.014012

Serial# -> 5303

Date Certified ->

CALIBRATION

	Plate or	H ₂ O	Qstd	I	IC	LINEAR	
	Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION	
1	18	12	1.723	60	59.155	Slope =	32.1856
2	13	9.8	1.558	54	53.239	Intercept =	3.4743
3	10	7.5	1.364	48	47.324	Corr. Coeff. =	0.9995
4	7	4.9	1.104	40	39.436		
5	5	3.1	0.879	32	31.549		

Calculations

$$Qstd = 1/m [\text{Sqrt} (H_2O (Pa/Pstd) (Tstd/Ta)) - b]$$

$$IC = I [\text{Sqrt} (Pa/Pstd) (Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

$$1/m ((I) [\text{Sqrt} (298/Tav) (Pav/760)] - b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



This is to certify that the above equipment has been calibrated in accordance with manufacturer's procedure.

ANDERSEN INSTRUMENTS INC.**GS2310 Series Sampler Calibration****(Dickson Recorder)****SITE**

Location -> Hill Court

Date -> 23-Jun-09

Sampler -> 694-0662

Tech -> Chan Kin Fung

CONDITIONS

Sea Level Pressure (hpa)	1004	Sampler Elevation (feet)	400
Sea Level Pressure (in Hg)	29.65	Corrected Pressure (mm Hg)	742.90
Temperature (deg C)	31	Temperature (deg K)	304.00
Seasonal SL Pressure (in Hg)	29.65	Corrected Seasonal (mm Hg)	742.90
Seasonal Temperature (deg C)	31.00	Seasonal Temperature (deg K)	304.00

CALIBRATION ORIFICE

Make -> Andersen Instruments Inc.

Qstd Slope -> 1.00

Model -> 25A

Qstd Intercept -> -0.014

Serial# -> 5303

Date Certified ->

CALIBRATION

Plate or	H ₂ O	Qstd	I	IC	LINEAR
Test #	(in)	(M ³ /min)	(chart)	(corrected)	REGRESSION
1	18	1.638	58	56.775	Slope = 35.4656
2	13	1.475	52	50.902	Intercept = -1.3303
3	10	1.308	46	45.028	Corr. Coeff. = 0.9999
4	7	1.051	37	36.219	
5	5	0.815	28	27.409	

Calculations

$$Qstd = 1/m [\text{Sqrt} (H_2O (Pa/Pstd) (Tstd/Ta)) - b]$$

$$IC = I [\text{Sqrt} (Pa/Pstd) (Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

$$1/m ((I) [\text{Sqrt} (298/Tav) (Pav/760)] - b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

This is to certify that the above equipment has been calibrated in accordance with manufacturer's procedure.





MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue 30th December, 2008

Certificate Number

MLCN081193S

Customer Information

Company Name

MTR Corporation Limited

Address

MTR Tower, Telford Plaza,
33 Wai Yip St., Kowloon Bay,
Kowloon,
Hong Kong

Unit Under Test (UUT)

Description

Precision Integrating Sound Level Meter

Manufacturer

Brüel & Kjær

Model Number

Type 2236

Serial Number

1814957

Equipment Number

-

Calibration Result

- * All calibration results are within the manufacturer's specification.
- * Calibration data are detailed on the attached sheet(s).

Approved By

Laboratory Manager

- * Calibration equipment used for this calibration are traceable to national / international standards.
- * The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the UUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
- * MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the UUT.
- * The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.



MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue 30th December, 2008

Certificate Number

MLCN081193S

Calibration Status

Date of Calibration

30th December, 2008

Calibration Equipment Used

4231 (MLTE008)/ CA0801167/ 24th Feb 2010

Calibration Procedure

MLCG00 & MLCG15.

Calibration Uncertainty

±0.2 dB

Calibration Condition

Lab

Temperature

23 °C ± 5 °C

Relative Humidity

55% ± 25%

UUT

Stabilizing Time

24 hours

Warm-up Time

10 minutes

Supply Voltage

Not applicable

Calibration Data

UUT Setting				UUT Rdg	Std Rdg	UUT Error	UUT Error Limit
Frequency Wt.	Parameter	Response	Range (dB)				
A (1 kHz Input)	SPL	F	20 - 100	93.9 dB	94 dB	-0.1 dB	0.7 dB
		S		93.9 dB	94 dB	-0.1 dB	0.7 dB
		I		93.9 dB	94 dB	-0.1 dB	0.7 dB
C (1 kHz Input)		F	20 - 100	93.9 dB	94 dB	-0.1 dB	0.7 dB
		S		93.9 dB	94 dB	-0.1 dB	0.7 dB
		I		93.9 dB	94 dB	-0.1 dB	0.7 dB
L (1 kHz Input)		F	20 - 100	93.9 dB	94 dB	-0.1 dB	0.7 dB
		S		93.9 dB	94 dB	-0.1 dB	0.7 dB
		I		93.9 dB	94 dB	-0.1 dB	0.7 dB
A (1 kHz Input)		F	40 - 120	113.9 dB	114 dB	-0.1 dB	0.7 dB
		S		113.9 dB	114 dB	-0.1 dB	0.7 dB
		I		113.9 dB	114 dB	-0.1 dB	0.7 dB



MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue 30th December, 2008

Certificate Number

MLCN081195S

Customer Information

Company Name

MTR Corporation Limited

Address

MTR Tower, Telford Plaza,
33 Wai Yip St., Kowloon Bay,
Kowloon,
Hong Kong

Unit Under Test (UUT)

Description

Precision Integrating Sound Level Meter

Manufacturer

Brüel & Kjær

Model Number

Type 2236

Serial Number

1814960

Equipment Number

-

Calibration Result

- * All calibration results are within the manufacturer's specification.
- * Calibration data are detailed on the attached sheet(s).

Approved By

Laboratory Manager

- * Calibration equipment used for this calibration are traceable to national / international standards.
- * The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the UUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
- * MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the UUT.
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MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue 30th December, 2008

Certificate Number

MLCN081195S

Calibration Status

Date of Calibration

30th December, 2008

Calibration Equipment Used

4231 (MLTE008)/ CA0801167/ 24th Feb 2010

Calibration Procedure

MLCG00 & MLCG15.

Calibration Uncertainty

±0.2 dB

Calibration Condition

Lab

Temperature

23 °C ± 5 °C

Relative Humidity

55% ± 25%

UUT

Stabilizing Time

24 hours

Warm-up Time

10 minutes

Supply Voltage

Not applicable

Calibration Data

UUT Setting				UUT Rdg	Std Rdg	UUT Error	UUT Error Limit
Frequency Wt.	Parameter	Response	Range (dB)				
A (1 kHz Input)	SPL	F	20 - 100	94.1 dB	94 dB	0.1 dB	0.7 dB
		S		94.1 dB	94 dB	0.1 dB	0.7 dB
		I		94.1 dB	94 dB	0.1 dB	0.7 dB
C (1 kHz Input)		F	20 - 100	94.1 dB	94 dB	0.1 dB	0.7 dB
		S		94.1 dB	94 dB	0.1 dB	0.7 dB
		I		94.1 dB	94 dB	0.1 dB	0.7 dB
L (1 kHz Input)		F	20 - 100	94.1 dB	94 dB	0.1 dB	0.7 dB
		S		94.1 dB	94 dB	0.1 dB	0.7 dB
		I		94.1 dB	94 dB	0.1 dB	0.7 dB
A (1 kHz Input)		F	40 - 120	114.0 dB	114 dB	0.0 dB	0.7 dB
		S		114.0 dB	114 dB	0.0 dB	0.7 dB
		I		114.0 dB	114 dB	0.0 dB	0.7 dB



MAXLAB CALIBRATION CERTIFICATE

Certificate Information

Date of Issue 6th November, 2008

Certificate Number MLCN080969S

Customer Information

Company Name MTR Corporation Limited
Address MTR Tower, Telford Plaza,
33 Wai Yip St., Kowloon Bay,
Kowloon,
Hong Kong

Unit Under Test (UUT)

Description Sound Level Calibrator
Manufacturer Brüel & Kjær
Model Number 4231
Serial Number 1795385
Equipment Number -

Calibration Result

- * All calibration results within the manufacturer's specification.
- * Calibration data are detailed on the attached sheet(s).

Approved By

Laboratory Manager

- * Calibration equipment used for this calibration are traceable to national / international standards.
- * The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the UUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
- * MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the UUT.
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CALIBRATION CERTIFICATE

Certificate Information

Date of Issue 6th November, 2008

Certificate Number

MLCN080969S

Calibration Status

Date of Calibration

6th November, 2008

Calibration Equipment Used

4231 (Spec) (MLTE008)/ CA0801167/ 24th Feb 2008

1351 (MLTE049)/ MLEC08/06/02/ 14th Jun 2009

Calibration Procedure

MLCG00 & MLCG15.

Calibration Uncertainty

± 0.1 dB

Calibration Condition

Lab

Temperature

23 °C ± 5 °C

Relative Humidity

55% ± 25%

UUT

Stabilizing Time

24 hours

Warm-up Time

Not applicable

Supply Voltage

Not applicable

Calibration Data

UUT Setting	STD Rdg	UUT Error	UUT Error Limit
94 dB	94.0 dB	0.0 dB	0.2 dB
114 dB	114.0 dB	0.0 dB	0.2 dB



MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue 6th November, 2008

Certificate Number MLCN080973S

Customer Information

Company Name MTR Corporation Limited
Address MTR Tower, Telford Plaza,
33 Wai Yip St., Kowloon Bay,
Kowloon,
Hong Kong

Unit Under Test (UUT)

Description Sound Level Calibrator
Manufacturer Brüel & Kjær
Model Number 4231
Serial Number 1795391
Equipment Number -

Calibration Result

- * All calibration results within the manufacturer's specification.
- * Calibration data are detailed on the attached sheet(s).

Approved By

Laboratory Manager

- * Calibration equipment used for this calibration are traceable to national / international standards.
- * The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the UUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
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MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue 6th November, 2008

Certificate Number

MLCN080973S

Calibration Status

Date of Calibration

6th November, 2008

Calibration Equipment Used

4231 (Spec) (MLTE008)/ CA0801167/ 24th Feb 2008

1351 (MLTE049)/ MLEC08/06/02/ 14th Jun 2009

Calibration Procedure

MLCG00 & MLCG15.

Calibration Uncertainty

± 0.1 dB

Calibration Condition

Lab

Temperature

23 °C ± 5 °C

Relative Humidity

55% ± 25%

UUT

Stabilizing Time

24 hours

Warm-up Time

Not applicable

Supply Voltage

Not applicable

Calibration Data

UUT Setting	STD Rdg	UUT Error	UUT Error Limit
94 dB	94.0 dB	0.0 dB	0.2 dB
114 dB	114.1 dB	0.1 dB	0.2 dB

Balance Calibration Report
Tested to MTRC Method WI/707M/01

Laboratory Equipment Identification Number			BA0011		
Manufacturer	Sartorius	Model	A200S-**DIB	Serial No.	1065989
Capacity	120g	Discrimination	0.1mg	Type	Top Loading
Location	Concrete Testing Area		Temperature	25°C	

Reference Mass Set Used (Equip. ID. No.)		RM001	
Manufacturer	Troemner	OIML Classification	F1
Last Calibration Date	29-04-2002	Calibrated By	South China National Centre of Metrology

(1) Repeatability of Reading

Reference Mass (g)	Standard Deviation of Balance Reading (g)	Maximum Difference Between Successive Readings (g)
10	0.000071	0.0002
60	0.0001333	0.0002
120	0.0001287	0.0003

Standard Deviation of the Balance = 0.0001333

(2) Departure from Nominal Value

Reading (g)	Correction (g)	Uncertainty (g)
10.0001	-0.0001	±0.000361
20.0001	-0.00005	
30.0001	-0.00005	
40.0001	0.00003	
50.0002	-0.00028	
60.0001	-0.00018	
70.000	0.00002	
80.0001	-0.00008	
90.0000	0.00005	
100.0001	-0.00025	

Maximum Correction = -0.00028

(3) Off-Centre Loading

A mass of approximately 60 was moved to various position on the balance pan. The balance readings obtained at different position are given in the table.

Centre	Front	Back	Left	Right
60.0001	60.0001	60.0004	59.9997	59.9997

Maximum Difference = 0.0007

(4) Hysteresis

Load (g)	Hysteresis (g)
50	-0.0001333

(5) Limit of Performance of the Balance = ± 0.000680

Checked by : Kenny Li

Certified by : 

Date : 13-02-2009

Date : 16/2/2009

Notes:

1.The balance has been tested according to the specifications laid down in Chapter 6 of the CSIRO Publication "The Calibration of Balances - by David B. Prowse".

2.Uncertainties quoted in this report have been estimated on the basis of there being not more than one chance in one hundred that any value differs from the true value by more than the stated uncertainty.

3.The Limit of Performance is the tolerance band within which all readings of the balance will fall.