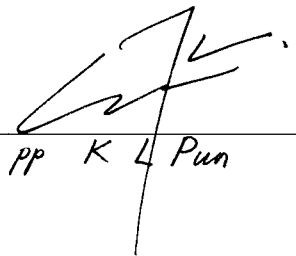


**Sha Tin New Town, Stage II Road D15 Linking Lok Shun Path and
Tai Po Road (Contract No. ST 77/01)**

**Quarterly Environmental Monitoring & Audit Report –
July to September 2002**

Checked in accordance with EML QP22
Environmental Team Leader



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EXECUTIVE SUMMARY

This quarterly environmental monitoring report was prepared by Environmental Management Limited (EML) for Environmental Monitoring & Audit (EM&A) Services of Sha Tin New Town, Stage II Road D15 Linking Lok Shun Path and Tai Po Road. This report summaries the EM&A carried out in the period from July to September 2002.

Environmental monitoring for this Project included both air quality and noise measurements. The parameters measured for air quality are 24-hour and 1-hour Total Suspended Particulate (TSP) while for noise monitoring, the A-weighted continuous sound pressure level (L_{eq}) as well as percentile levels (L_{10} and L_{90}) were measured.

Over the reporting period, apart from two documented complaints on construction noise at the Site, no exceedance in Action and Limit Levels were noted from the impact dust and noise and noise monitoring results.

The regular site inspections had been conducted in this reporting period and the mitigation measures, as discussed in the relevant documents, were identified and implemented. The mitigation measures implemented in this quarter included aspects of noise, air, water, wastewater and land contamination. During the quarter, two noise complaints against the Road D15 construction site had been received on 29 July and 8 August respectively. Ad hoc site visits were conducted, jointly by the Engineer, Contractor and Environmental Team. Based on the findings of the visits, the recommendations and mitigations actions had been taken and letters had been sent to the complaints (via Police) reporting the investigation results and subsequent actions taken. **Appendix E** listed details of all complaints received on the construction site.

During this quarter, a larger wastewater treatment facility had been installed in order to accommodate the increase in the wastewater flow. The quality of the effluent from the facility seems to be acceptable although proper laboratory testing are required to confirm tits compliance with the wastewater discharge Licence. Additional temporary noise barriers had been installed at the Site to minimize the noise impacts from additional pre-bored piling rig and generators.

A pink and a yellow site inspection record form were given to the Contractor by EPD. The issues were discussed in detail in **Section 3.4** and were related to dust (pink form) and water (yellow form) pollution. It was recommended to the Contractor that further mitigation measures should be taken to minimise dust and water impacts. These include:

- Regular water spraying and tarpaulin cover at areas where dust generations are likely
- Connect drains to water treatment facility prior to discharging into the drainage system when there are construction activities upstream which could cause water pollution.

Meanwhile, in the recent cases of Dengue Fever, the Contractor was advised to take particular attention to prevent any potential mosquitoes breeding, which include the removal and minimisation of water ponding at the Site in areas such as drains, empty tanks/containers and disused tyres.

1. INTRODUCTION

1.1 Background

Environmental Management Limited (EML) was appointed by Maunsell Consultants Asia Ltd. as the Environmental Specialist for the project *Sha Tin New Town, Stage II Road Linking Lok Shun Path and Tai Po road* (Agreement No. ST77/01).

The responsibilities of the Environmental Team included:

- Monitor the noise and air quality data as required in the Environmental Monitoring and Audit (EM&A) Manual;
- Analyse the monitoring data and review the success of EM&A program to cost effectively confirm the adequacy of mitigatory measures implemented and validity of the Environmental Impact Assessment Study predictions and to identify any adverse environmental impacts arising;
- Carry out site inspection to investigate and audit the Contractor's site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and anticipate environmental issues for proactive action before problems arise;
- Review the proposal for mitigation measures submitted by Contractor in accordance with Event and Action Plans.
- Propose any improvement or other alternative mitigation measures should Contractor's proposal be found to be inadequate;
- Adhere to the procedures for carrying out complaint investigation;
- Audit and prepare EM&A reports on environmental monitoring data and site environmental conditions;
- Report on EM&A results to Engineer, the ER and EPD;

This is the quarterly EM&A report for the period from July to September 2002. The report summarises the results of the impact air quality and noise monitoring in the reporting quarter as well as the environmental status and issues of the construction site for the Project. The remedial actions undertaken as a result of non-compliance with relevant environmental criteria or complaints related to the Project's construction works will also be discussed in the report.

The project area of the construction site for this Project is shown in **Figure 1.1** while the project organisation, contacts of key management for the project and EPD complaint hotline are shown in **Appendix D**.

1.2 Project Description

Road D15 Linking Lok Shun Path and Tai Po Road (hereinafter referred to as "Road D15") is part of the development of Sha Tin New Town, Stage II by NT East Development Office/Territory Development department. The project will provide a link between Lok Lo Ha Area (Planning Area 43 and 44) and Tai Po Road so as to relieve traffic congestion at the present access via Fo Tan Road. The construction of Road D15 includes the major components listed hereunder:

- (a) Construction of approximately 0.4km a single 2-lane carriageway forming part of D Road15 at Fo Tan. About 0.2km of road is on elevated structure.
- (b) Construction of vehicular bridge A, B and C with footpaths.

- (c) Construction of noise barriers.
- (d) Construction of associated footpaths, cycle tracks, drainage and workworks.
- (e) Construction of sewerage improvement works via Lok Lo Ha Village.
- (f) Slope works and landscaping works associated with the above roadworks.

1.3 Construction Activities During the Reporting Quarter

According to the Master Program, the activities performed during the reporting period are listed below:

- Utilities diversion;
- Forming access;
- Drainage works;
- Piling works;
- Procurement, manufacturing and testing of bridge bearing
- Precast yard setup
- Construction of pile caps and piers
- Construction of retaining walls and stairs, including pre-drill holes, working platform and install bored piles;
- Box culvert extension;
- Ground investigation.

The work program for the current and next quarter is attached in **Appendix F**.

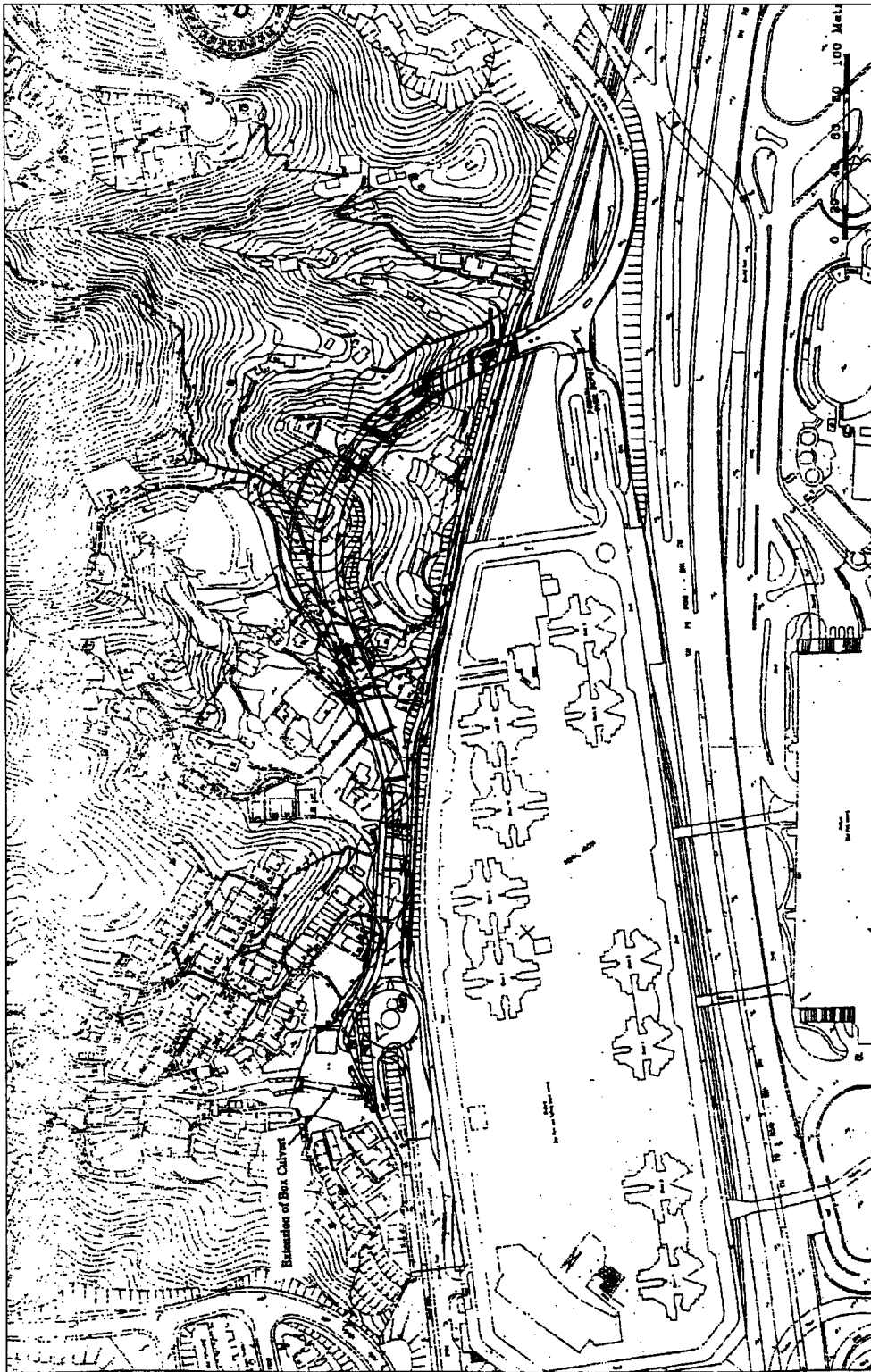


Figure I.1 Project Area

2. ENVIRONMENTAL MONITORING & AUDIT REQUIREMENTS

2.1 Monitoring Parameters

Impact monitoring on the Road D15 Project involved both air quality and noise. For air impact monitoring, continuous 24-hour and 1-hour TSP levels were sampled. For 24-hour TSP, monitoring are performed once in every six days while for 1-hour TSP, monitoring are performed three times in every six days.

Meanwhile, for noise monitoring, the A-weighted equivalent continuous sound pressure level (L_{eq}) was measured with a duration of 30 minutes. The measured L_{eq} was used to compare with the relevant noise criteria and the monitoring will be conducted once in every six days. As supplementary information for data auditing, statistical results, namely L_{10} and L_{90} , were also recorded for reference.

The monitoring parameters are summarised in **Table 2.1** below.

Table 2.1 Parameter, Frequency and Duration of Monitoring

Monitoring Type	Parameter	Duration
Air Quality	24-hour TSP	24 hours
	1-hour TSP	1 hour within 0700-1900 on working days
Noise	L_{eq} , L_{10} , L_{90}	30 minutes

2.2 Environmental Quality Performance Limits (Action & Limit Levels)

The Action and Limit (AL) Levels set the air quality and noise criteria for construction works. For air quality, the AL levels for the parameters 24 and 1-hour TSP are shown in **Table 2.2** below.

Table 2.2 Action / Limit Levels for Air Quality

Parameters	Action	Limit
24 Hour TSP Level in $\mu\text{g}/\text{m}^3$	For baseline level < $108 \mu\text{g}/\text{m}^3$, Action Level = average of baseline level plus 30% and Limit level; For baseline level > $108 \mu\text{g}/\text{m}^3$, and baseline level < $154 \mu\text{g}/\text{m}^3$, Action Level = $200 \mu\text{g}/\text{m}^3$; For baseline level > $154 \mu\text{g}/\text{m}^3$, Action Level = 130% of baseline level.	260
1 Hour TSP Level in $\mu\text{g}/\text{m}^3$	For baseline level < $154 \mu\text{g}/\text{m}^3$, Action Level = average of baseline level plus 30% and Limit Level; For baseline level > $154 \mu\text{g}/\text{m}^3$, and baseline level < $269 \mu\text{g}/\text{m}^3$, Action Level = $350 \mu\text{g}/\text{m}^3$; For baseline level > $269 \mu\text{g}/\text{m}^3$, Action Level = 130% of baseline level.	500

Meanwhile, for noise, the AL levels for the parameters L_{eq} are shown in **Table 2.3** below:

Table 2.3 Action / Limit Levels for Construction Noise

Time Period	Action Level	Limit Level
0700-1900 hours on normal weekdays	When one documented complaint is received	75* dB(A)
0700-2300 hours on holidays; and 1900-2300 hours on all other days		60/65/70** dB(A)
2300- 0700 hours of next day		45/50/55** dB(A)

** to be selected based on Area Sensitivity Rating

Note: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.

From the baseline study carried out in the period from 9 to 27 August 2001, the AL levels for air quality as specified in **Table 2.2** were determined and are shown again in **Table 2.4** and **2.5** below. Details of the baseline study were provided in the '*Baseline Environmental Monitoring Report*' by Maunsell Environmental Management Consultants Ltd., carried out prior to this EM&A report.

Table 2.4 Action and Limit Levels for 24-hour TSP

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
A1	156	260
A2	155	
A3	153	

Table 2.5 Action and Limit Levels for 1-hour TSP

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
A1	371	500
A2	378	
A3	368	

2.3 Environmental Mitigation Measures During Construction Phase

In order to minimise adverse environmental impacts to the surrounding area, the environmental impact assessment report and environmental review had recommended a number of mitigation measures on the Road D15 Project. These mitigation measures cover aspect in air, water and noise and the some of the mitigation measures are listed below:

Air

- Effective dust suppression equipment and other measures should be installed to ensure the concentration of air borne dust at the site boundary and any nearby sensitive receiver are within the established standard
- Wheel washing facilities should be installed and used by all vehicles leaving the construction site.
- All motorised vehicles should be restricted to a maximum speed of 8 km/h. Haulage and delivery vehicles should be confined to designated roadway inside the site
- In the process of material handling, any material which has the potential to create dust should be treated with water or sprayed with wetting agent.

Noise

- Temporary purposed-built barrier must be installed around heavy noise generated equipment. The design of the temporary barrier must meet the requirements specified in the *Technical*

Memorandum on Noise from Construction Works' and provide reduction of noise level to at least 10 dB(A).

- The arrangement of the number of equipment, procedure and sequence of construction should be arranged such that the noise levels generated from the plants are kept to the minimum.
- Quietened equipment shall be used for the construction works
- A noise mitigation proposal describing the above measures must be submitted to the EPD with prior verification from the Environmental Team (ET)

Water

- Temporary barrier shall be provided in order to protect the water quality of the stream course located in the site. The barrier shall be installed at the stream bank to prevent accidental dumping or spillage of materials into the stream course during construction.
- Proper mitigation measures as described in **Annex A** of the Environmental Permit will need to be implemented to mitigate environmental impacts due to site runoff and other potential water pollution caused by construction activities. A copy of **Annex A** are attached in **Appendix A** of this report.

3. ENVIRONMENTAL STATUS

3.1 Air Quality

3.1.1 *Monitoring Requirements*

In accordance with the EM&A Manual, air quality impact monitoring was conducted in terms of 1-hour and 24-hour TSP at the designated monitoring locations.

Continuous 24-hour TSP monitoring was performed once in every six days while 1-hour TSP monitoring was performed 3 times in every 6 days. The Action and Limit levels for air quality are discussed in **Section 2** of this report.

3.1.2 *Monitoring Locations*

The designated impact air quality monitoring stations are listed in **Table 3.1** and are shown in **Figure 3.1**.

Table 3.1 Air Quality Monitoring Locations

Monitoring Station	Location
A1	Village house at Lok Lo Ha Village
A2	Lok Lo Ha Village House No. 104
A3	Village House near Tsun King Road

3.1.3 *Summary of Monitoring Results*

The monitoring results obtained in this quarter are summarised in **Table 3.2** below. The graphical plots of the trends of 24-hour and 1-hour TSP in the quarter are presented in **Figure 3.2** and **3.3** respectively. Meanwhile, **Appendix B** shows the meteorological conditions during the monitoring days.

Table 3.2 Summary of 24 and 1-hour TSP Monitoring Results

Parameter	Monitoring Location	Mean TSP Levels ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	No. of Exceedance	
				Action Levels	Limit Levels
24 – hour TSP	A1	44.5	24 – 91	0	0
	A2	46.82	25 – 94	0	0
	A3	45.23	26 – 94	0	0
1 – hour TSP	A1	140.7	41 – 300	0	0
	A2	136.6	41 – 272	0	0
	A3	123.8	37 – 288	0	0

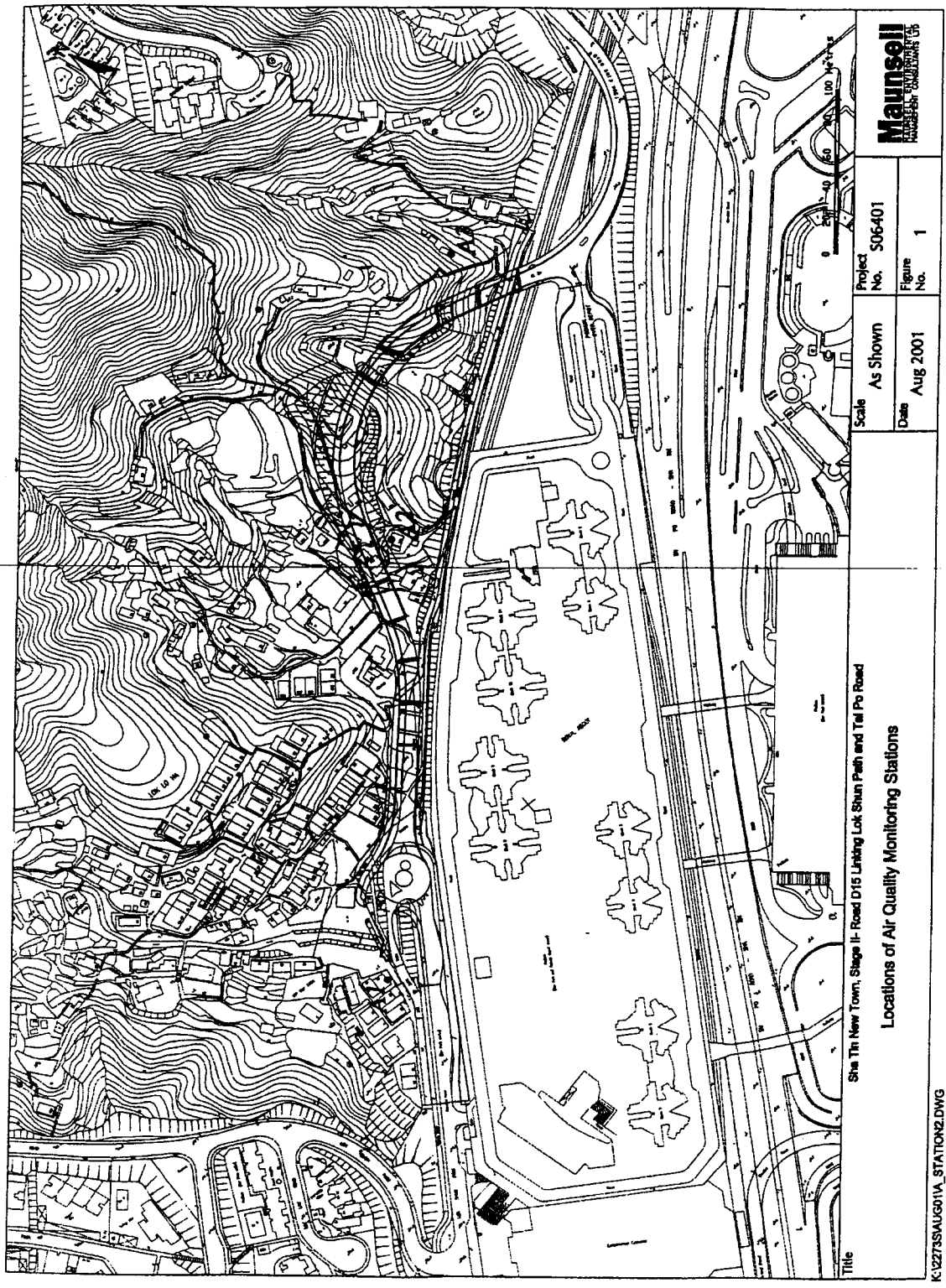


Figure 3.1 Air Quality Monitoring Locations

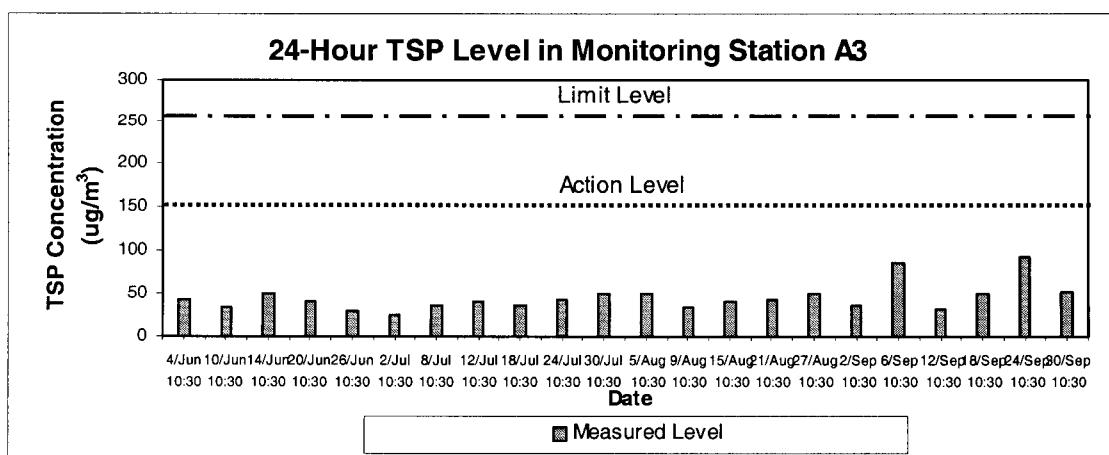
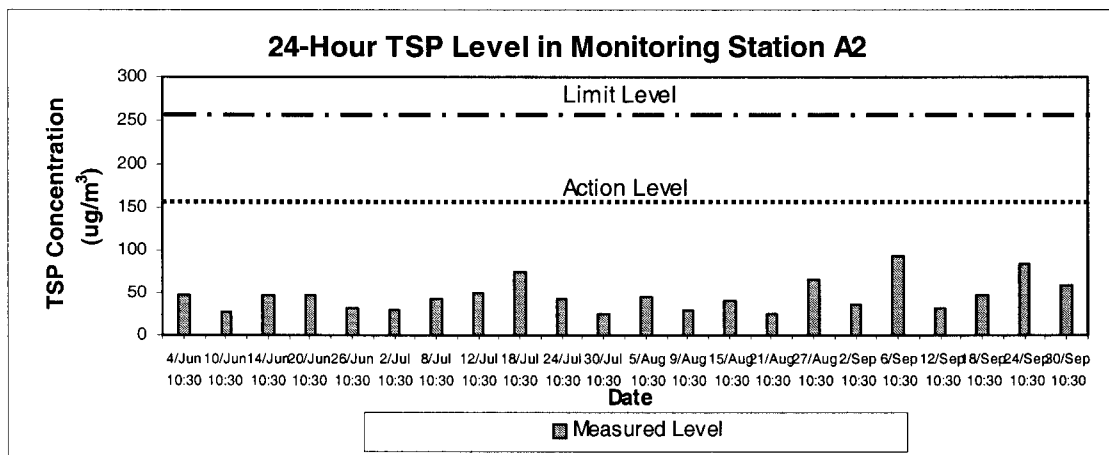
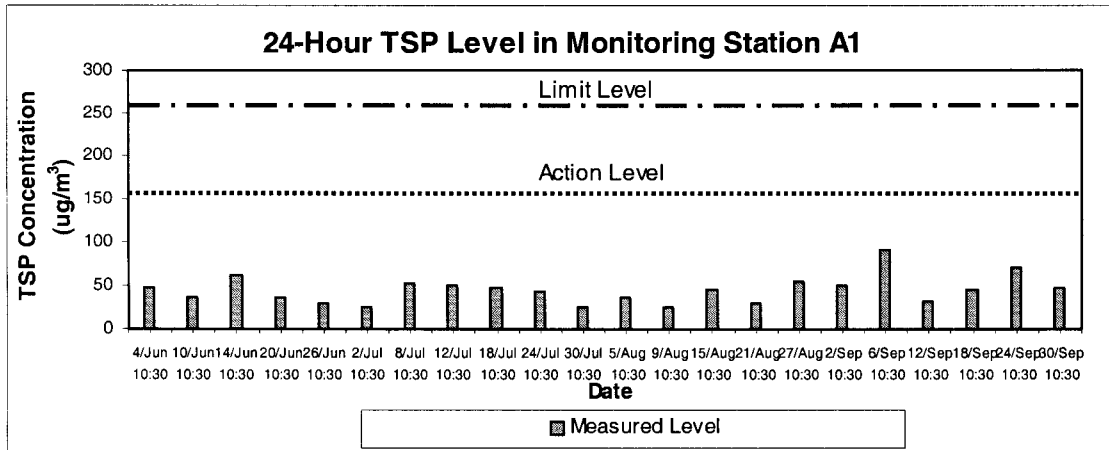


Figure 3.2 Plots of 24-hour TSP Concentration

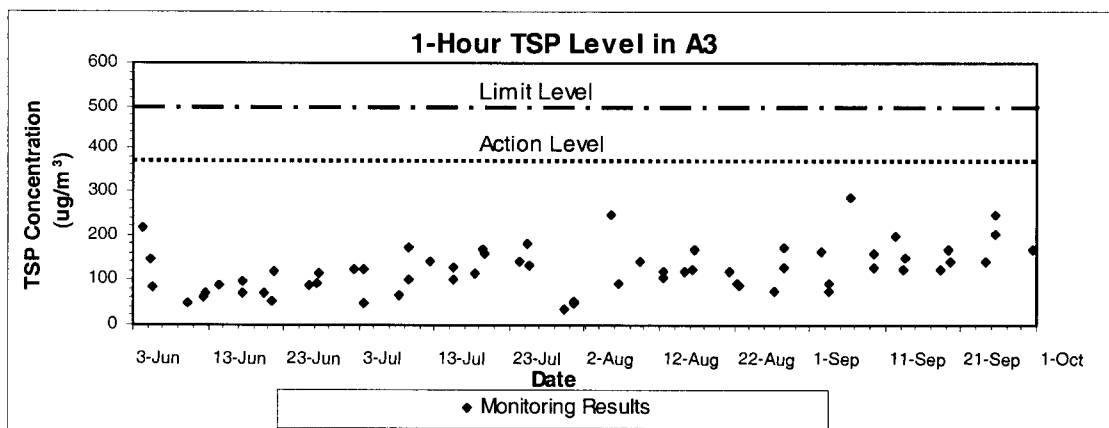
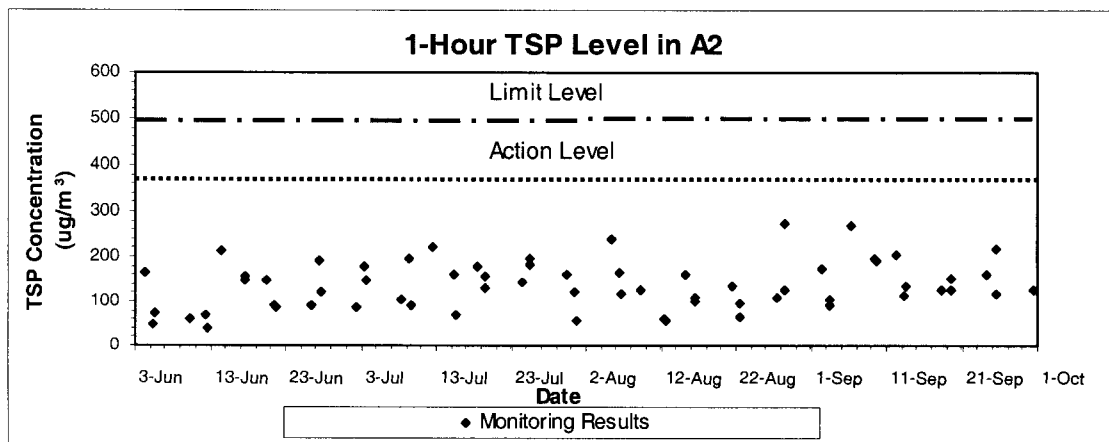
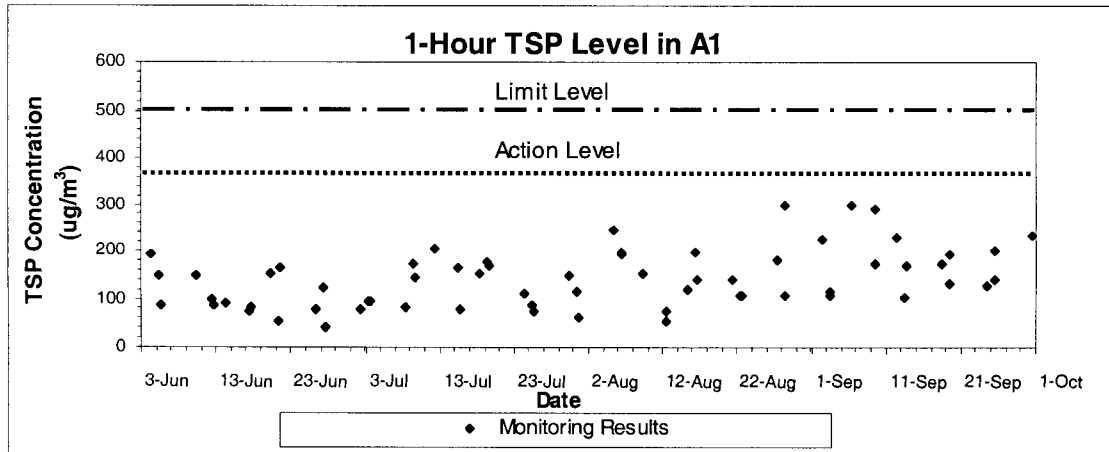


Figure 3.3 Plots of 1-hour TSP Concentrations

3.2 Noise

3.2.1 Monitoring Requirements

Impact noise monitoring was conducted once in every six days at the five designated monitoring locations in accordance with specifications in the EM&A Manual. The duration of sampling was 30 minutes in the reporting period. The Action and Limit levels for noise are discussed in **Section 2** of this report.

3.2.2 Monitoring Locations

The impact noise monitoring locations are presented in **Table 3.3** and shown in **Figure 3.4**.

Table 3.3 Noise Monitoring Locations

Monitoring Location	Measurement	Location
N1	Façade	Lok Lo Ha Village House No. 3B
N2	Façade	Lok Lo Ha Village House No. 32A
N3	Façade	Royal Ascot Block 9, Flat C
N4	Façade	Lok Lo Ha Village House No. 97
N5	Façade	Village near Royal Ascot

3.2.3 Summary of Monitoring Results

The monitoring results obtained in this quarter are summarised in **Table 3.4** below. Graphical plots of the noise level trends in the quarter are presented in **Figure 3.5** below. Meanwhile, **Appendix B** shows the meteorological conditions during the monitoring days.

Table 3.4 Summary of Noise Monitoring Results

Parameter	Monitoring Location	Range of Results dB(A)	No. of Exceedance	
			Action Levels	Limit Levels
30-minute Noise Measurement (Leq)	N1	58.2 – 71.2	2	0
	N2	63.2 – 71.2		0
	N3	55.6 – 62.9		0
	N4	58.0 – 70.4		0
	N5	57.8 – 66.7		0

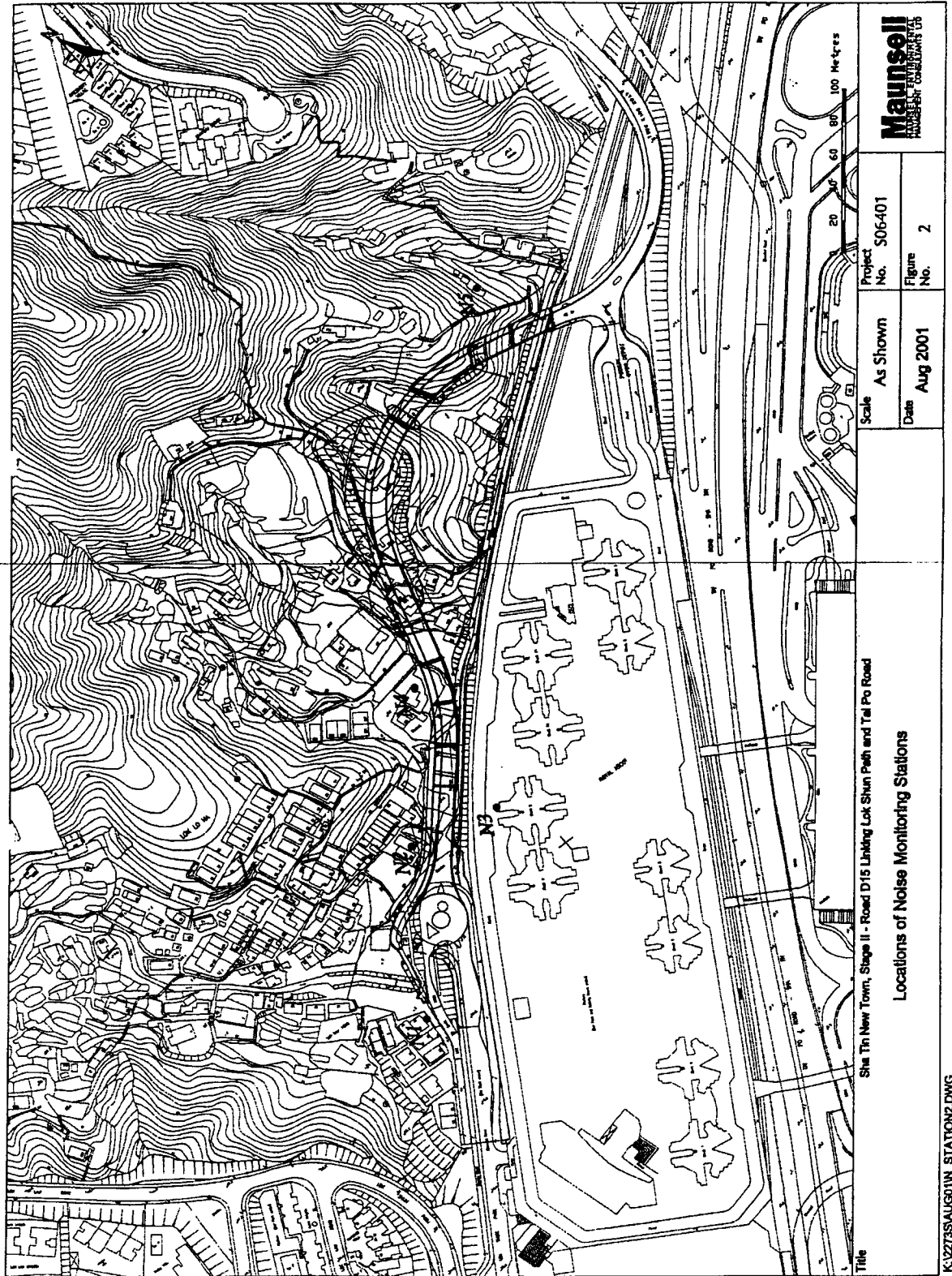


Figure 3.4 Noise Monitoring Locations

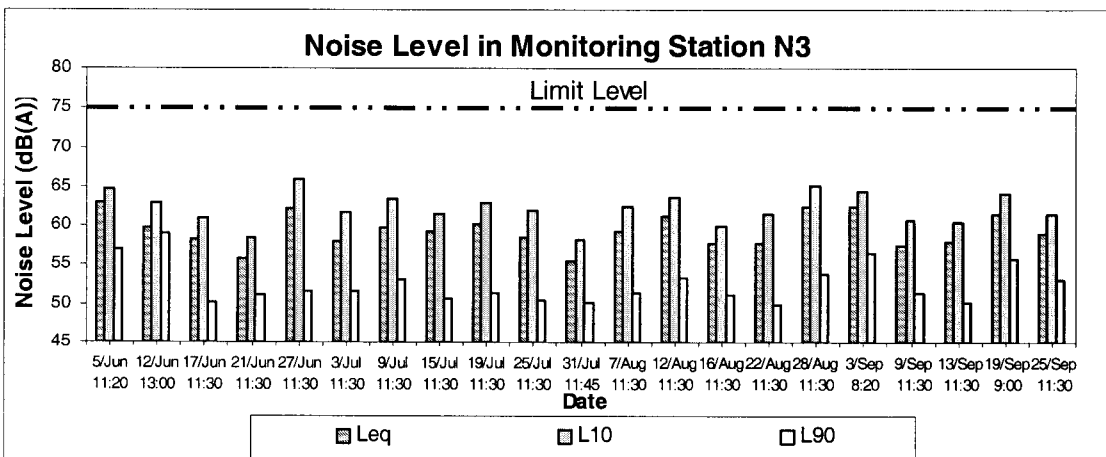
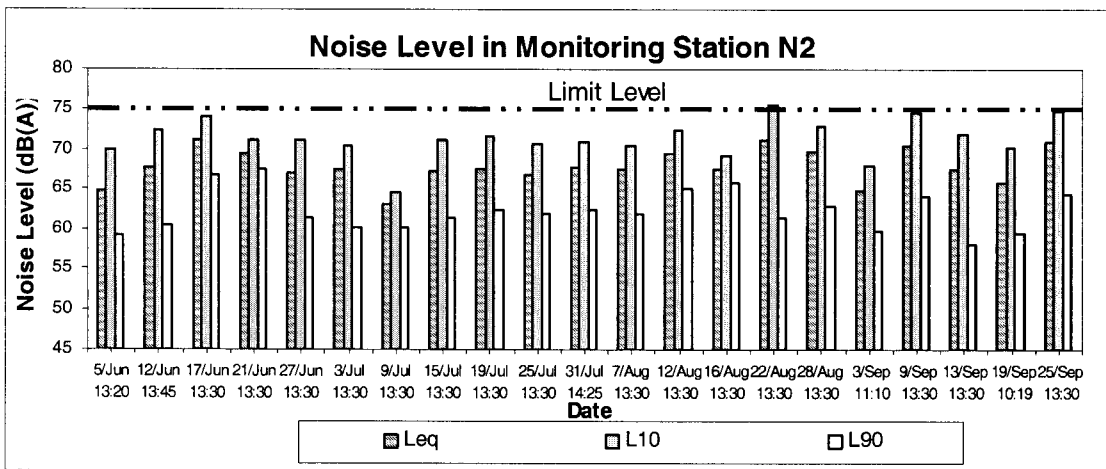
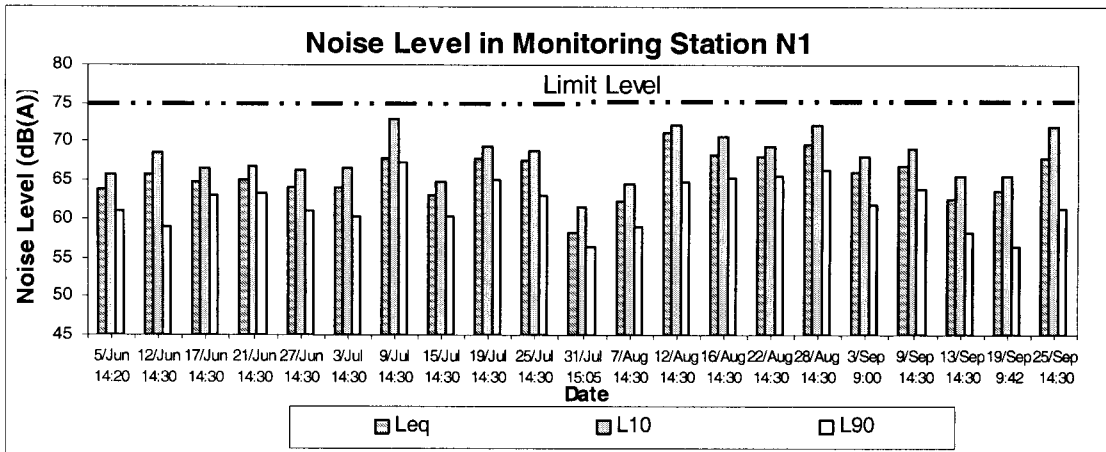


Figure 3.5 Plots of Noise Levels

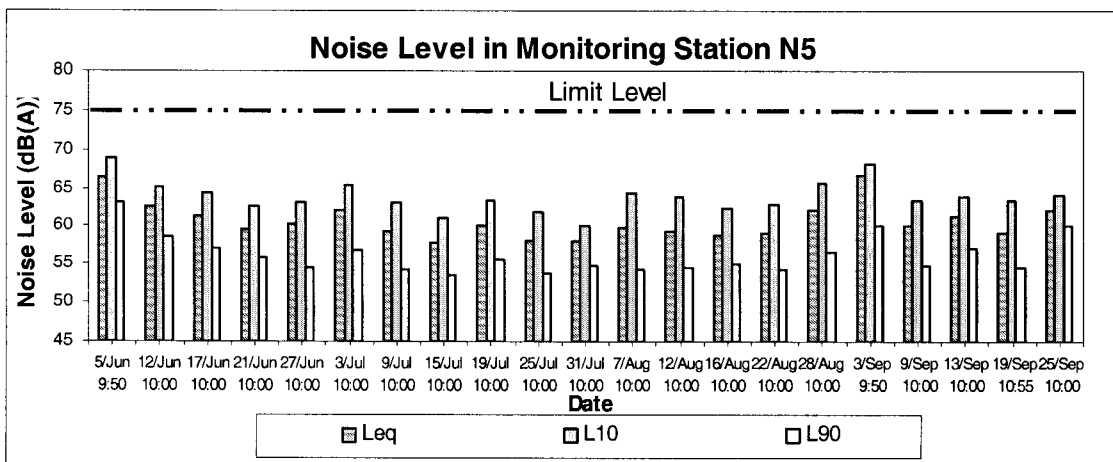
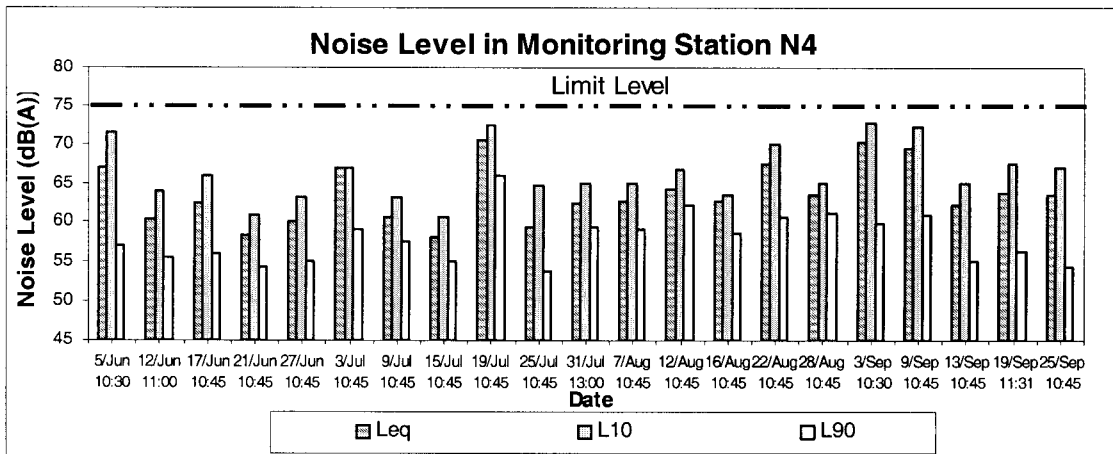


Figure 3.5 Plots of Noise Levels (con't)

4. ENVIRONMENTAL AUDIT

4.1 Summary of Environmental Monitoring Results

The monitoring work undertaken in this reporting quarter is summarised in the following table.

Table 4.1 Summary of Environmental Monitoring

Item	Parameter	Monitoring Period	Total No. of Samples Taken (on all stations)	No. of Exceedance	
				Action Levels	Limit Levels
1	24 – hour TSP	01/07/02 to 30/09/02	51	0	0
2	1 – hour TSP	01/07/02 to 30/09/02	147	0	0
3	30-minute Noise Measurement (Leq)	01/07/02 to 30/09/02	80	2 (due to documented complaints)	0

In this reporting quarter, no exceedance in Action and Limit Levels was recorded from the monitoring. However, as two documented complaints on construction noise from the Site were received, the Event and Action Plan as set out in **Appendix C** was triggered.

4.2 Environmental Complaints

Two noise complaints were received on Road D15 construction site on 29 July and 7 August.

The complaint on 29 July was in the vicinity of the Site Office (near the box culvert and north of Lok Shun Path Roundabout). An ad hoc site investigation was carried out on 31 July 2002, jointly by the Engineer, Contractor and Environmental Team. As reported by the Engineer and Contractor, at the time of the complaint, workers were breaking rocks using an excavator-mounted breaker. Meanwhile, as informed by the Engineer, no adequate temporary purpose-built noise barriers were installed in the complaint area. Since stated in the Particular Specification (Section 26), no excavator-mounted breaker will be carried out within 125m from nearby noise sensitive receivers. Thus it is recommended at the time that the Particular Specification should be strictly followed and that sufficient temporary purpose-built noise mitigation measures will need to be placed around PME with high noise level. A letter had been sent to the complaint (via Police) reporting the investigation results and subsequent actions taken.

The complaint on 7 August was from nearby residents in night-time concerning the noise emitted by an operating generator in Road D15 Site near Lok Lo Ha Village. An ad hoc site investigation was carried out on 8 August 2002, jointly by the Engineer, Contractor and Environmental team. It was identified that at the time of the complaint, a generator was running by accident in the area near Lok Lo Ha Village 85B and the noise complaint was valid as it concerned with construction noise emitted during the restricted hour (1900 to 0700 weekdays). The Contractor was reminded that as stated in the Noise Control Ordinance, the carrying out of general construction work using PME (including generators) during the restricted hours (between 7 p.m. and 7 a.m. or at any time on a general holiday (including Sunday) is prohibited unless a valid Construction Noise Permit is in force. In addition, it was recommended that a watchmen or site staff should be employed to check daily that all generators

and plants are switched off after the permissible working hours. A letter had been sent to the complainant (via Police) reporting the investigation results and subsequent actions taken.

Table 4.4 shows the complaint summary record for this reporting quarter while **Table 4.5** summarises the complaint statistics from the commencement of the project to date. **Appendix E** listed the details of all the complaints received on the construction site.

4.3 Assessment of Mitigation Measures

The mitigation measures listed in **Table 4.3** below had been implemented in this reporting period.

Table 4.3 Summary of Major Mitigation Measures at the Site

Type	Mitigation Measure	Comments
Noise	Temporary purposed-built Noise Barrier	<ul style="list-style-type: none"> Constructed based on the design in the Construction Noise Mitigation Proposal.
Water	Wheel Washing Facility	<ul style="list-style-type: none"> Installed and in operation.
	Sand/Silt Removal Facilities	<ul style="list-style-type: none"> A larger wastewater treatment system had been installed to treat site-runoffs and water from piling works north-east of Lok Shun Path Roundabout. Another treatment system was installed to treat wastewater from piling works near Bridge C.
	Measures along stream-banks north-east of Lok Shun Path Roundabout	<ul style="list-style-type: none"> Concrete, sandbags, sump pits and pumps were placed/installed along the banks to prevent construction debris and site run-off from entering the stream untreated.
	Diversion of Stream Course via drainage pipe	<ul style="list-style-type: none"> Installed at the existing concrete channel.
Wastewater	Water Reuse at wheel washing facility and site investigation drilling works.	Implemented
Land Contamination	Metal trays are placed underneath stationary machines where there are potential of oil leakage	Implemented
Air	Provide plastic sheeting covers on exposed soils	Satisfactory
	Regular water spraying on areas where there is likely generation of dust	Satisfactory

During the quarter, a larger wastewater treatment facility had been installed in order to accommodate the increase in the wastewater flow. The quality of the effluent from the facility seems to be acceptable although proper laboratory testing are required to confirm its compliance with the wastewater discharge Licence. Additional temporary noise barriers had been installed at the Site to minimise the noise impacts from additional pre-bored piling rig and generators. Meanwhile, mitigation measures related with the two documented noise complaints were implemented properly.

At the end of the quarter, a pink and a yellow site inspection record form were given to the Contractor by EPD. The issues were discussed in the Monthly EM&A Report for September and were related to dust (pink form) and water (yellow form) pollution. It was recommended to the Contractor that further mitigation measures should be taken to minimize dust and water impacts including regular water spraying and tarpaulin cover at areas where dust generations are likely and connect drains to water treatment facility prior to discharging into the drainage system when there are construction activities upstream which could cause water pollution.

Table 4.4 Environmental Complaints / Enquiry Received in the Reporting Quarter

Complaint No.	Received date & Time	Description (inc. location/ nature of complaint)	Follow-up Action Taken	Recommended Measures	Mitigation	Status/ Remarks
C02-N1	Morning, 29/7/2002	Around 9:30am on 29/7/02, police came on site to investigate a complaint of noise pollution emitted during rock breaking which carried out by the Contractor near the Site Office (near the box culvert and north Lok Shun Path Roundabout). The Contractor immediately halted the activity in response to police's advice	<ul style="list-style-type: none"> Ad hoc site inspection was carried out on 31/7/02, jointly with the Engineer and Contractor The complaint log sheet, the investigation findings and recommendations on mitigation measures were submitted to the Engineer and Contractor. A letter, addressing to the complainant, will be sent to the police. 	<p>Mitigation actions:</p> <ul style="list-style-type: none"> Excavator-mounted breaker shall not be carried out within 125m from any nearby noise sensitive receivers and; Temporary purpose built barrier should be installed whenever there are high noise level construction activities. 	<p>The complaint was considered as ad hoc rather than continuous. It is therefore considered not necessary to increase the noise monitoring frequency</p> <p>File Closed.</p>	
C02-N2	Night-time, 7 August, 2002	<ul style="list-style-type: none"> Nearby residents complained to police that a generator in Road D15 Site was operating in night-time near Lok Lo Ha Village. Police came to the site to investigate the complaint and inform watchmen to turn off the operating generator at around 8:30pm. The complaint was valid as it concerned with construction noise during the restricted hours. 	<ul style="list-style-type: none"> Ad hoc site inspection was carried out on 8 August 02, jointly with the Engineer and Contractor and ET. The complaint log sheet, the investigation findings and recommendations on mitigation measures were submitted to the Engineer and Contractor. A letter in both English and Chinese, addressing to the complainant, has been sent to the police. 	<p>Mitigation actions:</p> <ul style="list-style-type: none"> Under the Noise Control Ordinance, the carrying out of general construction work using powered mechanical equipment (including generators) during the restricted hours (between 7 p.m. and 7 a.m. or at any time on a general holiday (including Sunday) is prohibited unless a valid Construction Noise Permit is in force; A watchmen or site staff should be employed to check daily that all generators and plants are switched off after the permissible working hours. 	<p>File Closed.</p>	

Table 4.5 Summary of Total Number of Complaints Received to date

Total No. of Complaints to date	No. of Complaints in this reporting period	No. of Active Complaints	No. of Inactive/Closed Complaints
2	2	N/a	2

5. COMMENTS & CONCLUSION

Weekly site inspection has been carried out in this quarter in order to investigate the implementation and effectiveness of the mitigation measures. The Major mitigation measures were identified and are implemented as indicated in **Table 4.3**. Two documented noise complaints on the construction site were received in this reporting period, which triggered the Event and Action Plan set out in **Appendix C**. Meanwhile, a pink and a yellow site inspection record form were given to the Contractor by EPD relating to dust emission (pink form) and water pollution (yellow form). Further mitigation measures were recommended on the site as a result.

In respect to environmental monitoring for both air quality and noise, there was no exceedance in Action and Limit levels recorded in this reporting period. Therefore no remedial actions as listed in the Event and Action Plan in **Appendix C** was needed.

The updated work program for the current and next quarters are attached in **Appendix F**.

APPENDIX A:

**Water Mitigation Measures –
Extract from Annex A of the
Environmental Permit**

Annex A (as referred to in Condition 3.3)**Measures to Mitigate Environmental Impacts due to Site Run-off and Other Potential Water Pollution During Construction****(a) Surface Runoff**

- (i) Surface run-off from the construction site shall be directed into adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins before discharge into storm drains. Channels, earth bunds or sand bag barriers shall be provided on site to properly direct stormwater to such silt removal facilities.
- (ii) Catchpits and perimeter channels shall be constructed in advance of site formation works and earthworks.
- (iii) Silt removal facilities, channels and manholes shall be suitably maintained with the deposited silt and grit being removed at least once a week, and at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.
- (iv) Earthworks final surfaces shall be well compacted and the subsequent permanent work or surface protection shall be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate intercepting channels shall be provided along the site boundary or at the locations agreed with the ET Leader. Rainwater pumped out from trenches or foundation excavations shall be discharged into silt removal facilities before discharge into storm drains.
- (v) Open stockpiles of construction materials (e.g. aggregates and sand) on site shall be covered with tarpaulin or similar fabric during rainstorms. Measures such as providing sand bag barriers shall be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.
- (vi) All generators, fuel and oil storage shall be within bunded areas. Drainage from the areas shall be connected to storm drains via a petrol interceptor.

(b) General Construction Activities

At all parts of all works areas and construction sites, and throughout the full duration of the construction contract(s), debris and rubbish on site shall be handled and disposed of to avoid entering the water column and causing water quality impacts. Temporary on-site storage of excavated materials from construction works shall be covered with tarpaulin or similar fabric during rainstorms. Any washout of construction or excavated materials should be diverted to the drainage system via sediment traps. Stockpiling of the excavated material shall be minimised by scheduling the construction programme in a way that one section of the alignment can be constructed and completed before the excavation works of the next section commence.

To mitigate environmental impacts from wastewater due to construction activities, water used for water testing, boring, drilling works, concrete batching and precast concrete casting shall be

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recirculated and reused; wastewater from concrete batching and precast concrete casting shall be treated for pH adjustment and silt removed prior to discharge into stormwater drains and washwater from wheel washing facilities shall have sand, silt or other materials removed before discharge into stormwater drains; the access road sections between site exits and the public roads shall be paved with backfill to prevent site run-off from entering the public roads.

APPENDIX B:

**Weather Conditions During
Monitoring Periods**

**Weather Condition During Monitoring Period
(From 1 July to 30 September 2002)**

Date	Weather	Mean Air Temperature (°C)	Wind Speed (m/s)	Mean Relative Humidity (%)
2-July-02	Fine	28.7	<1.3	83
3-July-02	Fine	29.3	<1.3	80
8-July-02	Fine	28.5	<1.3	79
9-July-02	Sunny	28.9	<1.3	77
12-July-02	Sunny	30.4	<1.3	73
15-July-02	Fine	30.5	<1.3	77
18-July-02	Cloudy	29.7	<1.3	79
19-July-02	Cloudy	29.5	<1.3	80
24-July-02	Fine	29.2	<1.3	81
25-July-02	Sunny	29.4	<1.3	84
30-July-02	Rainy	26.8	<1.3	93
31-July-02	Cloudy	27	<1.3	92
5-August-02	Rainy	27.1	<1.0	84
6-August-02	Rainy	27.8	<1.0	84
7-August-02	Cloudy	28.7	N/a	82
9-August-02	Rainy	26.6	<1.0	92
12-August-02	Cloudy	28.3	<1.3	84
15-August-02	Sunny	29.0	<1.0	77
16-August-02	Fine	29.0	<1.0	76
21-August-02	Fine	28.0	<0.7	88
22-August-02	Fine	29.0	<0.9	80
27-August-02	Fine	29.7	N/a	79
28-August-02	Fine	29.5	<1.0	75
2-September-02	Fine	29.4	<0.8	74
3-September-02	Fine	27.8	<1.3	80
6-September-02	Fine	30	<0.8	69
9-September-02	Fine	28.7	<1.0	72
12-September-02	Rainy	26.5	<0.8	86
13-September-02	Rainy	26.6	<1.1	90
18-September-02	Cloudy	27.0	<1.0	81
19-September-02	Fine	27.8	<0.7	76
24-September-02	Cloudy	25.4	<0.9	79
25-September-02	Cloudy	25.0	<0.8	88
30-September-02	Cloudy	26.3	<0.8	77

APPENDIX C:

**Event and Action Plan for Air
Quality and Noise**

Event / Action Plan for Air Quality

EVENT	ACTION		
	ET	Engineer	CONTRACTOR
ACTION LEVEL			
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source; 2. Inform the Engineer and Contractor; 3. Repeat measurement to confirm finding; and 4. Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> 1. Notify Contractor; and 2. Check monitoring data and Contractor's working methods. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice, if any; and 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify source; 2. Inform the Engineer and Contractor; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily. 5. Discuss with Engineer for remedial actions required; 6. If exceedance continues, arrange meeting with the engineer; and 7. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Check monitoring data and Contractor's working methods; 4. Discuss with ET and Contractor on potential remedial actions; and 5. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Submit proposals for mitigation measures to the Engineer within 3 working days of notification; 2. Implement the agreed proposals; and 3. Amend proposal if appropriate.
LIMIT LEVEL			
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source; 2. Inform the Engineer and Contractor; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep EPD and the Engineer informed of results. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Check monitoring data and Contractor's working methods; 4. Discuss with ET and Contractor on potential remedial actions; and 5. Ensure remedial action properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to the Engineer within 3 working days of notification; 3. Implement the agreed proposals; and 4. Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify source; 2. Inform the Engineer and Contractor; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily. 5. Investigate the causes of exceedance; 6. Arrange meeting with EPD and the Engineer to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep EPD and the Engineer informed of the results; and 8. If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 4. Discuss among ET and Contractor on potential remedial actions; 5. Review Contractor's remedial action whenever necessary to assure their effectiveness; and 6. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop 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 the Engineer within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the Engineer until the exceedance is abated.

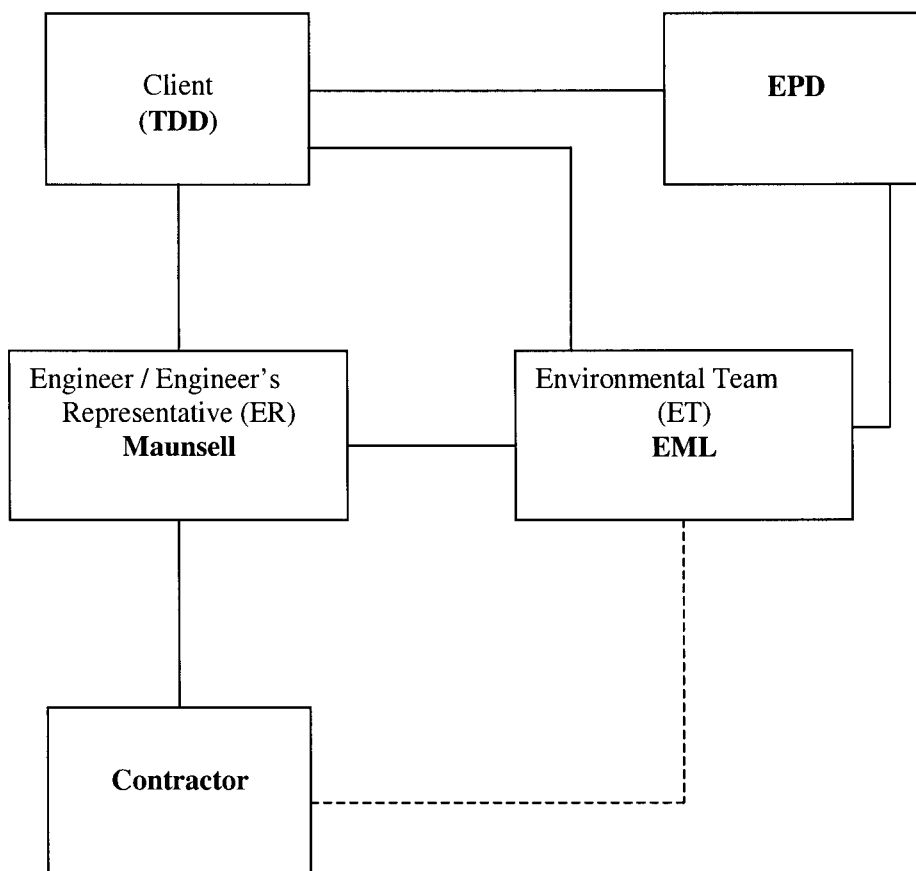
Event / Action Plan for Construction Noise

EVENT	ACTION	
	ET	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify the Engineer and Contractor; 2. Analyze investigation; 3. Require Contractor to propose measures for the analyzed noise problem; and 4. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to Environmental Team and the Engineer; and 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. Notify the Engineer and Contractor; 2. Notify EPD; and 3. Require Contractor to implement mitigation measures; and increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Implement mitigation measures; and 2. Prove to Environmental Team and the Engineer effectiveness of measures applied.

APPENDIX D:

**Project Organisation and
Contacts of Key Personnel**

Figure D.1: Project Management Structure



Contacts of Key Personnel:

Organisation	Nature of Duty	Contact Personnel	Contact Number	
			Telephone	Fax
Territory Development Department (TDD)	Client	Mr. Stephen Wong	2301-1376	2721-8630
Maunsell Consultants Asia Ltd. (MCAL)	Engineer	Mr. Alan Kwong	2602-3433	2691-2649
Environmental Management Ltd. (EML)	Environmental Team	Mr. Lawrence Tsui	2890-1090	2890-6901
EPD Complaint Hotline	24-hour Complaint Hotline	-	1823	

APPENDIX E:

**Summary Record of
Complaints Received**

Complaint No.	Received date & Time	Description (inc. location/nature of complaint)	Follow-up Action Taken	Recommended Measures	Mitigation	Status/ Remarks
C02-N1	Morning, 29/7/2002	<p>Around 9:30am on 29/7/02, police came on site to investigate a complaint of noise pollution emitted during rock breaking which carried out by the Contractor near the Site Office (near the box culvert and north Lok Shun Path Roundabout). The Contractor immediately halted the activity in response to police's advice</p>	<ul style="list-style-type: none"> Ad hoc site inspection was carried out on 31/7/02, jointly with the Engineer and Contractor The complaint log sheet, the investigation findings and recommendations on mitigation measures were submitted to the Engineer and Contractor. A letter, addressing to the complainant, will be sent to the police. 	<p>Mitigation actions:</p> <ul style="list-style-type: none"> Excavator-mounted breaker shall not be carried out within 125m from any nearby noise sensitive receivers and; Temporary purposed built barrier should be installed whenever there are high noise level construction activities. 	<p>The complaint was considered as ad hoc rather than continuous. It is therefore considered not necessary to increase the noise monitoring frequency</p> <p>File Closed.</p>	
C02-N2	Night-time, 7 August, 2002	<ul style="list-style-type: none"> Nearby residents complained to police that a generator in Road D15 Site was operating in night-time near Lok Lo Ha Village. Police came to the site to investigate the complaint and inform watchmen to turn off the operating generator at around 8:30pm. The complaint was valid as it concerned with construction noise during the restricted hours. 	<ul style="list-style-type: none"> Ad hoc site inspection was carried out on 8 August 02, jointly with the Engineer and Contractor and ET. The complaint log sheet, the investigation findings and recommendations on mitigation measures were submitted to the Engineer and Contractor. A letter in both English and Chinese, addressing to the complainant, has been sent to the police. 	<p>Mitigation actions:</p> <ul style="list-style-type: none"> Under the Noise Control Ordinance, the carrying out of general construction work using powered mechanical equipment (including generators) during the restricted hours (between 7 p.m. and 7 a.m. or at any time on a general holiday (including Sunday) is prohibited unless a valid Construction Noise Permit is in force; A watchmen or site staff should be employed to check daily that all generators and plats are switched off after the permissible working hours. 	<p>File Closed.</p>	

APPENDIX F:

**Construction Program for
Current and Next Quarter**
