

Ocean Park Master Redevelopment Project

Quarterly Environmental Monitoring & Audit Report – from October to December 2011

Certified by  on 7-February-12
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Verified by Independent Environmental Checker on 7-February-12
IEC Certificate attached in the submission? Yes

Ocean Park Master Redevelopment Project

Quarterly EM&A Report for October to December 2011

Submitted by Ocean Park Corporation on 07-02-2012

This is to verify that

Quarterly EM&A Report for October to December 2011

Submitted by Ocean Park Corporation

On 07-02-2012

Has been verified by the undersigned.

Signed



Dr Anne F Kerr
Independent Environmental Checker (IEC)
Retained by Ocean Park Corporation
pursuant to Environmental Permit No. EP-249/2006/B

Date

7 February 2012



Ocean Park Master Redevelopment Project

Quarterly Environmental Monitoring & Audit Report – from
October 2011 to December 2011

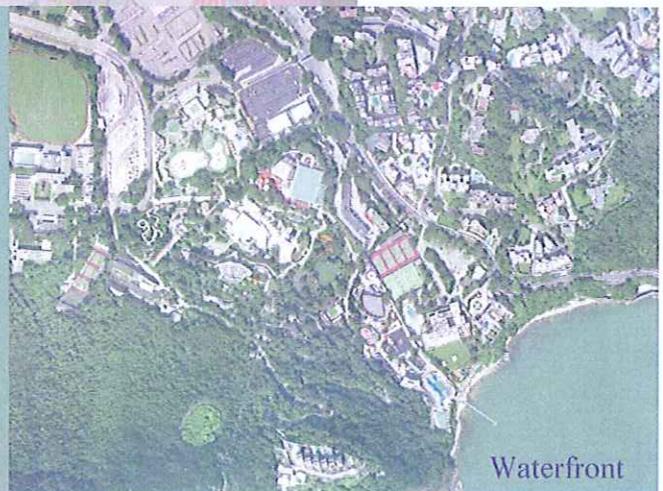




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EXECUTIVE SUMMARY

This is the nineteenth combined Quarterly Environmental Monitoring and Audit (EM&A) report for the Project "Master Redevelopment Project of Ocean Park". This report summarizes the EM&A works performed in the period between 26 September 2011 and 25 December 2011 for construction works and between 27 August 2011 and 26 November 2011 for Operational monitoring.

On completion of the works and opening of the Entry Plaza, Aqua City and Grand Aquarium to the public on 27 January 2011, the construction works under CI07 have been completed, and, as advised to EPD on 1 April 2011 (PD/PW/GOV/151/006107), no further construction monitoring for noise and air quality would be carried out.

Environmental monitoring for the Parks Operations commenced upon the opening of Aqua City and with the commencement of the Symbio Show on 27 January 2011.

Environmental Monitoring – Construction Works

Environmental Monitoring and Audit Progress

A summary of monitoring and audit activities for the construction works conducted in the reporting quarter is listed below:

Coral monitoring	1 session for Site 1-5 and Control Station C
Environmental site inspection	3 sessions (include IEC audit)

Air Quality & Noise Monitoring

Construction air quality & Noise monitoring have ceased since January 2011

Terrestrial Ecology

Terrestrial ecology monitoring had ceased since September 2008.

Coral Monitoring

The eighth coral monitoring survey, after the Coral Re-tagging exercise in November 2009, was conducted on 19 November 2011 for Site 1-5 & Control Station in the reporting quarter. The results showed that there was no exceedance of Action and Limit Levels.

Environmental Monitoring – Symbio Show

Monitoring was carried out from 27 August 2011 – 26 November 2011, for Operational Monitoring.

To satisfy potentials concerns over RSP concentrators, the number of monitoring stations was increased to a total of 3 monitoring stations. Monthly monitoring has taken place at each of the monitoring stations. No exceedance of A/L Level is monitored during the reporting period.

Noise monitoring was conducted at five designated noise monitoring locations in accordance with the approved EM&A Manual with 26 measurement sessions being carried out at each of the 5 monitoring stations.

Noise Monitoring results indicated that the background corrected Lagoon Night Show Noise Levels and the Daily Operational Noise Levels have complied with the Limit Levels at most of the monitoring stations during most of the monitoring dates.

Noise Monitoring results indicated that the background corrected Noise Levels have complied with the Limit Levels at most of the monitoring stations during most of the monitoring dates. Noise exceedances were recorded at AON1 (Open Area adjacent to Police Training School) and AON3 (Woodgreen Estate) due to noise emanating from the bus terminus and high background noise from the visitors and traffic during public holidays when visitors were leaving; at AON2 (Roof of Old Canteen Building) and AON4 (Manly Villa) due to special event held at Ocean Park and at AON3

(Woodgreen Estate) and AON5 (Hau Yuen) due to the traffic noise from Shouson Hill Road and construction works near the Cable Car Terminal.

The exceedances at AON2 were mainly due to special events held at Ocean Park and investigations were conducted to review the potential causes for the recorded noise levels. Noise from special event was minimised as far as practicable by monitoring the noise level, lowering the volume of speakers along the queue lines and other areas and appropriately adjusting the angles of speakers.

Environmental Complaints and Prosecutions

No complaint, non-compliance from IEC, summons or prosecution related to environmental issues was made against the Project within the reporting quarter.

1. INTRODUCTION

Background

- 1.1 The "Master Redevelopment Project of Ocean Park" (hereinafter known as the "Project") is implemented by the Ocean Park Corporation at its existing site of Ocean Park and Nam Long Shan, Aberdeen. The Project involves both reconstruction/modification of existing facilities and expansion of the Park, and therefore under Environmental Permit, EP-249/2006/B.
- 1.2 The construction works of the project consists of various contracts. Details of the contracts, which are required to perform the EM&A programme, are shown in **Table 1.1** below.

Table 1.1 Details of the Contracts

Contract No.	Contract Title	Contractor	Construction Commencement	Construction Completion
CI-05	Site Formation, Funicular Tunnel and Miscellaneous Works	Dragages-Bouygues JV	12 March 2007	June 2009
CS-01	Vet Hospital	Kaden – ATAL JV	26 March 2007	October 2008
CW-02	Astounding Asia	W. Hing Construction Co. Ltd.	1 August 2007	February 2010
CI-07	Entry Plaza, Aqua City and Grand Aquarium	Leighton Construction (Asia) Limited	15 August 2008	January 2011
CS-02	Rainforest	W. Hing Construction Co. Ltd.	11 May 2009	April 2011
CS-03	Thrill Mountain & Polar Adventure	Kaden – ATAL JV	2 November 2009	Ongoing

- 1.3 The contractors will conduct environmental monitoring and audits during the construction stage and produce contract specific monthly & quarterly EM&A reports. The RSS would prepare a combined quarterly EM&A for the whole project. This is the combined quarterly EM&A Report including the IEC audit findings for CS03 EM&A Works together with the Environmental Monitoring for the Park's Operation and the Symbio Show. This report presents the results of EM&A works conducted in the reporting quarter from 26 September 2011 to 25 December 2011 for construction works and in the reporting month of 27 August 2011 – 26 November 2011, for Operational Monitoring.

Project Organization and Contacts of Key Management

- 1.4 An organization structure and the line of communication were set up for the Project between the Project Proponent, Project Manager's Representative (PMR), Independent Environmental Checker (IEC), the Contractor and the Environmental Team (ET). The project organization and contact details of key management are shown in **Figure 1.1** and **Appendix A** respectively.

Construction Activities during the Reporting Quarter

- 1.5 Construction Activities had ceased for the following contracts.
- Waterfront (CI-05) – Construction Phase had ceased in early June 2009
 - Vet Hospital (CS-01) – Construction Phase had ceased in mid October 2008
 - Astounding Asia (CW-02) – Construction Phase had ceased in mid February 2010
 - Entry Plaza, Aqua City and Grand Aquarium (CI-07) – Construction Phase had ceased in January 2011
 - Rainforest (CS02) – Construction Phase had ceased in April 2011
- 1.6 The site activities during the reporting quarter are summarized in **Table 1.2**. The status of Construction permits is provided in **Appendix B**.

Table 1.2 Summary of Works undertaken in the Reporting Quarter

Thrill Mountain and Polar Adventure (CS03)

Item	Work Activity	Month		
		Oct 11	Nov 11	Dec 11
1	Construction of Tuxedos Restaurant at South Pole;	√	√	√
2	Finishing works of Bobsled Station superstructure and installation of rides	√	√	√
3	Erection of structure steel works for Thrill Mountain	√	√	
4	Finishing works at Thrill Mountain	√	√	
5	Carry out wall finishing works for PA Building	√	√	√
6	Theme works at PA Building	√	√	√
7	Finishing works at Floorless Coaster Station	√	√	
8	Wet trade work at Floorless Coaster	√	√	
9	Erection of structural steel for Face Marquee	√	√	
10	Erection of Structural Steel	√	√	

	for Hair Raiser			
11	Installation of theme works	√	√	√
12	Disposal of existing Stockpile	√	√	√
13	Erection of structure steel works at Bobsled Station			√
14	Defect works at Thrill Mountain			√

- 1.7 Layout plans of the Project are provided in Figure 1.2 (CS-03 Thrill Mountain and Polar Adventure).
- 1.8 The status of submissions until 25 December 2011 as specified in the Environmental Permit No. EP-249/2006/B is presented in Table 1.3.

Table 1.3 Status of Environmental Submissions

EP-249/2006/B Condition	Submission	Revision	Status
Contract CI05			
1.12	Notification of Commencement Date of construction stage	Dated 14 February 2007	Submitted to EPD on 15 February 2007
2.3	Management Organization	Dated 15 December 2006	Submitted to the EPD on 29 December 2006.
2.4	Construction Programme	2 Dated 14 February 2007	Submitted to the EPD on 15 February 2007
2.13	Drainage Proposal	A2 Dated 26 April 2007	Placed in EIAO Register Office for public information on 30 May 2007
2.14	Silt Curtain Proposal	B Dated 30 January 2007	Placed in EIAO Register Office for public information on 1 March 2007
2.18	As-built Drawing for Enhancement Works for Pond 35	A Dated 17 July 2007	Placed in EIAO Register Office for public information on 7 August 2007
2.20a	Transplantation Proposal for Uncommon Plant Species	D Dated 27 August 2007	Placed in EIAO Register Office for public information on 25 September 2007
2.20b	Detailed Compensatory Planting As-built Drawing	A Dated 4 October 2007	Placed in EIAO Register Office for public information on 30 October 2007
2.21	Waste Management Plan	D Dated 27 August 2007	Placed in EIAO Register Office for public information on 25 September 2007
3.3	Baseline Air Quality	B	Submitted to the EPD on 5

EP-249/2006/B Condition	Submission	Revision	Status
	and Noise Monitoring Report	Dated 28 February 2007	March 2007
3.3	Baseline Coral Survey Report	A Dated 13 June 2007	Submitted to the EPD on 18 June 2007
All Contract (including CW02, CI07, CS02 & CS03)			
3.1 and under Section 13.14 of EM&A Manual	Quarterly EM&A Report for October to December 2009	A Dated	Submitted to the EPD on 22 February 2010
3.4	Monthly EM&A Report for January 2010	A Dated 1 March 2010	Submitted to the EPD on 5 March 2010
3.4	Monthly EM&A Report for February 2010	A Dated 17 March 2010	Submitted to the EPD on 22 March 2010
3.4	Monthly EM&A Report for March 2010	A Dated 21 March 2010	Submitted to the EPD on 26 March 2010
3.1 and under Section 13.14 of EM&A Manual	Quarterly EM&A Report for January to March 2010	A Dated 23 April 2010	Submitted to the EPD on 28 April and re-submit on 17 May 2010
3.4	Monthly EM&A Report for April 2010	A Dated 31 May 2010	Submitted to the EPD on 3 June 2010
3.4	Monthly EM&A Report for May 2010	A Dated 21 June 2010	Submitted to the EPD on 22 June 2010
3.4	Monthly EM&A Report for June 2010	A Dated 14 July 2010	Submitted to the EPD on 15 July 2010
3.1 and under Section 13.14 of EM&A Manual	Quarterly EM&A Report for April to June 2010	A Dated 16 July 2010	Submitted to the EPD on 16 July 2010
3.4	Monthly EM&A Report for July 2010	A Dated 11 August 2010	Submitted to the EPD on 13 August 2010
3.4	Monthly EM&A Report for August 2010	A Dated 9 September 2010	Submitted to the EPD on 13 September 2010
3.4	Monthly EM&A Report for September 2010	A Dated 11 October 2010	Submitted to the EPD on 13 October 2010
3.1 and under Section 13.14 of EM&A Manual	Quarterly EM&A Report for July to September 2010	A Dated 11 October 2010	Submitted to the EPD on 13 October 2010

EP-249/2006/B Condition	Submission	Revision	Status
3.4	Monthly EM&A Report for October 2010	A Dated 10 November 2010	Submitted to the EPD on 10 November 2010
3.4	Monthly EM&A Report for November 2010	A Dated 14 December 2010	Submitted to the EPD on 14 December 2010
3.4	Monthly EM&A Report for December 2010	A Dated 24 February 2011	Submitted to the EPD on 24 February 2011
3.1 and under Section 13.14 of EM&A Manual	Quarterly EM&A Report for October to December 2010	A Dated 16 March 2011	Submitted to the EPD on 17 March 2011
3.4	Monthly EM&A Report for January 2011	A Dated 4 March 2011	Submitted to the EPD on 4 March 2011
3.4	Monthly EM&A Report for February 2011	A Dated 4 April 2011	Submitted to the EPD on 4 April 2011
3.4	Monthly EM&A Report for March 2011	A Dated 28 April 2011	Submitted to the EPD on 28 April 2011
3.1 and under Section 13.14 of EM&A Manual	Quarterly EM&A Report for January to March 2011	A Dated 16 March 2011	Submitted to the EPD on 17 March 2011
3.4	Monthly EM&A Report for April 2011	A Dated 25 May 2011	Submitted to the EPD on 25 May 2011
3.4	Monthly EM&A Report for May 2011	A Dated 22 May 2011	Submitted to the EPD on 22 May 2011
3.4	Monthly EM&A Report for June 2011	A Dated 1 August 2011	Submitted to the EPD on 1 August 2011
3.1 and under Section 13.14 of EM&A Manual	Quarterly EM&A Report for July to September 2011	A Dated 1 November 2011	Submitted to the EPD on 1 November 2011
3.4	Monthly EM&A Report for October 2011	A Dated 1 December 2011	Submitted to the EPD on 1 December 2011
3.4	Monthly EM&A Report for November 2011	A Dated 21 December 2011	Submitted to the EPD on 21 December 2011
3.4	Monthly EM&A Report for December 2011	A Dated 16 December 2011	Submitted to the EPD on 7 February 2012
CityBus Limited			
2.5	Written Notice on Completion of Total Petroleum	Dated 17 January 2007	Submitted to the EPD on 22 January 2007

EP-249/2006/B Condition	Submission	Revision	Status
	Hydrocarbon (TPH) Contaminated Soil Disposal		
2.6	Written Notice on Completion of Solidification Treatment of Heavy Metals Contaminated Soil	Dated 17 January 2007	Submitted to the EPD on 22 January 2007.
2.8	As-built Remediation Plan	Dated 14 March 2007	Submitted to the EPD on 16 March 2007
Hong Kong School of Motoring Ltd.			
2.10	Confirmation letter to confirm that land contamination remediation works within HKSM has been completed	Dated 13 April 2007	Submitted to EPD on 13 April 2007.
Environmental Permit Conditions			
2.24	Glare Impact Assessment Report	Dated 9 June 2010	Submitted to EPD on 11 June 2010.
2.25	Noise Review Study Report	Dated 14 October 2010	Submitted to EPD on 19 October 2010.
2.29	Air Quality Sampling Plan	Dated 14 October 2010	Submitted to EPD on 25 November 2010.
2.31	Air Quality Monitoring Programme	Dated 13 April 2011	Submitted to EPD on 28 April 2011
2.31	Trial PSEM Displays - Air Quality Monitoring Report	Dated 28 January 2011	Submitted to EPD on 28 January 2011
2.31	Use of PSEM for Two Shows - Air Quality Sampling Plan	Dated 21 November 2011	Submitted to EPD on 21 November 2011
2.31	Trial PSEM Displays - Preliminary Air Quality Monitoring Results	Dated 14 December 2011	Submitted to EPD on 14 December 2011

2. ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

Monitoring Parameters and Locations

Construction Works

- 2.1 Under EP-249/2006/B condition 3.2, impact environmental monitoring, including sampling, measurements and necessary remedial action should be conducted in accordance with the requirements of the EM&A Manual, which as been updated to include operational monitoring or the Ocean Park Symbio Show.
- 2.2 Contract CS03 at the Summit for the Thrill Mountain and Polar Adventure is still underway. However, other than ongoing Coral Survey, no construction monitoring will be undertaken for those works, only auditing works. The audits will continue to be carried out by the Contractors ET and OPC's ET and verified by the IEC.

Coral

- 2.3 The locations of the coral monitoring stations are presented in the table below and as shown in the **Figure 1.3**.

Coral Impact Monitoring Stations	Identity/Description
Site 1	Seaside near the Lowland
Site 2 to Site 5	Around Headland
Control Station	Between Near Round Island and Chung Hom Kok

Ocean Park Symbio Show

- 2.4 Operational Stage Monitoring for Ocean Park Symbio Show commenced on the 27 January 2011.
- 2.5 Air Quality monitoring was conducted monthly at the agreed designated air quality monitoring station (AQMS) located at locations as presented in **Table 2.1** below and as indicated in **Figure 1.4**:

AQMS ID	Location	Sampling Height (m above ground)
AM1	Rooftop of Administrative Building (former Staff Quarter) in Ocean Park	10
AM2	Landscape Storage Area in Ocean Park	3
AM3	Rooftop of Main Medical Block of Graham Hospital	20

Table 2.1 Location of Air Quality Monitoring Stations

- 2.6 One 24-hr average RSP sample was collected on each scheduled day for monitoring by a High Volume Sampler (HVS) following the USEPA method, EPA IO-2.1. Calibration of the equipment has followed the requirements set out in EPA IO-2.1.
- 2.7 Noise monitoring was conducted at five designated noise monitoring locations in accordance with the approved EM&A Manual. Alternative noise monitoring had been proposed because of accessibility problem, as set out in **Table 2.2** below and in **Figure 1.5**.

Monitoring Noise Monitoring Stations	Description	Location	With or without Façade Correction
AON1	Open Area adjacent to Police Training School	1.2m above street level	Without façade correction
AON2	Old canteen building, Ocean Park	1.2m above street level	With façade correction
AON3	Woodgreen Estate	1.2m above street level near the entrance gate	Without façade correction
AON4	Manly Villa	1.2m above street level near the entrance	With façade correction
AON5	Hau Yuen	1.2m above street level outside boundary wall	With façade correction

Table 2.2 Location of Noise Monitoring Stations

- 2.8 Six consecutive measurements of LAeq, 5 min reading were carried out to calculate the LAeq, 30 min noise level during the Lagoon Show.
- 2.9 Six consecutive measurements of LAeq, 5 min reading were carried out to calculate the LAeq, 30 min noise level before the lagoon night show, ie during daily operation of the Ocean Park without the Lagoon Show.
- 2.10 Three consecutive measurements of LAeq, 5 min reading were carried out to calculate the LAeq, 15 min noise level after the lagoon night show, ie without operation of the Ocean Park to establish the background noise levels.
- 2.11 Any significant influencing factors on the measured noise levels were taken into account in accordance with standard acoustical principles and practices. The corrected noise level due to the lagoon night show and the operation of Ocean Park was computed based on the background noise level and measured noise level.

Monitoring Methodology and Calibration Details

- 2.12 All monitoring works were conducted and monitoring equipment was regularly calibrated in accordance with the EM&A Manual. The calibration certificates were provided in the Monthly EM&A report.

Environmental Quality Performance Limits (Action and Limit Levels)

- 2.13 The environmental quality performance limits, i.e. Action and Limit levels (AL Levels) were derived from the baseline monitoring results and/or other approaches as detailed in the EM&A Manual. Should the measured environmental quality parameters exceed the AL Levels, the respective action plans would be implemented.

Environmental Mitigation Measures

- 2.14 Relevant mitigation measures as recommended in the Project EIA Report had been stipulated in the EM&A Manual and EMIS for the Contractor to adopt.

3. MONITORING RESULTS

Construction Monitoring Results

- 3.1 Construction monitoring has been completed in January 2011 and no construction monitoring has taken place in the reporting quarter.

Terrestrial Ecology

- 3.2 The monitoring of transplanted plants at the receptor has been completed in August 2008.

Marine Ecology

- 3.3 The 8th coral monitoring survey, after the Coral Re-tagging exercise in November 2009, was conducted on 19 November 2011. The monitoring survey showed that the change in level of sedimentation on the tagged colonies was minor and all tagged corals were in good condition and healthy in all the 5 monitoring Sites and the Control Site C. Neither Action nor Limit levels of sedimentation, bleaching or mortality was exceeded. The table of results are shown in **Appendix C**.

Operational Stage Monitoring for Ocean Park Symbio Show - Air Quality

- 3.4 For Air Quality Monitoring, 24-hr average Respirable Suspended Particulates (RSP) monitoring was conducted at a designated monitoring stations AM1, AM2 and AM3 on 20-21 Sept, 20-21 Oct and 28-29 Nov 2011 as detailed in **Table 3.1** below.
- 3.5 No 24-hour average RSP concentrations were monitored at AM1, AM2 and AM3 due to mechanical failure of the High Volume Sampler (HVS). The HVS has been repaired and 24-hour average RSP concentrations were measured at AM1, AM2 and AM3 on 28 November 2011. The results of the monitoring will be presented in the next quarterly monitoring report.
- 3.6 No exceedance of A/L Level was reported during the monitoring period. The graphical presentation of the monitoring results is provided in **Appendix D**.

Monitoring Location	Monitoring Date	24-hr RSP Concentration (μgm^{-3})	Action/Limit Level (μgm^{-3})
AM1 (Rooftop of Administrative Building (Old Staff Quarters in Ocean Park))	20-21 Sept 2011	55	180
	20-21 Oct 2011	54	180
AM2 (Landscape Storage Area)	20-21 Sept 2011	52	180
	20-21 Oct 2011	51	180
	9-10 August 2011	14	180
AM3 (Rooftop of the Main Medical Block of Graham Hospital)	20-21 Sept 2011	56	180
	20-21 Oct 2011	61	180

Table 3.1 Air Quality Monitoring Results

Operational Stage Monitoring for Ocean Park Symbio Show - Noise

- 3.7 Noise Monitoring results indicated that the background corrected Lagoon Night Show Noise

Levels have complied with the Limit Levels at all of the monitoring stations during all except one of the monitoring dates. The graphical presentation of the monitoring results is provided in **Appendix E**.

- 3.8 Noise Monitoring results indicated that the background corrected Noise Levels have complied with the Limit Levels at most of the monitoring stations during most of the monitoring dates. Noise exceedances were recorded at AON1 (Open Area adjacent to Police Training School) and AON3 (Woodgreen Estate) due to noise emanating from the bus terminus and high background noise from the visitors and traffic during public holidays when visitors were leaving; at AON2 (Roof of Old Canteen Building) and AON4 (Manly Villa) due to special event held at Ocean Park and at AON3 (Woodgreen Estate) and AON5 (Hau Yuen) due to the traffic noise from Shouson Hill Road and construction works near the Cable Car Terminal.
- 3.9 The exceedances at AON2 were mainly due to special events held at Ocean Park and investigations were conducted to review the potential causes for the recorded noise levels. Noise from special event was minimised as far as practicable by monitoring the noise level, lowering the volume of speakers along the queue lines and other areas and appropriately adjusting the angles of speakers.

Table 3.2 Summary of Daily Operational Noise Exceedance during this Reporting Period

Date	Noise Monitoring Station	Measured Noise Level, dB(A)		Daily Operational Noise Level, (Background Corrected) ^(a) , Leq (30 min) dB(A)	Limit Level Leq (30 min) dB(A)
		Daily Operational Noise Level Leq (30 min) dB(A)	Background Noise Level, Leq (15 min) dB(A)		
30 Aug 2011 (Weekday)	AON3	67.3	65.7	61.9	55
4 Sep 2011 (Public Holiday)	AON3	63.5	62.6	56.0	55
		63.4 ^(b)	62.6	56.0 ^(c)	55
6 Sep 2011 (weekday)	AON3	66.5	64.5	62.0	55
		66.1 ^(b)	64.5	60.9 ^(c)	55
11 Sep 2011 (Public Holiday)	AON5	59.7	55.5	57.6	55
		63.8	62.4	61.3	60
14 Sep 2011 (weekday)	AON3	66.9	65.3	61.6	55
18 Sep 2011 (Public holiday)	AON1	67.2	66.1	63.3	60
		66.0	63.0	58.9	55
21 Sep 2011 (weekday)	AON3	66.5	65.5	59.8	55
		65.8 ^(b)	64.8	58.9 ^(c)	55
25 Sep 2011 (Public Holiday)	AON1	69.0	66.1	68.9	60
		68.7 ^(b)	66.1	68.2 ^(c)	60
	AON2	73.0	68.0	71.2	60
		72.0 ^(b)	68.0	69.7 ^(c)	60
AON4	61.2	54.6	60.1	55	
	60.7 ^(b)	54.6	59.5 ^(c)	55	
27 Sep 2011 (weekday)	AON3	66.9	65.4	61.5	55
		65.9 ^(b)	65.4	56.2 ^(c)	55
2 Oct 2011 (Public holiday)	AON1	67.1	66.1	63.1	60
		68.0 ^(b)	66.1	66.5 ^(c)	60
		71.2	68.0	68.4	60
3 Oct 2011 (weekday)	AON2	70.6 ^(b)	68.0	67.1 ^(c)	60
		67.0	65.4	61.8	55
9 Oct 2011 (Public holiday)	AON3	66.4 ^(b)	65.4	59.7 ^(c)	55
		68.5	66.1	67.7	60
AON1	67.2 ^(b)	66.1	63.6 ^(c)	60	
	AON2	71.9	68.0	69.6	60

		71.2 (b)	68.0	68.3(c)	60
11 Oct 2011 (weekday)	AON3	65.0 64.8(b)	63.8 63.8	59.1 57.8 (c)	55 55
16 Oct 2011 (Public holiday)	AON1	67.6 66.7 (b)	66.1 66.1	65.1 60.9(c)	60 60
	AON2	72.5 73.1 (b)	68.0 68.0	70.5 71.4(c)	60 60
18 Oct 2011 (weekday)	AON1	64.8	63.7	61.1	60
23 Oct 2011 (Public holiday)	AON1	69.6 68.3(b)	66.1 66.1	70.1 67.2(c)	60 60
	AON2	74.0 74.1 (b)	68.0 68.0	72.8 72.8(c)	60 60
25 Oct 2011 (Public Holiday)	AON1	64.1	61.8	63.4	60
	AON3	65.5 65.3(b)	64.5 64.5	58.5 57.8 (c)	55 55
30 Oct 2011 (Public Holiday)	AON2	73.2 (b)	72.8	62.0 (c)	60
6 Nov 2011 (Public holiday)	AON1	68.7 67.4 (b)	66.8 66.8	67.1 60.8 (c)	60 60
	AON3	63.3 63.7 (b)	62.4 62.4	55.7 57.8 (c)	55 55
13 Nov 2011 (Public Holiday)	AON3	65.2	64.0	59.0	55
15 Nov 2011 (weekday)	AON1	64.3	61.7	63.8	60
	AON3	66.4	65.7	57.6	55
15 Nov 2011 (weekday)	AON1	64.3	61.7	63.8	60
	AON3	66.4	65.7	57.6	55
20 Nov 2011 (Public Holiday)	AON1	70.4 69.6 (b)	69.2 69.2	67.3 62.7 (c)	60 60
	AON3	64.1 62.8 (b)	61.8 61.8	60.3 55.8 (c)	55 55
22 Nov 2011 (weekday)	AON1	64.5 (b)	63.2	61.5 (c)	60
	AON2	62.9	58.3	61.0	60
	AON3	66.9 (b)	66.2	58.7 (c)	55

Note:

- (a) The Background corrected Noise Levels were either measured in front of a façade or with façade correction of 3dB(A).
- (b) Lagoon Night Show Level
- (c) Lagoon Night Show Noise level (Background corrected)

4. AUDIT RESULTS FOR CONSTRUCTION PHASE

Implementation Status of Environmental Mitigation Measures

- 4.1 This was the nineteenth quarter of Ocean Park Master Redevelopment Project including Contract CS02 and CS03. The major activities were summarized in Table 1.2. The Contractor and sub-Contractor had implemented most of the mitigation measures to minimize the environmental impacts due to construction activities. Regarding a few minor observations as noted during ET's site inspections, the Contractor and sub-Contractor rectified all the problems and no major environmental impact was induced.
- 4.2 IEC's audits were carried on monthly basis (i.e. on 18 October 2011, 15 November 2011 and 20 December 2011). No non-compliance was issued for CS03. Observations details were provided in the Monthly EM&A report.
- 4.3 The status of the construction phase audits are as follows.
- 4.3.1 *CI05 (Construction phase had ceased in early-June 2009)*
- 4.3.2 *CS01 (Construction phase had ceased in mid-October 2008)*
- 4.3.3 *CW02 (Construction phase had ceased in mid-February 2010)*
- 4.3.4 *CI07 (Construction phase had ceased in January 2011)*
- 4.3.5 *CS02 (Construction phase had ceased in April 2011)*
- 4.3.6 *CS03*

October 2011

- (a) General Refuse were scattered around the site.
- (b) A diesel drum and an air compressor were placed upon the bare ground and not provided with drip trays.
- (c) Part of the paved access road was dry and dusty
- (d) The Contractor was recommended to ensure that all cement mixing works were carried out with enclosure with 3 sides and the top enclosed.

November 2011

- (a) General Refuse were scattered around the site.
- (b) The Contractor was recommended to ensure that mortar mixing works were carried out with enclosure with the top and three sides enclosed.
- (c) Idled stockpile of sand was uncovered.

December 2011

- (a) General Refuse were scattered around the site.
- (b) The Contractor was recommended to ensure that mortar mixing works were carried out with enclosure with the top and three sides enclosed.
- (c) Over 20 bags of cement were not covered.
- (d) An idled stockpile of sand was not covered.

Status of Environmental Licensing and Permitting

- 4.4 Environmental licenses and permits including Environmental Permit for the Project, construction noise permits, chemical waste producer and effluent discharge license were in place and valid during the reporting quarter.

Advice on Materials Management Status

- 4.5 Table 4.1 summarises the estimated amounts of different types of materials generated from the Project during the reporting quarter as below:

Materials Type	Estimated Amount			Disposal Locations
	Oct 11	Nov 11	Dec 11	
C&D waste	339.80 tonnes	302.80 tonnes	165.70 tonnes	SENT Landfill
	--	--	--	TKOSF
Excavated Material (mainly soil)	818.70 tonnes	627.50 tonnes	319.90 tonnes	CWPFBP
	--	--	--	TKOFB
Chemical waste	nil	nil	nil	Collected by licensed collector
General waste	--	--	--	Collected by licensed collector

Table 4.1 Estimated Amounts of Different Types of Materials Generation from October 2011 to December 2011

5. NON-COMPLIANCE (EXCEEDANCES) OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMITS (ACTION AND LIMIT LEVELS)

Summary of Exceedances – Construction Phase

- 5.1 As there was no exceedance during the reporting quarter, no further action was required.

Summary of Exceedances – Operational Phase

- 5.2 For Air Quality Monitoring, no exceedance was reported during the September & October monitoring periods. In November, the monitoring was not carried out due to a malfunction of the equipment. The monitoring was subsequently conducted and the results will be available in the next quarterly report. As agreed with EPD, the number of monitoring stations was increased and additional monitoring and analysis was carried out.
- 5.3 Noise Monitoring results indicated that the background corrected Lagoon Night Show Noise Levels have complied with the Limit Levels at most of the monitoring stations during most of the monitoring dates.
- 5.3 The background corrected Noise Levels have complied with the Limit Levels at most of the monitoring stations during most of the monitoring dates. Noise exceedances were recorded at AON1 (Open Area adjacent to Police Training School) and AON3 (Woodgreen Estate) due to noise emanating from the bus terminus and high background noise from the visitors and traffic during public holidays when visitors were leaving; at AON2 (Roof of Old Canteen Building) and AON4 (Manly Villa) due to special event held at Ocean Park and at AON3 (Woodgreen Estate) and AON5 (Hau Yuen) due to the traffic noise from Shouson Hill Road and construction works near the Cable Car Terminal.

6. ENVIRONMENTAL COMPLAINTS

Complaints Log

- 6.1 No complaints were received during the reporting period.

Complaints Handling Procedure

- 6.2 All complaints will be handled in accordance with the EM&A Manual. The complaint handling procedure and the complaint log are provided in Appendix F.

7. NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

- 7.1 No summon or prosecution related to environmental issues was made against the Project within the reporting quarter.

8. COMMENTS, CONCLUSIONS AND RECOMMENDATIONS

- 8.1 During this quarter, no complaints were received.
- 8.2 No summons and prosecutions related to environmental issues were made against the Project in the reporting quarter.
- 8.3 The implemented EM&A programme ensured that any environmental impacts to the receivers would be readily detected and timely actions could be taken to rectify any non-compliance. Assessment and analysis of monitoring results collected demonstrated the environmental acceptability of the Project. Weekly site inspections ensured that the EIA recommendations were effectively implemented.

Construction Phase

- 8.4 On completion of the works and opening of the Entry Plaza, Aqua City and Grand Aquarium to the public on 27 January 2011, the construction works under CI07 have been completed, and, as advised to EPD on 1 April 2011 (PD/PW/GOV/151/006107), no further construction monitoring for noise and air quality would be carried out.
- 8.5 In the reporting quarter, no terrestrial ecology monitoring was conducted. According to the requirement in the EM&A Manual, the last two terrestrial ecology monitoring had been completed in August 2008.
- 8.6 In the reporting quarter, one coral monitoring was conducted and the results showed that there was no exceedance of Action and Limit Levels.

Operational Phase

- 8.7 For the operational phase, daily operational noise and lagoon night show noise monitoring was carried out at five designated monitoring stations during this reporting period. Noise exceedances were recorded at each of the five stations due to various circumstances.
- 8.8 Noise monitoring at the same stations using the same frequency and approach will be continued during the first year of the operation of the open-air night show.
- 8.9 To satisfy potentials concerns over RSP concentrators, Monthly monitoring has been conducted in three AQ monitoring stations in September and October 2011. The results were found to be within the AQO. Due to mechanical failure of the HVS, 24-hour average RSP concentrations were not measured at AM1, AM2 and AM3 in the reporting period 27 October to 26 November and the results of the monitoring will be presented in the next quarterly monitoring report.

Appendix A



APPENDIX A – CONTACTS OF KEY ENVIRONMENTAL PERSONNEL

Company	Contact Person	Position	Telephone No.
Ocean Park Corporation Operations	Frankie Hau	Senior Environmental Health & Safety Manager	39232639
Ocean Park Corporation Construction	Lindsay Pickles	Environmental Team Leader	29103109
Ocean Park Corporation Master Redevelopment Project	Arthur Wong	Project Manager Representative (PMR)	2552 1285
Mott MacDonald Hong Kong Ltd	Dr. Anne Kerr	Independent Environmental Checker	28285757
Kaden – ATEL JV (for Contract CS03)	Winson Chung	Contractor's Asst. ETL	93261588

Appendix B

Appendix B - Licenses and Permits

Permits & Licences

CS03 (KAJV)

Permit number	Starting Date	Expired Date	Location	Status
Construction Noise Permit				
GW-RS0516-11	9-June-11	30-Nov-11	Construction Noise Permit for Top of Nam Long Shan Rd., Ocean Park, 180 Wong Chuk Hang, Hong Kong	Valid
GW-RS1128-11	9-Dec-11	31-May-12	Construction Noise Permit for Top of Nam Long Shan Rd., Ocean Park, 180 Wong Chuk Hang, Hong Kong	Valid
Notification of Construction Work under APCO				
311433	N/A	N/A	Thrill Mountain & Polar Adventure	Notified
Effluent Discharge License				
WT00005926-2010	N/A	N/A	Thrill Mountain & Polar Adventure	Valid
Registration as Chemical Waste Producer				
WPN5213-176-K2880-02	26 Nov 09	N/A	Form Oil, Lubricant oil, paint, solvent & diesel	Registered
Construction Waste Disposal Billing Account with EPD				
7009695	N/A	N.A	Thrill Mountain & Polar Adventure	Issued

Appendix C



Lam Environmental Services Limited

Ocean Park Corporation Master
 Redevelopment Project
 Contract No. CS-03
 Thrill Mountain and Polar Adventure

Table 3.2 Sites 1 to 5 and Control Site C – Percentage and thickness of Sedimentation, Bleaching and Mortality of the Re-tagged Coral Colonies in Coral Re-tagging Exercise and Baseline Data Collection (November 2009) and the Present Monitoring Survey (November 2011). “▲” and “▼” indicate increased and decreased in percentage, respectively, when compared with the coral re-tagging exercise and baseline data collected in November 2009.

Site 1

Code	Coral Species	Area (cm ²)	Sedimentation (% , mm)			Bleaching (%)			Mortality (%)				
			21 Nov 09 (baseline)	May 2011	Aug 2011	Nov 2011	21 Nov 09 (baseline)	May 2011	Aug 2011	Nov 2011	21 Nov 09 (baseline)	May 2011	Aug 2011
A1	<i>Platygyra carmosus</i>	1200	0,0	0,0	0,0	0,0	0	0	0	0	0	0	0
A2	<i>Favites abdita</i>	400	5,1	2,1▼	0,0▼	2,1▼	0	0	0	2	2	2	2
A3	<i>Plesiastrea versipora</i>	600	0,0	0,0	0,0▼	0,0	0	0	0	0	0	0	0
A4	<i>Leptastrea purpurea</i>	6200	0,0	5,1▲	5,1▲	5,1▲	0	0	0	0	0	0	0
A5	<i>Platygyra carmosus</i>	3200	1,1	0,0▼	0,0▼	0,0▼	0	0	0	0	0	0	0
A6	<i>Platygyra carmosus</i>	2600	0,0	0,0	0,0	0,0	0	0	0	0	0	0	0
A7	<i>Favia speciosa</i>	500	2,1	5,1▲	0,0▼	0,0▼	0	0	0	5	5	5	5
A8	<i>Platygyra carmosus</i>	1500	2,1	0,0▼	0,0▼	0,0▼	0	0	0	0	0	0	0
*A9R	<i>Leptastrea purpurea</i>	1500	4,1	-	-	8,0	-	-	-	-	-	-	-
*A10R	<i>Platygyra carmosus</i>	2250	0,0	-	-	5,0	-	-	-	-	-	-	-

*Notes: A9R and A10R are re-tagged coral colonies as A9 and A10 were damaged by anchoring or typhoon events, and not suitable for monitoring purpose.

Site 2

Code	Coral Species	Area (cm ²)	Sedimentation (% , mm)			Bleaching (%)			Mortality (%)				
			29 Nov 09 (baseline)	May 2011	Aug 2011	Nov 2011	29 Nov 09 (baseline)	May 2011	Aug 2011	Nov 2011	29 Nov 09 (baseline)	May 2011	Aug 2011
B1	<i>Platygyra carmosus</i>	1300	2,1	0,0▼	0,0▼	0,0▼	0	0	0	0	0	0	0
B2	<i>Plesiastrea versipora</i>	650	4,1	0,0▼	0,0▼	0,0▼	0	0	0	0	0	0	0
B3	<i>Psammodora superficialis</i>	4400	5,1	5,1	10,1▲	5,1	0	0	0	3	3	3	3
B4	<i>Favia speciosa</i>	800	0,0	0,0	5,1▲	0,0	0	0	0	2	2	2	2
B5	<i>Plesiastrea versipora</i>	1000	2,1	2,1	2,1	2,1	0	0	0	2	2	2	2
B6	<i>Platygyra carmosus</i>	1500	0,0	0,0	0,0	0,0	0	0	0	0	0	0	0
B7	<i>Hydnophora exesa</i>	1600	1,1	0,0▼	0,0▼	0,0▼	0	0	0	0	0	0	0
B8	<i>Plesiastrea versipora</i>	1300	0,0	0,0	0,0	0,0	0	0	0	0	0	0	0
B9	<i>Favia speciosa</i>	450	1,1	4,1▲	5,1▲	1,1	0	0	0	2	2	2	2
B10	<i>Psammodora superficialis</i>	400	0,0	1,1▲	0,0	0,0	0	0	0	0	0	0	0



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Site 3

Code	Coral Species	Area (cm ²)	Sedimentation (% , mm)				Bleaching (%)				Mortality (%)			
			28 Nov 09 (baseline)	May 2011	Aug 2011	Nov 2011	28 Nov 09 (baseline)	May 2011	Aug 2011	Nov 2011	28 Nov 09 (baseline)	May 2011	Aug 2011	Nov 2011
C1	<i>Porites sp</i>	100	2,1	4,1▲	4,1▲	5,1▲	0	0	0	0	3	3	3	3
C2	<i>Porites sp</i>	210	3,1	3,1	5,1▲	3,1	0	0	0	0	5	5	5	5
C3	<i>Goniopora stutchburyi</i>	410	5,1	0,0▼	0,0▼	0,0▼	0	0	0	0	7	7	7	7
C4	<i>Pavona decussata</i>	240	4,1	2,1▼	4,1	2,1▼	0	0	0	0	0	0	0	0
C5	<i>Pavona decussata</i>	210	3,1	0,0▼	5,1▲	0,0▼	0	0	0	0	1	1	1	1
C6	<i>Pavona decussata</i>	200	3,1	0,0▼	5,1▲	0,0▼	0	0	0	0	0	0	0	0
C7	<i>Montipora peltiformis</i>	960	3,1	3,1	3,1	3,1	0	0	0	0	0	0	0	0
C8	<i>Goniopora stutchburyi</i>	140	1,1	3,1▲	5,1▲	1,1	0	0	0	0	0	0	0	0
C9	<i>Porites sp</i>	300	3,1	3,1	3,1	3,1	0	0	0	0	0	0	0	0
C10	<i>Cyphastrea serailia</i>	600	4,1	2,1▼	4,1	2,1▼	0	0	0	0	0	0	0	0

Site 4

Code	Coral Species	Area (cm ²)	Sedimentation (% , mm)				Bleaching (%)				Mortality (%)			
			28 Nov 09 (baseline)	May 2011	Aug 2011	Nov 2011	28 Nov 09 (baseline)	May 2011	Aug 2011	Nov 2011	28 Nov 09 (baseline)	May 2011	Aug 2011	Nov 2011
E1	<i>Goniopora stutchburyi</i>	290	5,1	3,1▼	5,1	0,0▼	0	0	0	0	0	0	0	0
E2	<i>Coccinaraea sp.</i>	620	0,0	0,0	5,1▲	0,0	0	0	0	0	0	0	0	0
E3	<i>Goniopora stutchburyi</i>	300	4,1	0,0▼	5,1▲	0,0▼	0	0	0	0	3	3	3	3
E4	<i>Goniopora stutchburyi</i>	130	3,1	3,1	3,1	0,0▼	0	0	0	0	0	0	0	0
E5	<i>Goniopora stutchburyi</i>	460	6,1	3,1▼	5,1▼	3,1▼	0	0	0	0	4	4	4	4
E6	<i>Goniopora stutchburyi</i>	380	10,1	5,1▼	5,1▼	5,1▼	0	0	0	0	8	8	8	8
E7	<i>Goniopora stutchburyi</i>	120	3,1	0,0▼	0,0▼	0,0▼	0	0	0	0	0	0	0	0
E8	<i>Goniopora stutchburyi</i>	230	4,1	4,1	4,1	4,1	0	0	0	0	2	2	2	2
E9	<i>Goniopora stutchburyi</i>	170	3,1	3,1	3,1	3,1	0	0	0	0	0	0	0	0
E10	<i>Goniopora stutchburyi</i>	540	7,1	5,1▼	5,1▼	5,1▼	0	0	0	0	3	3	3	3



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Site 5

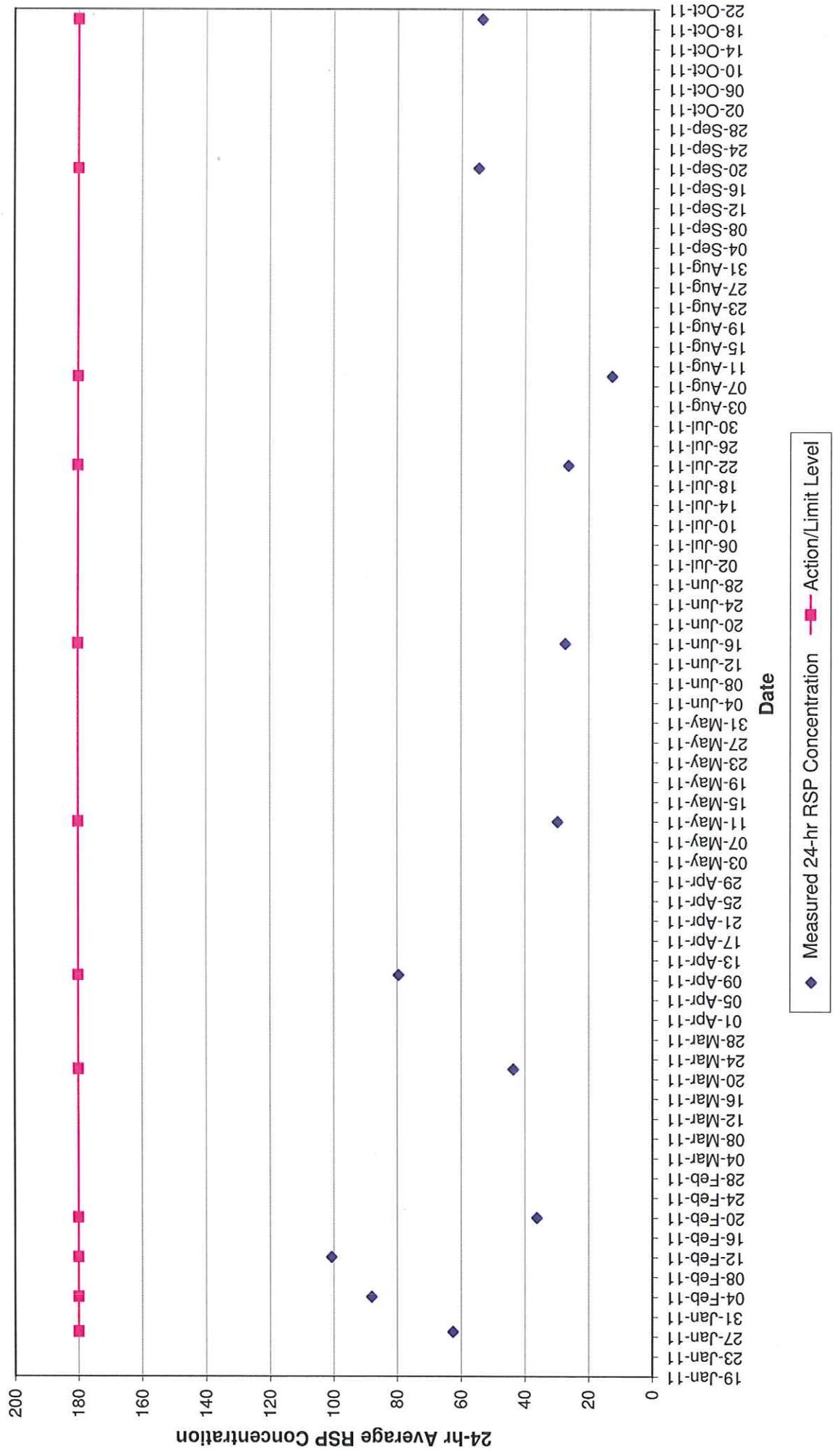
Code	Coral Species	Area (cm ²)	Sedimentation (% , mm)			Bleaching (%)			Mortality (%)				
			29 Nov 09 (baseline)	May 2011	Aug 2011	Nov 2011	29 Nov 09 (baseline)	May 2011	Aug 2011	Nov 2011	29 Nov 09 (baseline)	May 2011	Aug 2011
D1	<i>Psammocora</i> sp.	800	6, 1	5, 1▼	2, 1▼	0, 0▼	0	0	0	3	3	3	3
D2	<i>Montipora peltiformis</i>	600	4, 1	1, 1▼	1, 1▼	1, 1▼	0	0	0	0	0	0	0
D3	<i>Goniopora stutchburyi</i>	450	2, 1	0, 0▼	0, 0▼	0, 0▼	0	0	0	0	0	0	0
D4	<i>Cyphastrea seraila</i>	100	3, 1	0, 0▼	3, 1	3, 1	0	0	0	0	0	0	0
D5	<i>Montipora cf. turgescens</i>	320	4, 1	4, 1	5, 1▲	4, 1	0	0	0	0	0	0	0
D6	<i>Montipora peltiformis</i>	480	10, 1	5, 1▼	5, 1▼	5, 1▼	0	0	0	20	20	20	20
D7	<i>Montipora peltiformis</i>	500	8, 1	8, 1	8, 1	8, 1	0	0	0	2	2	2	2
D8	<i>Montipora peltiformis</i>	410	6, 1	6, 1	10, 1▲	6, 1	0	0	0	0	0	0	0
D9	<i>Montipora peltiformis</i>	200	5, 1	5, 1	10, 1▲	5, 1	0	0	0	5	5	5	5
D10	<i>Goniopora stutchburyi</i>	510	7, 1	5, 1▼	5, 1▼	5, 1▼	0	0	0	5	5	5	5

Control Site C

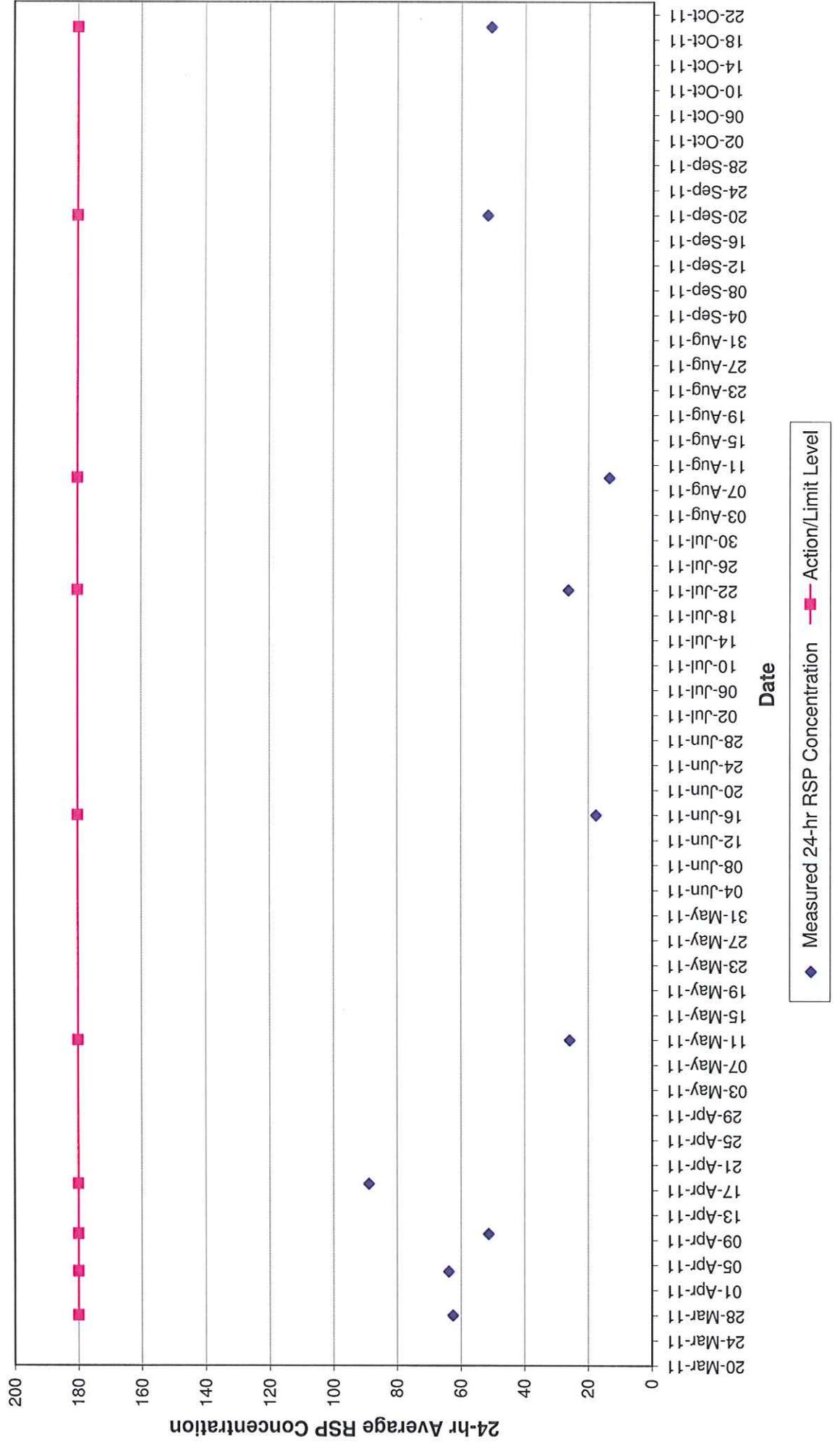
Code	Coral Species	Area (cm ²)	Sedimentation (% , mm)			Bleaching (%)			Mortality (%)				
			21 Nov 09 (baseline)	May 2011	Aug 2011	Nov 2011	21 Nov 09 (baseline)	May 2011	Aug 2011	Nov 2011	21 Nov 09 (baseline)	May 2011	Aug 2011
F1	<i>Goniastrea aspera</i>	450	2, 1	1, 1▼	2, 1	0, 0▼	0	0	0	0	0	0	0
F2	<i>Favites pentagona</i>	2100	2, 1	2, 1	2, 1	2, 1	0	0	0	2	2	2	2
F3	<i>Favites pentagona</i>	1000	0, 0	1, 1▲	5, 1▲	0, 0	0	0	0	5	5	5	5
F4	<i>Porites sp</i>	1300	2, 1	2, 1	2, 1	2, 1	0	0	0	0	0	0	0
F5	<i>Cyphastrea seraili</i>	2100	0, 0	1, 1▲	10, 1▲	10, 1▲	0	0	0	0	0	0	0
F6	<i>Porites sp</i>	2100	5, 1	5, 1	2, 1▼	5, 1	0	0	0	2	2	2	2
F7	<i>Plesiastraea versipora</i>	3000	2, 1	4, 1▲	4, 1▲	2, 1	0	0	0	0	0	0	0
F8	<i>Favites pentagona</i>	680	0, 0	1, 1▲	2, 1▲	0, 0	0	0	0	0	0	0	0
F9	<i>Favites pentagona</i>	2600	0, 0	0, 0	4, 1▲	4, 1▲	0	0	0	0	0	0	0
F10	<i>Favia rotumana</i>	600	0, 0	0, 0	1, 1▲	0, 0	0	0	0	0	0	0	0

Appendix D

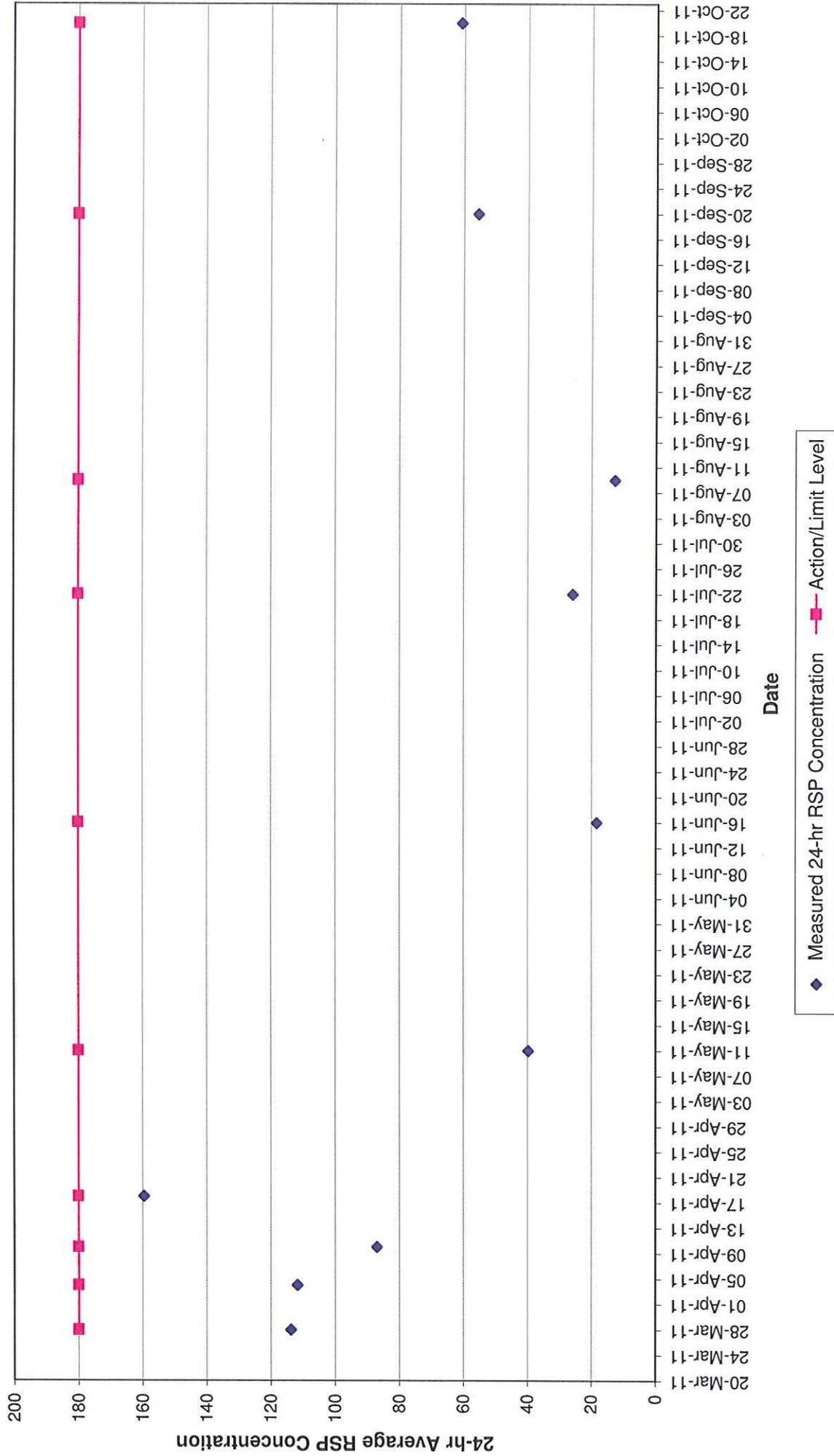
**Measured 24-hr Average RSP Concentration
AM1 - Rooftop of Administrative Building (Former Staff Quarters) in Ocean Park**



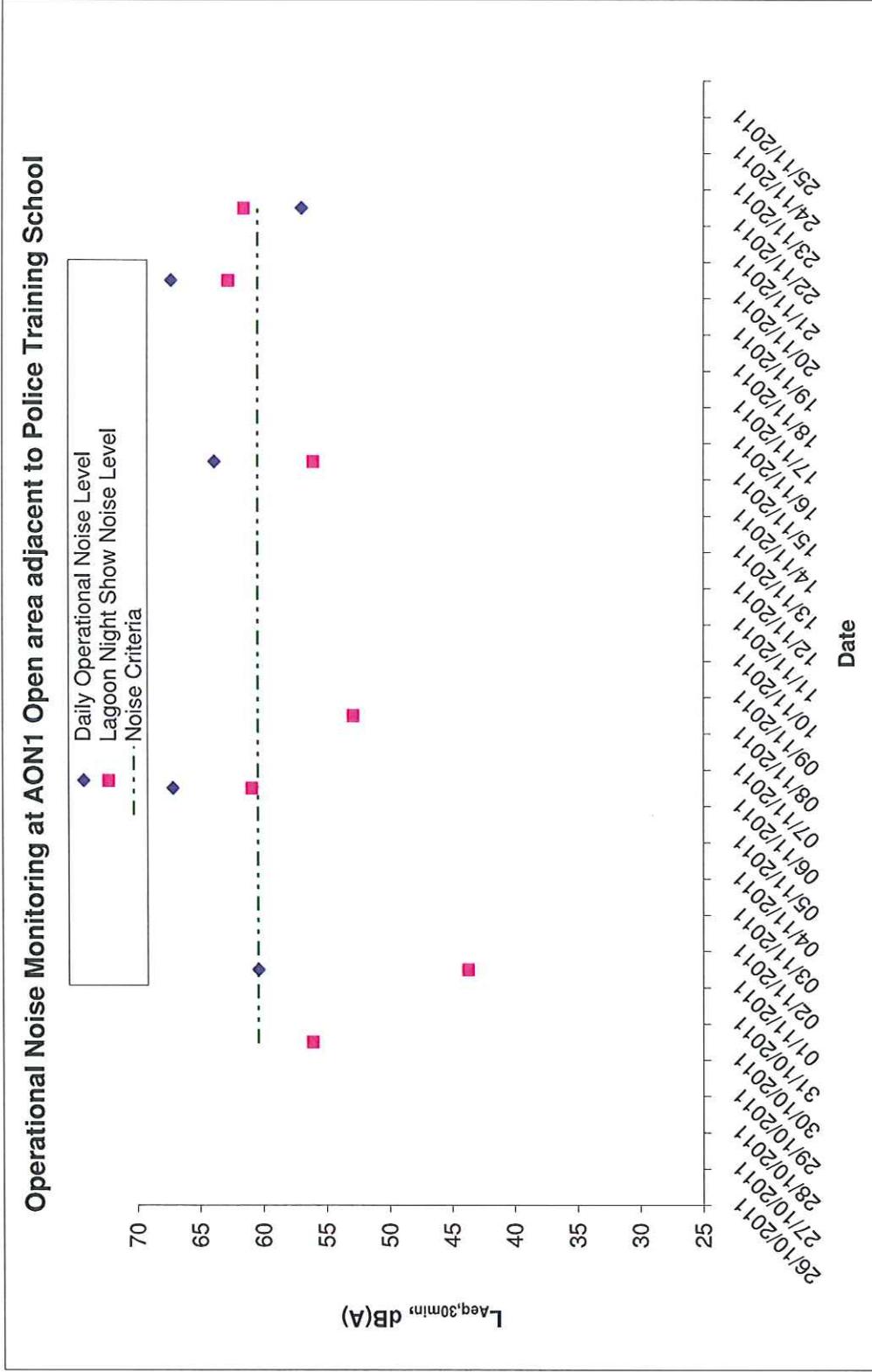
**Measured 24-hr Average RSP Concentration
AM 2 - Landscape Storage Area in Ocean Park**



**Measured 24-hr Average RSP Concentration
AM3 - Rooftop of Main Medical Block of Graham Hospital**

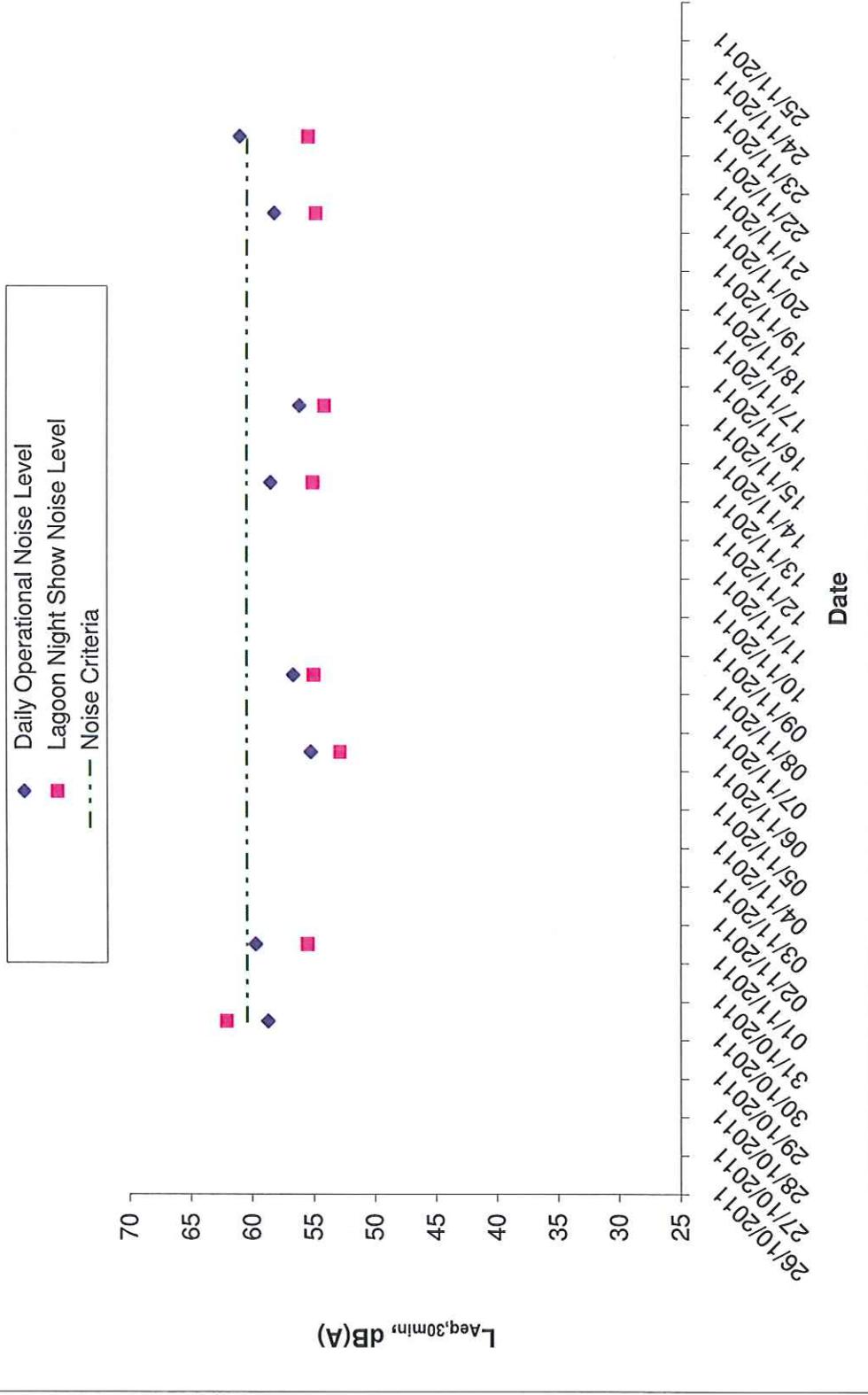


Appendix E



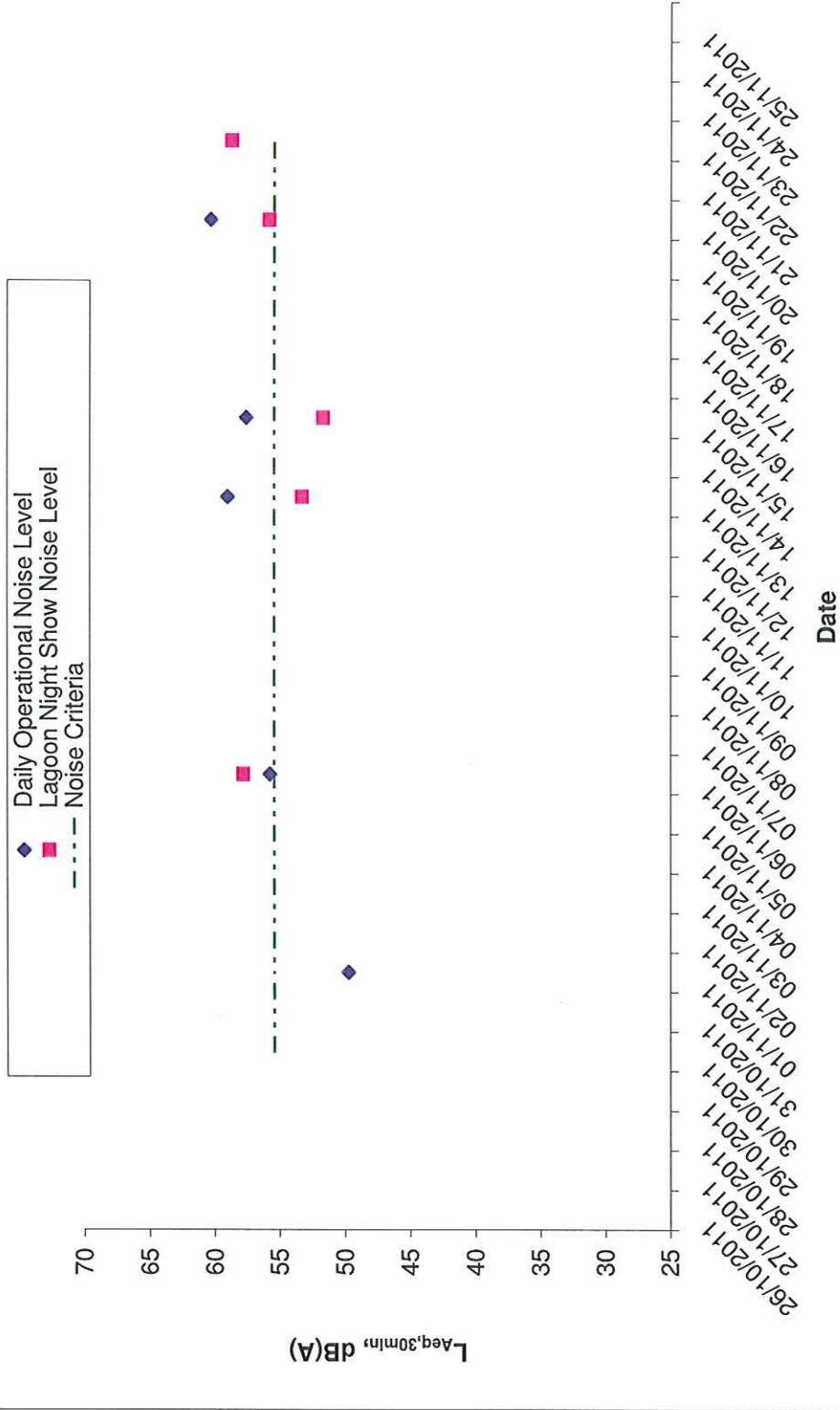
Note: The exceedances were due to the high level of background noise from visitors and traffic.

Operational Noise Monitoring at AON2 Old Canteen Building



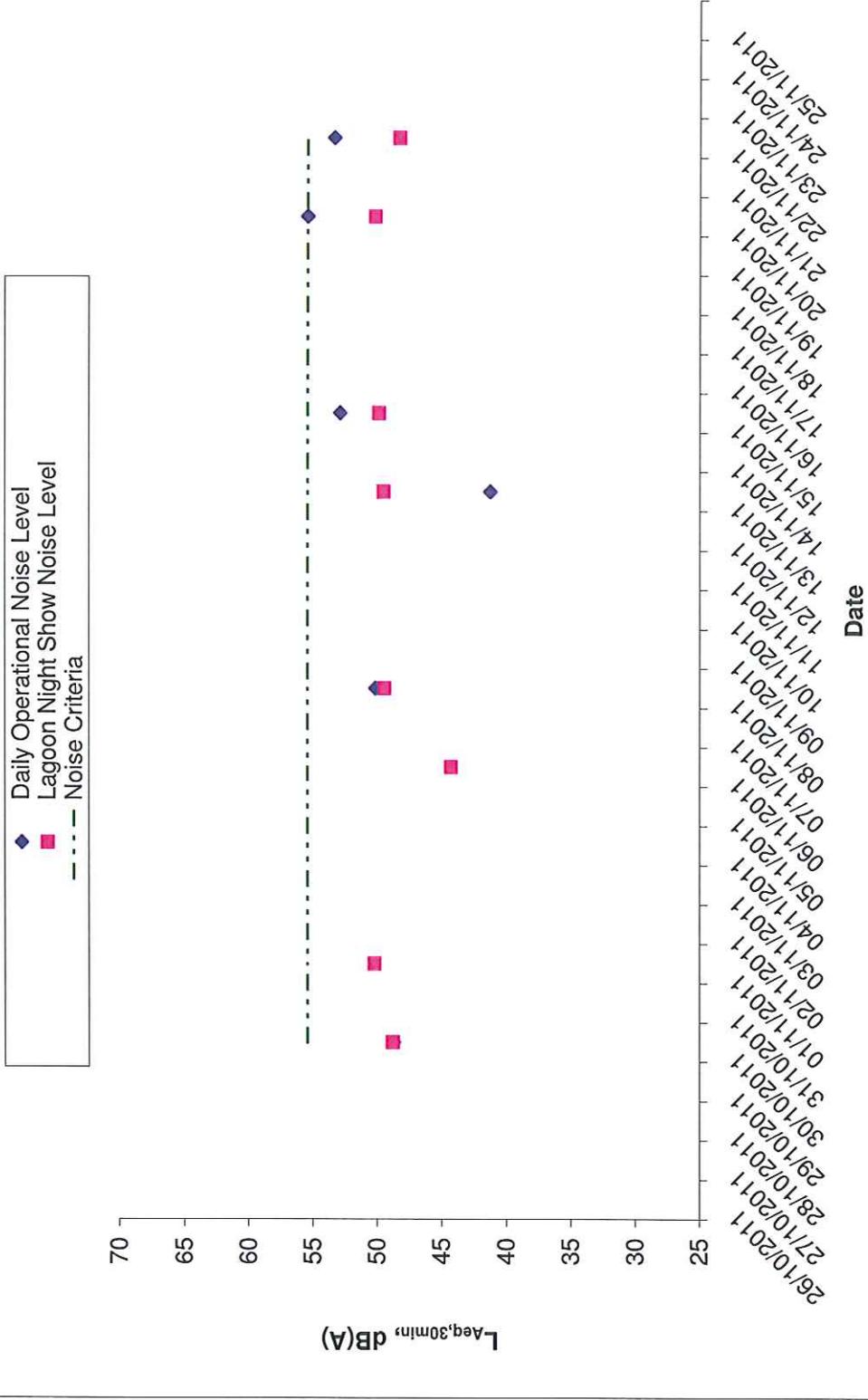
Note: The exceedances were due to noise from special event at Ocean Park and noise from construction works near the Cable Car Terminal (CNP No. GW-RS0314-11).

Operational Noise Monitoring at AON3 Woodgreen Estate

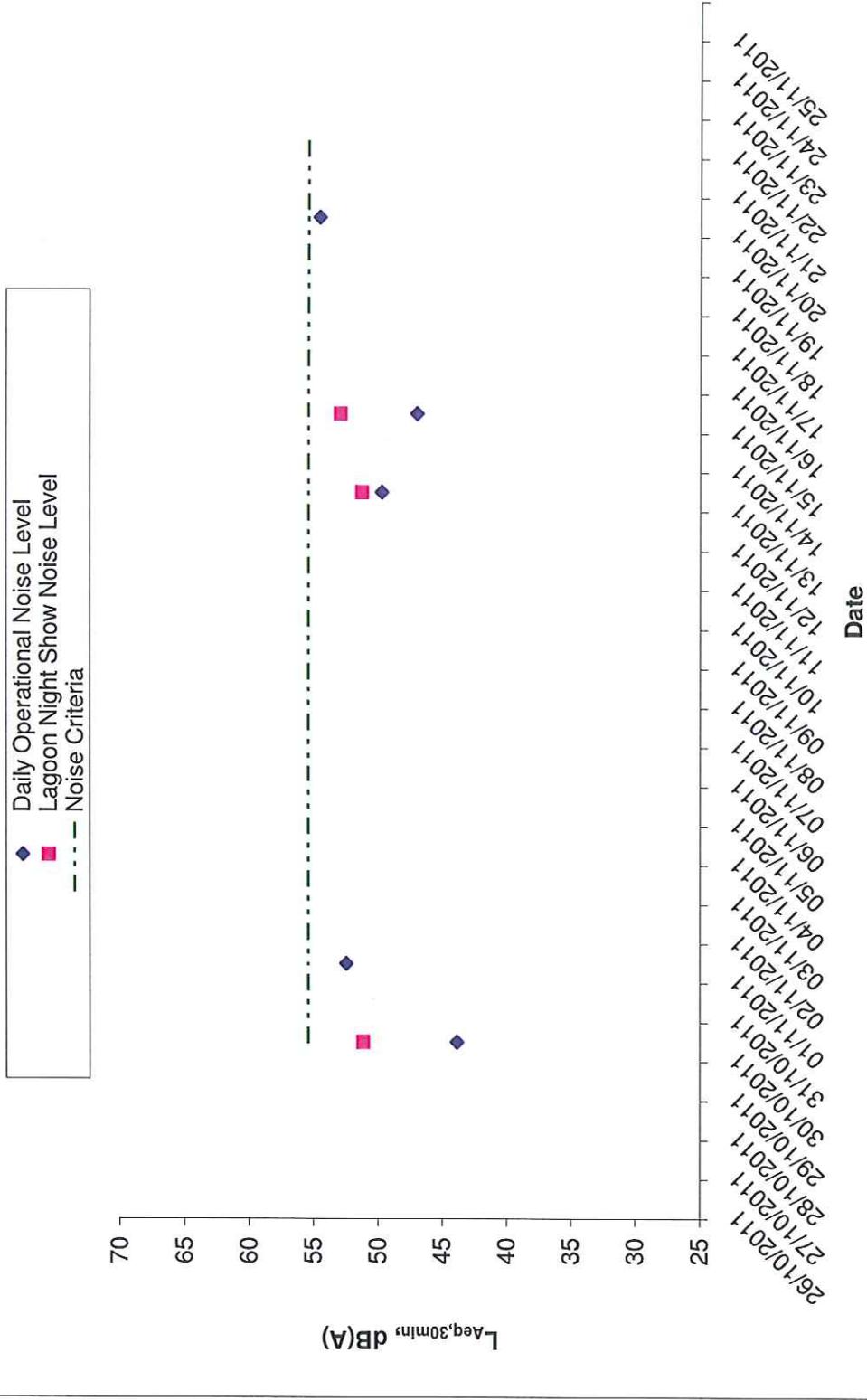


Note: The exceedances were due to the traffic noise from Shouson Hill Road.

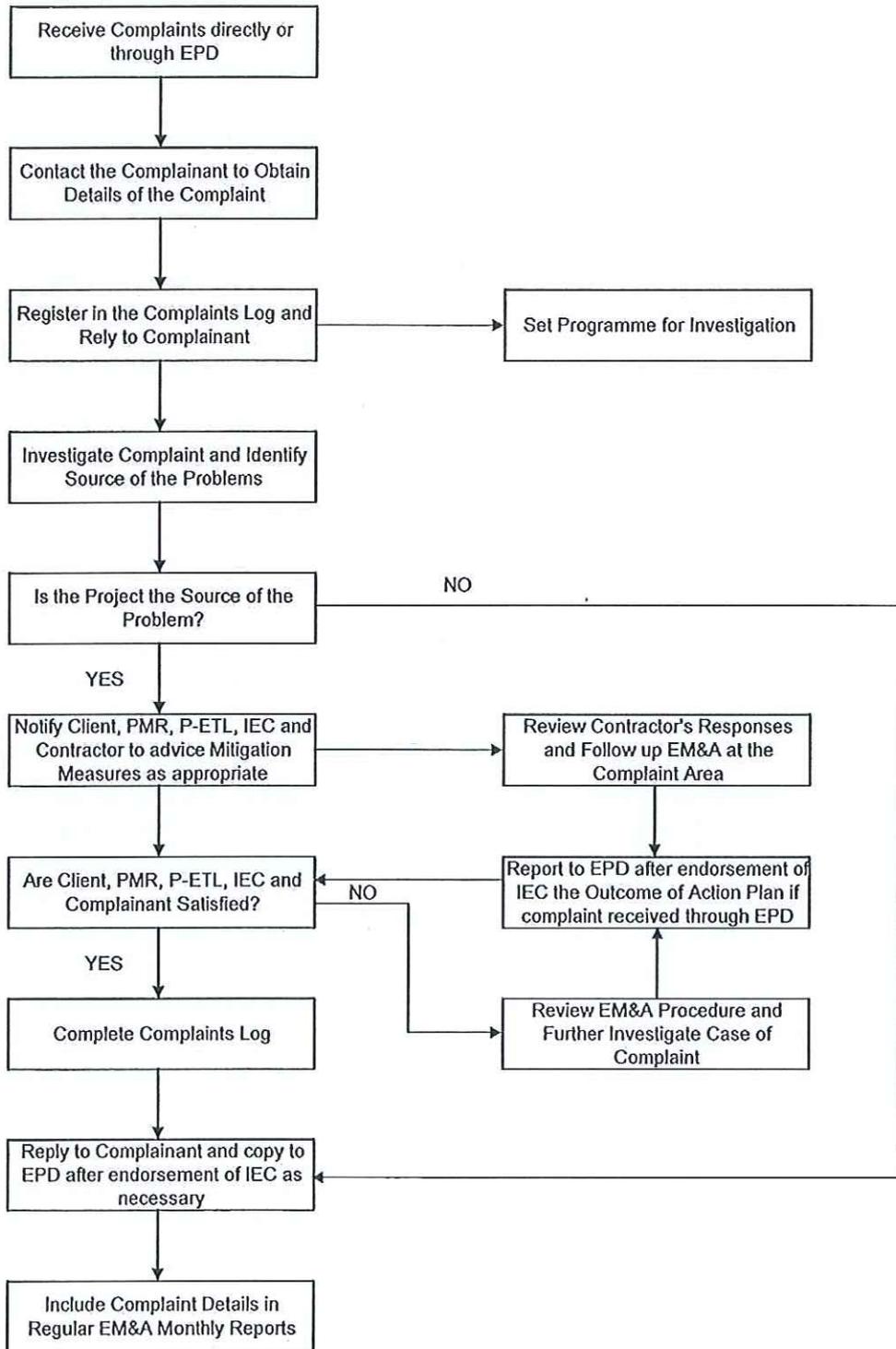
Operational Noise Monitoring at AON4 Manly Villa



Operational Noise Monitoring at AON5 Hau Yuen



Appendix F





Ocean Park Redevelopment Project
Contract No. CS03 - Thrill Mountain & Polar Adventure
Quarterly EM&A Report – October, November and December 2011

There was no Complaint Record Register during these three months

Figure 1.1

Figure 1.1 – Management Organisation

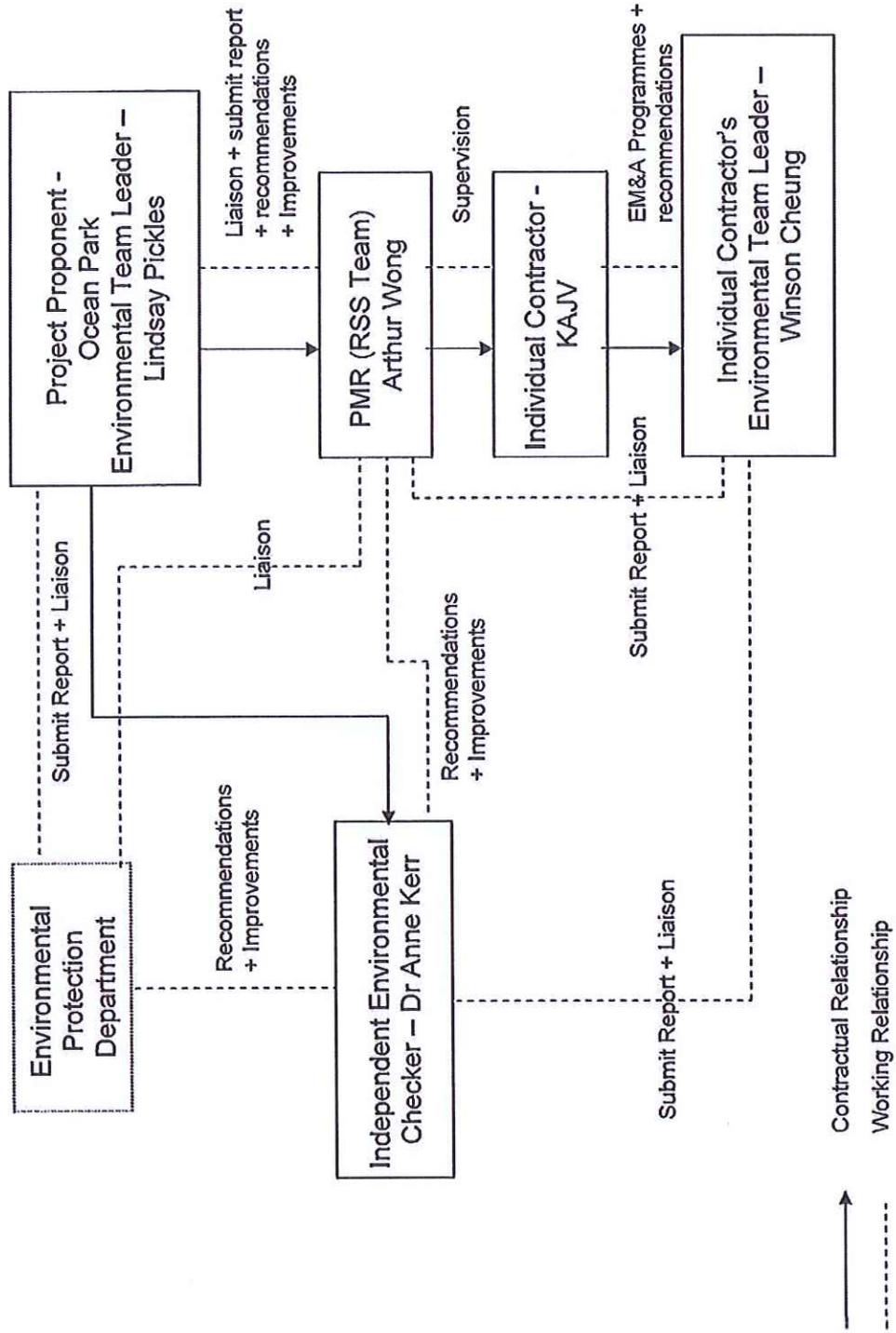
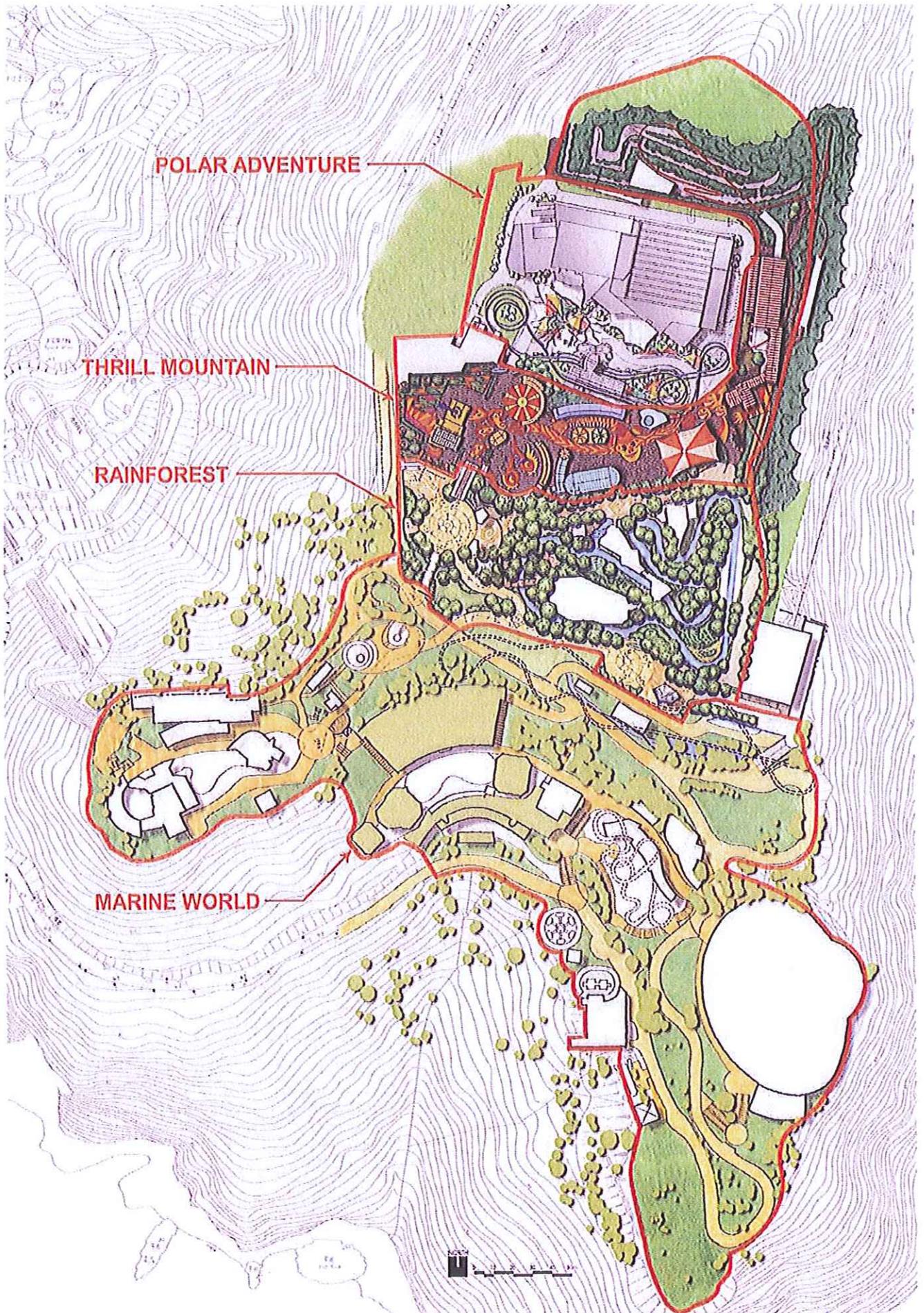


Figure 1.2



POLAR ADVENTURE

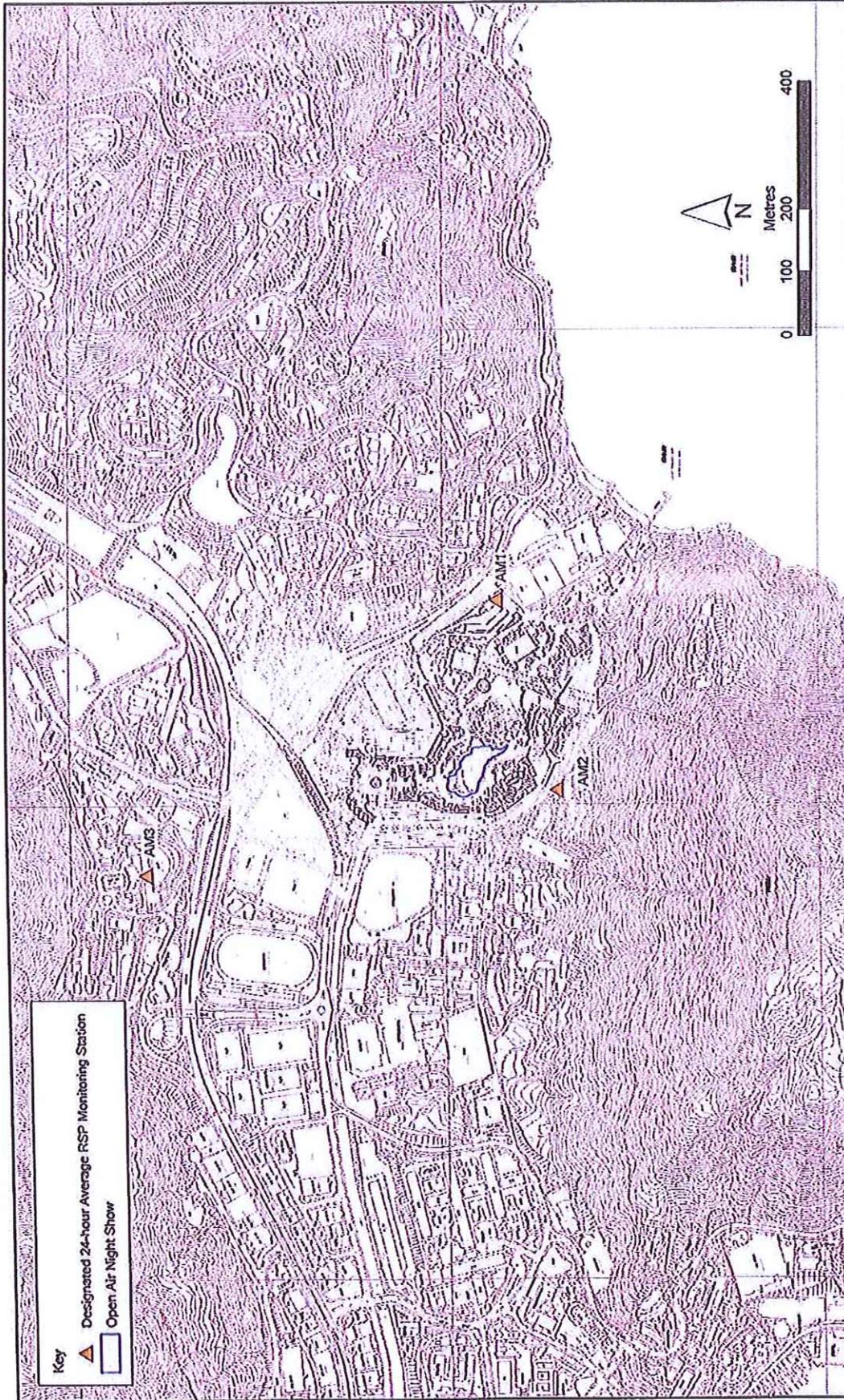
THRILL MOUNTAIN

RAINFOREST

MARINE WORLD

Figure 1.3

Figure 1.4



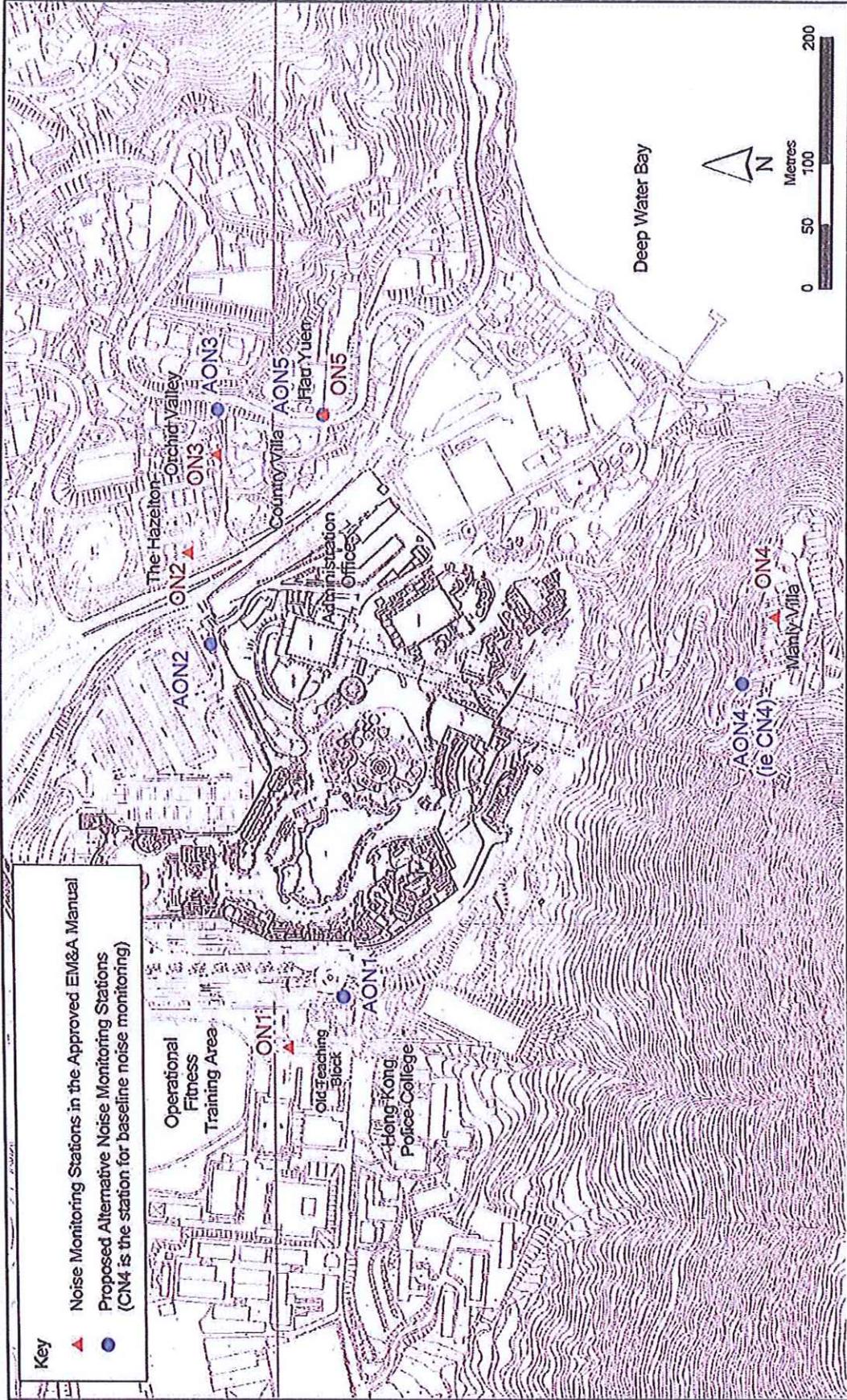
Key
 ▲ Designated 24-hour Average RSP Monitoring Station
 ▭ Open Air Night Show

Figure 2.1

Designated 24-hour Average RSP Monitoring Stations during Operation of Open Air Night Show

File: D:\2005_SCP_monitoring_station.mxd
 Date: 11/02/01

Figure 1.5



Key

- ▲ Noise Monitoring Stations in the Approved EM&A Manual
- Proposed Alternative Noise Monitoring Stations (CN4 is the station for baseline noise monitoring)

Figure 3.1

Proposed Noise Monitoring Stations in the Approved EM&A Manual and Proposed Alternative Noise Monitoring Stations

File: G:\2002\2002\year monitoring station.mxd
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