Ocean Park Master Redevelopment Project

EP-249/2006/A – Condition 3.4

Monthly EM&A Report – December 2011

Certified by _____ **on 16-Jan-12**

Lindsay Pickles (ETL)

Verified by Independent Environmental Checker on 19-Jan-12

IEC Certificate attached in the submission? Yes

Ocean Park Master Redevelopment Project

Environmental Permit No. EP-249/2006/B - Condition 3.4

Monthly EM&A Report – December 2011

Submitted by Ocean Park Corporation on 16-01-2012

This is to verify that

Monthly EM&A Report – December 2011

Submitted by Ocean Park Corporation

On 16-01-2012

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 19 January 2012

Ocean Park Master Redevelopment Project

Monthly Environmental Monitoring & Audit Report – December 2011

Table of Content

Part 1 Project Overview

Executive Summary

This is the combined monthly EM&A Report for Ocean Park Master Redevelopment Project, which includes CS03 "Thrill Mountain and Polar Adventure" under Part 2. This report presents the results of EM&A works conducted in the reporting month of December 2011 (from 26 November 2011 to 25 December 2011) for construction works and in the reporting month of November (27 October 2011 to 26 November 2011) for Operational Monitoring.

Construction works at the Entry Plaza, Aqua City and Grand Aquarium under CI07 have been completed in January 2011 and, as advised to EPD on 1 April (PD/PW/GOV/151/006107), no further construction monitoring will be undertaken.

Construction works at the Summit, CS02 for the Rainforest have been completed in April 2011.

At the Summit, Contract CS03, for the Thrill Mountain and Polar Adventure, is still underway. Other than ongoing Coral Survey, there will be no construction monitoring undertaken. The audits will continue to be carried out by the Contractors ET and OPC's ET and verified by the IEC.

Environmental monitoring for the Park's Operations has commenced upon the opening of Aqua City and with the commencement of the Symbio Show on 27 January 2011. The 10th Air Quality and Noise Monitoring Report for the Ocean Park Symbio Show is included in this report under Part 3.

No complaint, non-compliance from IEC, summons or prosecution related to environmental issues was made against the Ocean Park Master Redevelopment Project in the reporting period of December 2011 for Construction works and in the reporting month of November (27 October 2011 to 26 November 2011) for Operational Monitoring.

1. Introduction

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 under Environmental Permit, EP-249/2006/B.

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 below.

Contract No.	Contract Title	Contractor	Construction Commencement
CI-05	Site Formation, Funicular Tunnel and Miscellaneous Works	Dragages-Bouygues JV	12 March 2007 and Construction phase has ceased in early June 2009
CS-01	Back of House for Marine Mammal Veterinary Hospital	Kaden – ATAL JV	26 March 2007 and Construction phase has ceased in mid-October 2008
CW-02	Astounding Asia	W. Hing Construction Co. Ltd.	1 August 2007 and Construction phase has ceased in mid-February 2010
CI-07	Entry Plaza, Aqua City and Grand Aquarium	Leighton Contractors (Asia) Ltd.	15 August 2008 and Construction Phase has ceased in January 2011
CS-02	Rainforest	W. Hing Construction Co. Ltd.	11 May 2009 and construction has ceased in April 2011
CS-03	Thrill Mountain and Polar Adventure	Kaden – ATAL JV	2 November 2009

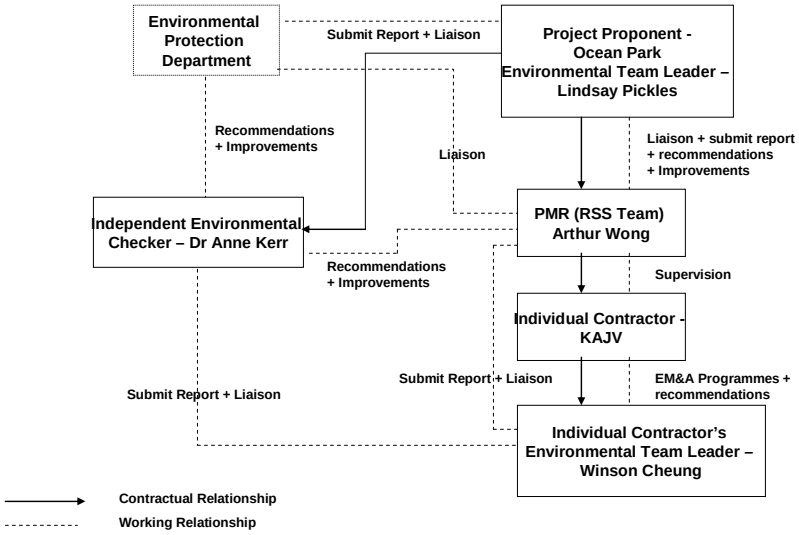
The Contractors conduct environmental audits during the construction stage and produce contract specific monthly EM&A reports. This is the combined monthly EM&A Report including the IEC audit findings, CS03 Monthly EM&A Report, and the Operational Monitoring Report for the Ocean Park Symbio Show.

This report presents the results of EM&A works conducted in the reporting month of December 2011 (from 26 November 2011 to 25 December 2011) for construction works and in the reporting month of November (27 October 2011 to 26 November 2011) for Operational Monitoring.

2. Project Organisation

The structure of the environmental management team is shown in below figure.

Figure 1.1 – Management Organisation



3. Construction Works Undertaken during the Reporting Month

In the reporting month, the construction activities are summarised as follows.

CI-05

- Construction phase has ceased in early June 2009.

CS-01

- Construction phase has ceased in mid-October 2008.

CW-02

- Construction phase has ceased in mid-February 2010.

CI-07

- Construction phase has ceased in January 2011.

CS-02

- Construction phase has ceased in April 2011.

CS-03

- Finishing works at Tuxedos Restaurant of South Pole;
- Finishing works of Bobsled Station superstructure and installation of rides;
- Erection of structure steel works at Bobsled Station;
- Defect works at Thrill Mountain;
- Carry out wall finishing works for PA Building;
- Theme works at PA Building;
- Installation of theme works and
- Disposal Existing Stockpile.

4. Permits and License Status

4.1 Environmental Permit

The Environmental Impact Assessment (EIA) Report of the Project has been approved by the Environmental Protection Department (EPD) (Register No.: AEIAR-101/2006) on 12 July 2006. Subsequently, EPD issued Environmental Permit (EP) for the construction and operation of the project. Table below is a full list of the EPs.

EP No.	Issue Date	Key Variation
EP-249/2006	28 July 2006	First EP
EP-249/2006/A	25 September 2006	• Enhance the roosting habitat for freshwater birds by enlarging Pond 35 and its surrounds with a total area of no less than 120 squares meters and no construction works and discharge from construction sites shall be allowed within Pond 35 after enhancement. • Filling of Pond 37 at the Lowland Area. • Submission of the as-built drawings showing the enhancement works of Pond 35.
EP-249/2006B	3 November 2010	• Total sound power level of all loudspeaker clusters shall not exceed 109 db(A) and the sound pressure level at 9m away from each loudspeaker cluster shall not exceed 75 db(A). • Submit noise review study. • Submit detail design of night time functional and thematic lighting. • Trial pyrotechnical special effects materials display and submit air quality sampling plan.

4.2 CNP

Table below shows a list of CNP within the reporting month.

Permit No.	Starting Date	Expired Date	Validity	Location	Contract No.	Status
CS-03 (KAJV)						
GW-RS1128-11	9-Dec-11	31-May-12	*Various*	Top of Nam Long Shan Road	CS03	Valid

4.3 Other Permits & Licenses

Tables below show lists of other permits & license for individual contracts.

CS-03

Permit/Ref/No	Valid Period		Section	Status
Notification of Construction Work under APCO				
311433	N/A	N/A	Thrill Mountain and Polar Adventure	Valid
Water Discharge License				
WT00005926-2010	12-Feb-10	28-Feb-15	Thrill Mountain and Polar Adventure	Valid

Registration as Chemical Waste Producer				
WPN5213-176-K2880-02	25-Nov-09	N/A	Thrill Mountain and Polar Adventure	Registered
Construction Waste Disposal Billing Account with EPD				
7009695	N/A	N/A	Thrill Mountain and Polar Adventure	Issued

5. EP Submissions Status

Environmental submissions to EPD since the commencement of construction works at Ocean Park, i.e. from 12 March 2007 to 25 December 2011 are as below.

Contract	Submissions
CI-05	• Notification of Commencement Date • Management Organisation Chart • Construction Programme • Drainage Proposal • Silt Curtain Proposal • Waste Management Plan • Baseline Air Quality and Noise Monitoring Report • Transplantation Proposal for Uncommon Species • Baseline Coral Survey Report • As-built Drawings of Pond 35 • Detailed Compensatory Planting As-built Drawing
CS03	• Monthly EM&A Report (November 2011)
City Bus Limited	• Written Notice on Completion of TPH Contaminated Soil Disposal • Written Notice on Completion of Solidification Treatment of Heavy Metals Contaminated • As-built Remediation Plan
Hong Kong School of Motoring Ltd.	• Confirmation Letter to confirm that Land Contamination remediation Works within HKSM has been completed
Environmental Permit Conditions	• Noise Review Study Report • Glare impact Assessment report • Air Quality Sampling Plan

6. Materials Management

Section 6.17 in the EIA report specified the disposal of materials to the public fill reception facilities should be considered as last resorts with the preferred approach to reuse the material within the project and/or other projects.

The amounts of different types of materials generated by the activities of the Project in the month are shown in following table. The total materials quantities of the project showed that the reuse of materials was maximized and the disposal to the public filling facilities was minimized. Mitigation measures under the Waste Management Plan (WMP) revision D have been implemented during the reporting period.

Materials Type	Disposal Locations	CS-03	Total
C&D Waste	SENT	165.70 Tonnes	165.70 Tonnes
	TKOSF	--	-
	TMSF	--	-
C&D Material	CWPFBP	319.90 Tonnes	319.90 Tonnes
	TKOFB	--	-
Chemical Waste	Collected by licensed collector	0 Litres	0 litres
General Waste	Collected by licensed collector	--	-

7. Environmental Monitoring and Results

7.1 Monitoring Requirements

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 has been updated to include operational monitoring of the Ocean Park Symbio Show.

7.1.1 Construction Monitoring

Construction works at the Entry Plaza, Aqua City and Grand Aquarium under CI07 have been completed in January 2011 and, as advised to EPD on 1 April 2011 (PD/PW/GOV/151/006107), no further construction monitoring will be undertaken.

One contract at the Summit, CS03 for the Thrill Mountain and Polar Adventure is still underway. However, other than ongoing Coral Survey, no construction monitoring will be undertaken for these works, only auditing works. The audits will continue to be carried out by the Contractors ET, certified by the OPC's ET and verified by the IEC.

Terrestrial Ecology

Monitoring of the health and condition of the transplanted plant species of conservation interest should be conducted at least once a month during the first

12 month after transplantation. Proposed monitoring location would be next to the Contract CI-05 site office.

Coral

The locations of the coral monitoring stations are presented in the table below.

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

Operational Stage Monitoring for Ocean Park Symbio Show for Environmental Monitoring for the Symbio Show commenced on the 27 January 2011.

Air Quality monitoring was conducted at the agreed designated air quality monitoring station (AQMS) located at locations as presented in the Table below.

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

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.

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 the Table below.

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	With 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

Six consecutive measurements of LAeq, 5 min reading were carried out to calculate the LAeq, 30 min noise level during the Lagoon Show.

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.

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.

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.

7.2 Monitoring Results

7.2.1 Construction Monitoring Results

Terrestrial Ecology

According to the requirement in the EM&A Manual, the monitoring of transplanted plants at the receptor has been completed in August 2008.

Coral

No coral monitoring survey was carried out in December 2011. The next coral monitoring survey will be carried out in February 2012.

7.2.2 Operational Stage Monitoring for Ocean Park Symbio Show

The report on the impact monitoring results for the open-air night show, which commenced on 27 January 2011, is provided at Part 3 of this report.

Air Quality Monitoring

No 24-hour average RSP concentrations were monitored at AM1, AM2 and AM3 due to mechanical failure of the 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 monthly monitoring report.

Noise Monitoring

Noise exceedances were recorded at AON1 (Open Area adjacent to Police Training School), AON2 (Roof of Old Canteen Building) and at AON3 (Woodgreen Estate) due to noise emanating from the bus terminus, high background noise from visitors and traffic, the traffic noise from Shouson Hill Road, construction works near the Cable Car Terminal and the special events held at Ocean Park which were completed by the end of October 201. Corrective actions have been identified where appropriate.

Details are provided in the summary table below.

Summary of Daily Operational Noise Exceedance during this Reporting Period:

Date	**Noise Monitoring Station**	**Measured Noise Level, dB(A)** **Daily Operational Noise Level**, Leq (30 min) **dB(A)**	**Background Noise Level,** Leq (15 min) **dB(A)**	**Daily Operational Noise Level (Background Corrected) [a],** Leq (30 min) **dB(A)**	**Limit Level,** Leq (30 min) **dB(A)**
30 Oct 2011 (Public Holiday)	AON2	73.2 (Night Show noise level)	72.8	62.0(Night Show noise Level) (Background Corrected))	60
6 Nov 2011 (Public Holiday)	AON1	68.7	66.8	67.1	60
		67.4 (Night Show Noise level)	66.8	60.8 (Night Show Noise Level (Background Corrected)	60
	AON3	63.3	62.4	55.7	55
		63.7 (Night Show Noise level)	62.4	57.8 (Night Show Noise Level) (Background Corrected)	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

Summary of Daily Operational Noise Exceedance during this Reporting Period (Cont):

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)		
20 Nov 2011 (Public Holiday)	AON1	70.4	69.2	67.3	60
		69.6 (Night Show noise level)	69.2	62.7 (Night Show noise level) (Background Corrected)	60
	AON3	64.1	61.8	60.3	55
		62.8 (Night Show noise level)	61.8	55.8 (Night Show noise Level (Background Corrected)	55
22 Nov 2011 (Weekday)	AON1	64.5 (Night Show Noise Level)	63.2	61.5 (Night Show Noise Level) (Background Corrected)	60
	AON2	62.9	58.3	61.0	60
	AON3	66.9 (Night Show Noise Level)	66.2	58.7 (Night Show Noise Level) (Background Corrected)	55

Note :

(a) The Background corrected Noise Levels were either measured in front of a façade at AON2, AON4 and AON5 or with façade correction of 3dB(A) at AON1.

8. Site Audit

8.1 IEC Site Audit

IEC conducted monthly site audit on CS-03 on 20 December 2011. Audit checklists are attached in Appendix A of Part 1.

CS-03 Observations:

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

8.2 Non- Compliance

No non-compliances were recorded in December 2011.

9. Implementation status of Environmental Mitigation Measures

Please see Part 2, of this Report for the individual contractual report for the details of the implementation of environmental mitigation measures.

10. Summary of Complaint, Summon or Prosecution

No complaint, summon or prosecution was recorded in the reporting month.

11. Future Issues

Key Issues to be considered in the coming month include:

CI-05
- Construction phase had ceased in early-June 2009.

CS-01
- Construction phase had ceased in mid-October 2008.

CW-02
- Construction phase had ceased in mid-February 2010.

CI-07
- Construction phase had ceased in January 2011.

CS-02
- Construction phase had ceased in April 2011.

CS-03
- Finishing works at Tuxedos Restaurant of South Pole;
- Finishing works of Bobsled Station superstructure and installation of rides;
- Erection of structure steel works at Bobsled Station;
- Defect works at Thrill Mountain;
- Carry out wall finishing works for PA Building;
- Theme works at PA Building;
- Installation of theme works and
- Disposal Existing Stockpile.

12. Conclusion and Recommendation

12.1 Conclusion

No non-compliance from IEC, complaint, summons or prosecution related to environmental issues was made against the Ocean Park Master Redevelopment Project in the reporting period of December 2011.

The monitoring of the 24-hour average RSP concentrations was not carried out as planned at AM1, AM2 and AM3 due to mechanical failure of the 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 monthly monitoring report.

Daily operational noise and lagoon night show noise monitoring were carried out at five designated monitoring stations during this reporting period.

Noise exceedances were recorded at AON1 (Open Area adjacent to Police Training School), AON2 (Roof of Old Canteen Building) and at AON3 (Woodgreen Estate) due to noise emanating from the bus terminus, high background noise from visitors and traffic, the traffic noise from Shouson Hill Road, construction works near the Cable Car Terminal and the special events held at Ocean Park which were completed by the end of October 201. Corrective actions have been identified where appropriate.

12.2 Recommendation

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

Air Quality Impact

- To prohibit any open burning on site.
- To regular maintain the machinery and vehicles on site.
- To implement dust suppression measures on dry surfaces.

Noise Impact

- To inspect the noise sources from inside and outside of the site.
- To space out noisy equipment and position as far away as possible from sensitive receivers.
- To have regular maintenance of vessels and equipment used.

Water Quality Impact

- To minimize water discharge runoff into nearby water body.
- To treat site surface runoffs and wastewater generated from various construction activities with wastewater treatment system (comprised of chemical coagulation, sedimentation and pH control)
- To review and implement temporary site drainage management plan.
- Silt removal facilities, channels, manholes and wastewater treatment system should be frequently cleaned the deposited silt and grit to maintain in proper condition.
- To review the adequacy of the desilting facilities' capacity.

Waste/Chemical Management

- To check for any accumulation of waste materials or rubbish on site.
- To avoid any discharge of chemical waste or oil directly from the site.
- To regularly and properly collect, store and dispose of all waste types, including floating refuses around the silt curtain.

Operational Stage Monitoring for Ocean Park Symbio Show

Recommendation has been given to continue with noise monitoring at the same stations using the same frequency and approach during the second to the twelfth months of the operation of the open-air night show.

To satisfy potentials concerns over RSP concentrators, the number of monitoring stations has been increased to a total of 3 monitoring stations. As the monitored results remain within the AQO, the frequency remains reduced to monthly.

Appendix A

Part 1 Independent Environmental Checker's Site Inspection Records

Ocean Park Master Redevelopment Project
Contract P007
Independent Environmental Checker

MONTHLY SITE INSPECTION CHECKLIST

Inspection Date	20/12/2011	Time	15:30	Inspected By	EM: IEC: Florence Yuen Contractor: CS03: W. Chung
Site Location	CS03				

Weather

Condition		Sunny		Fine	✓	Overcast		Drizzle		Rain		Storm		Hazy
Temperature	18 °C				Humidity	✓	High		Moderate		Low		
Wind	✓	Calm		Light		Breeze		Strong		Direction			

		Close-out on last comments Y/N	N/A or not obs	Yes	No	Photo/Remarks
	Construction Noise					
S2.18	Is a valid Construction Noise Permit (CNP) obtained for works during restricted hours?			✓		
S2.26	Good Site Practices: • Are the operating plants well-maintained and serviced regularly?			✓		
	• Are silencers or mufflers utilized on construction equipment? Are they properly maintained?			✓		
	• Is the mobile plant sited far enough from NSRs?			✓		
	• Are intermittently used machines and plants shut down between work periods?			✓		
	• Is the plant known to emit noise strongly in one direction, if any, oriented to direct noise away from the NSRs?		✓			
	• Is the stockpile or other structures utilized effectively, wherever practicable, in screening noise from the works?		✓			
S2.27	Are suitable quiet plants adopted?			✓		
S2.28	Are movable barriers used for both movable PME and stationary PME?		✓			
S2.29	Do the screening materials used achieve the predicted noise reduction?		✓			
S2.30	Are the noisy works avoided during examination period of the nearby school?		✓			
	Blasting Noise					
S2.32	• Are the NSRs informed of the blasting work in advance?		✓			
	• Is sufficient time allowed for alerting all the potential NSRs prior to every blasting work?		✓			

• Are proper procedures put in place to alert and minimise any startling effect on the staff working in Ocean Park?		✓			
• Is the optimal amount of charge used evaluated for noise reduction?		✓			
Landscape and Visual					
S3.10 Consideration on existing surrounding vegetation:					
• Are temporary tree nurseries set up?		✓			
• Is "no-intrusion zones" implemented?		✓			
• Is the existing vegetation protected from damage?			✓		
• Are hill fire prevention measures taken?			✓		
• Is dust and erosion controlled for exposed soil?			✓		
• Are the irrigation networks set up throughout the Establishment Period?		✓			
• Is Quarterly Report on existing trees to be retained or transplanted prepared by the Contractor?		✓			
S3.11 Consideration on appearance and view:					
• Is the appearance of hoardings suitable?			✓		
• Is the appearance of construction workers, plants/machines suitable?			✓		
• Are the screening and alignment of the temporary barging point and conveyor system suitable?		✓			
• Are the selected security floodlights suitable		✓			
Ecology					
S4.5 Transplantation:					
• Is the transplantation work supervised by a qualified botanist/horticulturalist in the ET?			✓		
• Are the transplanted plant species of conservation interest monitored during the first 12 months after transplantation?			✓		
S4.7 Construction:					
• Is the runoff entering watercourses avoided by control measure, especially during heavy rain?			✓		
• Is the site runoff directed to regularly cleaned and maintained silt traps (or oil separators)?			✓		
• Are sediment traps included in drainage to collect and control construction run-off?			✓		
• Is suitable size silt traps or oil interceptor used?			✓		
• Is vegetation survey carried out to determine the feasibility and suitability of individual plants for transplantation?			✓		
• Are the trees located within the works area preserved suitably?			✓		
• Are individual plants of conservation interest transplanted prior to the construction phase?			✓		
• Are the equipments and stockpiles placed in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats?			✓		

- Are construction activities restricted to the work areas demarcated? ✓
- Are waste skips provided to collect general refuse and construction wastes? ✓
- Are the wastes disposed of timely and properly off-site? ✓
- Is open burning on works sites prohibited? ✓
- Are native plant species made use of as far as possible on newly formed land? ✓

Construction Waste

S5.4 Good Site Practices

- Are arrangements made for collection and effective disposal of all wastes generated? ✓
- Are the waste management and chemical handling procedures followed? ✓
- Are sufficient waste disposal points provided? ✓ ①P1140567
- Are the wastes disposed of regularly? ✓
- Are appropriate measures taken to minimise windblown litter and dust during transportation of waste by either covering trucks or transporting wastes in enclosed containers? ✓
- Are the drainage systems, sumps and oil interceptors regularly cleaned and maintained? ✓

S5.5 Waste Reduction Measures:

- Is the C&D waste from demolition and decommissioning of existing facilities sorted to recover recyclable materials? ✓
- Are different types of wastes segregated and stored in different containers, skips or stockpiles to enhance reuse or recycling and the proper disposal? ✓
- Are aluminium cans segregated in labelled bins and collected by individual collectors for recycling? ✓
- Are proper storage and site practices maintained to minimise the potential for damage or contamination of construction material? ✓
- Are the construction materials planned and stocked carefully to avoid unnecessary generation of waste? ✓

S5.7 General Refuse

- Is the general refuse stored in enclosed bins or compaction units separate from C&D material? ✓
- Is the general refuse removed regularly by a waste collector? ✓

S5.8 C&D Material

- Are the excavated materials from site formation of the expansion areas and tunnel construction for the funicular system reused on-site as backfilling material and for landscape works? ✓
- Are the surplus rock and other inert C&D material disposed of at the public fill sites? ✓
- Is a waste management plan prepared? ✓
- Is a recording system present for the record of amount of wastes generated, recycled and disposed? ✓

	• Is the trip-ticket system required in ETWB TCW No.31/2004 followed on site?			✓		
	Chemical Wastes					
S5.9	Is chemical wastes generated from the works? And if yes,			✓		
	• Is the Contractor registered as a Chemical Waste Producer?			✓		
	• Are good quality containers used for separating and storing chemical wastes?			✓		
	• Are appropriate labels securely attached on each chemical waste container to indicate their corresponding chemical characteristics?			✓		
	• Is the Contractor licensed to transport and dispose of the chemical wastes?			✓		
	Land Contamination					
S6.11	• Is the contact of construction workers with contaminated materials minimised by using bulk earth-moving excavator equipment?		✓			
	• Are appropriate cloth, personal protective equipment, hygiene and washing facilities provided to minimise exposure to any contaminated material?		✓			
	• Is stockpiling of contaminated excavated materials avoided?		✓			
	• Is the use of contaminated soil for landscaping without proper treatment prohibited?		✓			
	• Are vehicles containing excavated materials covered properly to limit potential dust emissions or contaminated wastewater runoff?		✓			
	• Is the speed of the trucks carrying contaminated materials controlled?		✓			
	• Are the necessary waste disposal permits obtained from appropriate authorities in according with Waste Disposal (Chemical Waste) (General) Regulation?		✓			
	• Are silt removal facilities provided with retention time for silt/sand traps of 5 minutes under maximum flow conditions?		✓			
	• Are the records maintained for quantity of wastes generated and disposal of?		✓			
	Remediation Process					
S6.12	• Is biopile covered by tarpaulin or low permeable sheet to avoid dust emission?		✓			
	• Is vented air from biopile treated by blower and carbon adsorption system before released to the atmosphere?		✓			
	• Are the materials which may generate airborne dust emissions adequately wetted prior to and during the loading, unloading and handling operations?		✓			
	• Are silencers installed at biopile blower to minimise noise impact?		✓			
	• Are quiet plants such as generator and blower used for biopile?		✓			
	• Are the mixing process and other associated material handling activities properly scheduled to minimise potential noise impact?		✓			
	• Are impermeable liners placed at the bottom of biopile?		✓			

- Is leachate collection sump construction along the perimeter of biopile? ✓
- Is the lachate recycled back to the biopile or truck away to Chemical Waste Treatment Centre for disposal? ✓
- Is the mixing of contaminated soils and cement/water/other additive(s) undertaken at a solidification plant to minimise the potential for leaching? ✓
- Is a concrete bund construction along the perimeter of the solidification/stabilisation area to prevent runoff? ✓
- Are the loading, unloading, handling, transfer and storage of cement carried out in an enclose system? ✓
- Are the contaminated soils transported by roll-off trucks (containerisation)? ✓
- Is temporary hoarding provided around the treatment area to minimise the visual impact? ✓

Air Quality

S7.23 Good Site Practices

- Is watering carried out regularly with complete coverage to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather? ✓
- Is watering frequently carried out for particularly dusty construction areas, temporary stockpiles and areas close to ASRs? ✓
- Are the aggregate or dusty material storage piles covered with their side enclosed to reduce emissions? Or if this is not practicable, is watering applied to aggregate fines? ✓ ④ P1140570 ③ P1140565
- Is open stockpiles avoided or covered and placed far enough from the ASRs? ✓ ④ P1140369
- Is the dropping height of material restricted to minimise the fugitive dust from unloading/loading? ✓
- Is tarpaulin used to cover all dusty vehicle loads transported to, from and within the site? ✓
- Are vehicle wheel and body washing facilities available at the exit points of the site? ✓
- Are wind shield and dust extraction units or similar dust mitigation measures provided at the loading points? If dust generation is likely during the process, particularly in dry seasons, is water sprinklers provided at the loading site? ✓
- Do the vehicles comply with the recommended speed limit of 10 km/h on unpaved roads? ✓
- Are dusty activities rescheduled during high-wind conditions? ✓
- Are the routing of vehicles and positioning of construction plants at maximum possible distance from the ASRs? ✓
- Is suitable buffer zone provided and work areas fenced off with hoarding (not less than 2.4m from ground level)? ✓

S7.24 Drilling & Blasting

- Is watering carried out on the exposed area after blasting? ✓
- Is vacuum extraction drilling method used? ✓
- Is the blasting process carefully sequenced? ✓

	• Is the firing of explosive carried out in the morning prior to opening of the Park?		✓		
S7.25	Crushing Plant				
	• Is water sprayed on the crusher?		✓		
	• Are fabric filters installed for the crushing plant?		✓		
	• Is chute or dust curtain used for controlling dust when transferring materials from crusher to the conveyors?		✓		
S7.26	Barging Point & Conveyor Belt System				
	• Are the conveyors placed within enclosed structures?		✓		
	• Is profiled steel cladding provided at two sides of loading point?		✓		
	• Are dust suppression sprays installed and operated at the feeding inlet and outlet?		✓		
	• Is the barging point placed within an enclosed structure incorporating an enclosed chute for material transfer to the barge?		✓		
	• Is a flexible curtain hanged on the enclosed chute to prevent dust emission when excavated materials/rocks transported into the barge?		✓		
	Water Quality				
S8.3	Site Run-off and Drainage				
	• Are all sewer and drainage connections sealed to prevent debris, soil, sand etc. from entering public sewer before commencing any site formation work?			✓	
	• Are temporary ditches provided to facilitate runoff discharge into appropriate watercourses, via appropriate sized silt retention pond?			✓	
	• Are cut-off ditches provided for all major site clearance/excavation works where soils would be exposed to control runoff from the areas?			✓	
	• Are channels, earth/concrete bunds and sand bags deployed to direct surface runoff?			✓	
	• Are catchpits and perimeter channels constructed in advance of relevant site formation works?			✓	
	• Are the boundaries of earthworks marked and surrounded by dykes or embankments for flood protection?			✓	
	• Are sand/silt traps and sediment basins provided to remove sand/silt particles from runoff?			✓	
	• Are silt removal facilities, channels and manholes maintained and deposited silt/grit removed regularly to ensure that these facilities are functioning properly at all times?			✓	
	• Are exposed soil surfaces covered?			✓	
	• Is the water pumped out from foundation excavations discharged into silt removal facilities?			✓	
	• Are exposed soil areas minimised to reduce potential for increased siltation and contamination of runoff?			✓	
	• Are earthwork final surfaces well compacted and is subsequent permanent work or surface protection performed immediately?			✓	

- Is the rainwater pumped out from trenches or excavation directed to silt removal facilities before discharge?

- Are open stockpiles of construction materials or construction wastes of more than $50m^3$ covered with tarpaulin during rainstorm?

In case of an excavation in rainy seasons:

- Is temporary exposed slope/soil surfaces covered by tarpaulin as far as practicable?

- Are intercepting channels provided to prevent storm runoff from washing across exposed soil surfaces?

- Are surface protection measures and arrangements implemented to prepare for arrival of a rainstorm?

Coral Sites

S8.4

- Are enhanced (with the use of flocculants added) sand/silt removal facilities employed for treatment of runoff from the major excavation at the Summit?

- Is a silt curtain system used to enclose the construction phase discharge point at Tai Shue Wan?

- Are debris and refuse collected, handled and disposed of properly to avoid entering any nearby water bodies and public drainage system?

- Are stockpiles of cement and other construction materials kept covered when not being used?

- Are oils and fuels used and stored in designated areas which have pollution prevention facilities (Fuel tanks and storage areas provided with locks and sited on sealed areas, within bunds of a capacity equality to 110% of the storage capacity of the largest tank)?

- Are temporary sanitary facilities, such as portable chemical toilets, employed on-site where necessary to hand sewage from the workforce? Is a licensed contractor employed for disposal of waste matter and maintenance of these facilities?

- Is a reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law?

- Are aluminium cans recovered from the waste stream and collected separate labelled bins?

- Are office wastes reduced through the recycling of paper?

- Are training provided to workers on site cleanliness & waste management procedure?

Cultural Heritage

S10.6 If there is any work planned within one metre of the grave, is a one metre buffer zone provided around the grave and is the grave demarcated by temporary fence?

Hazard to Life

S11.3 Good Site Practices:

- Is the area around the magazine free of vegetation?

- Is the control of (small) fires planned and provided through the following?

- Weekly checking of fire fighting equipment and the on-site fire water tank level. | | ✓ | | |
- Daily checking of all critical safety equipment on vehicle, including the fire extinguishers. | | ✓ | | |
- Maintaining back-up means of fighting fire on the explosive vehicles. | | ✓ | | |
- Providing safety training for drivers and other personnel present during explosive delivery with regard to operating fire hydrants and fighting of explosive fires. | | ✓ | | |

- Is the magazine secured against unauthorised entry and theft of explosive through the following?

- Maintaining a list of persons authorised to enter the magazine and ensuring the list is available to the magazine security guard. | | ✓ | | |
- Activating an alarm system that limits times at which explosive can be removed from the magazine and connecting the system to central security station. | | ✓ | | |
- Incorporating "Duress code" function in the alarm system. | | ✓ | | |
- Maintaining alarm system in good condition. | | ✓ | | |

- Is the magazine security guard located separately from the magazine complex? | | ✓ | | |
- Is the communication maintained in emergency with the following measures?

- Providing non-hazardous electronic equipment for persons working within 60 m of detonators. | | ✓ | | |
- Ensuring availability of phone numbers for all key personnel. | | ✓ | | |
- If there is a typhoon signal no. 3 or above, or black rainstorm signal, are all operations at magazine and transport ceased? | | ✓ | | |
- Is the risk of detonators explosion on vehicle reduced during transit through the following?

- Ensuring that magazine within vehicle is lined. | | ✓ | | |
- Limiting off-site transport to 5 to 6 a.m. each day. | | ✓ | | |
- Escorting vehicles with separate security vehicle when using the public road. | | ✓ | | |
- Ensuring that UN 1.4B packaging of detonators remains intact until handed over at blasting site. | | ✓ | | |
- Is the fuel isolation switch available on vehicle to prevent fire spreading in case a fire breaks out? | | ✓ | | |
- Is an experienced driver with accident-free record employed for explosive vehicle and security escort? | | ✓ | | |
- Are the drivers checked for health before employing? | | ✓ | | |
- Are the vehicles regularly checked to maintain in good condition to reduce chance of accident due to breaking down? | | ✓ | | |
- Is the truck fuel fire escalating to cause explosion avoided through the following means?

- Ensuring that the Contractor is aware of the potential hazards to site. | | ✓ | | |
- Maintaining appropriate fire fighting equipment. | | ✓ | | |

- Requiring the Contractor to plan and make emergency arrangements. | | ✓ | | | |

- Is spare/redundant fire fighting equipment provided? | | ✓ | | | |
- Can communications be maintained between two vehicles (drivers and security) during the trip to prevent collision of two explosive vehicles in case of an accident? | | ✓ | | | |
- Are the processes of checking of condition of drivers to suspend any driver of concern carried out? | | ✓ | | | |

Project specific measures:

- Is the speed of vehicle limited along the Ocean Park portion of Nam Long Shan Road within 100 m of the explosives magazine to 25 km/hr? | | ✓ | | | |
- Is other contractors' use of the Ocean Park internal service road restricted during delivery of explosives, i.e. 6 to 7 a.m? | | ✓ | | | |
- Is the Ocean Park guard required to call to the magazine guard on an hourly basis when explosives are stored in magazines? | | ✓ | | | |
- Is the evacuation of part or all of Ocean Park Headland Area arranged in case of the explosive magazine being engulfed in fire? | | ✓ | | | |
- Is the risk to the public from accidental initation during charging and blasting limited by the following means?

  - Closing the Ocean Park from commencement of charging holes until completion of blasting each day. | | ✓ | | | |
  - Arranging for relevant authorities to post notices to mariners – warning them of blasting operations and advising them to stay away from a strip 100m wide immediately to the east of Headland from commencement of charge holes until completion of blasting each day (i.e. 9 a.m). | | ✓ | | | |
  - Not operating amusement rides in the event of accidental explosion until confirmed free of critical damage. | | ✓ | | | |
- If unexploded explosives are found in blasthole(s), is the opening of Ocean Park delayed or is part of the Ocean Park delayed when there are unspent explosives? | | ✓ | | | |
- Is the opportunity for arson/deliberate initiation of explosive reduced with the following means?

  - Paying attention to the security alert status from the Government. | | ✓ | | | |
  - Developing a security plan to address high alert level. | | ✓ | | | |
- Is an emergency plan developed to address uncontrolled fire in magazine area? | | ✓ | | | |
- Is the transfer of explosives between 5 to 6 a.m agreed by Mines Division? | | ✓ | | | |
- Is the road surface along the explosive transportation route maintained? | | ✓ | | | |
- Are the contractor's driver and security escort tested in respect of safety plan? Is the route driven before the driver undertakes the first delivery of explosives? | | ✓ | | | |
- Is adequate space provided for the explosive vehicle to manoeuvre without reversing close to the magazine to limit the likelihood of vehicle accident? | | ✓ | | | |
- Is lighting for explosive vehicles provided on temporary | | ✓ | | | |

	road(s)?				
S11.4	• Is ammonium nitrate emulsion (ANE) delivered outside of Park opening times?		✓		

Observations for this month

① General refuse were scattered around the site.

② The Contractor was recommended to ensure all mortar mixing works were carried out within an enclosure with the top and 3 sides enclosed.

③ Over 20 bags of cement were not covered.

④ An idled stockpile of sand was not covered.

IEC Representative	Environmental Manager	Contractor's Representative CS03
Florence Yuen		
(Florence Yuen)	(Lindsay Rickles)	(Wilson Chung)

Ocean Park Master Redevelopment Project
Contract P007
Independent Environmental Checker

MONTHLY SITE INSPECTION PHOTOS

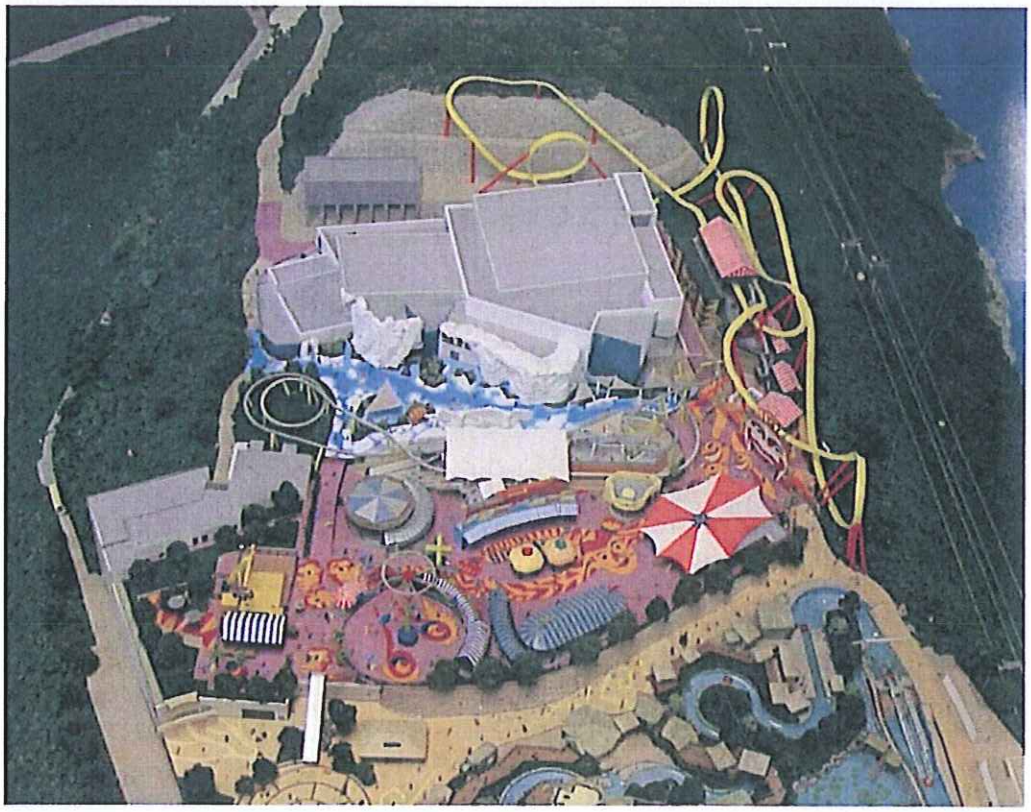
Contract CS03 Thrill Mountain and Polar Adventure	
Follow up observations in November 2011	
Observation in last site inspection	**Observation in this site inspection**
	
P1140353: General refuse were scattered around the site. The Contractor was reminded to provide more waste skips for storage of general refuse.	P1140567: General refuse were scattered around the site. The Contractor was reminded to provide more waste skips for storage of general refuse.
	
P1140348: The Contractor was recommended to ensure all mortar mixing works were carried out within an enclosure with the top and three sides enclosed.	P1140570: The Contractor was recommended to ensure all mortar mixing works were carried out within an enclosure with the top and three sides enclosed.
	
P1140351: An idled stockpile of sand was not covered. The Contractor was reminded to cover any idled dusty stockpile on-site to suppress dust.	P1140569: An idled stockpile of sand was not covered. The Contractor was reminded to cover any idled dusty stockpile on-site to suppress dust.

MONTHLY SITE INSPECTION PHOTOS

Observations in December 2011	
	
P1140565: Over 20 cement bags were not covered. The Contractor was reminded to cover any piles of over 20 cement bags on-site with tarpaulin sheets or other means to suppress dust.	

Part 2 CS-03 EM&A REPORT (December 2011)

KADEN - ATAL JOINT VENTURE



Contract No. CS03

Ocean Park Redevelopment Project - Thrill Mountain & Polar Adventure

Monthly EM&A Report

December 2011

Prepared By	Alex Enagnon Gbaguidi
Certified By	
	(Keith Kwan)
	(Acting Project Manager)

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EXECUTIVE SUMMARY

Introduction

This is the 23rd monthly Environmental Monitoring and Audit (EM&A) Report prepared by Kaden – ATAL JV for the Contract No. CS03 "Ocean Park Redevelopment Project – Thrill Mountain & Polar Adventure" (hereinafter called "the Project"). The Project was commenced on 2nd November 2009. This document reports the findings of the environmental auditing works conducted in December 2011.

The major site activities undertaken in the reporting month included:

- Finishing works at Tuxedos Restaurant of South Pole;
- Finishing works of Bobsled Station superstructure and installation of rides;
- Erection of structure steel works at Bobsled Station;
- Defect works at Thrill Mountain
- Carry out wall finishing works for PA Building;
- Theme works at PA Building;
- Installation of theme works at PA Building and
- Disposal Existing Stockpile.

Environmental Monitoring and Audit Works

Environmental monitoring and audit works for the Project was performed as stipulated in the updated EM&A Manual. Site audits were conducted once per week. Environmental site audits were conducted on 2nd, 9th, 16th, 20th & 30th December 2011 and the environmental ICE monthly site inspection was conducted on 20th December 2011 and No non-compliance was observed during the site audits.

The implementation of the environmental mitigation measures was checked and the environmental management plan was submitted.

No notification of exceedance was received from the Assistance Project Environmental Team Leader (ETL) in the reporting month.

Environmental Licenses and Permits

Licenses/Permits granted to the Project include the Environmental Permit (EP) for the Redevelopment Project, Construction Noise Permit (CNP), Billing Account for Disposal of Construction Waste and Water Discharge License

Registration of Waste Producer (Chemical Waste), and notification pursuant to Section 3(1) of the Air Pollution Control (Construction Dust) Regulation was acknowledged by EPD.

Complaints and Prosecutions

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

Future Key Issues

Key issues to be considered in the coming month include:

- Finishing works at Tuxedos Restaurant of South Pole;
- Finishing works of Bobsled Station superstructure and installation of rides;
- Erection of structure steel works at Bobsled Station;
- Defect works at Thrill Mountain
- Carry out wall finishing works for PA Building;
- Theme works at PA Building;
- Installation of theme works at PA Building and
- Disposal Existing Stockpile.

1. INTRODUCTION

Background

1.1 Kaden-ATAL JV (the Contractor) was commissioned by the Employer to undertake the construction of the Contract No. CS03 "Ocean Park Redevelopment Project – Thrill Mountain & Polar Adventure" (the Project) and the project was commenced on 2nd November 2009. The site layout plan is illustrated in Figure 1.1.

1.2 These report summaries the environmental monitoring and audit works for the Project in the month of December 2011.

1.3 The scope of works for the Project includes:

(a) Construction of summit reservoir and associated pump room.
(b) Construction of vehicular bridge.
(c) Construction of the Polar Adventure Building.
(d) Construction of back of house facilities in the Polar Adventure Building.
(e) Construction of other one to three storey buildings in Polar Adventure.
(f) Construction of foundation and installation of Bobsled Ride.
(g) Installation of Life Support Systems.
(h) Construction of one to three storey buildings in Thrill Mountain.
(i) Construction of foundation and installation of the Floorless Coaster.
(j) Installation of the Ultramax, Aviator, Musik Express and Bumper Car.
(k) New roadwork, paving, footpaths and infrastructure support.
(l) Installation of building services.
(m) Soft and hard landscape works.
(n) Construction of underground utilities and services.
(o) Construction of earth retaining structures.
(p) Construction of all interior fitting out works.
(q) Supply and installation of all elevator(s) and escalator(s).
(r) Coral survey and maintenance of existing suit curtain.

Project Organizations

1.4 Different parties with different levels of involvement in the project organization include:

- The Engineer and Project Environmental Team Leader (ETL) – AECOM Consultant Ltd.
- Contractor – Kaden-ATAL JV.
- Independent Environmental Checker (IEC) – Mott MacDonald HK Ltd.

1.5 The responsibilities of respective parties are provided in Section the Contractor's EM&A Manual of the Project.

1.6 The key contacts of the Project are shown in **Table 1.1**.

Table 1.1 Key Project Contacts

Party	Name	Role	Phone No.	Fax No.
Project ET	Mr. Tommy Lau	RSS Representative (Safety & Environmental)	2552 1546	2552 1406
Contractor	Mr. Keith Kwan	Acting Project Manager	3582 6099	3582 4877
	Mr. Lai Tung Yee	Construction Manager	3582 6005	
Contractor's ET	Mr. Alex Enagnon Gbaguidi	Contractor's Assistance Environmental Team Leader	3582 4880	3582 4877
IEC	Miss Florence Yuen	Independent Environmental Checker (IEC) Representative	2828 5757	28271823

Construction Programme

1.7 The site activities undertaken in the reporting month were:

- Finishing works at Tuxedos Restaurant of South Pole;
- Finishing works of Bobsled Station superstructure and installation of rides;
- Erection of structure steel works at Bobsled Station;
- Defect works at Thrill Mountain
- Carry out wall finishing works for PA Building;
- Theme works at PA Building;
- Installation of theme works at PA Building and
- Disposal Existing Stockpile.

Summary of EM&A Requirements

1.8 The EM&A programme requires construction phase environmental site audit. The duties and responsibilities comprise the following:

- monitor various environmental parameters, if necessary, as specified in the Contractor's EM&A Manual;
- analyze the environmental monitoring and audit data;
- review the EM&A programme to confirm the adequacy of mitigation measures implemented and the validity of the EIA predictions and to identify and 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 effect proactive action to pre-empt problems;

- audit and prepare EM&A reports on the site environmental conditions;
- report the environmental audit results to the Contractor;
- recommend appropriate mitigation measures to the Contractor in case of exceedance of Action and Limit Levels in accordance with the Event and Action Plans; and
- adhere to the procedures for carrying out complaint investigation in accordance with the Contractor's EM&A Manual.

1.9 This report presents the environmental monitoring and audit works for the Project in December 2011.

2. ENVIRONMENTAL AUDIT

Environmental Site Audits

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

2.2 Site audits for the Project in the reporting month were conducted on Environmental site audits were conducted on 2nd, 9th, 16th, 20th & 30th December 2011 and the environmental ICE monthly site inspection was conducted on 20th December 2011 and no non-compliance was observed during the site audits. The summaries of site audits are attached in **Appendix A**.

2.3 During site inspections in the reporting month, no non-conformance was identified. The observations and recommendations are summarized in **Table 2.1**.

Table 2.1 Observations and Recommendations of Site Audits

Parameters	Date	Observations / Recommendations	Remediation/ Follow up
Waste/ Chemical Management	2/12/11	General refuse were scattered around the site.	General refuse was stored in waste skip and remove offsite regularly.
	16/12/11	A few drums with hydraulic vegetable oil were placed on bareground.	These oil were used for installation work. Any oil drum not used will be placed in permanent storage area.
Dust Control	20/12/11	An idled stockpile of sand was not covered.	Stockpiles of sand was covered by tarpaulin sheet.

Parameters	Date	Observations / Recommendations	Remediation/ Follow up
	20/12/11	Over 20 bags of cement were not covered.	Cement stock was covered by tarpaulin sheet.
	20/12/11	The contractor was recommended to ensure all motor mixing works were carried out within an enclosure with the top and 3 sides enclosed.	All motor mixing works will be carried out within an enclosure with the top and 3 sides enclosed.
Water Pollution	9/12/11	Nil.	
Air Pollution	30/12/11	Nil	

Status of Environmental Licensing and Permitting

2.4 All valid permits/licenses obtained for the Project are summarized in **Table 2.2.**

Table 2.2 Summary of Environmental Licensing and Permit Status

Permit No.	Valid Period		Details	Status
	From	To		
Environmental Permit				
EP-249/2006/A	23/10/2006	N/A	Expansion of the existing Ocean Park and reconstruction / modification of its existing facilities.	Valid
Registration of Chemical Waste Producer				
WPN5213-176-K2880-02	25/11/2009	N/A	Waste Disposal (Chemical Waste) (General) Regulation - Registration of Waste Producer	Valid
Construction Noise Permit				
GW-RS1128-11	09/12/2011	31/5/2012	Construction Noise Permit for Top of Nam Long Shan Rd., Ocean Park, 180 Wong Chuk Hang, Hong Kong	Valid
Water Discharge License				
WT00005926-2010	05/11/2009	28/02/2015	Discharge of industrial trade effluent arising from the Sedimentation tank at the construction site (CS03 Ocean Park Redevelopment Project) to communal storm water drain.	Valid
Others				
311433	N/A	N/A	Notification Pursuant to Section 3(1) of the Air Pollution Control (Construction Dust) Regulation	Valid
7009695	N/A	N/A	Construction Waste Disposal Billing Account with EPD	Valid

Status of Waste Management

2.5 The amount of waste generated by the construction activities of the Project in the reporting month is attached in **Table 2.3.**

Table 2.3 Actual Quantity of Waste Generated in December 2011

Waste Type	Examples	Actual quantity disposed (Tonnes / Liter)	Disposal Locations
C&D Waste	Construction waste (Plastic, wood and bamboo)	165.7 (T)	SENT Landfill
	Mixed rock & soil	319.9 (T)	CW barging point
Chemical waste	Used oil, spent solvent	0 L	Collected by licensed collector

Implementation Status of Environmental Mitigation Measures

2.6 During site inspections in the month, the following observations and recommendations were made.

Water Quality Mitigation Measures

- The wastewater was recycled for wheel washing and dust control and Septic Tank should be maintained well functioning.

Air Quality Mitigation Measures

- The Contractor to ensure cement materials was well covered.
- The Contractor to ensure water spray was carrying out during breaking of rocks.
- The Contractor was reminded to cover the existing stockpile general fill material when they were not in use.

Noise

- No violation was observed nor recorded.

Ecology

- No violation was observed nor recorded.

Waste / Chemical Management

- Stagnant water was accumulated in drip tray. Contractor to ensure all contaminated water was well collected and stored in chemical waste storage area without spillage.
- Oil drums were observed without drip tray and place on the ground. Ensure no spillage of the chemical oil and provide trip tray accordingly.
- Collection of waste oil by registered waste collector.

Others

- No other violation was observed nor recorded.

Summary of Exceedances

2.7 No Action/Limit Level exceedance was reported in the reporting month.

Implementation Status of Event Action Plans

2.8 No complaint, summons or prosecution related to environmental issues was received or made against the Project in the reporting month.

Summary of Complaints and Prosecutions

2.9 No environmental complaint and prosecution related to the Project works was received during the reporting month.

3. FUTURE KEY ISSUES

Key Issues for the Coming Month

3.1 Key issues to be considered in the coming month include:

- Finishing works at Tuxedos Restaurant of South Pole;
- Finishing works of Bobsled Station superstructure and installation of rides;
- Erection of structure steel works at Bobsled Station;
- Defect works at Thrill Mountain
- Carry out wall finishing works for PA Building;
- Theme works at PA Building;
- Installation of theme works at PA Building and
- Disposal Existing Stockpile.

4. CONSTRUCTION OF DRAINAGE, SEWERAGE AND WATER MAIN SYSTEM.CONCLUSIONS AND RECOMMENDATIONS

Conclusions

4.1 Five environmental site audits were performed in December 2011. No non-compliance was observed during the site audits.

4.2 No exceedance of environmental monitoring was reported in the reporting month.

4.3 No environmental complaint and prosecution related to the project was received in the reporting month.

Recommendations

4.4 According to the environmental audits performed in the reporting month, the following recommendations are suggested:

Water Quality Impact

- Should ensure that the sedimentation tank is well function before discharging waste water off site.

Dust Impact

- To carry out routine water spray to all haul roads and during rock breaking activity.
- To cover the existing stockpile general fill material when they were not in use.
- To ensure auto water spray head is on when the floor is dry and dusty.

Waste / Chemical Waste Impact

- To carry out routine inspection for chemical waste storage area after rainy day.
- To ensure spent oil keep in dip tray during drilling rig maintenance.
- To ensure all domestic waste was fully cover in rubbish bin and cleaning up frequently.
- To ensure general refuse were store in the enclosed container or compaction units and separate from C& D materials.

Air Pollution Impact

- To ensure all plants and equipments are well maintained in good condition and replace air filter frequently.

Site Layout Plan

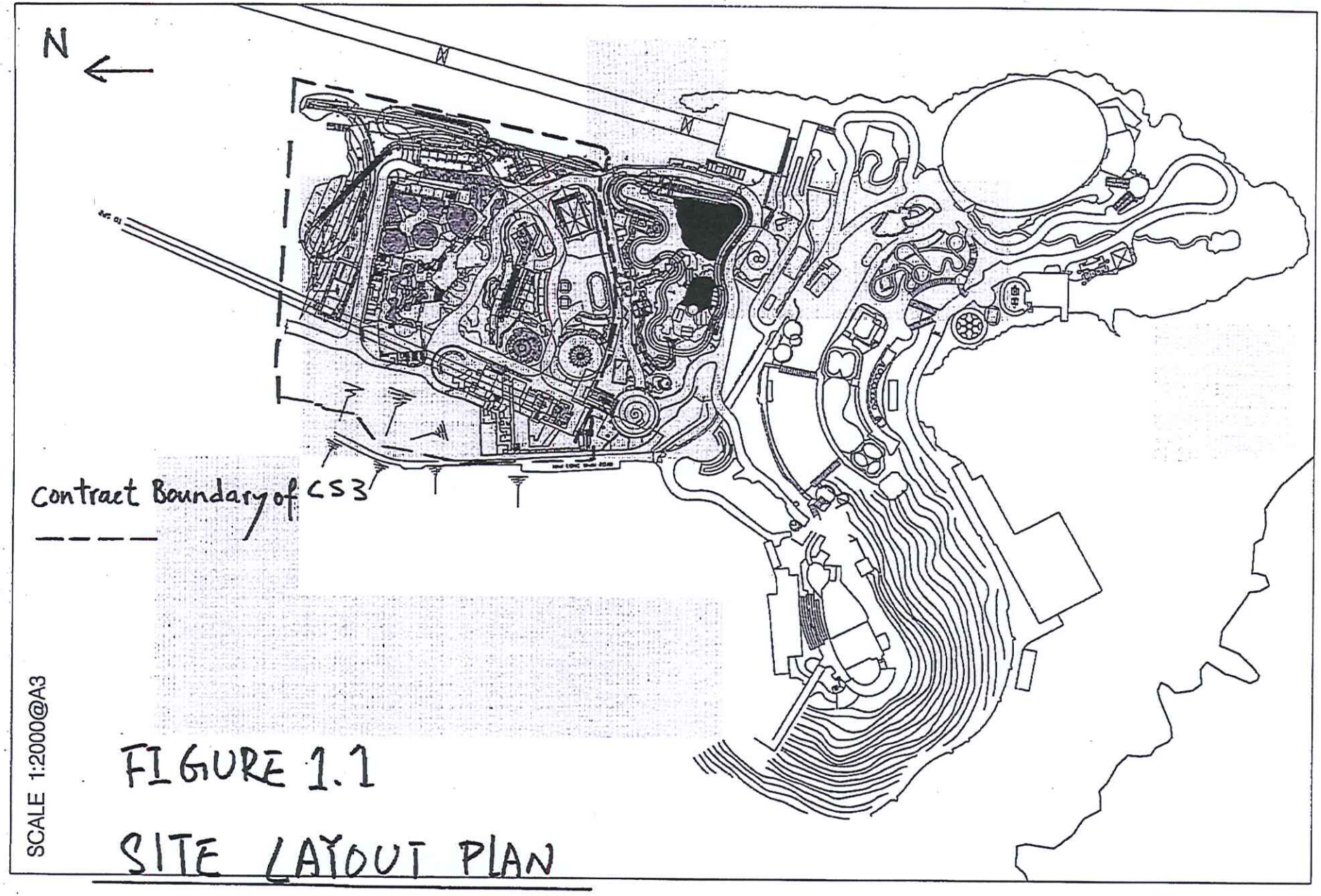

FIGURE 1.1

SITE LAYOUT PLAN

APPENDIX A
Site Audit Summary
(refer to Appendix A of EM & A Report)

Part 3 Ocean Park Symbio Show
10th Monthly Monitoring Report

REPORT

Ocean Park Corporation, Hong Kong

Ocean Park Symbio Show:
10th Air Quality and Noise Monitoring Report

December 2011

Environmental Resources Management
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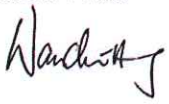
REPORT

Ocean Park Corporation, Hong Kong

Ocean Park Symbio Show: *10th Air Quality and Noise Monitoring Report*

December 2011

Reference 0128330

For and on behalf of ERM-Hong Kong, Limited	
Approved by:	Frank Wan
Signed:	
Position:	Partner
Date:	5 December 2011

CONTENTS

ANNEXES

1 INTRODUCTION

ERM-Hong Kong, Limited (ERM) has been appointed by Ocean Park Corporation (OPC) to undertake air quality and noise monitoring for the first operational year of the Open-air Night Show under the *"Repositioning and Long Term Operation Plan of Ocean Park"* (the Project).

1.1 PURPOSE OF THE REPORT

The Open-air Night Show commenced on 27 January 2011. This is the 10th air quality and noise monitoring report which summarises the impact monitoring results during the reporting period from **27 October** to **26 November 2011**.

1.2 STRUCTURE OF THE REPORT

After this introductory section, the remainder of this report is arranged as follows:

Section 2 describes the air quality sampling methodology;

Section 3 describes the noise monitoring methodology, presents the monitoring results and discusses the results;

Section 4 presents an overall conclusion of the air quality and noise monitoring.

2 AIR QUALITY MONITORING

2.1 INTRODUCTION

In accordance with Clause 2.31 of the Environmental Permit (EP), an updated air quality monitoring programme shall be developed as part of the updated EM&A Manual for the measurement of air quality impact (in terms of respirable suspended particulates, RSP) during the first operational year of the Open-air Night Show and for submission to the Director of Environmental Protection (DEP) in January 2011. The air quality monitoring has been carried out based on the requirements given in the updated air quality monitoring programme.

2.2 SAMPLING METHODOLOGY

2.2.1 *Sampling Parameters and Frequency*

In accordance with the updated air quality monitoring programme, 24-hr average RSP levels should be monitored on a weekly basis in the first month of the Open-air Night Show. If the monitored results in the first month complied with Action/Limit (A/L) Level, the monitoring frequency should be reduced to a monthly interval for the rest of eleven months in the first operational year. Monitoring of the 24-hr average RSP has commenced at AM1 in the 1st reporting month and at AM2 and AM3 in the 3rd reporting month.

2.2.2 *Sampling Locations*

Air quality monitoring was conducted at three designated air quality monitoring stations (AQMS) as presented in *Table 2.1* and illustrated in *Figure 2.1*.

Table 2.1 *Air Quality Monitoring Station*

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

2.2.3 *Sampling and Laboratory Analysis Methodology*

One 24-hr average RSP sample was collected on each scheduled day 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. A summary of the sampling methodology and equipment is presented in *Table 2.2*.

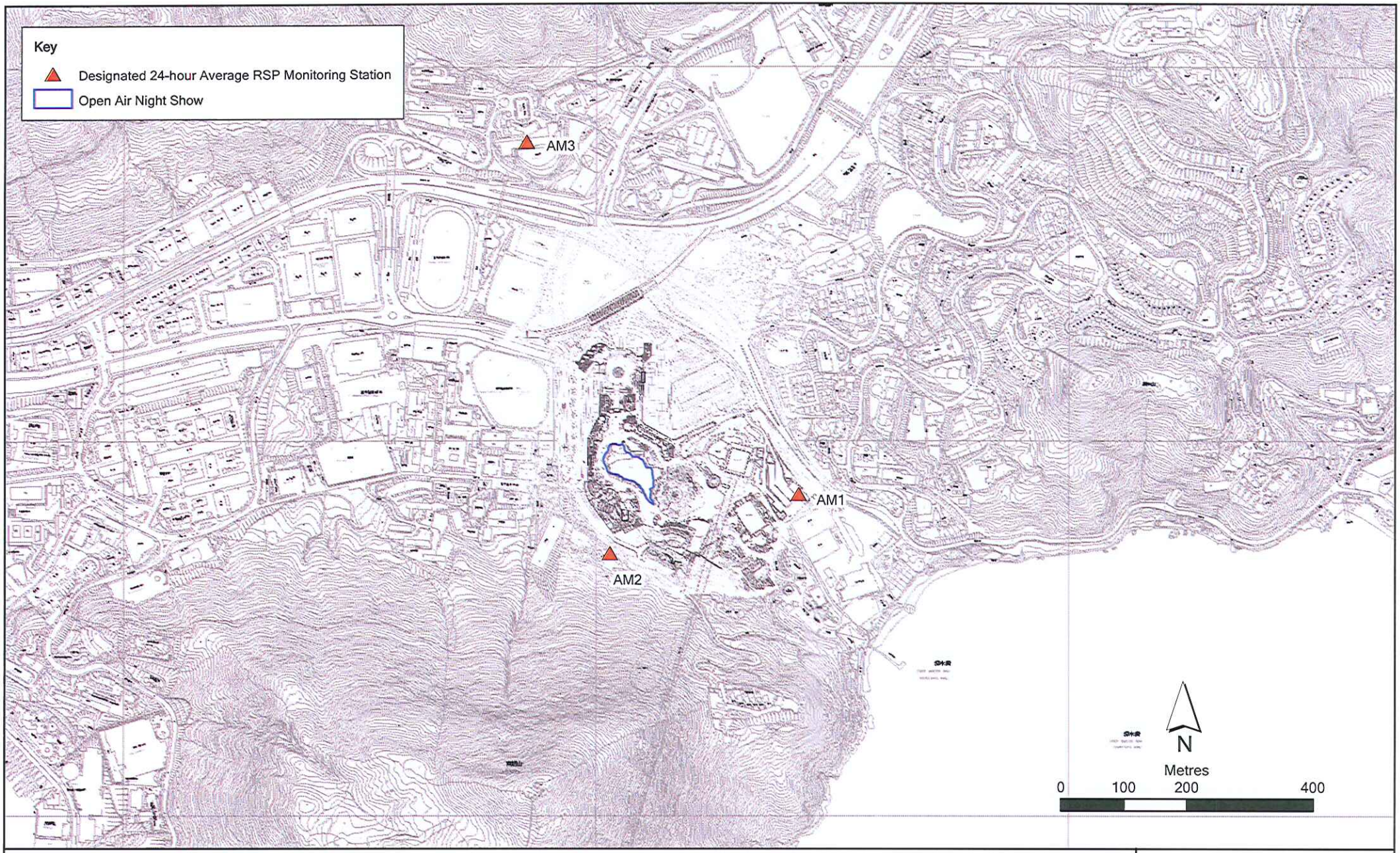


Figure 2.1

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

File: 0128330_RSP monitoring station.mxd
Date: 11/05/2011

Environmental Resources Management

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Table 2.2 *Summary of Sampling and Laboratory Analysis Method*

Sampling Parameter	Method	Equipment
24-hr average RSP	EPA IO-2.1	High volume sampler

2.3 *MONITORING RESULTS*

No 24-hour average RSP concentrations were monitored at AM1, AM2 and AM3 due to mechanical failure of the HVS. The HVS was repaired and 24-hour average RSP concentrations were measured at AM1, AM2 and AM3 on 28 November 2001. The results will be presented in the next monthly monitoring report.

3 NOISE MONITORING

3.1 INTRODUCTION

Noise monitoring has been carried out following the requirements given in the updated EM&A Manual. The requirements and results are detailed in the following sections.

3.2 NOISE MONITORING REQUIREMENTS

It has been recommended in the EIA Report for *"Repositioning and Long Term Operation Plan of Ocean Park"* and stated in the EM&A Manual that fixed plant noise source monitoring should be conducted during the first operational year of the Open-air Night Show at the Aqua City.

The monitoring of fixed plant noise source impact is to be conducted:

- During the lagoon night show (hereinafter referred to as "lagoon night show noise monitoring")
- Not during the lagoon night show (hereinafter referred to as "daily operational noise monitoring")

Lagoon night show noise monitoring was carried out at all designated monitoring stations during the performance of lagoon night shows at a logging interval of 30 minutes. The noise monitoring was conducted twice a week, i.e. once on a normal weekday and once on a general holiday or Sunday.

The need for noise monitoring during the lagoon night show was reviewed based on the monitoring results, any requirements to adjust the loudspeaker system, and any change to the show schedule or rundown. With the same loudspeaker system and show rundown, if the noise levels of the month comply with the fixed plant noise criteria as stipulated in *Technical Memorandum on Environmental Impact Assessment Process* (EIAO-TM), or are consistent with the baseline noise levels, the ETL may consider not including the noise monitoring in the subsequent monitoring programme. Agreement from the IEC and approval from EPD must be sought prior to suspension of noise monitoring. Impact monitoring can be resumed if there is any change to the power, orientation, and volume of the loudspeaker system, or to the show rundown, or an increase of show frequency.

For daily operational noise monitoring, 30-minute average noise measurement at each designated station during the operational hours of Ocean Park but not during the lagoon night show should be conducted. The monitoring frequency should be the same as that for the noise monitoring during the lagoon night show. Agreement from the IEC and approval from EPD must be obtained prior to suspension of noise monitoring.

The following sections describe the detailed methodology of the fixed plant noise monitoring.

3.2.1 *Monitoring Locations*

Noise monitoring was conducted at five designated noise monitoring locations in accordance with the approved EM&A Manual. Alternative noise monitoring has been proposed because of accessibility problem, as presented in *Table 3.1*, and shown in *Figure 3.1*.

Table 3.1 Alternative Noise Monitoring Stations during the Operational Phase

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

3.2.2 *Monitoring Parameters*

Lagoon Night Show Noise Monitoring

Six consecutive measurements of $L_{Aeq,\ 5\ min}$ reading were carried out to calculate the $L_{Aeq,\ 30\ min}$ noise level during the lagoon night show.

Daily Operational Noise Monitoring

Six consecutive measurements of $L_{Aeq,\ 5\ min}$ reading were carried out to calculate the $L_{Aeq,\ 30\ min}$ noise level before the lagoon night show, ie during operation of the Ocean Park.

Background Noise Level

Three consecutive measurements of $L_{Aeq,\ 5\ min}$ reading were carried out to calculate the $L_{Aeq,\ 15\ min}$ noise level after the lagoon night show, ie without operation of the Ocean Park.

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.

3.2.3 *Monitoring Frequency*

The monitoring for both lagoon night show noise monitoring and daily operational noise monitoring were conducted twice per week - one on a

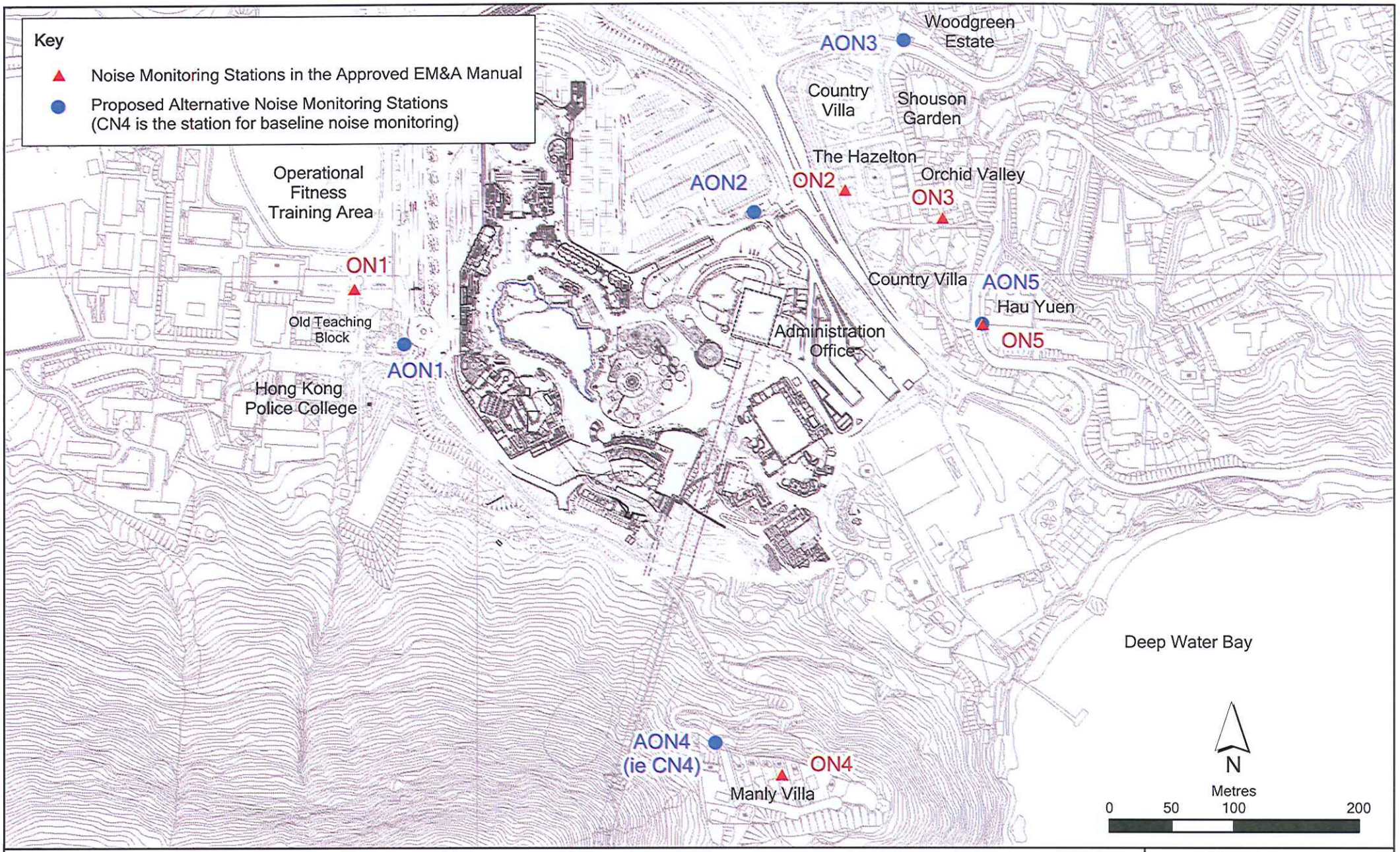

Figure 3.1

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

File: 0128330_noise monitoring station.mxd
Date: 10/06/2011

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normal weekday and one on a general holiday, including Sundays during this reporting month.

3.2.4 *Monitoring Methodology*

The sound level meters and calibrator used for the noise monitoring, as listed in *Table 3.2* below, complies with IEC 651: 1979 and 804:1985 (Type 1) specification.

Table 3.2 *Noise Measurement Equipments*

Monitoring Location		Monitoring Equipment
AON1	Open Area adjacent to Police Training School	RION NA-27/RION NL-52 Sound Level Meter RION NC-73 calibrator
AON2	Old canteen building, Ocean Park	RION NL-31 Sound Level Meter RION NC-73 calibrator
AON3	Woodgreen Estate	RION NL-31 Sound Level Meter RION NC-73 calibrator
AON4	Manly Villa	RION NL-18 Sound Level Meter RION NC-73 calibrator
AON5	Hau Yuen	RION NA-27/ B&K 2238 Sound Level Meter RION NC-73 calibrator

Noise monitoring was conducted with reference to the calibration and measurement procedures as stated in the *Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (IND-TM).* Immediately prior to and following each noise measurement the accuracy of the monitoring equipments was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements were accepted if the calibration levels from before and after the noise measurement agree to within 1.0 dB.

The sound level meters and acoustic calibrator have been calibrated by a HOKLAS accredited laboratory every two years. The relevant calibration certificates are presented in *Annex A1.*

Noise measurements were made without the presence of fog and rain, and with steady wind speed and gusts not exceeding $5ms^{-1}$ and $10\ ms^{-1}$, respectively in accordance with international standards and practices (1). Broadband measurement of L_{Aeq}, L_{10}, L_{90}, L_{max} and L_{min} has been recorded at 100ms interval.

3.2.5 *Compliance Assessment*

Fixed Plant Noise

As recommended in the EIA and stated in the EM&A Manual, OPC will follow the Action and Limit (A/L) Levels as recommended in EIA and EM&A Manual which are summarised in *Table 3.3.* In case exceedances are resulted

(1) ISO 11819-1:1997 and ISO/FDIS 13472-1:2001

from cumulative impacts, all steps stipulated in the Event/ Action Plan shall be followed.

Table 3.3 *Action and Limit Levels for Entertainment Noise*

Identification No.	Action Level	Limit Level
ON1/AON1	When documented complaint is received from any one of the sensitive receivers	$L_{eq\ (30\ min)}$ 60 dB(A)
ON2/AON2		$L_{eq\ (30\ min)}$ 60 dB(A)
ON3/AON3		$L_{eq\ (30\ min)}$ 55 dB(A)
ON4/AON4		$L_{eq\ (30\ min)}$ 55 dB(A)
ON5/AON5		$L_{eq\ (30\ min)}$ 55 dB(A)

3.3 RESULTS OF NOISE MONITORING

The measured noise levels at the monitoring locations are given in *Annex A2* and graphically presented in *Annex A3*.

Exceedances in the background corrected noise levels were recorded at AON1 (Open Area adjacent to Police Training School), AON2 (Roof of Old Canteen Building) and AON3 (Woodgreen Estate) due to high background noise from the visitors and traffic, the special events at Ocean Park and noise from construction works.

Detail discussion on noise exceedances are given in *Section 3.4* below.

3.4 SUMMARY OF NOISE EXCEEDANCES

Noise exceedances recorded during this reporting period are summarised in *Table 3.4* below.

Table 3.4 *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], $L_{eq\ (30min)}$ dB(A)	Limit Level, $L_{eq\ (30\ min)}$ dB(A)
		Daily Operational Noise Level, $L_{eq\ (30min)}$ dB(A)	Background Noise Level, $L_{eq\ (15min)}$ dB(A)		
30 October 2011 (Public Holiday)	AON2	73.2 (Night Show Noise Level)	72.8	62.0 (Night Show Noise Level (Background Corrected))	60 60
6 November 2011 (Public Holiday)	AON1	68.7	66.8	67.1	60
		67.4 (Night Show Noise Level)	66.8	60.8 (Night Show Noise Level (Background Corrected))	60
	AON3	63.3 63.7 (Night Show Noise Level)	62.4 62.4	55.7 57.8 (Night Show Noise Level (Background Corrected))	55 55
13 November 2011 (Public Holiday)	AON3	65.2	64.0	59.0	55
15 November 2011 (Weekday)	AON1	64.3	61.7	63.8	60
	AON3	66.4	65.7	57.6	55
20 November 2011 (Public Holiday)	AON1	70.4	69.2	67.3	60
		69.6 (Night Show Noise Level)	69.2	62.7 (Night Show Noise Level (Background Corrected))	60
	AON3	64.1 62.8 (Night Show Noise Level)	61.8 61.8	60.3 55.8 (Night Show Noise Level (Background Corrected))	55 55
22 November 2011 (Weekday)	AON1	64.5 (Night Show Noise Level)	63.2	61.5 (Night Show Noise Level (Background Corrected))	60
	AON2	62.9	58.3	61.0	60

Date	Noise Monitoring Station	Measured Noise Level, dB(A)		Daily Operational Noise Level (Background Corrected) [a], $L_{eq\ (30min)}$ dB(A)	Limit Level, $L_{eq\ (30\ min)}$ dB(A)
		Daily Operational Noise Level, $L_{eq\ (30min)}$ dB(A)	Background Noise Level, $L_{eq\ (15min)}$ dB(A)		
	AON3	66.9 (Night Show Noise Level)	66.2	58.7 (Night Show Noise Level (Background Corrected))	55

Note:

(a) The Background Corrected Noise Levels were either measured in front of a façade at AON2, AON3, AON4 and AON5 or with façade correction of 3 dB(A) at AON1.

AON1 – High Background Noise during Public Holidays

The monitoring station AON1 is directly facing the bus terminus of Ocean Park. The measured noise levels were dominated by bus movements, ie. buses moving in and out of the terminus to pick up visitors leaving Ocean Park during the evening time. The measured background noise levels were in the range of 62 to 69 dB(A), ie 2 to 9 dB(A) higher than the Limit Level, during the four days with noise exceedances (see *Table 3.4*).

AON2 – Noise from Special Event

The exceedance recorded on 30 October 2011 at AON2 was mainly due to special events held at Ocean Park. The exceedance recorded on 22 November 2011 was due to noise from construction works near the Cable Car Terminal (CNP No. GW-RS0314-11) ie not due to the fixed plant noise sources or the lagoon night show from the Ocean Park. Investigations were conducted to review the potential causes for the recorded noise level on 30 October 2011. A summary of the investigation results is presented in *Table 3.5* below:

Table 3.5 *Summary of Investigation Results*

Station	Record of Exceedance	Result of Investigation	Corrective Actions
AON2	Exceedance of Limit Level on 30 October 2011	It was observed that special event was held at the Ocean Park during the noise monitoring section. This is confirmed by Ocean Park. According to information provided by Ocean Park, several Halloween shows took place during the noise monitoring events, including background music, public announcement and noise from visitors. Based on the above, the exceedance observed is considered attributable to the noise from the special event.	Ocean Park will take the following action to minimize the noise from special event as far as practicable: • Monitor the noise level around the locations of the special event will be monitored and take an adjustment when the level limit is exceeded; • Lower the volume of the speakers along the queuing area; • lower the volume of any related shows; and • Adjust the angles of the speakers facing down to the queuing visitors.

It was noted that the measured noise levels were all within the noise criteria during the remaining reporting month with the special events completed on 31 October 2011, except the noise exceedance due to night-time construction works (CNP No. GW-RS0314-11) recorded on 22 November 2011.

AON3– Traffic Noise from Shouson Hill Road

The exceedances at AON3 were mainly due to the traffic on Shouson Hill Road.

Summary

As mentioned above, the noise exceedances were due to bus movements at the bus terminus, traffic from Shouson Hill Road, construction works near the Cable Car Terminal and special events at Ocean Park which were completed on 31 October 2011.

4 OVERALL CONCLUSIONS

The Open-air Night Show commenced on 27 January 2011. According to the requirements set out in the Environmental Permit (EP) and the updated EM&A Manual, air quality and noise monitoring shall be carried out during the first year of the operation of Open-air Night Show. This is the 10th monthly air quality and noise monitoring report which summarises the impact monitoring results during the reporting period from **27 October** to **26 November 2011**.

No 24-hr average respirable suspended particulates (RSP) monitoring was conducted due to mechanical failure of the HVS. The HVS was repaired and 24-hour average RSP concentrations were measured at AM1, AM2 and AM3 on 28 November 2001. The results will be presented in the next monthly monitoring report.

Daily operational noise and lagoon night show noise monitoring were carried out at five designated monitoring stations during this reporting period. Noise exceedances were recorded at AON1 (Open Area adjacent to Police Training School), AON2 (Roof of Old Canteen Building) and AON3 (Orchid Valley) due to noise emanating from the bus terminus, high background noise from visitors and traffic, the traffic noise from Shouson Hill Road, construction works near the Cable Car Terminal and the special events held at Ocean Park, which were completed by the end of October 2011. Corrective actions have been identified where appropriate.

Annex A1

Calibration Certificates of the Noise Measurement Equipment

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

Certificate No. : C113973

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Meter

Manufacturer : Rion

Model No. : NL-31

Serial No. : 00320533

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C113973.

The equipment is supplied by

Co. Name : Envirotech Services Co.

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

Date of Issue : 18 July 2011

Certified by : H C Chan

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

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

Report No. : C113973

Calibration Report

ITEM TESTED

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

TEST CONDITIONS

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

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 16 July 2011 ***JOB NO.*** : IC11-1746

TEST RESULTS

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

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

Tested by : *K C Lee* *Date : 18 July 2011*

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

Report No. : C113973

Calibration Report

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

2. Self-calibration was performed before the test.

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C110018
CL281	Multifunction Acoustic Calibrator	C1006860

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

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

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L_A	A	Fast	94.00	1	93.9 (Ref.)
				104.00		103.9
				114.00		113.9

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

6.2 Time Weighting

6.2.1 Continuous Signal

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

Report No. : C113973

Calibration Report

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
20 - 110	L_A	A	FAST	106.00	Continuous	106.0	Ref.
	L_{AMAX}				200 ms	105.1	-1.0 ± 1.0
	L_A		SLOW		Continuous	106.0	Ref.
	L_{AMAX}				500 ms	102.0	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_A	A	Fast	94.00	31.5 Hz	54.2	-39.4 ± 1.5
					63 Hz	67.6	-26.2 ± 1.5
					125 Hz	77.7	-16.1 ± 1.0
					250 Hz	85.2	-8.6 ± 1.0
					500 Hz	90.6	-3.2 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	95.1	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.8	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.9	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_C	C	Fast	94.00	31.5 Hz	90.7	-3.0 ± 1.5
					63 Hz	92.9	-0.8 ± 1.5
					125 Hz	93.6	-0.2 ± 1.0
					250 Hz	93.8	0.0 ± 1.0
					500 Hz	93.9	0.0 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	90.9	-3.0 (+1.5 ; -3.0)
					12.5 kHz	88.1	-6.2 (+3.0 ; -6.0)

Report No. : C113973

Calibration Report

6.4 Time Averaging

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

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

- Uncertainties of Applied Value : 94 dB : 31.5 Hz - 125 Hz : ± 0.35 dB
  250 Hz - 500 Hz : ± 0.30 dB
  1 kHz : ± 0.20 dB
  2 kHz - 4 kHz : ± 0.35 dB
  8 kHz : ± 0.45 dB
  12.5 kHz : ± 0.70 dB
  104 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
  114 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
  Burst equivalent level : ± 0.2 dB (Ref. 110 dB continuous sound level)

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

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

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

Certificate No. : C113270

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Meter

Manufacturer : Rion

Model No. : NL-31

Serial No. : 00410224

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C113270.

The equipment is supplied by

Co. Name : Envirotech Services Co.

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

Date of Issue : 10 June 2011

Certified by : H C Chan

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

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

Report No. : C113270

Calibration Report

ITEM TESTED

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

TEST CONDITIONS

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

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 10 June 2011 ***JOB NO.*** : IC11-1416

TEST RESULTS

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

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

Tested by : *K C Lee* *Date : 10 June 2011*

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

Report No. : C113270

Calibration Report

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

2. Self-calibration was performed before the test.

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C110018
CL281	Multifunction Acoustic Calibrator	C1006860

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

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

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L_A	A	Fast	94.00	1	93.9 (Ref.)
				104.00		103.9
				114.00		113.9

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

6.2 Time Weighting

6.2.1 Continuous Signal

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

Report No. : C113270

Calibration Report

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
20 - 110	L_A	A	FAST	106.00	Continuous	106.0	Ref.
	L_{AMAX}				200 ms	105.1	-1.0 ± 1.0
	L_A		SLOW		Continuous	106.0	Ref.
	L_{AMAX}				500 ms	102.0	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_A	A	Fast	94.00	31.5 Hz	54.2	-39.4 ± 1.5
					63 Hz	67.6	-26.2 ± 1.5
					125 Hz	77.7	-16.1 ± 1.0
					250 Hz	85.2	-8.6 ± 1.0
					500 Hz	90.7	-3.2 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	90.0	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_C	C	Fast	94.00	31.5 Hz	90.7	-3.0 ± 1.5
					63 Hz	93.0	-0.8 ± 1.5
					125 Hz	93.7	-0.2 ± 1.0
					250 Hz	93.9	0.0 ± 1.0
					500 Hz	93.9	0.0 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	93.3	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	88.1	-6.2 (+3.0 ; -6.0)

Report No. : C113270

Calibration Report

6.4 Time Averaging

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

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

- Uncertainties of Applied Value : 94 dB : 31.5 Hz - 125 Hz : ± 0.35 dB
  250 Hz - 500 Hz : ± 0.30 dB
  1 kHz : ± 0.20 dB
  2 kHz - 4 kHz : ± 0.35 dB
  8 kHz : ± 0.45 dB
  12.5 kHz : ± 0.70 dB
  104 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
  114 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
  Burst equivalent level : ± 0.2 dB (Ref. 110 dB continuous sound level)

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

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

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

Certificate No. : C113112

Certificate of Calibration

This is to certify that the equipment

Description : Precision Integrating Sound Level Meter

Manufacturer : Rion

Model No. : NL-18

Serial No. : 00360030

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C113112.

The equipment is supplied by

Co. Name : Envirotech Services Co.

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

Date of Issue : 2 June 2011

Certified by : H C Chan

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

Report No. : C113112

Calibration Report

ITEM TESTED

DESCRIPTION : Precision Integrating Sound Level Meter
MANUFACTURER : Rion
MODEL NO. : NL-18
SERIAL NO. : 00360030

TEST CONDITIONS

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

TEST SPECIFICATIONS

Calibration

DATE OF TEST : 1 June 2011 ***JOB NO.*** : IC11-1337

TEST RESULTS

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

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

Tested by : *K C Lee* *Date : 2 June 2011*

Report No. : C113112

Calibration Report

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

2. Self-calibration using the internal standard (After Adjustment) was performed before the test 6.1.1.2 - 6.4.

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C110018
CL281	Multifunction Acoustic Calibrator	C1006860

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Adjustment

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 110	LA	A	Fast	94.00	1	94.5	± 0.7

6.1.1.2 After Adjustment

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 110	LA	A	Fast	94.00	1	94.0	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
60 - 120	LA	A	Fast	94.00	1	94.1 (Ref.)
				104.00		104.1
				114.00		114.0

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

Report No. : C113112

Calibration Report

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 110	LA	A	Fast	94.00	1	94.0	Ref.
			Slow			94.0	± 0.1

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
50 -110	LA	A	Fast	106.00	Continuous	106.0	Ref.
	LAmx				200 ms	105.1	-1.0 ± 1.0
	LA		Slow		Continuous	106.0	Ref.
	LAmx				500 ms	102.5	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 110	LA	A	Fast	94.00	31.5 Hz	54.4	-39.4 ± 1.5
					63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.7	-16.1 ± 1.0
					250 Hz	85.2	-8.6 ± 1.0
					500 Hz	90.7	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.3	+1.2 ± 1.0
					4 kHz	95.1	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.7	-4.3 (+3.0 ; -6.0)

Report No. : C113112

Calibration Report

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 110	LC	C	Fast	94.00	31.5 Hz	90.9	-3.0 ± 1.5
					63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.9	-0.2 ± 1.0
					250 Hz	94.1	0.0 ± 1.0
					500 Hz	94.1	0.0 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	93.9	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.7	-6.2 (+3.0 ; -6.0)

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Integrating Time	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
50 - 110	LAeq	A	10 sec.	4	1	1/10	110.0	100	100.0	± 0.5
						$1/10^2$		90	90.0	± 0.5
			60 sec.			$1/10^3$		80	79.6	± 1.0
			5 min.			$1/10^4$		70	69.7	± 1.0

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

- Uncertainties of Applied Value : 94 dB : 31.5 Hz - 125 Hz : ± 0.35 dB
  250 Hz - 500 Hz : ± 0.30 dB
  1 kHz : ± 0.20 dB
  2 kHz - 4 kHz : ± 0.35 dB
  8 kHz : ± 0.45 dB
  104 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
  114 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
  Burst equivalent level : ± 0.2 dB (Ref. 110 dB continuous sound level)

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

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

輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C106297

Certificate of Calibration

This is to certify that the equipment

Description : Integrating Sound Level Meter

Manufacturer : Bruel & Kjaer

Model No. : 2238

Serial No. : 2448529

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C106297.

The equipment is supplied by

Co. Name : Hyder Consulting Limited

Address : 47/F., Hopewell Centre, 183 Queen's Road East, Wanchai, Hong Kong

Date of Issue : 16 November 2010

Certified by : K C Lee

The test equipment used for calibration are traceable to the National Standards as specified in this report.
This report shall not be reproduced except in full and with prior written approval from this laboratory.

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

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

Report No. : C106297

Calibration Report

ITEM TESTED

DESCRIPTION : Integrating Sound Level Meter
MANUFACTURER : Bruel & Kjaer
MODEL NO. : 2238
SERIAL NO. : 2448529

TEST CONDITIONS

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

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 16 November 2010 ***JOB NO.*** : IC10-2916

TEST RESULTS

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

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

Tested by : *L L Cheung* *Date : 16 November 2010*

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

Report No. : C106297

Calibration Report

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

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

3. Test equipment :

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

4. Test procedure : MA101N.

5. Results :

5.1 Sound Pressure Level

5.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT	IEC 60651
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Type 1 Spec. (dB)
50 - 130	L_{AFP}	A	F	94.00	1	94.0	± 0.7

5.1.2 Linearity

UUT Setting				Applied Value		UUT
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)
50 - 130	L_{AFP}	A	F	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.0

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

5.2 Time Weighting

5.2.1 Continuous Signal

UUT Setting				Applied Value		UUT	IEC 60651
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Type 1 Spec. (dB)
50 - 130	L_{AFP}	A	F	94.00	1	94.0	Ref.
	L_{ASP}		S			94.1	± 0.1
	L_{AIP}		I			94.1	± 0.1

Report No. : C106297

Calibration Report

5.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
30 - 110	L_{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L_{AFMax}				200 ms	105.0	-1.0 ± 1.0
	L_{ASP}		S		Continuous	106.0	Ref.
	L_{ASMax}				500 ms	101.9	-4.1 ± 1.0

5.3 Frequency Weighting

5.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{AFP}	A	F	94.00	31.5 Hz	54.9	-39.4 ± 1.5
					63 Hz	67.9	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.7	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.9	-4.3 (+3.0 ; -6.0)

5.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{CFP}	C	F	94.00	31.5 Hz	91.3	-3.0 ± 1.5
					63 Hz	93.3	-0.8 ± 1.5
					125 Hz	93.9	-0.2 ± 1.0
					250 Hz	94.0	0.0 ± 1.0
					500 Hz	94.0	0.0 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.9	-6.2 (+3.0 ; -6.0)

Report No. : C106297

Calibration Report

5.4 Time Averaging

UUT Setting				Applied Value					UUT	IEC 60804
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)	Reading (dB)	Type 1 Spec. (dB)
30 - 110	L_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	99.9	± 0.5
						$1/10^2$		90	89.7	± 0.5
			60 sec.			$1/10^3$		80	79.9	± 1.0
			5 min.			$1/10^4$		70	69.7	± 1.0

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

- Uncertainties of Applied Value :

94 dB :	31.5 Hz - 125 Hz	: ± 0.40 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz	: ± 0.40 dB
	4 kHz	: ± 0.50 dB
	8 kHz	: ± 0.70 dB
	12.5 kHz	: ± 1.20 dB
104 dB :	1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB :	1 kHz	: ± 0.10 dB (Ref. 94 dB)
Burst equivalent level		: ± 0.2 dB (Ref. 110 dB continuous sound level)

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

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

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

Certificate No. : C114103

Certificate of Calibration

This is to certify that the equipment

Description : Precision Sound Level Meter

Manufacturer : Rion

Model No. : NA-27

Serial No. : 00201194

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C114103.

The equipment is supplied by

Co. Name : Envirotech Services Co.

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

Date of Issue : 26 July 2011

Certified by : K C Lee

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

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

Report No. : C114103

Calibration Report

ITEM TESTED

DESCRIPTION : Precision Sound Level Meter
MANUFACTURER : Rion
MODEL NO. : NA-27
SERIAL NO. : 00201194

TEST CONDITIONS

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

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 22 July 2011 ***JOB NO.*** : IC11-1826

TEST RESULTS

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

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

Tested by : *H C Chan* *Date : 26 July 2011*

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

Report No. : C114103

Calibration Report

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

2. Self-calibration was performed before the test.

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

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C110018
CL281	Multifunction Acoustic Calibrator	C1006860

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Self-Calibration

UUT Setting			Applied Value		UUT Reading (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 110	LA	Fast	94.00	1	94.1

6.1.1.2 After Self-Calibration

UUT Setting			Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 110	LA	Fast	94.00	1	94.0	± 0.7

6.1.2 Linearity

UUT Setting			Applied Value		UUT Reading (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
60 - 120	LA	Fast	94.00	1	94.0 (Ref.)
			104.00		104.0
			114.00		114.0

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

Report No. : C114103

Calibration Report

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting			Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 110	LA	Fast	94.00	1	94.0	Ref.
		Slow			94.0	± 0.1

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting			Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
50 -110	LA	Fast	106.00	Continuous	106.0	Ref.
	LAmax			200 ms	105.0	-1.0 ± 1.0
	LA	Slow		Continuous	106.0	Ref.
	LAmax			500 ms	102.0	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting			Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 110	LA	Fast	94.00	31.5 Hz	54.4	-39.4 ± 1.5
				63 Hz	67.8	-26.2 ± 1.5
				125 Hz	77.8	-16.1 ± 1.0
				250 Hz	85.3	-8.6 ± 1.0
				500 Hz	90.7	-3.2 ± 1.0
				1 kHz	94.0	Ref.
				2 kHz	95.2	+1.2 ± 1.0
				4 kHz	95.0	+1.0 ± 1.0
				8 kHz	92.9	-1.1 (+1.5 ; -3.0)
				12.5 kHz	89.7	-4.3 (+3.0 ; -6.0)

Report No. : C114103

Calibration Report

6.3.2 C-Weighting

UUT Setting			Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 110	LC	Fast	94.00	31.5 Hz	91.0	-3.0 ± 1.5
				63 Hz	93.1	-0.8 ± 1.5
				125 Hz	93.8	-0.2 ± 1.0
				250 Hz	94.0	0.0 ± 1.0
				500 Hz	94.0	0.0 ± 1.0
				1 kHz	94.0	Ref.
				2 kHz	93.8	-0.2 ± 1.0
				4 kHz	93.2	-0.8 ± 1.0
				8 kHz	90.9	-3.0 (+1.5 ; -3.0)
				12.5 kHz	87.8	-6.2 (+3.0 ; -6.0)

6.4 Time Averaging

UUT Setting			Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Mode	Integrating Time	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
50 - 110	LAeq	10 sec.	4	1	1/10	110.0	100	100.1	± 0.5
					$1/10^2$		90	90.1	± 0.5
		60 sec.			$1/10^3$		80	80.0	± 1.0
		5 min.			$1/10^4$		70	70.0	± 1.0

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

- Uncertainties of Applied Value : 94 dB : 31.5 Hz - 125 Hz : ± 0.35 dB
  250 Hz - 500 Hz : ± 0.30 dB
  1 kHz : ± 0.20 dB
  2 kHz - 4 kHz : ± 0.35 dB
  8 kHz : ± 0.45 dB
  12.5 kHz : ± 0.70 dB
  104 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
  114 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
  Burst equivalent level : ± 0.2 dB (Ref. 110 dB continuous sound level)

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

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

RION CO., LTD.

3-20-41 Higashimotomachi Kokubunji Tokyo 185-8533
Phone:042(359)7888, Facsimile:042(359)7442

Certificate of Calibration

Name	:	**Precision sound level meter**
Model	:	**NL-52 S/No. : 00710259** **(NX-42EX installed)**
Microphone	:	**UC-59 S/No. : 02695**
Preamplifier	:	**NH-25 S/No. : 10253**
Date of Calibration	:	**September, 20, 2011**

We hereby certify that the above product was tested and calibrated according to the prescribed Rion procedures, and that it fulfills specification requirements.

The measuring equipment and reference devices used for testing and calibrating this unit are managed under the Rion traceability system and are traceable according to official Japanese standards and official standards of countries belonging to the International Committee of Weights and Measures.

RION CO., LTD.

Manager, Quality Control Department

Annex A2

Results of Noise Monitoring

Annex A2
Operational Noise Monitoring Results

Monitoring Location: AON1 Open area adjacent to Police Training School

Date	Weekdays/ Public Holiday (WD/PH)	Measurement Period, hours		Measured Noise Level [1], dB(A)			Daily Operational Noise Level (Background Corrected), $L_{eq, 30min}$		Lagoon Night Show Noise Level (Background Corrected), $L_{eq, 30min}$		Noise Criteria, $L_{eq(30mins)}$, dB(A)	Remark / Other Noise Source(s)
		Start	End	Daily Operational Noise Level, $L_{eq, 30min}$	Lagoon Night Show Noise Level, $L_{eq, 30min}$	Background Noise Level, $L_{eq, 15min}$	Without façade	With façade correction	Without façade	With façade correction		
30-Oct-11	PH	1820	1930	67.0	67.3	**67.1**	Negligible	Negligible	53.1	56.1	60	Note [1]
01-Nov-11	WD	1820	1930	63.1	61.8	**61.8**	57.4	60.4	40.7	43.7	60	-
06-Nov-11	PH	1820	1930	68.7	67.4	**66.8**	64.1	**67.1**	57.8	**60.8**	60	Note [1] & [2]
08-Nov-11	WD	1820	1930	63.8	64.1	**63.9**	Negligible	Negligible	49.8	52.8	60	Note [1]
13-Nov-11	PH	1820	1930	66.9	66.7	**66.9**	Negligible	Negligible	Negligible	Negligible	60	Note [1]
15-Nov-11	WD	1820	1930	64.3	62.2	**61.7**	60.8	**63.8**	53.0	56.0	60	Note [1] & [2]
20-Nov-11	PH	1820	1930	70.4	69.6	**69.2**	64.3	**67.3**	59.7	**62.7**	60	Note [1] & [2]
22-Nov-11	WD	1820	1930	63.7	64.5	**63.2**	53.9	56.9	58.5	**61.5**	60	Note [1] & [2]

Monitoring Location: AON2 Roof of Old Canteen Building

Date	Weekdays/ Public Holiday (WD/PH)	Measurement Period, hours		Measured Noise Level [1], dB(A)			Daily Operational Noise Level (Background Corrected), $L_{eq, 30min}$	Lagoon Night Show Noise Level (Background Corrected), $L_{eq, 30min}$	Noise Criteria, $L_{eq(30mins)}$, dB(A)	Remark / Other Noise Source(s)
		Start	End	Daily Operational Noise Level, $L_{eq, 30min}$	Lagoon Night Show Noise Level, $L_{eq, 30min}$	Background Noise Level, $L_{eq, 15min}$				
30-Oct-11	PH	1820	1930	73.0	73.2	**72.8**	58.7	**62.0**	60	Note [1] & [3]
01-Nov-11	WD	1820	1930	62.0	60.0	58.1	59.7	55.4	60	-
06-Nov-11	PH	1820	1930	60.8	60.2	59.3	55.2	52.8	60	-
08-Nov-11	WD	1820	1930	60.6	60.0	58.4	56.6	54.9	60	-
13-Nov-11	PH	1820	1930	61.1	59.5	57.5	58.5	55.0	60	-
15-Nov-11	WD	1820	1930	59.9	59.2	57.6	56.1	54.1	60	-
20-Nov-11	PH	1820	1930	60.9	59.4	57.5	58.2	54.8	60	-
22-Nov-11	WD	1820	1930	62.9	60.1	58.3	**61.0**	55.4	60	Note [1] & [4]

Monitoring Location: AON3 Woodgreen Estate

Date	Weekdays/ Public Holiday (WD/PH)	Measurement Period, hours		Measured Noise Level [1], dB(A)			Daily Operational Noise Level (Background Corrected), $L_{eq, 30min}$	Lagoon Night Show Noise Level (Background Corrected), $L_{eq, 30min}$	Noise Criteria, $L_{eq(30mins)}$, dB(A)	Remark / Other Noise Source(s)
		Start	End	Daily Operational Noise Level, $L_{eq, 30min}$	Lagoon Night Show Noise Level, $L_{eq, 30min}$	Background Noise Level, $L_{eq, 15min}$				
30-Oct-11	PH	1820	1930	64.6	63.4	**64.7**	Negligible	Negligible	55	Note [1]
01-Nov-11	WD	1820	1930	64.9	64.7	**64.8**	49.7	Negligible	55	Note [1]
06-Nov-11	PH	1820	1930	63.3	63.7	**62.4**	**55.7**	**57.8**	55	Note [1] & [5]
08-Nov-11	WD	1820	1930	68.1	68.3	**68.7**	Negligible	Negligible	55	Note [1]
13-Nov-11	PH	1820	1930	65.2	64.4	**64.0**	**59.0**	53.3	55	Note [1] & [5]
15-Nov-11	WD	1820	1930	66.4	65.9	**65.7**	**57.6**	51.7	55	Note [1] & [5]
20-Nov-11	PH	1820	1930	64.1	62.8	**61.8**	**60.3**	**55.8**	55	Note [1] & [5]
22-Nov-11	WD	1820	1930	64.6	66.9	**66.2**	Negligible	**58.7**	55	Note [1] & [5]

Monitoring Location: AON4 Manly Villa

Date	Weekdays/ Public Holiday (WD/PH)	Measurement Period, hours		Measured Noise Level [1], dB(A)			Daily Operational Noise Level (Background Corrected), $L_{eq, 30min}$	Lagoon Night Show Noise Level (Background Corrected), $L_{eq, 30min}$	Noise Criteria, $L_{eq(30mins)}$, dB(A)	Remark / Other Noise Source(s)
		Start	End	Daily Operational Noise Level, $L_{eq, 30min}$	Lagoon Night Show Noise Level, $L_{eq, 30min}$	Background Noise Level, $L_{eq, 15min}$				
30-Oct-11	PH	1820	1930	55.6	55.6	**54.6**	48.7	48.8	55	-
01-Nov-11	WD	1820	1930	55.1	56.5	55.3	Negligible	50.2	55	Note [1]
06-Nov-11	PH	1820	1930	54.9	55.8	**55.5**	Negligible	44.3	55	Note [1]
08-Nov-11	WD	1820	1930	55.4	55.2	53.8	50.1	49.4	55	-
13-Nov-11	PH	1820	1930	55.1	56.0	54.9	41.2	49.5	55	-
15-Nov-11	WD	1820	1930	56.6	55.6	54.2	52.9	49.9	55	-
20-Nov-11	PH	1820	1930	57.6	55.2	53.6	55.4	50.1	55	-
22-Nov-11	WD	1820	1930	57.2	55.8	54.9	53.3	48.2	55	-

Monitoring Location: AON5 Hau Yuen

Date	Weekdays/ Public Holiday (WD/PH)	Measurement Period, hours		Measured Noise Level [1], dB(A)			Daily Operational Noise Level (Background Corrected), $L_{eq, 30min}$	Lagoon Night Show Noise Level (Background Corrected), $L_{eq, 30min}$	Noise Criteria, $L_{eq(30mins)}$, dB(A)	Remark / Other Noise Source(s)
		Start	End	Daily Operational Noise Level, $L_{eq, 30min}$	Lagoon Night Show Noise Level, $L_{eq, 30min}$	Background Noise Level, $L_{eq, 15min}$				
30-Oct-11	PH	1820	1930	56.7	57.6	**56.4**	43.9	51.1	55	-
01-Nov-11	WD	1820	1930	58.6	56.8	**57.4**	52.5	Negligible	55	Note [1]
06-Nov-11	PH	1820	1930	56.4	57.3	**57.6**	Negligible	Negligible	55	Note [1]
08-Nov-11	WD	1820	1930	60.0	59.6	**60.4**	Negligible	Negligible	55	Note [1]
13-Nov-11	PH	1820	1930	58.8	59.1	**58.3**	49.7	51.2	55	-
15-Nov-11	WD	1820	1930	58.1	59.0	**57.7**	47.0	52.9	55	-
20-Nov-11	PH	1820	1930	58.0	55.2	55.4	54.5	Negligible	55	-
22-Nov-11	WD	1820	1930	60.6	61.0	**61.0**	Negligible	Negligible	55	Note [1]

Notes:

[1] Bolded value indicates exceedance over the noise criteria.
Negligible refers to the measured impact noise levels lower than the background noise levels.

[2] The exceedances were due to the high level of background noise from visitors and traffic.

[3] The exceedance at AON2 were due to noise from special event at Ocean Park held on 30 Oct 2011.

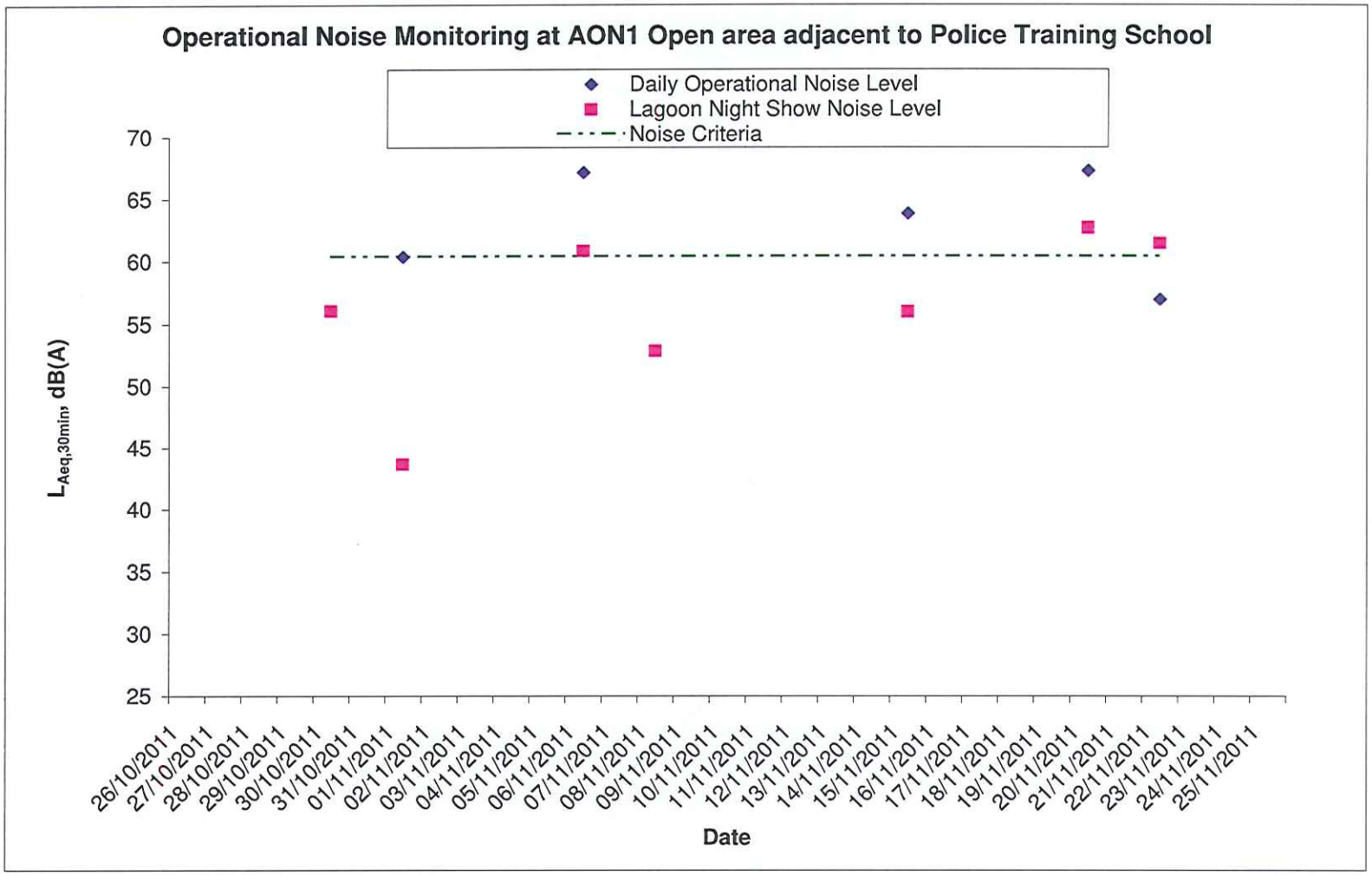
[4] The exceedance at AON2 was due to the noise from construction works near the Cable Car Terminal on 22 Nov 2011, CNP No. GW-RS0314-11.

[5] The exceedances at AON3 were due to traffic noise from Shouson Hill Road.

Annex A3

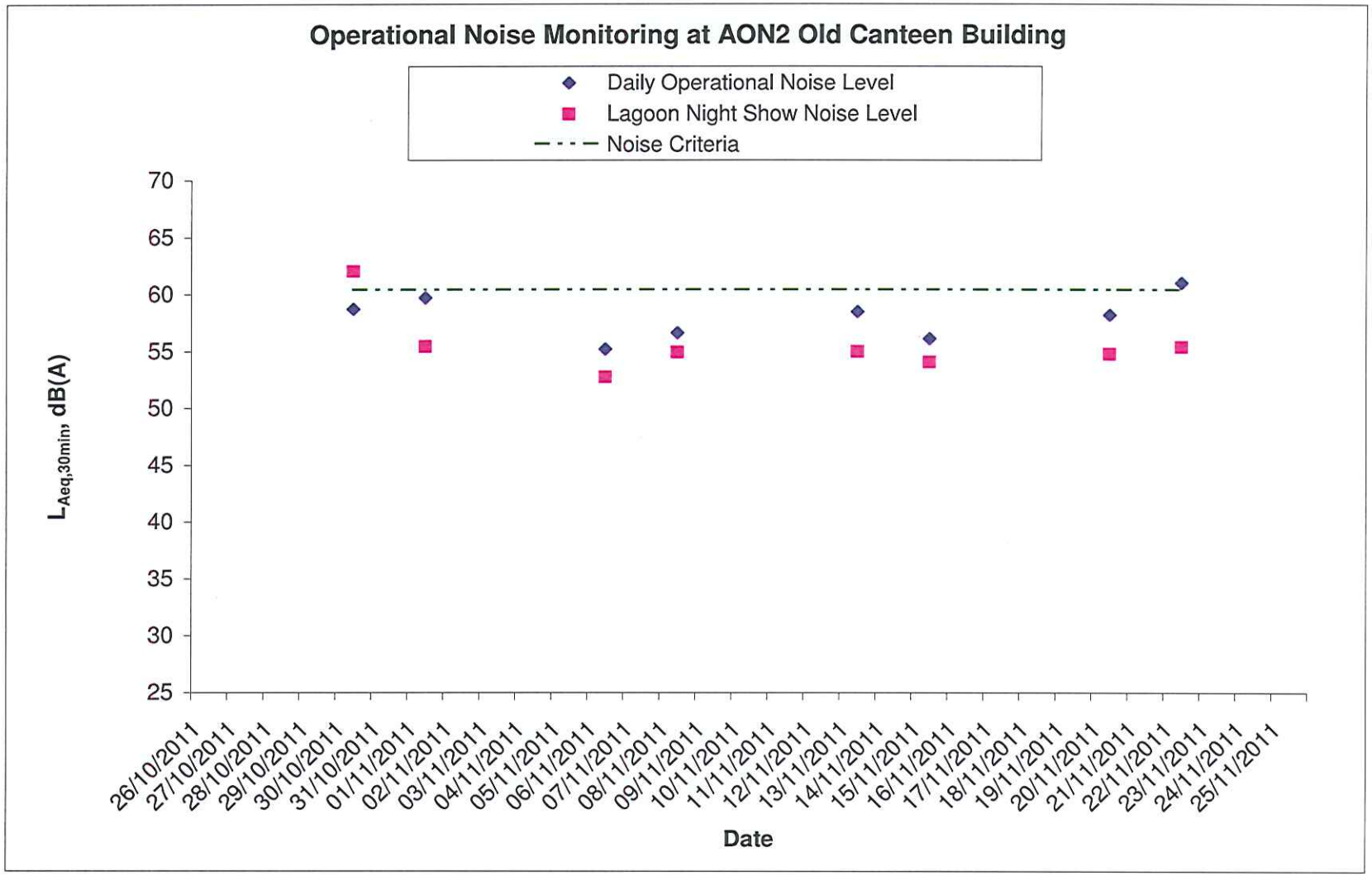
Graphical Presentation of Noise Monitoring Result

Annex A3-1



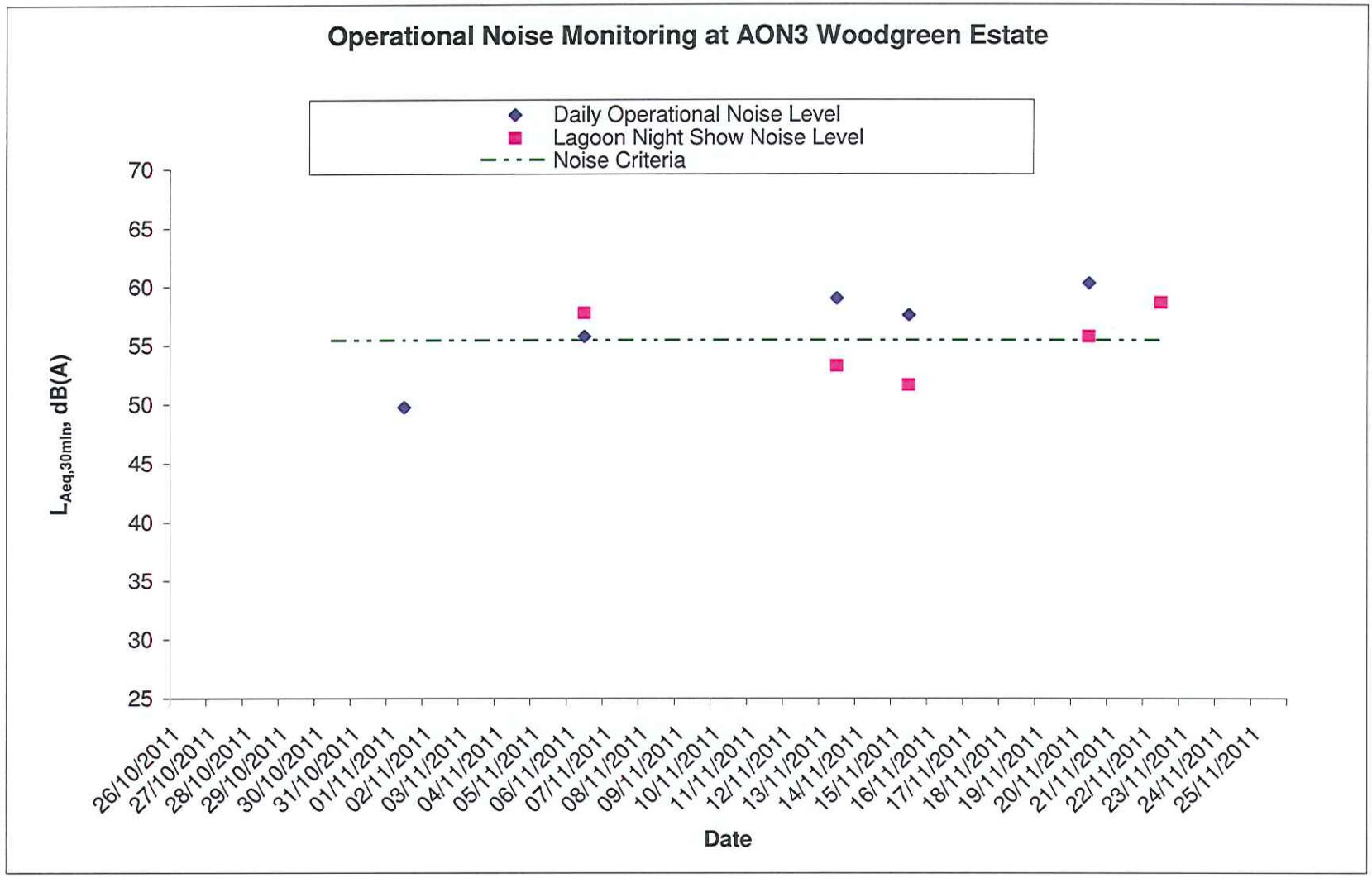
Note: The exceedances were due to the high level of background noise from visitors and traffic.

Annex A3-2



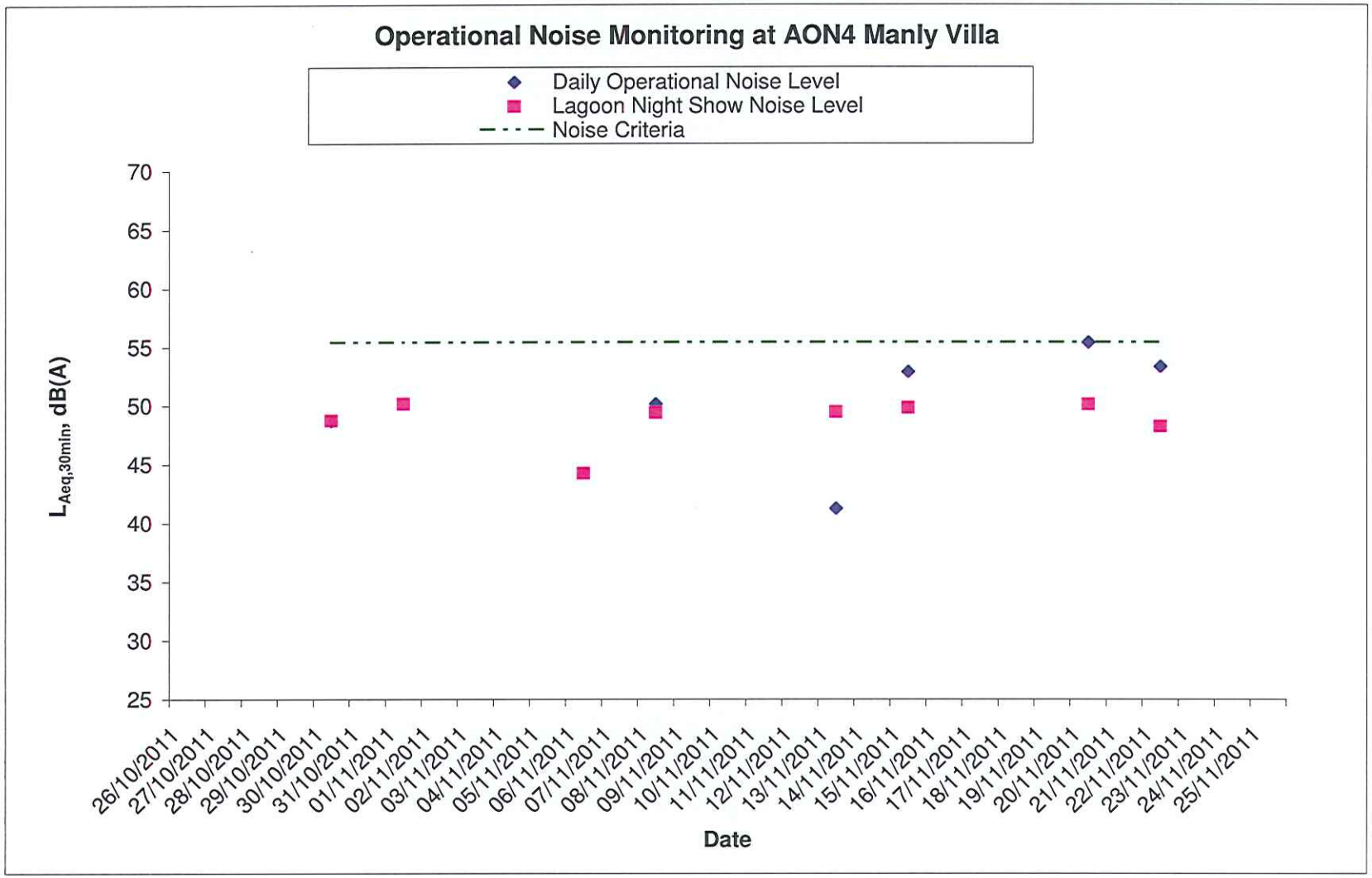
Note: The exceedances were due to noise from special event at Ocean Park and noise from construction works near the Cable Car Terminal (CNP No. GW-RS0314-11).

Annex A3-3

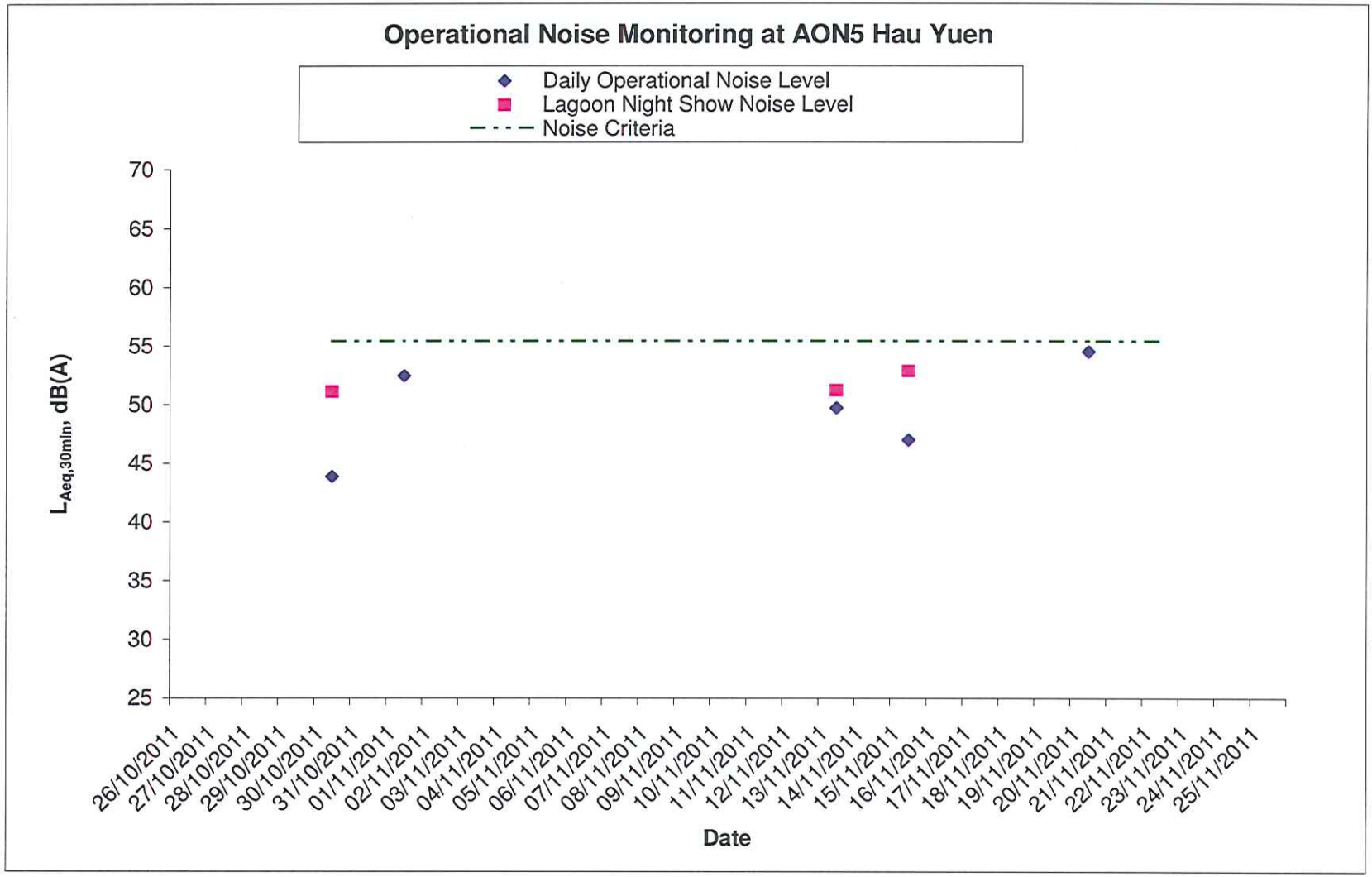


Note: The exceedances were due to the traffic noise from Shouson Hill Road.

Annex A3-4


Operational Noise Monitoring at AON4 Manly Villa
Daily Operational Noise Level
Lagoon Night Show Noise Level
Noise Criteria
$L_{Aeq,30min}$, dB(A)
70
65
60
55
50
45
40
35
30
25
26/10/2011
27/10/2011
28/10/2011
29/10/2011
30/10/2011
31/10/2011
01/11/2011
02/11/2011
03/11/2011
04/11/2011
05/11/2011
06/11/2011
07/11/2011
08/11/2011
09/11/2011
10/11/2011
11/11/2011
12/11/2011
13/11/2011
14/11/2011
15/11/2011
16/11/2011
17/11/2011
18/11/2011
19/11/2011
20/11/2011
21/11/2011
22/11/2011
23/11/2011
24/11/2011
25/11/2011
Date

Annex A3-5


Operational Noise Monitoring at AON5 Hau Yuen
Daily Operational Noise Level
Lagoon Night Show Noise Level
Noise Criteria
70
65
60
55
50
45
40
35
30
25
$L_{Aeq,30mln}$, dB(A)
26/10/2011
27/10/2011
28/10/2011
29/10/2011
30/10/2011
31/10/2011
01/11/2011
02/11/2011
03/11/2011
04/11/2011
05/11/2011
06/11/2011
07/11/2011
08/11/2011
09/11/2011
10/11/2011
11/11/2011
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15/11/2011
16/11/2011
17/11/2011
18/11/2011
19/11/2011
20/11/2011
21/11/2011
22/11/2011
23/11/2011
24/11/2011
25/11/2011
Date