

Annex F

## Noise

Annex F1

# Calibration Certificates for Noise



輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

# Certificate of Calibration 校正證書

Certificate No. : C230386

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC23-0164)

Date of Receipt / 收件日期 : 27 January 2023

Description / 儀器名稱 : Precision Acoustic Calibrator

Manufacturer / 製造商 : LARSON DAVIS

Model No. / 型號 : CAL200

Serial No. / 編號 : 10227

Supplied By / 委託者 : Envirotech Services Co.

Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,  
New Territories, Hong Kong

## TEST CONDITIONS / 測試條件

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$

Relative Humidity / 相對濕度 :  $(50 \pm 25)\%$

Line Voltage / 電壓 : ---

## TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 28 January 2023

## TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

The results are detailed in the subsequent page(s).

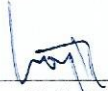
The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By

測試

:

  
H T Wong  
Assistant Engineer

Certified By

核證

:

  
K C Lee  
Engineer

Date of Issue

簽發日期

:

30 January 2023

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

Sun Creation Engineering Limited - Calibration & Testing Laboratory

c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

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Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

# Certificate of Calibration

## 校正證書

Certificate No. : C230386

證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C223647
CL281	Multifunction Acoustic Calibrator	AV210017
TST150A	Measuring Amplifier	C221750

- Test procedure : MA100N.

- Results :

### 5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	93.9	± 0.2
114 dB, 1 kHz	113.9	

### 5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Uncertainty of Measured Value (Hz)
1	1.000	± 1

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

Note :

Only the original copy or the laboratory's certified true copy is valid.

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





輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

# Certificate of Calibration

## 校正證書

Certificate No. : C222710

證書編號

ITEM TESTED / 送檢項目 ( Job No. / 序引編號 : IC22-0821 )

Date of Receipt / 收件日期 : 3 May 2022

Description / 儀器名稱 : Sound Level Meter

Manufacturer / 製造商 : Rion

Model No. / 型號 : NL-52

Serial No. / 編號 : 00542913

Supplied By / 委託者 : Envirotech Services Co.

Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,  
New Territories, Hong Kong

### TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C

Relative Humidity / 相對濕度 : (50 ± 25)%

Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 20 May 2022

### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

The results do not exceed 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
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By

測試

: 

C K Lo

Project Engineer

Certified By

核證

: 

K C Lee

Engineer

Date of Issue

簽發日期

:

24 May 2022

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Sun Creation Engineering Limited Calibration & Testing Laboratory

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E-mail 電郵: callab@suncreation.com

Website 網址: www.suncreation.com

# Certificate of Calibration

## 校正證書

Certificate No. : C222710

證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- Self-calibration was performed before the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C220381
CL281	Multifunction Acoustic Calibrator	AV210017

- Test procedure : MA101N.

- Results :

### 6.1 Sound Pressure Level

#### 6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	93.3	± 1.1

#### 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	93.3 (Ref.)
				104.00		103.3
				114.00		113.3

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

### 6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	93.3	Ref.
			Slow			93.3	± 0.3

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# Certificate of Calibration

## 校正證書

Certificate No. : C222710  
證書編號

### 6.3 Frequency Weighting

#### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>A</sub>	A	Fast	94.00	63 Hz	67.1	-26.2 ± 1.5
					125 Hz	77.1	-16.1 ± 1.5
					250 Hz	84.6	-8.6 ± 1.4
					500 Hz	90.1	-3.2 ± 1.4
					1 kHz	93.3	Ref.
					2 kHz	94.5	+1.2 ± 1.6
					4 kHz	94.3	+1.0 ± 1.6
					8 kHz	92.3	-1.1 (+2.1 ; -3.1)
					16 kHz	85.4	-6.6 (+3.5 ; -17.0)

#### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>C</sub>	C	Fast	94.00	63 Hz	92.5	-0.8 ± 1.5
					125 Hz	93.1	-0.2 ± 1.5
					250 Hz	93.3	0.0 ± 1.4
					500 Hz	93.3	0.0 ± 1.4
					1 kHz	93.3	Ref.
					2 kHz	93.1	-0.2 ± 1.6
					4 kHz	92.5	-0.8 ± 1.6
					8 kHz	90.4	-3.0 (+2.1 ; -3.1)
					16 kHz	83.4	-8.5 (+3.5 ; -17.0)

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# Certificate of Calibration

## 校正證書

Certificate No. : C222710  
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- Remarks : - UUT Microphone Model No. : UC-59 & S/N : 06492
- Mfr's Spec. : IEC 61672 Class 1
- Uncertainties of Applied Value :
- |        |                  |                          |
|--------|------------------|--------------------------|
| 94 dB  | : 63 Hz - 125 Hz | : ± 0.35 dB              |
|        | 250 Hz - 500 Hz  | : ± 0.30 dB              |
|        | 1 kHz            | : ± 0.20 dB              |
|        | 2 kHz - 4 kHz    | : ± 0.35 dB              |
|        | 8 kHz            | : ± 0.45 dB              |
|        | 16 kHz           | : ± 0.70 dB              |
| 104 dB | : 1 kHz          | : ± 0.10 dB (Ref. 94 dB) |
| 114 dB | : 1 kHz          | : ± 0.10 dB (Ref. 94 dB) |

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

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Annex F2

## Monitoring Schedule for Noise

## Tung Chung New Town Extension (East) Noise Monitoring Schedule (April 2023)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Apr
						<b>Noise Monitoring</b>
2-Apr	3-Apr	4-Apr	5-Apr	6-Apr	7-Apr	8-Apr
				<b>Noise Monitoring</b>		
9-Apr	10-Apr	11-Apr	12-Apr	13-Apr	14-Apr	15-Apr
		<b>Noise Monitoring</b>				
16-Apr	17-Apr	18-Apr	19-Apr	20-Apr	21-Apr	22-Apr
	<b>Noise Monitoring</b>				<b>Noise Monitoring</b>	
23-Apr	24-Apr	25-Apr	26-Apr	27-Apr	28-Apr	29-Apr
				<b>Noise Monitoring</b>		
30-Apr						

Annex F3

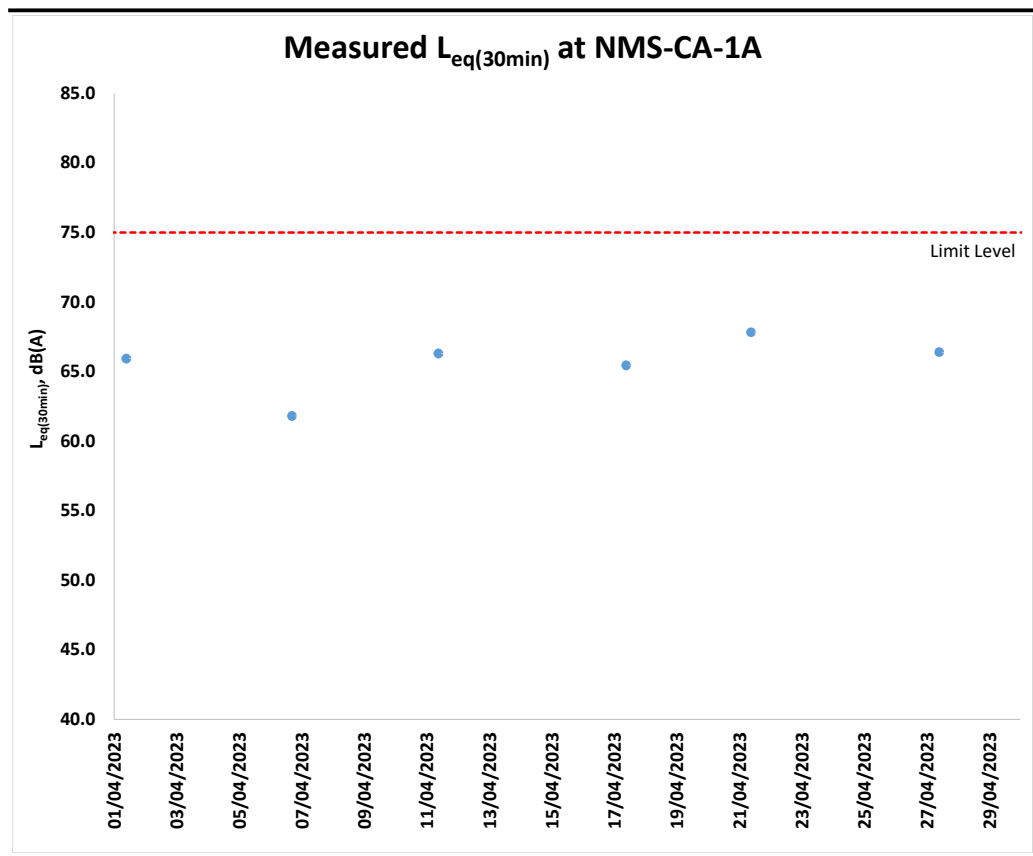
## Monitoring Results for Noise



**Table F3.1 Data for Noise Monitoring at Station NMS-CA-1A during Normal Working Hours (0700-1900 hours)**

Date & Time	L <sub>eq</sub> (5min)	L <sub>10</sub>	L <sub>90</sub>	L <sub>eq</sub> (30min)
2023-04-01 9:39	63.6	66.5	59.9	65.9
2023-04-01 9:44	65.3	68.4	59.2	
2023-04-01 9:49	66.7	70.4	59.3	
2023-04-01 9:54	66.3	69.8	59.9	
2023-04-01 9:59	66.6	69.7	60.2	
2023-04-01 10:04	66.3	70.1	59.4	61.8
2023-04-06 16:45	60.9	64.2	56.6	
2023-04-06 16:50	61.6	64.6	56.6	
2023-04-06 16:55	62.2	65.8	56.7	
2023-04-06 17:00	61.6	64.5	56.0	
2023-04-06 17:05	62.6	65.7	55.3	
2023-04-06 17:10	61.7	64.6	55.2	66.3
2023-04-11 9:12	66.3	68.7	62.3	
2023-04-11 9:17	66.7	69.0	61.5	
2023-04-11 9:22	66.5	69.7	61.5	
2023-04-11 9:27	65.9	68.3	61.0	
2023-04-11 9:32	65.8	68.6	61.6	
2023-04-11 9:37	66.5	69.1	62.0	65.4
2023-04-17 9:16	65.3	68.8	61.0	
2023-04-17 9:21	65.1	67.8	60.9	
2023-04-17 9:26	65.6	68.0	62.0	
2023-04-17 9:31	65.5	67.5	62.1	
2023-04-17 9:36	65.5	67.3	62.6	
2023-04-17 9:41	65.6	67.8	62.2	67.8
2023-04-21 9:13	67.1	69.7	60.7	
2023-04-21 9:18	69.2	70.7	62.1	
2023-04-21 9:23	66.8	70.1	60.5	
2023-04-21 9:28	69.3	72.7	62.0	
2023-04-21 9:33	66.7	68.9	60.7	
2023-04-21 9:38	66.9	70.3	60.4	66.4
2023-04-27 9:40	65.1	68.6	59.9	
2023-04-27 9:45	68.2	72.0	59.7	
2023-04-27 9:50	64.1	67.5	59.3	
2023-04-27 9:55	65.5	67.6	58.7	
2023-04-27 10:00	66.3	69.6	62.3	
2023-04-27 10:05	67.7	71.2	62.1	

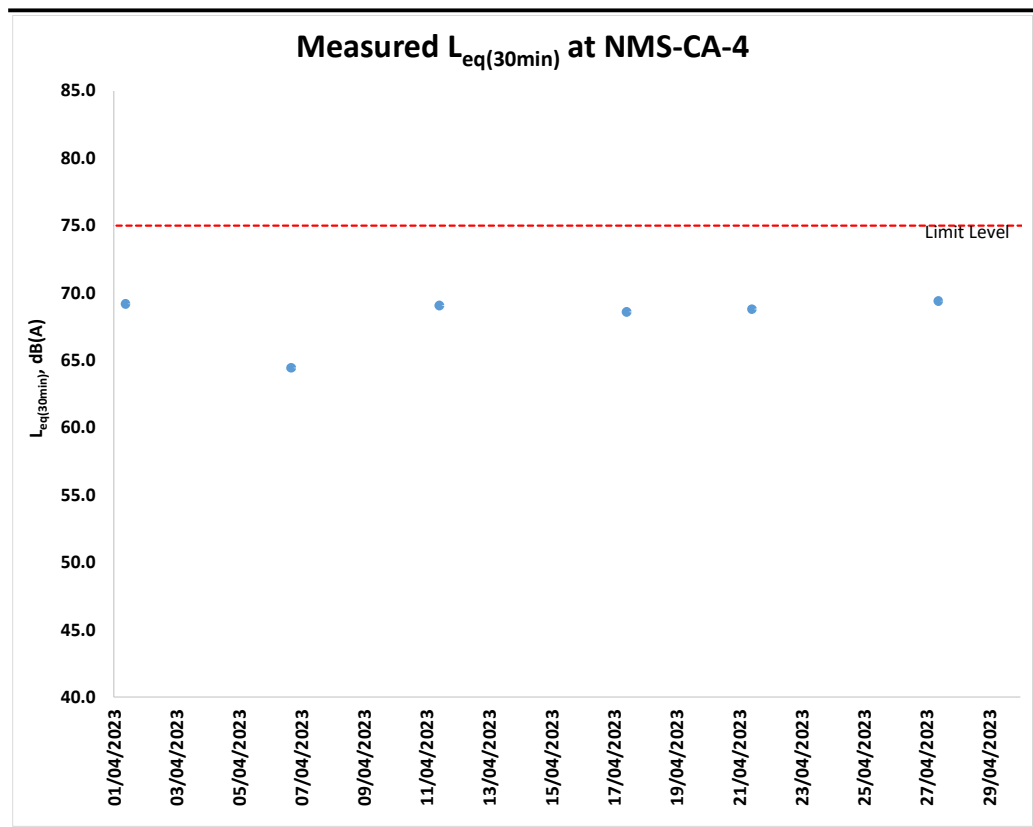
**Figure F3.1 Graphical Presentation for Noise Monitoring at Station NMS-CA-1A**



**Table F3.2 Data for Noise Monitoring at Station NMS-CA-4 during Normal Working Hours (0700-1900 hours)**

Date & Time	L <sub>eq</sub> (5min)	L <sub>10</sub>	L <sub>90</sub>	L <sub>eq</sub> (30min)
2023-04-01 9:02	70.2	73.0	65.8	69.2
2023-04-01 9:07	68.1	70.4	63.5	
2023-04-01 9:12	71.0	73.9	66.0	
2023-04-01 9:17	69.4	72.9	65.6	
2023-04-01 9:22	67.1	70.4	63.6	
2023-04-01 9:27	68.1	69.9	63.4	64.5
2023-04-06 16:08	63.3	65.3	60.3	
2023-04-06 16:13	64.5	68.0	61.1	
2023-04-06 16:18	63.1	64.5	59.9	
2023-04-06 16:23	65.3	68.5	61.0	
2023-04-06 16:28	64.8	68.8	60.5	69.1
2023-04-06 16:33	65.2	67.6	60.9	
2023-04-11 9:54	69.2	71.5	64.2	
2023-04-11 9:59	67.4	69.8	64.1	
2023-04-11 10:04	69.8	71.5	66.0	
2023-04-11 10:09	68.8	71.0	65.6	68.6
2023-04-11 10:14	69.1	71.2	66.0	
2023-04-11 10:19	69.7	71.8	63.9	
2023-04-17 9:49	66.7	69.5	60.4	
2023-04-17 9:54	65.8	68.8	60.6	
2023-04-17 9:59	68.0	71.1	62.3	68.8
2023-04-17 10:04	69.2	72.5	62.9	
2023-04-17 10:09	70.4	72.9	63.2	
2023-04-17 10:14	69.7	72.1	62.1	
2023-04-21 9:50	67.1	69.4	64.3	
2023-04-21 9:55	66.3	68.3	64.0	69.4
2023-04-21 10:00	70.1	73.3	64.9	
2023-04-21 10:05	70.2	70.8	65.3	
2023-04-21 10:10	69.0	71.1	65.7	
2023-04-21 10:15	68.7	70.7	66.1	
2023-04-27 9:01	70.0	71.9	67.1	69.4
2023-04-27 9:06	68.7	70.6	66.4	
2023-04-27 9:11	68.9	70.6	66.3	
2023-04-27 9:16	68.9	70.8	66.6	
2023-04-27 9:21	69.1	70.6	67.2	
2023-04-27 9:26	70.5	71.3	66.5	

**Figure F3.2 Graphical Presentation for Noise Monitoring at Station NMS-CA-4**



Annex F4

## Event and Action Plan for Noise



**Annex F4**      *Event and Action Plan for Construction Noise*

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