

AIR MONITORING RISK ASSESSMENT  
CRINGILA PUBLIC SCHOOL  
35 SHEFFIELD STREET  
CRINGILA NSW 2502

Weekly Report  
21-11-2018

NSW Department  
of Education

Cringila Public School

35 Sheffield Street  
Cringila NSW 2502

November 2018  
C107826: J153825: RC/TO

## Statement of Limitations

All and any Services proposed by Greencap to the Client are subject to the Terms and Conditions listed on the Greencap website at: [www.greencap.com.au/about-greencap/terms-and-conditions](http://www.greencap.com.au/about-greencap/terms-and-conditions). Unless otherwise expressly agreed to in writing and signed by Greencap, Greencap does not agree to any alternative terms or variation of these terms if subsequently proposed by the Client. The Services are to be carried out in accordance with the current and relevant industry standards of testing, interpretation and analysis. The Services are to be carried out in accordance with Commonwealth, State or Territory legislation, regulations and/or guidelines. The Client will be deemed to have accepted these Terms when the Client signs the Proposal (where indicated) or when the Company commences the Services at the request (written or otherwise) of the Client.

The services were carried out for the Specific Purpose, outlined in the body of the Proposal. To the fullest extent permitted by law, Greencap, its related bodies corporate, its officers, consultants, employees and agents assume no liability, and will not be liable to any person, or in relation to, any losses, damages, costs or expenses, and whether arising in contract, tort including negligence, under statute, in equity or otherwise, arising out of, or in connection with, any matter outside the Specific Purpose.

The Client acknowledges and agrees that proposed investigations rely on information provided to Greencap by the Client or other third parties. Greencap makes no representation or warranty regarding the completeness or accuracy of any descriptions or conclusions based on information supplied to it by the Client, its employees or other third parties during provision of the Services. The Client releases and indemnifies Greencap from and against all Claims arising from errors, omissions or inaccuracies in documents or other information provided to Greencap by the Client, its employees or other third parties. Under no circumstances shall Greencap have any liability for, or in relation to, any work, reports, information, plans, designs, or specifications supplied or prepared by any third party, including any third party recommended by Greencap.

The Client will ensure that Greencap has access to all sites and buildings as required by or necessary for Greencap to undertake the Services. Notwithstanding any other provision in these Terms, Greencap will have no liability to the Client or any third party to the extent that the performance of the Services is not able to be undertaken (in whole or in part) due to access to any relevant sites or buildings being prevented or delayed due to the Client or their respective employees or contractors expressing safety or health concerns associated with such access.



Greencap, its related bodies corporate, its officers, employees and agents assume no liability and will not be liable for lost profit, revenue, production, contract, opportunity, loss arising from business interruption or delay, indirect or consequential loss or loss to the extent caused or contributed to by the Client or third parties, suffered or incurred arising out of or in connection with our Proposals, Reports, the Project or the Agreement. In the event Greencap is found by a Court or Tribunal to be liable to the Client for any loss or damage arising in connection with the Services, the Client's entitlement to recover damages from Greencap shall be reduced by such amount as reflects the extent to which any act, default, omission or negligence of the Client, or any third party, caused or contributed to such loss or damage. Unless otherwise agreed in writing and signed by both parties, Greencap's total aggregate liability will not exceed the total consulting fees paid by the client in relation to this Proposal. For further detail, see Greencap's Terms and Conditions available at [www.greencap.com.au/about-greencap/terms-and-conditions](http://www.greencap.com.au/about-greencap/terms-and-conditions).

The Report is provided for the exclusive use of the Client for this Project only, in accordance with the Scope and Specific Purpose as outlined in the Agreement, and only those third parties who have been authorised in writing by Greencap. It should not be used for other purposes, other projects or by a third party unless otherwise agreed and authorised in writing by Greencap. Any person relying upon this Report beyond its exclusive use and Specific Purpose, and without the express written consent of Greencap, does so entirely at their own risk and without recourse to Greencap for any loss, liability or damage. To the extent permitted by law, Greencap assumes no responsibility for any loss, liability, damage, costs or expenses arising from interpretations or conclusions made by others, or use of the Report by a third party. Except as specifically agreed by Greencap in writing, it does not authorise the use of this Report by any third party. It is the responsibility of third parties to independently make inquiries or seek advice in relation to their particular requirements and proposed use of the site.

The conclusions, or data referred to in this Report, should not be used as part of a specification for a project without review and written agreement by Greencap. This Report has been written as advice and opinion, rather than with the purpose of specifying instructions for design or redevelopment. Greencap does not purport to recommend or induce a decision to make (or not make) any purchase, disposal, investment, divestment, financial commitment or otherwise in relation to the site it investigated.

This Report should be read in whole and should not be copied in part or altered. The Report as a whole sets out the findings of the investigations. No responsibility is accepted by Greencap for use of parts of the Report in the absence (or out of context) of the balance of the Report.

## Document Control

Document Quality Management Details.		
<b>Report Name:</b>	AMR-IAQ-07 Air Monitoring Risk Assessment	
<b>Site Details:</b>	Cringila Public School, 35 Sheffield Street, Cringila NSW 2502	
<b>Client Name:</b>	NSW Department of Education	
<b>Client Number:</b>	C107826	
<b>Signatures:</b>	Prepared By:  Tom Oyston Property Risk Consultant	Authorised By:  Rowan Clark Property Risk/Environmental Consultant

## Issue Status

Version No.	Date	Creator	Reviewer	Comments
1	21/11/2018	Tom Oyston	Rowan Clark	

## Document Circulation

No	Type	Customer Name	Position & Title
1	<b>Electronic</b>	NSW Department of Education	Greg Mott Senior Group Leader

# Air Monitoring Risk Assessment - IAQ

Cringila Public School, 35 Sheffield Street, Cringila NSW 2502

## Table of Contents

<b>1. Introduction .....</b>	<b>1</b>
<b>2. Objectives .....</b>	<b>1</b>
<b>3. Assessment Criteria .....</b>	<b>1</b>
<b>3.1 Carbon Dioxide (CO2) .....</b>	<b>1</b>
<b>4. Indoor Air Quality Monitoring Methodology .....</b>	<b>2</b>
<b>4.1 Indoor Air Quality Monitoring.....</b>	<b>2</b>
<b>4.2 Data Analysis and Reporting .....</b>	<b>2</b>
<b>5. Indoor Air Quality Monitoring Results.....</b>	<b>3</b>
<b>6. Discussion .....</b>	<b>4</b>
<b>Appendix A: Site Map and Sampling Locations .....</b>	<b>5</b>
<b>Appendix B: Calibration Certificates.....</b>	<b>7</b>

## 1. INTRODUCTION

At the request of the Department of Education, Greencap were engaged to undertake indoor air monitoring utilising real-time monitoring devices at Cringila Public School, 35 Sheffield Street Cringila NSW 2502. The aim of this monitoring program was primarily to investigate concerns raised by school employees and the Department of Education regarding the potential exposure to elevated concentrations of air pollutants, specifically carbon dioxide (CO<sub>2</sub>), during the normal occupation of rooms within the school.

## 2. OBJECTIVES

Based on the correspondence provided by the NSW Department of Education, the objective of this assessment is to undertake an assessment of the indoor air quality to determine the concentration of CO<sub>2</sub> within school buildings at Cringila Public School.

This report presents the results relating to the weekly indoor air quality monitoring investigation carried out within the Staffroom (Room 7R0007) in Building B007 at Cringila Public School. The location of the monitoring is displayed in **Appendix A: Site Map and Sample Locations**.

## 3. ASSESSMENT CRITERIA

Carbon Dioxide (CO<sub>2</sub>) measurements are compared against the ASHRAE Standard 62-2010 *Ventilation for Acceptable Indoor Air Quality* (American Society of Heating, Refrigeration and Air-Conditioning Engineers).

CO<sub>2</sub> measurements provide an indication of the adequacy of fresh air levels supplied to rooms within a building. A person's comfort and health may be affected by high concentrations of CO<sub>2</sub>.

For the purpose of this assessment, the recorded CO<sub>2</sub> measurements will be referenced against the ASHRAE Guideline value of 1,000 parts per million (ppm). This criteria is set for human comfort factors and is deemed to be the most conservative level to adopt.

### 3.1 CARBON DIOXIDE (CO<sub>2</sub>)

CO<sub>2</sub> is a normal constituent of exhaled breath and is commonly measured as a screening tool to evaluate whether adequate volumes of fresh outdoor air are being introduced into indoor air.

The outdoor level of CO<sub>2</sub> usually ranges from 300 ppm to 400 ppm. The CO<sub>2</sub> level is usually greater inside a building than outside, even in buildings with few complaints about indoor air quality. If indoor carbon dioxide levels are more than 1,000 ppm, there is probably inadequate ventilation; and complaints such as headaches, fatigue, and eye and throat irritation may be prevalent.

## 4. INDOOR AIR QUALITY MONITORING METHODOLOGY

### 4.1 INDOOR AIR QUALITY MONITORING

Indoor air quality monitoring was conducted at a single location over the course of a school day to study the concentration of CO<sub>2</sub> within school buildings while they are occupied. Weekly monitoring was conducted within the staffroom (7R000R), Building B007 at Cringila Public School.

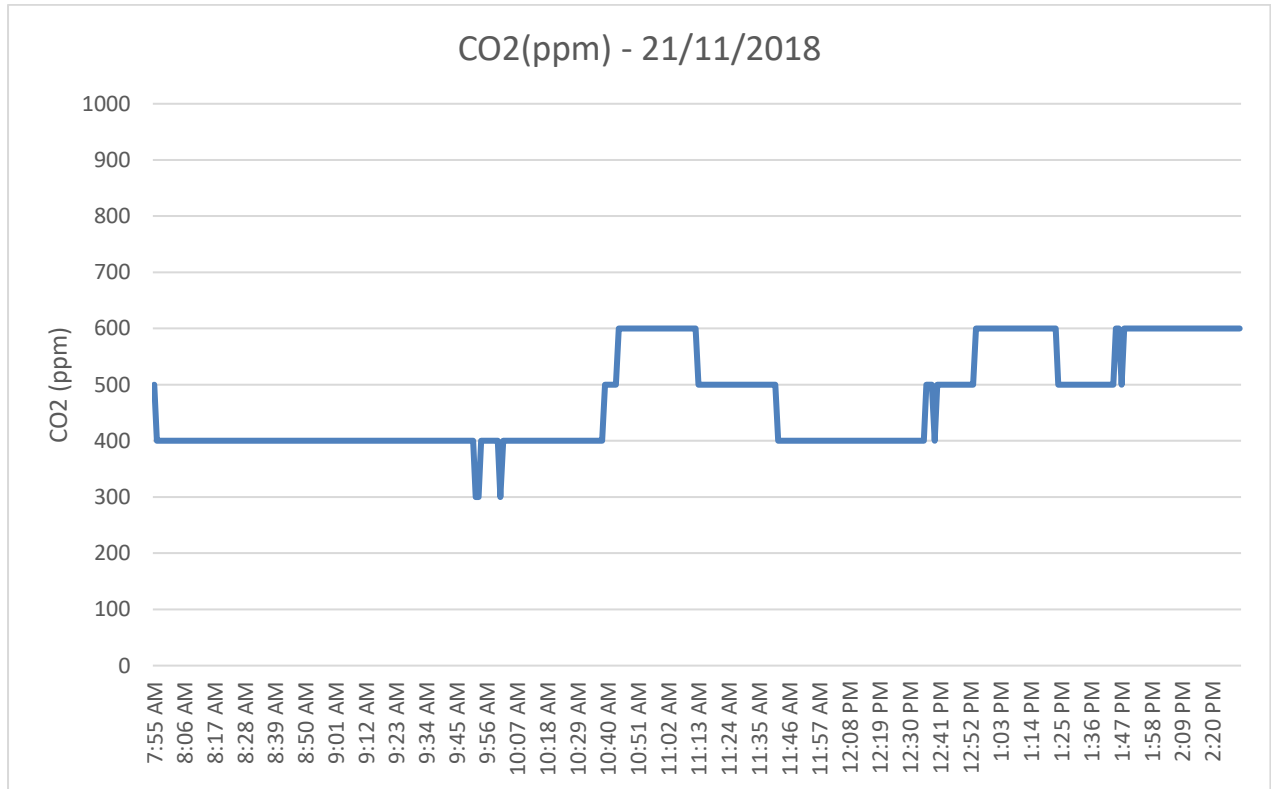
In this assessment, RAE Systems Multi RAE Gas Detectors were used with a specific sensor configuration to target CO<sub>2</sub> concentrations to be assessed against the adopted ASHRAE Guideline of 1,000 ppm as detailed above.

### 4.2 DATA ANALYSIS AND REPORTING

The units are configured to log data at one minute intervals and run throughout the course of the school day. Logged data was downloaded from the device and tabulated to present the results. Refer to **Section 5: Indoor Air Quality Monitoring Results**.

### 5. INDOOR AIR QUALITY MONITORING RESULTS

The CO<sub>2</sub> concentration results for the monitoring conducted on 21/11/2018 are summarised below in Figure 1. Monitoring locations are displayed in **Appendix A: Site Map and Sampling Locations**.



## 6. DISCUSSION

Generally, the monitoring results for CO<sub>2</sub> within the staffroom at Cringila Public School were between 300 ppm and 600 ppm during the monitoring. All results were below the ASHRAE guideline level of 1,000 ppm.

It should be noted that the adopted ASHRAE Guideline of 1,000 ppm is set for comfort only. A time weighted average (TWA) of 5,000 ppm has been set by Safe Work Australia for health purposes.

It should be noted that short term static monitoring results cannot be compared to exposure monitoring criteria and therefore may be used as guidance only with regard to concentrations of CO<sub>2</sub> in the staffroom.

Adequate supply of fresh air is required to dilute CO<sub>2</sub> and other pollutants to acceptable levels for human comfort and health considerations.

This concludes the weekly indoor air quality monitoring report for monitoring conducted on the 21<sup>st</sup> November 2018. It is recommended that interim assessments are continued in order to gain firm and reliable data sets regarding the concentration of CO<sub>2</sub> within indoor environments at the school whilst further investigation of the site is undertaken.



## Air Monitoring Risk Assessment

**Cringila Public School NW Hotspot – 35 Sheffield Street, Cringila NSW 2502**

### **Appendix A: Site Map and Sampling Locations**



**Legend:**

- ✕ Air monitor location
- North West Hotspot Investigation Area

Site	Cringila Public School
Area	Staffroom (Building B007)
Consultant	Rowan Clark/Tom Oyston
Date	Wednesday, 21 November 2018
Job Number	J153825
Report	AMR-IAQ-07
Version	1.0

## Air Monitoring Risk Assessment

**Cringila Public School NW Hotspot – 35 Sheffield Street, Cringila NSW 2502**

### **Appendix B: Calibration Certificates**

**Company:** Active Environmental Solutions Hire  
**Contact:** Aleks Todorovic  
**Address:** 2 Merchant Avenue  
 Thomastown Vic 3074  
**Phone:** 03 9464 2300 | **Fax:** 03 9464 3421  
**Email:** [Hire@aesolutions.com.au](mailto:Hire@aesolutions.com.au)

**Manufacturer:** RAE Systems  
**Instrument:** MultiRAE Lite  
**Model:** PGM 6208  
**Configuration:** PID, OFCH  
**Wireless:** -  
**Network ID:** -  
**Unit ID:** -

**Serial #:** MAA30042QB  
**Asset #:** -  
**Part #:** -  
**Sold:** -  
**Last Cal:** -  
**Job #:** -  
**Cal Spec:** Std

Item	Test	Pass/Fail	Comments
Battery	Li Ion	✓	
Charger	Charger, Power supply	✓	
	Cradle	✓	
Pump	Flow	✓	>300 mL/min
Filter	Filter, fitting, etc	✓	
Alarms	Audible, visual, vibration	✓	
Display	Operation	✓	
PCB	Operation	✓	
Connectors	Condition	✓	
Firmware	Version	✓	1.40
Datalogger	Operation	✓	
Monitor Housing	Condition	✓	
Case	Condition/Type	✓	
<b>Sensors</b>			
Oxygen	O2	✓	
LEL	LEL	✓	
PID	10.6eV	✓	
Toxic 1	CO	✓	
Toxic 2	H2S	✓	
Toxic 3			
Toxic 4			
Toxic 5			

### Engineer's Report

Setup, service and calibration for hire

### Calibration Certificate

Sensor	Type	Serial No:	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
Oxygen	O2	03420555UC	Fresh Air	20.9%	WO163704-3		20.9%	
			Oxygen	18.0%				18.0%
LEL	LEL	03110703T9	Methane	2.5% (50% LEL)	WO163704-3		0	50%
PID	10.6eV	03A30381QB	Isobutylene	100ppm	689134		0	100ppm
Toxic 1	CO	03060033N5	Carbon Monoxide	50ppm	WO163704-3		0	50ppm
Toxic 2	H2S	03AR0216Q3	Hydrogen Sulfide	10ppm	WO163704-3		0	10ppm
Toxic 3								
Toxic 4								
Toxic 5								

Calibrated/Repaired by: William Pak

Date: 12.07.2018

Next due: 12.01.2019

**Head Office – Melbourne**  
 2 Merchant Avenue  
 Thomastown VIC 3074 Australia  
 T: +61 3 9464 2300

**NSW Office – Ashfield**  
 Level 2, Suite 14, 6 - 8 Holden Street  
 Ashfield NSW 2131 Australia  
 T: +61 2 9716 5966

**WA Office – Malaga**  
 Unit 6, 41 Holder Way  
 Malaga WA 6090 Australia  
 T: +61 8 9249 5663

**QLD Office – Banyo**  
 Unit 17, 23 Ashtan Place  
 Banyo QLD 4014 Australia  
 T: +61 7 3267 1433

[sales@aesolutions.com.au](mailto:sales@aesolutions.com.au)



[www.aesolutions.com.au](http://www.aesolutions.com.au)



**Company:** Active Environmental Solutions Hire  
**Contact:** Aleks Todorovic  
**Address:** 2 Merchant Avenue  
 Thomastown Vic 3074  
**Phone:** 03 9464 2300 | **Fax:** 03 9464 3421  
**Email:** [Hire@aesolutions.com.au](mailto:Hire@aesolutions.com.au)

**Manufacturer:** RAE Systems  
**Instrument:** MultiRAE Lite  
**Model:** PGM 6208  
**Configuration:** NO, NO2, SO2, CO2  
**Wireless:** -  
**Network ID:** -  
**Unit ID:** -

**Serial #:** M01C005735  
**Asset #:** -  
**Part #:** -  
**Sold:** -  
**Last Cal:** -  
**Job #:** -  
**Cal Spec:** Std

Item	Test	Pass/Fail	Comments
Battery	Li Ion	✓	
Charger	Charger, Power supply	✓	
	Cradle	✓	
Pump	Flow	✓	>300 mL/min
Filter	Filter, fitting, etc	✓	
Alarms	Audible, visual, vibration	✓	
Display	Operation	✓	
PCB	Operation	✓	
Connectors	Condition	✓	
Firmware	Version	✓	1.40
Datalogger	Operation	✓	
Monitor Housing	Condition	✓	
Case	Condition/Type	✓	
<b>Sensors</b>			
Oxygen			
LEL			
PID			
Toxic 1	NO	✓	
Toxic 2	NO2	✓	
Toxic 3	SO2	✓	
Toxic 4	CO2	✓	
Toxic 5			

### Engineer's Report

Setup, service and calibration for hire

### Calibration Certificate

Sensor	Type	Serial No:	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
Oxygen								
LEL								
PID								
Toxic 1	NO	03740026U9	Nitric Oxide	25ppm	WO153855-2		0	25ppm
Toxic 2	NO2	03750052RC	Nitrogen Dioxide	5ppm	WO169855-1		0	5ppm
Toxic 3	SO2	03AF0109T5	Sulfur Dioxide	5ppm	WO155612-5		0	5ppm
Toxic 4	CO2	03610036QC	Carbon Monoxide	5000ppm	WO169824-1		0	5000ppm
Toxic 5								

Calibrated/Repaired by: William Pak

Date: 12.07.2018

Next due: 12.01.2019

**Head Office – Melbourne**  
 2 Merchant Avenue  
 Thomastown VIC 3074 Australia  
 T: +61 3 9464 2300

**NSW Office – Ashfield**  
 Level 2, Suite 14, 6 - 8 Holden Street  
 Ashfield NSW 2131 Australia  
 T: +61 2 9716 5966

**WA Office – Malaga**  
 Unit 6, 41 Holder Way  
 Malaga WA 6090 Australia  
 T: +61 8 9249 5663

**QLD Office – Banyo**  
 Unit 17, 23 Ashtan Place  
 Banyo QLD 4014 Australia  
 T: +61 7 3267 1433