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# AIR MONITORING RISK ASSESSMENT CRINGILA PUBLIC SCHOOL - NW HOTSPOT 35 SHEFFIELD STREET CRINGILA NSW 2502

## Weekly Report 18/06/18 – 22/06/18

# **Cringila Public School**

June 2018 C107826 : J153825 : RC

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## **Document Control**

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Signatures:	Prepared By:	Authorised By:							
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#### **Issue Status**

Version No.	Date	Creator	Reviewer	Comments
1	22/06/2018	Ellyssa Angelucci	Rowan Clark	
2				

#### **Document Circulation**

No	Туре	Customer Name	Position & Title			
1	Electronic	NSW Department of Education	Greg Mott Senior Group Leader			





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

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#### **1.INTRODUCTION**

At the request of the Department of Education, Greencap were engaged to undertake 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 those of the general public regarding the potential exposure to air pollutants originating from the pre-identified subsurface hotspot occurring in this particular area of the school.

Based on the correspondence provided by the NSW Department of Education, the objectives of this assessment are as follows:

- Undertake an assessment of the air quality at the source of the subsurface hotspot and to determine the extent of associated atmospheric pollutants (gases) distribution within Cringila Public School;
- Pollutants to be monitored using real-time monitors to provide a profile of air quality i.e. carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), volatile organic compounds, sulphur dioxide (SO<sub>2</sub>), hydrogen sulphide (H<sub>2</sub>S), methane (CH<sub>4</sub> – LEL), oxygen (O<sub>2</sub>), nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>).
- Real time monitoring was to provide a snapshot to determine the extent of atmospheric pollutant levels on School grounds.

This report presents the results relating to an ongoing air monitoring investigation carried out in the North-Western Hotspot, situated on the Cringila Public School grounds, located at 35 Sheffield Street, Cringila NSW 2502.

#### **2.ASSESSMENT CRITERIA**

As demonstrated in Table 1 below, the assessment criteria referenced as part of this project is based on several sources as this monitoring assessment had to consider numerous factors including outside air exposure, indoor air quality exposure and personal worker exposure. These reference sources included *Approved Methods for Modelling and Assessment of Air Pollutants in NSW* (NSW EPA 2016), *Workplace Exposure Standards for Airborne Contaminants* (SWA, 2013), *ASHRAE Standard 62.1 Ventilation for Acceptable Indoor Air Quality* (2016), or equivalent publications as a point of reference.

For the purpose of this assessment, these criteria values highlighted in bold will be referenced in this report as they are deemed to be the most conservative levels based on the multifaceted monitoring works undertaken. It is however important to note that WES do not apply to children. Reference to WES is purely for guidance purposes only.





POLLUTANT	AVERAGING PERIOD	CRITERIA	SOURCE
Carbon monoxide (CO)	8-hours	9 ppm	NSW EPA 2016 <sup>a</sup>
		9 ppm	ASHRAE Standard 62.1-2016
		30 ppm	SWA 2013 <sup>b</sup>
Carbon dioxide (CO <sup>2</sup> )	8-hours	5000 ppm	SWA 2013 <sup>b</sup>
		Not greater than 700 ppm above local outdoor concentration levels	ASHRAE Standard 62.1-2016
Sulphur dioxide (SO <sup>2</sup> )	24-hours	0.08 ppm (8 ppm)	NSW EPA 2016 <sup>a</sup>
	8-hours	2 ppm (5 ppm STEL) <sup>d</sup>	SWA 2013 <sup>b</sup>
Hydrogen sulphide (H <sup>2</sup> S)	8-hour	10 ppm (15 ppm STEL) <sup>d</sup>	SWA 2013
		0.9 ppm (Peak)	NSW EPA 2016
Nitric oxide (NO)	8-hour	25 ppm	SWA 2013
Nitrogen dioxide (NO <sup>2</sup> )	1-hour	0.12 ppm (12 ppm)	NSW EPA 2016 <sup>a</sup>
	8-hours	3 ppm (5 ppm STEL) <sup>d</sup>	SWA 2013 <sup>b</sup>
Oxygen (O²)	-	19.5-23.5%	SWA 2011 <sup>c</sup>
Volatile organic compounds (VOC)	-	Contaminant specific	-
Methane (as LEL)	-	<5%	SWA 2011 <sup>c</sup>

#### Table 1 Air Quality Monitoring Assessment Criteria

Sources:

a - NSW EPA 2016, Approved methods for the Modelling and Assessment of Air Pollutants in New South Wales, NSW Environment Protection Authority.

b - SWA 2013, Workplace Exposure Standards for Airborne Contaminants, Safe Work Australia. These concentrations are based on Time Weighted Averages (TWA) for an 8-hour shift.

c - SWA 2011, Confined Spaces Code of Practice, Safe Work Australia. These concentrations are based on conditions that do not pose an immediate risk to human health.

d - Short term exposure limit (STEL) means the average airborne concentration of a substance calculated over a 15-minute period. The STEL should not be exceeded at any time during a normal eight hour working day.



#### **3.AIR QUALITY MONITORING METHODOLOGY**

#### **3.1 SPOT CHECK / REAL TIME AIR QUALITY MONITORING**

'Spot-check' air quality monitoring at locations within the vicinity of the subsurface hotspot area was conducted to determine the extent of atmospheric pollutants (gases) associated with the hotspot. Pollutants monitored using real-time Multi-Gas Detectors provided and continue to provide a profile of air quality which include: carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), volatile organic compounds (VOCs), sulphur dioxide (SO<sub>2</sub>), hydrogen sulphide (H<sub>2</sub>S), methane (CH<sub>4</sub>) as LEL, oxygen (O<sub>2</sub>), nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>).

These air quality parameters were recorded at specific nominated locations within the northwest hotspot area over an interval of up to 15 minutes at each location. Monitoring included sensitive receptors such as locations within the school boundary and adjacent neighbouring residences in order to effectively delineate the extent and distribution of these atmospheric pollutants. This will be performed at the digression of the Greencap Consultant on site.

In this assessment, RAE Systems Multi RAE Gas Detectors were used with specific sensor configurations to target the nominated pollutants/gases to be assessed against the Air Quality Monitoring Criteria detailed below in Table 2. Each unit will be configured to log data at one second intervals, and upper and lower alarm limits will be set to reflect the adopted air monitoring criteria.

UNIT	SENSOR	RANGE	RESOLUTION	
Multi RAE Lite – Unit 1	SO <sub>2</sub>	0 to 20 ppm	0.1 ppm	
	NO	0 to 250 ppm	0.5 ppm	
	NO <sub>2</sub>	0 to 20 ppm	0.1 ppm	
	O <sub>2</sub>	To 30% (Volume)	0.1% (Volume)	
	VOCs	0 to 1,000 ppm	1 ppm	
Multi RAE Lite – Unit 2	СО	0 to 200 ppm	0.1 ppm	
	CO <sub>2</sub>	0 to 50,000 ppm	100 ppm	
	H <sub>2</sub> S	0 to 100 ppm	0.1 ppm	
	LEL (Methane)	0 to 100%	1%	

Table 2 Multi-Gas Detector Sensor Specifications

#### **3.2 MONITORING LOCATIONS**

Spot measurements were taken within the North-Western Hotspot area and at surrounding locations to determine whether potential air pollutants from the subsurface hotspot were present. These monitoring locations included the following:

- A-01 General Background
- A-02 NW Hotspot Concrete Cap Surface
- A-03 NW Hotspot Small Mound
- A-04 NW Hotspot NE fence line
- A-05 Exclusion Area Fence Line East of Hotspot (Approx. 10m)
- A-06 Exclusion Area Fence Line Southeast of Hotspot (Approx. 15m)
- A-07 Exclusion Area Fence Line South of Hotspot (Approx. 30m)
- A-08 Exclusion Area Fence Line Northwest of Hotspot, adjacent 17 Lackawanna Street (Approx. 50m)



#### **4.SPOT CHECK / REAL TIME AIR MONITORING RESULTS**

The atmospheric pollutant results for each monitoring event are summarised below in Table 3, and locations can be viewed in **Appendix A**.

Date o	f Monitoring: Wednesd	lay 20 <sup>th</sup> June	2018								
Locat	tion	Carbon monoxide (CO) (ppm)	Carbon dioxide (CO <sup>2</sup> ) (ppm)	Sulphur dioxide (SO <sup>2</sup> ) (ppm)	Hydrogen sulphide (H <sup>2</sup> S) (ppm)	Nitric oxide (NO) (ppm)	Nitrogen dioxide (NO <sup>2</sup> ) (ppm)	Oxygen (O <sup>2</sup> ) (%)	Volatile organic compounds (VOC) (ppm)	Methane (as LEL) (%)	Within Acceptable Limits?
A-01	General Background – West of Site Fence	0	300	0	0	0	0	20.9	0	0	✓
A-02	NW Hotspot – Adjacent Concrete Cap	0	300	0	0	0	0	20.9	0	0	✓
A-03	NW Hotspot – Small Mound	0	300	0	0	0	0	20.9	0	0	✓
A-04	NE Fence Line Adjacent Hotspot	0	300	0	0	0	0	20.9	0	0	~
A-05	Exclusion Area Fence Line East of Hotspot (Approx. 10m)	0	300	0	0	0	0	20.9	0	0	✓
A-06	Exclusion Area Fence Line Southeast of Hotspot (Approx. 15m)	0	300	0	0	0	0	20.9	0	0	~
A-07	Exclusion Area Fence Line South of Hotspot (Approx. 30m)	0	300	0	0	0	0	20.9	0	0	✓
A-08	Exclusion Area Fence Line Northwest of Hotspot, adjacent 17 Lackawanna Street (Approx. 50m)	0	300	0	0	0	0	20.9	0	0	✓





Date o	f Monitoring: Thursday	21 <sup>st</sup> June 20	18								
Locat	tion	Carbon monoxide (CO) (ppm)	Carbon dioxide (CO <sup>2</sup> ) (ppm)	Sulphur dioxide (SO <sup>2</sup> ) (ppm)	Hydrogen sulphide (H <sup>2</sup> S) (ppm)	Nitric oxide (NO) (ppm)	Nitrogen dioxide (NO <sup>2</sup> ) (ppm)	Oxygen (O <sup>2</sup> ) (%)	Volatile organic compounds (VOC) (ppm)	Methane (as LEL) (%)	Within Acceptable Limits?
A-01	General Background – West of Site Fence	0	300	0	0	0	0	20.9	0	0	✓
A-02	NW Hotspot – Adjacent Concrete Cap	0	300	0	0	0	0	20.9	0	0	~
A-03	NW Hotspot – Small Mound	0	300	0	0	0	0	20.9	0	0	✓
A-04	NE Fence Line Adjacent Hotspot	0	300	0	0	0	0	20.9	0	0	~
A-05	Exclusion Area Fence Line East of Hotspot (Approx. 10m)	0	300	0	0	0	0	20.9	0	0	~
A-06	Exclusion Area Fence Line Southeast of Hotspot (Approx. 15m)	0	300	0	0	0	0	20.9	0	0	~
A-07	Exclusion Area Fence Line South of Hotspot (Approx. 30m)	0	300	0	0	0	0	20.9	0	0	~
A-08	Exclusion Area Fence Line Northwest of Hotspot, adjacent 17 Lackawanna Street (Approx. 50m)	0	300	0	0	0	0	20.9	0	0	*





Date oj	f Monitoring: Friday 22	<sup>nd</sup> June 2018									
Locat	ion	Carbon monoxide (CO) (ppm)	Carbon dioxide (CO <sup>2</sup> ) (ppm)	Sulphur dioxide (SO <sup>2</sup> ) (ppm)	Hydrogen sulphide (H <sup>2</sup> S) (ppm)	Nitric oxide (NO) (ppm)	Nitrogen dioxide (NO <sup>2</sup> ) (ppm)	Oxygen (O <sup>2</sup> ) (%)	Volatile organic compounds (VOC) (ppm)	Methane (as LEL) (%)	Within Acceptable Limits?
A-01	General Background – West of Site Fence	0	300	0	0	0	0	20.9	0	0	~
A-02	NW Hotspot – Adjacent Concrete Cap	0	300	0	0	0	0	20.9	0	0	~
A-03	NW Hotspot – Small Mound	0	300	0	0	0	0	20.9	0	0	~
A-04	NE Fence Line Adjacent Hotspot	0	300	0	0	0	0	20.9	0	0	4
A-05	Exclusion Area Fence Line East of Hotspot (Approx. 10m)	0	300	0	0	0	0	20.9	0	0	~
A-06	Exclusion Area Fence Line Southeast of Hotspot (Approx. 15m)	0	300	0	0	0	0	20.9	0	0	~
A-07	Exclusion Area Fence Line South of Hotspot (Approx. 30m)	0	300	0	0	0	0	20.9	0	0	~
A-08	Exclusion Area Fence Line Northwest of Hotspot, adjacent 17 Lackawanna Street (Approx. 50m)	0	300	0	0	0	0	20.9	0	0	•



#### **5. DISCUSSION**

Based on the air quality monitoring data obtained as part of this monitoring assessment, the inhalation risk to human health as a result of the subsurface hotspot remains low. The reasons for this conclusions are as follows:

Real time monitoring results did not indicate the presence of gas in elevated concentrations; even at the source (i.e. the subsurface hotspot vent source). Concentrations of gases commonly associated with combustion (e.g. carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), volatile organic compounds, sulphur dioxide (SO<sub>2</sub>), hydrogen sulphide (H<sub>2</sub>S), methane (CH<sub>4</sub> – LEL), oxygen (O<sub>2</sub>), nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>), were not detected at concentrations that pose a risk to human health in the North-Western Hotspot area, including locations surrounding the hotspot.

This concludes the interim air monitoring report from the 18<sup>th</sup> June 2018, to the 22<sup>nd</sup> June 2018. It is recommended that weekly interim assessments are conducted to continually monitor the potential risk to human health whilst further investigation of the site is undertaken.





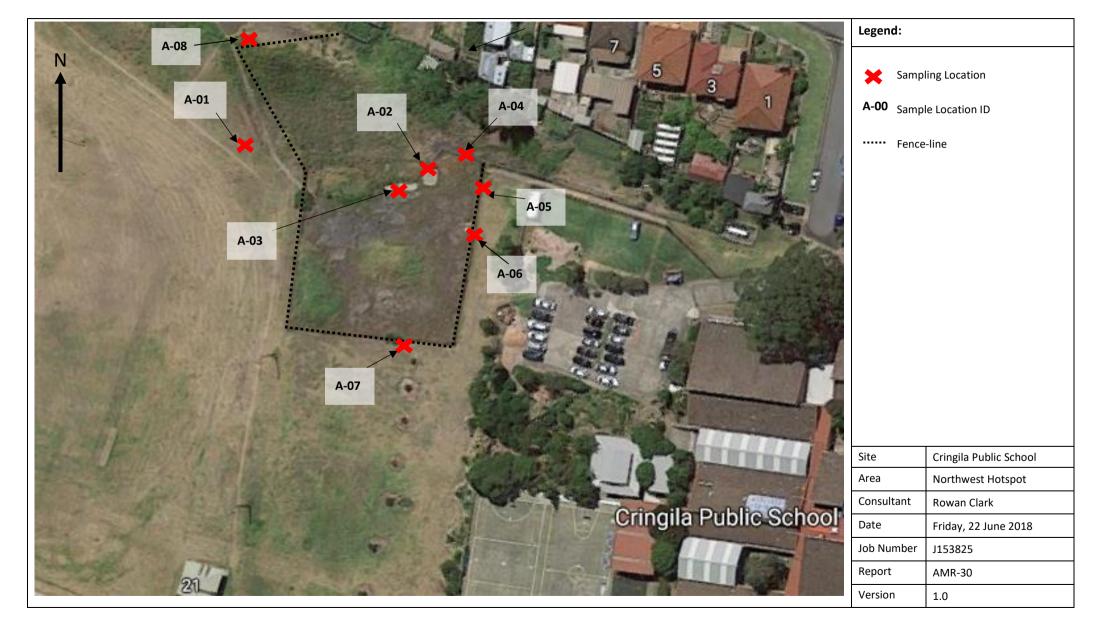
## Air Monitoring Risk Assessment

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

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











## Air Monitoring Risk Assessment

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

**Appendix B: Calibration Certificates** 



## Calibration and Service Report – Gas Monitor

Company:	Active Environmental Solutions Hire	Manufacturer:	RAE Systems	Serial #:	MAA30042QB
Contact:	Aleks Todorovic	Instrument:	MultiRAE	Asset #:	-
Address:	Unit 3	Model:	PGM 6208	Part #:	-
	266 Bolton Street	Configuration:	PID, LEL, O2, COSH	Sold:	-
	ELTHAM, VIC 3095				
Phone:	03 9431 3500	Wireless:	s=	Last Cal:	-
Fax:	03 9431 3577	Network ID:	12	Job #:	-
Email:	hire@aesolutions.com.au	Unit ID:	-	Cal Spec:	Standard
		Details:	-	Order #:	-

Item	Test	Pass/Fail	Comments	Part Code	S/W
Battery	Li lon	~			
Charger	Charger, Power supply	~			
	Cradle	~			
Pump	Flow	~	>300mL/min		
Filter	Filter, fitting, etc	~			
Alarms	Audible, visual, vibration	~			
Display	Operation	~			
Switches	Operation	~			
PCB	Operation	~			
Connectors	Condition	~			
Firmware	Version	~	V1.40		
Datalogger	Operation	~			
Monitor Housing	Condition	~			
Case	Condition/Type	~			
Sensors		Note the second second			
Oxygen	02	~			
LEL	LEL	~			
PID	10.6eV	✓			
Toxic 1	COSH	~			
Toxic 2		-			
Toxic 3		_			
Toxic 4		-			
Toxic 5		-			
Toxic 6		-			
Other		-			
			cer's Report calibration for hire.		

#### **Calibration Certificate**

Sensor	Туре	Serial No:	Span	Concentration	Traceability	CF	Readin	g (ppm)
			Gas		Lot #		Zero	Span
Oxygen	02	03420684RC	Fresh Air	20.9%	C1040CE 1		20.9%	
Oxygen	02	03420684RC	Oxygen	18.0%	S104965-1			18.0%
LEL	LEL	03110703T9	Methane	2.5% (50% LEL)	S104965-1		0	50%
PID	10.6eV	03A3031QB	Isobutylene	100ppm	WO19052-4		0	100
Toxic 1	COSH	0313001257	Carbon Monoxide	50ppm	C1040CF 1		0	50
	COSH	0313001257	Hydrogen Sulfide	10ppm	S104965-1		0	10
Toxic 2								
Toxic 3								
Toxic 4								
Toxic 5								
Toxic 6								
Other								

Calibrated/Repaired by:

W.PAK

Date:

06.11.2017

Next Due:

06.05.2018

sales@aesolutions.com.au		ISO 9001:2008 CERTIFIED			www.aesolution	s.com.au	
Brisbane	Unit 17	23 Ashtan Place	BANYO	QLD	4014	T: +(617) 3267 1433	F:+ (617) 3267 3559
Perth	Unit 6	41 Holder Way	MALAGA	WA	6090	T: +(618) 9249 5663	F:+ (618) 9249 5362
Sydney	S14 Lv12	6-8 Holden Stree	t ASHFIELD	NSW	2131	T: +(612) 9716 5966	F:+ (612) 9716 5988
Melbourne	Head Office	2 Merchant Aven		rown	VIC 3074	T: +(613) 9464 2300	F: + (613) 9464 3421

c:\users\william\desktop\calibration certificates\multirae\maa30042qb 06-11-2017.docx



#### Calibration and Service Report – Gas Monitor

Company:	Active Environmental Solutions Hire	Manufacturer:	RAE Systems	Serial #:	M01C005735
Contact:	Aleks Todorovic	Instrument:	MultiRAE	Asset #:	-
Address:	Unit 3	Model:	PGM 6208	Part #:	-
	266 Bolton Street	Configuration:	CO2, NO, NO2, SO2	Sold:	-
	ELTHAM, VIC 3095	-			
Phone:	03 9431 3500	Wireless:	-	Last Cal:	-
Fax:	03 9431 3577	Network ID:	x-	Job #:	<u></u>
Email:	hire@aesolutions.com.au	Unit ID:	-	Cal Spec:	Standard
		Details:	-	Order #:	-

ltem	Test	Pass/Fail	Comments	Part Code	S/W
Battery	Li lon	~			
Charger	Charger, Power supply	~			
	Cradle	~			
Pump	Flow	~	>300mL/min		
Filter	Filter, fitting, etc	~			
Alarms	Audible, visual, vibration	~			<u> </u>
Display	Operation	~			
Switches	Operation	~			
PCB	Operation	~			
Connectors	Condition	~			
Firmware	Version	~	V1.40		
Datalogger	Operation	~			
Monitor Housing	Condition	~			
Case	Condition/Type	~			
Sensors		Propagation and		and the second	·
Oxygen		-			
LEL		-			
PID		-			
Toxic 1	CO2	✓			
Toxic 2	NO	~			
Toxic 3	NO2	~			
Toxic 4	SO2	~			
Toxic 5		-			
Toxic 6		-			
Other		-			
			eer's Report alibration for hire.		

#### **Calibration Certificate**

Sensor	Туре	Serial No:	Span Gas	Concentration	Traceability Lot #	CF	Reading (ppm)	
							Zero	Span
Oxygen								
LEL								1
PID								
Toxic 1	CO2	03610036QC	Carbon Dioxide	5000ppm	WO131063-1		0	5000
Toxic 2	NO	03740180Q2	Nitric Oxide	25ppm	WO124693-1		0	25
Toxic 3	NO2	03750052RC	Nitrogen Dioxide	5ppm	WO137782-1		0	5
Toxic 4	SO2	03AF0109T5	Sulfur Dioxide	5ppm	WO123886-2		0	5
Toxic 5								
Toxic 6	· · · · · · · · · · · · · · · · · · ·							
Other								

Calibrated/Repaired by: W.PAK Date: 06.11.2017 Next Due: 06.05.2018 Melbourne Head Office THOMASTOWN VIC 3074 T: +(613) 9464 2300 F: + (613) 9464 3421 2 Merchant Avenue 6-8 Holden Street Sydney S14 Lv12 ASHFIELD NSW 2131 T: +(612) 9716 5966 F:+(612) 9716 5988 Perth 41 Holder Way MALAGA WA 6090 BANYO QLD 4014 Unit 6 T: +(618) 9249 5663 F:+ (618) 9249 5362 Brisbane Unit 17 23 Ashtan Place T: +(617) 3267 1433 F:+ (617) 3267 3559 sales@aesolutions.com.au www.aesolutions.com.au ISO 9001:2008 CERTIFIED

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