

CRINGILA PUBLIC SCHOOL NEAR-SURFACE TEMPERATURE MONITORING INVESTIGATION

Summary Report
24/02/2020 – 06/03/2020

NSW Department
of Education

Cringila Public School

35 Sheffield Street
Cringila NSW 2502

March 2020
C107471: J153825-03: TO/RC

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Near-Surface Temperature Monitoring

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1. INTRODUCTION

At the request of the NSW Department of Education, Greencap were engaged to undertake 'spot-check' near-surface temperature monitoring utilising real-time monitoring devices at Cringila Public School, 35 Sheffield Street Cringila NSW 2502. The aim of this investigation was primarily to investigate near-surface temperatures associated with the pre-identified subsurface hotspot located in the northwest grounds at the school.

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

- Conduct spot checks, to gather near-surface temperature readings via the use of heat sensing equipment; and
- Gather data at various points across the site to aid in the spatial delineation of the near-surface hotspot.

This report presents the results of Greencap's historical data relating to near-surface temperatures as well as the results of the ongoing temperature monitoring investigation carried out between on a weekly basis, between 24th February 2020 and 6th March 2020 in the northwest Hotspot, situated on the Cringila Public School grounds.

2. TEMPERATURE MONITORING METHODOLOGY

2.1. Visual Observations

Visual site observations such as evidence of vegetation stress and associated surface combustion hazards are recorded. Meteorological data such as wind and ambient temperature is also recorded.

2.2. Near Surface Temperature Monitoring

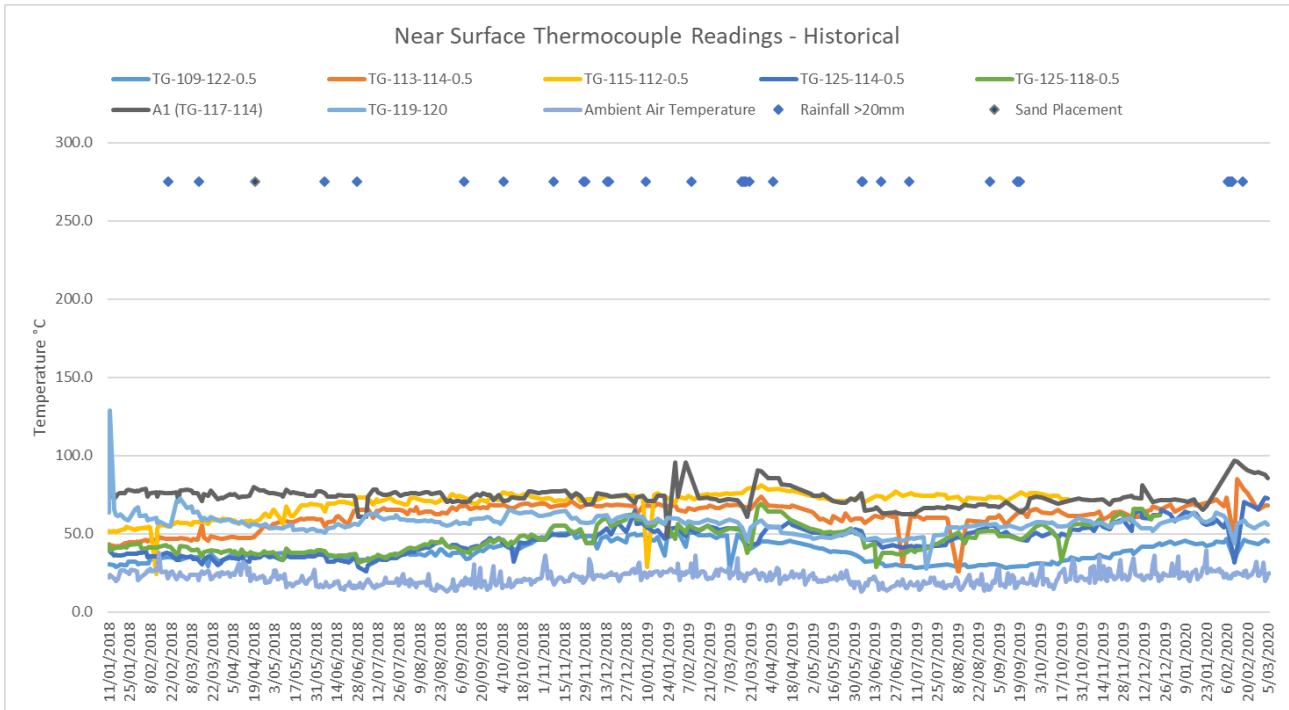
Across the northwest hotspot, a grid system has been established in order to provide a near-surface temperature profile for the hotspot and the immediate surrounding area. Grid locations have been determined by Greencap Consultants following initial surface temperature spot checks. Thermocouple monitoring points have been installed at depths of 0.3m and 0.5m across the northwest hotspot. Temperature measurements are taken at each grid point location using digital thermometers with 'K type' thermocouples designed for continuous temperature measurement. Near surface temperature data has been extrapolated to produce subsurface temperature isotherm maps for the hotspot.

3. TEMPERATURE MONITORING RESULTS

The near-surface temperatures for representative monitoring locations, spread across the northwest Hotspot, are presented in the tables below. Temperature isotherms have been plotted on a site map to show an illustration of the near-surface temperatures in a spatial context. Refer to **Appendix B: Near Surface Temperature Isotherm Map (0.5m)**.

3.1. Near-Surface Temperature Graph – Selected Points (Historical)

Near surface temperature measurements for key thermocouple locations, progressive from Thursday 11th January 2018 to present.

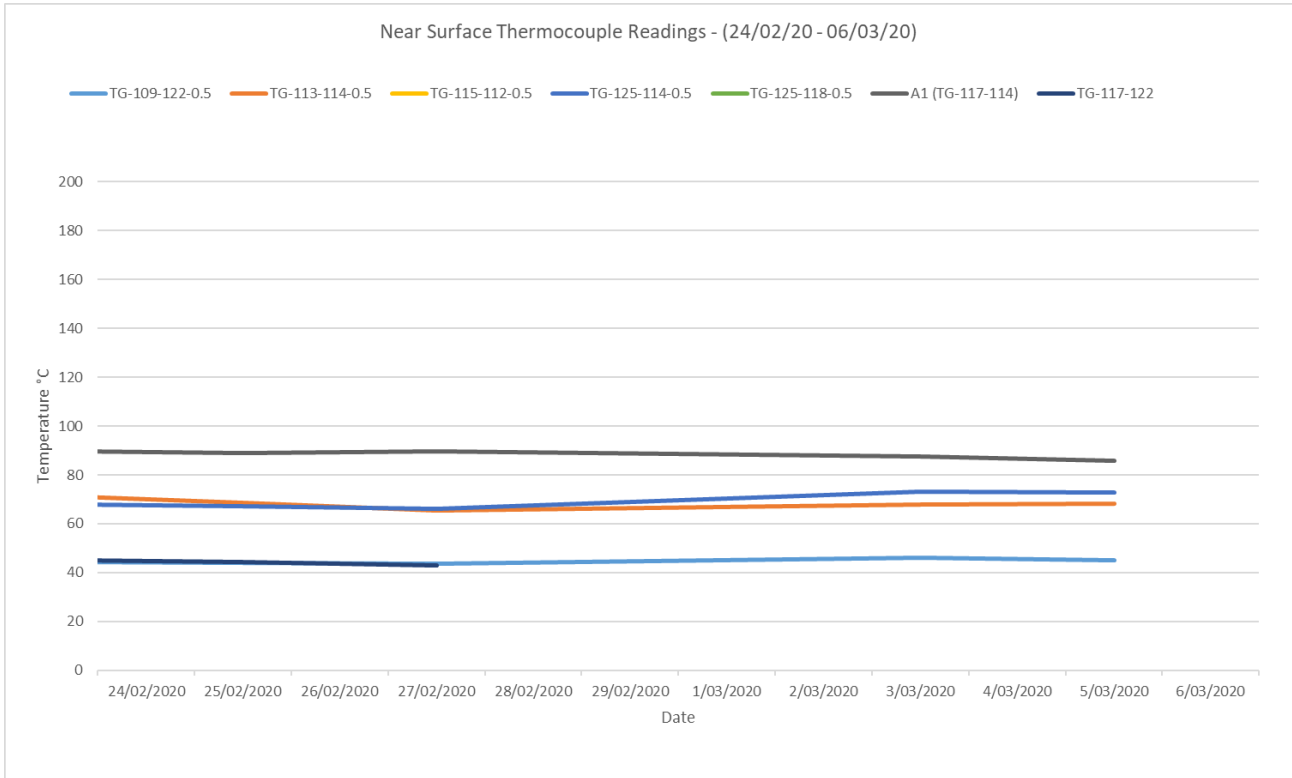


The near-surface temperature appears to fluctuate seasonally across the surface of the northwest hotspot grid monitoring area.

Fluctuations in near-surface temperature are also evident following significant rain events (i.e. over 20mm rain).

3.2. Near-Surface Temperature Graph – Selected Points (Fortnightly)

Near-surface temperature measurements for key thermocouple locations, over the monitoring period – between 24th February 2020 and 6th March 2020. Please note – data from certain points was not available within this date range due to technical constraints.



Variations in the near-surface temperature at selected points across the northwest hotspot over the period of monitoring appear to coincide with the high rainfall events during the period.

4. ANALYSIS OF ISOTHERM MAP DATA

The isotherm map shows the general zone of influence for temperatures between 30°C and 70°C at 0.5m, coloured orange. The isotherm map suggests that the hotspot may extend deeper than 0.5m and that the increased temperature in these areas is a result of heat venting to the surface.

It is noted that temperature at the near-surface may be variable across the hotspot due to inconsistencies in the consolidation and compaction of subsurface materials.

5. DISCUSSION

The near-surface temperature monitoring conducted between 24th February 2020 and 6th March 2020 indicates that the spatial extent of the northwest hotspot appears to remain localised.

There were no significant near-surface temperature variations identified during the period of monitoring.

No significant rainfall events (>20mm) were recorded during the period of monitoring.

It is recommended that weekly site inspections and recording are continued to monitor the near-surface temperatures surrounding the subsurface hotspot identified at the site.

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Appendix A: Area of Concern – Northwest Hotspot Map



Near-Surface Temperature Investigation

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Appendix B: Near-Surface Temperature Isotherm Map (0.5m)