Muswellbrook Coal Company Limited

Spontaneous Combustion Report

For: Environmental Protection Licence 656

Reporting Period:	**August 2020**
Authority Holder:	**Muswellbrook Coal Company Limited**
Report Date:	**28 September 2020**
Approved by:	**Julie Thomas** **Environmental Superintendent**

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1.0 INTRODUCTION

The coal seams mined by the Muswellbrook Coal Company (MCC) operations are the Greta Coal Measures. These measures have a history of spontaneous combustion. Spontaneous combustion has been a long-term issue at MCC since the first operation commenced in 1907.

A Spontaneous Combustion Management Plan (SCMP) has been prepared according to the specific requirements of the Development Consent. The main objective of the SCMP is to minimise the occurrence of spontaneous combustion and manage the effect by identification, control, removal, mitigation and prevention in the following areas:

- Existing open cut and underground workings;
- Drilling and blasting;
- Mining of overburden;
- Mining of coal;
- Emplacement of overburden;
- Emplacement of washery reject; and
- Coal stockpiles.

The Environment Protection Authority (EPA) require MCC to provide reports on spontaneous combustion management and monitoring on a monthly basis. This report identifies:

- Spontaneous combustion management during the reporting period;
- Gas monitoring results;
- Number of complaints relating to spontaneous combustion;
- Response to hydrogen sulphide levels above the odour threshold; and
- Correlation between spontaneous combustion on site with gas results and complaints received.

2.0 SPONTANEOUS COMBUSTION MANAGEMENT MEASURES

The daily spontaneous combustion management measures for the reporting period are shown in **Table 1**.

Table 1: Spontaneous Combustion Management Measures

Date	Water Sprays	Water Carts Assisting	Capping	Hot Material Removal	Comments
01/08/20	-	OC1	-	-	
02/08/20	-	OC1	-	-	
03/08/20	-	OC1	-	-	
04/08/20	-	S22	-	S22	
05/08/20	-	OC1	-	S22	
06/08/20	-	S22	-	S22	
07/08/20	-	OC1	-	S22	
08/08/20	-	OC1	-	S22	Wet Weather
09/08/20	-	OC1	-	S22	Wet Weather

Date	Water Sprays	Water Carts Assisting	Capping	Hot Material Removal	Comments
10/08/20	-	OC1	-	S22	Wet Weather
11/08/20	-	OC1	-	-	Wet Weather
12/08/20	-	OC1	-	-	
13/08/20	-	OC1	-	-	
14/08/20	-	S22	-	S22	Wet Weather
15/08/20	-	OC1	-	-	Wet Weather
16/08/20	-	OC1	-	-	
17/08/20	-	OC1	-	-	
18/08/20	-	OC1	-	-	
19/08/20	-	OC1	-	-	
20/08/20	-	OC1	-	-	
21/08/20	-	OC1	-	-	
22/08/20	-	OC1	-	RL200 Dump and OC1 Ramp	
23/08/20	-	OC1	S22 and RL200 Dump	S22	
24/08/20	-	OC1	S22	S22	
25/08/20	-	OC1	-	-	
26/08/20	-	OC1	OC1	S22	
27/08/20	-	OC1	-	-	
28/08/20	-	OC1	-	-	
29/08/20	-	OC1	-	-	
30/08/20	-	OC1	-	S22	
31/08/20	-	OC1	S22	S22	

The classification system for spontaneous combustion outbreaks is provided in **Table 2**. A summary of the areas affected by spontaneous combustion and the areas controlled and treated during the reporting period is provided in **Table 3**. The locations of these areas can be seen in **Figure 1** to **Figure 2**.

Table 2: Classification of Spontaneous Combustion Outbreaks

Classification	Description
A	Open flame
B	Visible steam or smoke
C	Other physical evidence of spontaneous combustion (e.g. cracks, coal tars, sulphur crusting, etc)

* - classification revised in November 2019

Table 3: Summary of Spontaneous Combustion

Site Map Location	Classification (A-C)	Affected Area Without Active Control *(m^2)*	Active Controls Completed	Area Controlled *(m^2)*
Open Cut 1	A B C	4* 108* 22*	Mining Capping Infusion	1,000** 2,724** 0**
Open Cut 2	N/A	0*	None Required	0**
SUMMARY				
Total Area Affected		134*		
Total Area Controlled		3,724**		

* - at end of reporting period

** - during reporting period

No spontaneous combustion outbreaks were observed in Open Cut 2 throughout August 2020. Therefore, no active controls were implemented in Open Cut 2.

3.0 GAS MONITORING RESULTS

The gas monitoring results are displayed graphically in **Figure 3** to **Figure 7.** As noted in these graphs, there were no results above the health impact assessment criteria for the reporting period. However, there was one occasion in the reporting period where H_2S was above the odour threshold and an alarm was received. This alarm was received on 10th August 2020 at 10:18pm at Nisbet (Site 9).

The data capture rates for the reporting period and the last 12 months are shown in **Table 4**.

Table 4: Data Capture Rates

Monitoring Location	Pollutant	Averaging Period	Data Capture – August (%)	Data Capture – 12 Month Rolling (%)
Point 9, Nisbet	Hydrogen Sulphide	30 minutes	93.5	92.1
		1 hour	91.9	90.9
		24 hours	96.8	94.5
Point 10, Muscle Creek	Hydrogen Sulphide	30 minutes	95.6	95.9
		1 hour	95.2	94.6
		24 hours	100.0	99.2
Point 15, Nisbet	Sulphur Dioxide	1 hour	91.7	**89.1**
		24 hours	96.8	92.6
Point 16, Muscle Creek	Sulphur Dioxide	1 hour	95.3	94.8
		24 hours	100.0	99.5

Data capture for all monitoring sites was 90% or higher during August 2020. However, the data capture 12-month rolling average for sulphur dioxide at Nisbet (Site 15) remained less than 90% due to the previous outages in February and May 2020.

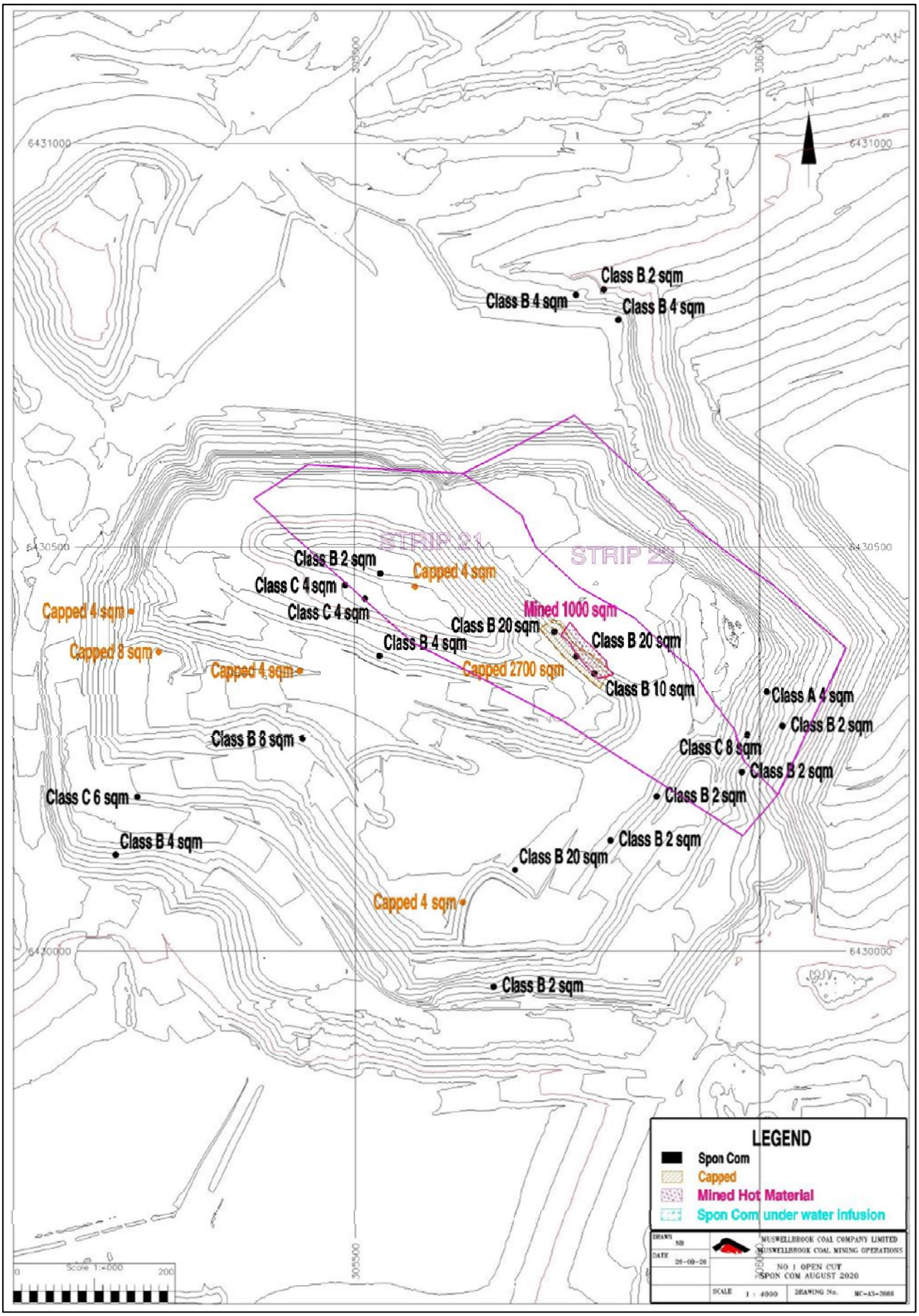

Figure 1: Location of Spontaneous Combustion Outbreaks in Open Cut 1

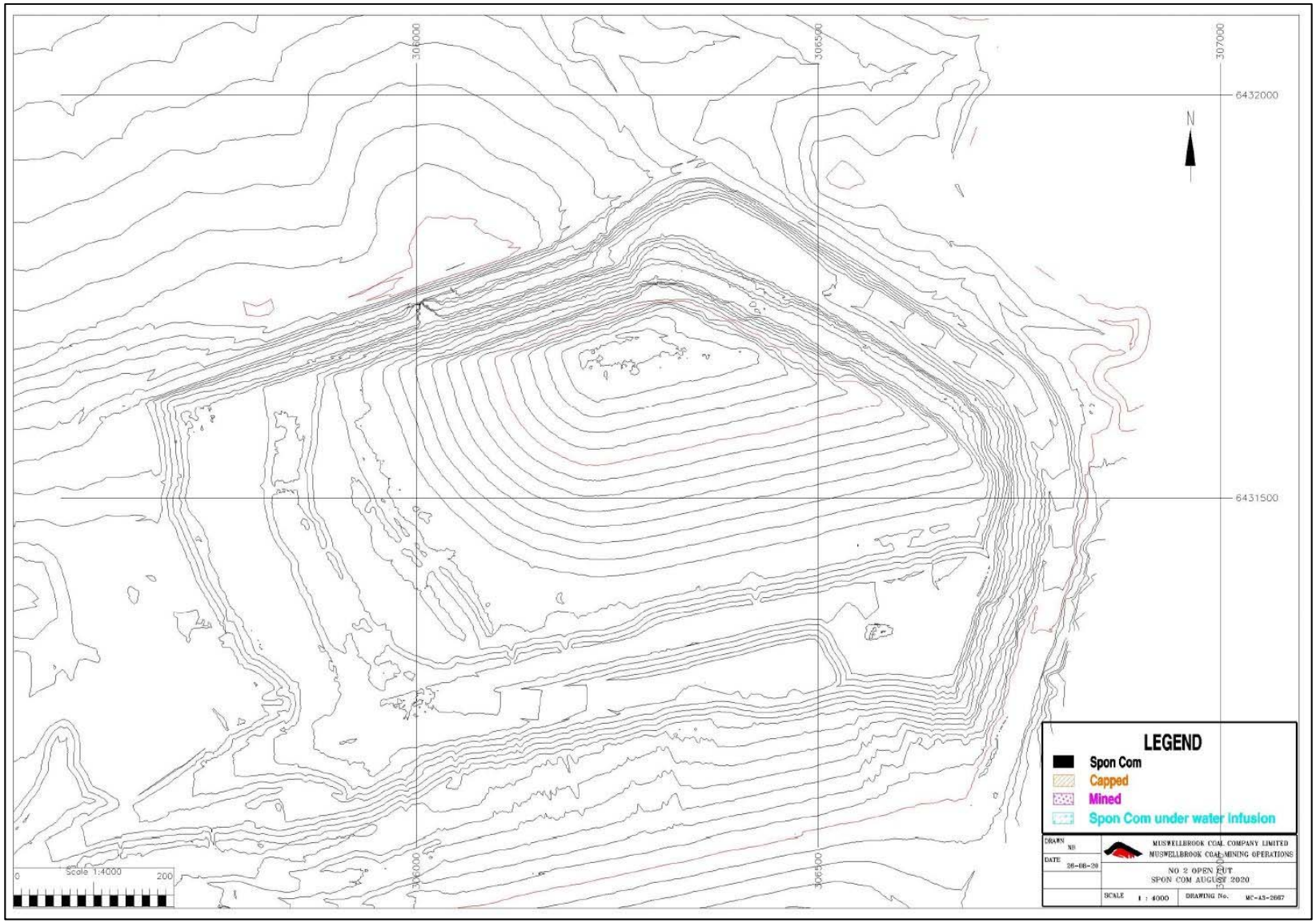

Figure 2: Location of Spontaneous Combustion Outbreaks in Open Cut 2

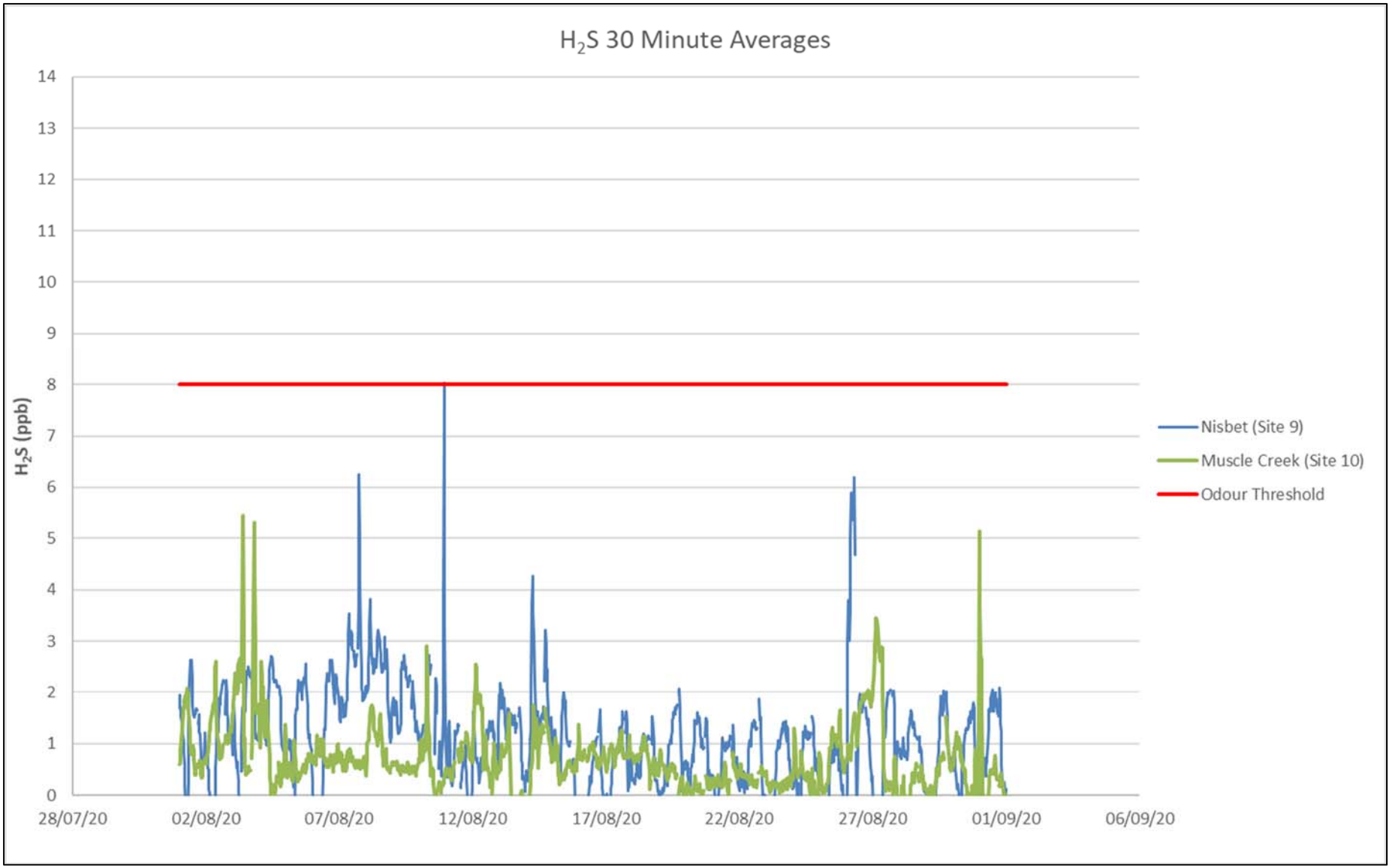

Figure 3: Hydrogen Sulphide 30 Minute Results

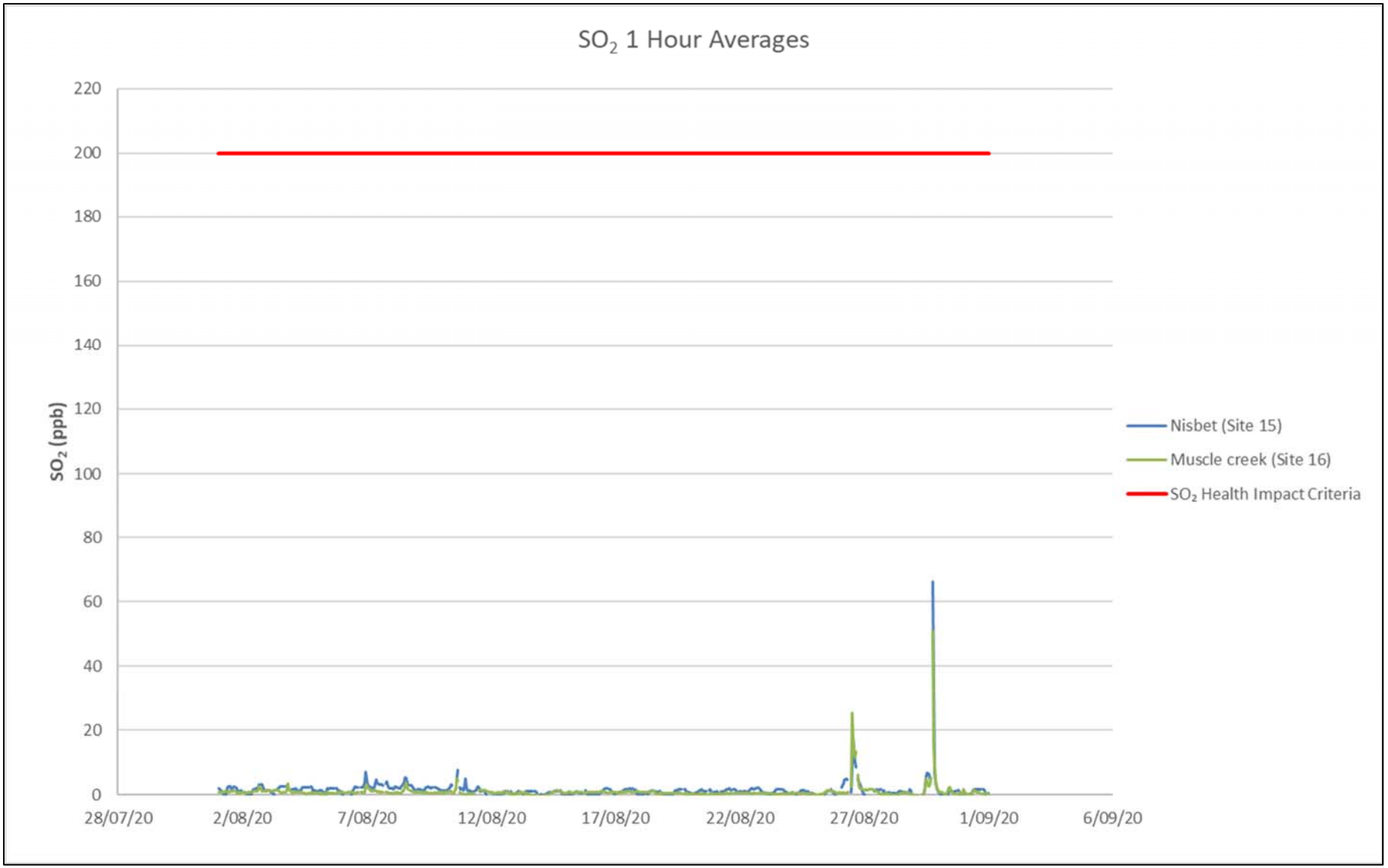

Figure 4: Sulphur Dioxide 1 Hour Results

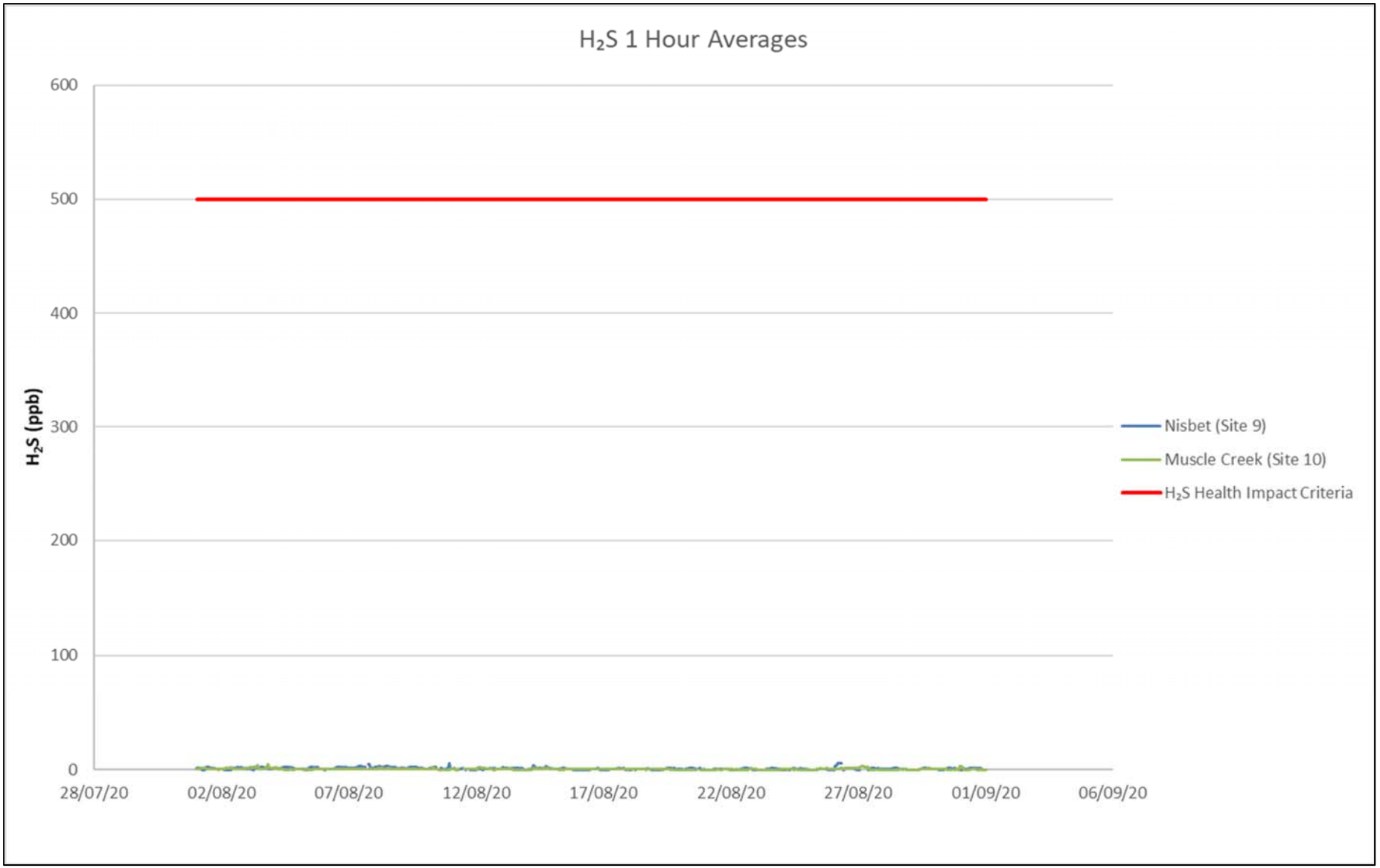

Figure 5: Hydrogen Sulphide 1 Hour Results

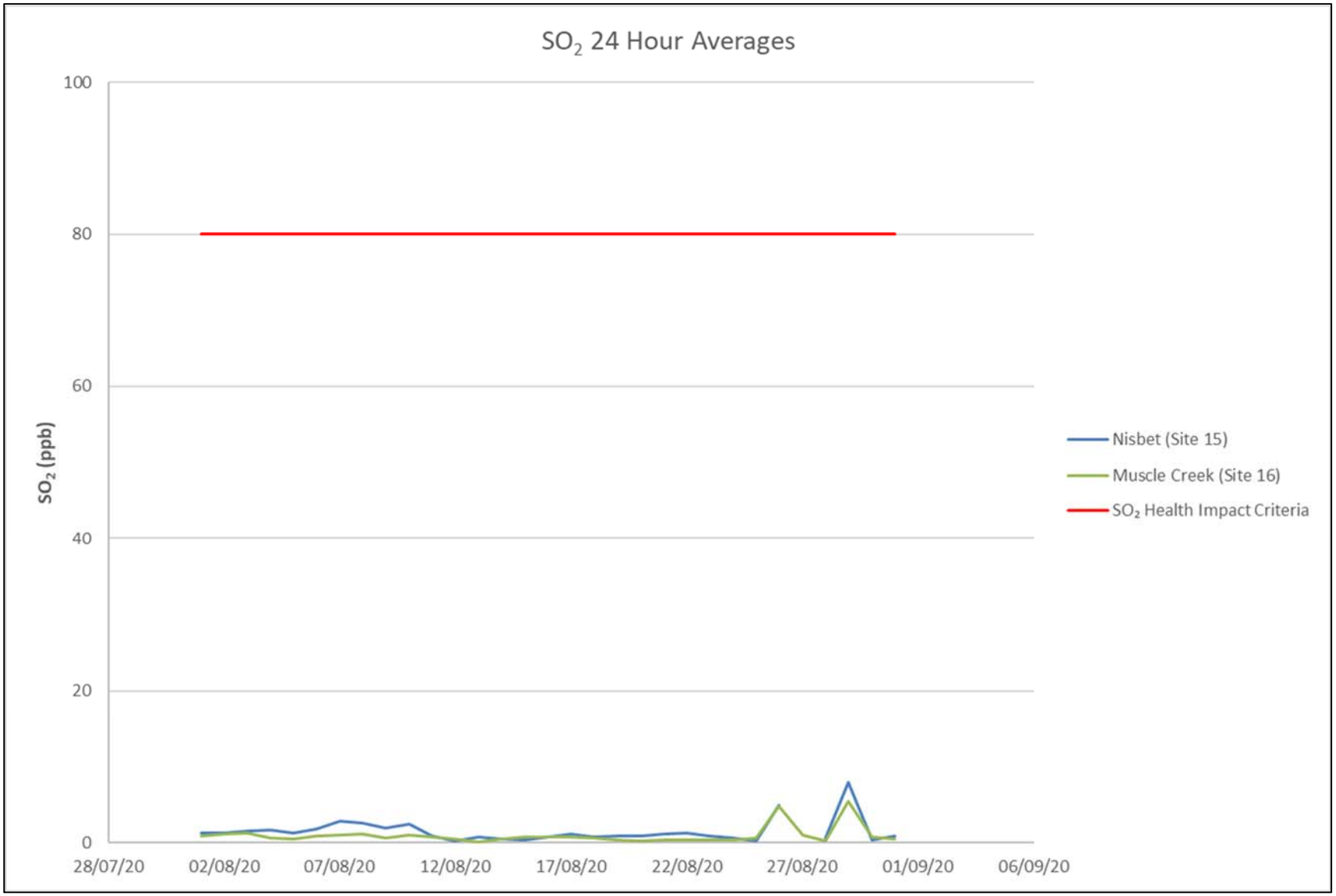

Figure 6: Sulphur Dioxide 24 Hour Results

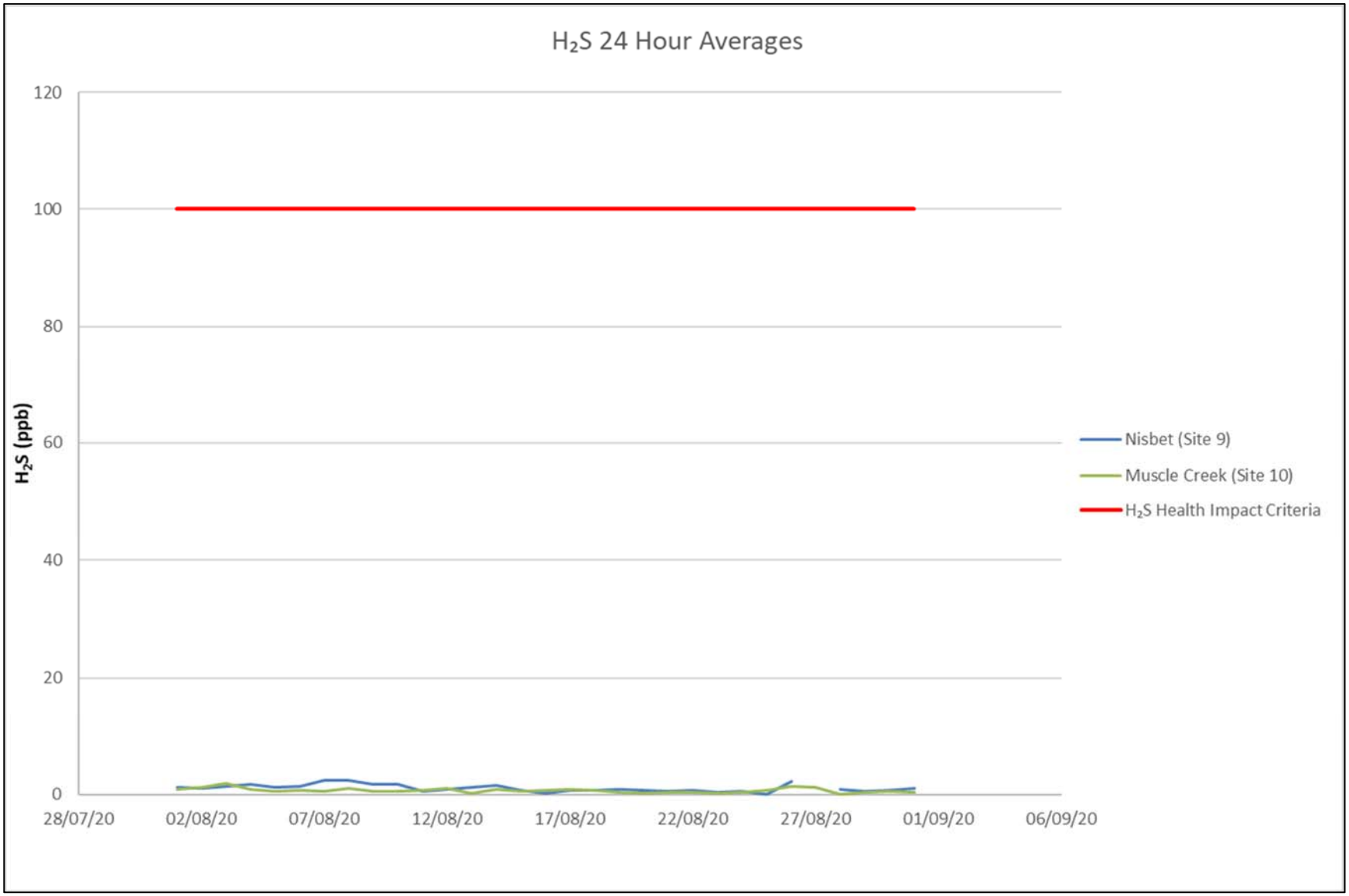

Figure 7: Hydrogen Sulphide 24 Hour Results

4.0 RESPONSE TO ELEVATED GAS LEVELS

When MCC receive an alarm that the hydrogen sulphide levels at the gas monitors are above the odour threshold of 8ppb, a review of operations and gas sources in the local area is undertaken. The responses to any alarms received during the reporting period are shown in **Table 5.**

Table 5: Actions Taken in Response to Elevated Gas Levels

Date and Time of Alarm	Location of Alarm	Weather Conditions at Time of Alarm	Response to Alarm	Classification of Spontaneous Combustion
10/08/2020 10:18pm	Nisbet	Wind speed = 2.2 m/s from the south west. No rainfall at the time of the alarm but there was 13 mm of rainfall earlier in the day until 11:00am.	Hot coal was being removed from S22 and processed on the ROM. Spontaneous combustion emissions were being managed by using water carts to cool the coal and removing the hot material using a digger.	Combination of Class A, B and C.

5.0 CORRELATION BETWEEN MANAGEMENT ACTIVITIES AND GAS LEVELS

A review of the correlation between spontaneous combustion management activities, gas levels and complaints has been undertaken. This review has found that spontaneous combustion management activities were occurring throughout the reporting period and gas levels during the reporting period were generally low. Spontaneous combustion management activities were being undertaken at the time of the elevated gas levels on 10th August 2020.

6.0 CORRELATION BETWEEN COMMUNITY COMPLAINTS AND GAS LEVELS

There were five complaints received during the reporting period which related to odour impacts from spontaneous combustion. The time, date and details of these complaints are summarised in **Table 6.** A review of these complaints shows that they weren't received when gas levels were elevated and on two occasions the wind was not blowing from MCC towards the complainant's residence.

Table 6: Complaints relating to Spontaneous Combustion Odour

Date and Time of Complaint	Location	Details
1:55 pm on 9th August 2020	Muscle Creek, 6km east of the site.	A westerly wind was blowing at 5.8 m/s at the time of the complaint.
10:23 am on 10th August 2020	Muscle Creek, 6km east of the site.	A south westerly wind was blowing at 1.4 m/s at the time of the complaint – wind not blowing from MCC towards complainant's residence.
4:40 pm on 19th August 2020	Muscle Creek, 6km east of the site.	A north westerly wind was blowing at 10.2 m/s at the time of the complaint.
9:05 am on 29th August 2020	Muscle Creek, 6km east of the site.	A northerly wind was blowing at 2.2 m/s at the time of the complaint – wind not blowing from MCC towards complainant's residence.
9:13 am on 30th August 2020	Muscle Creek, 6km east of the site.	A westerly wind was blowing at 2.2 m/s at the time of the complaint.

A review of the gas data for the complaints received throughout August shows that the 30 minute and 1-hour gas levels were <2.5ppb for both sulphur dioxide and hydrogen sulphide at both monitoring locations at the time of the complaints. This gas data is summarised in **Table 7.**

Table 7: Hydrogen Sulphide and Sulphur Dioxide Levels at the Time of Complaints

Date and Time of Complaint	H_2S Level (ppb) at Nisbet (Site 9)	H_2S Level (ppb) at Muscle Creek (Site 10)	SO_2 Level (ppb) at Nisbet (Site 15)	SO_2 Level (ppb) at Muscle Creek (Site 16)
1:55 pm on 9th August 2020	30 Min Ave: 2.1 1 Hr Ave: 2.2	30 Min Ave: 0.6 1 Hr Ave: 0.6	1 Hr Ave: 1.9	1 Hr Ave: 0.6
10:23 am on 10th August 2020	30 Min Ave: 2.5 1 Hr Ave: ND	30 Min Ave: 0.4 1 Hr Ave: 0.4	1 Hr Ave: ND	1 Hr Ave: 0.5
4:40 pm on 19th August 2020	30 Min Ave: ND 1 Hr Ave: ND	30 Min Ave: ND 1 Hr Ave: ND	1 Hr Ave: ND	1 Hr Ave: ND
9:05 am on 29th August 2020	30 Min Ave: 0.4 1 Hr Ave: 0.4	30 Min Ave: 0.5 1 Hr Ave: 0.5	1 Hr Ave: 0.4	1 Hr Ave: 0.7
9:13 am on 30th August 2020	30 Min Ave: 0.7 1 Hr Ave: 0.9	30 Min Ave: 0.5 1 Hr Ave: 0.5	1 Hr Ave: 1.0	1 Hr Ave: 2.4

ND No Data