ESTABLISHED 1907

Muswellbrook Coal Company Limited

Spontaneous Combustion Report

For: Environmental Protection Licence 656

Reporting Period:	**October 2022**
Authority Holder:	**Muswellbrook Coal Company Limited**
Report Date:	**23 November 2022**
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
01/10/22	-	OC1	-	-	
02/10/22	-	OC1	-	-	
03/10/22	-	OC1	-	-	
04/10/22	-	OC1	-	-	
05/10/22	-	OC1	-	-	
06/10/22	-	-	-	-	Wet weather
07/10/22	-	OC1	-	-	
08/10/22	-	OC1	-	-	Wet weather
09/10/22	-	-	-	-	Wet weather
10/10/22	-	OC1	-	-	Wet weather

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

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	55* 875* 680*	Mining Capping Infusion	0** 0** 0**
Open Cut 2	B	55*	None	55**
SUMMARY				
Total Area Affected		1665*		
Total Area Controlled		0**		

* - at end of reporting period
** - during reporting period

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.

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	96.4	96.5
		1 hour	95.0	94.6
		24 hours	100.0	99.2
Point 10, Muscle Creek	Hydrogen Sulphide	30 minutes	97.2	94.7
		1 hour	95.3	92.4
		24 hours	100.0	97.0
Point 15, Nisbet	Sulphur Dioxide	1 hour	94.6	94.4
		24 hours	100.0	98.6
Point 16, Muscle Creek	Sulphur Dioxide	1 hour	94.8	92.5
		24 hours	96.8	96.4

Data capture for all monitoring sites was greater than 90% during October 2022.

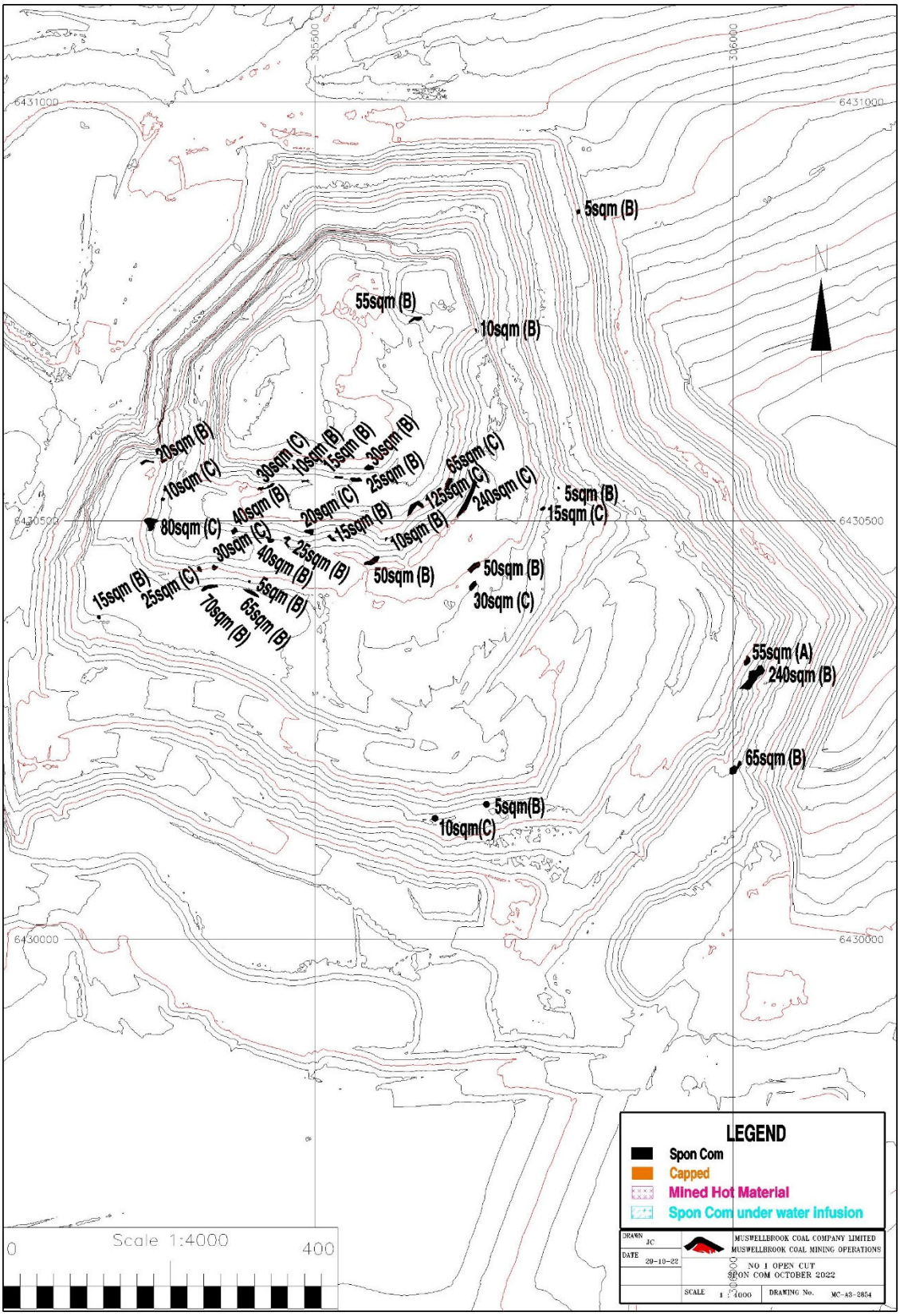

Figure 1: Location of Spontaneous Combustion Outbreaks in Open Cut 1

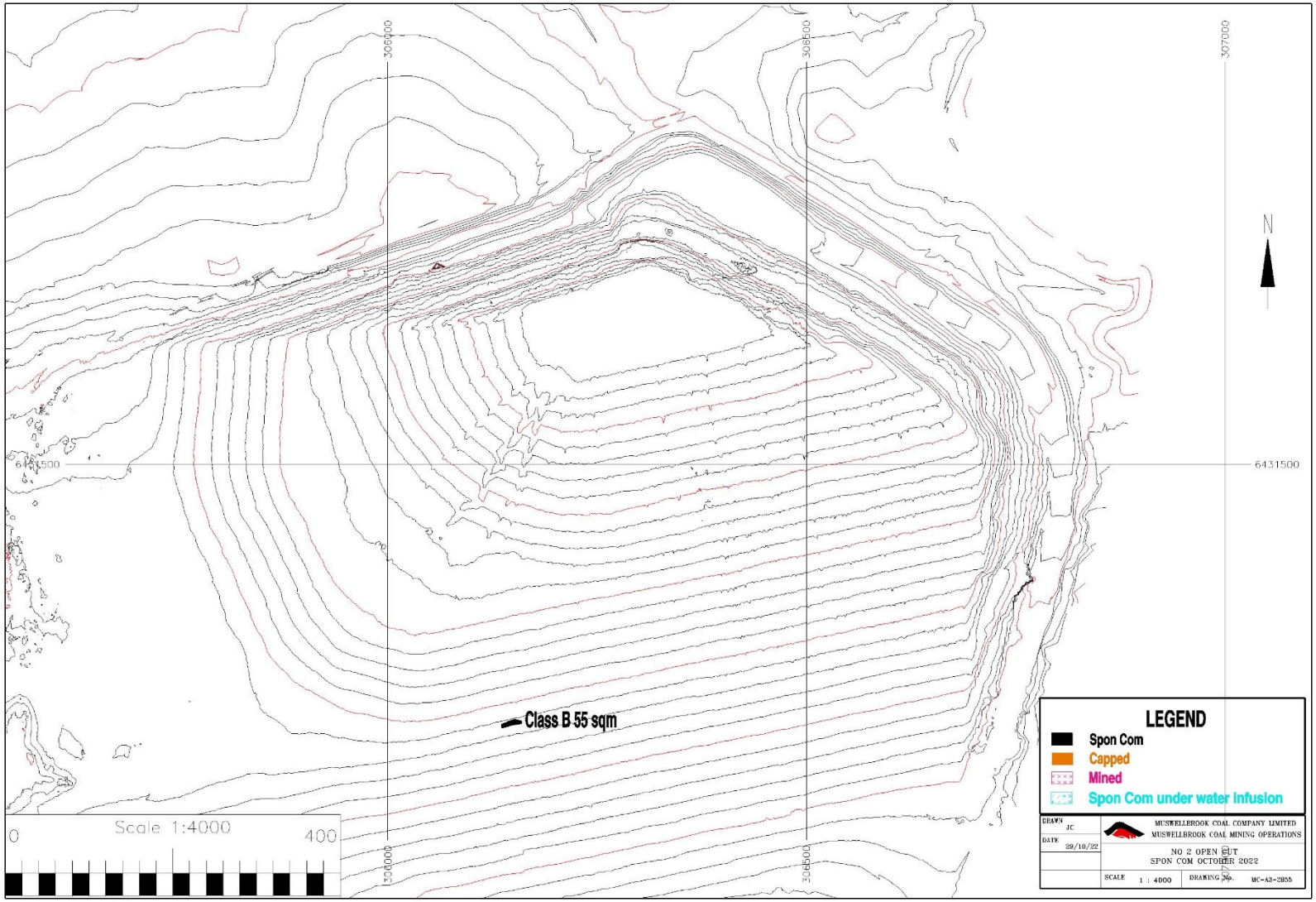

Figure 2: Location of Spontaneous Combustion Outbreaks in Open Cut 2

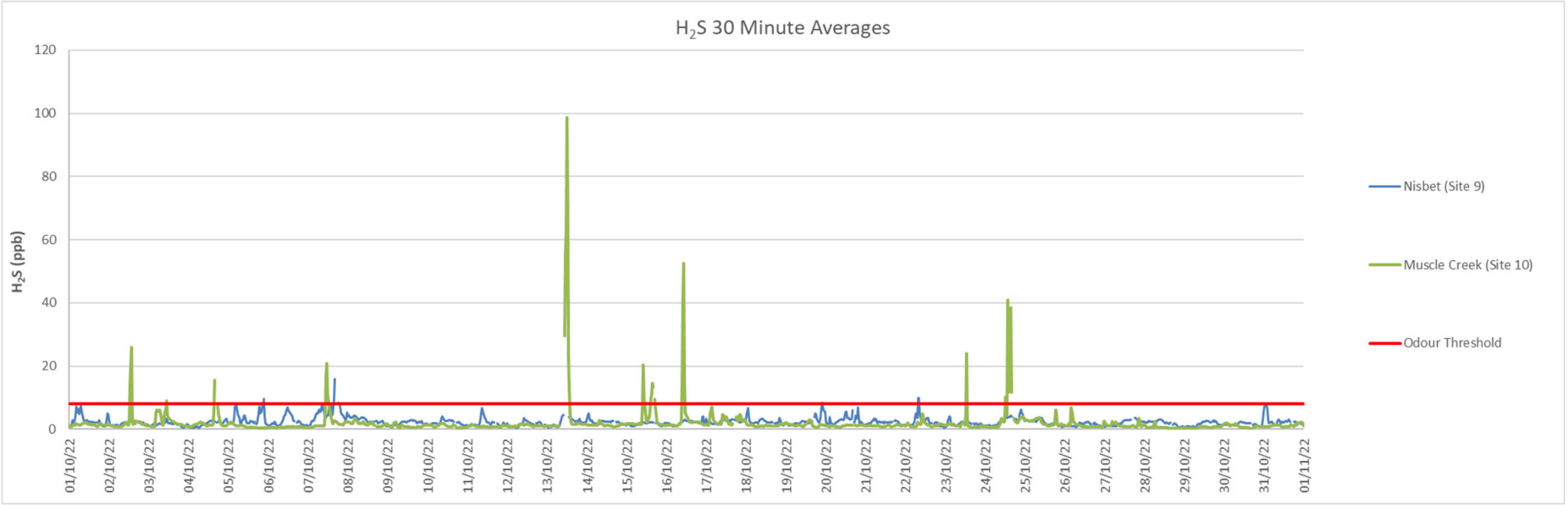

Figure 3: Hydrogen Sulphide 30 Minute Results

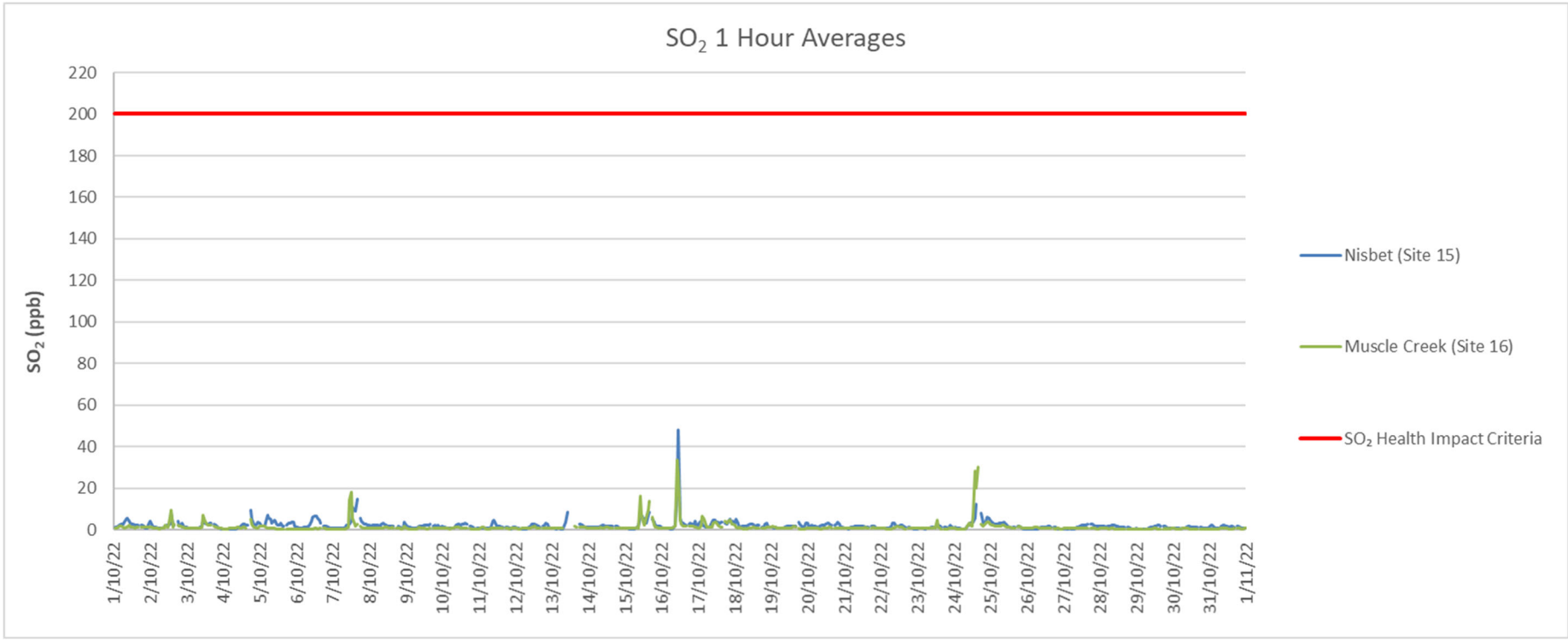

Figure 4: Sulphur Dioxide 1 Hour Results

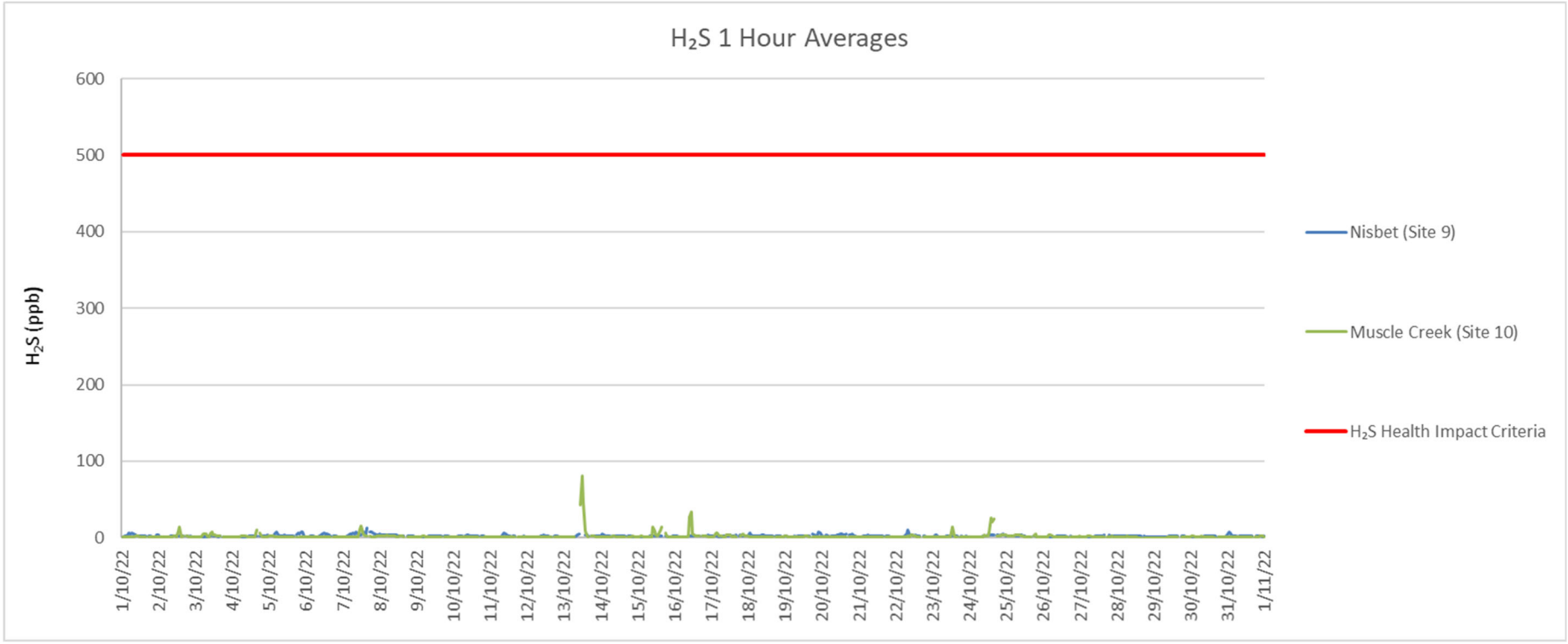

Figure 5: Hydrogen Sulphide 1 Hour Results

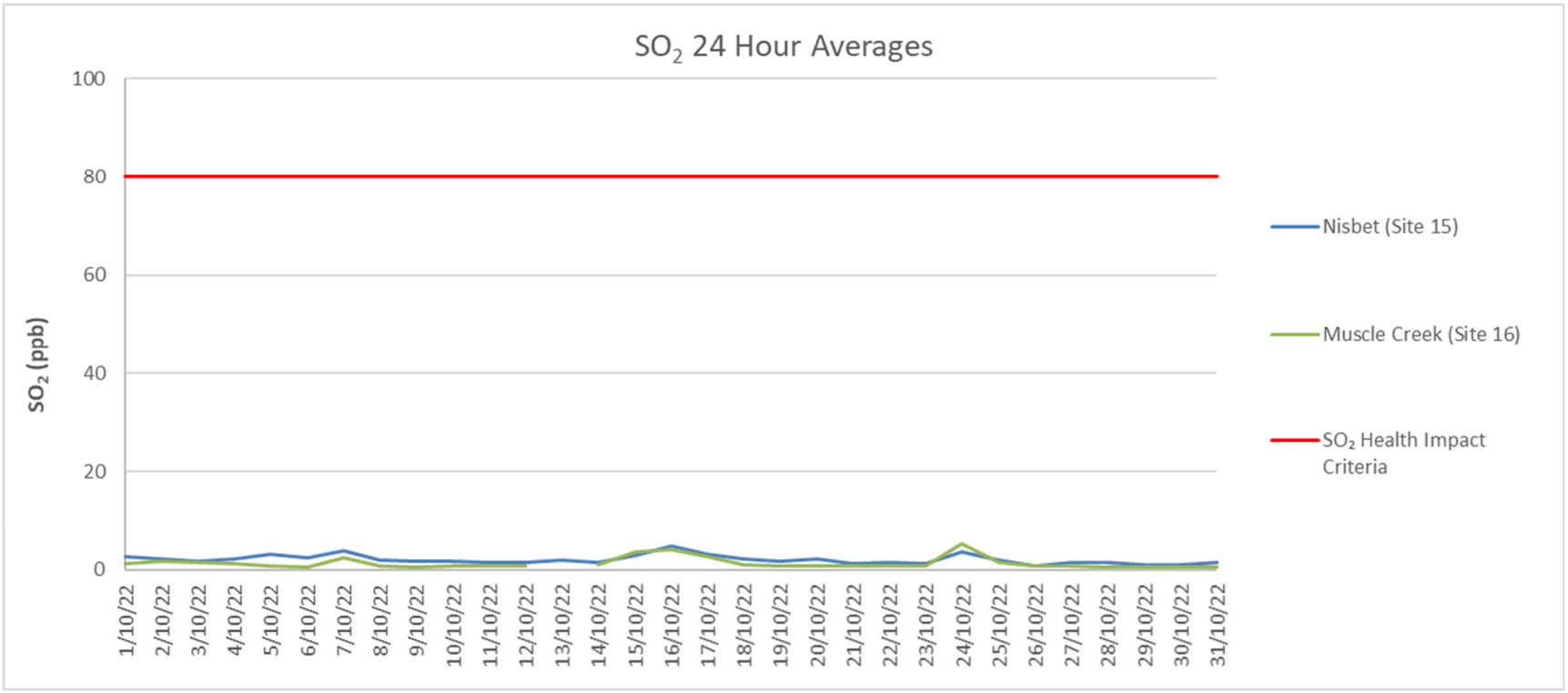

Figure 6: Sulphur Dioxide 24 Hour Results

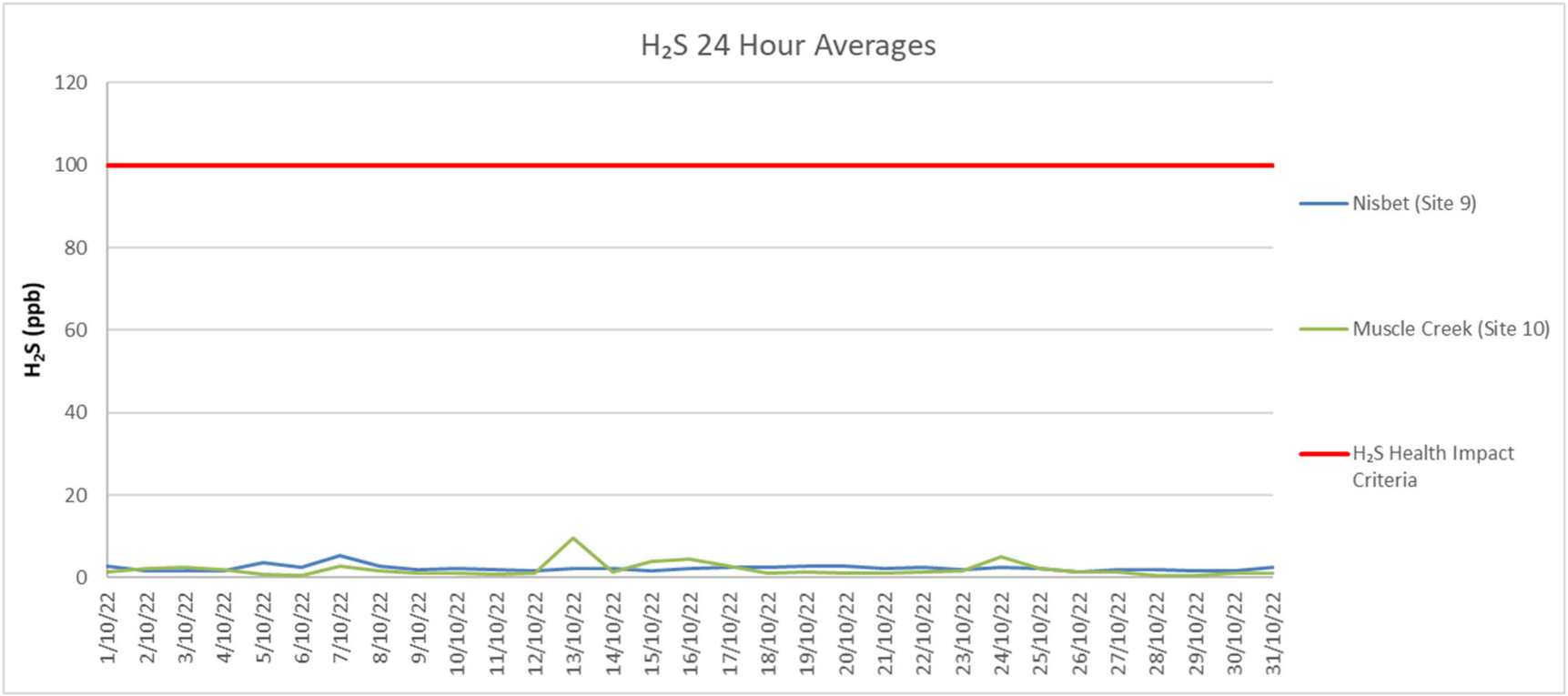

Figure 7: Hydrogen Sulphide 24 Hour Results

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.** When the majority of alarms were received, the wind was not blowing from the mine towards the monitor, indicating that MCC were most likely not the source of the elevated gas at the monitor.

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
02/10/22 01:48pm	Muscle Creek	Wind – 2.6m/s from the SSE. Wind was not blowing from the mine towards the monitor.	Water cart assisting with managing spontaneous combustion.	Combination of Class A and B
03/10/22 11:58am	Muscle Creek	Wind – 2.8m/s from the SSE. Wind was not blowing from the mine towards the monitor.	Water cart assisting with managing spontaneous combustion.	Combination of Class A and B
04/10/22 05:58pm	Muscle Creek	Wind – 2.2m/s from the ESE. Wind was not blowing from the mine towards the monitor.	Water cart assisting with managing spontaneous combustion.	Combination of Class A and B
05/10/22 09:38pm	Nisbet	Wind – 2.9m/s from the SE.	Wet weather – no operations.	Combination of Class A and B
05/10/22 10:18pm	Nisbet	Wind – 2.4m/s from the SE.	Wet weather – no operations.	Combination of Class A and B
07/10/22 09:38am	Nisbet	Wind – 1.9m/s from the WSW. Wind was not blowing from the mine towards the monitor.	No changes made – wet weather.	Combination of Class A and B
07/10/22 11:38am	Nisbet	Wind – 1.9m/s from the SSW. Wind was not blowing from the mine towards the monitor.	No changes made – wet weather.	Combination of Class A and B
07/10/22 04:28pm	Nisbet	Wind – 0.8m/s from the SSW.	No changes made – wet weather.	Combination of Class A and B

Date and Time of Alarm	Location of Alarm	Weather Conditions at Time of Alarm	Response to Alarm	Classification of Spontaneous Combustion
07/10/22 05:48pm	Nisbet	Wind – 1.5m/s from the ENE. Wind was not blowing from the mine towards the monitor.	No changes made – wet weather.	Combination of Class A and B
13/10/22 11:08am	Muscle Creek	Wind – 1.2m/s from the SE. Wind was not blowing from the mine towards the monitor.	No mining operations. Ancillary activities only.	Combination of Class A and B
15/10/22 10:38am	Muscle Creek	Wind – 1.0m/s from the WNW.	Water cart assisting with managing spontaneous combustion.	Combination of Class A and B
15/10/22 03:18pm	Muscle Creek	Wind – 3.1m/s from the WNW.	Water cart assisting with managing spontaneous combustion.	Combination of Class A and B
15/10/22 05:58pm	Muscle Creek	Wind – 0.7m/s from the E. Wind was not blowing from the mine towards the monitor.	Water cart assisting with managing spontaneous combustion.	Combination of Class A and B
16/10/22 10:28am	Muscle Creek	Wind – 1.1m/s from the WSW. Wind was not blowing from the mine towards the monitor.	Water cart assisting with managing spontaneous combustion.	Combination of Class A and B
17/10/22 04:28am	Muscle Creek	Wind – 3.6m/s from the SE. Wind was not blowing from the mine towards the monitor.	Night shift – no operations.	Combination of Class A and B
19/10/22 10:48pm	Nisbet	Wind – 2.8m/s from the SE.	Wet weather – no mining operations. Ancillary activity only.	Combination of Class A and B
22/10/22 08:38am	Nisbet	Wind – 1.3m/s from the WSW. Wind was not blowing from the mine towards the monitor.	No mining operations. Ancillary activity only.	Combination of Class A and B

Date and Time of Alarm	Location of Alarm	Weather Conditions at Time of Alarm	Response to Alarm	Classification of Spontaneous Combustion
23/10/22 01:38pm	Muscle Creek	Wind – 2.7m/s from the SE. Wind was not blowing from the mine towards the monitor.	Dozer assisting with spontaneous combustion.	Combination of Class A and B
24/10/22 01:38pm	Muscle Creek	Wind – 3.1m/s from the SSE. Wind was not blowing from the mine towards the monitor.	No mining operations. Ancillary activity only.	Combination of Class A and B
24/10/22 02:08pm	Muscle Creek	Wind – 1.5m/s from the SSE. Wind was not blowing from the mine towards the monitor.	No mining operations. Ancillary activity only.	Combination of Class A and B
24/10/22 05:58pm	Muscle Creek	Wind – 2.3m/s from the SSE. Wind was not blowing from the mine towards the monitor.	No mining operations. Ancillary activity only.	Combination of Class A and B
26/10/22 05:08am	Muscle Creek	Wind – 3.2m/s from the NW.	Water carts assisting with spontaneous combustion management.	Combination of Class A and B
31/10/22 01:48am	Nisbet	Wind – 0.5m/s from the NE. Wind was not blowing from the mine towards the monitor.	Night shift – no operations.	Combination of Class A and B

5.0 CORRELATION BETWEEN MANAGEMENT ACTIVITIES AND GAS LEVELS

A review of the correlation between spontaneous combustion management activities and gas levels has been undertaken. This review found that spontaneous combustion management activities were occurring and gas levels during the reporting period were generally low.

6.0 CORRELATION BETWEEN COMMUNITY COMPLAINTS AND GAS LEVELS

There were no complaints received during the reporting period.