



Muswellbrook Coal Company Limited

Spontaneous Combustion Report

For: Environmental Protection Licence 656

Reporting Period: Quarter 1 2023

Authority Holder: Muswellbrook Coal Company Limited

Report Date: 18 April 2023

**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 quarterly. 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

Spontaneous combustion management measures for the reporting period included water carts assisting with cooling down hot spots and capping of spontaneous combustion outbreaks. Mining operations ceased at MCC in November 2022, so the reporting of spontaneous combustion management measures has changed and there is no longer a daily report prepared.

The classification system for spontaneous combustion outbreaks is provided in **Table 1**. A summary of the areas affected by spontaneous combustion and the areas controlled and treated during the reporting period is provided in **Table 2**. The locations of these areas can be seen in **Figure 1** to **Figure 6**.

**Table 1: 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 2: Summary of Spontaneous Combustion

Month	Areas Capped (m ²)*	Areas Mined (m ²)*	Area Under Water Infusion (m ²)*	Area Without Active Control (m ²)**
Open Cut 1				
January 23	0	0	8,250	2,085
February 23	0	0	5,972	1,870
March 23	3,605	0	6,502	2,560
Open Cut 2				
January 23	55	0	0	0
February 23	0	0	0	0
March 23	0	0	0	0

* - during reporting period

** - at end of reporting period

3.0 GAS MONITORING RESULTS

The gas monitoring results are displayed graphically in **Figure 7** to **Figure 11**. 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 last 12 months are shown in **Table 3**.

Table 3: Data Capture Rates

Monitoring Location	Pollutant	Averaging Period	Data Capture – 12 Month Rolling (%)
Point 9, Nisbet	Hydrogen Sulphide	30 minutes	98.5
		1 hour	99.5
		24 hours	97.2
Point 10, Muscle Creek	Hydrogen Sulphide	30 minutes	99.5
		1 hour	99.1
		24 hours	98.4
Point 15, Nisbet	Sulphur Dioxide	1 hour	95.3
		24 hours	93.4
Point 16, Muscle Creek	Sulphur Dioxide	1 hour	97.5
		24 hours	94.9

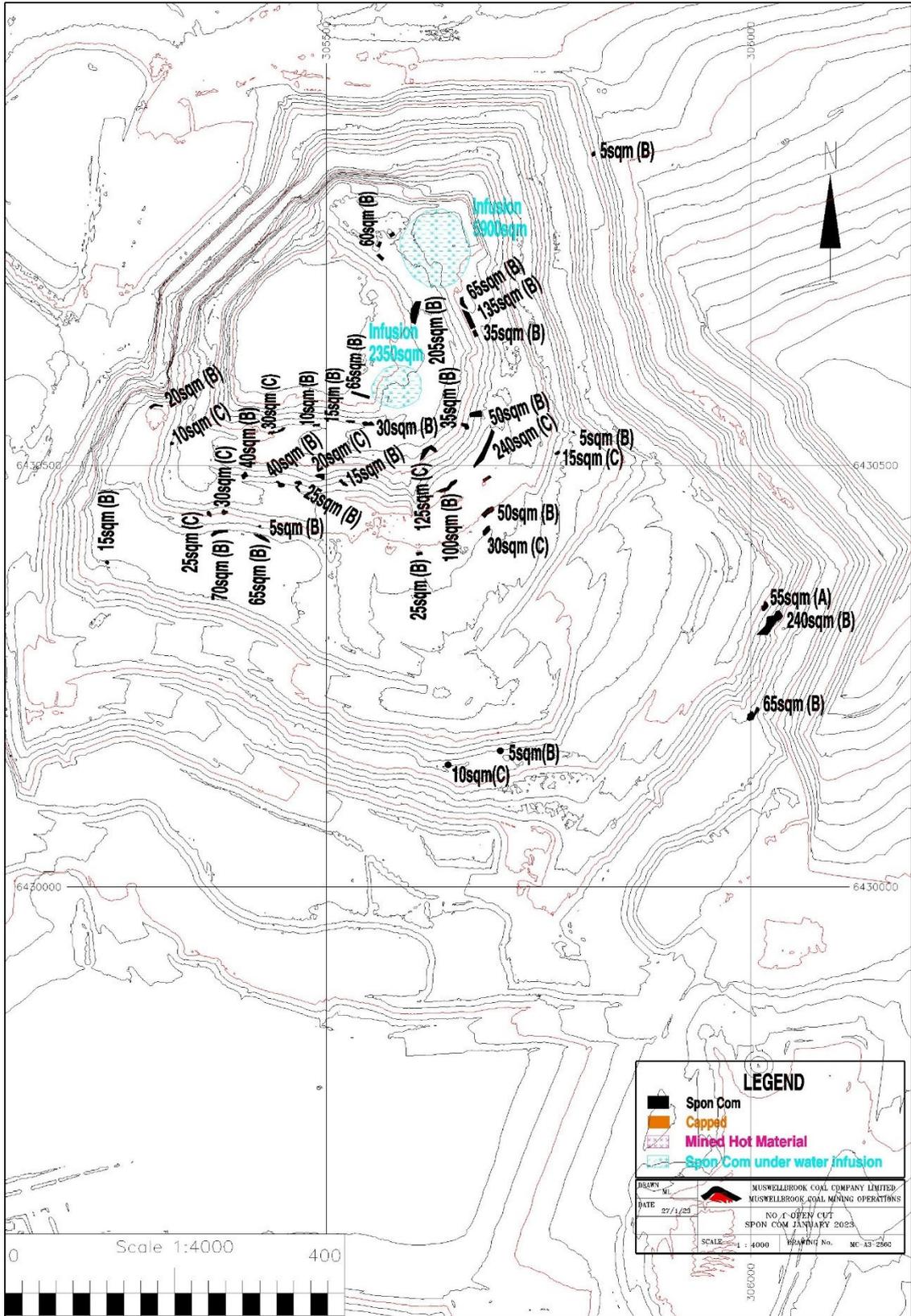


Figure 1: Location of Spontaneous Combustion Outbreaks in Open Cut 1 – January 2023

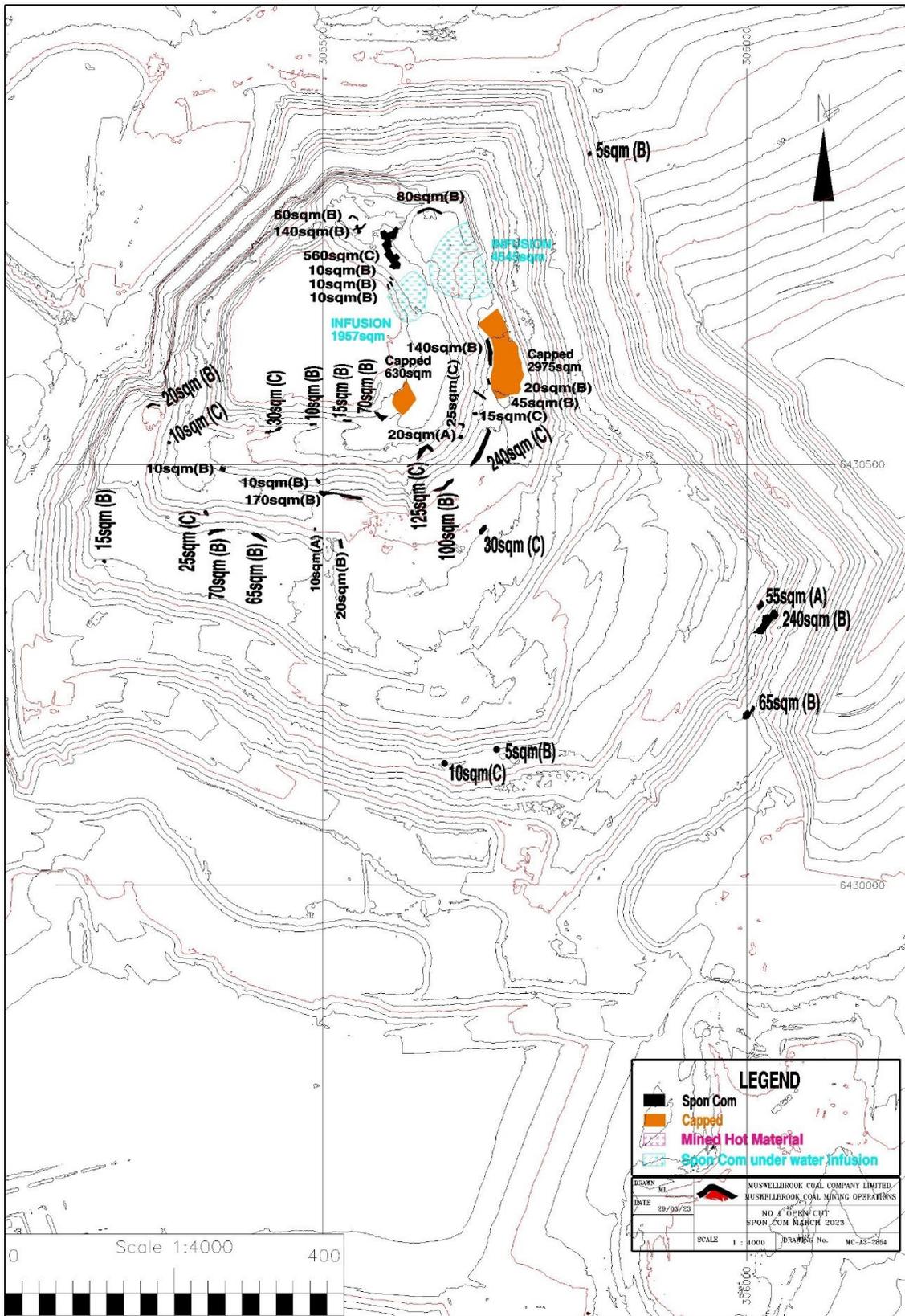


Figure 3: Location of Spontaneous Combustion Outbreaks in Open Cut 1 – March 2023

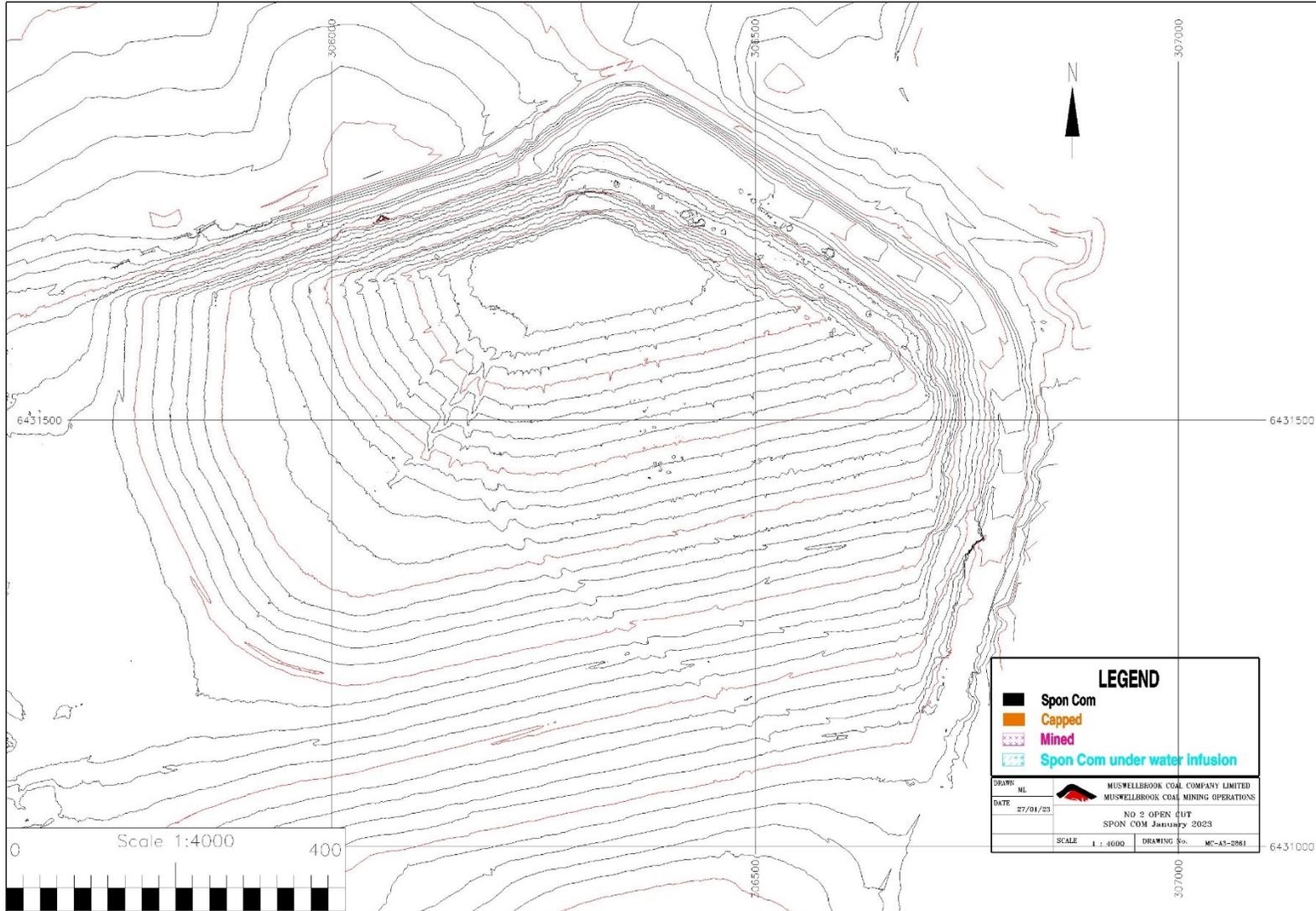


Figure 4: Location of Spontaneous Combustion Outbreaks in Open Cut 2 – January 2023

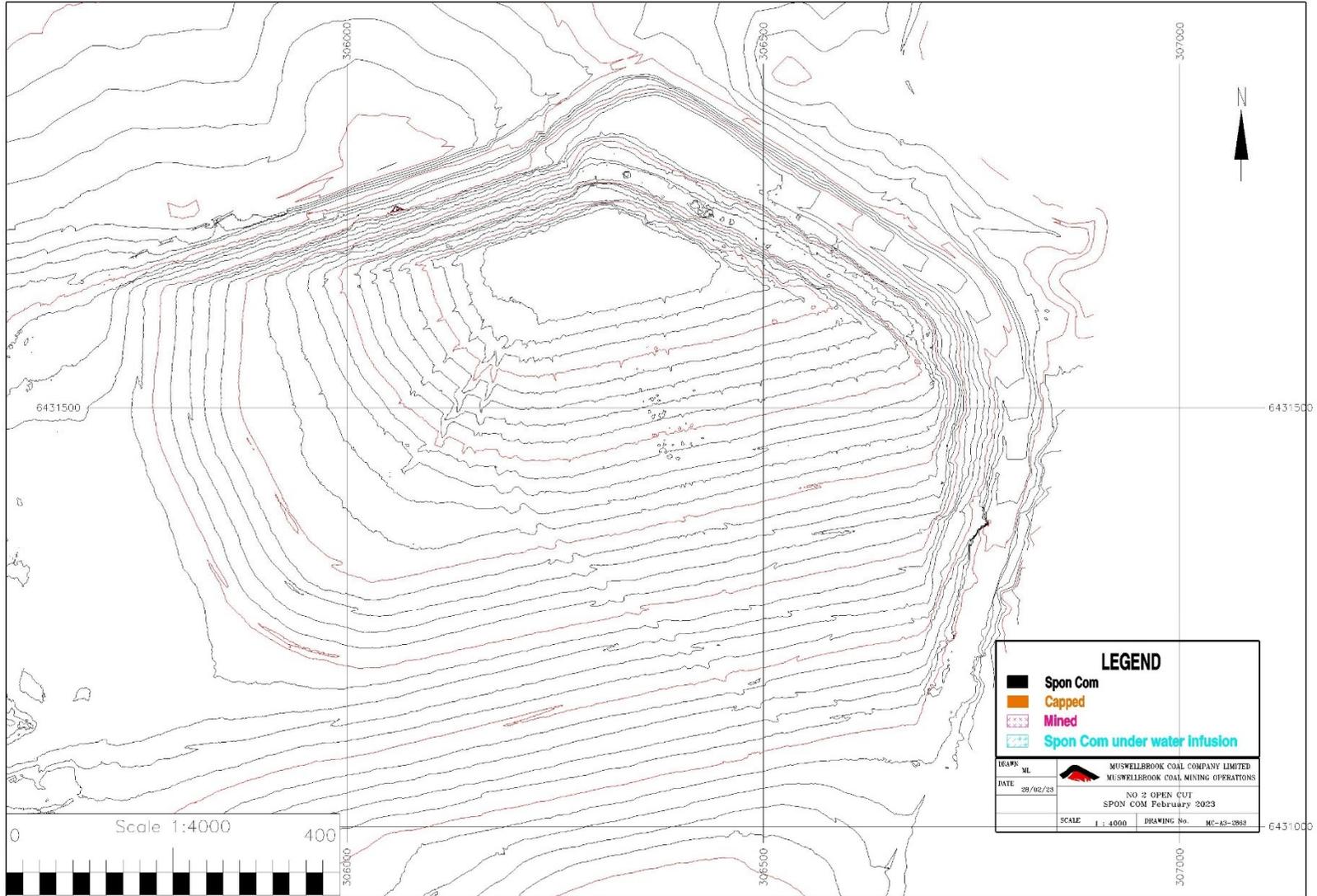


Figure 5: Location of Spontaneous Combustion Outbreaks in Open Cut 2 – February 2023

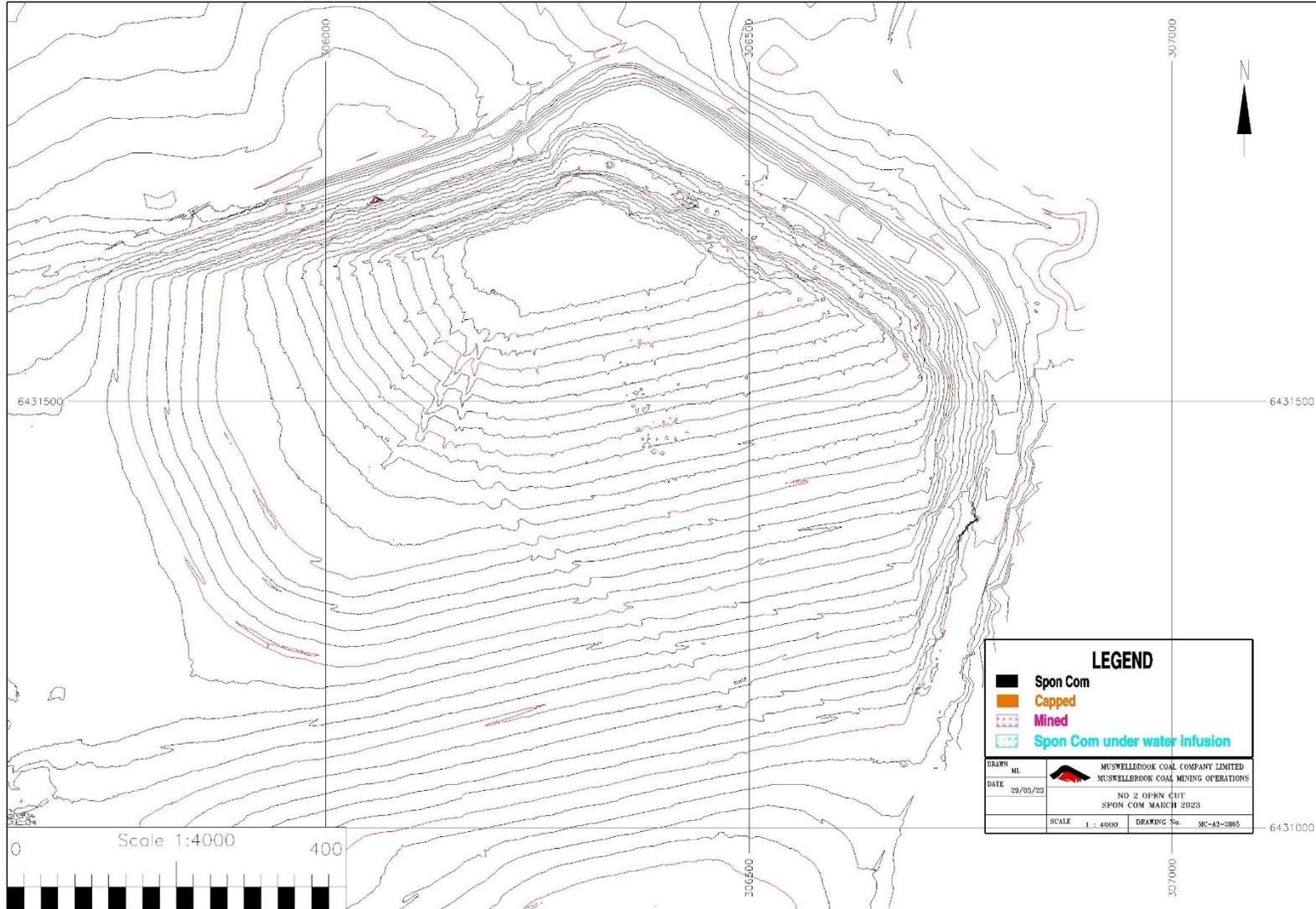
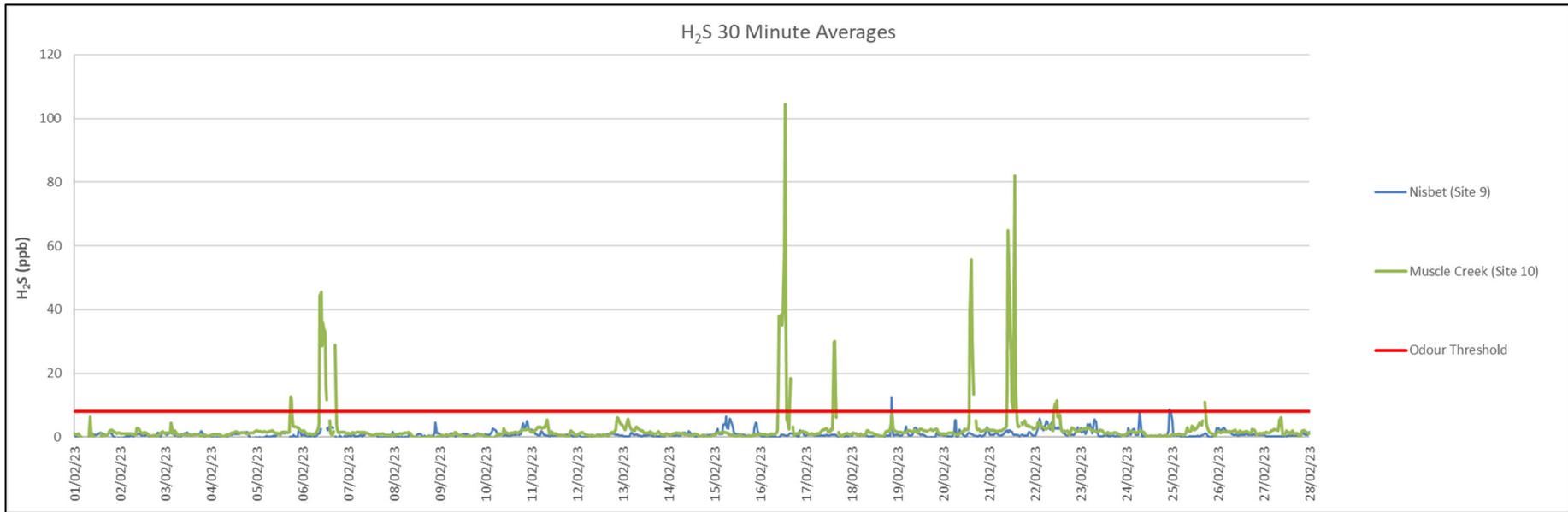
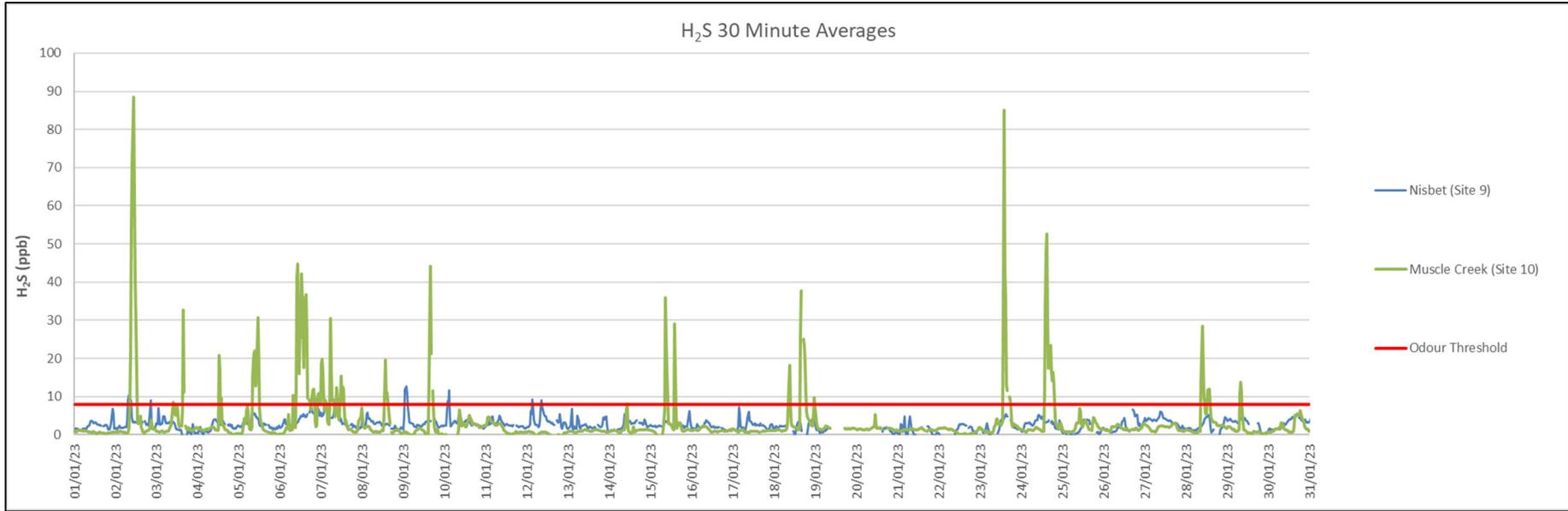


Figure 6: Location of Spontaneous Combustion Outbreaks in Open Cut 2 – March 2023



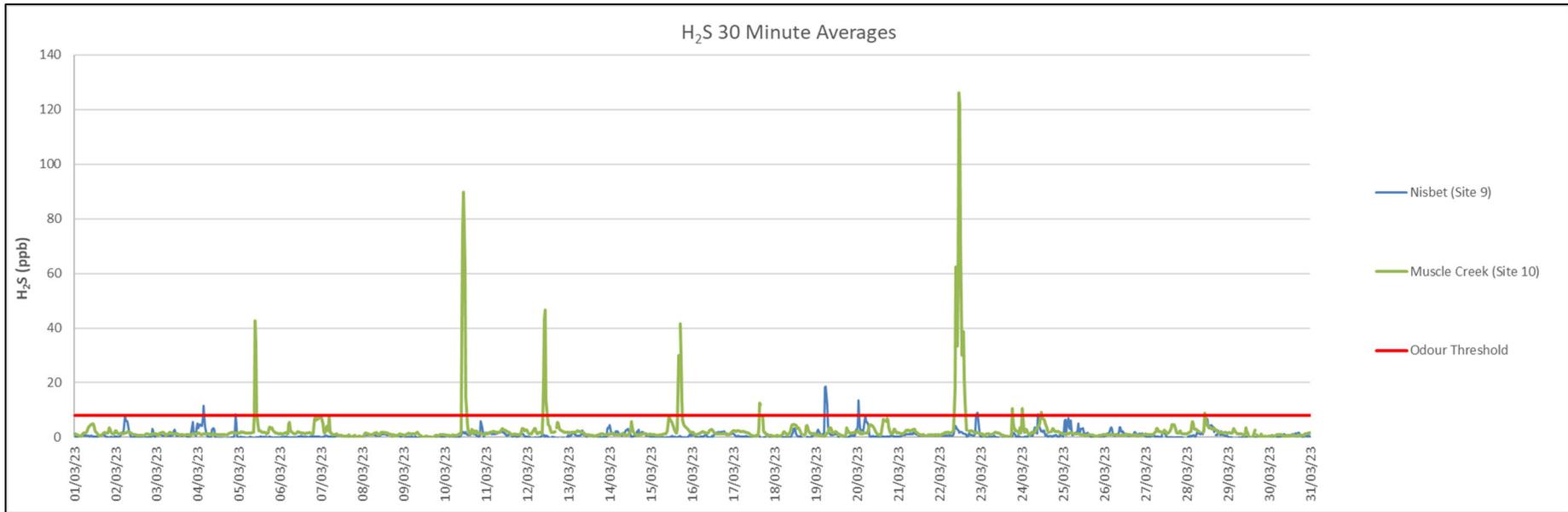
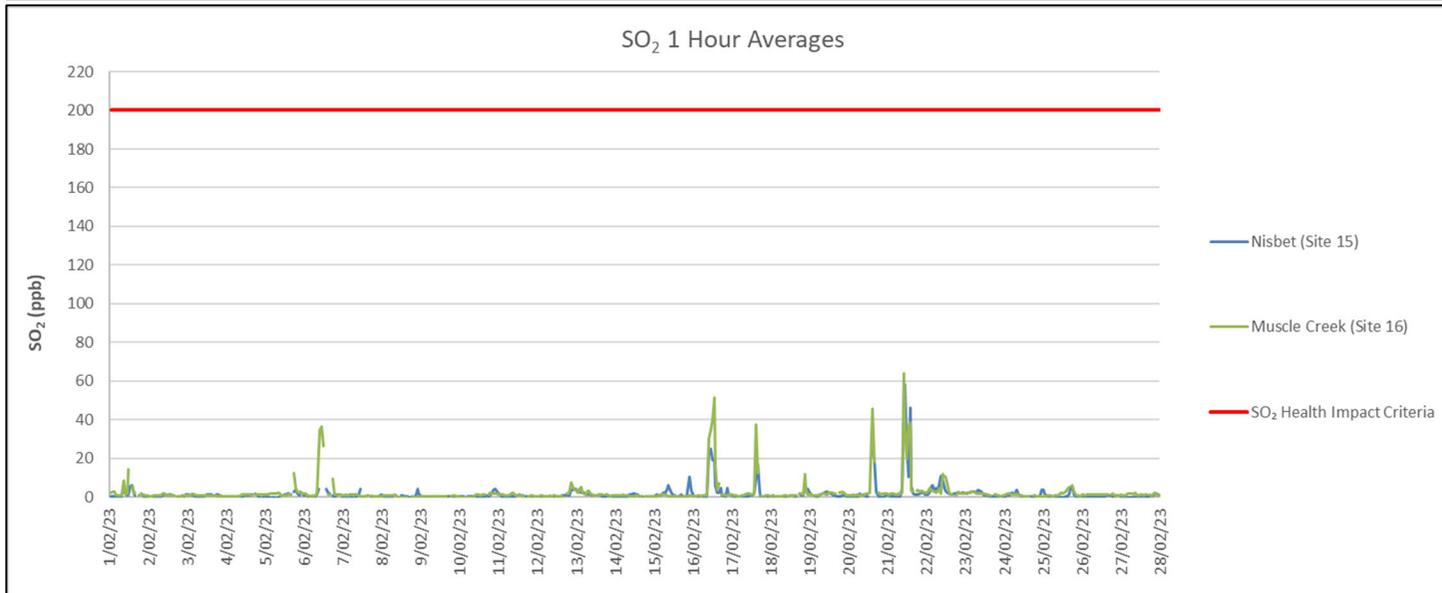
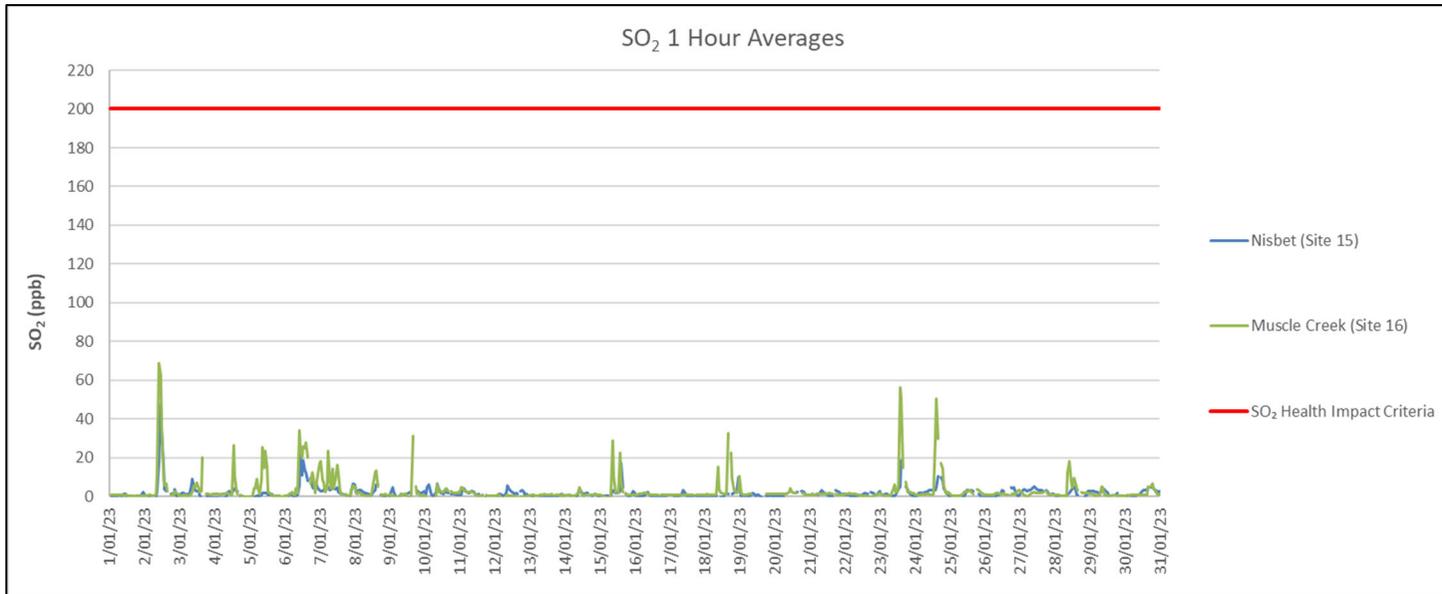


Figure 7: Hydrogen Sulphide 30 Minute Results



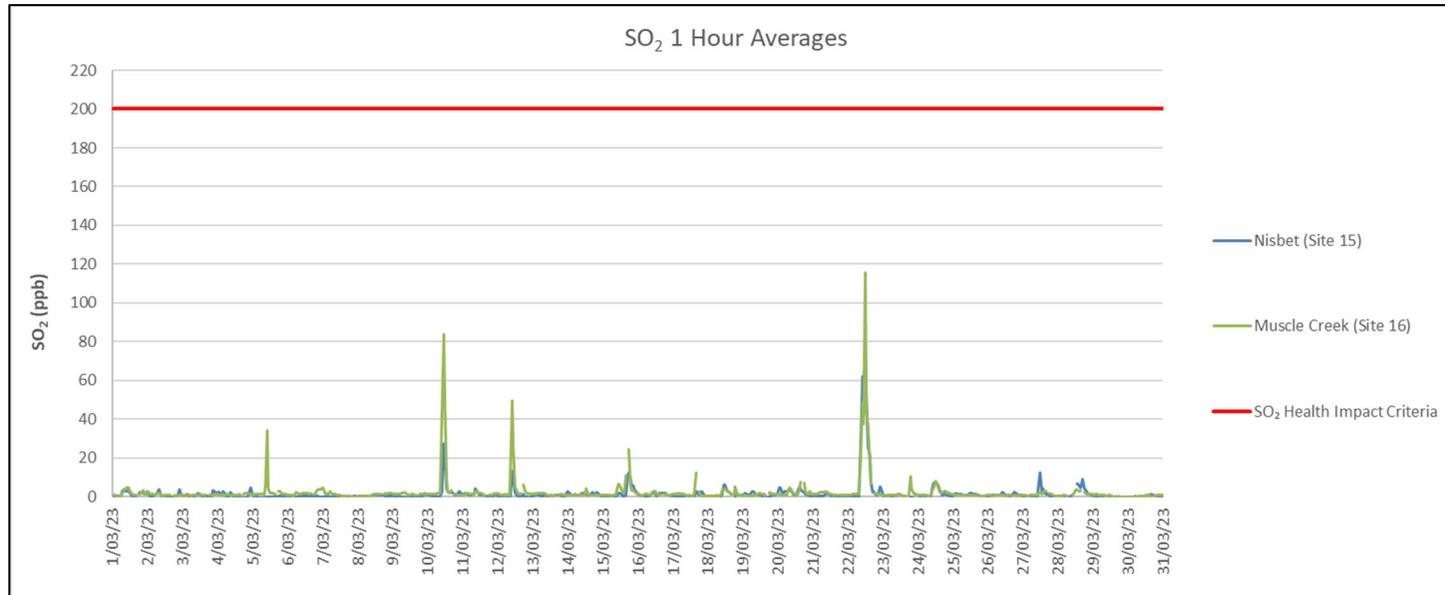
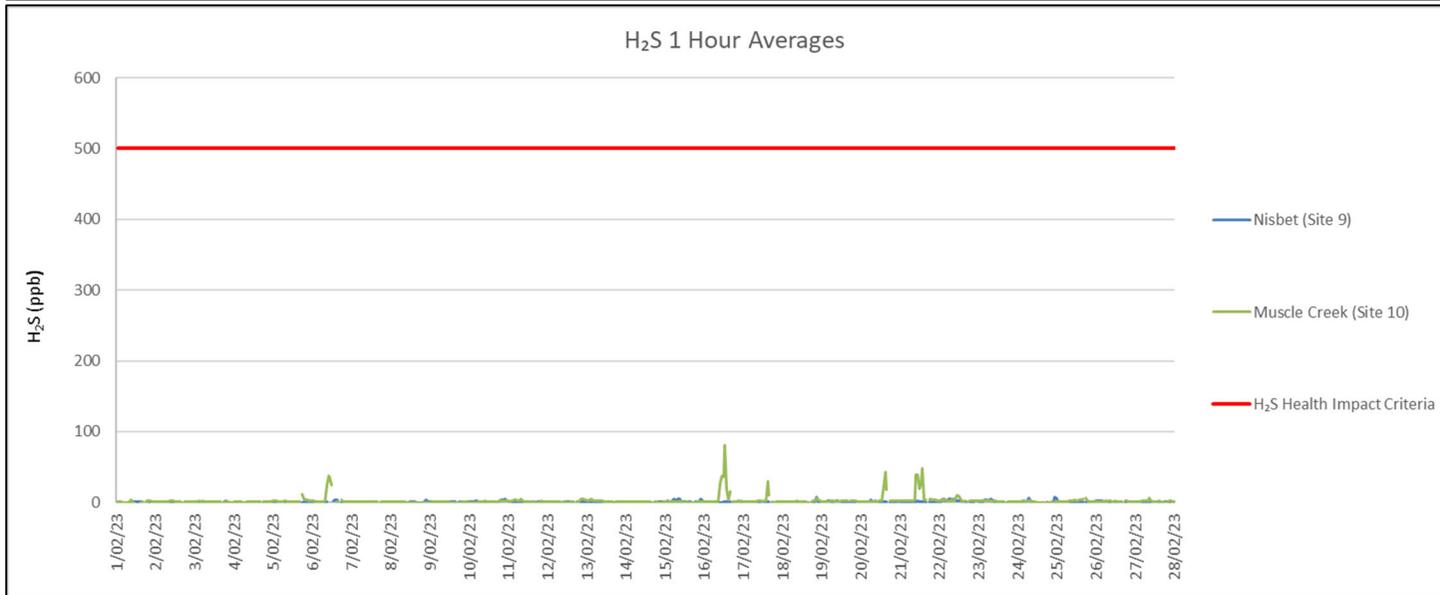
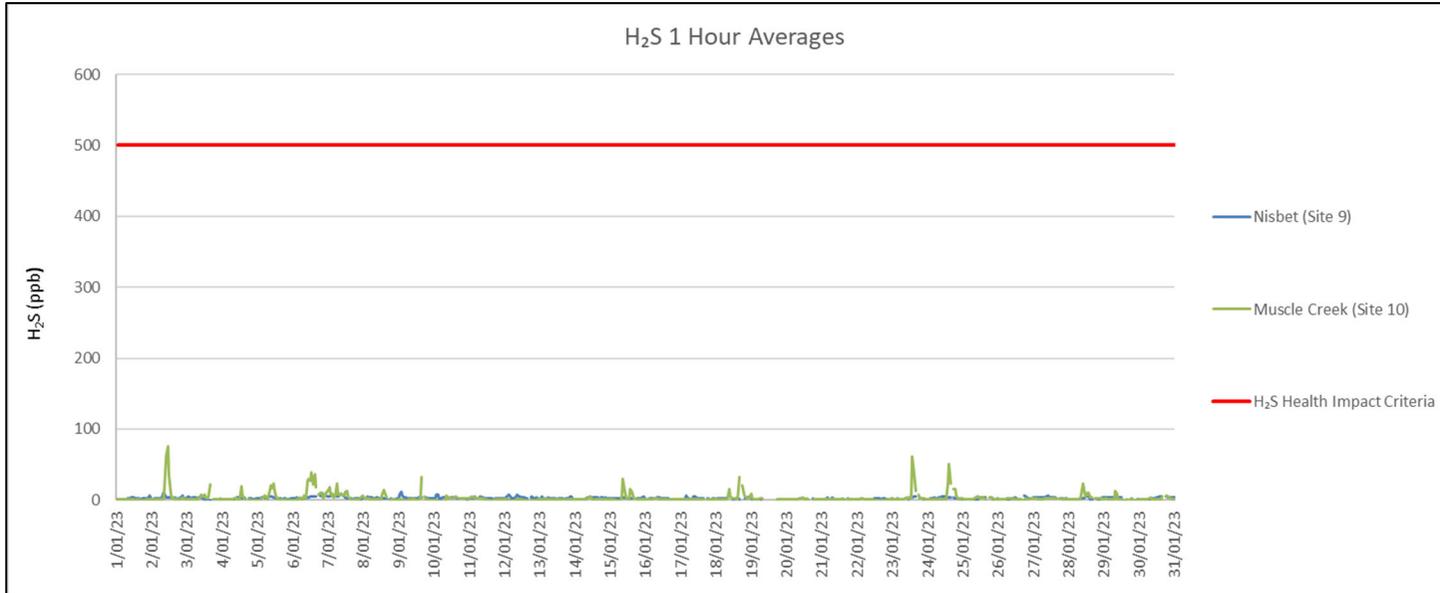


Figure 8: Sulphur Dioxide 1 Hour Results



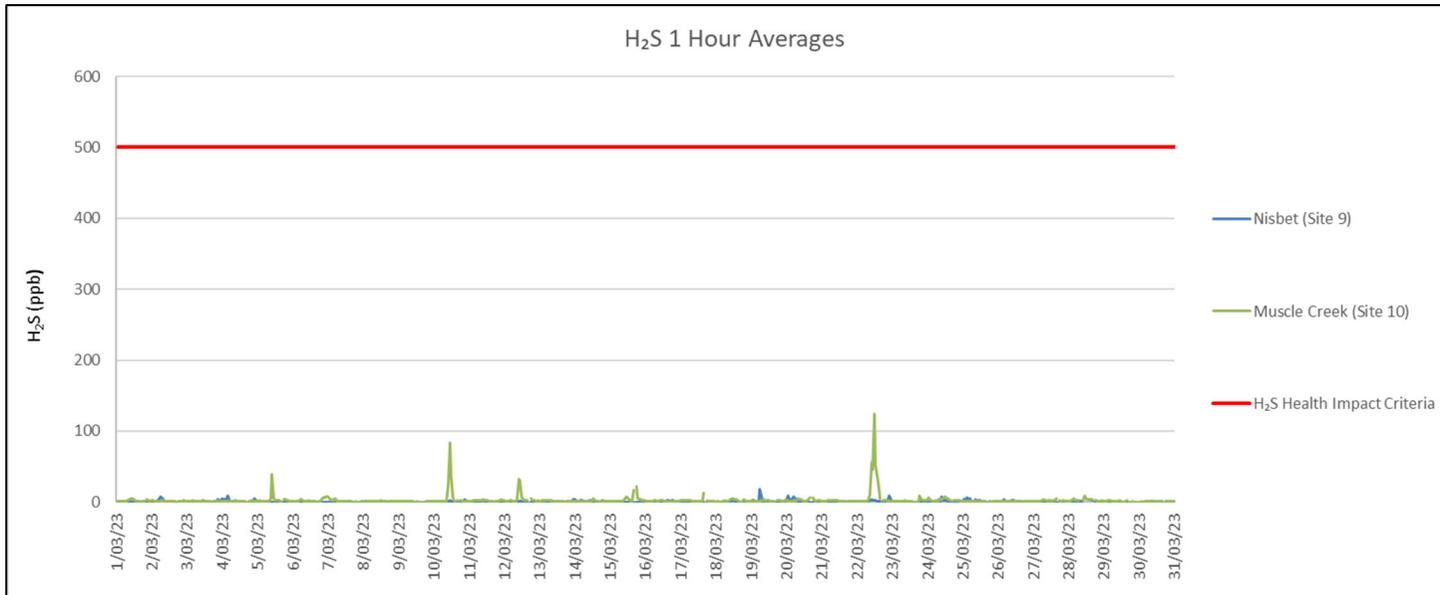
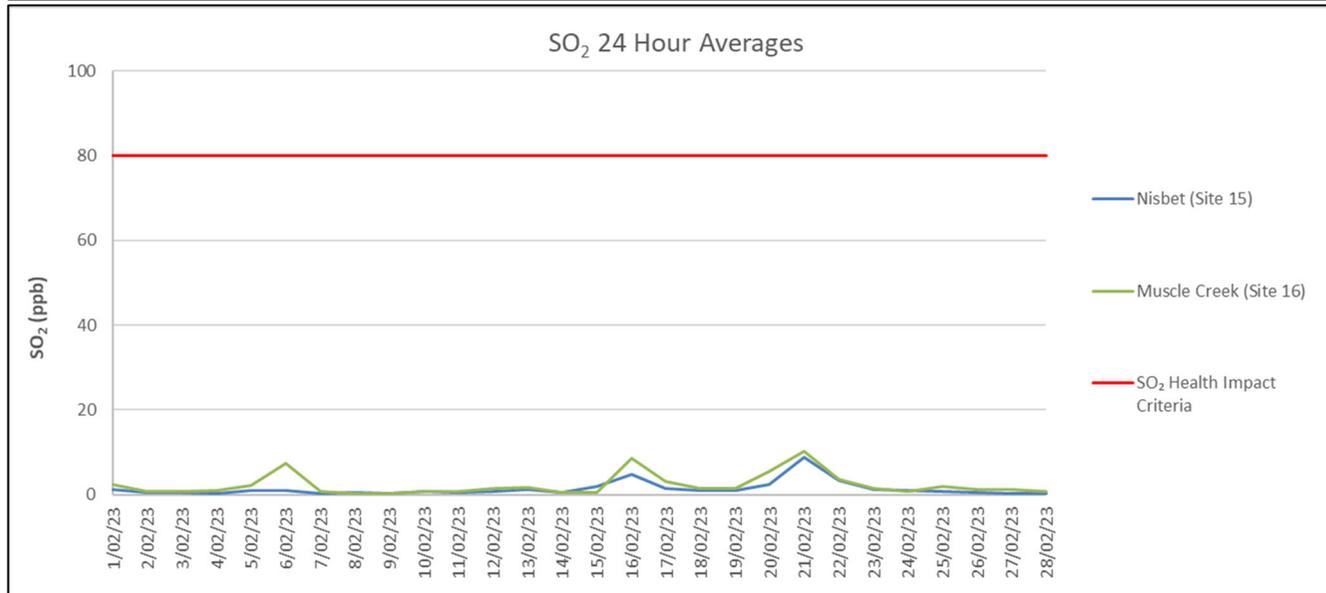
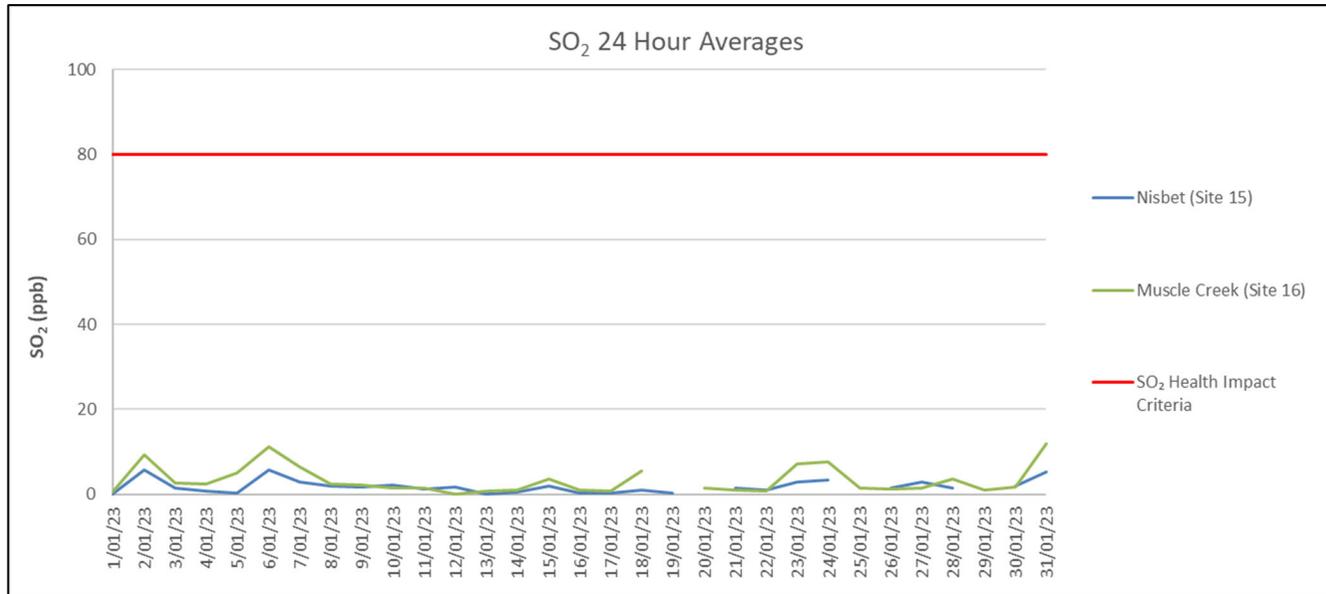


Figure 9: Hydrogen Sulphide 1 Hour Results



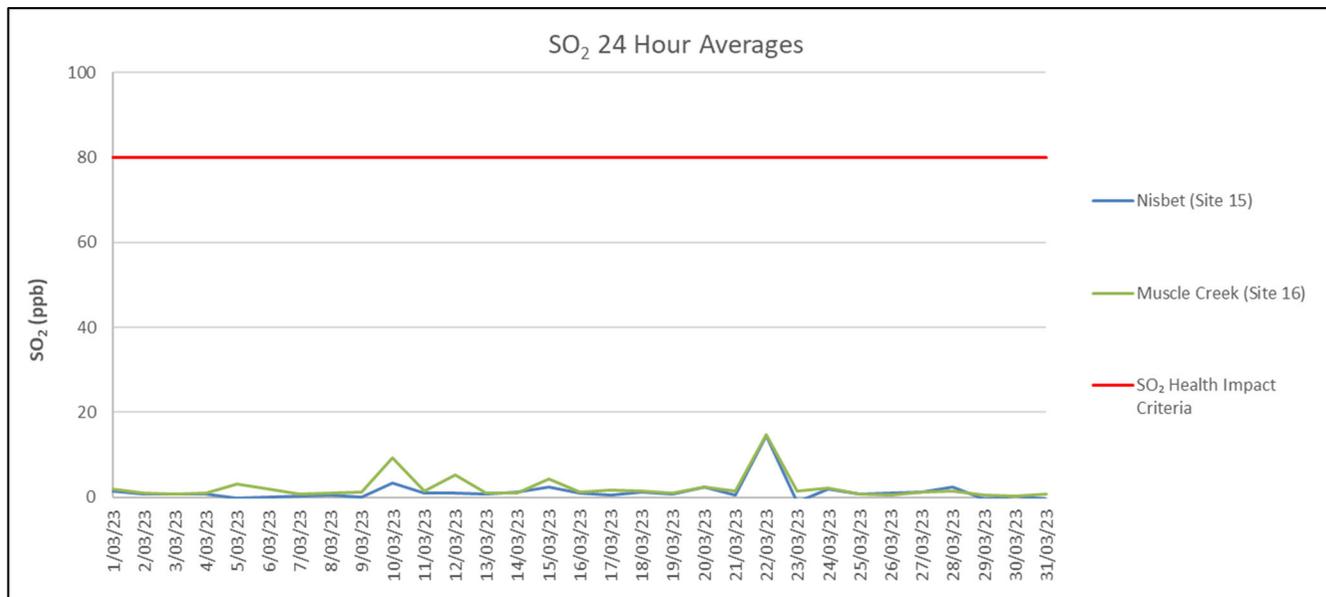
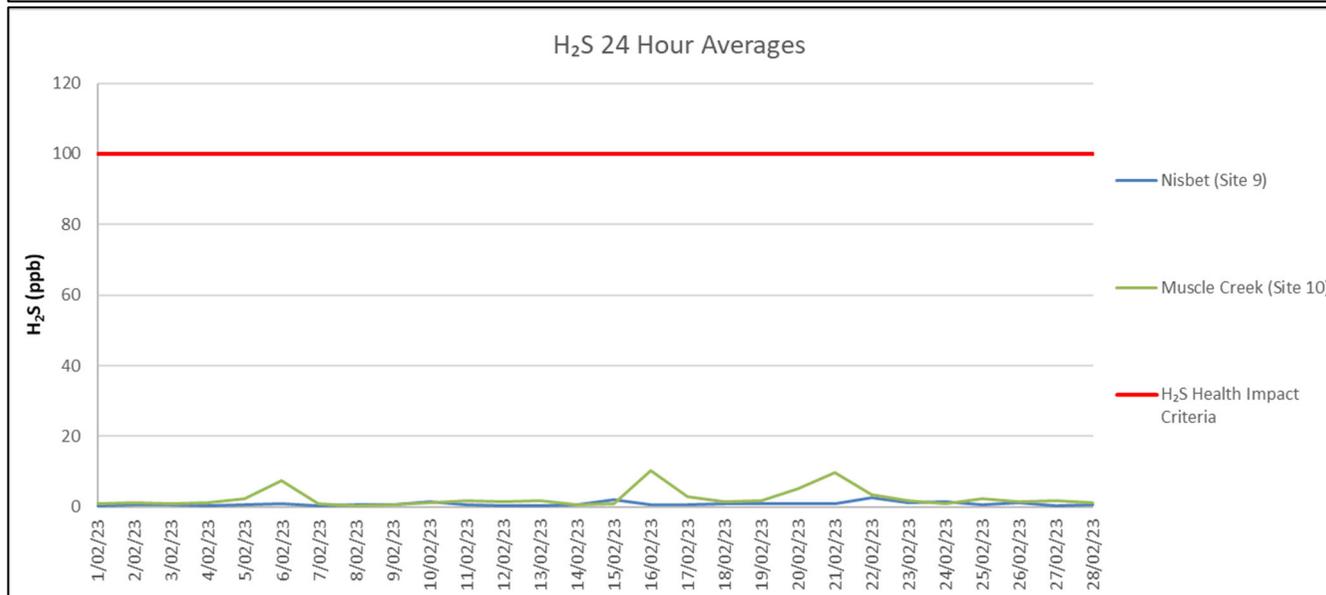
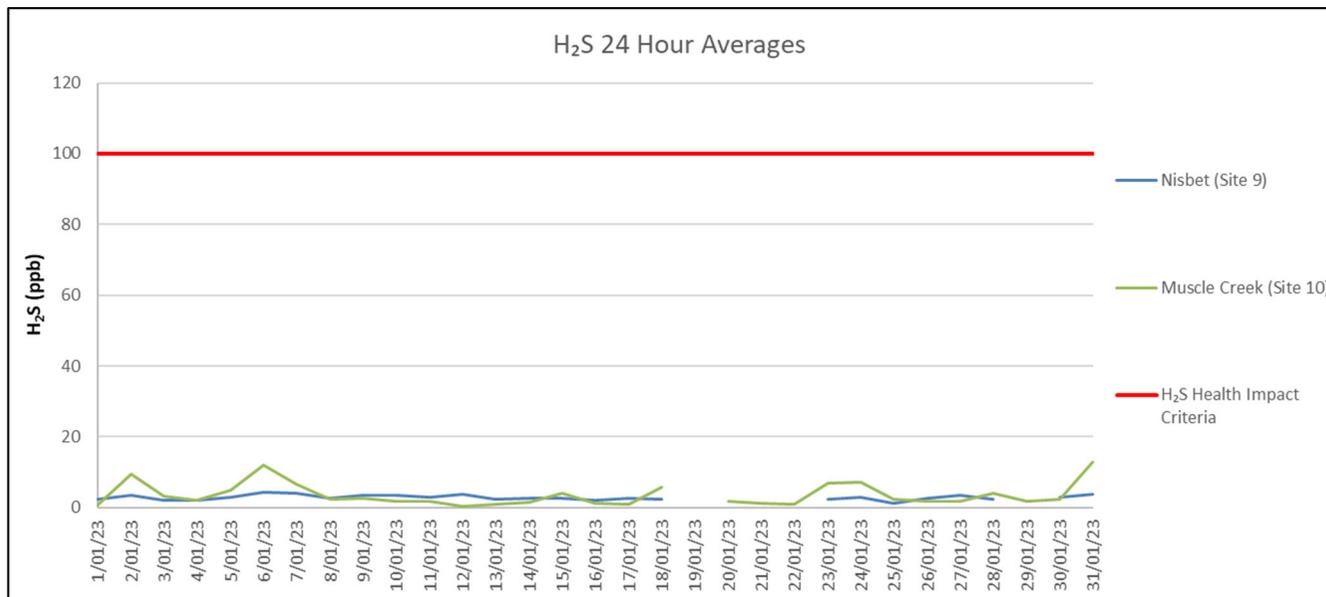


Figure 10: Sulphur Dioxide 24 Hour Results



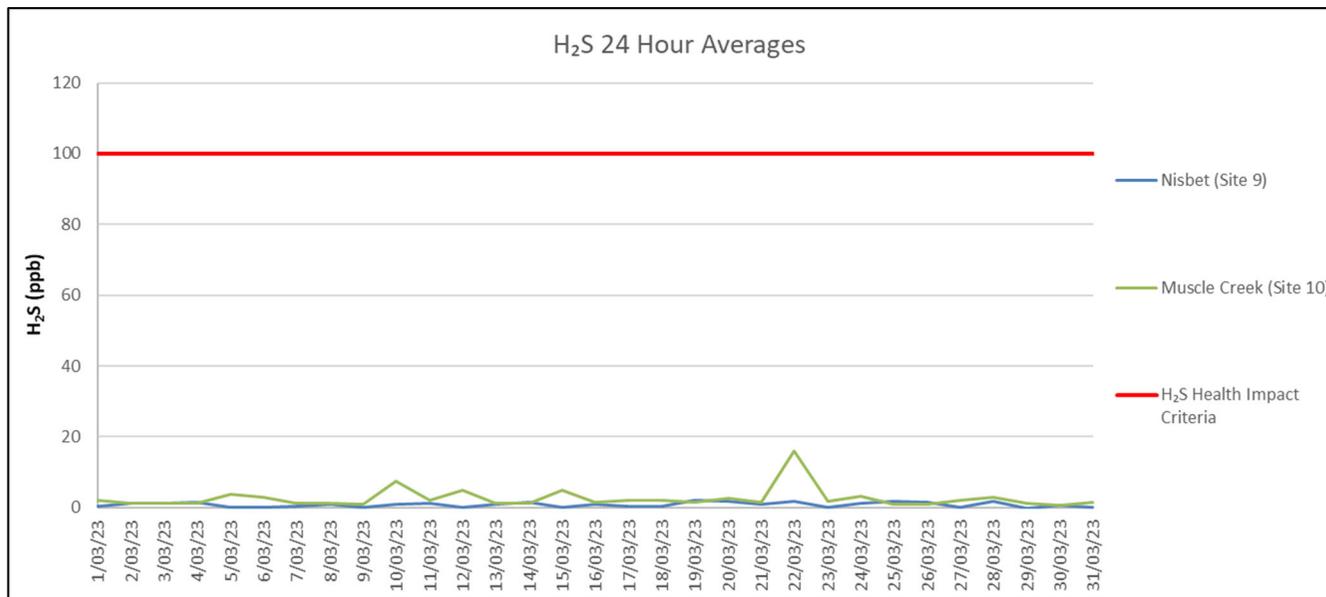


Figure 11: Hydrogen Sulphide 24 Hour Results



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 4**. When the majority of alarms were received (~75%), 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 4: 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
01/01/23 11:30pm	Nisbet	Wind – 4.2m/s from the SSE.	No mining occurring – no action required	Combination of Class A, B and C
02/01/23 08:30am	Nisbet	Wind – 0.9m/s from the NNE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
02/01/23 09:30am	Muscle Creek	Wind – 2.0m/s from the SSE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
02/01/23 09:15pm	Nisbet	Wind – 3.9m/s from the SE.	No mining occurring – no action required	Combination of Class A, B and C
03/01/23 10:45am	Muscle Creek	Wind – 2.0m/s from the NW.	No mining occurring – no action required	Combination of Class A, B and C
04/01/23 01:15pm	Muscle Creek	Wind – 3.0m/s from the ESE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
05/01/23 08:45am	Muscle Creek	Wind – 4.5m/s from the ESE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
06/01/23 08:25am	Muscle Creek	Wind – 3.2m/s from the SE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
06/01/23 10:05pm	Nisbet	Wind – 3.2m/s from the S.	No mining occurring – no action required	Combination of Class A, B and C
07/01/23 12:35am	Muscle Creek	Wind – 2.8m/s from the SSE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
07/01/23 03:05am	Nisbet	Wind – 2.1m/s from the SSW. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C



Date and Time of Alarm	Location of Alarm	Weather Conditions at Time of Alarm	Response to Alarm	Classification of Spontaneous Combustion
07/01/23 03:25am	Muscle Creek	Wind – 2.3m/s from the SSE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
07/01/23 01:35pm	Muscle Creek	Wind – 2.9m/s from the SSE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
08/01/23 01:45pm	Muscle Creek	Wind – 3.1m/s from the SE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
09/01/23 01:48am	Nisbet	Wind – 0.7m/s from the WSW. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
09/01/23 03:55pm	Muscle Creek	Wind – 2.4m/s from the S. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
10/01/23 02:25am	Nisbet	Wind – 1.9m/s from the SSE.	No mining occurring – no action required	Combination of Class A, B and C
10/01/23 09:45am	Muscle Creek	Wind – 2.5m/s from the SSE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
12/01/23 03:55am	Nisbet	Wind – 1.3m/s from the SSW. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
12/01/23 09:15am	Nisbet	Wind – 1.3m/s from the WNW. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
14/01/23 11:05am	Muscle Creek	Wind – 1.9m/s from the SSW. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
15/01/23 09:15am	Muscle Creek	Wind – 1.3m/s from the ESE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
15/01/23 02:55pm	Muscle Creek	Wind – 3.5m/s from the SE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C



Date and Time of Alarm	Location of Alarm	Weather Conditions at Time of Alarm	Response to Alarm	Classification of Spontaneous Combustion
17/01/23 04:45am	Nisbet	Wind – 2.4m/s from the SE.	No mining occurring – no action required	Combination of Class A, B and C
18/01/23 09:15am	Muscle Creek	Wind – 1.8m/s from the NW.	No mining occurring – no action required	Combination of Class A, B and C
18/01/23 04:15pm	Muscle Creek	Wind – 2.9m/s from the S. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
19/01/23 12:25am	Muscle Creek	Wind – 4.9m/s from the SE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
23/01/23 02:05pm	Muscle Creek	Wind – 1.9m/s from the SSE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
24/01/23 02:25pm	Muscle Creek	Wind – 2.0m/s from the NE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
28/01/23 09:45am	Muscle Creek	Wind – 1.7m/s from the N. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
28/01/23 01:35pm	Muscle Creek	Wind – 2.0m/s from the SSW. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
29/01/23 08:25am	Muscle Creek	Wind – 1.6m/s from the E. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
31/01/23 11:25am	Muscle Creek	Wind – 2.3m/s from the SE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
01/02/23 12:25pm	Muscle Creek	Wind – 2.4m/s from the SW. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
05/02/23 06:25pm	Muscle Creek	Wind – 2.5m/s from the SE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C



Date and Time of Alarm	Location of Alarm	Weather Conditions at Time of Alarm	Response to Alarm	Classification of Spontaneous Combustion
06/02/23 09:45am	Muscle Creek	Wind – 1.5m/s from the ENE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
16/02/23 10:15am	Muscle Creek	Wind – 1.5m/s from the W. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
17/02/23 03:25pm	Muscle Creek	Wind – 3.0.6m/s from the E. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
18/02/23 09:35pm	Nisbet	Wind – 4.1m/s from the S.	No mining occurring – no action required	Combination of Class A, B and C
18/02/23 09:45pm	Muscle Creek	Wind – 4.2m/s from the SE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
20/02/23 03:35pm	Muscle Creek	Wind – 1.9m/s from the S. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
21/02/23 10:25am	Muscle Creek	Wind – 2.0m/s from the ESE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
22/02/23 03:05pm	Muscle Creek	Wind – 6.0m/s from the SE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
24/02/23 11:25pm	Nisbet	Wind – 1.3m/s from the SSE.	No mining occurring – no action required	Combination of Class A, B and C
25/02/23 05:35pm	Muscle Creek	Wind – 2.9m/s from the S. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
02/03/23 06:35am	Nisbet	Wind – 2.6m/s from the SE.	No mining occurring – no action required	Combination of Class A, B and C
04/03/23 04:05am	Nisbet	Wind – 2.6m/s from the SE.	No mining occurring – no action required	Combination of Class A, B and C
04/03/23 10:55pm	Nisbet	Wind – 3.4m/s from the ESE.	No mining occurring – no action required	Combination of Class A, B and C
05/03/23 10:05am	Muscle Creek	Wind – 1.6m/s from the NNE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C



Date and Time of Alarm	Location of Alarm	Weather Conditions at Time of Alarm	Response to Alarm	Classification of Spontaneous Combustion
07/03/23 05:25am	Muscle Creek	Wind – 7.5m/s from the NW.	No mining occurring – no action required	Combination of Class A, B and C
10/03/23 10:35am	Muscle Creek	Wind – 1.9m/s from the S. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
12/03/23 10:05am	Muscle Creek	Wind – 1.4m/s from the SW. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
15/03/23 04:45pm	Muscle Creek	Wind – 2.9m/s from the SSE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
17/03/23 04:15pm	Muscle Creek	Wind – 4.7m/s from the SSE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
19/03/23 06:15am	Nisbet	Wind – 0.8m/s from the N. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
20/03/23 01:45am	Nisbet	Wind – 0.9m/s from the SE.	No mining occurring – no action required	Combination of Class A, B and C
22/03/23 09:45am	Muscle Creek	Wind – 4.7m/s from the SE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
22/03/23 10:25pm	Nisbet	Wind – 4.5m/s from the SE.	No mining occurring – no action required	Combination of Class A, B and C
23/03/23 07:35pm	Muscle Creek	Wind – 5.8m/s from the SE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
24/03/23 01:15am	Muscle Creek	Wind – 2.4m/s from the NNW.	No mining occurring – no action required	Combination of Class A, B and C
24/03/23 10:35am	Nisbet	Wind – 1.5m/s from the SSW. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
24/03/23 12:15pm	Muscle Creek	Wind – 3.0m/s from the SE. Wind was not blowing from the mine towards the monitor.	No mining occurring – no action required	Combination of Class A, B and C
25/03/23 04:05am	Nisbet	Wind – 3.7m/s from the SE.	No mining occurring – no action required	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 and gas levels has been undertaken. This review found that gas levels during the reporting period were generally low.

6.0 CORRELATION BETWEEN COMMUNITY COMPLAINTS AND GAS LEVELS

There were two complaints received during the reporting period in relation to odour. Both were received in March and related to general observations rather than specific timeframes that can be correlated to gas levels.