ESTABLISHED 1907

Muswellbrook Coal Company Limited

Spontaneous Combustion Report

For: Environmental Protection Licence 656

Reporting Period: June 2021

Authority Holder: Muswellbrook Coal Company Limited

Report Date: 12 July 2021

Approved by: Brooke York
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
01/06/21	S23	OC1			
02/06/21	S23	S23			
03/06/21	S23	S23		S23	Wet weather
04/06/21	S23	S23			
05/06/21	S23	S23	S23	S23	
06/06/21	S23	S23/ROM	S23		
07/06/21	S23	S23		S23	
08/06/21	S23	OC1	OC1		Wet weather
09/06/21	S23	OC1			Wet weather

Date	Water Sprays	Water Carts Assisting	Capping	Hot Material Removal	Comments
10/06/21	S23				Wet weather
11/06/21	S23	OC1		S23	
12/06/21		OC1		S23	Wet weather
13/06/21		OC1		S23	
14/06/21		OC1			
15/06/21		S23			
16/06/21		S23			Wet weather
17/06/21		S23	RL150	S23	
18/06/21		S23		S23	
19/06/21	S23	S23	S23		Wet weather
20/06/21	S23	ROM			Wet weather
21/06/21	S23	OC1		S23	
22/06/21	S23	S23			
23/06/21	S23	S23			Wet weather
24/06/21	S23	S23			Wet weather
25/06/21	S23	S23		S23	Wet weather
26/06/21	S23	OC1	150BT	S23	
27/06/21	S23	OC1	S23	S23/150BT	
28/06/21	S23	OC1	S23		Wet weather
29/06/21	S23	OC1	S23		Wet weather
30/06/21		OC1		S23	Wet weather

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* 42*	Mining Capping Infusion	5,800** 1,350** 22,000**
Open Cut 2	N/A	0*	None Required	0**
SUMMARY				
Total Area Affected		154*		
Total Area Controlled		29,150**		

* - at end of reporting period

** - during reporting period

No spontaneous combustion outbreaks were observed in Open Cut 2 throughout June 2021. 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.

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 – June (%)	Data Capture – 12 Month Rolling (%)
Point 9, Nisbet	Hydrogen Sulphide	30 minutes	93.9	95.0
		1 hour	93.3	93.8
		24 hours	96.7	98.4
Point 10, Muscle Creek	Hydrogen Sulphide	30 minutes	97.6	96.4
		1 hour	95.4	95.1
		24 hours	100.0	99.7
Point 15, Nisbet	Sulphur Dioxide	1 hour	93.5	94.6
		24 hours	96.7	99.2
Point 16, Muscle Creek	Sulphur Dioxide	1 hour	95.6	95.1
		24 hours	100.0	99.7

Data capture for all monitoring sites was 90% or higher during June 2021.

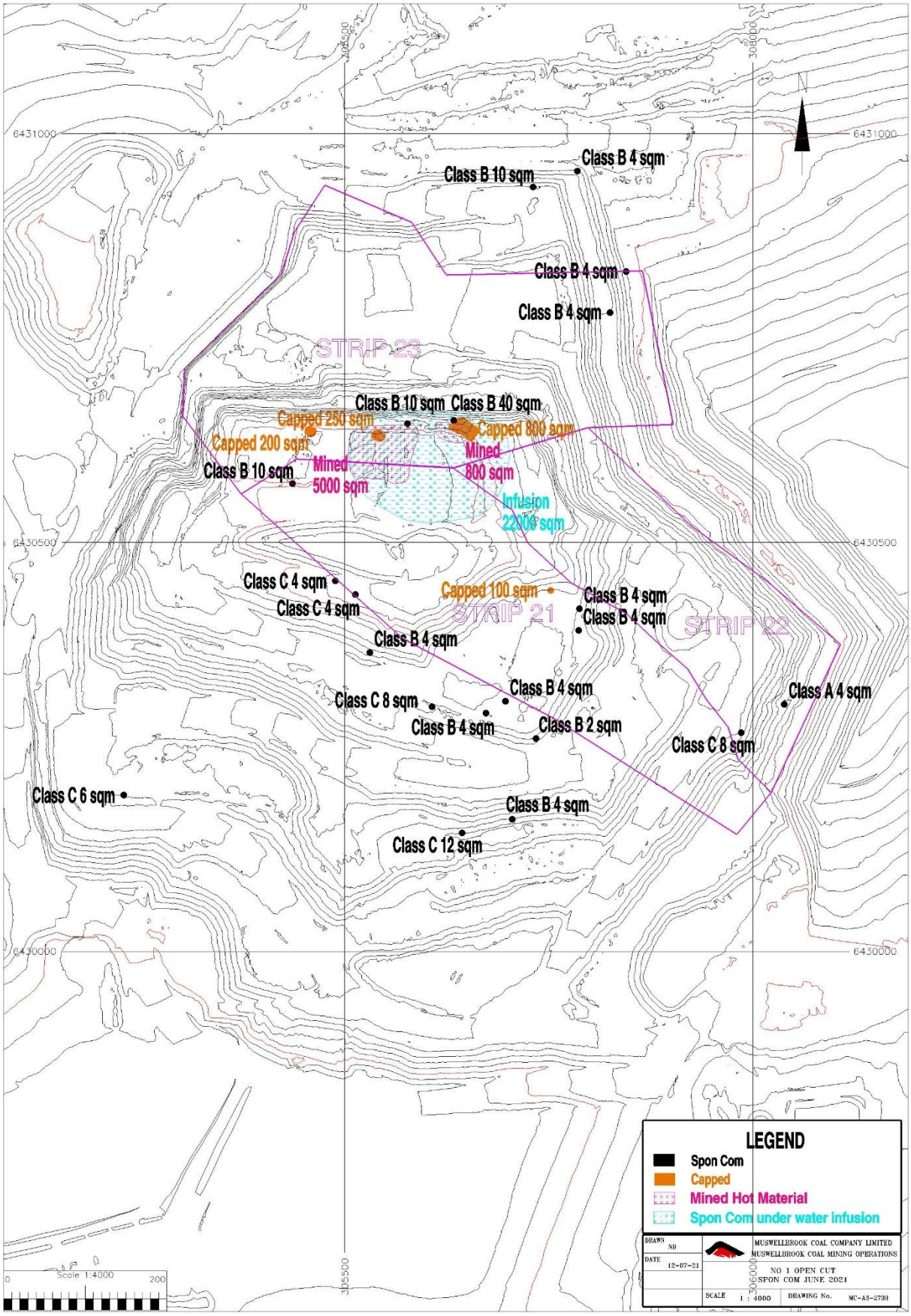

Figure 1: Location of Spontaneous Combustion Outbreaks in Open Cut 1

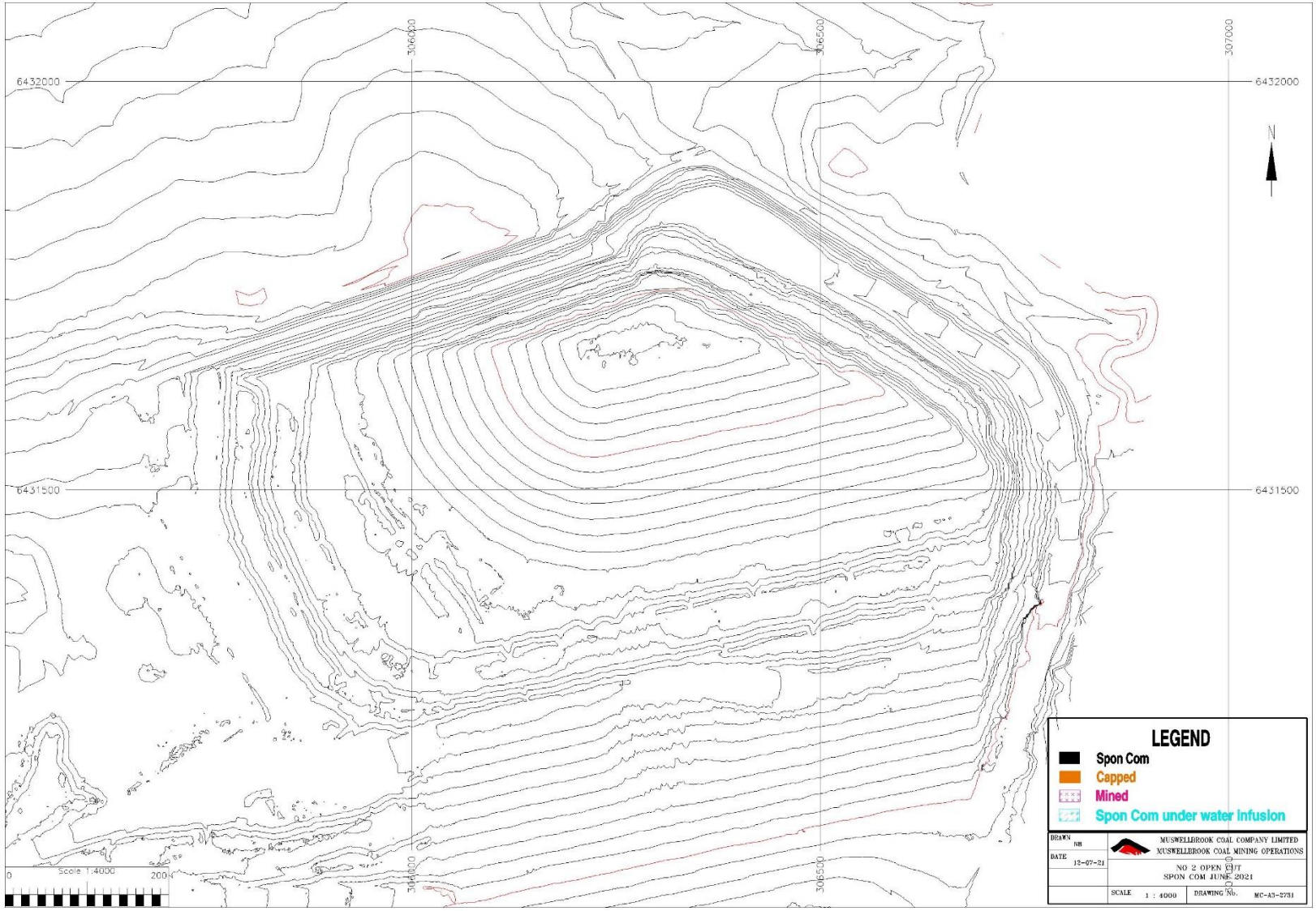

Figure 2: Location of Spontaneous Combustion Outbreaks in Open Cut 2

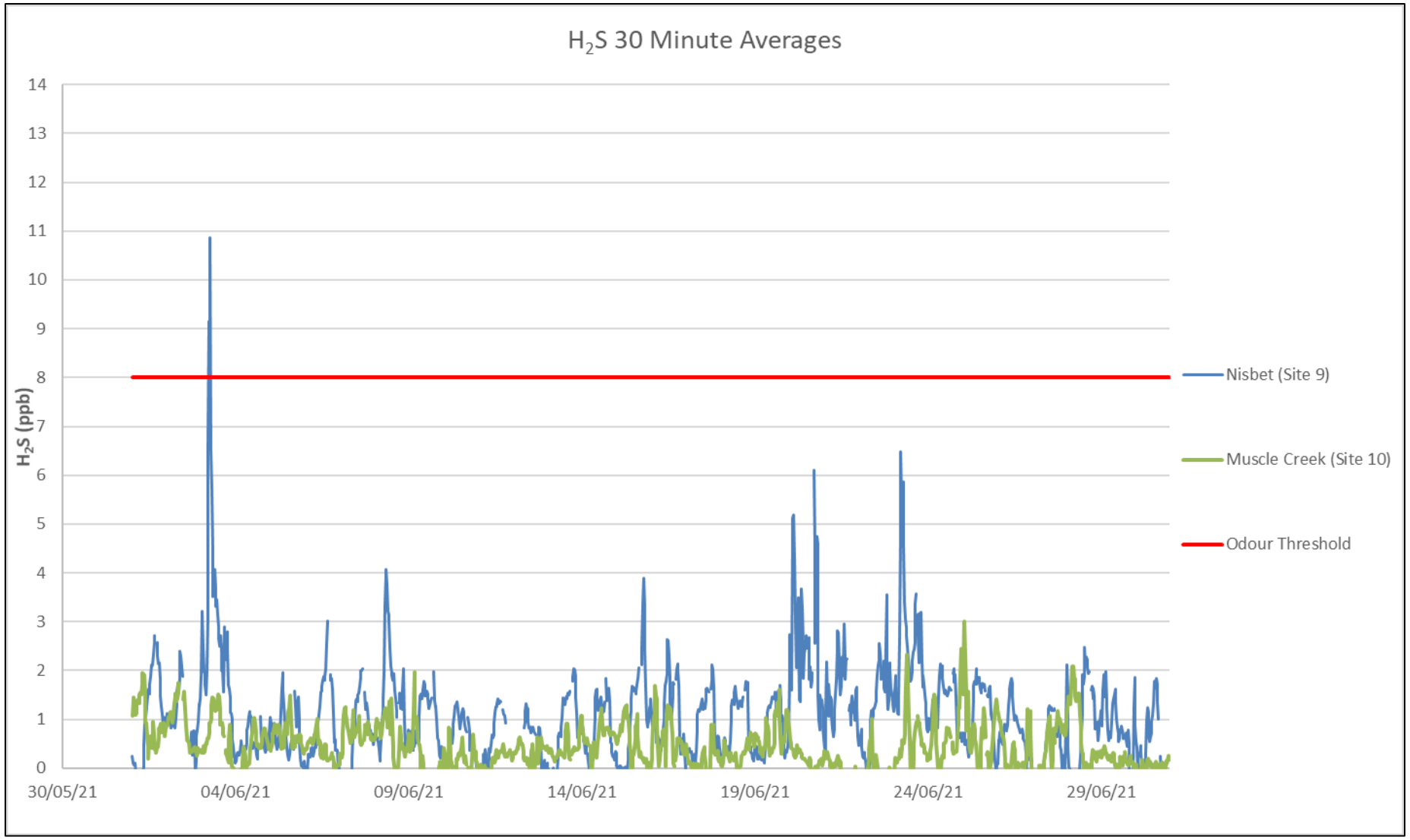

Figure 3: Hydrogen Sulphide 30 Minute Results

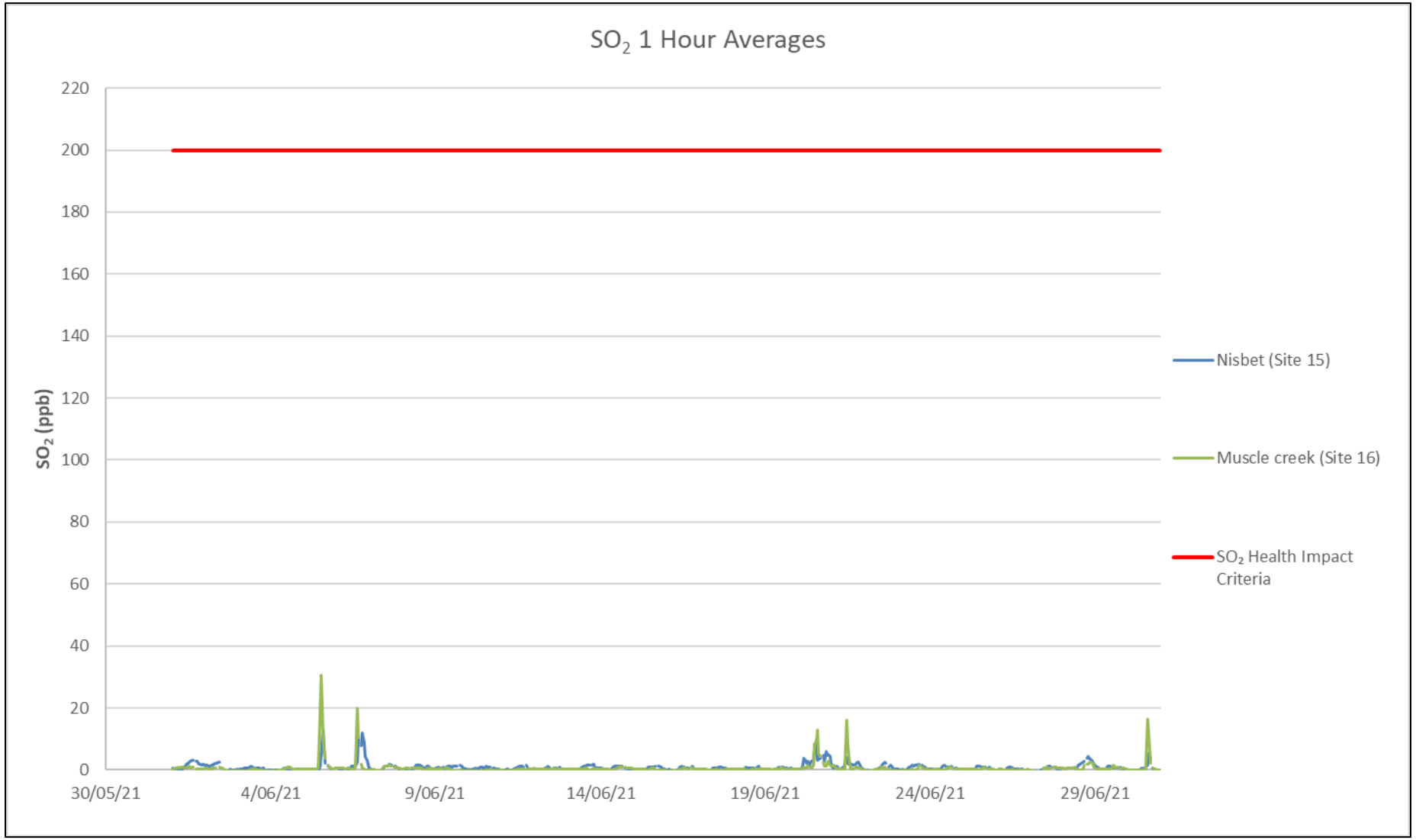

Figure 4: Sulphur Dioxide 1 Hour Results

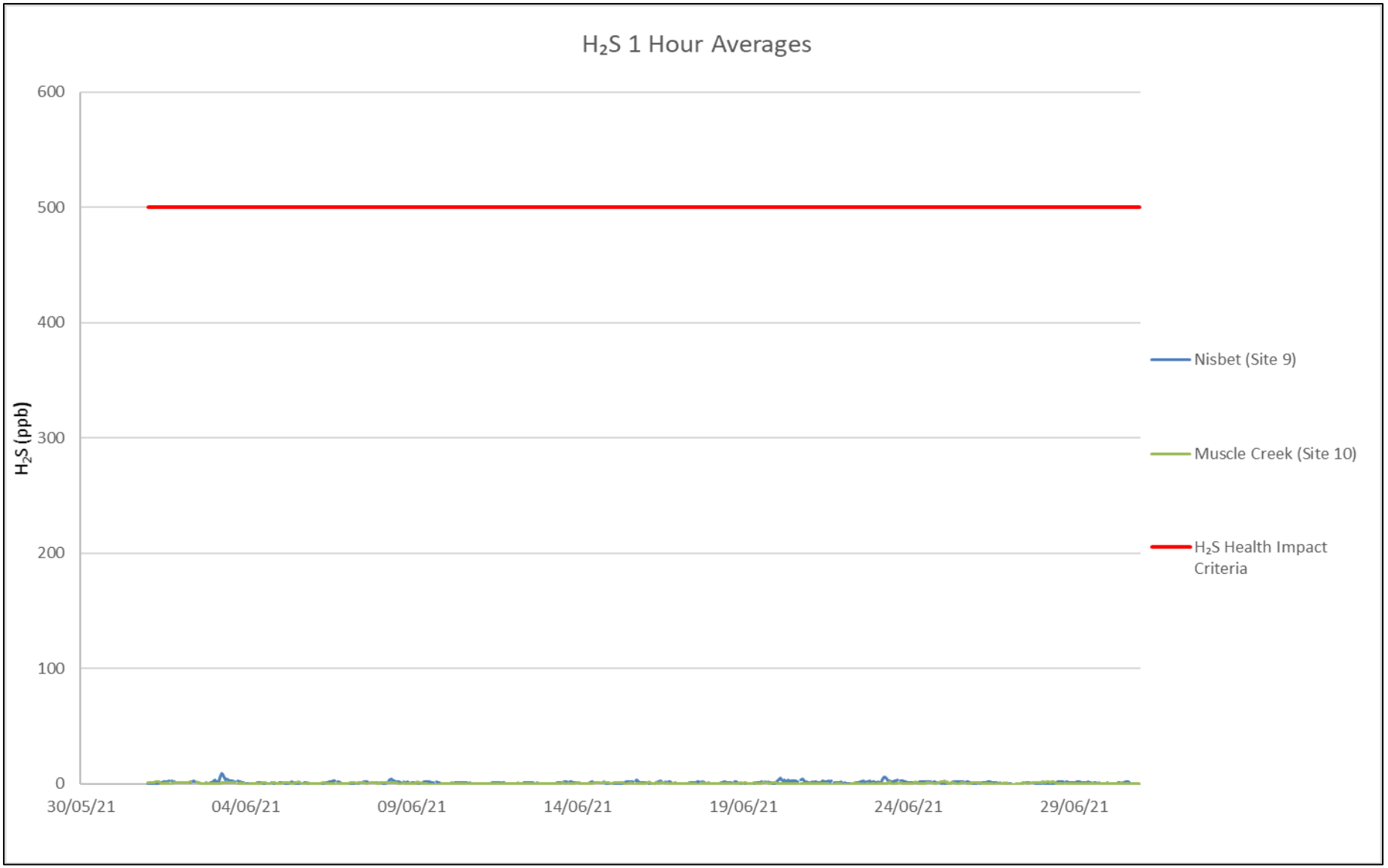

Figure 5: Hydrogen Sulphide 1 Hour Results

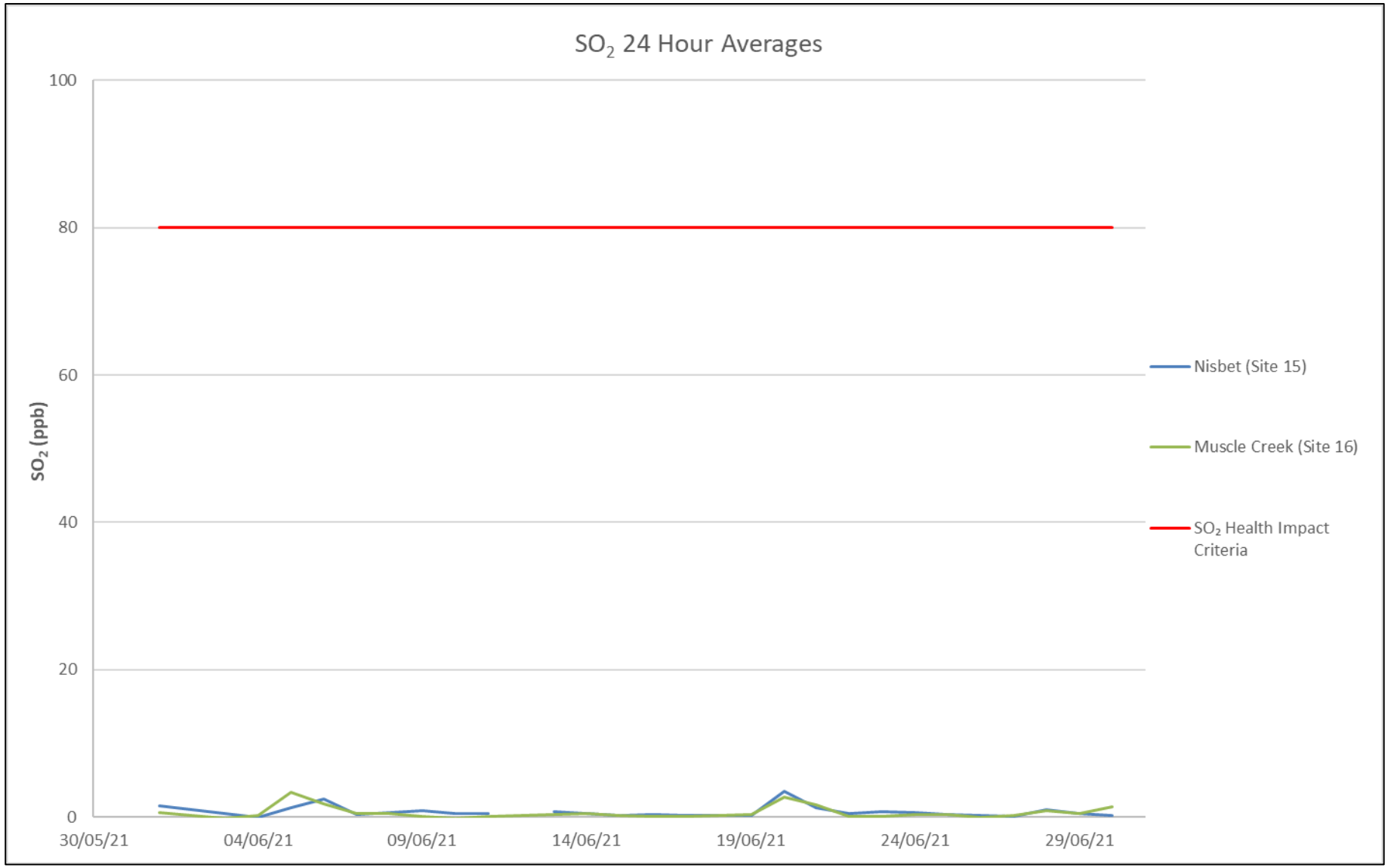

Figure 6: Sulphur Dioxide 24 Hour Results

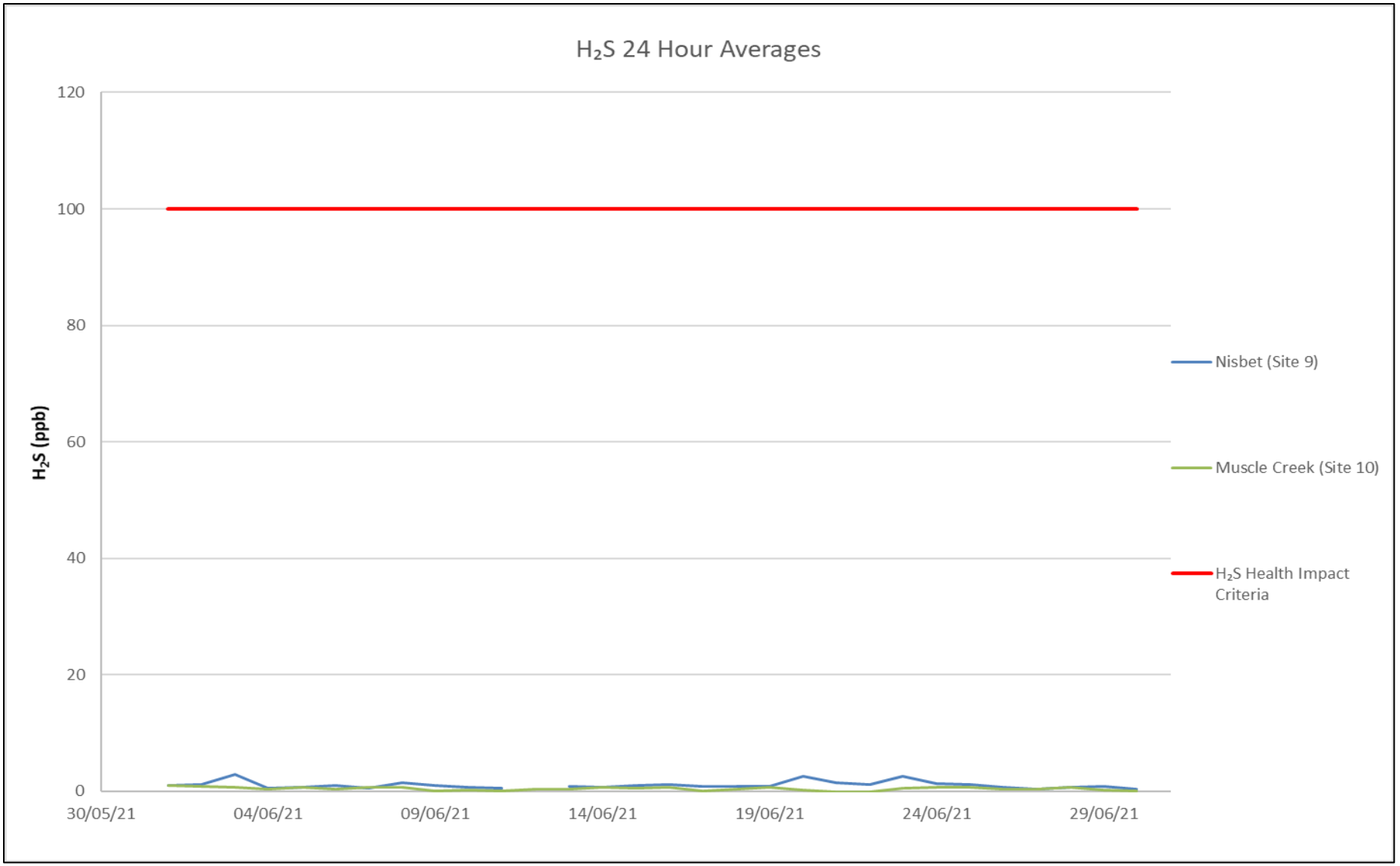

Figure 7: Hydrogen Sulphide 24 Hour Results

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 and 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
03/06/2020 05:18am	Nisbet	At the time of the alarm, the wind speed was 1.1 m/s from the west. There was no rainfall at the time of the alarm.	Two water carts were cooling spontaneous combustion areas in Strip 23, water infusion sprays were working in Strip 23 and hot material in Strip 23 was being capped with clay and inert material.	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 spontaneous combustion management activities were occurring and gas levels during the reporting period were generally low. All possible management controls for spontaneous combustion were being undertaken at the time of the elevated gas levels and operations were modified where possible to reduce the spontaneous combustion emissions.

6.0 CORRELATION BETWEEN COMMUNITY COMPLAINTS AND GAS LEVELS

There were two complaints received during the reporting period which related to odour impacts from spontaneous combustion. The first was received on 7 June 2021, at 9:37am from a resident in Muscle Creek, approximately 7 km south east of the mine. A northerly wind was blowing at 1.6 m/s at the time of the complaint. The second was received on 11 June 2021, at 7:12pm from a resident in Muscle Creek, approximately 4 km south of the mine. A northerly wind was blowing at 3.9 m/s at the time of the complaint.

A review of the gas data for the complaint received on 7 June 2021 shows that the 30 minute and 1-hour gas levels were <0.9 ppb for hydrogen sulphide and <0.7 ppb for sulphur dioxide and at both monitoring locations at the time of the complaint.

A review of the gas data for the complaint received on 11 June 2021 shows that the 30 minute and 1-hour gas levels were <0.2 ppb for hydrogen sulphide and <0.2 ppb for sulphur dioxide and at both monitoring locations at the time of the complaint.