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Stack Particulate Management Plan Annual Stack Particulate Report

Period: October 2021 – September 2022

Licensed site: Adelaide Brighton Cement, Angaston Works

845, Stockwell Road, Angaston, SA 5353

EPA Licence number: 35

Date of Submission: 18 November 2022

Version Number: 1



Report Submitted by: Sustainability/Environmental Engineer

Glossary

Term	Definition
$\mu\text{g}/\text{m}^3$	micrograms per cubic metre
mg/m^3	milligrams per cubic metre
m	metre
m^3	cubic metres
m^3/s	cubic metres per second
Nm^3	Gas volume in cubic metres at STP dry basis
Abbreviations	Definition
Air EPP	Environment Protection (Air Quality) Policy 2016
SA EPA	South Australian Environment Protection Authority
STP	Standard Temperature and Pressure (zero degrees Celsius and 101.3 kilo Pascals absolute)
TSP	Total Suspended Particulates
SPMP	Stack Particulate Management Plan

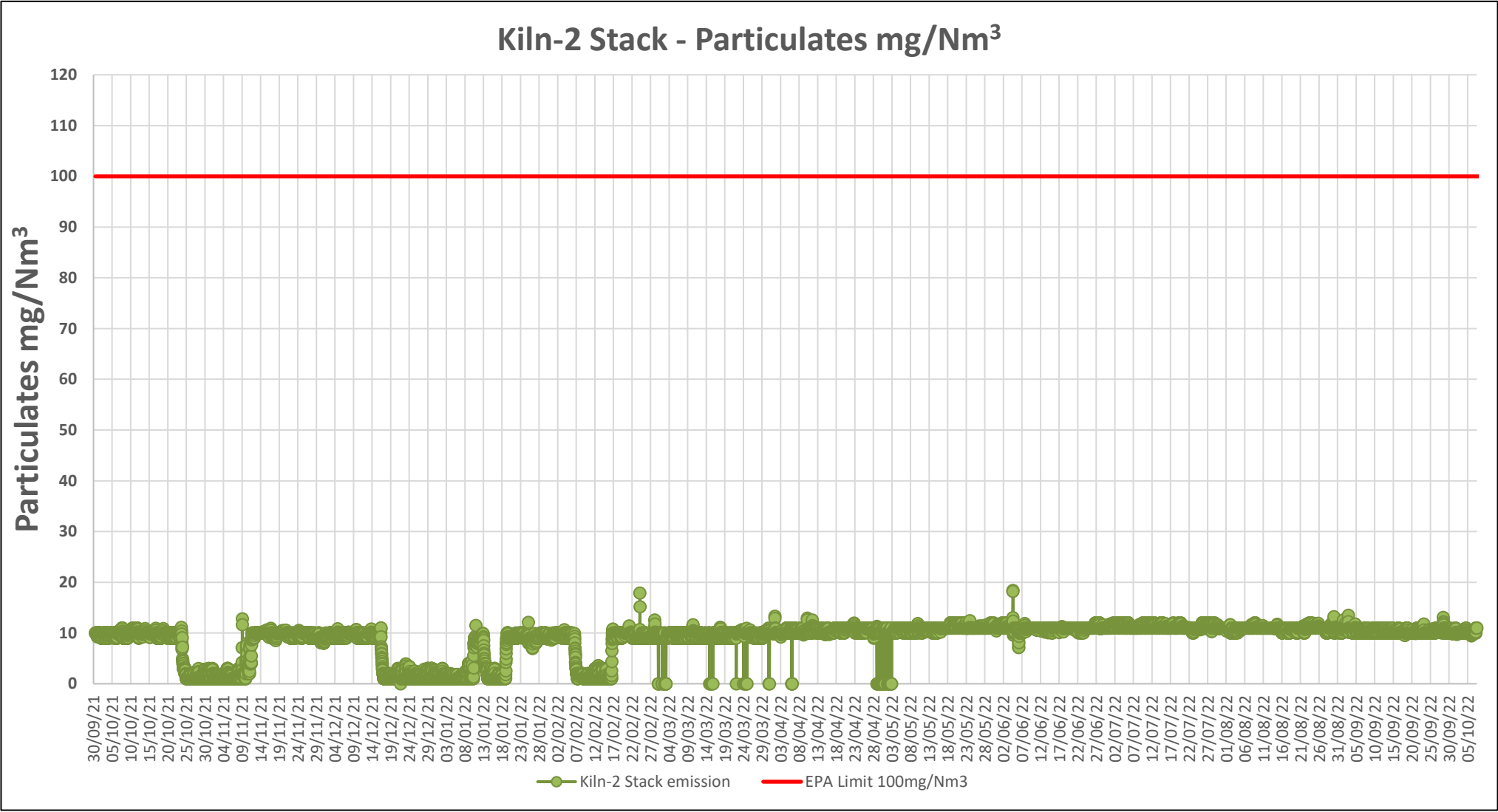
Monitoring Objective	<p>All stack particulate emissions events for the reporting period, where levels have exceeded the reporting thresholds:</p> <ul style="list-style-type: none"> • 100 mg/Nm³ (1-hour averaging period) on Kiln Stack 1 • 100 mg/Nm³ (1-hour averaging period) on Kiln Stack 2 • 25 mg/Nm³ (1-hour averaging period) on Kiln Stack 3 <p>An annual report will be prepared and submitted by the last day of October of each year that provides an analysis of the 1-hour particulate reporting events including:</p> <ul style="list-style-type: none"> • A table detailing the number and cause of reporting events for Kiln Stacks 1,2 and 3 <ul style="list-style-type: none"> • date, time and duration • the measured particulate concentration mg/Nm³ (STP-dry) • immediate actions taken to reduce particulate emissions • cause and corrective actions taken to prevent future reoccurrence • A trend analysis of magnitude and duration of 1-hour notifications on a time series graph for each stack for the current year • A trend analysis of community complaints by type against 1-hour reporting events by cause on a time series graph for each stack • A table comparing the number of 1-hour reporting events by cause for the current and previous 1, 3 and 5 years. To provide consistency in data management, the new licence reporting requirements will be phased in as follows; <table border="1" data-bbox="480 1043 1385 1290"> <thead> <tr> <th>Reporting year</th><th>Comparison with previous reporting years</th></tr> </thead> <tbody> <tr> <td>2019 - 2020 data</td><td>No comparison</td></tr> <tr> <td>2020 - 2021 data</td><td>1 year comparison</td></tr> <tr> <td>2021 - 2022 data</td><td>1 and 3 year comparison</td></tr> <tr> <td>2022 - 2023 data</td><td>1 and 3 year comparison</td></tr> <tr> <td>2023 - 2024 data</td><td>1, 3 and 5 year comparison</td></tr> </tbody> </table> <ul style="list-style-type: none"> • Identification of opportunities for improvement to decrease the frequency, duration and magnitude of 1-hour reporting events 	Reporting year	Comparison with previous reporting years	2019 - 2020 data	No comparison	2020 - 2021 data	1 year comparison	2021 - 2022 data	1 and 3 year comparison	2022 - 2023 data	1 and 3 year comparison	2023 - 2024 data	1, 3 and 5 year comparison
Reporting year	Comparison with previous reporting years												
2019 - 2020 data	No comparison												
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2022 - 2023 data	1 and 3 year comparison												
2023 - 2024 data	1, 3 and 5 year comparison												
Monitoring Plan	<p>This monitoring report has been prepared in line with the Stack Particulate Management Plan approved on 25 October 2019 by the South Australian EPA.</p> <p>The Plan is available on the ABC Angaston Community Website: https://www.angastoncommunity.com.au</p>												

Kiln - 1 Stack – Summary of 1-hr Reporting events for the period 1/10/2021 to 30/9/2022

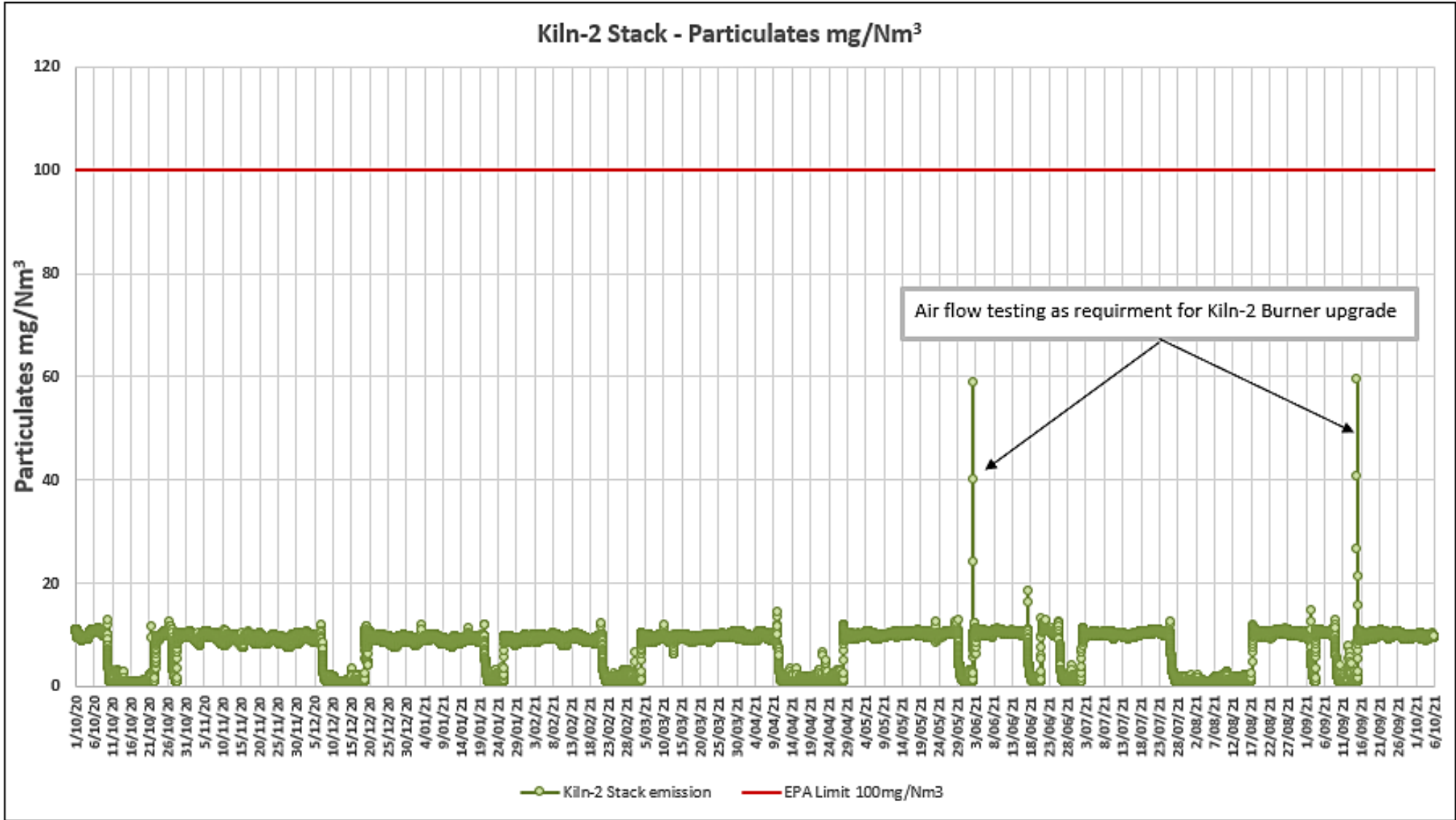
No emission report as kiln was off for the period 1/10/2021 to 30/09/2022 (last three years)

Kiln - 2 Stack – Summary of 1-hr Reporting events for the period 1/10/2021 to 30/9/2022

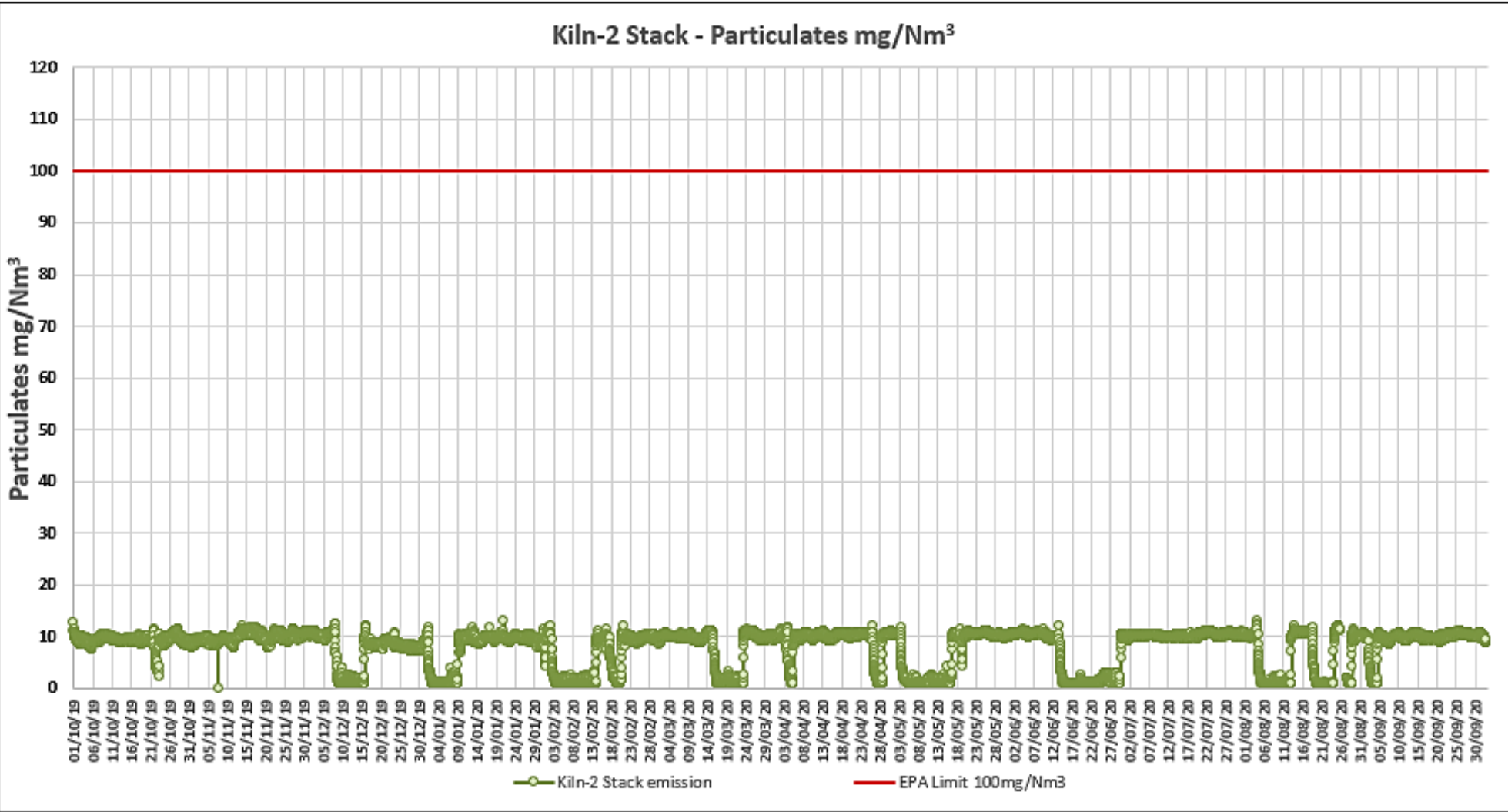
No 1- hr reporting events (particulate emissions exceeding 100 mg/Nm³) for the period 1/10/2021 to 30/09/2022



No 1- hr reporting events (particulate emissions exceeding 100 mg/Nm³) for the period 1/10/2020 to 30/09/2021

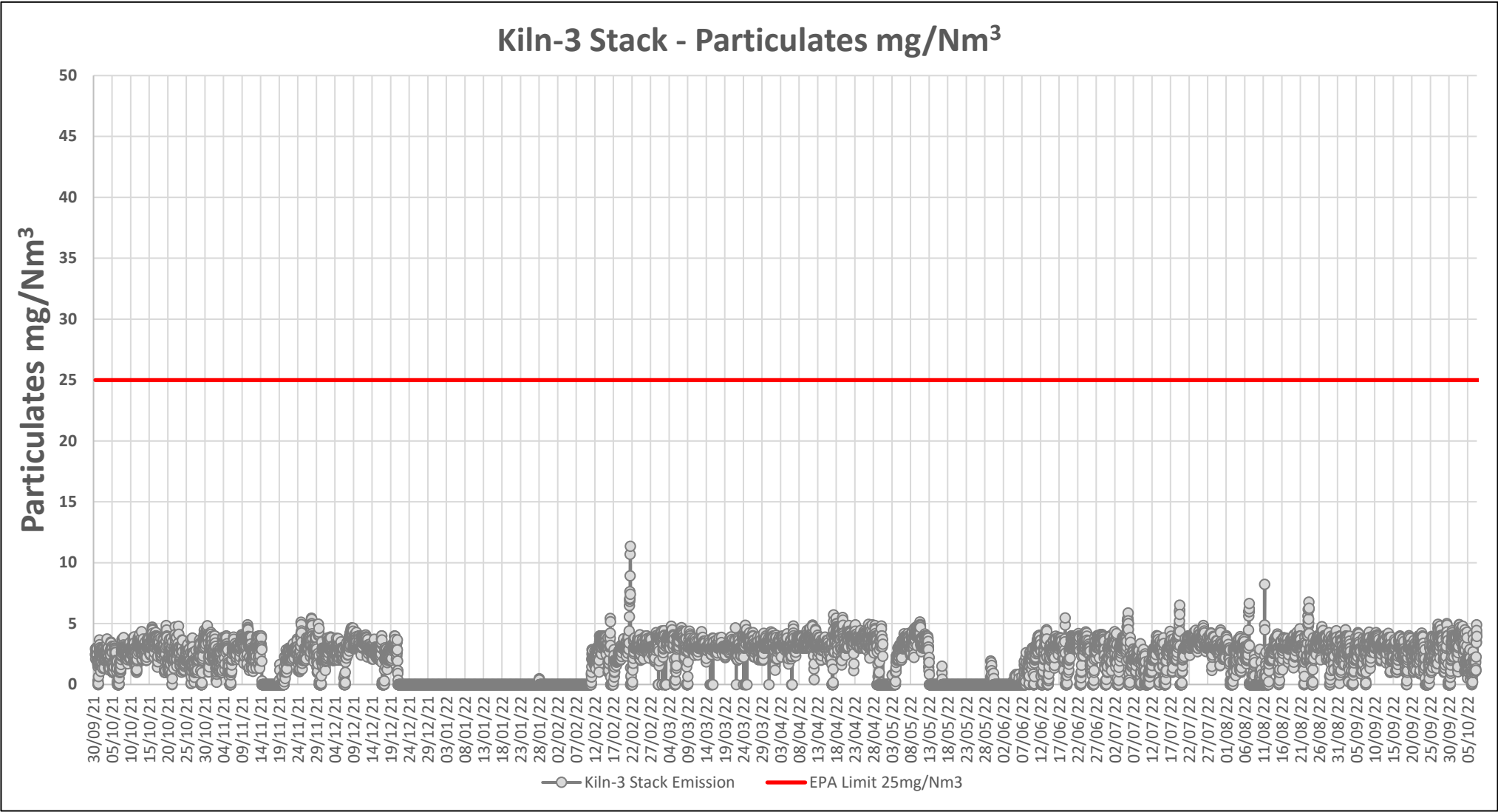


No 1- hr reporting events (particulate emissions exceeding 100 mg/Nm³) for the period 1/10/2019 to 30/09/2020

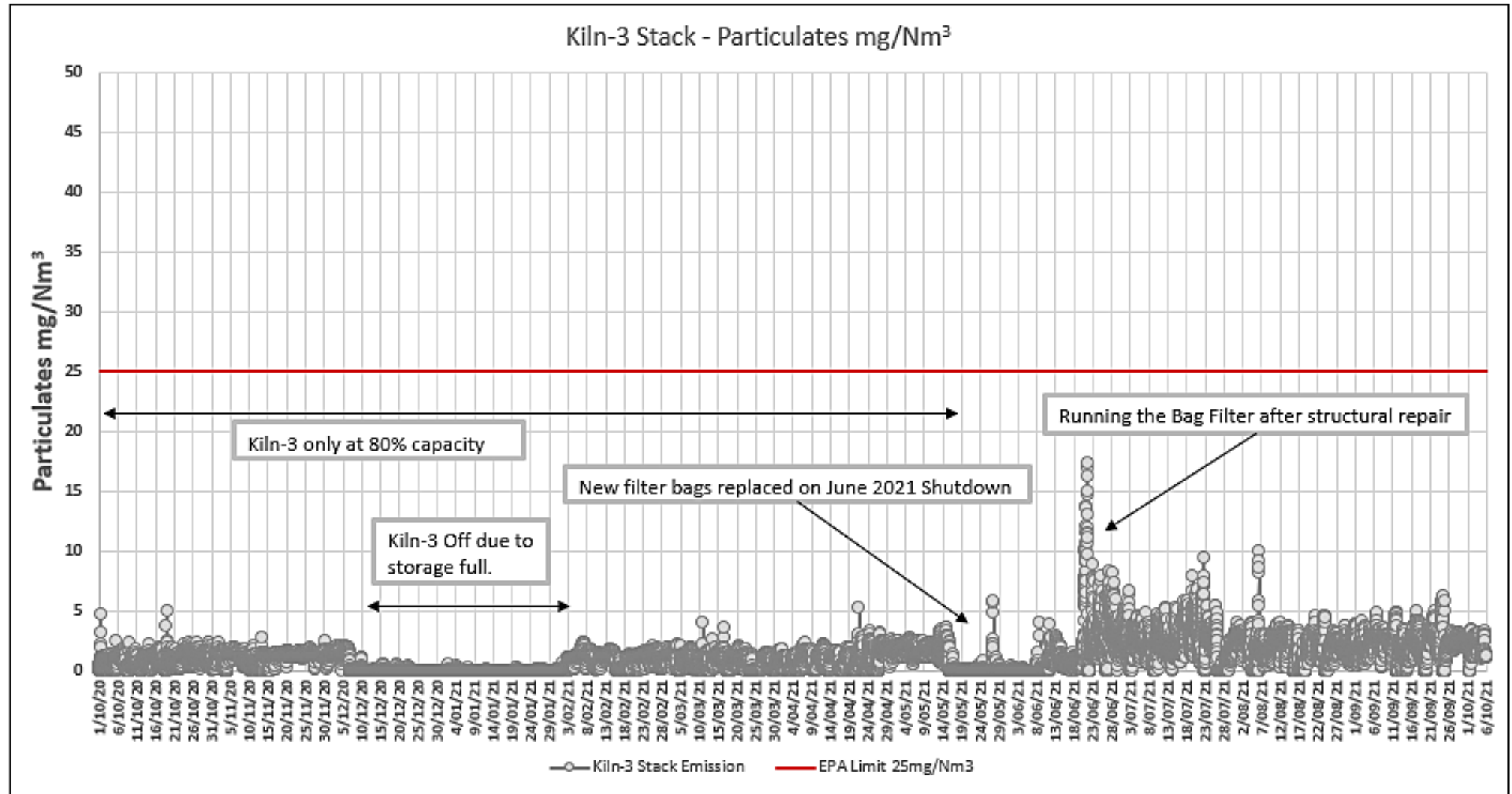


Kiln-3 Stack – Summary of 1-hr Reporting events for the period 1/10/2021 to 30/9/2022

No 1- hr reporting events (particulate emissions exceeding 25 mg/Nm³) for the period 1/10/2021 to 30/09/2022



No 1- hr reporting events (particulate emissions exceeding 25 mg/Nm³) for the period 1/10/2020 to 30/09/2021



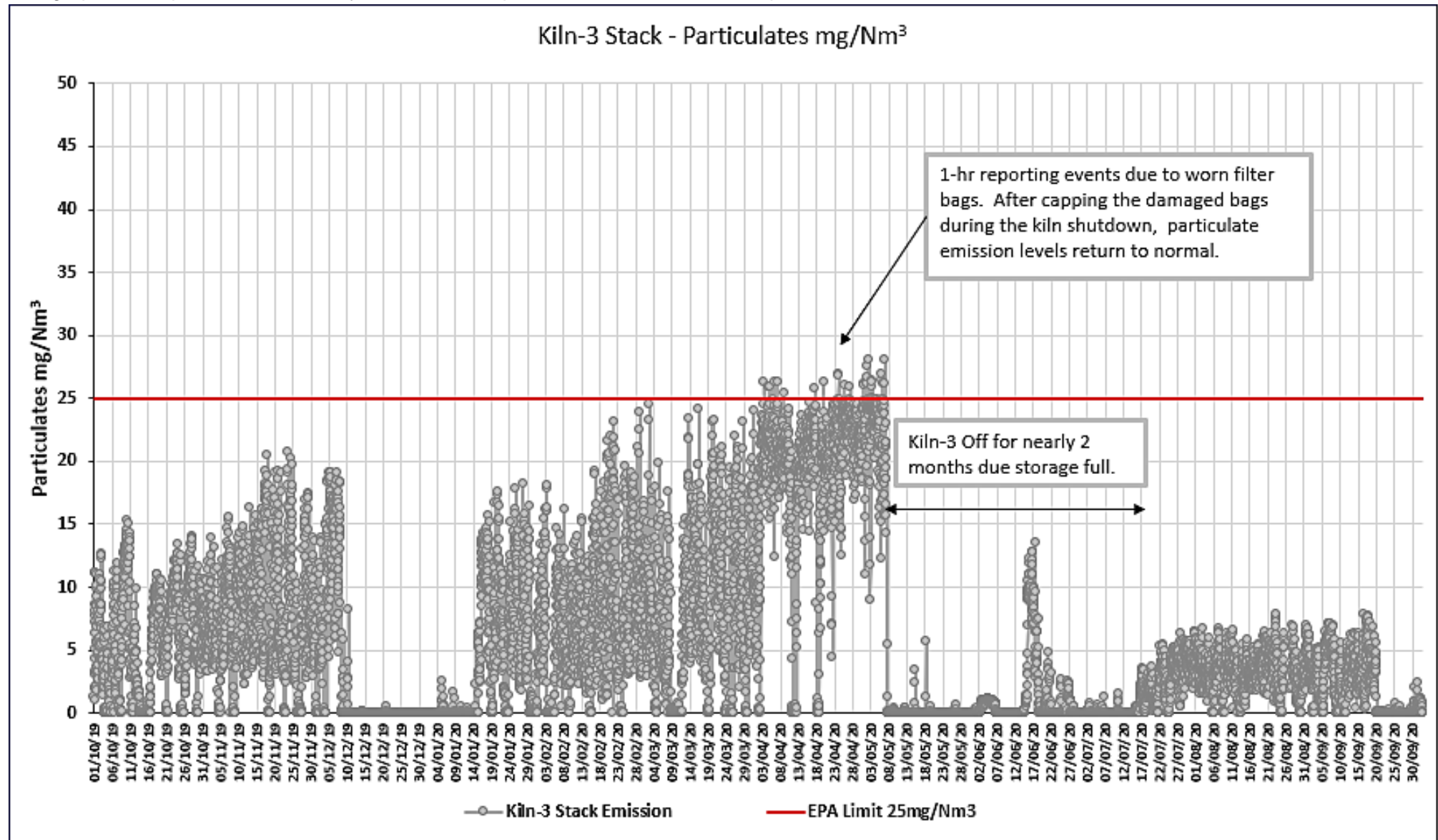
- Kiln-3 has been running at 80% capacity due to the filter bags in poor condition. All the filter bags were replaced in the June 2021 Shutdown.

The table below provides a summary of the 1-hr reporting events (particulate emissions greater than 25 mg/Nm³) for the period 1/10/2019 to 30/09/2020

Event number	Start Date Time	End Date Time	Duration (mins)	Magnitude (mg/Nm ³)	Cause	Immediate Actions Taken	Actions Taken to Prevent Reoccurrence
1	3/04/2020 10:32	3/04/2020 10:37	0:04:50	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
2	4/04/2020 17:57	4/04/2020 18:02	0:04:50	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
3	5/04/2020 4:52	5/04/2020 4:57	0:04:50	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
4	6/04/2020 7:58	6/04/2020 8:02	0:03:40	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
5	7/04/2020 4:35	7/04/2020 5:17	0:41:40	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
6	8/04/2020 22:37	8/04/2020 22:42	0:04:50	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
7	17/04/2020 12:17	17/04/2020 12:22	0:04:50	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
8	19/04/2020 22:59	19/04/2020 23:01	0:02:40	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
Event number	Start Date Time	End Date Time	Duration (mins)	Magnitude (mg/Nm ³)	Cause	Immediate Actions Taken	Actions Taken to Prevent Reoccurrence
9	24/04/2020 2:36	24/04/2020 3:01	0:24:50	28	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
10	24/04/2020 3:31	24/04/2020 3:46	0:14:50	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
11	25/04/2020 20:04	25/04/2020 21:16	1:11:40	27	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
12	27/04/2020 6:44	27/04/2020 7:56	1:11:50	27	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
13	30/04/2020 22:23	30/04/2020 23:06	0:42:40	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
14	1/05/2020 07:51	1/05/2020 08:06	0:15:00	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.

15	1/05/2020 22:46	1/05/2020 22:51	0:04:50	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
16	1/05/2020 22:51	1/05/2020 22:56	0:04:50	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
17	2/05/2020 1:06	2/05/2020 1:11	0:04:50	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
18	2/05/2020 1:56	2/05/2020 2:00	0:04:10	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
19	2/05/2020 3:16	2/05/2020 3:21	0:04:50	28	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
20	2/05/2020 5:21	2/05/2020 5:26	0:04:50	27	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
21	2/05/2020 13:51	2/05/2020 14:11	0:19:50	27	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
22	3/05/2020 03:51	3/05/2020 03:56	0:04:50	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
23	3/05/2020 04:31	3/05/2020 04:36	0:04:50	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
Event number	Start Date Time	End Date Time	Duration (mins)	Magnitude (mg/Nm3)	Cause	Immediate Actions Taken	Actions Taken to Prevent Reoccurrence
24	3/05/2020 10:41	3/05/2020 10:46	0:04:50	26	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
25	6/05/2020 0:56	6/05/2020 01:26	0:29:50	27	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
26	6/05/2020 01:26	6/05/2020 01:31	0:04:50	27	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
27	6/05/2020 05:46	6/05/2020 05:51	0:04:50	28	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
28	6/05/2020 22:36	6/05/2020 22:41	0:04:50	27	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.
29	7/05/2020 00:46	7/05/2020 00:51	0:04:50	27	Damaged filter bags.	Isolated purge air lines with suspected damaged filter bags.	Capped all damaged bags during down days. Cleaned the Baghouse.

The graph below provides a summary of Kiln 3 stack particulate emissions for the period 1/10/2019 to 30/9/2020



Trend Analysis of magnitude and duration of 1- hr reporting events between 1/10/2021 – 1/10/2022

Kiln 1 Stack: Kiln was off for the period 1/10/2021 to 30/09/2022

Kiln 2 Stack: No 1- hr Reporting events

Kiln 3 Stack: No 1- hr Reporting events

Trend analysis of community complaints by type against 1-hr reporting events

There was one community dust complaint that was not related to stack emissions or plant operations. There was no 1-hr particulate emission reporting event recorded on the day of the complaint. Furthermore, Kiln-3 was off on that day and only Kiln-2 was running.

The table below captures community complaint by type and stack 1-hr reporting events for the period 1/10/2021 to 30/09/2022

Date	Time	Kiln-1 Stack 1-hr Reporting Event	Kiln-2 Stack 1-hr Reporting Event	Kiln-3 Stack 1-hr Reporting Event	Dust Complaint	Kiln -1 Stack Emission Complaint	Kiln – 2 Stack Emission Complaint	Kiln – 3 Stack Emission Complaint
1/02/2022	04:20:00				1			

Kiln Stacks 1, 2 & 3 - Number and Cause of 1- hour Reporting Events - 1/10/2021 – 30/09/2022

The number of reporting events by cause for each stack is summarised in the table below.

Stack	Cause of 1-hr Reporting Event	Type of 1-hr Reporting Event	Number of 1-hr reporting events current year October 2021-2022
Kiln-1	None (Not running)	Process Related	0
	None (Not running)	Equipment Related	0
	Total Number of Events		0
Kiln-2	None	Process Related	0
	None	Equipment Related	0
	Total Number of Events		0
Kiln-3	None	Process Related	0
	None	Equipment Related	0
	Total Number of Events		0

Identification of opportunities to prevent or prevent the frequency, duration and magnitude of 1-hr reporting events

The table below details the opportunities to reduce the frequency, duration and magnitude of 1-hr reporting events, that have been identified.

All of the improvement opportunities have been implemented to include the replacement of the 468 filter bags in Kiln-3 during the June 2021 Shutdown.

Stack	Improvement Opportunities Identified and Implemented	Improvement Opportunities to be Implemented
Kiln-2	Installed new burner in Kiln-2 in November 2021 which improves efficiency in the operation	Rehabilitate Kiln-2 wet chain section during Shutdown schedule to improve dust retention when kiln is in operation
	Q14 exhaust fan and electrostatic precipitator inspection and cleaning are scheduled for extended kiln shutdowns to minimise the potential for particulate emissions on start up.	
	Alarm settings have been fine-tuned to give operators early warning of conditions that could result in a 1-hr reporting event for stack particulate emission.	
Kiln-3	Bag filter, inspections, capping or replacement of worn/damaged filter bags and air side cleaning are scheduled for extended kiln shutdown maintenance periods.	
	Alarm settings have been fine-tuned to give operators early warning of conditions that could result in 1-hr reporting event for stack particulate emission	
	Replaced all the 468 filter bags in Kiln-3 during the June 2021 Shutdown	

Stack Particulate Management Plan / TARP Review:

The Stack Particulate Management Plan (SPMP) incorporates the use of stack particulate emissions Trigger Action Reporting Plans (TARP's) since Oct 2019.

All the 468 filter bags in Kiln-3 main exhaust have been replaced during the June 2021 Shutdown.

Preventive cleaning and maintenance of the Bag Filter and Electrostatic Precipitator, during kiln shutdown periods, has been the most effective way to minimise 1-hr reporting events.

The current Trigger Action Reporting Plans have been effective in improving operation response times to process conditions that have the potential for stack emissions to reach 1-hr reporting levels.

There have been no identified improvements required in the existing TARP's.

Summary:

- The current Trigger Action Reporting Plans have been effective in improving operation response times to process conditions that have the potential for stack emissions to reach 1-hr reporting levels.
 - Opportunities to reduce the frequency, number and magnitude of 1-hr reporting events have been identified and implemented.
 - It is recommended that the performance of the existing TARP's be monitored over the next 12 months.
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