

Adelaide Brighton Cement Birkenhead Works. Licence Number: 1126

**QUARTERLY STACK MONITORING  
REPORT**

**April - June 2016**

**Version: 1**

**Submitted: 31 July 2016**

**EPA LICENCE NO: 1126**

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# Quarterly Report April-June 2016

## Monitoring Objective

The aim of the Quarterly Stack Monitoring Report is to identify and report on emissions to compare actual emissions from Adelaide Brighton Cement Birkenhead Works against the Environment Protection (Air Quality) Policy 1994, Authorisation 1126 and Exemption Authorisation 12368. Furthermore the aim of the report is to continuously monitor and provide reasons for the particulate emissions exceeding reporting limits in order to establish key areas where opportunities lie for process and mechanical improvements to reduce the level of stack dust emissions from the site.

## Monitoring Plan

Monitoring of stacks 4A and 4B on the Birkenhead site is performed using Durag Dust and Opacity Meters. These meters provide a continuous % opacity and this is converted to  $\text{mg}/\text{Nm}^3$  using a calibration curve. The results are then summarized as one hourly averages based on 10 minute averages for the purpose of this report.

The license that Adelaide Brighton Cement operates under in regard to stack emissions is summarized below.

### Environment Protection (Air Quality) Policy

- Schedule 1 (1) - limit of  $250\text{mg}/\text{Nm}^3$  stack 4A and 4B
- Exemptions License
  - Kiln or calciner light up &/or purge – max 10 minutes
  - Level 3 combustibles trip – max 5 minutes
  - Power failure – duration of emergency situation
  - Stack emissions testing for calibration of opacity meter – provided that an EPA authorised officer is on site

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- Reporting Levels
  - All emissions in excess of 80 mg/m<sup>3</sup> (Stack 4B) and 150 mg/m<sup>3</sup> (Stack 4A)

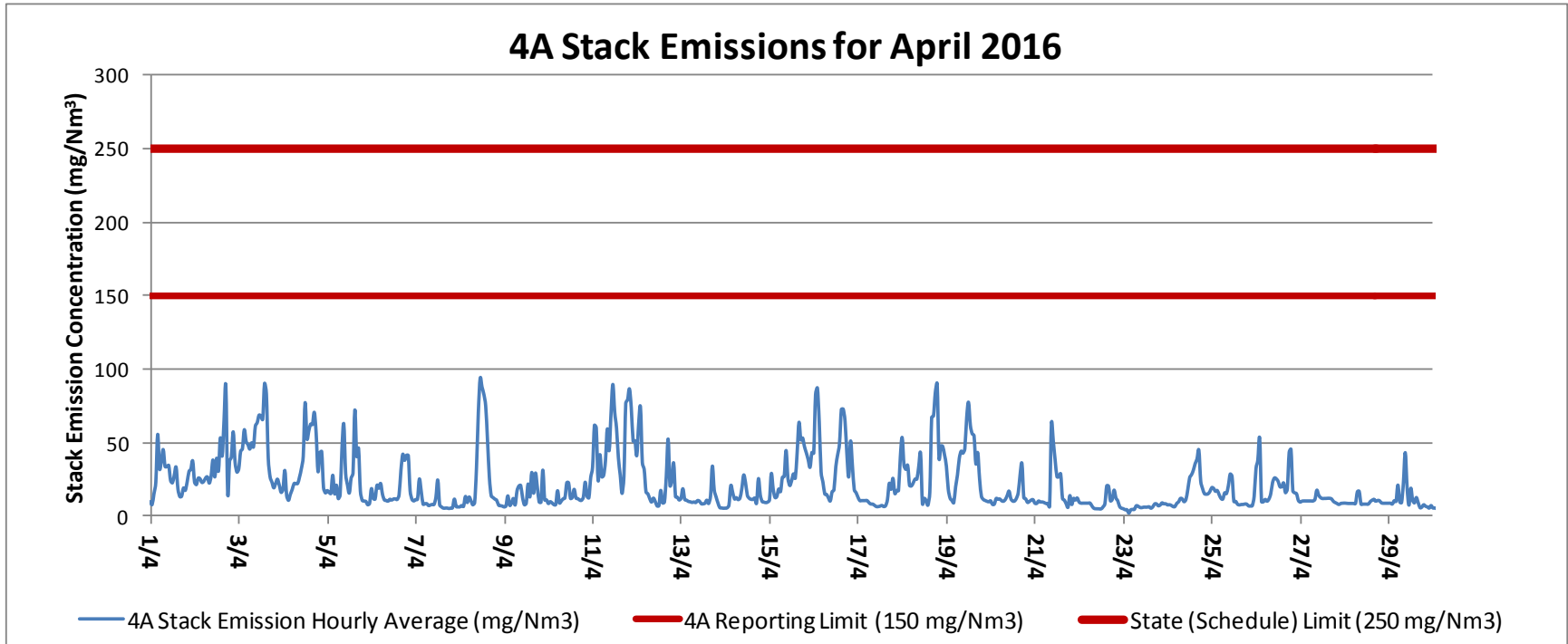
The Environmental Protection Authority (EPA) must be notified as soon as practicably possible of all emissions in excess of the Schedule 1 (1) limit or reporting limit and cause as well as remedial actions must be communicated. Where particulate emissions exceed the Schedule 1(1) limit and the cause is not explicitly covered by the exemptions an investigation will be carried out by the EPA to ensure that ABC Birkenhead has taken all reasonable and practicable measures to reduce the emissions.

## **Monitoring Results**

### **Presentation of Results**

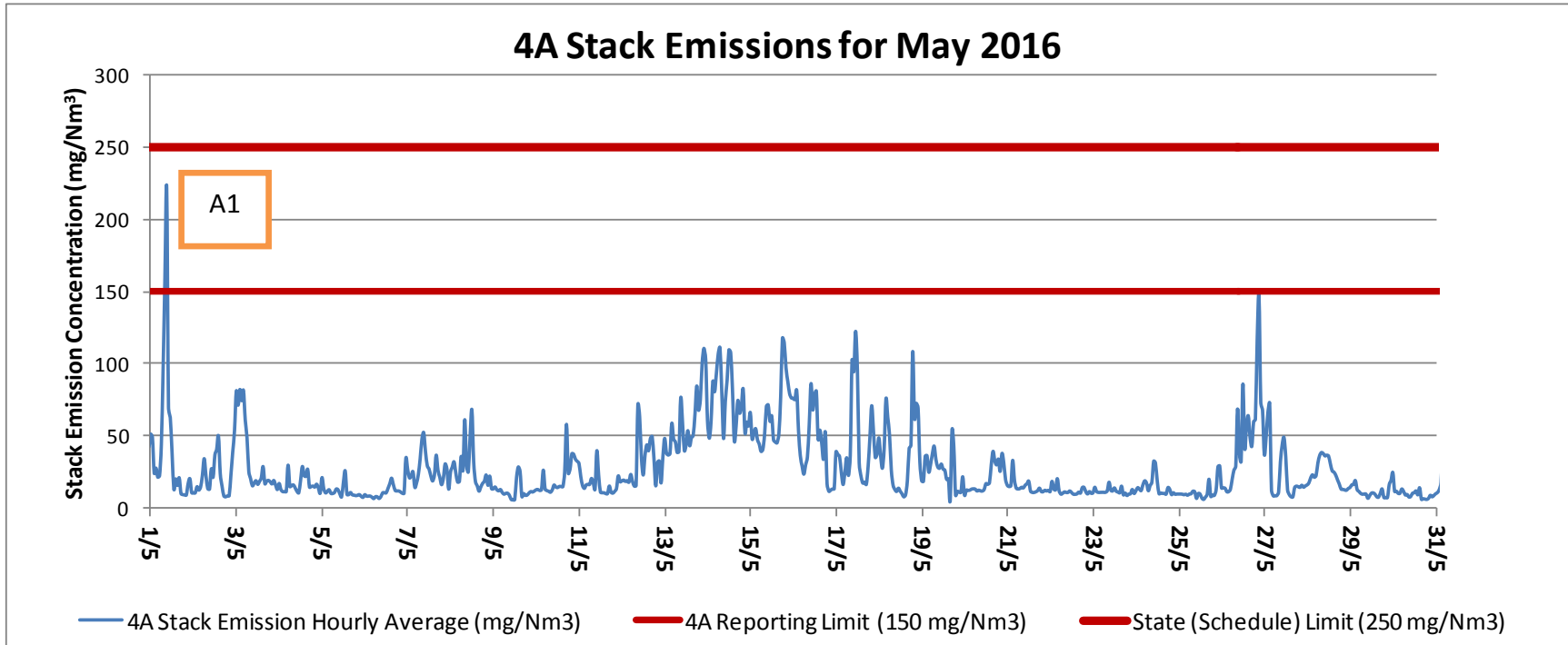
The graphs on the following pages detail the hourly averages of 10 minute averages of stack emissions from 4A and 4B stacks by month. The tables below each chart show the results of RCA (root cause analysis) that was undertaken for plant stoppages resulting in emissions above either the reporting limit or the Air Quality Policy Schedule 1 (1) limit on an hourly average.

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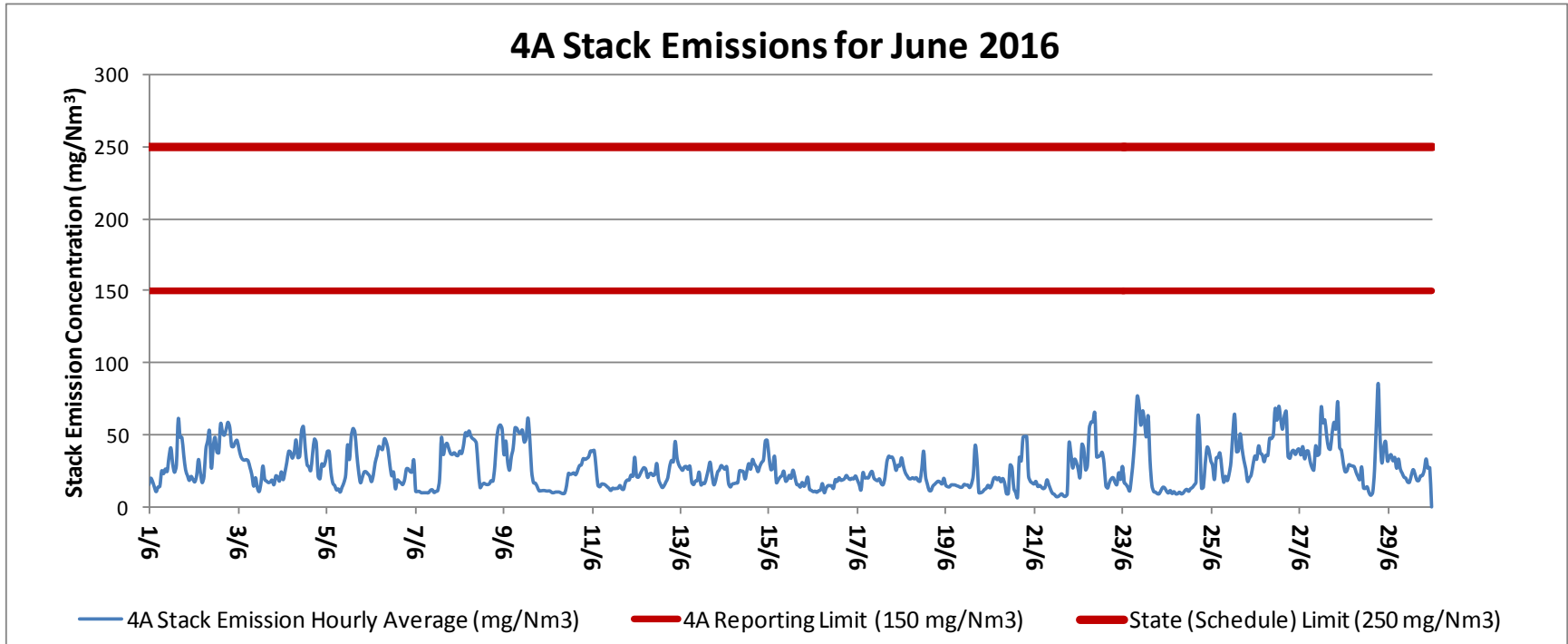
Tag	Description	

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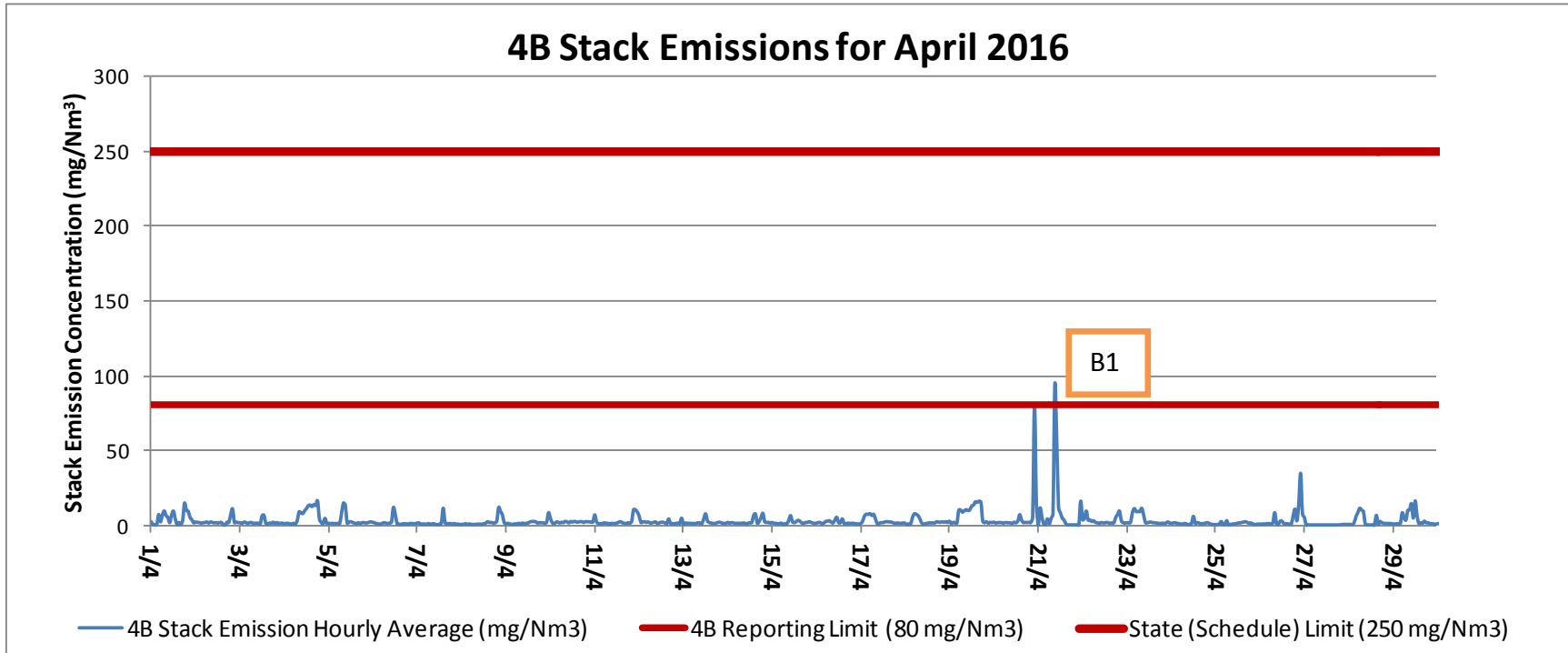
Tag	Description
A1	4A equipment failure – kiln taken offline.

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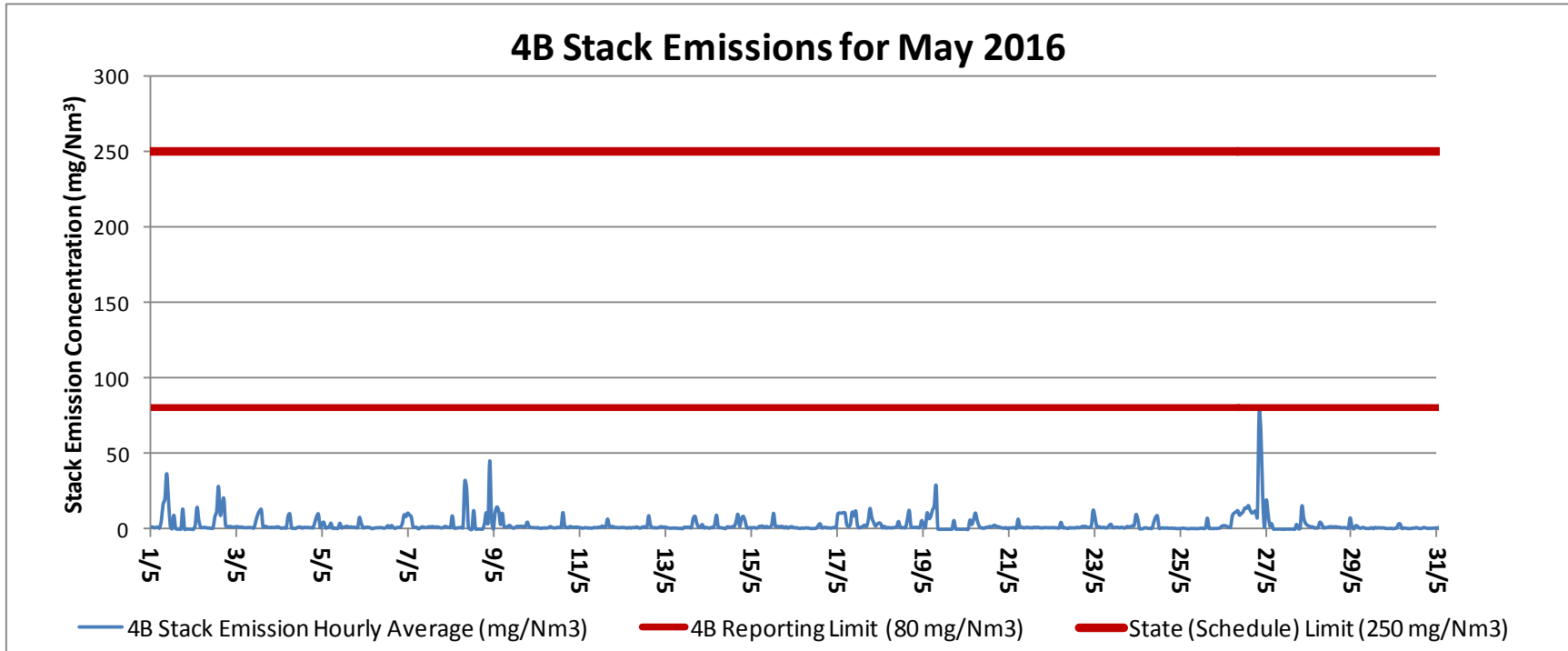
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Tag	Description
B1	Kiln/calcliner trip

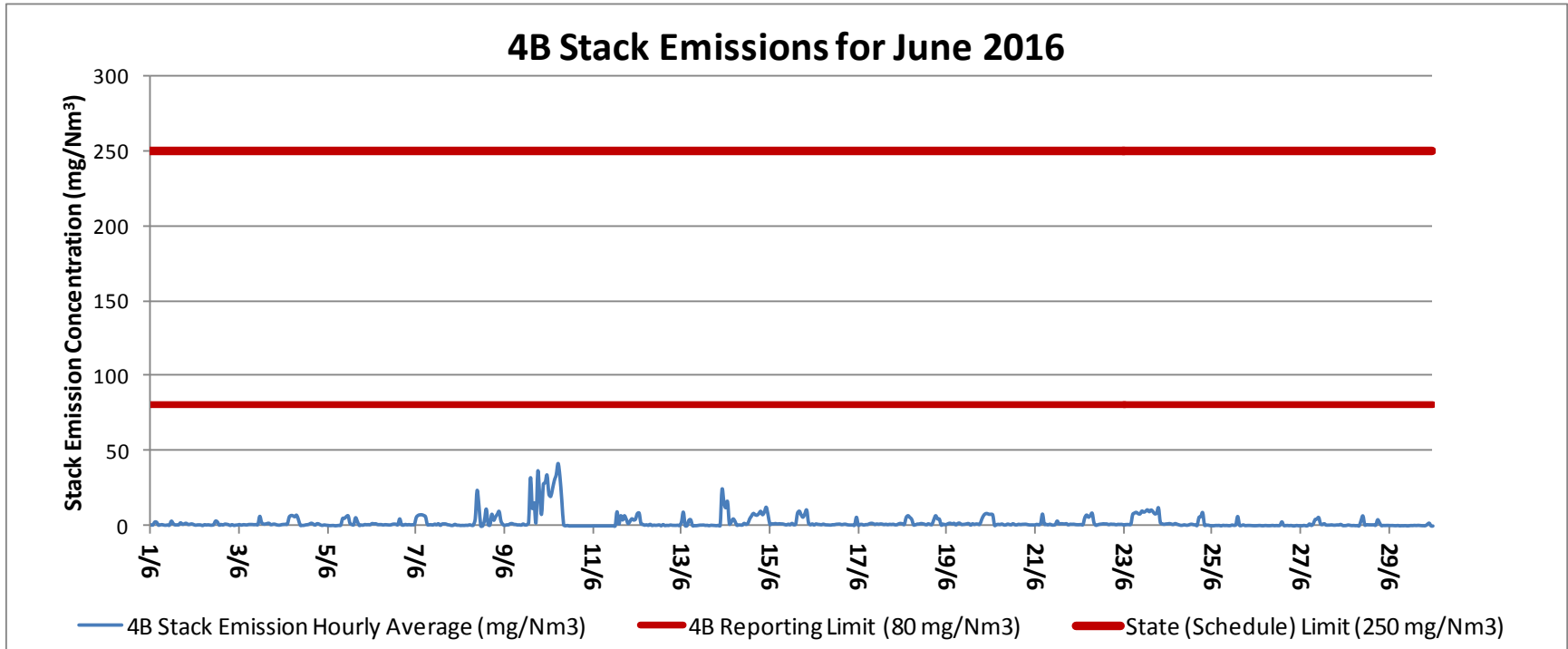
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Tag	Description



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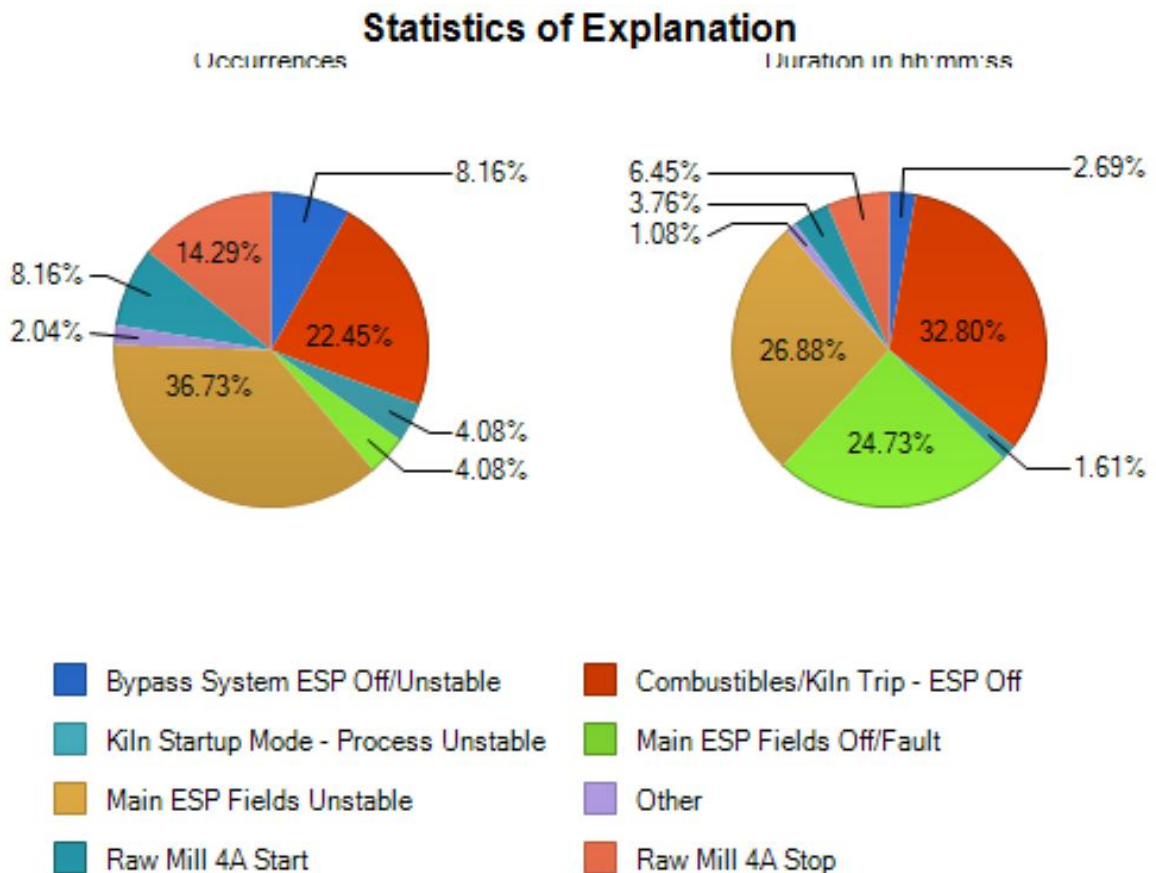
Tag	Description

## Short Term Report Summary

### 1. Short Term Excursions above 250mg/Nm<sup>3</sup>

In addition to hourly averages shown earlier in the report short term excursions above 250mg/Nm<sup>3</sup> are reported during the period to the EPA. Below is a pie chart of the causes on both 4A and 4B stack.

### 4A Greater Than 250mg/Nm<sup>3</sup> Emissions Qtr 2 2016

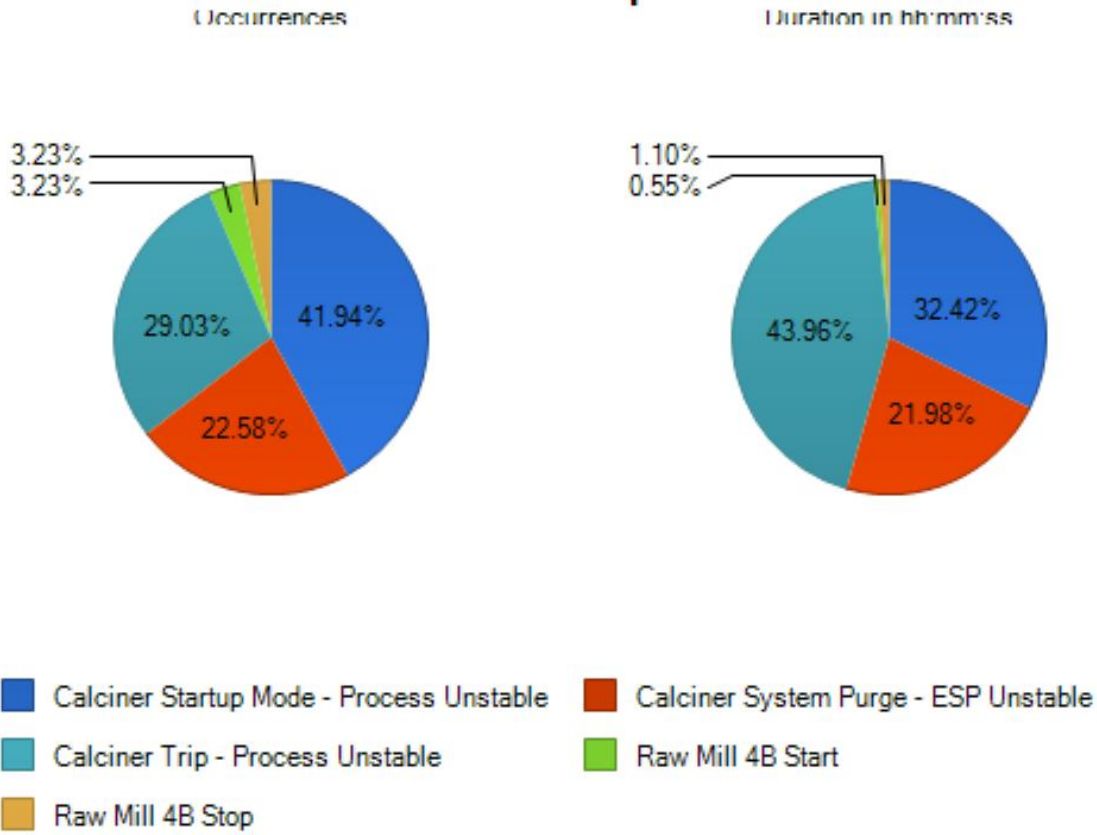


4A Stack Pie Chart of causes over 250 mg/Nm<sup>3</sup> in terms of number of occurrences and total time

Total number of occurrences =49; total time 31 minutes 00 seconds

## 4B Greater Than 250mg/Nm<sup>3</sup> Emissions Qtr 2 2016

### Statistics of Explanation



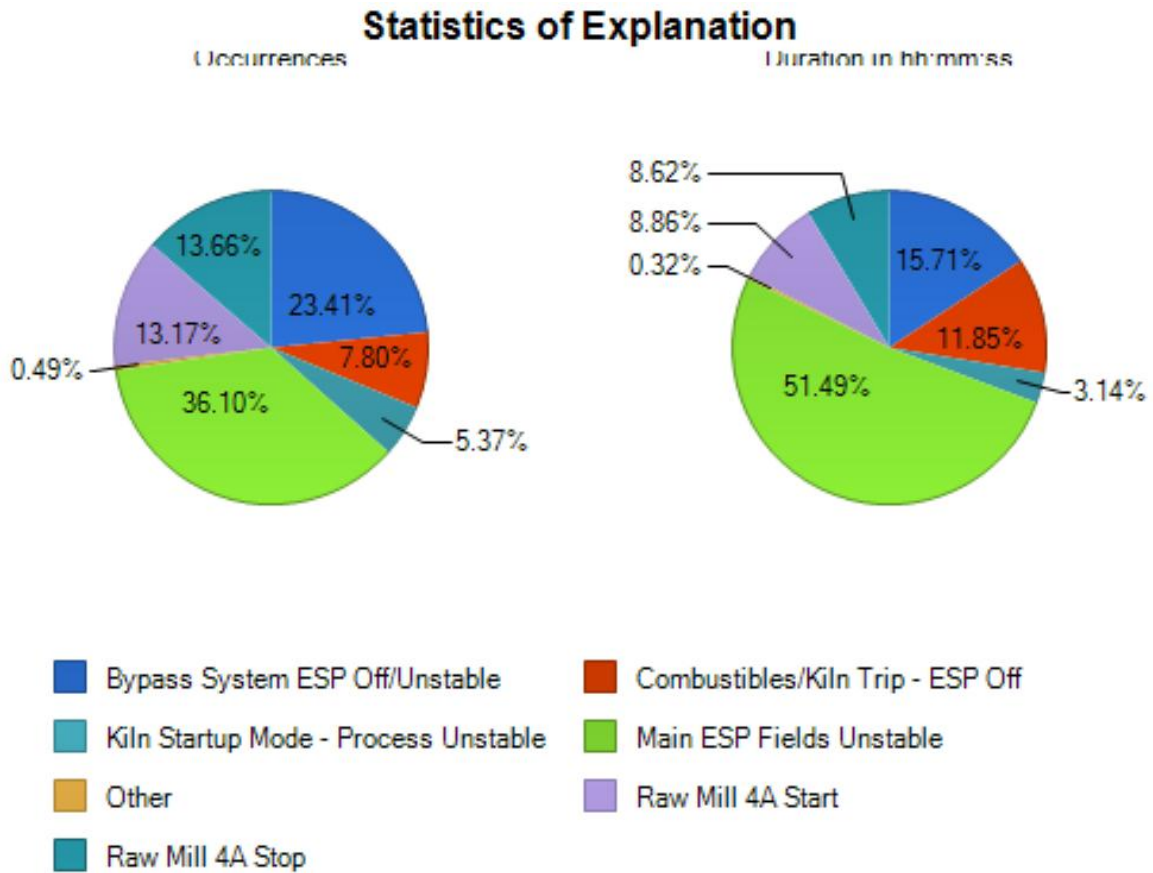
4B Stack Pie Chart of causes over 250 mg/Nm<sup>3</sup> in terms of number of occurrences and total time

Total number of occurrences = 31; total time 30 minutes 20 seconds

**2. Causes of reporting limit excursions**

Stack emissions greater than 150 mg/Nm<sup>3</sup> (4A Stack) and 80 mg/Nm<sup>3</sup> (4B Stack) are reported to the EPA on a weekly basis. A pie chart and the total time are presented. Below are pie charts for 4A and 4B stack for the three month period; and also the total time charts up until the end of June 2015.

**4A Greater Than 150mg/Nm<sup>3</sup> Emissions Qtr 2 2016**

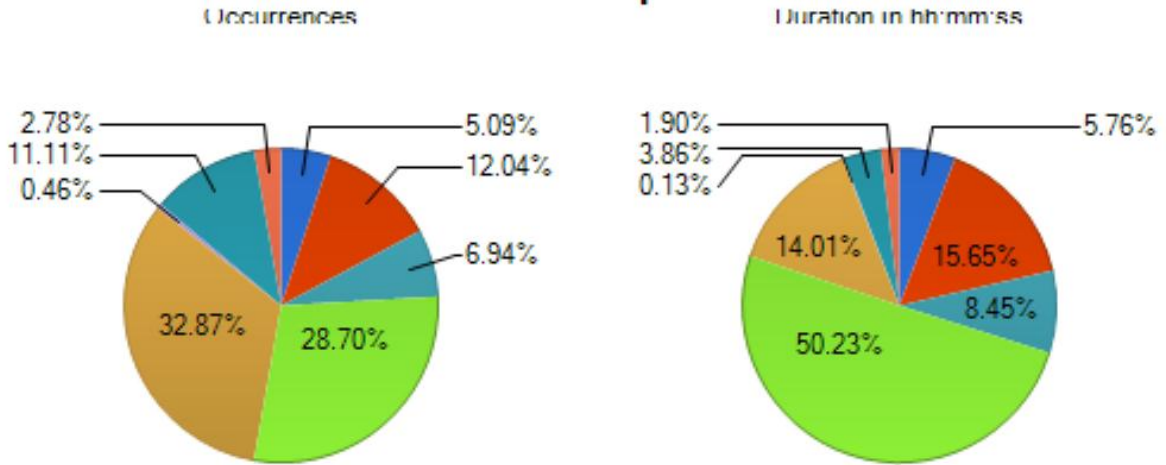


4A Stack Pie Chart of causes over 150 mg/Nm<sup>3</sup> in terms of number of occurrences and total time

Total number of occurrences = 205; total time 3 hours 26 minutes 50 seconds

## 4B Greater Than 80mg/Nm<sup>3</sup> Emissions Qtr 2 2016

### Statistics of Explanation

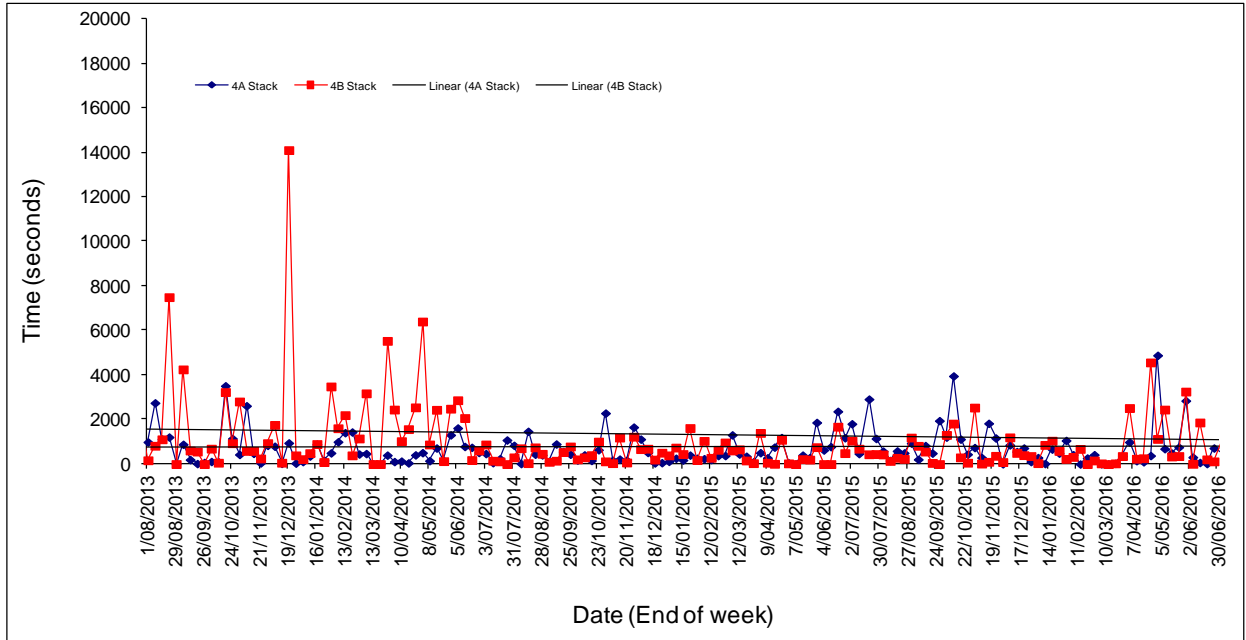


- <Not Specified>
- Calciner Startup Mode - Process Unstable
- Calciner System Purge - ESP Unstable
- Calciner Trip - Process Unstable
- Main ESP Fields Unstable Rapping
- Other
- Raw Mill 4B Start
- Raw Mill 4B Stop

4B Stack Pie Chart of causes over 80mg/Nm<sup>3</sup> in terms of number of occurrences and total time

Total number of occurrences = 216; total time 4 hours 14 minutes 30 seconds

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Tracking total time for stack emissions greater than the reporting levels of 150mg/Nm<sup>3</sup> on 4A stack and 80mg/Nm<sup>3</sup> on 4B stack.

### Monitoring Results – Quality Assurance / Quality Control Evaluation

The data shown in the graphs above was calculated using an opacity curve generated by a number of iterations of spot testing by Axiom Air whom are accredited for compliance with ISO/IEC 17025. The opacity meters are also calibrated daily and via regular planned maintenance as per the suppliers’ standard.

## Process Improvement for the Quarter

### Process Improvement for the Quarter

The post shutdown period presented challenges in the short-term through difficult chemistry control and commissioning issues. While the Accolade ship was away on its drydock repair, the kiln was fed with limestone stockpiled over the past 4 years. The reclaimed limestone stockpile was extremely variable in composition and led to great process instability which adversely affected stack emissions.

During the shutdown, 48 new blaster nozzles were installed in the kiln tower to address process instability due to build up. The blasters were being commissioned in May, and while there was a great improvement in process stability overall, the commissioning of the blasters did introduce some short term instability while the optimum operating methodology was being determined.

There have been ongoing improvement works related to the findings of the FLSmidth audit conducted at the shutdown and the operations team has been methodically trialing the improvements recommended.

### Conclusions and Recommendations

There were no incidents above  $250\text{mg}/\text{Nm}^3$  for a one hour average on 4A or 4B stack in the quarter. There was one incident above  $150\text{ mg}/\text{Nm}^3$  on 4A stack, due to a field failure in 4A ESP. The kiln was taken offline and the problem was resolved. There was one  $80\text{ mg}/\text{Nm}^3$  on 4B stack for a one hour average in the quarter, during a calciner/kiln trip.

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## Appendix A

See attached PDF files.



4A GT150 Emissions  
Q2.pdf



4A GT250 Emissions  
Q2.pdf



4B GT80 Emissions  
Q2.pdf



4B GT250 Emissions  
Q2.pdf