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Date:
07 December 2020

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Ref: LRP03PLA000 _0218/20201126

Dear Mr. Sibaya

RESUBMISSION OF LETHABO POWER STATION MONTHLY EMISSIONS REPORTS

Lethabo Power Station has resubmitted the monthly emissions reports for the period from November 2019 to September 2020. This letter serves as explanation for the need to resubmit the reports and key factors to be considered when interpreting the attached reports.

Replacement of Particulate Matter Monitors

As part of a capital project, Lethabo Power Station replaced the emissions monitors for Particulate Matter (PM) during November 2019. Due to the Original Equipment Manufacturer (OEM) support which expired at the end of 2019. The exact dates of monitor replacements are as follow:

Unit	Monitor Replacement Date	Period Without PM Emissions Data
Unit 1	18 November 2019	18 November 2019 at 09:20, until 19 November 2019 at 14:50
Unit 2		
Unit 3		
Unit 4	14 November 2019	N/A – Unit was off during the time of replacement
Unit 5		
Unit 6		14 November 2019 at 09:54 until 16:19

Since the replacement dates above, the new monitors have been used for reporting purposes and the previous correlation curves were still valid at the time of monitor replacement. Although it was advised to have new correlation curves generated for the new monitors and correlation tests had to be redone. After the valid correlation curves were received the data had to be back fitted with valid correlation factors. It was noted in original monthly reports, as well as the Lethabo Power Station Annual Emissions Report for 2020 Financial Year, that the correlation tests used previously are invalid since the monitor replacement.

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Conducting Correlation Tests and Implementation

The correlation test for Unit 1 and 2 were completed in December 2019 and the results were received on 27 February 2020 (Unit 1) and 2 March 2020 (Unit 2). Units 3 and 4 correlation tests were conducted in February 2020, and the reports were received in 23 May 2020 (Unit 3) and 27 June (Unit 4).

The correlation test for Unit 5 and Unit 6 took place in May 2020 and results for both Units were received on 30 June 2020. Delays in the correlation tests for Units 5 and 6 were attributed to the Units being off for outages for extended periods until February 2020 and April 2020 respectively. Thereafter COVID-19 lockdown restrictions caused additional delays to the test being conducted.

During verification of the correlation curves it was determined that the Units 4 and 6 correlations curves were not acceptable due to the coefficient factor not being within specification. Additionally, defects were identified on the new PM monitors and a decision was made redo to all PM correlations for all six units. The correlation tests were redone in July and August 2020 and the reports for second round of correlation tests were finalized and implemented in October 2020. Once the correlation tests were finalized, the station commenced with back fitting the data with valid curves.

Gaseous Emissions Investigations

Challenges were experienced with gaseous monitor reliability since February 2020, mainly due to calibration gas not being available intermittently. The lack of calibration gas meant that proper calibration of the monitors could not occur as planned. The challenge of procuring calibration gas was experienced by multiple Eskom sites; however, the station was able to place a temporary order for the procurement of calibration gas to do calibration on the monitors. Numerous investigations have been launched to determine which times have been affected by the monitors that were not properly calibrated. The findings from these investigation results have been actioned and the affected data was corrected as recommended.

Correlation Curve Validity and Back Fitting Rationale:

The table below reflects the previous and present gaseous and PM correlation dates and validity.

	PM and Gaseous Correlation Curves Validity and Implementation as at 26 October 2020					
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Correlation 1 PM	02/07/2018	17/08/2018	31/10/2019	22/06/2019	13/05/2018	22/06/2019
Expiry	02/07/2020	17/08/2020	31/10/2021	22/06/2021	13/05/2020	22/06/2021
Validity	Not Valid Due to PM Monitor change (Nov-19)	Not Valid Due to PM Monitor change (Nov-19)	Not Valid Due to PM Monitor change (Nov-19)	Not Valid Due to PM Monitor change (Nov-19)	Not Valid Due to PM Monitor change (Nov-19)	Not Valid Due to PM Monitor change (Nov-19)
Implemented	31/08/2018	05/10/2018	20/11/2019	31/07/2019	04/07/2018	12/07/2019
Reference	RSL285	RSL286	RSL345	RSL324	RSL274	RSL323

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Correlation 2 PM	10/12/2019	15/12/2019	20/02/2020	22/06/2019	20/05/2020	22/06/2019
Expiry	10/12/2022	15/12/2022	20/02/2022	22/06/2021	20/05/2022	22/06/2021
Validity	Valid	Valid	Valid	Not Valid Due to PM Monitor change (Nov-19)	Valid	Not Valid Due to PM Monitor change (Nov-19)
Implemented 1	12/03/2020	12/03/2020	-	-	-	-
Implemented 2	15/07/2020 (Reviewed curves using Eskom's Tool)	15/07/2020 (Reviewed curves using Eskom's Tool)	15/07/2020 (Reviewed curves using Eskom's Tool)		15/07/2020 (Reviewed curves using Eskom's Tool)	
Reference	RGND020(0)	RGND021(0)	RGND026(0)	RSL324	RGND031(0)	RSL323

Correlation 1 Gaseous	01/07/2018	16/08/2018	14/08/2018	24/04/2018	13/05/2018	10/06/2018
Expiry	01/07/2020	16/08/2020	14/08/2020	24/04/2020	13/05/2020	10/06/2020
Validity	Not Valid					
Implemented	30/07/2018	29/10/2018	12/11/2018	04/06/2018	25/06/2018	20/08/2018
Reference	RSL282	RSL288	RSL290	RSL269	RSL272	RSL276

Correlation 3 PM	15/08/2020	07/08/2020	01/08/2020	26/07/2020	16/07/2020	21/07/2020
Expiry	15/08/2022	07/08/2022	01/08/2022	26/07/2022	16/07/2022	21/07/2022
Validity	Valid	Valid	Valid	Valid	Valid	Valid
Implemented	08/10/2020	08/10/2020	08/10/2020	08/10/2020	16/10/2020	08/10/2020
Reference	RSL370	RSL367	RSL365R1	RSL363R1	RSL359R3	RSL361R1

Correlation 2 Gaseous	15/08/2020	07/08/2020	01/08/2020	26/07/2020	16/07/2020	21/07/2020
Expiry	15/08/2022	07/08/2022	01/08/2022	26/07/2022	16/07/2022	21/07/2022
Validity	Valid	Valid	Valid	Valid	Valid	Valid
Implemented	16/10/2020	07/10/2020	07/10/2020	07/10/2020	07/10/2020	07/10/2020
Reference	RSL371	RSL368	RSL366	RSL364	RSL360	RSL362

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Based on the above implementation dates and change of monitors the following back fitting exercise was undertaken to ensure reported data is correlated correctly:

- Unit 1 Gaseous curves back fitted from 01/07/2020 to 16/10/2020 (09:55 AM) using curves from RSL371.
Reports affected: July 2020; August 2020; September 2020; October 2020)

Item	Old Curve	New Curve
Oxides of Nitrogen	$y=1.2185*x-32.5304$	$y=0.9811*x+34.305$
Sulphur Dioxide	$y=1.0503*x$	$y=1.026*x$
Carbon Monoxide	$y=1.1671*x+3.8652$	$y=0.9948*x-0.0062$
Carbon Dioxide	$y=0.9119*x$	$y=1.0156*x$
Oxygen	$y=0.9487*x$	$y=1.0698*x$
Velocity	$y=x$	$y=0.6706*x+7.9232$
Moisture	$y=x$	$y=0.9339*x$

- Unit 2 Oxygen curves back fitted from 01/11/20219 to 07/10/2020 (15:15 PM) using curves from RSL368. Due to issues with the Oxygen correlation curves it is recommended that back fitting of Oxygen data be done using curves from RSL368.
Reports affected: November 2019, December 2019; January 2020; February 2020; March 2020; April 2020; May 2020; June 2020; July 2020; August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Oxygen	$y=1.408*x$	$y=1.0583*x$

- Unit 2 Gaseous curves back fitted from 16/08/2020 to 07/10/2020 (15:15 PM) using curves from RSL368.
Reports affected: August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Oxides of Nitrogen	$y=1.0425*x+49.3013$	$y=1.0079*x+29.1776$
Sulphur Dioxide	$y=1.0354*x$	$y=1.0316*x$
Carbon Monoxide	$y=1.3611*x-28.5933$	$y=1.1025*x+26.3043$
Carbon Dioxide	$y=1.0698*x$	$y=1.0903*x$
Velocity	$y=x$	$y=1.4539*x-1.8744$
Moisture	$y=x$	$y=1.2962*x$

- Unit 3 Gaseous curves back fitted from 14/08/2020 to 07/10/2020 (15:15 PM) using curves from RSL366.
Reports affected: August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Oxides of Nitrogen	$y=0.8459*x+35.4541$	$y=1.0646*x+19.9141$
Sulphur Dioxide	$y=0.9883x$	$y=1.0605*x$
Carbon Monoxide	$y=x$	$y=1.0364*x+7.0817$
Carbon Dioxide	$y=1.0225*x$	$y=0.9455*x$
Oxygen	$y=1.0002*x$	$y=1.0505*x$
Velocity	$y=x$	$y=0.4851*x+14.6883$
Moisture	$y=x$	$y=1.1852*x$

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- Unit 4 Gaseous curves back fitted from 24/04/2020 to 07/10/2020 using curves from RSL364.
Reports affected: April 2020; May 2020; June 2020; July 2020; August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Oxides of Nitrogen	$y=1.183*x-26.2333$	$y=1.1474*x-3.4711$
Sulphur Dioxide	$y=1.0051*x$	$y=1.0282*x$
Carbon Monoxide	$y=1.0699*x-13.504$	$y=1.2766*x-25.9368$
Carbon Dioxide	$y=0.9542*x$	$y=1.0822*x$
Oxygen	$y=1.1686*x$	$y=1.0236*x$
Velocity	$y=x$	$y=1.6122*x-11.3395$
Moisture	$y=x$	$y=1.1819*x$

- Unit 5 Gaseous curves back fitted from 13/05/2020 to 07/10/2020 using curves from RSL360. It is noted that the Moisture curve was incorrect and inflated during the time of the correlation. It was determined that an average of (6.4% H₂O) will be used from the point of curve expiry until the test is redone. The order has already been place to redo this correlation.
Reports affected: May 2020; June 2020; July 2020; August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Oxides of Nitrogen	$y=1.0708*x$	$y=1.0025*x$
Sulphur Dioxide	$y=0.9824*x$	$y=1.0251*x$
Carbon Monoxide	$y=0.9084*x-3.1968$	$y=1.5634*x+15.3230$
Carbon Dioxide	$y=1.0039*x$	$y=1.015*x$
Oxygen	$y=1.1186*x$	$y=1.0698*x$
Velocity	$y=x$	$y=0.3782*x+17.909$
Moisture	$y=x$	$y=3.2336*x+0.0349$

- Unit 6 Oxygen curves back fitted from 01/11/2020 to 07/10/2020 (15:15 PM) using curves from RSL362. Due to issues with the Oxygen instrument was changed soon after the previous QAL 2 tests were done. The recommendation was to utilize a calculated curve due to this. For this reason, it was recommended that back fitting of Oxygen data be done using curves from RSL362.
Reports affected: November 2019, December 2019; January 2020; February 2020; March 2020; April 2020; May 2020; June 2020; July 2020; August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Oxygen	$y=x$	$y=1.1686x$

- Unit 6 Gaseous curves back fitted from 10/06/2020 to 07/10/2020 (15:15 PM) using curves from RSL362.
Reports affected: June 2020; July 2020; August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Oxides of Nitrogen	$y=1.4129*x+114.035$	$y=1.0959*x+0.6585$
Sulphur Dioxide	$y=1.0505*x$	$y=1.0105*x$
Carbon Monoxide	$y=x$	$y=x$
Carbon Dioxide	$y=1.0383*x$	$y=1.1272*x$
Velocity	$y=x$	$y=1.2482*x-2.8833$
Moisture	$y=x$	$y=1.1184*x$

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- Unit 1 PM curves back fitted from 18/11/2020 to 12/03/2020 (08:20 AM) using curves from RGND020(0) (Implementation 1).
Reports affected: November 2019, December 2019; January 2020; February 2020; March 2020

Item	Old Curve	New Curve
Output 1	$y=6.0444*x-21.3859$	$y=10.2387*x-52.91$
Output 2	$y=40.2962*x-158.393$	$y=68.2582*x-284.99$

- Unit 2 PM curves back fitted from 18/11/2019 to 12/03/2020 (08:20 AM) using curves from RGND021(0) (Implementation 1).
Reports affected: November 2019, December 2019; January 2020; February 2020; March 2020

Item	Old Curve	New Curve
Output 1	$y=6.708*x-26.9533$	$y=11.4509*x-39.52$
Output 2	$y=33.54*x-134.281$	$y=57.2545*x-222.74$

- Unit 3 PM curves back fitted from 18/11/2019 to 19/11/2020 using curves from RGND026(0).
Reports affected: November 2019

Item	Old Curve	New Curve
Output 1	$y=11.8552*x-42.9435$	$y=16.57*x-68.913$
Output 2	$y=39.5172*x-153.592$	$y=54.3377*x-219.96$

- Unit 3 PM curves back fitted from 20/11/2020 to 15/07/2020 (10:10 AM) using curves from RGND026(0).
Reports affected: November 2019, December 2019; January 2020; February 2020; March 2020; April 2020; May 2020; June 2020; July 2020

Item	Old Curve	New Curve
Output 1	$y=13.1908*x-52.7815$	$y=16.57*x-68.913$
Output 2	$y=37.1843*x-141.2112$	$y=54.3377*x-219.96$

- Unit 4 PM curves back fitted from 14/11/2019 to 08/10/2020 (10:00 AM) using curves from RSL363R1. (Note after the monitor change, the correlation test did not meet the requirements and could not be used. Due to this the back fitting was done from November 2019 to the next curve implementation)
Reports affected: November 2019, December 2019; January 2020; February 2020; March 2020; April 2020; May 2020; June 2020; July 2020; August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Output 1	$y=7.8865*x-27.5857$	$y=9.5164*x-38.7168$
Output 2	$y=26.2883*x-101.193$	$y=31.7214*x-127.5366$

- Unit 5 PM curves back fitted from 14/11/2020 to 15/07/2020 (10:40 AM) using curves from RGND031(0).
Reports affected: November 2019, December 2019; January 2020; February 2020; March 2020; April 2020; May 2020; June 2020; July 2020

Item	Old Curve	New Curve
Output 1	$y=10.9526*x-47.1537$	$y=8.6012*x-31.658$
Output 2	$y=36.5087*x-149.378$	$y=28.627*x-111.67$

RESUBMISSION OF LETHABO POWER STATION MONTHLY EMISSIONS REPORTS

- Unit 6 PM curves back fitted from 14/11/2020 to 08/10/2020 (10:00 AM) using curves from RSL362. (Note after the monitor change, the correlation test did not meet the requirements and was not used. Due to this the back fitting was done from November 2019 to the next curve implementation)

Reports affected: November 2019, December 2019; January 2020; February 2020; March 2020; April 2020; May 2020; June 2020; July 2020; August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Output 1	$y=4.9333*x-19.2737$	$y=11.2651*x-46.9329$
Output 2	$y=25.1964*x-94.9214$	$y=37.5503*x-152.0737$

Other factors that affected the gaseous data especially include corrective actions stemming from investigations done on site relating to data integrity issues related to gaseous emissions. These findings and actions are summarized below:

	Finding	Action
Unit 4	<p>SO₂ and NO data: On 25th January 2020 the gas readings dropped to zero and it was later discovered that the air purge valve was closed on the common airline at the bottom of the smoke stack. The monitor does an auto zero correction every 12 hours and if the air is closed it will cause the values to drop to zero. It was rectified on 27th January 2020. The time frame where this happened is from 25th January 2020 12:11 to 27th January 2020 11:15.</p> <p>On 29th January a faulty gas calibration was done. The SO₂ made a big upward step and caused a few exceedances consequently. Due to the lack of available calibration gas the problem could only be rectified on 7th March 2020.</p> <p>Oxygen data: When Eskom Research Training and Development (RT&D) did O₂ verifications in January they found the O₂'s higher than what it is supposed to be and therefore their average of 6.18% were used from 29th January to 24th April. On 24th April RT&D did a verification again and their average of 7.12% was used from then. Due to the unavailability of calibration gas and unverified gas the oxygen had to be corrected with the verified values.</p>	<ol style="list-style-type: none"> O₂ Data: <ul style="list-style-type: none"> 29th January to 24th April 2020 use 6.18% O₂; 25th April to 31st May 2020 use 7.12% O₂. NO and SO₂ Data: <ul style="list-style-type: none"> The NO and SO₂ values should be removed from 25th January 2020 12:11 to 27th January 2020 11:15 due to the air purge valve that was closed. SO₂ Data: <ul style="list-style-type: none"> For 29th-31st January 2020 use the average for 1-28 January 2020; For 1st-29th February 2020 use the average of January and March which is 1st-28th January and 8th-31st March 2020. For 1st-7th March use the average of 8th-31st March 2020

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	Finding	Action
Unit 5	<p>Oxygen adjustments: On 23rd April 2020 RT&D did gas verifications and saw that the O₂ readings were too high. An average of their values were calculated and it was 6.8%. Therefore, this value will be used from 1st April 2020 to 13th May 2020. Calibrations were not done as frequently as supposed to due to the lack of calibration gas. The monitors were calibrated on 13th May and QAL 2 tests were completed on the 16th July 2020</p>	<p>O₂ Data: The QAL2 test was due and was finished on 16th July 2020, therefore 6.8% is used from 1 April 2020 until 16th July 2020</p>
Unit 6	<p>SO₂ and NO adjustments: On 3rd April 2020 Unit 6 came back from an outage, but the gas monitor was removed during the outage to be used on Unit 3 that had a problem at the time. On 6th April 2020 the monitor was moved back to Unit 6. Therefore, no gas values were available from 3rd to 6th April 2020. It must be noted that only on 11th April 2020 the calibration coefficients were changed and therefore the monthly averages from the 12th April 2020 to 30th April 2020 must be used for the SO₂ and NO.</p> <p>There was a problem with the heater on the gas analyser that started on 16th May 2020. There was a loose wire on the SSR (solid state relay) that switched the heater off. That caused the process gas temperature values to go below 110°C which caused the monitor to go into a purge mode. When that happened all the gas values dropped to zero. It mainly happened during early morning hours when ambient temperatures were low. On 9th June the loose wire was found and corrected and that rectified the problem. The following dates and times are when that happened and will be removed from the reported data:</p> <p>Oxygen adjustments: When RT&D did verifications on 22nd April they discovered that the O₂ measurements were reading higher and therefore the average of 6.13% was used for the period where no valid calibration was done due to the lack of calibration gas. This value is used from 3rd April to 27 May 2020.</p>	<p>O₂ Data:</p> <ul style="list-style-type: none"> • Use 6.13% O₂ for 3 April 2020 to 27 May 2020 <p>NO and SO₂ Data</p> <ul style="list-style-type: none"> • A monthly average for SO₂ and NO should be used for 3rd-11th April 2020. That means an average from 12th-30th April 2020 will replace the SO₂ and NO values for 3rd-11th April 2020. • Also, the heater tube had a loose wire that caused the heater to operate intermittently and therefore the following dates and times must be removed when these occurrences happened. <ul style="list-style-type: none"> ○ 16 May 2020, 06:37-09:13; ○ 24 May 2020, 06:58-12:33; ○ 26 May 2020, 06:53-11:37; ○ 27 May 2020, 03:56-10:11; ○ 28 May 2020, 00:48-10:41; ○ 29 May 2020, 03:09-09:17; ○ 3 June 2020, 05:08-07:32; ○ 4 June 2020, 02:41-10:58; ○ 6 June 2020, 03:28-11:01; ○ 7 June 2020, 01:08-13:18; ○ 8 June 2020, 01:09-10:25; ○ 9 June 2020, 03:24-11:56.

RESUBMISSION OF LETHABO POWER STATION MONTHLY EMISSIONS REPORTS

Note on use of average for gaseous emission values, where it was required to utilize averages, it is the view of the station to take it as monitor unavailability (even if the monitor was reading and available, but the data was not reliable). This would ultimately adversely affect the percentage availability of the various monitors for that period, therefore the monitor availability for respective months were affected.

Backfitting Results

A significant reduction of gaseous exceedances was observed after the back fitting exercise and the remaining exceedances are being investigated diligently.

Numerous additional PM exceedances were picked up during the back fitting exercise, some of which result in the station exceeding the 72 hours grace period during upset, maintenance, start up and shut down conditions. However, it should be noted the station was not observing the correct emission figures at the time as the monitors were not correlated for the monitors in use, as such the station could not act on emission excursion incurred during this period, as it was under the impression that the emissions were within acceptable limits. If the station was aware of such exceedances, it would have acted immediately to intervene with these emissions exceedances.

Lethabo Power Station remains committed to minimize emissions and continue to operate within the confine of legislative requirements.

Yours sincerely



Karabo Rakgolela
GENERAL MANAGER

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Ref: LRP03PLA000 _0209/20201111 Rev 01

Dear Mr. Sibaya

**LETHABO POWER STATION EMISSION MONTHLY REPORT FOR APRIL 2020
RESUBMISSION**

Please find attached Lethabo Power Station emission report for the month of April 2020.

Also attached ambient air quality monitoring report, complaints register and the fugitive dust fallout monitoring report for April 2020.

For any additional information please do not hesitate to contact us.

Yours sincerely



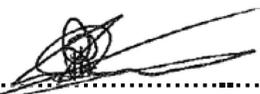
Karabo Rakgolela
GENERAL MANAGER

	Report	Lethabo Power Station
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Report name: Lethabo Power Station April 2020 Emission Report - Resubmission	Reference number: LRP03PLA000 _0209/20201111 Rev 01
Document Type: Report	Area of Applicability: Environment
Report Date: November 2020	Classification: Controlled Disclosure

Signatures:

Compiled by:



P Parag
System Engineer

Verified by :



W de Klerk
Environmental Officer

Reviewed by:



N Mazibuko
BPE Manager

Date: 27/11/2020

Date: 2020-11-26

Date: 27/11/2020

Reviewed by:



C Gwinden
PE Manager

Reviewed by:



L Nel
C&I Manager

Reviewed by:



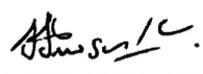
M Hariram
Environmental Manager

Date: 27/11/2020

Date: 2020-11-30

Date: 2020-12-03

Approved by:



H Sewsunker
Engineering Manager

Date: 2020/12/03

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LETHABO POWER STATION MONTHLY EMISSIONS REPORT

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1. RAW MATERIALS AND PRODUCTS

Raw Materials and Products	Raw Material Type	Units	Maximum Permitted Consumption Rate	Consumption Rate Apr-2020
	Coal	Tons	2 000 000	1 123 485
Fuel Oil	Tons	1 700	1342.3	

Production Rates	Product / By-Product Name	Units	Maximum Production Capacity Permitted	Production Rate Apr-2020
	Energy	GWh	2743.2	1 678.29
Ash	Tons	770 000	437 485.1	
RE Ash	kg/MWh	<i>not specified</i>	260.67	

2. ENERGY SOURCE CHARACTERISTICS

Coal Characteristic	Units	Stipulated Range	Monthly Average Content
Sulphur Content	%	0.55 (Standard)	0.940
Ash Content	%	36.89 (Standard)	38.940

3. EMISSION LIMITS (mg/Nm³)

Associated Unit/Stack	PM	SO _x	NO _x
Unit 1	100	3500	1100
Unit 2	100	3500	1100
Unit 3	100	3500	1100
Unit 4	100	3500	1100
Unit 5	100	3500	1100
Unit 6	100	3500	1100

4. ABATEMET TECHNOLOGY (%)

Associated Unit/Stack	Technology Type	Efficiency Apr-2020
Unit 1	<i>Electrostatic Precipitator (ESP)</i>	<i>99.78%</i>
Unit 2	<i>Electrostatic Precipitator (ESP)</i>	<i>99.84%</i>
Unit 3	<i>Electrostatic Precipitator (ESP)</i>	<i>99.70%</i>
Unit 4	<i>Electrostatic Precipitator (ESP)</i>	<i>99.91%</i>
Unit 5	<i>Electrostatic Precipitator (ESP)</i>	<i>99.91%</i>
Unit 6	<i>Electrostatic Precipitator (ESP)</i>	<i>99.71%</i>

5. MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO ₂	NO	CO ₂
Unit 1	<i>91.3</i>	<i>100.0</i>	<i>99.9</i>	<i>99.8</i>
Unit 2	<i>96.5</i>	<i>100.0</i>	<i>100.0</i>	<i>99.6</i>
Unit 3	<i>98.5</i>	<i>96.7</i>	<i>96.7</i>	<i>96.7</i>
Unit 4	<i>98.7</i>	<i>99.8</i>	<i>100.0</i>	<i>99.8</i>
Unit 5	<i>96.2</i>	<i>100.0</i>	<i>100.0</i>	<i>99.7</i>
Unit 6	<i>95.2</i>	<i>67.8</i>	<i>67.8</i>	<i>86.4</i>

6. EMISSION PERFORMANCE

Table 6.1: Monthly tonnages for the month of April 2020

Associated Unit/Stack	PM (tons)	SO ₂ (tons)	NO _x (tons)
Unit 1	159.6	2 151	1 033
Unit 2	115.6	3 072	1 161
Unit 3	115.8	1 373	691
Unit 4	71.8	3 515	1 604
Unit 5	55.5	1 964	1 184
Unit 6	202.7	3 134	1 527
SUM	721.0	15 209	7 202

Table 6.2: Operating days in compliance to PM AEL Limit - April 2020

Associated Unit/Stack	Normal	Grace	Section 30	Contra-vention	Total Exceedance	Average PM (mg/Nm ³)
Unit 1	11	13	0	2	15	127.3
Unit 2	22	8	0	0	8	81.4
Unit 3	7	7	0	0	7	196.1
Unit 4	28	0	0	0	0	40.5
Unit 5	25	1	0	0	1	48.8
Unit 6	10	13	0	4	17	140.8
SUM	103	42	0	6	48	

*** Please Note Conventions found in the month of April 2020 were due to new exceedances determined during the Back fitting of valid correlation factors (Please refer to General Notes)**

Table 6.3: Operating days in compliance to SO_x AEL Limit - April 2020

Associated Unit/Stack	Normal	Grace	Section 30	Contra-vention	Total Exceedance	Average SO _x (mg/Nm ³)
Unit 1	27	0	0	0	0	1 639.4
Unit 2	30	0	0	0	0	1 997.4
Unit 3	17	0	0	0	0	1 764.0
Unit 4	30	0	0	0	0	1 888.9
Unit 5	27	0	0	0	0	1 652.4
Unit 6	28	0	0	0	0	2 041.4
SUM	159	0	0	0	0	

Table 6.4: Operating days in compliance to NOx AEL Limit - April 2020

Associated Unit/Stack	Normal	Grace	Section 30	Contra-vention	Total Exceedance	Average NOx (mg/Nm³)
Unit 1	27	0	0	0	0	786.6
Unit 2	30	0	0	0	0	751.3
Unit 3	17	0	0	0	0	870.1
Unit 4	30	0	0	0	0	856.3
Unit 5	25	0	0	2	2	992.7
Unit 6	27	0	0	1	1	993.9
SUM	156	0	0	3	3	

Table 6.5: Legend Description

Condition	Colour	Description
Normal	Green	Emissions below Emission Limit Value (ELV)
Grace	Blue	Emissions above the ELV during grace period
Section 30	Orange	Emissions above ELV during a NEMA S30 incident
Contra-vention	Red	Emissions above ELV but outside grace or S30 incident conditions

Figure 1: Lethabo Unit 1 PM Emissions - April 2020

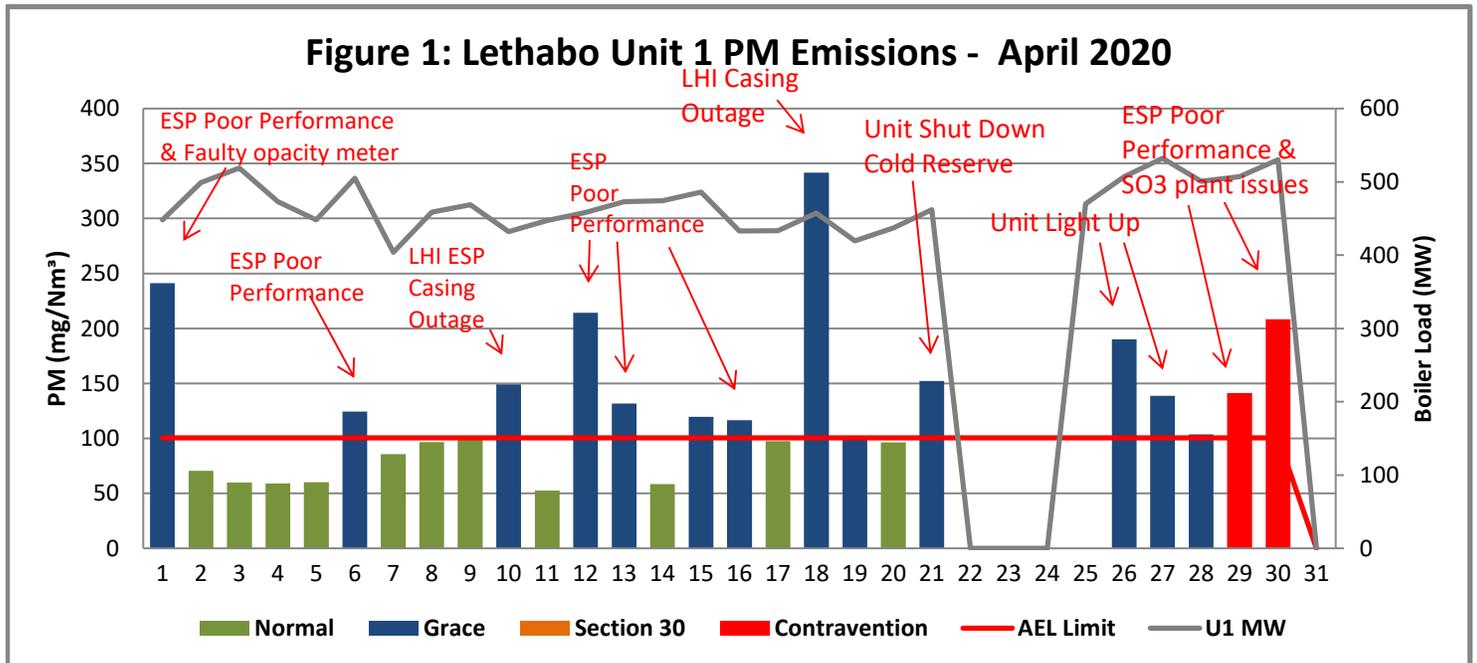


Figure 2: Lethabo Unit 2 PM Emissions - April 2020

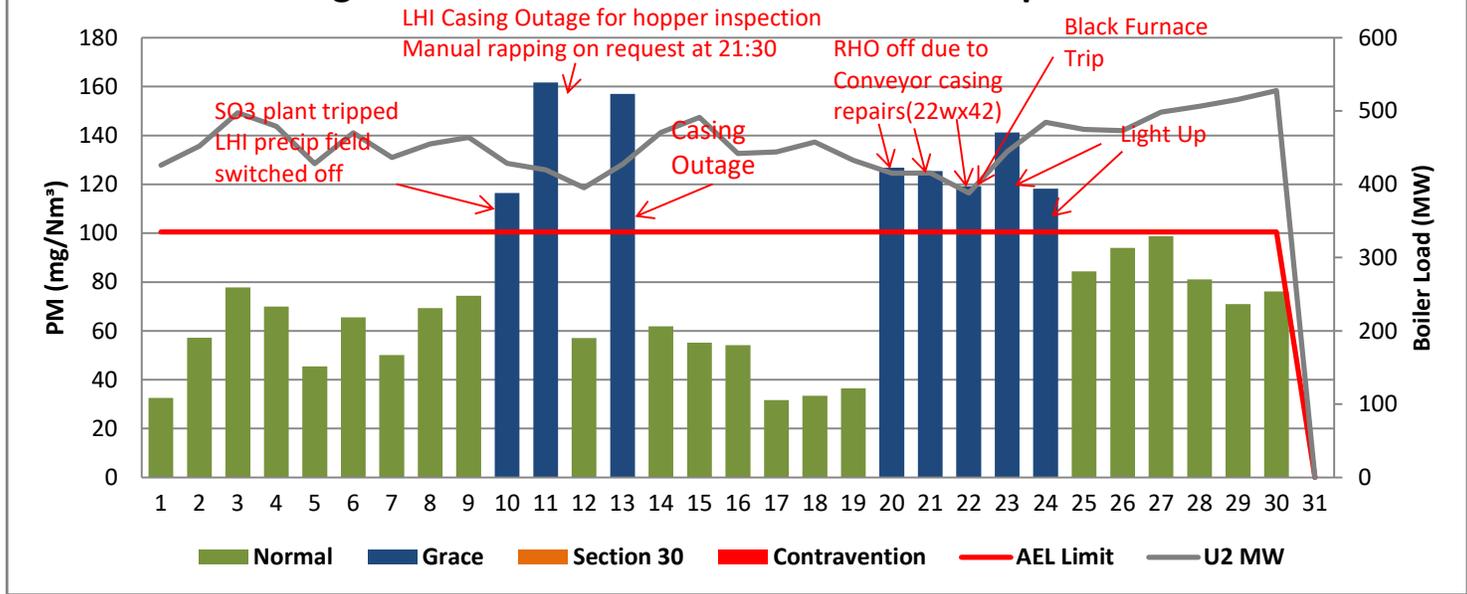


Figure 3: Lethabo Unit 3 PM Emissions - April 2020

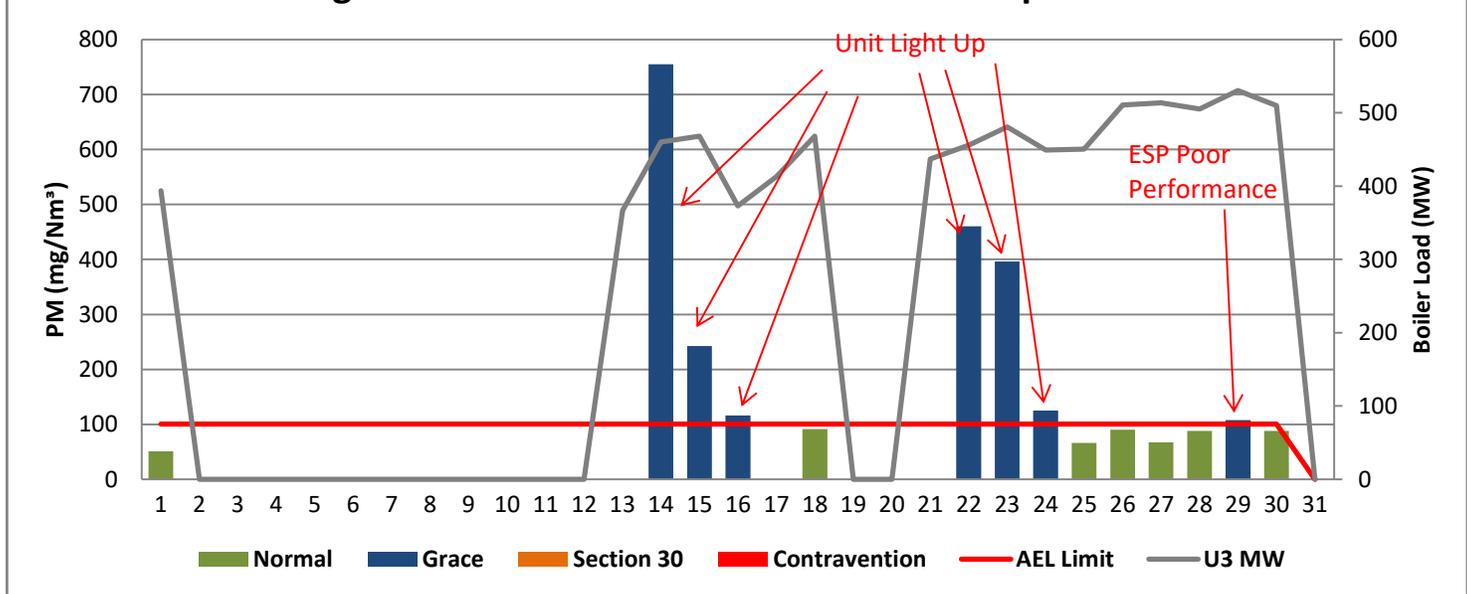


Figure 4: Lethabo Unit 4 PM Emissions - April 2020

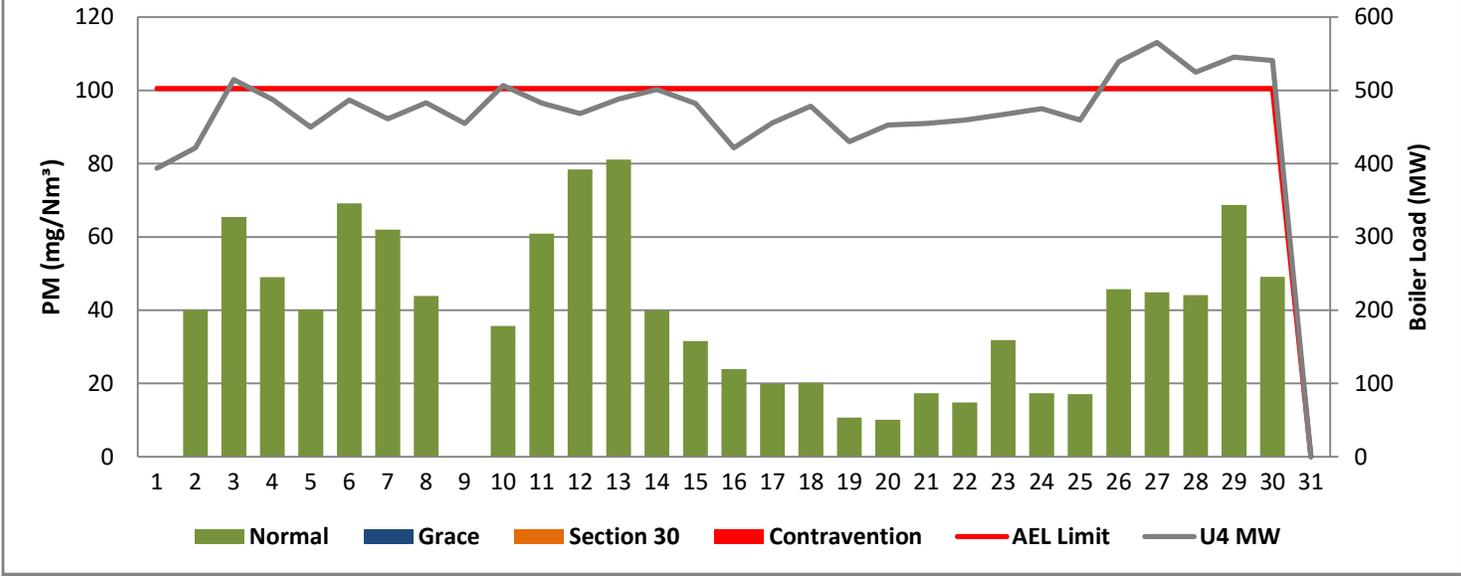


Figure 5: Lethabo Unit 5 PM Emissions - April 2020

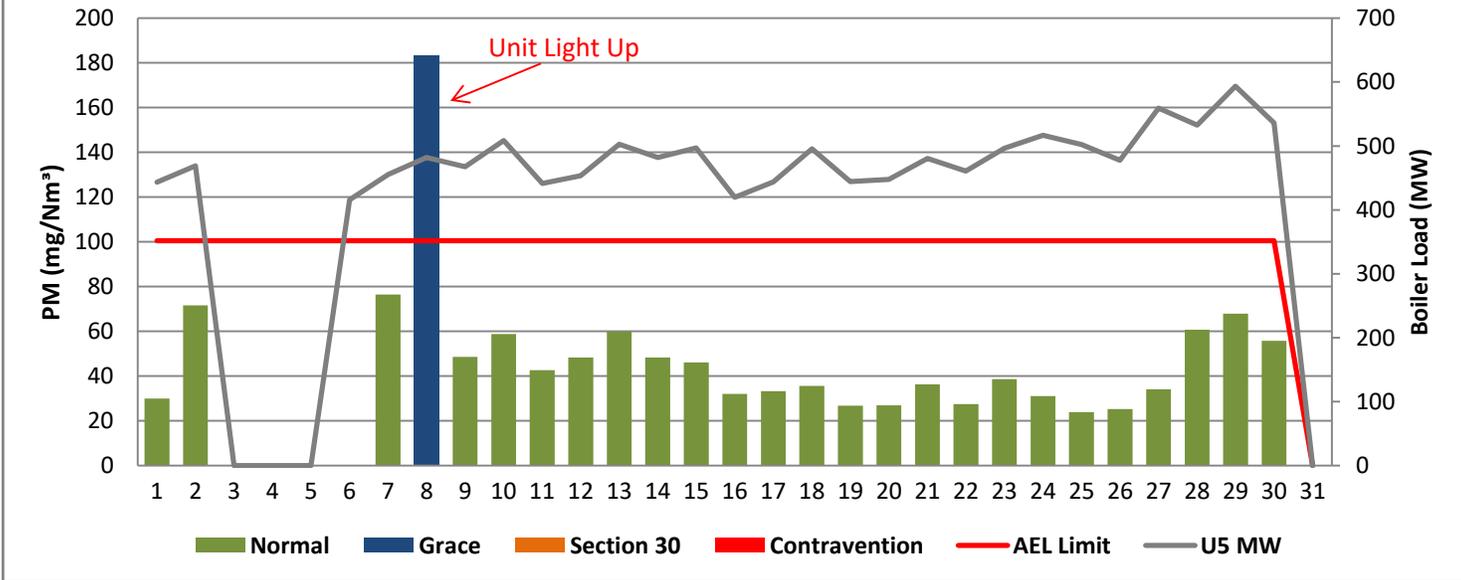


Figure 6: Lethabo Unit 6 PM Emissions - April 2020

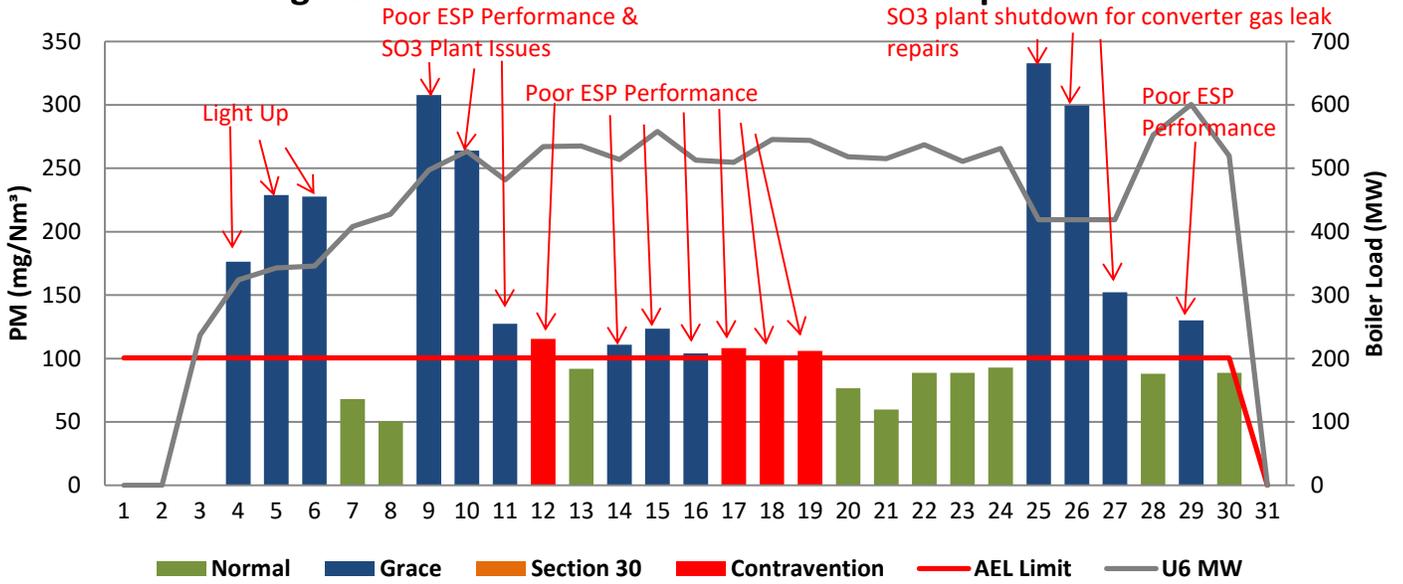


Figure 7: Lethabo Unit 1 SOx Emissions - April 2020

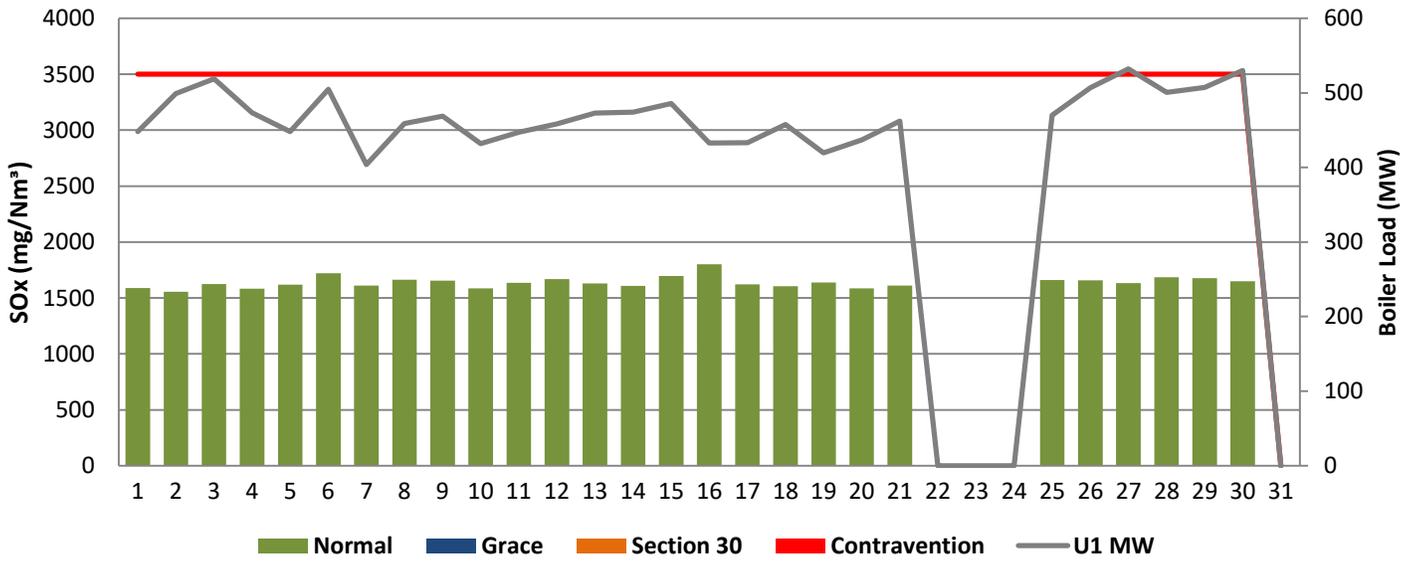


Figure 8: Lethabo Unit 2 SOx Emissions - April 2020

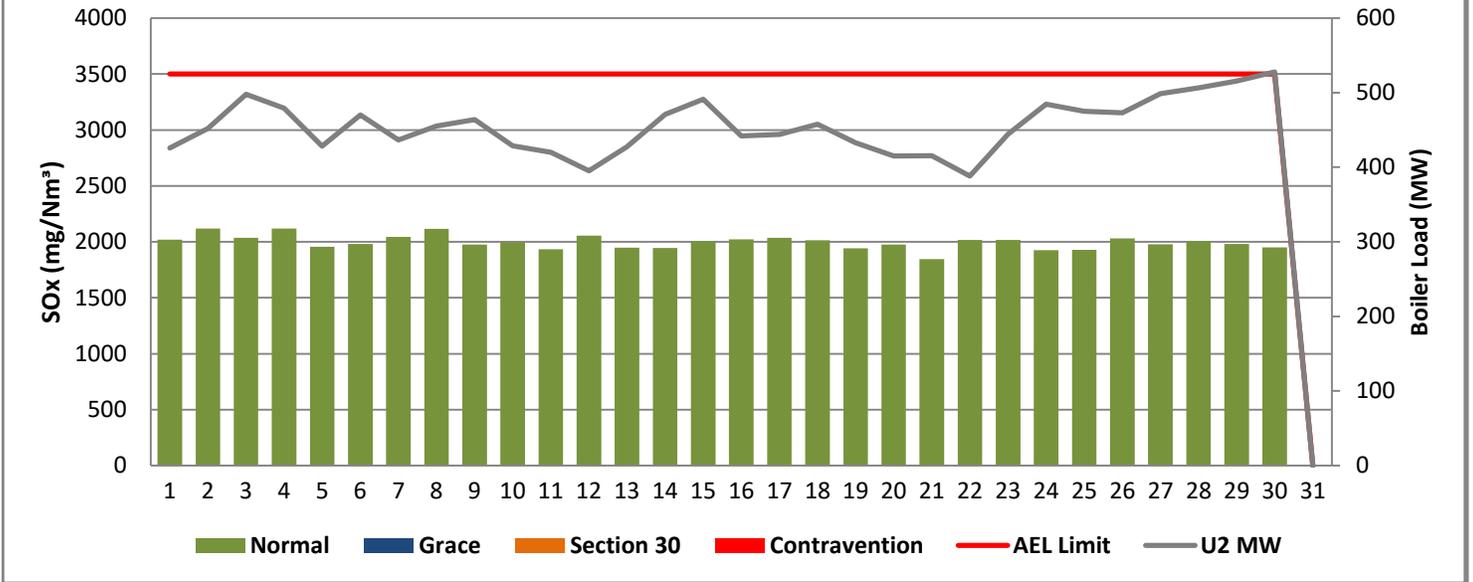


Figure 9: Lethabo Unit 3 SOx Emissions - April 2020

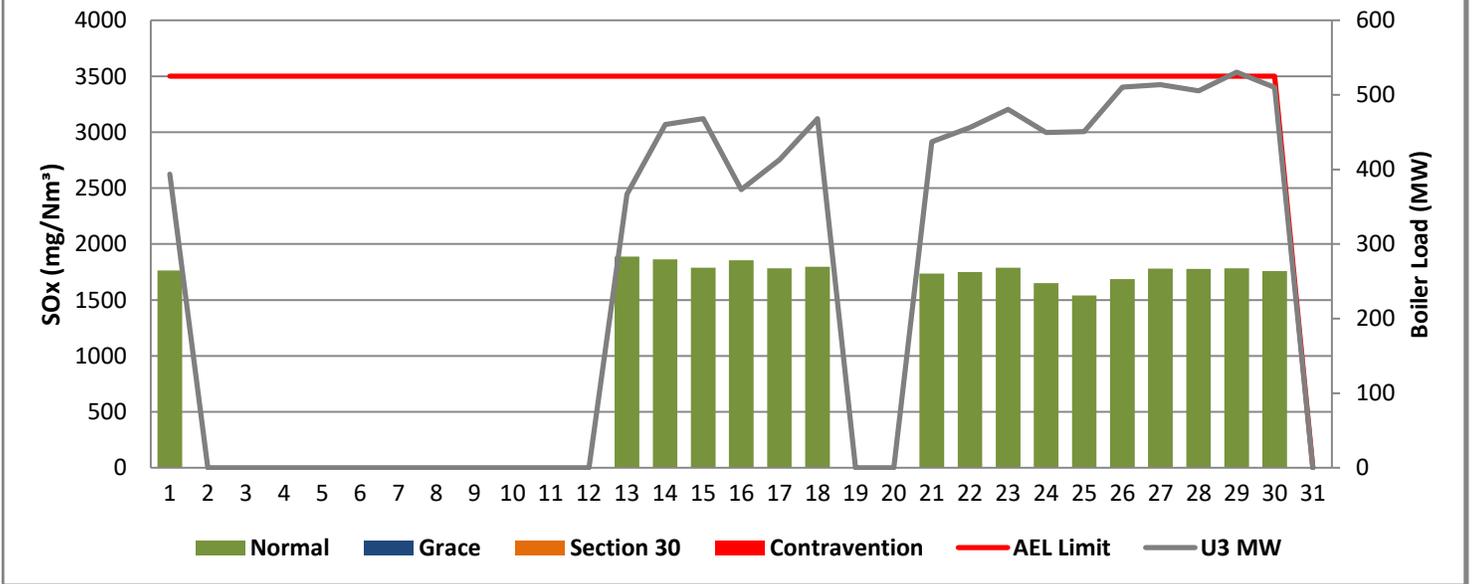


Figure 10: Lethabo Unit 4 SOx Emissions - April 2020

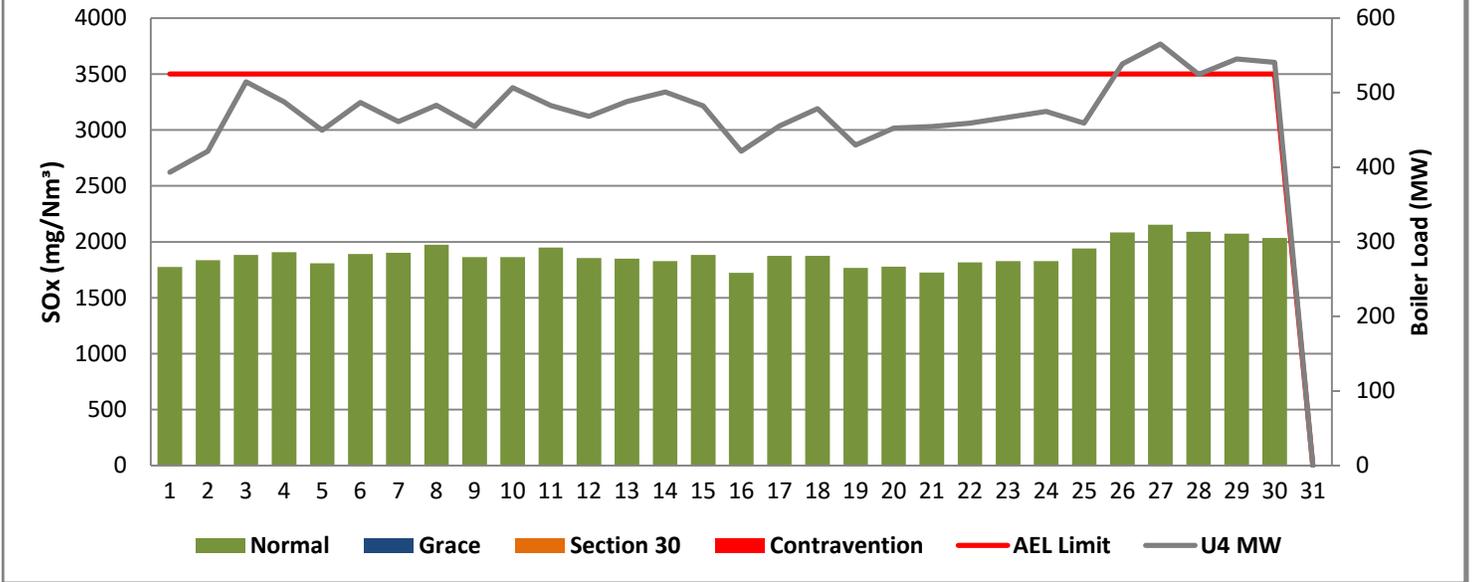


Figure 11: Lethabo Unit 5 SOx Emissions - April 2020

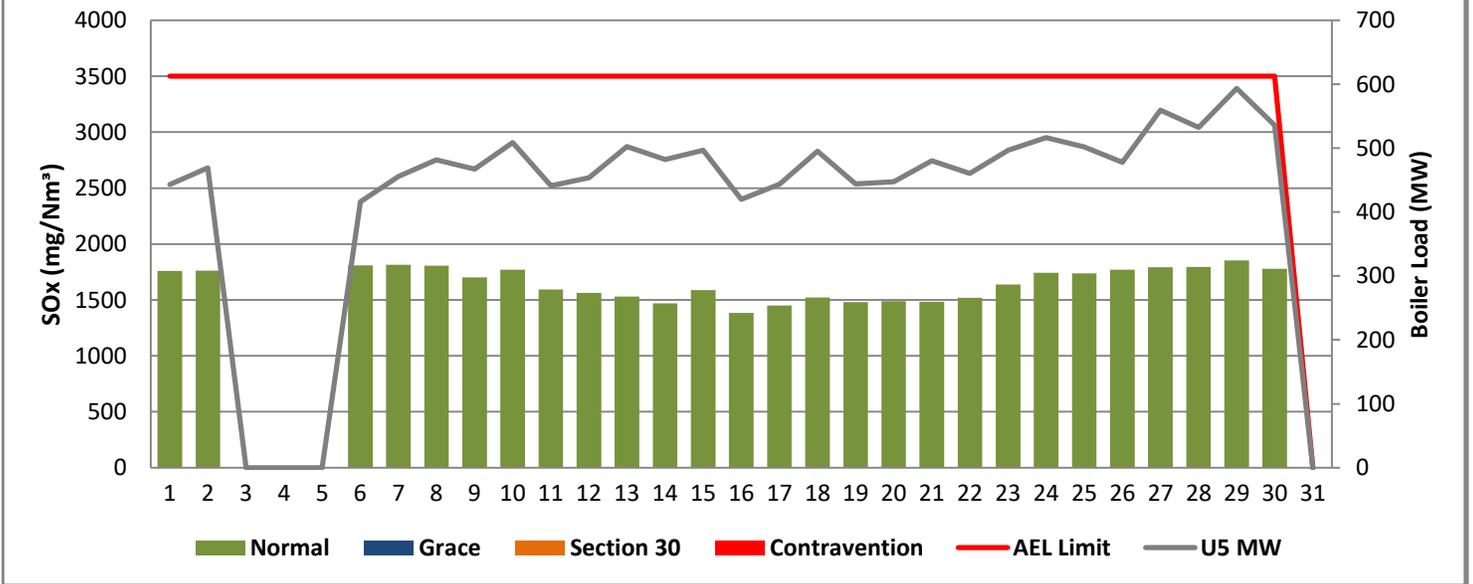


Figure 12: Lethabo Unit 6 SOx Emissions - April 2020

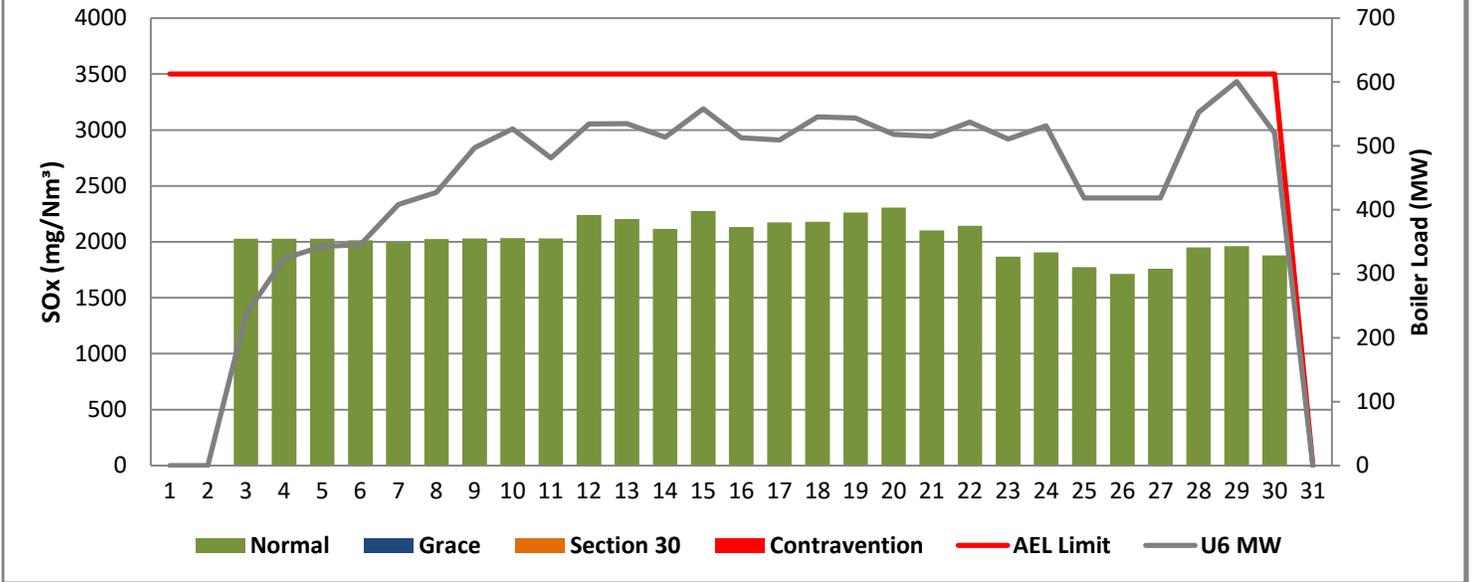


Figure 13: Lethabo Unit 1 NOx Emissions - April 2020

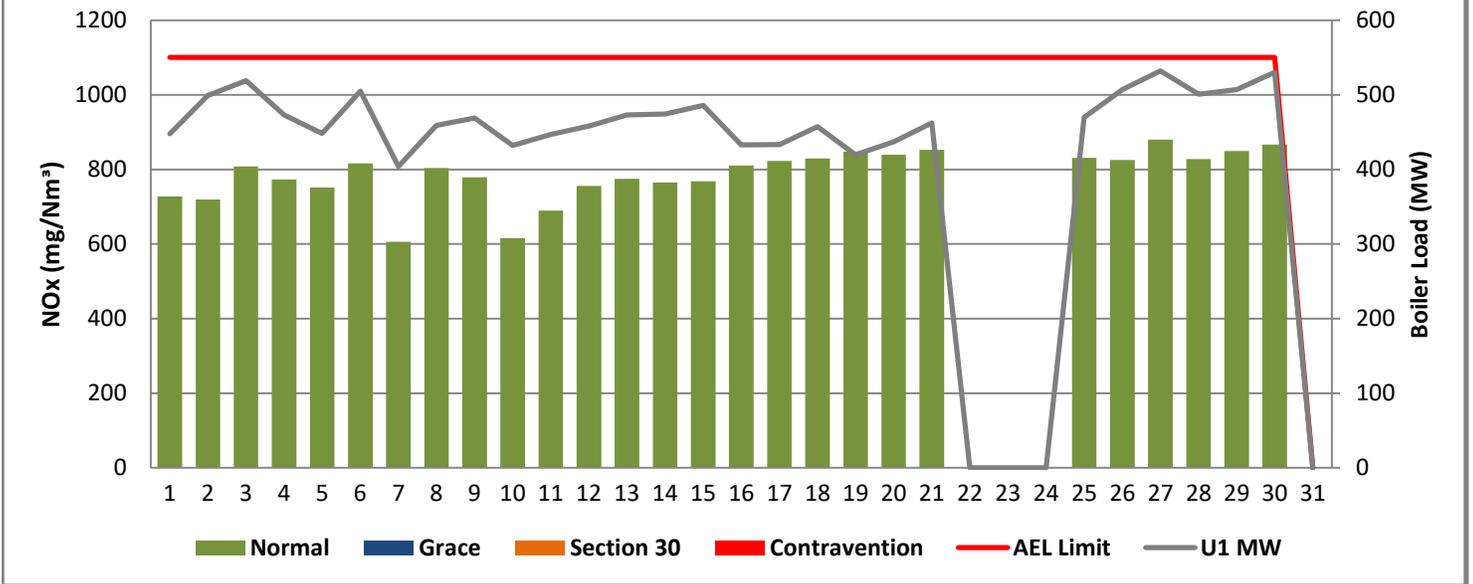


Figure 14: Lethabo Unit 2 NOx Emissions - April 2020

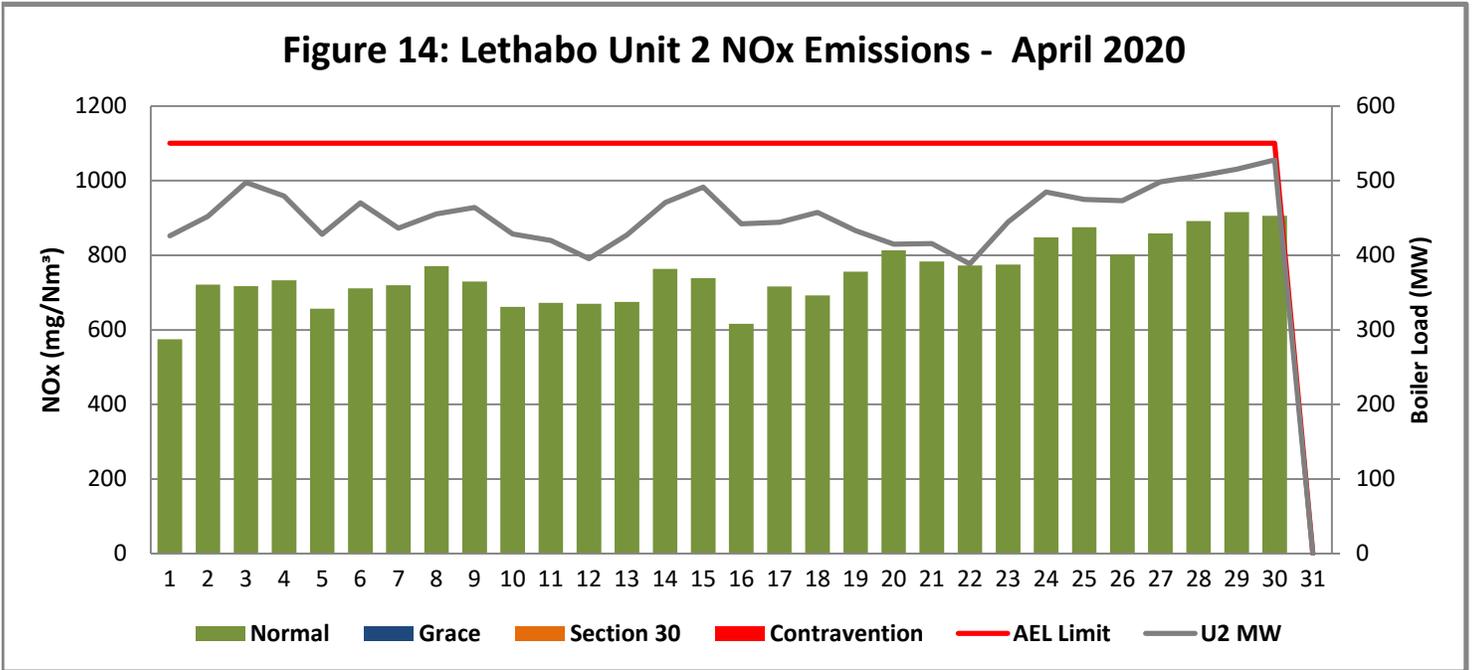


Figure 15: Lethabo Unit 3 NOx Emissions - April 2020

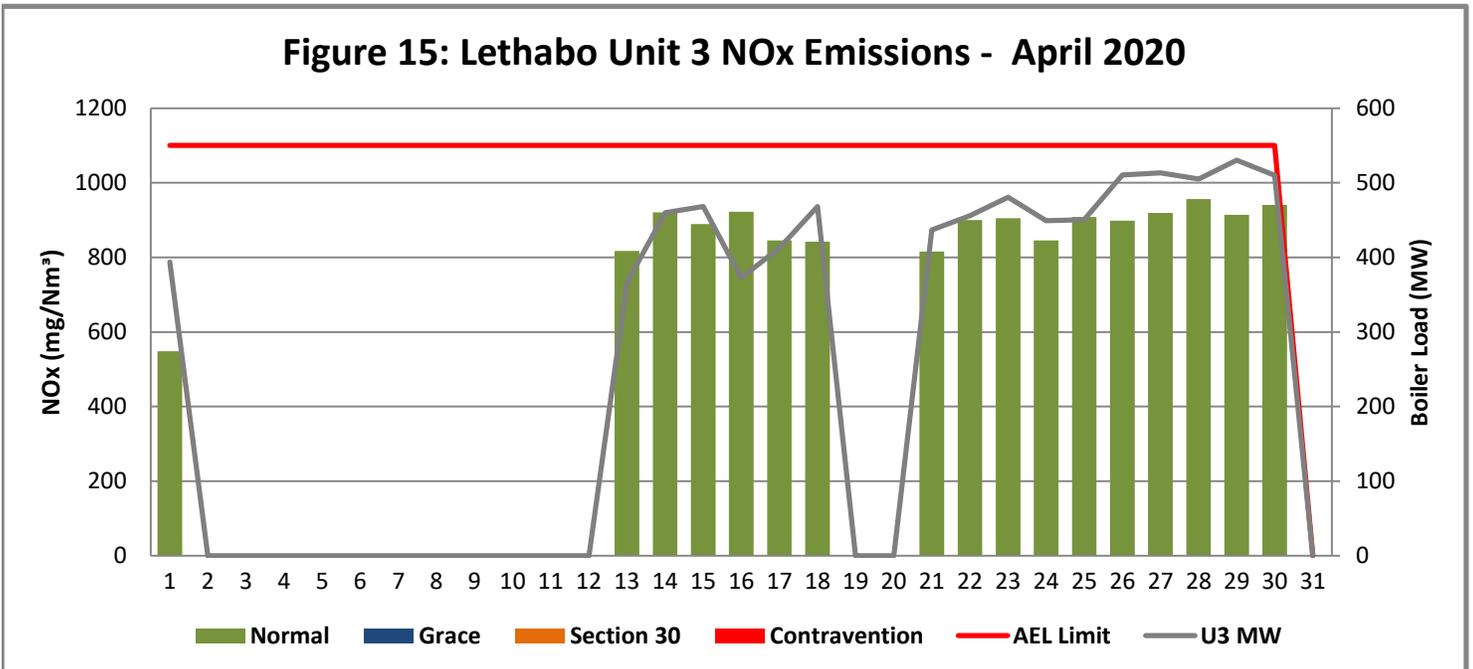


Figure 16: Lethabo Unit 4 NOx Emissions - April 2020

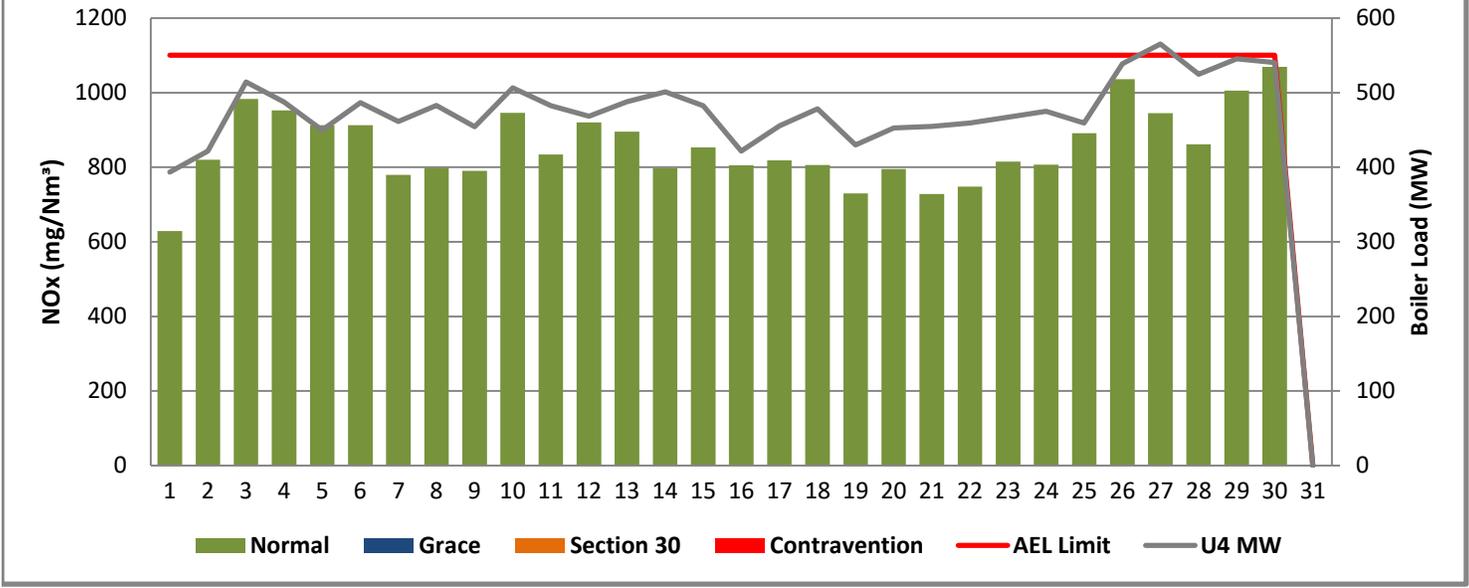
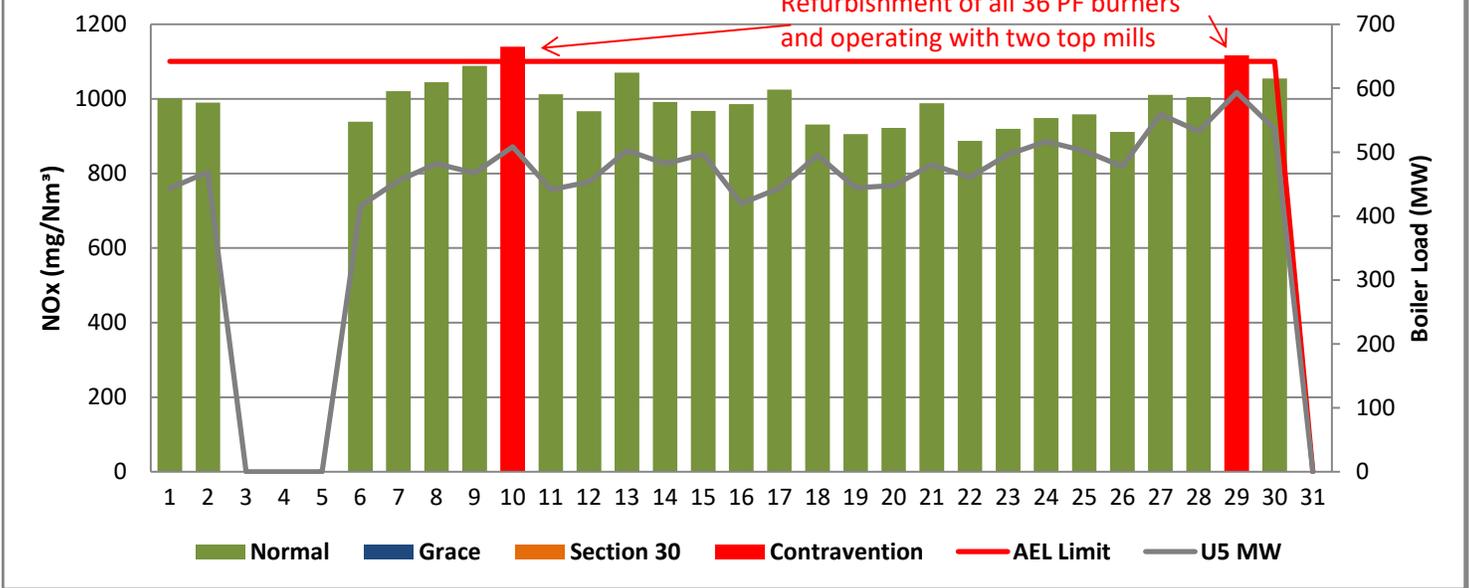
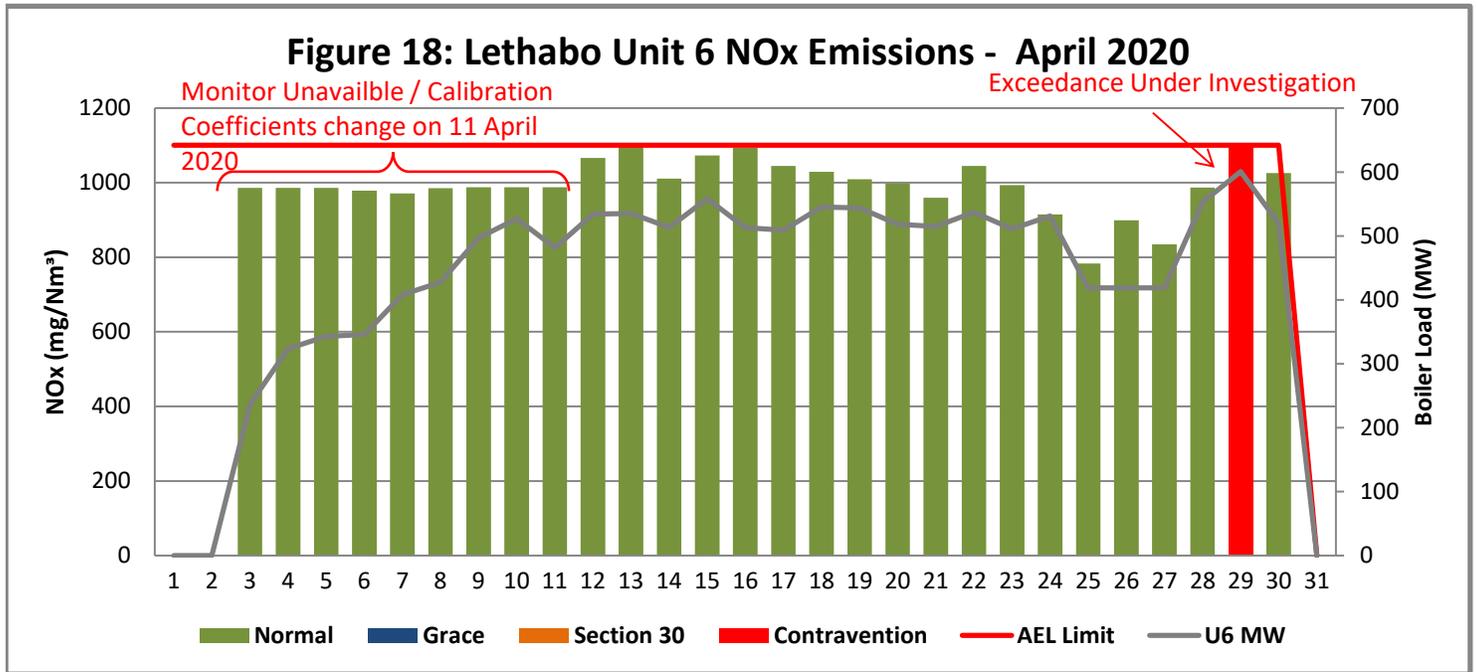


Figure 17: Lethabo Unit 5 NOx Emissions - April 2020





7. SHUT DOWN AND LIGHT UP INFORMATION

Table 7.1: PM Start-up information for the month of April 2020

Unit No.1	Cold Reserve						
Breaker Open (BO)	10:13 PM	2020/04/21					
Draught Group (DG) Shut Down (SD)	5:15 AM	2020/04/22					
BO to DG SD (duration)	00:07:01	DD:HH:MM					
Fires in time	1:25 AM	2020/04/25					
Synch. to Grid (or BC)	10:26 AM	2020/04/25					
Fires in to BC (duration)	00:09:01	DD:HH:MM					
Emissions below limit from BC (end date)	12:00 AM	2020/04/27					
Emissions below limit from BC (duration)	01:13:34	DD:HH:MM					

Unit No.2	Physical Over Speed Test		Black Furnace trip					
Breaker Open (BO)	12:22 AM	2020/04/16	4:56 PM	2020/04/22				
Draught Group (DG) Shut Down (SD)	DG did not trip or SD	DG did not trip or SD	5:25 PM	2020/04/22				
BO to DG SD (duration)	n/a	DD:HH:MM	00:00:29	DD:HH:MM				
Fires in time	4:42 AM	2020/04/16	5:30 PM	2020/04/22				
Synch. to Grid (or BC)	4:42 AM	2020/04/16	7:23 PM	2020/04/22				
Fires in to BC (duration)		DD:HH:MM	00:01:53	DD:HH:MM				
Emissions below limit from BC (end date)			12:00 AM	2020/04/23				
Emissions below limit from BC (duration)	n/a	DD:HH:MM	00:04:37	DD:HH:MM				

Unit No.3	Cold Reserve/ HP steam pipe inspection		Physical Over Speed Test		Unit 3 tripped due to water ingress into 20kv breaker ducting and diesel gen / Cold Reserve			
Breaker Open (BO)	10:49 AM	2020/04/01	10:23 PM	2020/04/16	1:43 PM	2020/04/18		
Draught Group (DG) Shut Down (SD)	5:40 AM	2020/04/02	DG did not trip or SD	DG did not trip or SD	4:55 PM	2020/04/18		
BO to DG SD (duration)	00:18:50	DD:HH:MM	n/a	DD:HH:MM	00:03:12	DD:HH:MM		
Fires in time	1:40 AM	2020/04/13	4:36 AM	2020/04/17	7:45 AM	2020/04/21		
Synch. to Grid (or BC)	6:31 AM	2020/04/13	4:36 AM	2020/04/17	11:49 AM	2020/04/21		
Fires in to BC (duration)	00:04:51	DD:HH:MM		DD:HH:MM	00:04:04	DD:HH:MM		
Emissions below limit from BC (end date)	12:00 AM	2020/04/16	4:00 AM	2020/04/18	12:00 AM	2020/04/25		
Emissions below limit from BC (duration)	02:17:29	DD:HH:MM	00:23:24	DD:HH:MM	03:12:11	DD:HH:MM		

Unit No.4	Boiler tube leak. & 20/11Kv unit transformer diff protection fault		Islanding test					
Breaker Open (BO)			9:30 PM	2020/04/08				
Draught Group (DG) Shut Down (SD)			9:40 PM	2020/04/08				
BO to DG SD (duration)		DD:HH:MM	00:00:10	DD:HH:MM				
Fires in time	3:40 AM	2020/04/01	5:43 AM	2020/04/09				
Synch. to Grid (or BC)	7:00 AM	2020/04/01	5:43 AM	2020/04/09				
Fires in to BC (duration)	00:03:20	DD:HH:MM		DD:HH:MM				
Emissions below limit from BC (end date)	12:00 AM	2020/04/02	12:00 AM	2020/04/10				
Emissions below limit from BC (duration)	00:17:00	DD:HH:MM	00:18:17	DD:HH:MM				

Unit No.5	Cold reserve							
Breaker Open (BO)	9:31 AM	2020/04/02						
Draught Group (DG) Shut Down (SD)	11:10 PM	2020/04/05						
BO to DG SD (duration)	03:13:38	DD:HH:MM						
Fires in time	3:05 AM	2020/04/06						
Synch. to Grid (or BC)	9:48 AM	2020/04/06						
Fires in to BC (duration)	00:06:43	DD:HH:MM						
Emissions below limit from BC (end date)	12:00 AM	2020/04/07						
Emissions below limit from BC (duration)	00:14:12	DD:HH:MM						

Unit No.6	<i>IR Outage</i>							
Breaker Open (BO)								
Draught Group (DG) Shut Down (SD)								
BO to DG SD (duration)		DD:HH:MM						
Fires in time	12:21 PM	2020/04/03						
Synch. to Grid (or BC)	12:21 PM	2020/04/03						
Fires in to BC (duration)		DD:HH:MM						
Emissions below limit from BC (end date)	12:00 AM	2020/04/07						
Emissions below limit from BC (duration)	03:11:39	DD:HH:MM						

7.2: Point Source emissions released during start-up (fires-in) and Shut-down (SD) for the month of April 2020 in mg/Nm³

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8. MAINTENANCE

Unit 1				
Beginning of	2020/04/10 00:00	2020/04/18 00:00		
Reason for Maintenance	LHI precip casing repairs.	LHI precip casing repairs.		
End (Time):	2020/04/10 19:19	2020/04/18 20:10		
Duration	19:19:00	20:10:00		

Unit 2				
Beginning of	2020/04/11 00:00	2020/04/20 00:04		
Reason for Maintenance	12WX42 dust plant hopping casing repairs	12WX42 dust plant hopping casing repairs		
End (Time):	2020/04/14 02:38	2020/04/22 16:56		
Duration	74:38:00	64:52:00		

Unit 3				
Beginning of				
Reason for Maintenance				
End (Time):				
Duration				

Unit 4				
Beginning of				
Reason for Maintenance				
End (Time):				
Duration				

Unit 5				
Beginning of				
Reason for Maintenance				
End (Time):				
Duration				

Unit 6				
Beginning of	2020/04/24 21:58			
Reason for Maintenance	SO3 plant convertor gas leak repairs			
End (Time):	2020/04/27 22:11			
Duration	72:13:00			

9. GENERAL

Unit 2:

The correction factor applied to the stack oxygen values on Unit 2 was very high due to the correlation curve that was determined from a faulty monitor. This was corrected with the back fitting exercise after the correlation tests were redone. This resulted in most of the previously reported NOx and SOx exceedances to no longer be exceedances.

Unit 4,5 and 6:

Research, Testing and Development division (RT&D) did verification test during late April 2020.

Unit 4

Calibrations were not done because of unavailability of calibration gas and unverified gas therefore the oxygen values were questionable and had to be adjusted. An average oxygen value of 6.18% was applied from 1-24 April 2020 based on verifications done by RT&D. On 24 April RT&D did another verification and an average of 7.13% was used from 25 - 30 April 2020.

Unit5

Calibrations were not done because of unavailability of calibration gas and unverified gas therefore the oxygen values were questionable and had to be adjusted. An average oxygen value of 6.8% was used for the whole of April 2020.

Exceedances on 10 and 29 April

All 36 PF burners were refurbished on Unit 5 during its outage to improve combustion. The refurbishment of all the burners simultaneously has a major impact on the combustion process, which improves the heat released and absorbed in the furnace. This directly influences the NOx produced.

The OEM performed an assessment on the burners to determine the amount of NOx produced after the refurbishment. The results from the assessment indicates that the expected NOx could vary between 904mg/Nm³ and 1166mg/Nm³ which is already higher than the limit of 1100mg/Nm³.

The production of NOx is increased when operating with high air flows and high temperatures. When the units are operated with top mills in service, the already high NOx (from after the refurbishment) is further increased which results in exceedance of the NOx limit of 1100mg/Nm³. The unit operated with two top mills in service on both occasions.

Unit 6:

Unit 6 was undergoing cold commission activities at the beginning of the month of April 2020.

When Unit 6 came back on load after it's outage there was no gaseous emission monitor installed at the unit, because it was moved to Unit 3 during the outage. The monitor at Unit 3 had problems and had to be sent away for repairs and therefore the Unit 6 monitor was used because the unit was off. The Unit 3 monitor was not repaired by the time Unit 6 came back on load on the 3 April 2020. C&I maintenance managed to borrow a spare monitor from Duvha power station for Unit 3, and on 6 April the monitor was moved back to Unit 6, therefore no gas values were available on Unit 6 from 3 to 6 April 2020. Only on 11 April 2020 the calibration coefficients were changed making the readings reliable, and therefore the monthly averages from 12 April to 30 April must be used for the SO2 and NO. These special arrangements form the reason for the delay in availability of the monitors and data.

Calibrations were not done because of unavailability of calibration gas and unverified gas therefore the oxygen values were questionable and had to be adjusted. An average oxygen value of 6.13% was applied from 3 - 30 April 2020 (unit only synchronized on 3rd of April).

Unit 2:

Unit 2 PM exceedances 20th - 24th April 2020:

20th - 21st April 2020 - RHO precipitator casing fields switched off due to collecting conveyor casing repairs (22wx42);

22nd April - Unit tripped on Black Furnace trip (16:56); Note RHO precipitator casing fields were still switched off due to collecting conveyor casing repairs (22wx42);

22nd April - Unit Synchronised on load (19:23)

22nd - 24th April 2020 - Unit under Light Up conditions

Note on the use of average values:

It is noted that, where it was required to utilize averages, it is the view of the station to take it as monitor unavailability (even if the monitor was reading and available, but the data was not reliable). This would ultimately adversely affect the percentage availability of the various monitors for that period.

Unit 1-6: Back Fitting of Valid Correlated Data:

Correlation Tests have been redone and implemented. Back Fitting was required based on correlation validity and implementation for the 2020 calendar year. Based on the back fitting exercise new exceedance in some cases would be added and some existing exceedances would be removed. This was the case for both Gaseous and Particulate matter emissions.

It is also noted that if the number of new exceedance days add up to greater than the allowable grace periods, it will be reported as contraventions. These would not have been reported and investigated as Section 30 incidents as the events were not known to the station at the time. These new Contraventions will be reported and investigated promptly. The following exceedances and associated contraventions are noted:

Unit 1 PM Exceedance on the 28th April 2020 was found to be an exceedance after the backfitting of the correlation curves were done.

Unit 6 PM Exceedance on the 11th-12th April 2020 was found to be an exceedance after the backfitting of the correlation curves were done.

Unit 6 PM Exceedance on the 14th-19th April 2020 was found to be an exceedance after the backfitting of the correlation curves were done.

ADDENDUM TO MONTHLY EMISSIONS REPORT

10. S30 INCIDENT OR LEGAL CONTRAVENTION REGISTER

To be completed in the case of a S30 incident or a legal contravention:

Unit no	Incident Start Date	Incident End Date	Incident Cause	Remedial action	S30 initial notification sent	Date S30 investigation report sent	Date DEA Acknowledgment	Date DEA Acceptable	Comments / Reference No.

11. PARTICULATE EMISSIONS

EMISSION RATE (ACTUAL EMISSION/MWh GENERATED - kg/MWh)

MONTH	UNIT 1	UNIT 2	UNIT 3	UNIT 4	UNIT 5	UNIT 6	STATION
MAY '19	0.23	0.24	0.81	0.34	OFF	0.33	0.37
JUNE '19	0.30	0.27	0.41	0.33	OFF	0.36	0.33
JULY '19	0.40	0.31	0.47	0.34	OFF	0.36	0.38
AUG '19	0.30	0.19	0.49	0.23	OFF	0.38	0.33
SEPT '19	0.31	0.17	0.46	OFF	OFF	0.35	0.32
OCT '19	0.35	0.24	0.48	OFF	OFF	0.45	0.38
NOV '19	0.31	0.47	0.37	OFF	OFF	0.59	0.43
DEC '19	0.58	0.48	0.51	OFF	OFF	0.77	0.59
JAN '20	0.42	0.52	0.62	0.25	OFF	0.73	0.49
FEB '20	0.56	0.46	0.67	0.29	0.27	OFF	0.47
MAR '20	0.37	0.58	0.72	0.26	0.33	OFF	0.45
APR '20	0.54	0.36	0.69	0.21	0.18	0.64	0.41

ADDENDUM TO MONTHLY EMISSIONS REPORT

12. DAILY EMISSIONS FIGURES

Final Dust Concentration (mg/Nm³) (Back Fitted Emissions)

Date	U1	U2	U3	U4	U5	U6	Limit
01-Apr	241	33	51	OFF	30	OFF	100
02-Apr	71	57	OFF	40	72	OFF	100
03-Apr	60	78	OFF	65	OFF	OFF	100
04-Apr	59	70	OFF	49	OFF	176	100
05-Apr	60	45	OFF	40	OFF	229	100
06-Apr	125	66	OFF	69	OFF	228	100
07-Apr	86	50	OFF	62	77	68	100
08-Apr	97	69	OFF	44	183	51	100
09-Apr	100	74	OFF	OFF	49	308	100
10-Apr	149	116	OFF	36	59	264	100
11-Apr	53	162	OFF	61	43	128	100
12-Apr	214	57	OFF	78	48	111	100
13-Apr	132	157	OFF	81	60	92	100
14-Apr	59	62	755	40	48	111	100
15-Apr	120	55	242	32	46	123	100
16-Apr	117	54	116	24	32	104	100
17-Apr	97	32	OFF	20	33	105	100
18-Apr	342	34	91	20	36	101	100
19-Apr	102	36	OFF	11	27	106	100
20-Apr	96	127	OFF	10	27	76	100
21-Apr	152	125	OFF	17	36	60	100
22-Apr	OFF	119	460	15	27	89	100
23-Apr	OFF	141	396	32	39	89	100
24-Apr	OFF	118	125	17	31	93	100
25-Apr	OFF	84	66	17	24	333	100
26-Apr	190	94	90	46	25	300	100
27-Apr	139	99	68	45	34	152	100
28-Apr	104	81	88	44	61	88	100
29-Apr	138	71	108	69	68	130	100
30-Apr	208	76	88	49	56	89	100

Final Dust Concentration (mg/Nm³) (Pre-Back Fitting)

Date	U1	U2	U3	U4	U5	U6	Limit
01-Apr	241	33	41	OFF	72	OFF	100
02-Apr	71	58	OFF	38	84	OFF	100
03-Apr	60	79	OFF	59	OFF	OFF	100
04-Apr	59	71	OFF	45	OFF	96	100
05-Apr	60	46	OFF	38	OFF	147	100
06-Apr	125	66	OFF	62	OFF	146	100
07-Apr	78	51	OFF	56	91	36	100
08-Apr	74	70	OFF	41	227	38	100
09-Apr	80	75	OFF	OFF	56	204	100
10-Apr	124	124	OFF	34	68	181	100
11-Apr	46	174	OFF	55	47	65	100
12-Apr	205	57	OFF	70	55	58	100
13-Apr	110	174	OFF	72	69	53	100
14-Apr	73	62	527	38	55	53	100
15-Apr	93	56	182	31	52	60	100
16-Apr	102	54	90	24	34	51	100
17-Apr	73	32	OFF	21	36	51	100
18-Apr	310	34	75	21	39	49	100
19-Apr	79	37	OFF	13	27	51	100
20-Apr	74	131	OFF	12	27	36	100
21-Apr	133	135	OFF	18	39	29	100
22-Apr	OFF	120	325	17	28	41	100
23-Apr	OFF	149	284	31	42	48	100
24-Apr	OFF	122	100	19	33	48	100
25-Apr	OFF	84	55	16	26	228	100
26-Apr	169	97	71	42	38	206	100
27-Apr	120	100	55	42	41	98	100
28-Apr	87	82	70	40	85	49	100
29-Apr	115	72	87	61	78	65	100
30-Apr	177	77	71	45	64	46	100

ADDENDUM TO MONTHLY EMISSIONS REPORT

Final SOx Concentration (mg/Nm³) (Back Fitted Emissions)

Date	U1	U2	U3	U4	U5	U6	Limit
01-Apr	1589	2019	1764	1776	1760	OFF	3500
02-Apr	1554	2118	OFF	1835	1763	OFF	3500
03-Apr	1623	2036	OFF	1884	OFF	2027	3500
04-Apr	1584	2120	OFF	1909	OFF	2027	3500
05-Apr	1620	1957	OFF	1809	OFF	2027	3500
06-Apr	1721	1981	OFF	1890	1810	2013	3500
07-Apr	1610	2043	OFF	1902	1814	1997	3500
08-Apr	1664	2117	OFF	1975	1807	2025	3500
09-Apr	1655	1976	OFF	1863	1701	2031	3500
10-Apr	1587	1997	OFF	1862	1769	2032	3500
11-Apr	1636	1935	OFF	1948	1593	2032	3500
12-Apr	1669	2057	OFF	1854	1564	2240	3500
13-Apr	1629	1949	1887	1851	1530	2203	3500
14-Apr	1608	1945	1864	1829	1470	2117	3500
15-Apr	1697	2006	1788	1883	1589	2275	3500
16-Apr	1800	2022	1856	1724	1384	2134	3500
17-Apr	1620	2037	1782	1875	1450	2175	3500
18-Apr	1606	2014	1797	1875	1523	2179	3500
19-Apr	1638	1941	OFF	1768	1482	2262	3500
20-Apr	1585	1977	OFF	1779	1489	2306	3500
21-Apr	1609	1845	1737	1727	1483	2102	3500
22-Apr	OFF	2016	1749	1816	1520	2142	3500
23-Apr	OFF	2016	1789	1829	1638	1867	3500
24-Apr	OFF	1926	1650	1828	1744	1907	3500
25-Apr	1660	1927	1541	1941	1738	1775	3500
26-Apr	1657	2030	1685	2084	1769	1714	3500
27-Apr	1631	1980	1781	2154	1794	1759	3500
28-Apr	1684	2005	1777	2089	1796	1949	3500
29-Apr	1676	1982	1783	2073	1853	1961	3500
30-Apr	1650	1950	1757	2034	1778	1880	3500

Final SOx Concentration (mg/Nm³) (Pre-Back Fitting)

Date	U1	U2	U3	U4	U5	U6	Limit
01-Apr	1589	2903	1764	1776	1760	OFF	3500
02-Apr	1554	3018	OFF	1835	1763	OFF	3500
03-Apr	1623	2842	OFF	1884	OFF	2027	3500
04-Apr	1584	3010	OFF	1909	OFF	2027	3500
05-Apr	1620	2801	OFF	1809	OFF	2027	3500
06-Apr	1721	2789	OFF	1890	1810	2013	3500
07-Apr	1610	2942	OFF	1902	1814	1997	3500
08-Apr	1664	3015	OFF	1975	1807	2025	3500
09-Apr	1655	2790	OFF	1863	1701	2031	3500
10-Apr	1587	2827	OFF	1862	1769	2032	3500
11-Apr	1636	2778	OFF	1948	1593	2032	3500
12-Apr	1669	3003	OFF	1854	1564	2240	3500
13-Apr	1629	2767	1887	1851	1530	2203	3500
14-Apr	1608	2745	1864	1829	1470	2117	3500
15-Apr	1697	2811	1788	1883	1589	2275	3500
16-Apr	1800	2841	1856	1724	1384	2134	3500
17-Apr	1620	2908	1782	1875	1450	2175	3500
18-Apr	1606	2853	1797	1875	1523	2179	3500
19-Apr	1638	2776	OFF	1768	1482	2262	3500
20-Apr	1585	2857	OFF	1779	1489	2306	3500
21-Apr	1609	2611	1737	1727	1483	2102	3500
22-Apr	OFF	2883	1749	1816	1520	2142	3500
23-Apr	OFF	2860	1789	1829	1638	1867	3500
24-Apr	OFF	2721	1650	1761	1744	1907	3500
25-Apr	1660	2737	1541	1870	1738	1775	3500
26-Apr	1657	2836	1685	2005	1769	1714	3500
27-Apr	1631	2757	1781	2070	1794	1759	3500
28-Apr	1684	2807	1777	2008	1796	1949	3500
29-Apr	1676	2765	1783	1994	1853	1961	3500
30-Apr	1650	2710	1757	1958	1778	1880	3500

ADDENDUM TO MONTHLY EMISSIONS REPORT

Final NOx Concentration (mg/Nm³) (Back Fitted Emissions)

Date	U1	U2	U3	U4	U5	U6	Limit
01-Apr	728	575	549	629	1001	OFF	1100
02-Apr	720	721	OFF	820	990	OFF	1100
03-Apr	808	717	OFF	983	OFF	986	1100
04-Apr	773	733	OFF	952	OFF	986	1100
05-Apr	752	657	OFF	913	OFF	986	1100
06-Apr	817	712	OFF	913	938	979	1100
07-Apr	606	720	OFF	780	1020	971	1100
08-Apr	804	771	OFF	799	1045	985	1100
09-Apr	779	730	OFF	791	1088	988	1100
10-Apr	616	662	OFF	946	1140	988	1100
11-Apr	689	672	OFF	834	1012	988	1100
12-Apr	756	670	OFF	920	966	1067	1100
13-Apr	775	675	817	896	1070	1096	1100
14-Apr	765	763	921	798	992	1011	1100
15-Apr	769	738	889	853	968	1073	1100
16-Apr	811	616	922	805	986	1094	1100
17-Apr	823	716	846	819	1025	1045	1100
18-Apr	830	692	842	806	931	1029	1100
19-Apr	848	756	OFF	730	905	1009	1100
20-Apr	840	813	OFF	796	922	999	1100
21-Apr	853	783	816	728	989	960	1100
22-Apr	OFF	773	900	748	888	1044	1100
23-Apr	OFF	775	905	815	920	994	1100
24-Apr	OFF	848	846	807	948	915	1100
25-Apr	831	875	908	891	959	783	1100
26-Apr	825	802	898	1037	912	900	1100
27-Apr	880	859	919	945	1011	835	1100
28-Apr	827	892	957	862	1005	987	1100
29-Apr	849	916	914	1005	1117	1106	1100
30-Apr	866	905	941	1069	1054	1026	1100

Final NOx Concentration (mg/Nm³) (Pre-Back Fitting)

Date	U1	U2	U3	U4	U5	U6	Limit
01-Apr	728	822	549	629	1001	OFF	1100
02-Apr	720	1024	OFF	820	990	OFF	1100
03-Apr	808	1000	OFF	983	OFF	986	1100
04-Apr	773	1039	OFF	952	OFF	986	1100
05-Apr	752	938	OFF	913	OFF	986	1100
06-Apr	817	1001	OFF	913	938	979	1100
07-Apr	606	1036	OFF	780	1020	971	1100
08-Apr	804	1098	OFF	799	1045	985	1100
09-Apr	779	1030	OFF	791	1088	988	1100
10-Apr	616	937	OFF	946	1140	988	1100
11-Apr	689	967	OFF	834	1012	988	1100
12-Apr	756	979	OFF	920	966	1067	1100
13-Apr	775	958	817	896	1070	1096	1100
14-Apr	765	1076	921	798	992	1011	1100
15-Apr	769	1035	889	853	968	1073	1100
16-Apr	811	864	922	805	986	1094	1100
17-Apr	823	1024	846	819	1025	1045	1100
18-Apr	830	982	842	806	931	1029	1100
19-Apr	848	1081	OFF	730	905	1009	1100
20-Apr	840	1174	OFF	796	922	999	1100
21-Apr	853	1107	816	728	989	960	1100
22-Apr	OFF	1108	900	748	888	1044	1100
23-Apr	OFF	1096	905	815	920	994	1100
24-Apr	OFF	1198	846	783	948	915	1100
25-Apr	831	1244	908	866	959	783	1100
26-Apr	825	1119	898	1012	912	900	1100
27-Apr	880	1195	919	917	1011	835	1100
28-Apr	827	1246	957	834	1005	987	1100
29-Apr	849	1277	914	979	1117	1106	1100
30-Apr	866	1257	941	1045	1054	1026	1100

ADDENDUM TO MONTHLY EMISSIONS REPORT

13. AVAILABILITY

ESP utilisation

Availability												
Month	Unit 1	Days Affected	Unit 2	Days Affected	Unit 3	Days Affected	Unit 4	Days Affected	Unit 5	Days Affected	Unit 6	Days Affected
May-19	100.00%	0	100.00%	0	100.00%	0	100.00%	0	OFF LOAD	0	100.00%	0
Jun-19	100.00%	0	100.00%	0	100.00%	0	100.00%	0	OFF LOAD	0	100.00%	0
Jul-19	100.00%	0	100.00%	0	100.00%	0	100.00%	0	OFF LOAD	0	100.00%	0
Aug-19	100.00%	0	100.00%	0	100.00%	0	100.00%	0	OFF LOAD	0	100.00%	0
Sep-19	100.00%	0	100.00%	0	100.00%	0	OFF LOAD	0	OFF LOAD	0	100.00%	0
Oct-19	100.00%	0	100.00%	0	100.00%	0	OFF LOAD	0	OFF LOAD	0	100.00%	0
Nov-19	98.33%	2	99.17%	1	100.00%	0	OFF LOAD	0	OFF LOAD	0	100.00%	0
Dec-19	98.39%	2	100.00%	0	100.00%	0	OFF LOAD	0	OFF LOAD	0	99.19%	1
Jan-20	95.16%	6	99.19%	1	100.00%	0	100.00%	0	OFF LOAD	0	100.00%	0
Feb-20	94.17%	3	100.00%	0	93.33%	4	100.00%	0	100.00%	0	OFF LOAD	0.00
Mar-20	99.19%	1	98.39%	2	97.58%	3	100.00%	0	100.00%	0	OFF LOAD	0.00
Apr-20	98.33%	2	95.00%	6	100.00%	0	100.00%	0	100.00%	0	100.00%	0

SO₃ plant utilisation

Availability												
Month	Unit 1	Days Affected	Unit 2	Days Affected	Unit 3	Days Affected	Unit 4	Days Affected	Unit 5	Days Affected	Unit 6	Days Affected
May-19	100.00%	0	100.00%	0	67.74%	10	93.55%	2	OFF LOAD	OFF LOAD	100.00%	0
Jun-19	100.00%	0	100.00%	0	98.00%	1	100.00%	0	OFF LOAD	OFF LOAD	100.00%	0
Jul-19	100.00%	0	100.00%	0	100.00%	0	100.00%	0	OFF LOAD	OFF LOAD	93.54%	2
Aug-19	100.00%	0	100.00%	0	100.00%	0	100.00%	0	OFF LOAD	OFF LOAD	100.00%	0
Sep-19	100.00%	0	100.00%	0	100.00%	0	OFF LOAD	OFF LOAD	OFF LOAD	OFF LOAD	94.60%	2
Oct-19	100.00%	0	100.00%	0	100.00%	0	OFF LOAD	OFF LOAD	OFF LOAD	OFF LOAD	96.77%	1
Nov-19	100.00%	0	100.00%	0	96.67%	1	100.00%	0	OFF LOAD	OFF LOAD	93.33%	2
Dec-19	100.00%	0	100.00%	0	100.00%	0	OFF LOAD	OFF LOAD	OFF LOAD	OFF LOAD	96.77%	1
Jan-20	100.00%	0	100.00%	0	100.00%	0	100.00%	0	OFF LOAD	OFF LOAD	100.00%	0
Feb-20	100.00%	0	100.00%	0	93.33%	1	100.00%	0	83.33%	4	OFF LOAD	OFF LOAD
Mar-20	100.00%	0	93.55%	2	87.10%	4	100.00%	0	64.52%	11	OFF LOAD	OFF LOAD
Apr-20	100.00%	0	100.00%	0	100.00%	0	100.00%	0	100.00%	0	90.00%	3

ADDENDUM TO MONTHLY EMISSIONS REPORT

Particulate Emission Monitors

Availability						
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
May-19	100.00%	100.00%	99.79%	100.00%	OFF	100.00%
Jun-19	99.86%	99.85%	98.47%	100.00%	OFF	97.27%
Jul-19	96.91%	97.08%	98.28%	97.70%	OFF	99.46%
Aug-19	98.19%	99.85%	100.00%	92.42%	OFF	98.26%
Sep-19	95.99%	99.28%	98.75%	OFF	OFF	98.51%
Oct-19	98.07%	100.00%	99.87%	OFF	OFF	98.66%
Nov-19	95.14%	95.00%	95.83%	OFF	OFF	77.98%
Dec-19	91.40%	100.00%	96.61%	OFF	OFF	68.55%
Jan-20	91.53%	98.92%	98.73%	99.81%	OFF	63.53%
Feb-20	75.98%	99.43%	98.42%	98.91%	99.68%	OFF
Mar-20	86.67%	96.97%	96.20%	99.44%	96.84%	OFF
Apr-20	91.26%	96.53%	98.53%	98.66%	96.22%	95.18%

Gaseous Emission Monitors

Availability												
Month	Unit 1		Unit 2		Unit 3		Unit 4		Unit 5		Unit 6	
	SO_x	NO_x										
May-19	99.19%	99.60%	99.31%	99.58%	0.00%	0.00%	99.70%	99.85%	OFF	OFF	99.86%	99.86%
Jun-19	99.72%	99.86%	97.84%	97.84%	43.19%	43.19%	100.00%	100.00%	OFF	OFF	95.69%	95.69%
Jul-19	96.55%	96.41%	96.37%	96.37%	98.06%	98.06%	96.94%	96.94%	OFF	OFF	99.87%	99.87%
Aug-19	96.10%	95.97%	99.55%	99.55%	99.87%	99.87%	85.98%	85.98%	OFF	OFF	93.75%	93.91%
Sep-19	95.98%	96.13%	99.17%	99.31%	99.31%	99.31%	OFF	OFF	OFF	OFF	90.95%	90.80%
Oct-19	97.41%	97.41%	100.00%	100.00%	100.00%	100.00%	OFF	OFF	OFF	OFF	100.00%	100.00%
Nov-19	98.75%	98.75%	98.61%	98.75%	99.79%	96.45%	OFF	OFF	OFF	OFF	99.81%	99.81%
Dec-19	99.33%	99.33%	99.13%	99.13%	99.23%	99.23%	OFF	OFF	OFF	OFF	92.61%	92.61%
Jan-20	99.64%	99.64%	100.00%	100.00%	100.00%	99.90%	78.95%	90.79%	OFF	OFF	100.00%	99.20%
Feb-20	99.84%	99.84%	96.55%	98.71%	98.85%	98.71%	0.00%	99.49%	85.71%	85.71%	0.00%	0.00%
Mar-20	99.73%	99.73%	98.80%	98.80%	99.68%	99.68%	71.12%	98.45%	98.79%	98.92%	OFF	OFF
Apr-20	100.00%	99.86%	100.00%	100.00%	96.68%	96.68%	99.83%	99.97%	99.96%	99.96%	67.82%	67.82%

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Oxygen Monitor Availability						
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
May-19	84.81%	99.44%	100.00%	99.70%	OFF	99.86%
Jun-19	99.86%	97.84%	99.58%	100.00%	OFF	95.42%
Jul-19	96.41%	96.24%	98.19%	97.08%	OFF	99.73%
Aug-19	96.77%	99.26%	99.87%	85.98%	OFF	93.91%
Sep-19	96.28%	99.17%	99.31%	OFF	OFF	90.95%
Oct-19	97.41%	100.00%	100.00%	OFF	OFF	99.46%
Nov-19	98.75%	100.00%	99.79%	OFF	OFF	99.81%
Dec-19	99.19%	98.94%	99.10%	OFF	OFF	100.00%
Jan-20	99.64%	99.19%	100.00%	82.95%	OFF	99.20%
Feb-20	99.84%	99.07%	98.85%	0.00%	67.86%	0.00%
Mar-20	100.00%	99.80%	97.24%	0.00%	99.19%	OFF
Apr-20	51.08%	100.00%	97.35%	0.00%	0.00%	0.00%

14. EFFICIENCY

ESP Efficiency (%)						
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
May-19	99.999%	99.999%	99.996%	99.998%	OFF	99.998%
Jun-19	99.999%	99.999%	99.998%	99.998%	OFF	99.998%
Jul-19	99.998%	99.998%	99.998%	99.998%	OFF	99.998%
Aug-19	99.998%	99.999%	99.997%	99.999%	OFF	99.998%
Sep-19	99.998%	99.999%	99.998%	OFF	OFF	99.998%
Oct-19	99.998%	99.999%	99.998%	OFF	OFF	99.998%
Nov-19	99.868%	99.785%	99.833%	OFF	OFF	99.729%
Dec-19	99.767%	99.787%	99.782%	OFF	OFF	99.654%
Jan-20	99.825%	99.768%	99.727%	99.086%	OFF	99.662%
Feb-20	99.998%	99.999%	99.997%	99.999%	99.998%	OFF
Mar-20	99.851%	99.749%	99.698%	99.892%	99.851%	OFF
Apr-20	99.777%	99.838%	99.695%	99.909%	99.914%	99.707%

ADDENDUM TO MONTHLY EMISSIONS REPORT

15. REMARKS

UNIT	MWLOSS	REASON	ACTUALSTARTDATE	ACTUALENDDATE
1	80	AM: LHI precip casing repairs	2020/04/10 00:00:00	2020/04/10 19:19:00
1	80	High stack emissions.	2020/04/15 18:25:00	2020/04/15 20:54:00
1	130	EF: High stack emissions	2020/04/15 20:54:00	2020/04/16 04:47:00
1	80	High stack emissions	2020/04/17 17:25:00	2020/04/18 00:00:00
1	80	LHI precip casing repairs.	2020/04/18 00:00:00	2020/04/18 20:10:00
1	0	Cold Reserve	2020/04/21 22:25:00	2020/04/25 10:26:00
1	297	System Generated Ramp Event for Event id : 1424175	2020/04/25 10:26:00	2020/04/25 13:26:00
1	179	EF:High stack emissions.	2020/04/28 20:37:00	2020/04/29 04:11:00
2	50	AM: 12WX42 dust plant hopping casing repairs	2020/04/11 00:00:00	2020/04/14 02:38:00
2	100	EF:High stack emissions.	2020/04/11 16:03:00	2020/04/12 00:03:00
2	118	High stack emissions	2020/04/12 00:03:00	2020/04/13 00:29:00
2	49	EF:High stack emissions.	2020/04/13 09:12:00	2020/04/14 02:38:00
2	593	Physical over speed test	2020/04/16 00:38:00	2020/04/16 04:42:00
2	297	System Generated Ramp Event for Event id : 1422056	2020/04/16 04:42:00	2020/04/16 06:12:00
2	118	AM: 22WX42 Dust plant hopper casing repairs.	2020/04/20 00:04:00	2020/04/22 16:56:00
2	74	EF: High stack emissions	2020/04/22 12:44:00	2020/04/22 16:56:00
2	593	Black Furnace trip	2020/04/22 16:56:00	2020/04/22 19:23:00
2	297	System Generated Ramp Event for Event id : 1424356	2020/04/22 19:23:00	2020/04/22 20:53:00
2	50	EF: High stack emissions	2020/04/25 16:38:00	2020/04/26 00:07:00
3	0	Cold Reserve	2020/04/01 10:55:00	2020/04/02 23:59:00
3	593	HP steam pipe inspection (IN)	2020/04/02 23:59:00	2020/04/12 10:58:00
3	0	Cold Reserve	2020/04/12 10:58:00	2020/04/13 06:31:00
3	297	System Generated Ramp Event for Event id : 1417955	2020/04/13 06:31:00	2020/04/13 09:31:00
3	175	AM: Dust plant standing	2020/04/16 04:20:00	2020/04/16 22:43:00
3	593	Physical over speed test	2020/04/16 22:43:00	2020/04/17 04:36:00
3	297	System Generated Ramp Event for Event id : 1422395	2020/04/17 04:36:00	2020/04/17 06:06:00
3	593	Unit 3 tripped due to water ingress into 20kv breaker ducting and diesel gen	2020/04/18 13:43:00	2020/04/20 19:27:00
3	0	Cold Reserve	2020/04/20 19:27:00	2020/04/21 11:49:00
3	297	System Generated Ramp Event for Event id : 1422873	2020/04/21 11:49:00	2020/04/21 14:49:00
3	150	High stack emissions.	2020/04/24 12:43:00	2020/04/24 18:10:00
4	593	Unit transformer 4A differential protection operation	2020/04/01 00:00:00	2020/04/01 07:00:00
4	297	System Generated Ramp Event for Event id : 1416180	2020/04/01 07:00:00	2020/04/01 10:00:00
4	593	Islanding test failed	2020/04/08 21:30:00	2020/04/09 05:43:00
4	296	System Generated Ramp Event for Event id : 1419891	2020/04/09 05:43:00	2020/04/09 08:13:00
5	0	Cold Reserve	2020/04/02 09:35:00	2020/04/06 09:48:00
5	297	System Generated Ramp Event for Event id : 1417741	2020/04/06 09:48:00	2020/04/06 12:48:00
6	593	System Generated Slip Event linked to PCLF Event : 1391756	2020/04/01 00:00:00	2020/04/03 07:45:00
6	354	System Generated Ramp Event for Event id : 1391756 (Recalculated)	2020/04/03 07:45:00	2020/04/03 10:10:00
6	593	Generator protection operated	2020/04/03 10:10:00	2020/04/03 12:21:00
6	297	System Generated Ramp Event for Event id : 1418037	2020/04/03 12:21:00	2020/04/03 13:51:00
6	198	SO3 plant convertor gas leak repairs	2020/04/24 21:58:00	2020/04/27 22:11:00
6	593	Physical over sped test	2020/04/30 23:07:00	2020/04/30 23:59:59

PM Exceedances		
U1.	ESP Poor Performance & Faulty opacity meter	01-Apr
U1.	ESP Poor Performance	06-Apr
U1.	ESP Poor Performance & opacity meter reading was being worked on	07-Apr
U1.	LHI ESP Casing Outage	10-Apr
U1.	ESP Casings Underperforming (LHI) LHI has high hopper levels	12-Apr
U1.	ESP Poor Performance	13-Apr
U1.	ESP Poor Performance & Faulty opacity meter (Calibration)	14-Apr
U1.	ESP Poor Performance	15-Apr
U1.	ESP Poor Performance	16-Apr
U1.	LHI ESP Casing Outage	18-Apr
U1.	ESP Poor Performance	19-Apr
U1.	Unit shut down for cold reserve on 21/04/2020 at 22:25	21-Apr
U1.	Unit Light up	26-Apr
U1.	Unit Light up & ESP Poor Performance	27-Apr
U1.	ESP Poor Performance	28-Apr
U1.	ESP Poor Performance & S03 Plant shut down due to fire (Contravention)	29-Apr
U1.	ESP Poor Performance S03 Plant tripped several times due to combustion chamber high temperature (Contravention)	30-Apr
U2.	ESP Poor Performance Opacity meter calibration done	02-Apr
U2.	Opacity meter were worked on and that is the reason for high emissions	07-Apr
U2.	S03 plant tripped LHI precip field switched off	10-Apr
U2.	LHI Casing Ouage for hopper inspection Manual rapping on request at 21:30	11-Apr
U2.	Precip casing Outage	13-Apr
U2.	RHO precip casing fields switched off due to collecting conveyor casing repairs (22wx42);	20-Apr
U2.	RHO precip casing fields switched off due to collecting conveyor casing repairs (22wx42); ESP Poor Performance	21-Apr
U2.	16:56 - Unit tripped on Black Furnace trip(3V4 LH Flame temperature low) 19:23 - Unit synchronised on load RHO precip casing fields switched off due to collecting conveyor casing repairs (22wx42);	22-Apr
U2.	Still under Light Up	23-Apr
U2.	Clean rapping from 11:30 am to 12:30 on all precip casing and unit dust emissions will increase during this activity	24-Apr
U2.	ESP Poor Performance	27-Apr
U3.	Light Up: Unit synchronised on load on 13/04/2020 at 06:32	14-Apr
U3.	Unit Light Up	15-Apr
U3.	Unit Light Up	16-Apr
U3.	Unit Light Up	22-Apr
U3.	Unit Light Up	23-Apr
U3.	Unit Light Up	24-Apr
U3.	ESP Poor Performance	29-Apr

U5.	Unit Light Up: 72 Hour grace Period ends: on 09/04/2020 at 09:48	08-Apr
U6.	Light Up	04-Apr
U6.	Light Up 72 HR Grace period ends at 12:21 06/04/2020. ESP Poor Performance & SO3 Plant challenges	05-Apr
U6.	Poor ESP Performance & SO3 Plant challenges	06-Apr
U6.	SO3 plant tripped on comms fault frequently & ESP poor Performance	09-Apr
U6.	Blockage of sulphur at the SO3 plant	10-Apr
U6.	SO3 Plant challenges and ESP Poor Performance	11-Apr
U6.	ESP Poor Performance (Contravention)	12-Apr
U6.	ESP Poor Performance	14-Apr
U6.	ESP Poor Performance	15-Apr
U6.	ESP Poor Performance	16-Apr
U6.	ESP Poor Performance (Contravention)	17-Apr
U6.	ESP Poor Performance (Contravention)	18-Apr
U6.	ESP Poor Performance (Contravention)	19-Apr
U6.	SO3 plant shutdown for converter gas leak repairs	25-Apr
U6.	SO3 Plant off	26-Apr
U6.	SO3 Plant In service at 12pm	27-Apr
U6.	ESP Poor Performance	29-Apr
NOX Exceedances		
U5.	Additional contributors besides monitor unreliability - the simultaneous refurbishment of all 36 burners and two top mills in operation.	10-Apr
U5.	Additional contributors besides monitor unreliability - the simultaneous refurbishment of all 36 burners and two top mills in operation.	29-Apr
U6.	Monitor Offline 3-6 April. Monitor commissioned calibration coefficients added on 11 April (No Exceedance)	03-Apr
U6.	Monitor Offline 3-6 April. Monitor commissioned calibration coefficients added on 11 April (No Exceedance)	04-Apr
U6.	Monitor Offline 3-6 April. Monitor commissioned calibration coefficients added on 11 April (No Exceedance)	05-Apr
U6.	Exceedance Under Investigation	29-Apr
SOX Exceedances		