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Date:
 03 March 2021

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Ref: 17/4/AEL/MP312/11/09

Dear Ms Nembilwi

KRIEL POWER STATION'S MONTHLY STACK EMISSIONS REPORT FOR THE MONTH OF SEPTEMBER 2020

This serves as the monthly report required in terms of Section 7.4 in Kriel Power Station's Atmospheric Emission License 17/4/AEL/MP312/11/09. The emissions are for the month of September 2020. Verified emissions of particulates matter, SO₂ and NO_x (as NO₂) are also included.

Raw Materials and Products

Table 1: Quantity of Raw Materials and Products used/produced for the month of September 2020

| Raw Materials and Products used | Raw Material Type | Units | Maximum Permitted Consumption / Rate (Quantity) | Consumption / Rate in Month of September 2020 |
|---------------------------------|--------------------------|------------|--|---|
| | Coal | Tons/month | 1 227 600 | 529 158.00 |
| | Fuel Oil | Tons/month | 5 000 | 1 876.08 |
| Production Rates | Product/ By-Product Name | Unit | Maximum Production Capacity Permitted (Quantity) | Production Rate in Month of September 2020 |
| | Ash | Tons/month | not specified | 491.3 |
| | RE PM | kg/MWh | not specified | 0.48 |

1/...

Abatement Technology

Table 2: Abatement Equipment Control Technology for September 2020.

| Associated Unit/Stack | Technology Type | Minimum Control Efficiency | Actual Efficiency (%) |
|-----------------------|-----------------|----------------------------|-----------------------|
| | | | September 2020 |
| Unit 1 | ESP | 98% | 99.67% |
| Unit 2 | ESP | 98% | 99.64% |
| Unit 3 | ESP | 98% | Outage |
| Unit 4 | ESP | 98% | 99.42% |
| Unit 5 | ESP | 98% | 99.50% |
| Unit 6 | ESP | 98% | 99.73% |

Energy Source Characteristics

Table 3: Energy Source Material Characteristics for the month of September 2020




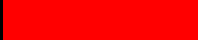
| Characteristic | Stipulated Range (Unit) | Monthly Average Content |
|-----------------|-------------------------|-------------------------|
| Sulphur Content | 0.6-1.2 (%) | 0.87 |
| Ash Content | 21-36 (%) | 26.56 |

Monthly Monitor Reliability

| Associated Unit/Stack | PM (%) | SOx (%) | NOx (%) |
|-----------------------|--------|---------|---------|
| North | 99.72% | 99.86% | 100% |
| South | 94.05% | 100% | 100% |

Emissions Reporting

Graph Legend Description

| Condition | Colour | Description |
|---------------|---|--|
| Normal |  | Emissions below Emission Limit Value (ELV) |
| Grace |  | Emissions above the ELV during grace period |
| Section 30 |  | Emissions above ELV during a NEMA S30 incident |
| Contravention |  | Emissions above ELV but outside grace or S30 incident conditions |

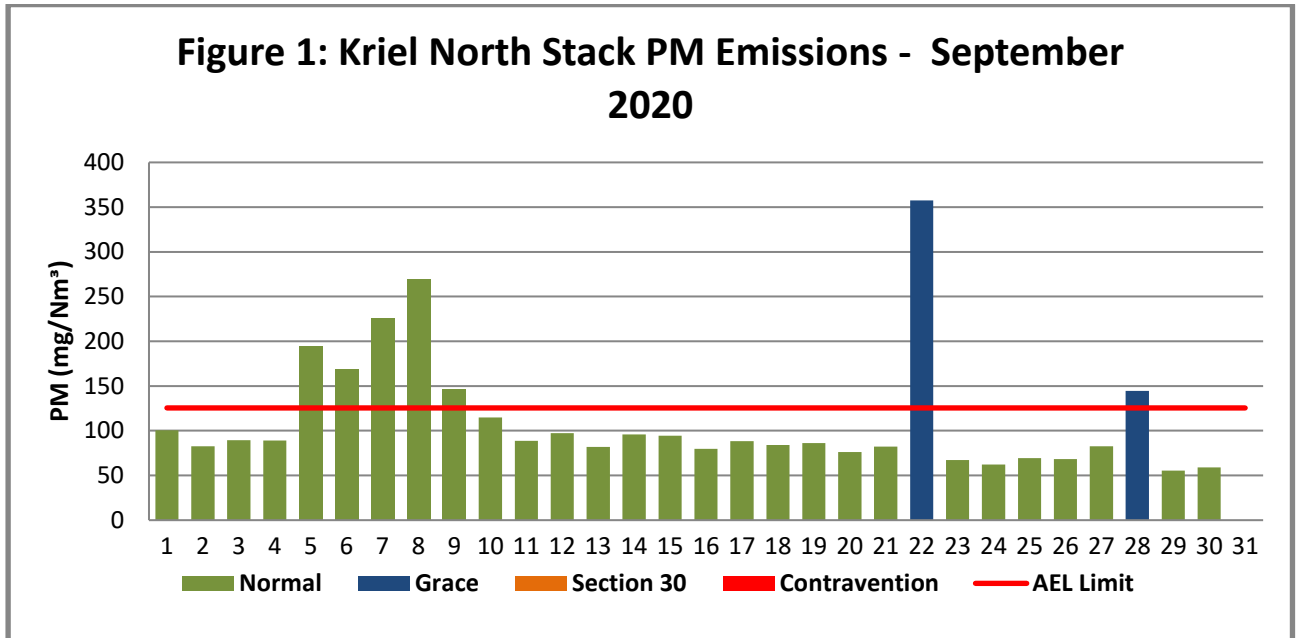


Figure 1: PM emissions (daily averages) for the month of September 2020 against emission limit for the North Stack; monthly average 113.39 mg/Nm³

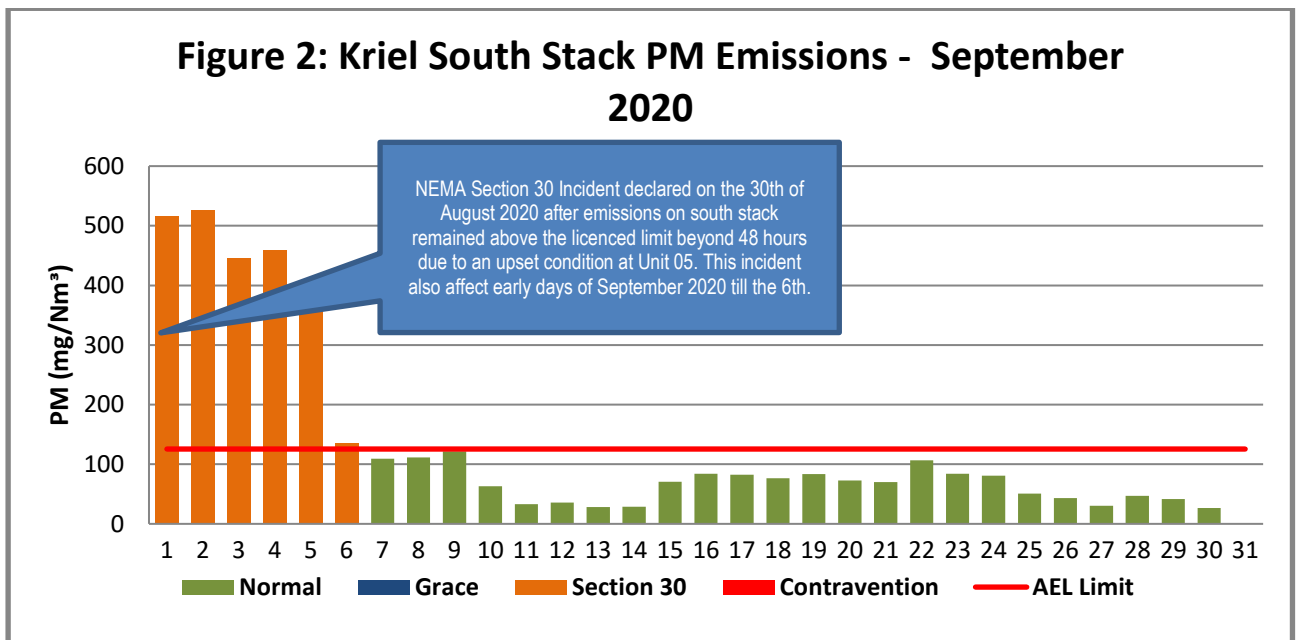


Figure 2: PM emissions (daily averages) for the month of September 2020 against emission limit for the South Stack; monthly average 134.28 mg/Nm³

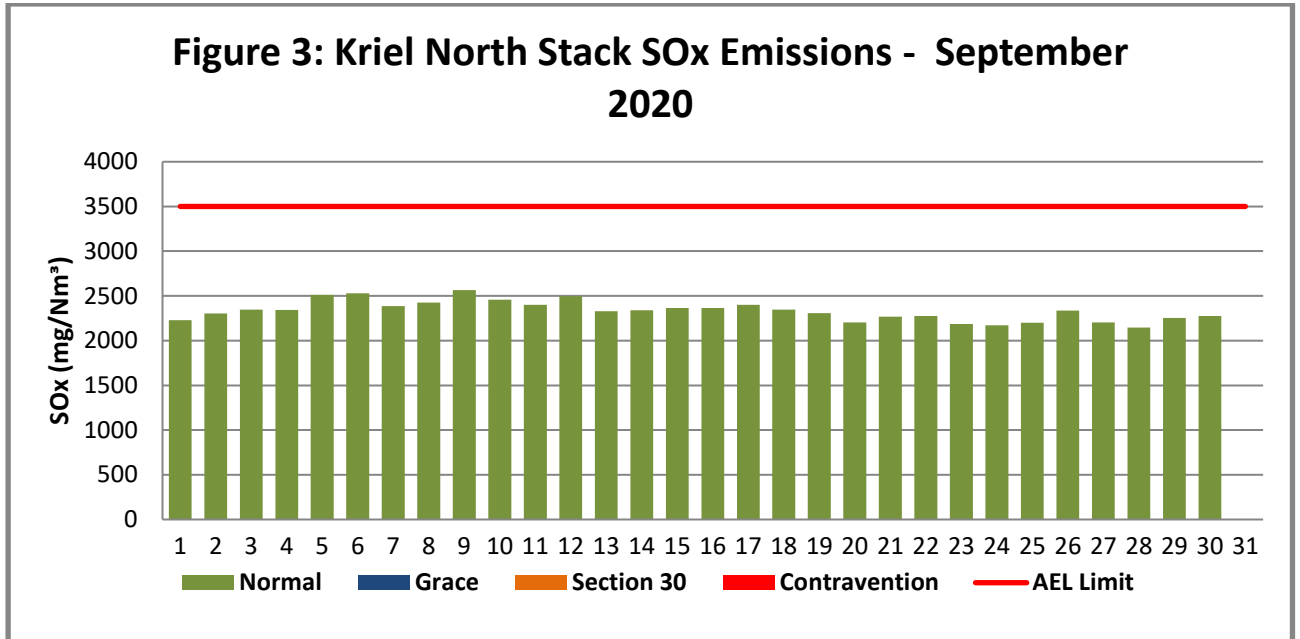


Figure 3. SO_x emissions (daily averages) for the month of September 2020 against emission limit for the North Stack. The SO_x Limit is 3500mg/Nm³.

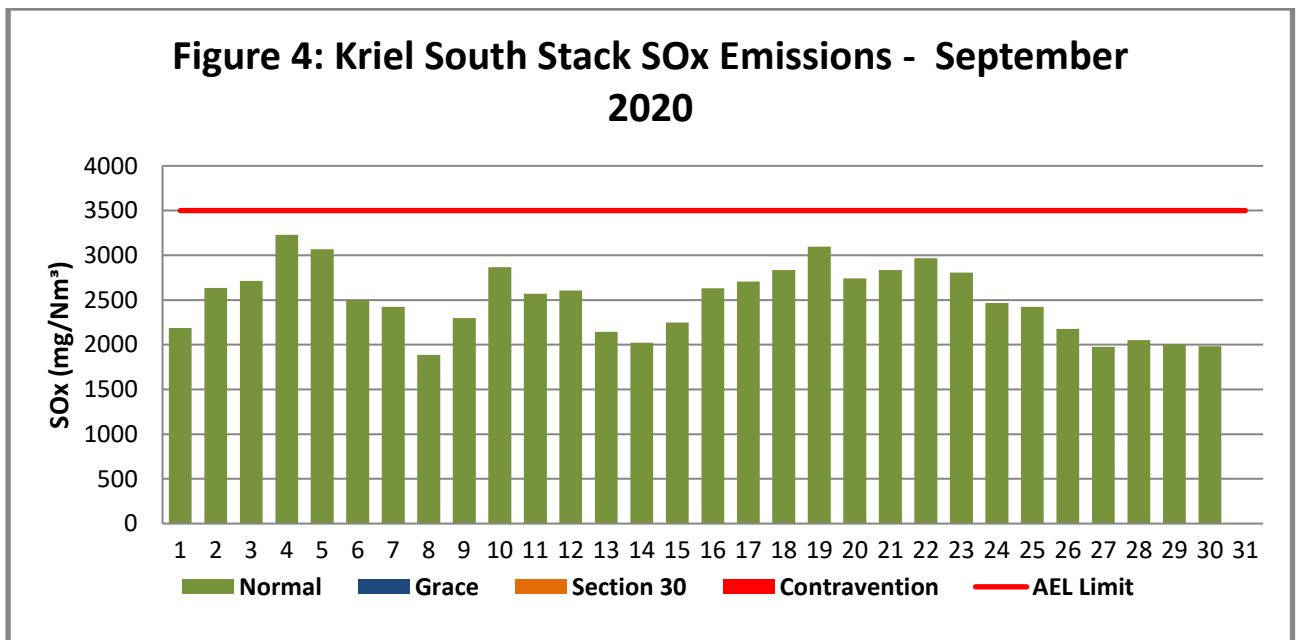


Figure 4. SO_x emissions (daily averages) for the month of September 2020 against emission limit for the South Stack. The SO_x Limit is 3500mg/Nm³.

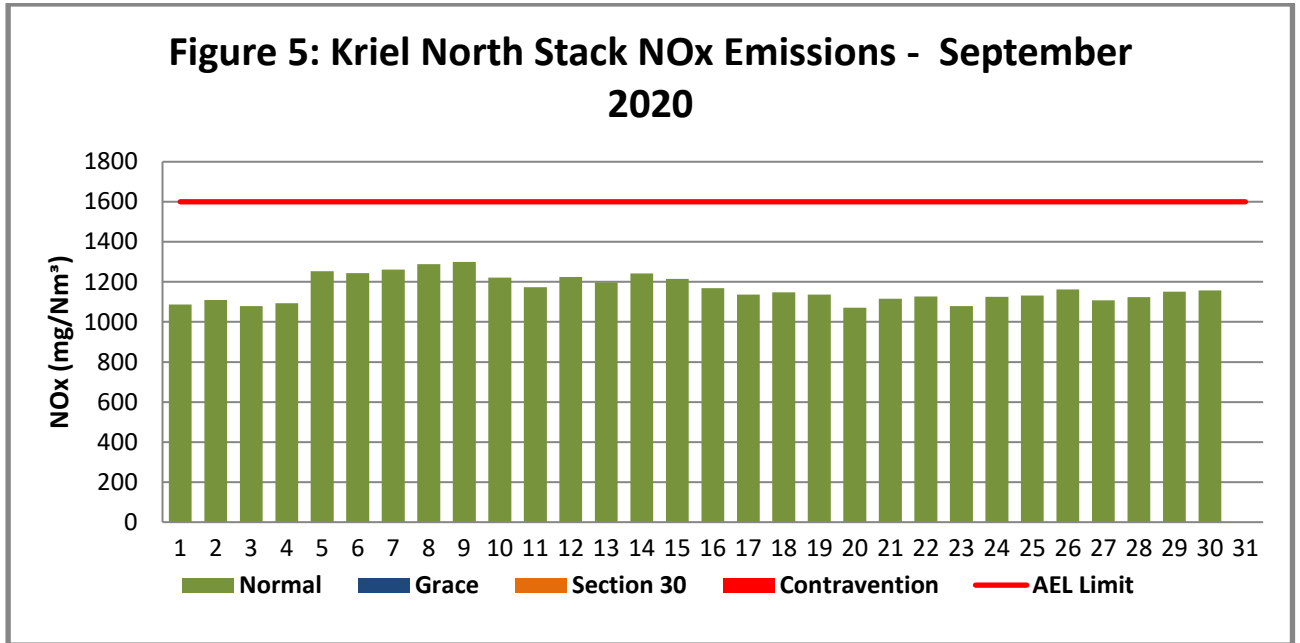


Figure 5. NO_x emissions (daily averages) for the month of September 2020 against emission limit for the North Stack. The NO_x Limit is 1600mg/Nm³.

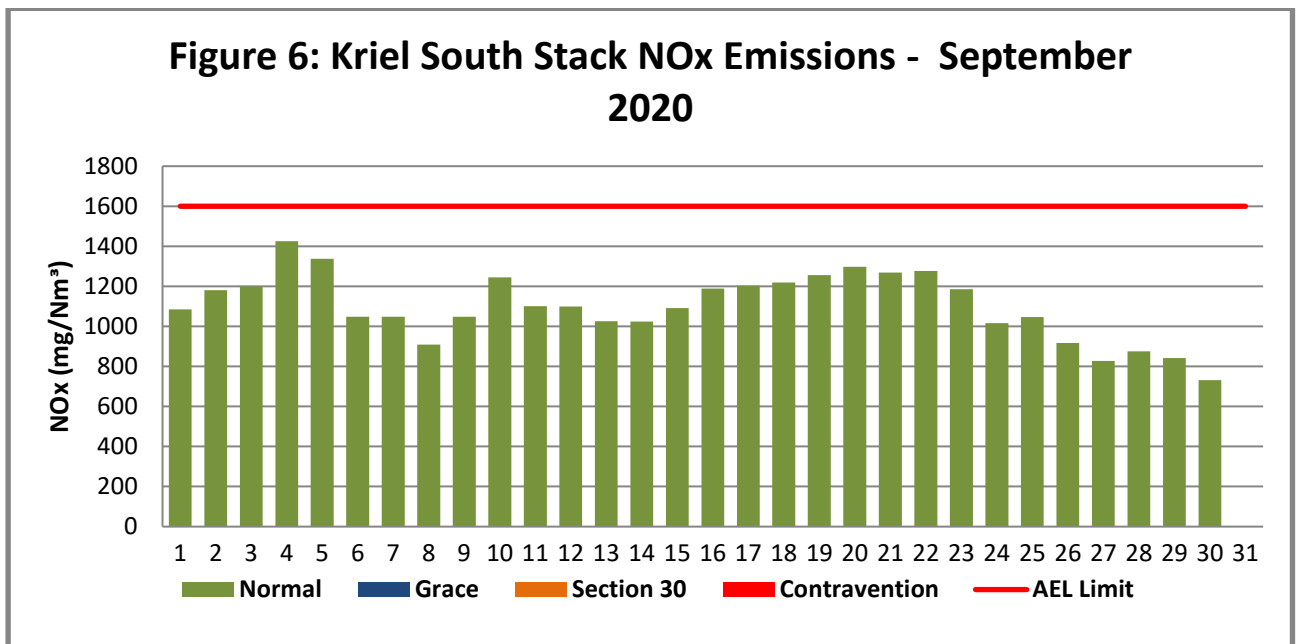


Figure 6. NO_x emissions (daily averages) for the month of September 2020 against emission limit for the South Stack. The NO_x Limit is 1600mg/Nm³.

Table 4: Monthly tonnages for the month September 2020

| Unit | PM (tons) | SO ₂ (tons) | NO ₂ (tons) |
|------|-----------|------------------------|------------------------|
| SUM | 491.3 | 10 153.9 | 4 675.7 |

Table 5: Each unit and respective days operating under normal operation and section 30 days respectively

Table 5.1: Operating days in compliance to PM AEL Limit - September 2020

| Associated Unit/Stack | Normal | Grace | Section 30 | Contravention | Total Exceedance | Average PM (mg/Nm ³) |
|-----------------------|--------|-------|------------|---------------|------------------|----------------------------------|
| North | 5 | 2 | 0 | 0 | 7 | 113.4 |
| South | 0 | 0 | 6 | 0 | 6 | 134.3 |

Table 5.2: Operating days in compliance to SOx AEL Limit - September 2020

| Associated Unit/Stack | Normal | Grace | Section 30 | Contravention | Total Exceedance | Average SOx (mg/Nm ³) |
|-----------------------|--------|-------|------------|---------------|------------------|-----------------------------------|
| North | 30 | 0 | 0 | 0 | 0 | 2 332.5 |
| South | 30 | 0 | 0 | 0 | 0 | 2 503.1 |

Table 5.3: Operating days in compliance to NOx AEL Limit - September 2020

| Associated Unit/Stack | Normal | Grace | Section 30 | Contravention | Total Exceedance | Average NOx (mg/Nm ³) |
|-----------------------|--------|-------|------------|---------------|------------------|-----------------------------------|
| North | 30 | 0 | 0 | 0 | 0 | 1 164.4 |
| South | 30 | 0 | 0 | 0 | 0 | 1 100.7 |

Light up information

Table 6: PM Start-up information for the month of September 2020

| North Stack | Event 1 | | Event 2 | | Event 3 | | Event 4 | |
|--|----------|----------|----------|------------|----------|------------|-------------|-------------|
| Unit No. | no event | | Unit 2 | | no event | | Unit 2 | |
| Breaker Open (BO) | | | 12:55 AM | 2020/09/02 | 8:40 AM | 2020/09/21 | 3:00 AM | 2020/09/19 |
| Draught Group (DG) Shut Down (SD) | | | 11:50 AM | 2020/09/02 | 11:10 PM | 2020/09/21 | 5:30 PM | 2020/09/19 |
| BO to DG SD (duration) | | DD:HH:MM | 00:10:55 | DD:HH:MM | 00:14:30 | DD:HH:MM | 00:14:30 | DD:HH:MM |
| Fires in time | | | 8:20 PM | 2020/09/03 | | | 11:10 AM | 2020/09/20 |
| Synch. to Grid (or BC) | | | 1:25 AM | 2020/09/04 | | | 7:40 AM | 2020/09/21 |
| Fires in to BC (duration) | | DD:HH:MM | 00:05:05 | DD:HH:MM | | DD:HH:MM | 00:20:30 | DD:HH:MM |
| Emissions below limit from BC (end date) | | | 12:00 AM | 2020/08/26 | | | not > limit | not > limit |
| Emissions below limit from BC (duration) | | DD:HH:MM | ##### | DD:HH:MM | | DD:HH:MM | n/a | DD:HH:MM |

| North Stack ...Cont. | Event 1 | Event 2 | Event 3 | Event 4 |
|----------------------|----------|----------|----------|----------|
| Unit No. | no event | no event | no event | no event |

| | | | | | | | | |
|---|----------|------------|----------|------------|----------|------------|----------|------------|
| Breaker Open (BO) | 6:35 AM | 2020/09/28 | 4:15 PM | 2020/09/29 | 12:25 AM | 2020/10/01 | 12:25 PM | 2020/10/01 |
| Draught Group (DG) Shut Down (SD) | 10:20 PM | 2020/09/28 | 9:40 AM | 2020/09/30 | 7:45 AM | 2020/10/01 | 2:00 AM | 2020/10/02 |
| BO to DG SD (duration) | 00:15:45 | DD:HH:MM | 00:17:25 | DD:HH:MM | 00:07:20 | DD:HH:MM | 00:13:35 | DD:HH:MM |
| Fires in time | | | | | | | | |
| Synch. to Grid (or BC) | | | | | | | | |
| Fires in to BC (duration) | | DD:HH:MM | | DD:HH:MM | | DD:HH:MM | | DD:HH:MM |
| Emissions below limit from BC (end date) | | | | | | | | |
| Emissions below limit from BC (duration) | | DD:HH:MM | | DD:HH:MM | | DD:HH:MM | | DD:HH:MM |

| South Stack | <i>Event 1</i> | | <i>Event 2</i> | | <i>Event 3</i> | | <i>Event 4</i> | |
|---|-----------------|----------|-----------------------|-----------------------|-----------------|------------|----------------|---------------|
| Unit No. | <i>no event</i> | | <i>Unit 5</i> | | <i>no event</i> | | <i>Unit 6</i> | |
| Breaker Open (BO) | | | 11:15 PM | 2020/09/04 | 10:35 PM | 2020/09/02 | BO previously | BO previously |
| Draught Group (DG) Shut Down (SD) | | | 12:05 PM | 2020/09/05 | 3:10 PM | 2020/09/03 | n/a | n/a |
| BO to DG SD (duration) | | DD:HH:MM | 00:12:50 | DD:HH:MM | 00:16:35 | DD:HH:MM | n/a | DD:HH:MM |
| Fires in time | | | 7:35 AM | 2020/09/07 | | | 1:20 AM | 2020/09/04 |
| Synch. to Grid (or BC) | | | 11:45 AM | 2020/09/07 | | | 2:45 PM | 2020/09/04 |
| Fires in to BC (duration) | | DD:HH:MM | 00:04:10 | DD:HH:MM | | DD:HH:MM | 00:13:25 | DD:HH:MM |
| Emissions below limit from BC (end date) | | | <i>not > limit</i> | <i>not > limit</i> | | | 12:00 AM | 2020/08/26 |
| Emissions below limit from BC (duration) | | DD:HH:MM | n/a | DD:HH:MM | | DD:HH:MM | ##### | DD:HH:MM |

| South Stack ...Cont. | <i>Event 1</i> | | <i>Event 2</i> | | <i>Event 3</i> | | <i>Event 4</i> | |
|---|----------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|
| Unit No. | <i>Unit 4</i> | | <i>no event</i> | | <i>no event</i> | | <i>no event</i> | |
| Breaker Open (BO) | 10:25 PM | 2020/09/09 | 2:05 AM | 2020/09/25 | 12:30 PM | 2020/09/25 | 8:45 PM | 2020/09/26 |
| Draught Group (DG) Shut Down (SD) | 9:10 AM | 2020/09/10 | 4:10 AM | 2020/09/25 | 10:50 AM | 2020/09/26 | 5:05 AM | 2020/09/27 |
| BO to DG SD (duration) | 00:10:45 | DD:HH:MM | 00:02:05 | DD:HH:MM | 00:22:20 | DD:HH:MM | 00:08:20 | DD:HH:MM |
| Fires in time | 7:15 AM | 2020/09/14 | | | | | | |
| Synch. to Grid (or BC) | 3:05 PM | 2020/09/14 | | | | | | |
| Fires in to BC (duration) | 00:07:50 | DD:HH:MM | | DD:HH:MM | | DD:HH:MM | | DD:HH:MM |
| Emissions below limit from BC (end date) | 12:00 AM | 2020/08/26 | | | | | | |

| | | | | | | | | |
|--|-------|----------|--|----------|--|----------|--|----------|
| Emissions below limit from BC (duration) | ##### | DD:HH:MM | | DD:HH:MM | | DD:HH:MM | | DD:HH:MM |
|--|-------|----------|--|----------|--|----------|--|----------|

Complaints Register

Table 7: Complaints for the month of September 2020.

| Source Code/ Name | Root Cause Analysis | Calculation of Impacts/ emissions associated with the incident | Dispersion modeling of pollutants where applicable | Measures implemented to prevent reoccurrence | Date by which measure will be implemented |
|--|---------------------|--|--|--|---|
| There was no complaint related to air quality received during the month of September 2020. | | | | | |

General

The particulate matter (PM10) emissions on the North common stack were within the monthly limit during the month of September 2020. North stack recorded the monthly PM10 average emissions figure of **113.4 mg/Nm3**. South stack recorded PM10 monthly average figure of **65.88 mg/Nm3** under normal operation (07 – 30 September 2020) and the overall figure of **118.99 mg/Nm3** including days under abnormal/upset condition (01- 30 September 2020). The gaseous (NOx & SOx) emissions on the north stack were also within the daily limit; however there were days at which South stack (NOx & Sox) monitors were defective during the month of September 2020.

South Stack – Gaseous Monitors Unavailable

On the 8th of September 2020, the NOx and SOx monitor on the south stack failed and became unavailable; this was exactly a day after the said monitor was calibrated by the OEM. The investigations immediately carried out by maintenance department found that the monitor had failed due to a faulty O2/H2O analyzer. The OEM was then called to site to fix and calibrate the aforementioned monitors which were successfully fixed and restored to service on the 14th of September 2020. The rest of the days at which the monitor was functional during the month of September 2020 was used to determine emissions compliance status as indicated above (para 1).

The above discussed monitor incident has impacted on Kriel Power Station’s statutory reporting requirements of NOx emissions on the south stack. However, based on the investigation on maximum emissions release rate conducted at both north and south emissions stacks, gaseous emissions at Kriel Power Station have never come close to exceeding the limits during Plant Start-Up, Upset or Maintenance and Shutdown Conditions. Based on previous readings during normal operations, the gaseous emission limits have not been exceeded then either. Kriel Power Station is confident that NOx and SOx emissions on south stack have been within the limit during the period when the monitor was unavailable.

NB: The rest of the information demonstrating compliance with the emission license conditions is supplied in the annual emission reports sent to your office.

Kriel Power Station’s List of NEMA Section 30 Incidents for 2020/2021 Financial Year

| Month | Description of Section30 Incidents - including the reference number | Root Cause (s) | Status of S30 Incident with DEFF (open or | Remarks |
|-------|---|----------------|---|---------|
|-------|---|----------------|---|---------|

| | | | closed) | |
|---------------------|--|---|---------|---------------------|
| April - 2020 | No section 30 incident reported. | | | No event to report. |
| May - 2020 | No section 30 incident reported. | | | No event to report. |
| June - 2020 | No section 30 incident reported. | | | No event to report. |
| July - 2020 | No section 30 incident reported. | | | No event to report. |
| Aug - 2020 | Upset condition in Unit 05 exceeded 48 hours grace period. | High hopper levels and ash transportation backlog at Unit 05 due to MCB | | Incident processed |
| Sep - 2020 | No section 30 incident reported. | | | No event to report. |
| Oct - 2020 | | | | |
| Nov - 2020 | | | | |
| Dec - 2020 | | | | |
| Jan - 2021 | | | | |
| Feb - 2021 | | | | |
| Mar - 2021 | | | | |