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| Effective Date | February 2022 | | ı |
| Review Date | February 2024 | | |

Date: 2022/11/30

Tel: 014 762 6820

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Stanley Koenaite

Waterberg District Municipality Private Bag X1018 Modimolle 0510

skoenaite@waterberg.gov.za

Ref: H16/1/13-AEL/M1/R1 - November 2022

Dear Mr Koenaite

MEDUPI POWER STATION MONTHLY EMISSIONS REPORT FOR THE MONTH OF NOVEMBER 2022

This document serves as the monthly emissions report required in terms of Section 7.7.1 of Medupi Power Station Provisional Atmospheric Emission License (AEL), H16/1/13-AEL/M1/R1.

This report is a reflection of Unit 1, 2, 3, 5 and 6 gaseous and particulate emissions performance against the AEL limit for the month of November 2022 only.

1. Raw Materials and Products

TABLE 1: QUANTITY OF RAW MATERIALS AND PRODUCTS CONSUMPTION IN NOVEMBER 2022

| Raw Materials and | Raw Material Type | Unit | Maximum Permitted Consumption/ Rate (Quantity) | Consumption - November 2022 |
|-------------------------|------------------------------|------------|--|--|
| Products | Coal | Tons/month | 1 875 000 | 991 090 |
| used | Fuel Oil | Tons/month | 20 000 | 1 114 |
| | | | | |
| Production Rates | Product/ By- Product Name | Unit | Maximum Production Capacity Permitted (Quantity) | Production Rate in Month of November 2022 |
| | Energy | GWh | 3 571.2 | 2 144.74 |
| | Ash Emitted | Tons/month | not specified | 333.6 |

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TABLE 2: DAILY CONSUMPTION AND PRODUCTION RATES

| | | Repor | table hou | rs of Ope | eration | | Coal | | Р | roduction | n rate (MV | V) | |
|--------|------|-------|-----------|-----------|---------|------|-------|-----|-----|-----------|------------|-----|-----|
| Date | U1 | U2 | U3 | U4 | U5 | U6 | usage | U1 | U2 | U3 | U4 | U5 | U6 |
| 01-Nov | 24,0 | 0,0 | 24,0 | 0,0 | 24,0 | 24,0 | 27122 | 701 | off | 666 | off | 721 | 644 |
| 02-Nov | 24,0 | 0,0 | 24,0 | 0,0 | 24,0 | 24,0 | 27730 | 682 | off | 724 | off | 695 | 678 |
| 03-Nov | 24,0 | 0,0 | 24,0 | 0,0 | 24,0 | 24,0 | 28040 | 727 | off | 718 | off | 726 | 608 |
| 04-Nov | 24,0 | 0,0 | 24,0 | 0,0 | 24,0 | 24,0 | 29745 | 722 | off | 754 | off | 761 | 656 |
| 05-Nov | 24,0 | 0,0 | 24,0 | 0,0 | 24,0 | 24,0 | 29241 | 716 | off | 753 | off | 777 | 669 |
| 06-Nov | 24,0 | 0,0 | 24,0 | 0,0 | 24,0 | 24,0 | 27777 | 694 | off | 688 | off | 727 | 649 |
| 07-Nov | 24,0 | 0,0 | 24,0 | 0,0 | 24,0 | 24,0 | 30770 | 743 | off | 739 | off | 755 | 750 |
| 08-Nov | 24,0 | 0,0 | 24,0 | 0,0 | 24,0 | 24,0 | 28226 | 737 | off | 769 | off | 650 | 729 |
| 09-Nov | 24,0 | 0,0 | 24,0 | 0,0 | 24,0 | 24,0 | 25992 | 723 | off | 698 | off | 565 | 734 |
| 10-Nov | 24,0 | 0,0 | 24,0 | 0,0 | 24,0 | 24,0 | 26848 | 686 | off | 743 | off | 646 | 672 |
| 11-Nov | 24,0 | 0,0 | 24,0 | 0,0 | 24,0 | 24,0 | 27776 | 733 | off | 681 | off | 614 | 770 |
| 12-Nov | 24,0 | 0,0 | 24,0 | 0,0 | 24,0 | 24,0 | 28849 | 742 | off | 701 | off | 590 | 770 |
| 13-Nov | 24,0 | 0,0 | 24,0 | 0,0 | 24,0 | 24,0 | 33464 | 759 | 330 | 768 | off | 601 | 744 |
| 14-Nov | 24,0 | 9,6 | 24,0 | 0,0 | 24,0 | 24,0 | 34120 | 732 | 582 | 759 | off | 579 | 714 |
| 15-Nov | 24,0 | 24,0 | 24,0 | 0,0 | 24,0 | 24,0 | 32084 | 653 | 639 | 676 | off | 586 | 653 |
| 16-Nov | 24,0 | 24,0 | 24,0 | 0,0 | 24,0 | 24,0 | 38733 | 754 | 794 | 779 | off | 687 | 699 |
| 17-Nov | 24,0 | 24,0 | 24,0 | 0,0 | 24,0 | 24,0 | 37692 | 738 | 769 | 784 | off | 680 | 723 |
| 18-Nov | 24,0 | 24,0 | 24,0 | 0,0 | 24,0 | 24,0 | 38411 | 761 | 766 | 780 | off | 638 | 708 |
| 19-Nov | 24,0 | 24,0 | 24,0 | 0,0 | 24,0 | 24,0 | 37694 | 761 | 738 | 746 | off | 694 | 662 |
| 20-Nov | 24,0 | 14,3 | 24,0 | 0,0 | 24,0 | 24,0 | 35858 | 722 | 685 | 746 | off | 693 | 682 |
| 21-Nov | 24,0 | 0,8 | 24,0 | 0,0 | 24,0 | 24,0 | 35506 | 707 | 720 | 765 | off | 606 | 600 |
| 22-Nov | 24,0 | 0,0 | 24,0 | 0,0 | 24,0 | 24,0 | 35748 | 731 | 645 | 750 | off | 650 | 709 |
| 23-Nov | 24,0 | 11,8 | 24,0 | 0,0 | 24,0 | 24,0 | 34665 | 741 | 676 | 649 | off | 620 | 645 |
| 24-Nov | 24,0 | 24,0 | 24,0 | 0,0 | 24,0 | 24,0 | 37847 | 747 | 723 | 731 | off | 662 | 673 |
| 25-Nov | 24,0 | 24,0 | 24,0 | 0,0 | 24,0 | 24,0 | 38499 | 765 | 770 | 786 | off | 727 | 746 |
| 26-Nov | 24,0 | 24,0 | 24,0 | 0,0 | 24,0 | 24,0 | 36569 | 764 | 761 | 788 | off | 654 | 740 |
| 27-Nov | 24,0 | 24,0 | 24,0 | 0,0 | 24,0 | 24,0 | 35311 | 756 | 735 | 745 | off | 622 | 660 |
| 28-Nov | 24,0 | 24,0 | 24,0 | 0,0 | 24,0 | 24,0 | 36105 | 762 | 792 | 778 | off | 661 | 686 |
| 29-Nov | 24,0 | 24,0 | 24,0 | 0,0 | 24,0 | 24,0 | 36604 | 763 | 783 | 789 | off | 679 | 678 |
| 30-Nov | 24,0 | 24,0 | 24,0 | 0,0 | 24,0 | 24,0 | 38064 | 752 | 754 | 794 | off | 670 | 674 |

NB: reportable hours less than 24 highlighted in pink

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2. Abatement Technology

Table 3: Abatement Equipment Control Technology efficiency for month of November 2022

| Associated Unit/Stack | Technology Type | Efficiency | FFP Utilization |
|-----------------------|---------------------------|------------|-----------------|
| Unit 1 | Fabric Filter Plant (FFP) | 99,937% | 100% |
| Unit 2 | Fabric Filter Plant (FFP) | 99,959% | 100% |
| Unit 3 | Fabric Filter Plant (FFP) | 99,891% | 100% |
| Unit 4 | Fabric Filter Plant (FFP) | Unit Off | Unit Off |
| Unit 5 | Fabric Filter Plant (FFP) | 99,825% | 100% |
| Unit 6 | Fabric Filter Plant (FFP) | 99,854% | 100% |

Note: FFP does not have bypass mode operation, hence plant 100% Utilised.

3. Energy Source Characteristics

TABLE 4: ENERGY SOURCE MATERIAL CHARACTERISTICS FOR THE MONTH OF NOVEMBER 2022

| Characteristic | Stipulated Range (% by weight on a dry basis) | Monthly Average Content (% by weight on a dry basis) | |
|-----------------|--|--|--|
| | Coal | | |
| Sulphur Content | 1.3 - 2.2 | 1.28 | |
| Ash Content | 35 - 39 | 33.74 | |

TABLE 5: ENERGY SOURCE MATERIAL CHARACTERISTICS FOR THE MONTH OF NOVEMBER 2022

| Characteristic | Stipulated Range (%) | Monthly Average Content (%) |
|-----------------|----------------------|-----------------------------|
| | 0 |)il |
| Sulphur Content | 0.5 - 3.5 | 2.45 |
| Ash Content | 0.02 - 0.1 | 0.025 |

4. Emissions Reporting

Medupi Power Station uses Continuous Emission Monitoring System which uses the extractive method for analysis.

The emission limits are as follows:

 SO_2 Monthly = 3500 mg/Nm³ Dust Daily= 50 mg/Nm³ NO₂ Daily= 750 mg/Nm³

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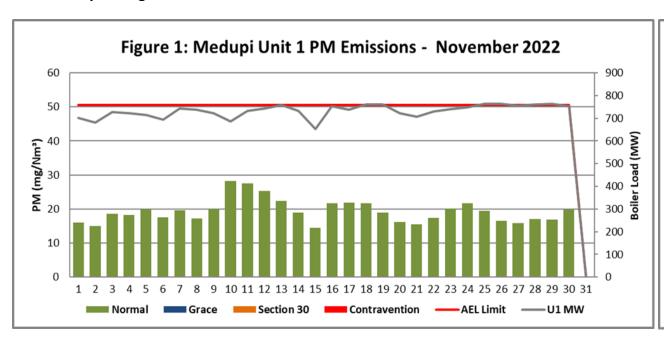
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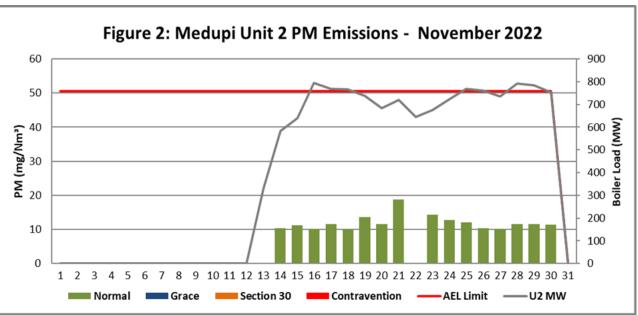
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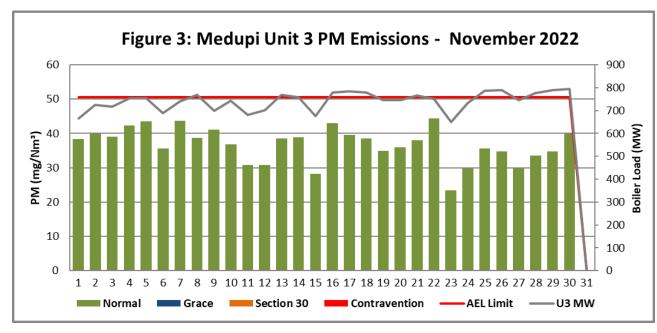


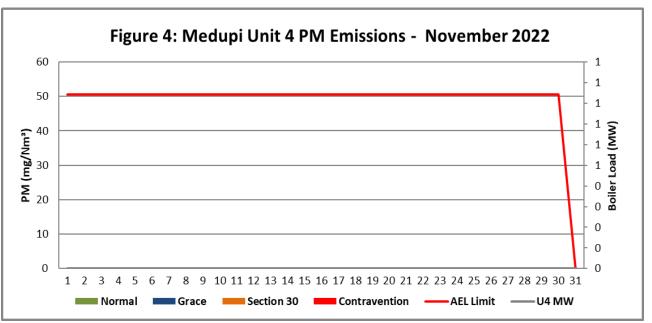
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4.1 PM Daily Averages





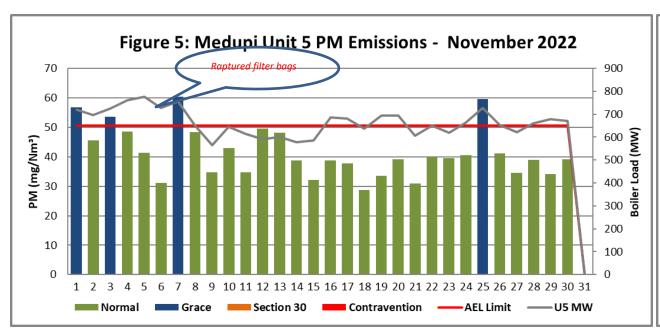


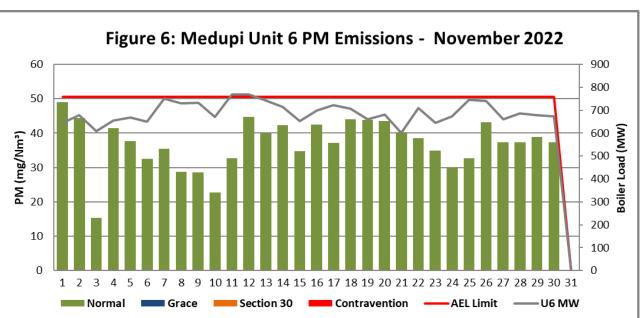


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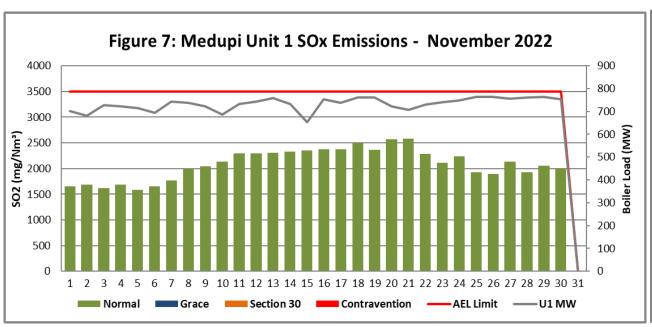


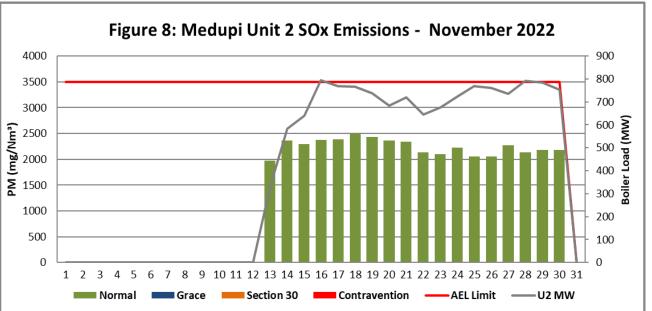
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4.2 SOx Daily Averages

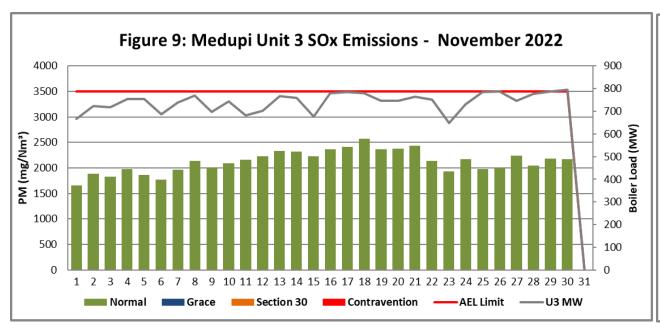


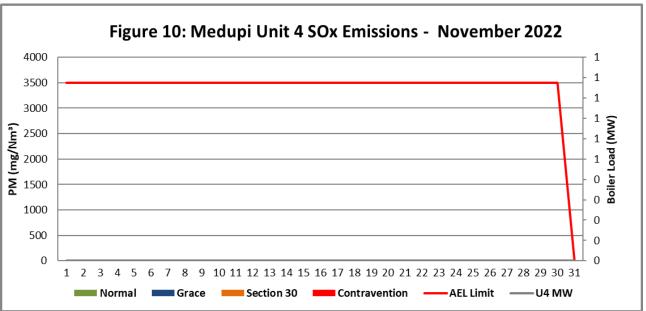


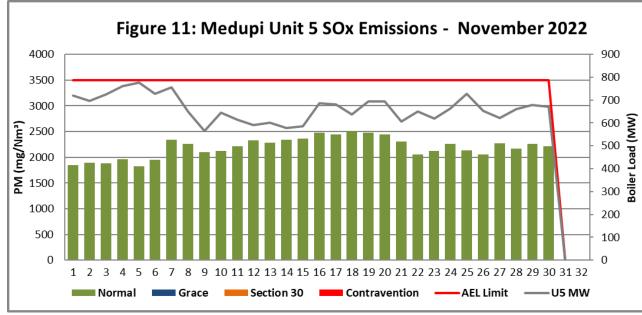
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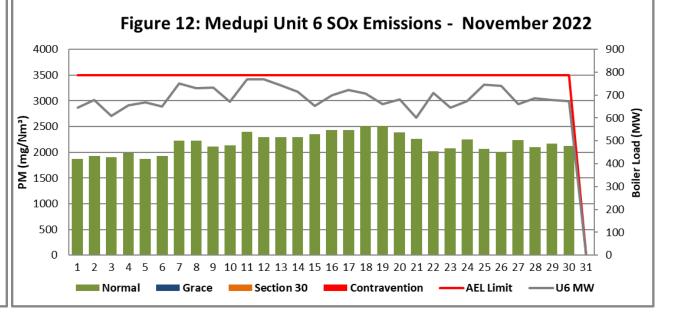


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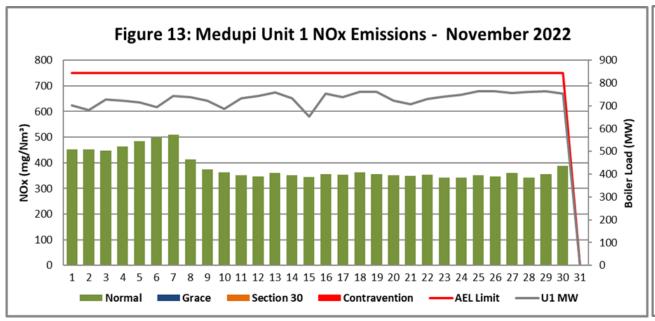


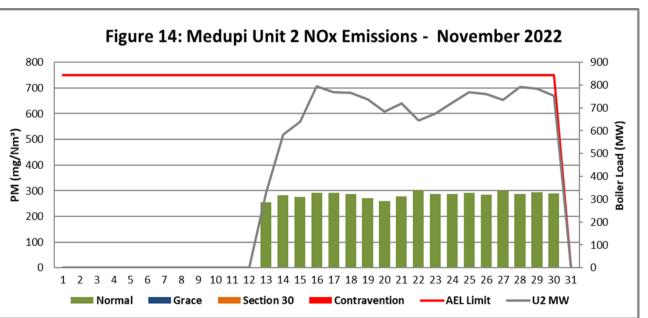


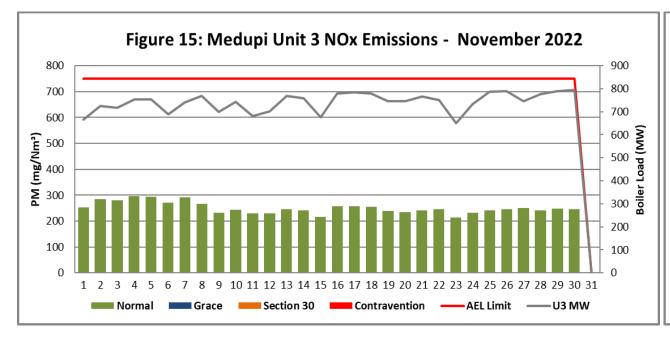


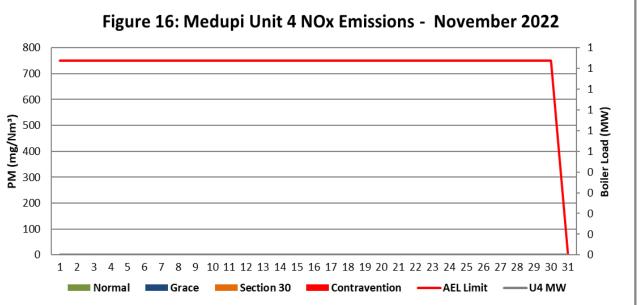
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4.3 NOx Daily Averages





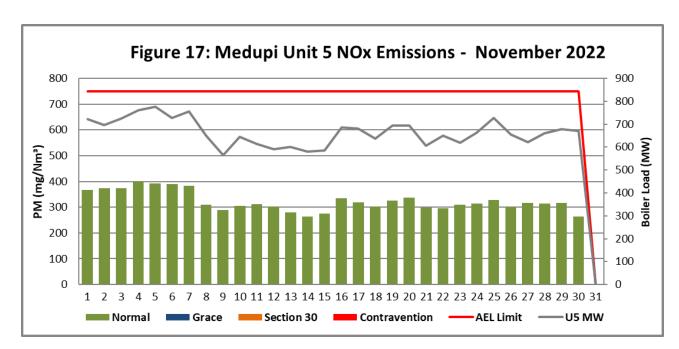


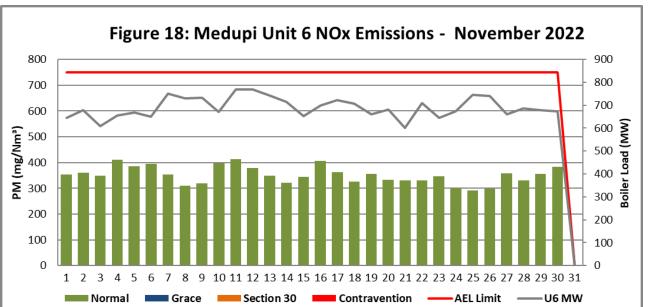


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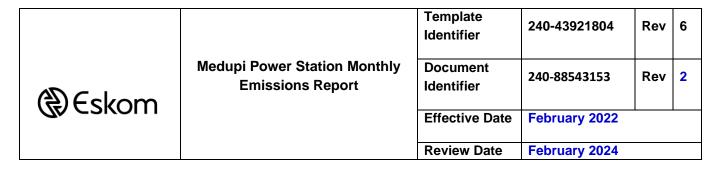


Table 6: Monthly tonnages for the month of November 2022

| Associated Unit/Stack | PM | SO ₂ | NO ₂ |
|-----------------------|----------|-----------------|-----------------|
| Unit 1 | 42.0 | 4 541.7 | 830.0 |
| Unit 2 | 15.6 | 3 758.2 | 477.2 |
| Unit 3 | 87.3 | 5 057.8 | 596.1 |
| Unit 4 | Unit Off | Unit Off | Unit Off |
| Unit 5 | 101.9 | 5 343.1 | 795.7 |
| Unit 6 | 86.8 | 5 108.3 | 822.3 |
| SUM | 333.6 | 23 809.1 | 3 521.3 |

TABLE 7: MONTHLY AVERAGES FOR THE MONTH OF NOVEMBER 2022

| Associated Unit/Stack | Average PM (mg/Nm³) | Average SOx (mg/Nm³) | Average NOx (mg/Nm³) |
|-----------------------|---------------------|-------------------------|-------------------------|
| Unit 1 | 19.3 | 2 091.5 | 383.8 |
| Unit 2 | 12.0 | 2 240.8 | 284.3 |
| Unit 3 | 36.7 | 2 130.8 | 251.0 |
| Unit 4 | Unit Off | Unit Off | Unit Off |
| Unit 5 | 41.4 | 2 196.4 | 323.0 |
| Unit 6 | 37.1 | 2 179.2 | 351.6 |

4 Continuous Emission Monitoring Systems (CEMS)

Unit 1, 2, 3, 5 and 6 Continuous Emission Monitoring Systems were in operation at all times when the unit was on load. For days where the CEMS were readings incorrectly are indicated on the performance graphs above.

TABLE 8: PERIODS DURING WHICH CEMS WAS INOPERATIVE

| Date | CEMS status | Comments |
|------|-------------|----------|
| | | |

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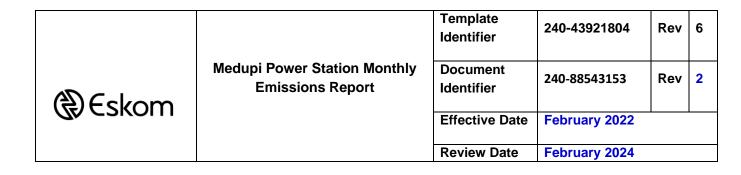


TABLE 9: CEMS MONITOR RELIABILITY PERCENTAGE (%)

| Associated Unit/Stack | PM | SO₂ | NO | CO ₂ | O ₂ |
|--------------------------|----------|----------|----------|-----------------|----------------|
| Unit 1 | 99,6 | 99,2 | 99,2 | 98,6 | 99,2 |
| Unit 2 | 100,0 | 100,0 | 100,0 | 99,9 | 98,5 |
| Unit 3 | 99,2 | 98,9 | 98,9 | 94,9 | 20,6 |
| Unit 4 | Unit Off | Unit off | Unit off | Unit off | Unit off |
| Unit 5 | 97,2 | 96,7 | 96,7 | 97,1 | 96,7 |
| Unit 6 | 97,2 | 96,3 | 96,3 | 47,9 | 97,1 |

5 CEMS Calibration certificates and equipment used for calibration

A service provider was appointed to calibrate CEMS equipment at Medupi Power Station, calibration certificates to be made available upon request. The service appointed for the CEMS calibration is in a process of obtaining SANAS accreditation. Verification of the CEMS after calibration is conducted internally by Eskom.

6 Ambient Air Quality Monitoring Report

The Ambient Air Quality Monitoring and Dust fall-out report for November 2022 was e-mailed to the Licensing Authority.

7 Visual inspection of the exterior walls of the fuel oil tanks and TVOC Estimation

Visual inspection was conducted and there were no leaks observed on the exterior walls of the fuel oil tanks.

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TABLE 10: TOTAL VOLATILE ORGANIC COMPOUND (TVOC) FOR NOVEMBER 2022

| CALCULATION | OF EMISSIONS OF TOTAL VOLATILE COMPO | UNDS FROM FUEL OIL ST | ORAGE TANKS |
|-----------------------|--|-----------------------------|-------------|
| Date: | Wednesday, 30 November 2022 | | |
| Station: | Medupi Power Station | | |
| Province: | Limpopo Province | | |
| Tank no. | 1-2 | | |
| Description: | Outdoor fuel oil storage tank | | |
| Tank Type: | Vertical fixed roof (vented to atmosphere) | | |
| Material stored: | Fuel Oil 150 | | |
| | MONTHLY INPUT DATA FOR TI | HE STATION | |
| | Please only insert relevant monthly data input | s into the blue cells below | |
| | Choose from a dropdown menu in | the green cells | |
| | The total VOC emissions for the month | are in the <u>red cells</u> | |
| | IMPORTANT: Do not change any other cells with | thout consulting the AQ CoE | |
| MONTH: | November | | |
| GENERAL INFO | RMATION: | Data | Unit |
| Total number of | fuel oil tanks: | 2 | NA |
| Height of tank:* | | 14,2 | m |
| Diameter of tank | : | 12 | m |
| Net fuel oil throu | ghput for the month: | <u>1114</u> | tons/month |
| Molecular weigh | t of the fuel oil: | 166,00 | Lb/lb-mole |
| METEROLOGIC | AL DATA FOR THE MONTH | Data | Unit |
| Daily average an | nbient temperature | 26,22 | °C |
| | ambient temperature | 32,63 | °C |
| Daily minimum a | mbient temperature | 20,19 | °C |
| Daily ambient te | mperature range | 12,44 | °C |
| Daily total insola | tion factor | 6,14 | kWh/m²/day |
| - Tank paint coloι | ır | Aluminum/Specular | NA |
| Tank paint solar | absorbtance | 0,39 | NA |
| FINAL OUTPUT | | Result | Unit |
| Breathing losses | s: | 0,72 | kg/month |
| Working losses: | | 0,03 kg/month | |
| | | | |

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8 Air quality improvements initiatives and public education and awareness campaigns

No awareness campaigns for this month.

9 Complaints Register

TABLE 6: COMPLAINTS FOR THE MONTH OF NOVEMBER 2022

| Source Code/ Name | Air pollution complaints received | Calculation of Impacts/ emissions associated with the incident | Date of complaint and date of response by the license holder | Results of investigation | Action taken to resolve the complaint |
|----------------------|-----------------------------------|--|--|--------------------------|---------------------------------------|
| N/A | No complaints received | N/A | N/A | N/A | N/A |

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pp

Zweli Witbooi

GENERAL MANAGER: MEDUPI POWER STATION

Medupi Power Station Monthly Emissions Report

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Date: 2022/12/30

| Compiled by: | Lutendo Murovhi Frantamba France Environmental Officer | _Date: 30 December 2022 |
|----------------------------------|--|--------------------------|
| Verified by: | Malose Langa System Engineer Boiler | _Date: 30 December 2022 |
| Verified by: | Kevin Mathebula System Engineer C&I | _Date: 30 December 2022 |
| Supported by: | Mokgadi Dikgale PP Environmental Manager | _ Date: 30 December 2022 |
| Supported by: | Jabulani Mkhatshwa Manager Engineering Group Manager | _ Date: 2022-12-30 |
| I Zweli Witbooi, declar correct. | es that the information provided in this re | eport is accurate and |
| Vours sincoroly | | |

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