

Ambient Air and Sound
Monthly Report

STONEY TRAIL AGGREGATE RESOURCE

BURNCO

LAFARGE



Volker Stevin
Contracting Ltd.

Heidelberg
Materials

August 2023

Glossary

- L_{eq}** - Equivalent Continuous Sound Pressure Level. The total sound energy logged over the course of a measurement. (Uses logarithmic averaging).
- L_{eq24}** - Measured over the entire 24-period (00:00 – 23:59)
- L_{eqDay}** - Measured over the daytime period (07:00 – 22:00)
- L_{eqNight}** - Measured over the nighttime period (22:00 – 07:00)
- SPL (dBA)** - Sound Pressure Level in dBA (A-weighted, which is corrected for human hearing)
- TSP** - Total Suspended Particulate Matter. Includes particulates with a diameter of greater than 10 micrometers and smaller.
- PM_{2.5}** - Particulate Matter with a diameter of 2.5 micrometers and smaller.

1.0 SOUND LEVEL MEASUREMENT RESULTS

The results of the sound monitoring at the STAR Pit can be found in Table 1. Table 1 provides the daily averaged L_{eq24} , L_{eqDay} and $L_{eqNight}$ sound levels in addition to the minimum and maximum L_{eq24} values.

Table 1. August 2023 – STAR PIT – Sound Monitoring Results¹

Day	Leq24	L _{eq} Min	L _{eq} Max	LeqDay	LeqNight
Thursday 24-Aug-23	61.1	59.8	62.4	56.5	55.8
Friday 25-Aug-23	57.3	46.8	60.6	57.8	56.1
Saturday 26-Aug-23	49.2	38.5	53.8	50.5	49.6
Sunday 27-Aug-23	49.4	39.6	54.0	49.1	50.1
Monday 28-Aug-23	56.3	44.4	61.7	56.1	55.6
Tuesday 29-Aug-23	56.5	48.9	60.7	55.1	56.7
Wednesday 30-Aug-23	59.2	57.9	60.7	59.2	58.2
Thursday 31-Aug-23	55.6	41.5	60.7	54.8	54.6
Monthly Average	55.6	47.2	59.3	54.9	54.6
Monthly Maximum	61.1	59.8	62.4	59.2	58.2
Monthly Minimum	49.2	38.5	53.8	49.1	49.6

Figure 1 provides the graphical representation of the results found in Table 1. Figure 2 illustrates the hourly average, maximum and minimum L_{eq} dBA values for the entire month. In addition, the City of Calgary's Community Standards Bylaw values have been included.

Lastly, it is important to note that the monitoring stations are located inside the perimeter berms, adjacent to operations and not beyond the site boundaries. Measurements are intended to help monitor and measure the internal operations performance and are not representative of the lower offsite levels.

¹ It should be noted that all measured sound levels provided in Table 1 are for instances in which the wind speeds were below 11 km/hr and rainfall was below 3mm/hr, as both conditions will impact the validity of the measured results. As such, it is possible that there will time periods/days in which there is no valid data.

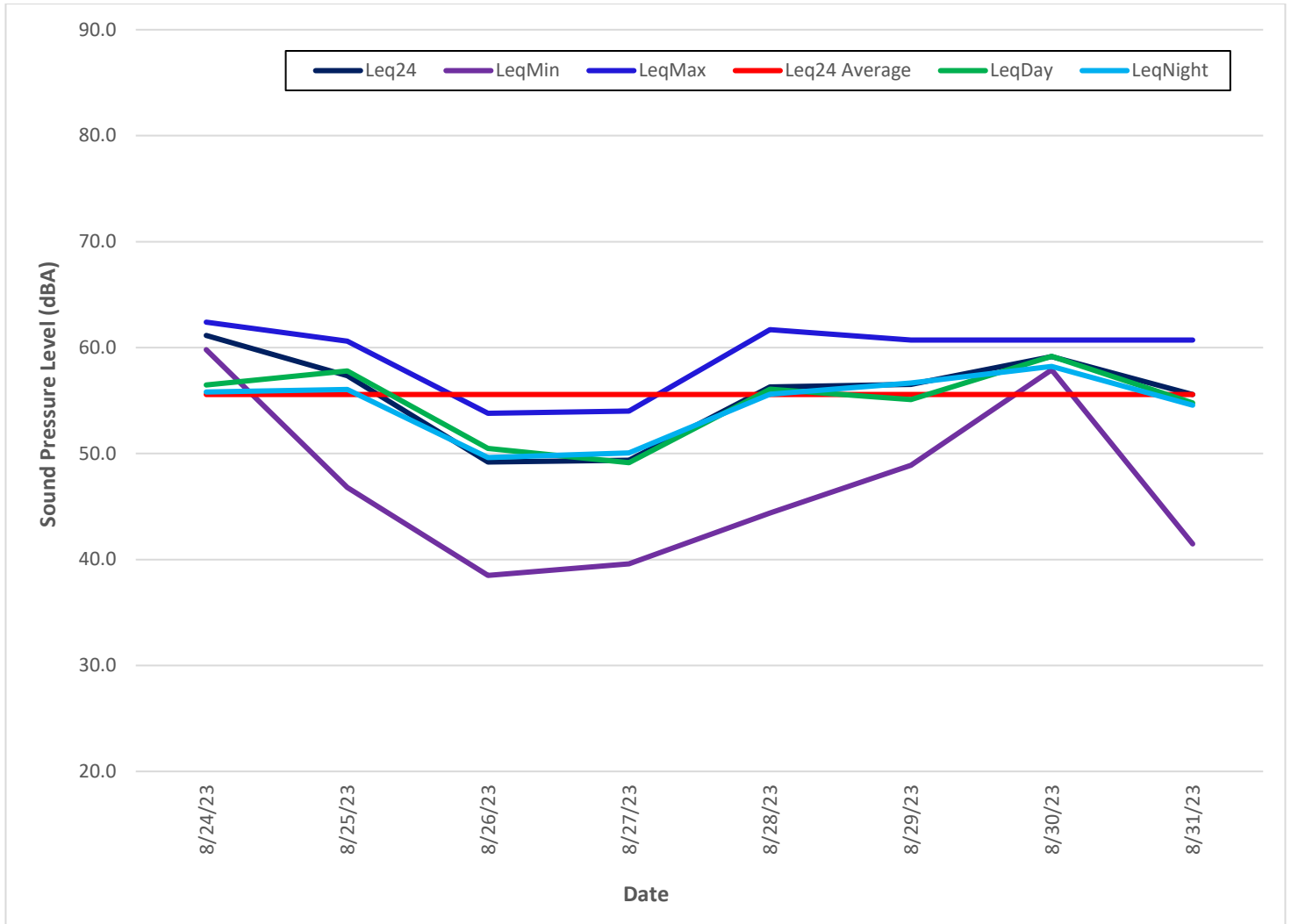


Figure 1. STAR PIT – August 2023 – Daily Sound Monitoring Results

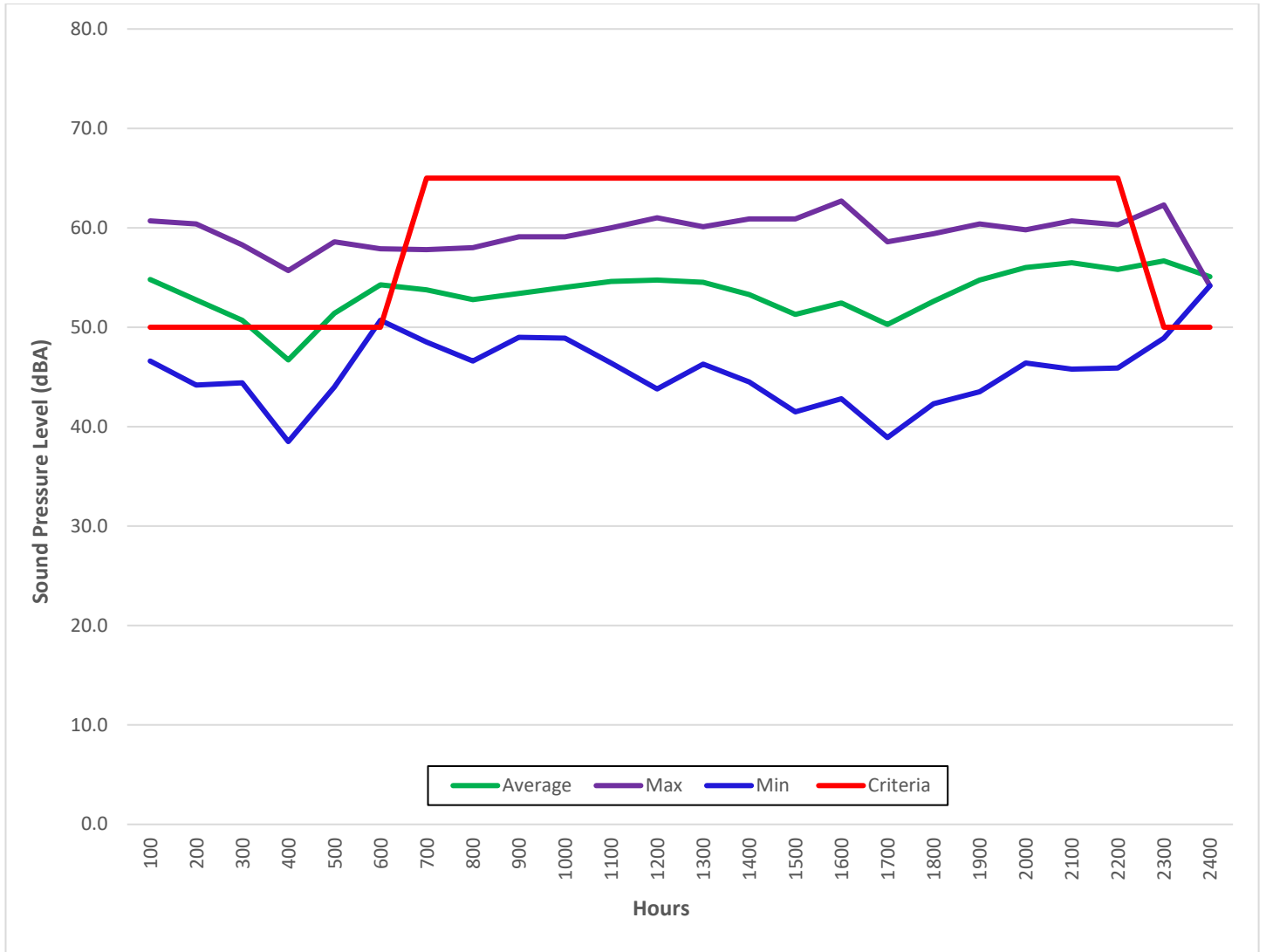


Figure 2. STAR PIT – August 2023 – Hourly Sound Monitoring Summary

2.0 SOUND LEVEL EXCEEDANCES

As per the development permit, the permissible sound level for this site is 50 dBA L_{eq} -1Hour. As shown in Table 2, from August 24 to 31, 2023 there were 22 exceedances.

Table 2. STAR PIT – August 2023 – Sound Level Exceedances

Date	L_{eq} -hour (dBA)	Wind Speed (Km/hr)	Temperature (°C)	Wind Direction	Hourly Rainfall (mm)	Day/Night
Aug-24-2023 23:00	62.3	7.4	10.7	North-West	0.00	Night
Aug-25-2023 00:00	62.4	8.6	10.1	North-West	0.00	Night
Aug-25-2023 01:00	60.6	7.9	9.9	West	0.00	Night
Aug-25-2023 02:00	60.4	5.9	10.6	North-West	0.00	Night
Aug-25-2023 03:00	53.2	4.6	10.5	North	0.00	Night
Aug-25-2023 05:00	53.2	7.2	10.3	North	0.00	Night
Aug-26-2023 01:00	50.3	8.8	14.5	South	0.00	Night
Aug-26-2023 02:00	51.8	6.8	13.9	South	0.00	Night
Aug-27-2023 01:00	52.5	6.7	16.3	West	0.00	Night
Aug-27-2023 23:00	54.0	10.3	20.3	North	0.00	Night
Aug-28-2023 23:00	60.0	4.8	20.4	North	0.00	Night
Aug-29-2023 00:00	61.7	4.5	19.8	North	0.00	Night
Aug-29-2023 01:00	57.4	9.7	19.5	South	0.00	Night
Aug-29-2023 02:00	55.5	10.0	19.3	South	0.00	Night
Aug-29-2023 03:00	53.0	10.5	18.5	South-West	0.00	Night
Aug-29-2023 06:00	57.3	10.8	18.7	South-West	0.00	Night
Aug-29-2023 23:00	57.6	4.8	21.2	South-West	0.00	Night
Aug-30-2023 00:00	60.7	7.6	19.2	North	0.00	Night
Aug-30-2023 01:00	60.7	4.2	17.6	North-East	0.00	Night
Aug-30-2023 02:00	57.9	6.2	17.7	South	0.00	Night
Aug-30-2023 03:00	58.3	5.1	16.3	West	0.00	Night
Aug-31-2023 23:00	57.9	7.8	14.2	North-West	0.00	Night

3.0 PARTICULATE RESULTS

As per development permit the air quality threshold values of particulate matter for this site are of 100 µg/m³ for TSP Daily, 29 µg/m³ for the PM2.5 Daily and 80 µg/m³ for the PM2.5 Hourly. As shown in Table 3, there was one exceedance of the PM2.5 Daily on Wednesday August 30, 2023. In reviewing the data, there were no exceedances of the hourly values.

Table 3. STAR PIT – August 2023 – Particulate Results

Date	TSP Daily Average	PM2.5 Daily Average	CRAZ NW PM2.5
Thursday 24-Aug-23	4.0	8.8	24.8
Friday 25-Aug-23	13.2	9.2	14.1
Saturday 26-Aug-23	24.4	9.5	16.5
Sunday 27-Aug-23	18.5	12.6	22.0
Monday 28-Aug-23	57.4	15.8	22.5
Tuesday 29-Aug-23	32.5	14.4	24.7
Wednesday 30-Aug-23	96.4	30.8	24.6
Thursday 31-Aug-23	17.0	14.7	26.4
Monthly Average	32.9	14.5	21.9

Figure 3 & Figure 4 illustrate the values in Table 3 and compares the TSP & PM 2.5 values to the AAAQO & AAAQG criteria, respectively.

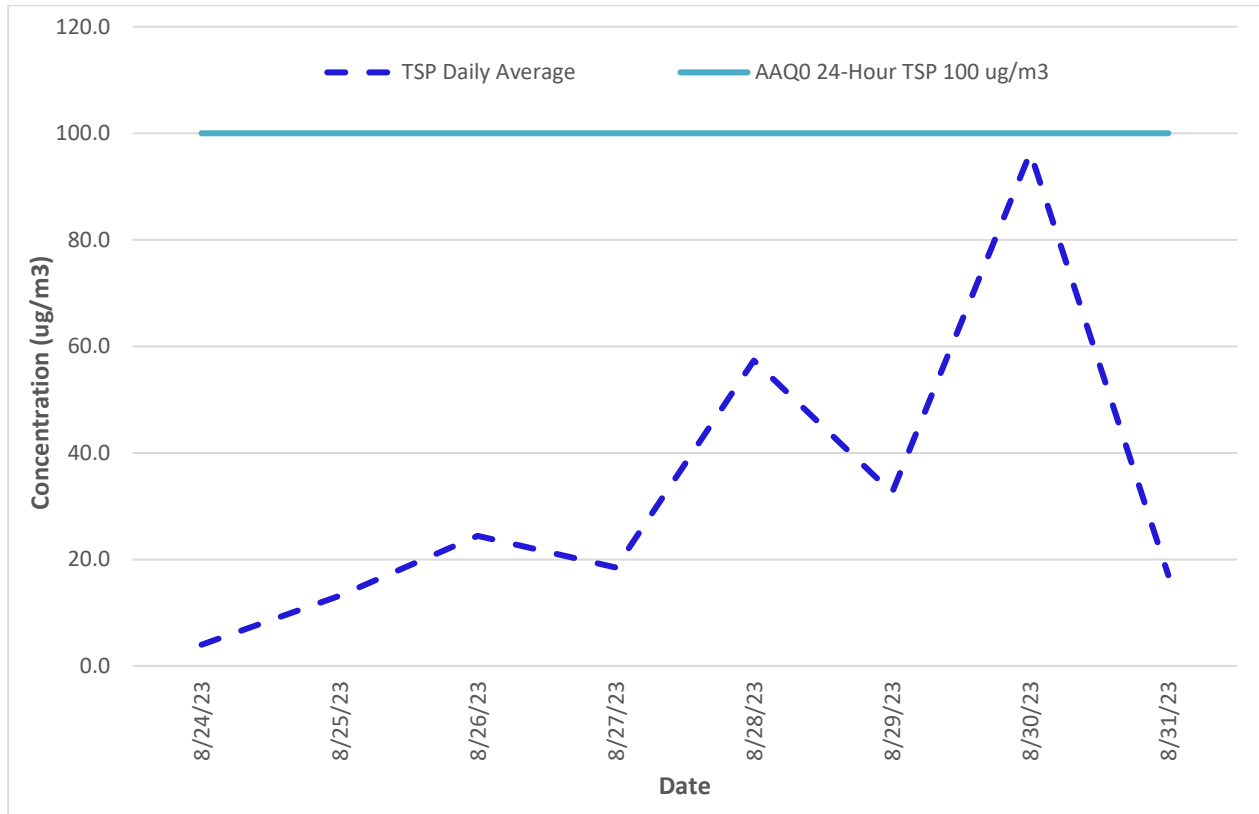


Figure 3. STAR PIT – August 2023 – TSP Daily Particulate Monitoring Results

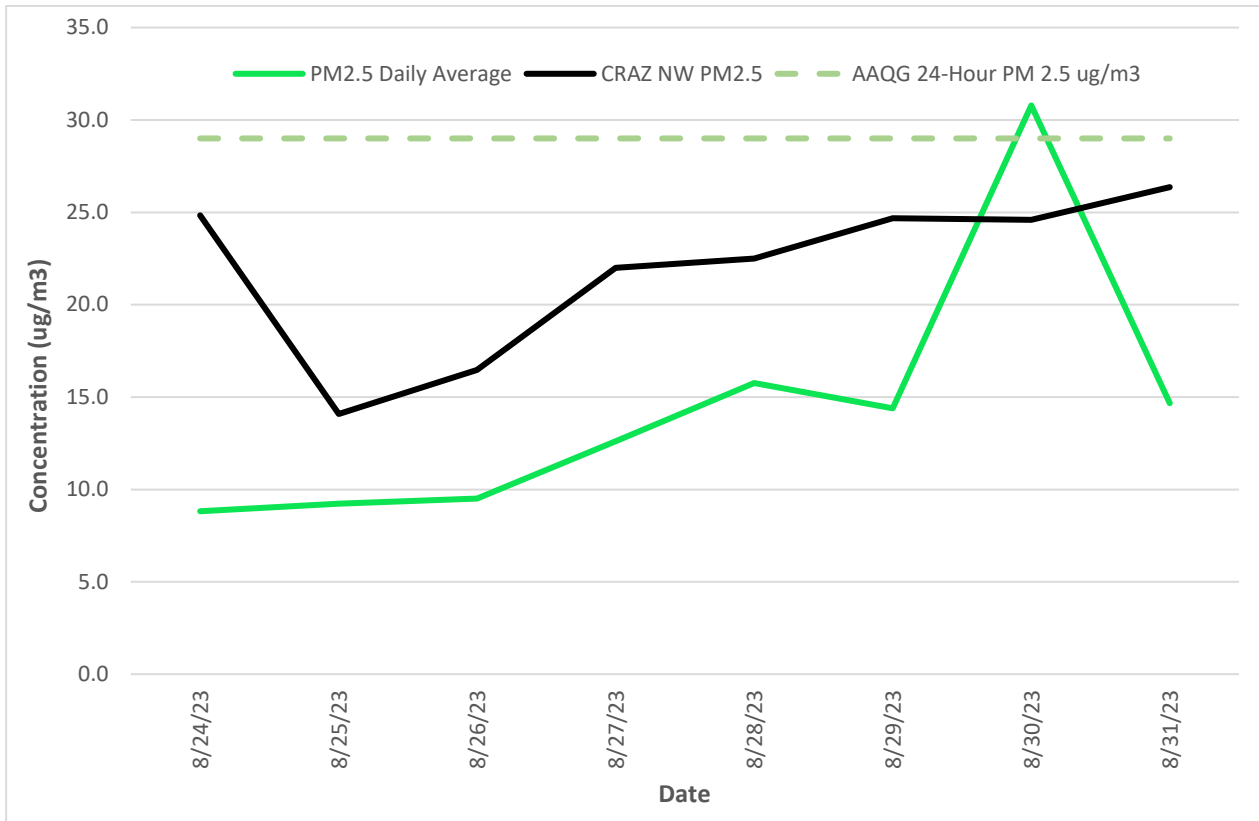


Figure 4. STAR PIT – August 2023 – PM 2.5 Daily Particulate Monitoring Results

4.0 METEOROLOGICAL DATA

4.1 TRAILER

As indicated in Table 4 & Figure 5, the primary wind direction for August 2023 was from the northwest and southeast with moderate windspeeds (between 4 – 20 km/hr). The monthly values for the temperature and precipitation can be found in Table 5.

Table 4. STAR PIT Trailer – August 2023 – Wind Data Results

Count of Direction	Column Labels								Grand Total
Row Labels	East	North	Northeast	Northwest	South	Southeast	Southwest	West	Grand Total
0-4	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.56%	0.00%	0.56%
4-8	3.93%	2.81%	4.49%	7.30%	3.93%	2.81%	1.12%	2.81%	29.21%
8-12	5.06%	1.12%	0.56%	3.37%	1.69%	3.37%	5.06%	7.87%	28.09%
12-16	0.00%	0.00%	0.00%	2.81%	0.00%	3.93%	0.00%	6.74%	13.48%
16-20	0.00%	0.56%	0.00%	7.30%	0.00%	3.37%	0.00%	0.00%	11.24%
20-24	0.00%	1.69%	0.00%	7.30%	0.00%	3.93%	0.00%	0.00%	12.92%
>24	0.00%	0.00%	0.00%	0.00%	0.00%	4.49%	0.00%	0.00%	4.49%
Grand Total	8.99%	6.18%	5.06%	28.09%	5.62%	21.91%	6.74%	17.42%	100.00%

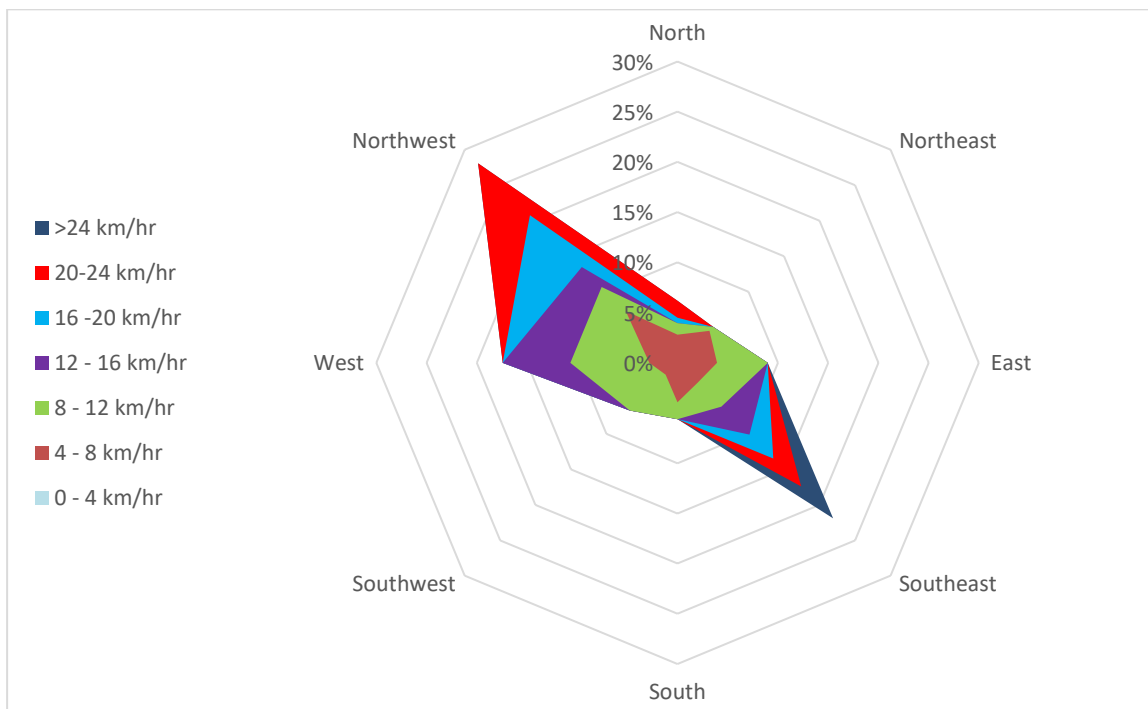


Figure 5. STAR PIT Trailer – August 2023 - Wind Rose

Table 5. STAR PIT Trailer – August 2023 – Wind Data Results

Parameter	Monthly Average	1-Hour	
		Maximum	Minimum
Temperature (°C)	18.3	27.7	9.9
Precipitation (mm)	0.2	14.0	0.0
Total Monthly Precipitation (mm)		42.7	

4.2 OFFICE

As indicated in Table 6 & Figure 6, the primary wind direction for August 2023 was from the northwest and southeast with moderate windspeeds (between 4 – 20 km/hr). The monthly values for the temperature and precipitation can be found in Table 7.

Table 6. STAR PIT Office – August 2023 – Wind Data Results

Count of Direction	Column Labels								Grand Total
Row Labels	East	North	Northeast	Northwest	South	Southeast	Southwest	West	Grand Total
0-4	0.00%	0.56%	0.00%	0.56%	0.00%	0.00%	0.56%	0.00%	1.69%
4-8	5.65%	6.21%	1.13%	1.69%	1.13%	3.39%	6.21%	4.52%	29.94%
8-12	3.95%	3.39%	0.56%	3.95%	3.95%	3.95%	0.56%	2.26%	22.60%
12-16	0.00%	1.69%	0.00%	0.56%	2.26%	2.82%	0.00%	4.52%	11.86%
16-20	0.00%	1.13%	0.00%	3.39%	2.82%	1.69%	0.00%	0.56%	9.60%
20-24	0.00%	1.13%	0.00%	5.08%	3.39%	1.13%	0.00%	0.00%	10.73%
>24	0.00%	6.21%	0.00%	5.65%	1.69%	0.00%	0.00%	0.00%	13.56%
Grand Total	9.60%	20.34%	1.69%	20.90%	15.25%	12.99%	7.34%	11.86%	100.00%

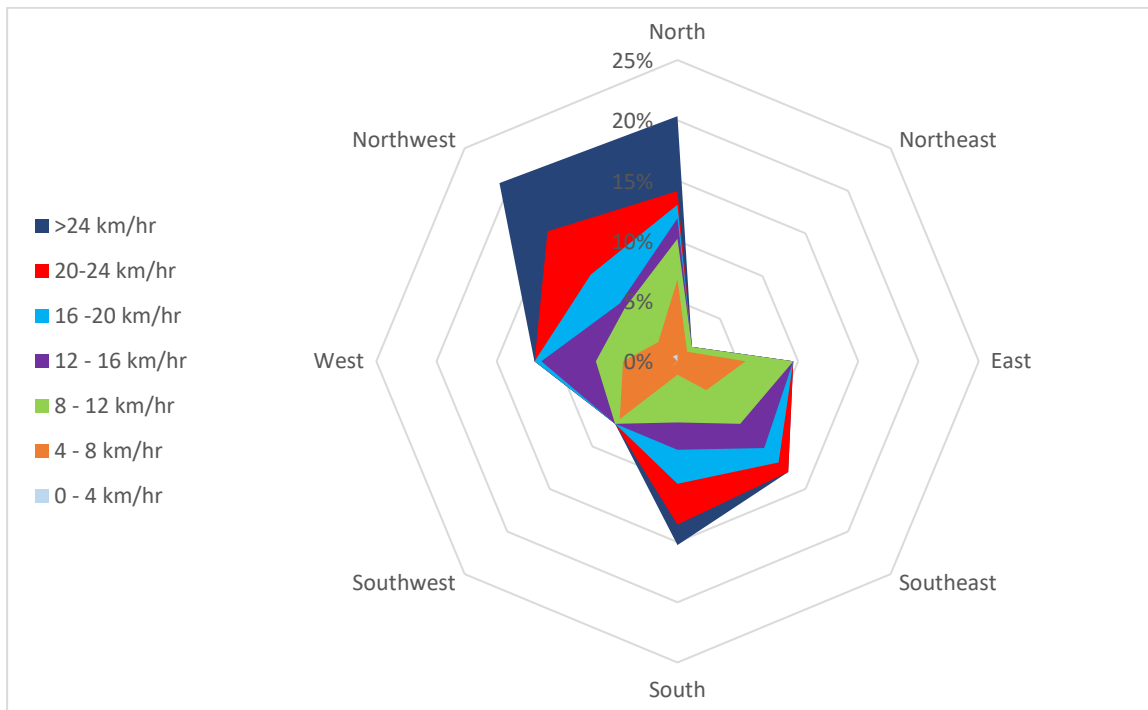


Figure 6. STAR PIT Office – August 2023 - Wind Rose

Table 7. STAR PIT Office – August 2023 – Wind Data Results

Parameter	Monthly Average	1-Hour	
		Maximum	Minimum
Temperature (°C)	18.4	27.9	10.2
Precipitation (mm)	0.2	11.0	0.0
Total Monthly Precipitation (mm)		35.0	

5.0 CALIBRATION RECORDS

Record of Calibration Results

Description	Location	Date	Time	Pre / Post	Calibration Level	Calibrator Model	Serial Number
Pre-Measurement Calibration	STAR PIT	August 24, 2023	13:15	Pre	93.9 dBA	B&K 4231	2575493