

Ambient Air and Sound

Monthly Report

STONEY TRAIL AGGREGATE RESOURCE

BURNCO

LAFARGE



Volker Stevin
Contracting Ltd.

Heidelberg
Materials

March 2024

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. March 2024 – STAR PIT – Sound Monitoring Results¹

Day	Leq24	L _{eq} Min	L _{eq} Max	LeqDay	LeqNight
Friday 01-Mar-24	36.1	33.3	38.8	20.0	36.1
Saturday 02-Mar-24	37.7	33.9	42.4	39.4	35.8
Sunday 03-Mar-24	35.1	32.1	37.6	36.5	33.2
Monday 04-Mar-24	40.3	31.9	46.1	40.7	39.3
Tuesday 05-Mar-24	41.0	33.7	47.8	40.0	42.4
Wednesday 06-Mar-24	44.7	30.9	50.9	46.4	36.3
Thursday 07-Mar-24	44.4	38.1	48.4	44.4	20.0
Friday 08-Mar-24	37.1	37.1	37.1	20.0	37.1
Saturday 09-Mar-24	42.1	34.2	47.3	44.1	37.3
Sunday 10-Mar-24	38.5	31.7	41.8	40.3	35.3
Monday 11-Mar-24	46.7	30.5	51.2	47.8	43.7
Tuesday 12-Mar-24	46.2	38.8	50.9	49.4	42.1
Wednesday 13-Mar-24	No Data				
Thursday 14-Mar-24	No Data				
Friday 15-Mar-24	No Data				
Saturday 16-Mar-24	No Data				
Sunday 17-Mar-24	No Data				
Monday 18-Mar-24	No Data				
Tuesday 19-Mar-24	No Data				
Wednesday 20-Mar-24	No Data				
Thursday 21-Mar-24	No Data				
Friday 22-Mar-24	No Data				
Saturday 23-Mar-24	No Data				
Sunday 24-Mar-24	No Data				
Monday 25-Mar-24	No Data				
Tuesday 26-Mar-24	No Data				
Wednesday 27-Mar-24	No Data				
Thursday 28-Mar-24	No Data				
Friday 29-Mar-24	No Data				
Saturday 30-Mar-24	No Data				
Sunday 31-Mar-24	No Data				
Monthly Average	40.8	33.9	45.0	39.1	36.5
Monthly Maximum	46.7	38.8	51.2	49.4	43.7
Monthly Minimum	35.1	30.5	37.1	20.0	20.0

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 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.

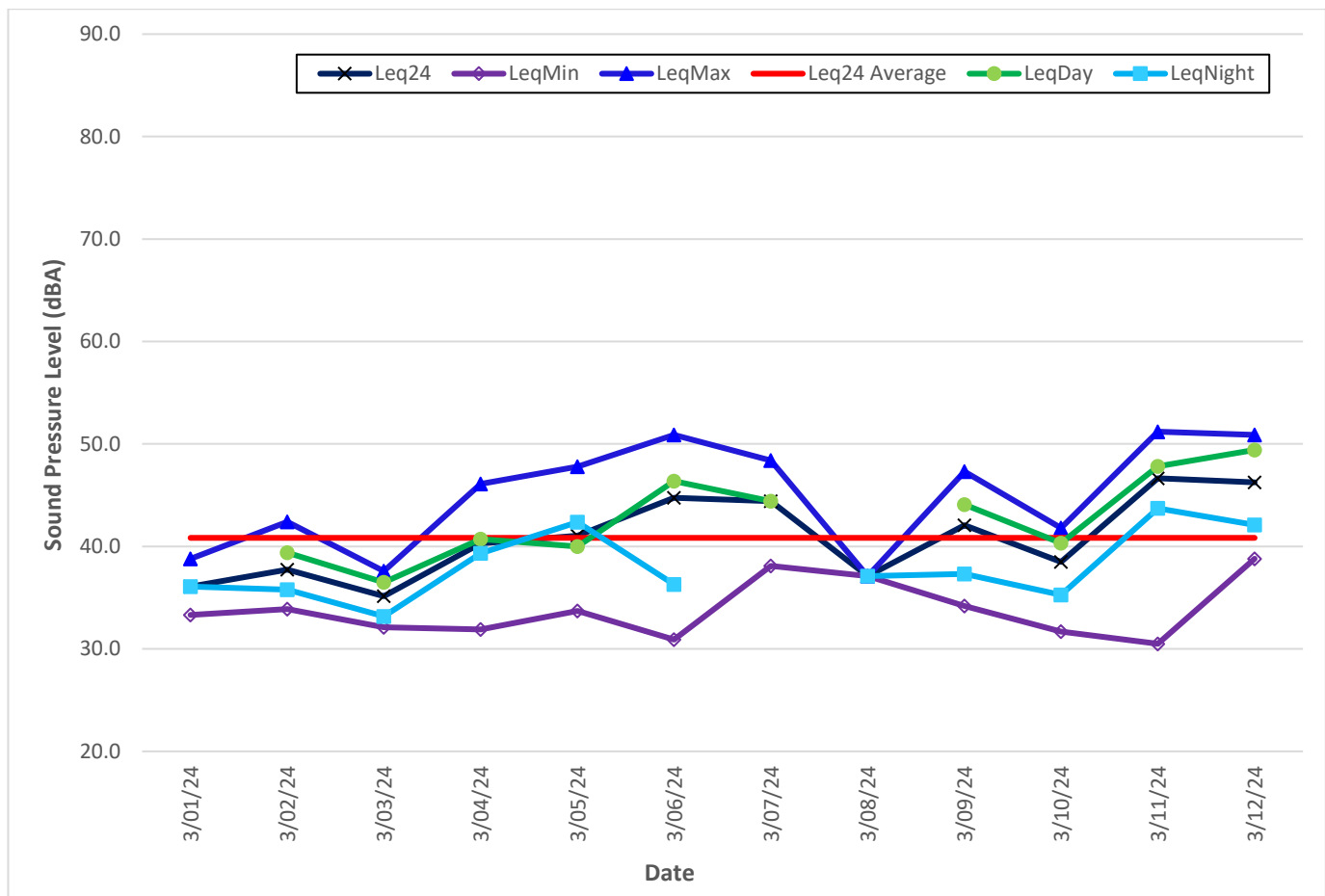


Figure 1. STAR PIT – March 2024 – Daily Sound Monitoring Results²

² Values of 30 were given to dates in which there was no data. This was to allow for the creation of the graph. The values within Table 1 are correctly calculated ignoring the dates of no data (due to wind or rain).

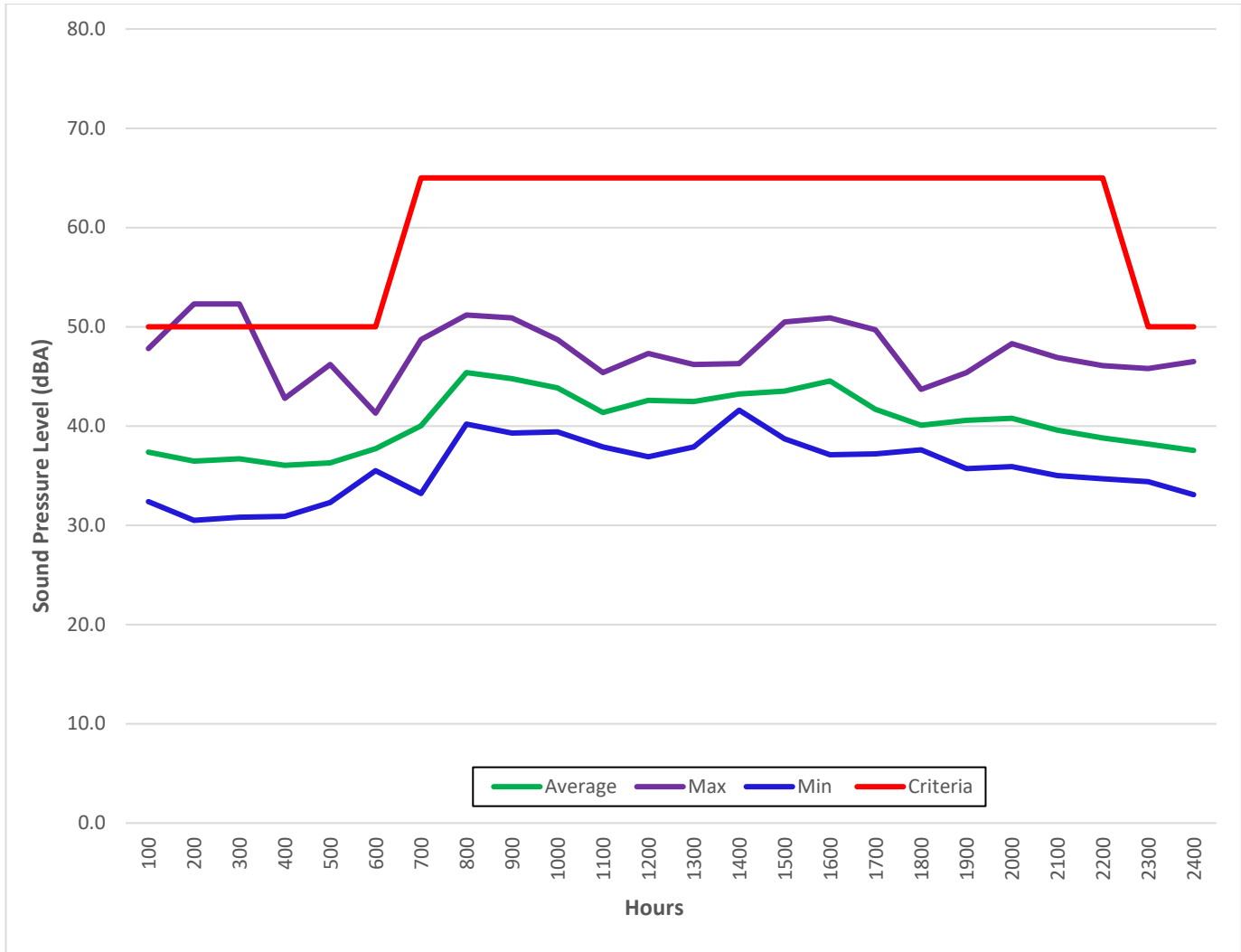


Figure 2. STAR PIT – March 2024 – Hourly Sound Monitoring Summary

2.0 SOUND LEVEL EXCEEDANCES

As per the development permit, the permissible sound level for this site is 50 dBA L_{eq} -1Hour for the nighttime and 65 dBA L_{eq} -1Hour for the daytime hours. As shown in Table 2, from March 1 to 13, 2024 there were 5 exceedances.

Table 2. STAR PIT – March 2024 – Sound Level Exceedances

Date	L_{eq} -1-hour (dBA)	Wind Speed (Km/hr)	Temperature (°C)	Wind Direction	Hourly Rainfall (mm)	Day/Night
Mar-13-2024 02:00	52.3	7.5	0.9	North-West	0.00	Night
Mar-13-2024 03:00	52.3	7.4	0.3	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 were exceedances from the CRAZ data. This was consistent with higher values from the Site.

Table 3. STAR PIT – March 2024 – Particulate Results

Date	TSP Daily Average	PM2.5 Daily Average	CRAZ NW PM2.5	PM2.5 Hourly Max
Friday 01-Mar-24	3.1	2.9	9.1	4.9
Saturday 02-Mar-24	3.0	2.6	7.8	4.1
Sunday 03-Mar-24	2.1	1.8	4.9	1.9
Monday 04-Mar-24	3.3	2.4	6.0	4.0
Tuesday 05-Mar-24	2.6	1.8	6.3	2.7
Wednesday 06-Mar-24	4.0	2.3	7.9	7.1
Thursday 07-Mar-24	2.5	0.9	5.0	1.2
Friday 08-Mar-24	0.8	0.5	2.9	0.5
Saturday 09-Mar-24	3.1	0.8	3.7	2.7
Sunday 10-Mar-24	0.9	0.3	3.0	0.6
Monday 11-Mar-24	1.8	0.6	3.6	1.2
Tuesday 12-Mar-24	1.6	0.6	3.7	1.3
Wednesday 13-Mar-24	0.9	0.4	2.0	0.6
Thursday 14-Mar-24	No Data			
Friday 15-Mar-24	No Data			
Saturday 16-Mar-24	No Data			
Sunday 17-Mar-24	No Data			
Monday 18-Mar-24	No Data			
Tuesday 19-Mar-24	No Data			
Wednesday 20-Mar-24	No Data			
Thursday 21-Mar-24	No Data			
Friday 22-Mar-24	No Data			
Saturday 23-Mar-24	No Data			
Sunday 24-Mar-24	No Data			
Monday 25-Mar-24	No Data			
Tuesday 26-Mar-24	No Data			
Wednesday 27-Mar-24	No Data			
Thursday 28-Mar-24	No Data			
Friday 29-Mar-24	No Data			
Saturday 30-Mar-24	No Data			
Sunday 31-Mar-24	No Data			
Monthly Average	2.3	1.4	5.1	2.5

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

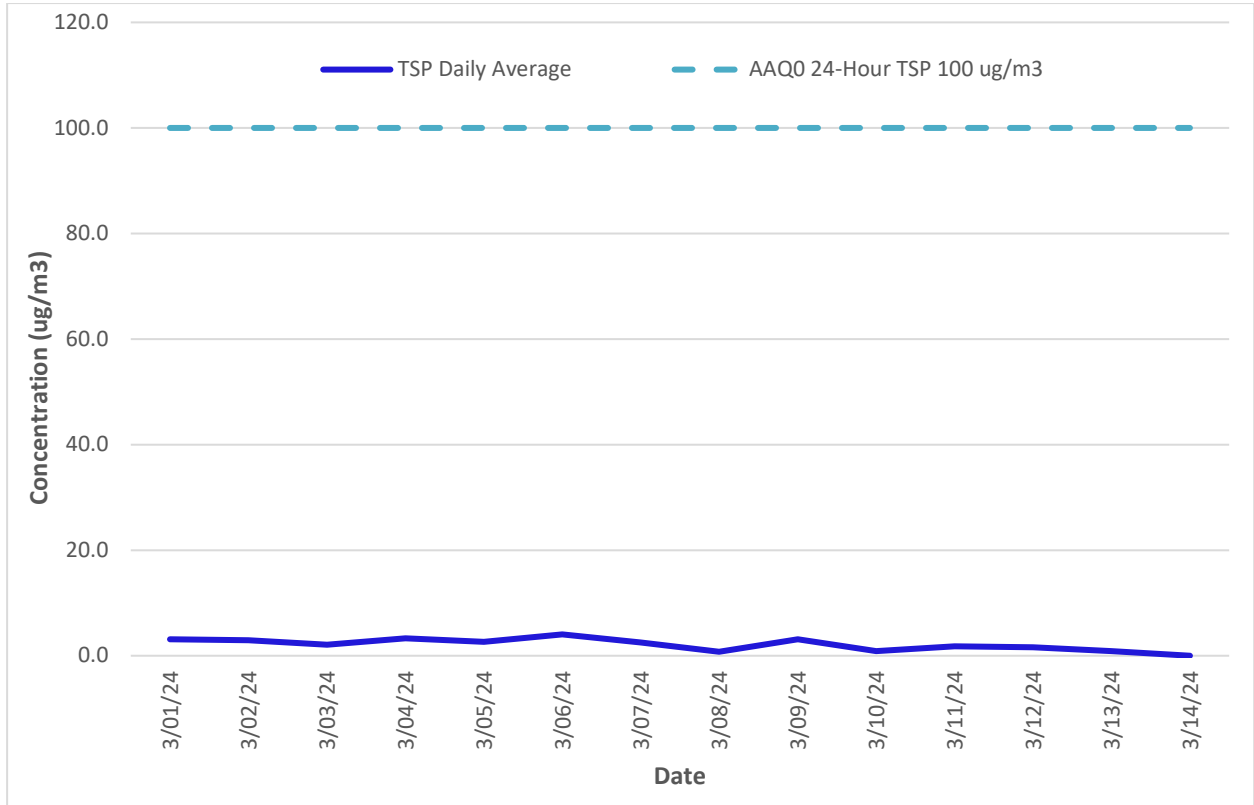


Figure 3. STAR PIT – March 2024 – TSP Daily Particulate Monitoring Results

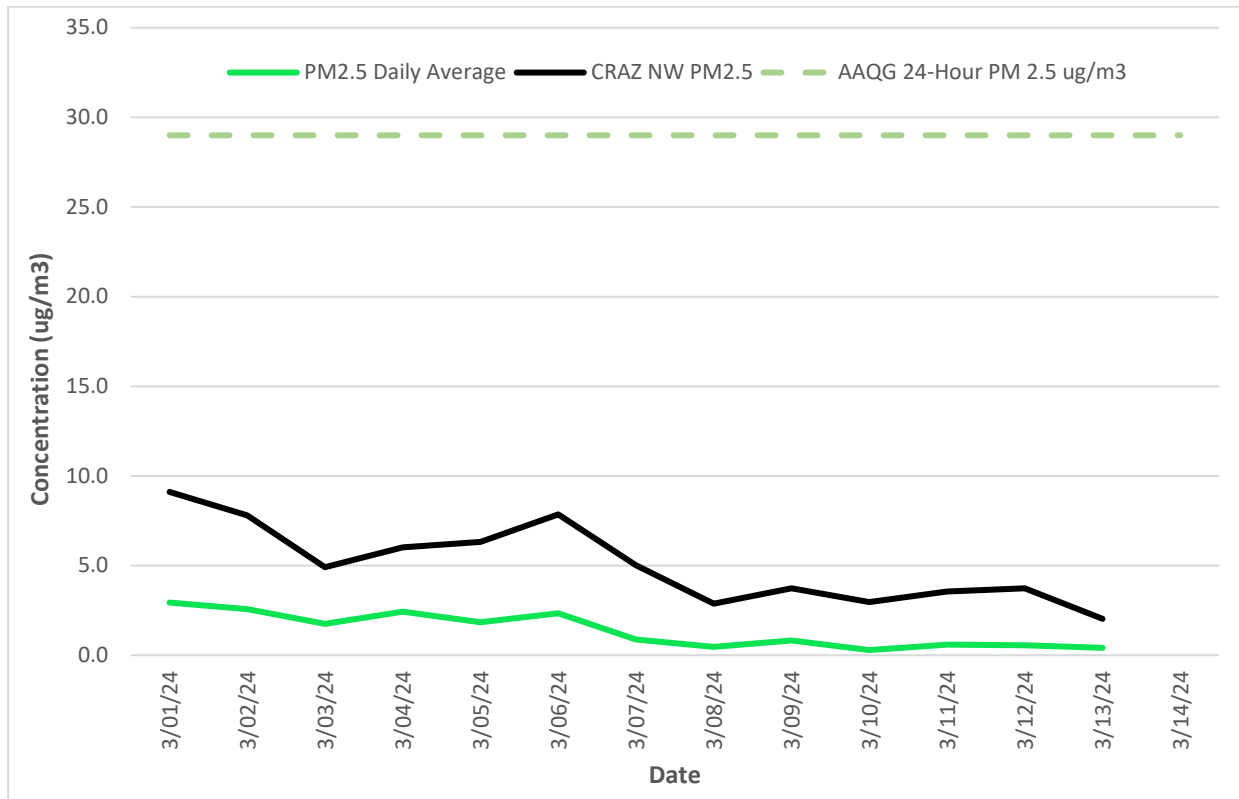


Figure 4. STAR PIT – March 2024 – PM 2.5 Daily Particulate Monitoring Results

As previously discussed, there were no exceedances of the particulate limits in the month of March 2024.

Table 4. STAR PIT – March 2024 – Particulate Exceedances

Date	PM2.5	Wind Speed (Km/hr)	Temperature (°C)	Wind Direction	Hourly Rainfall (mm)	Day/Night
No Exceedances						

4.0 METEOROLOGICAL DATA

4.1 TRAILER

As indicated in Table 5 & Figure 5, the primary wind direction for March 2024 was from the west and southwest with moderate to high windspeeds (between 4 – 20 km/hr). The monthly values for the temperature and precipitation can be found in Table 6.

Table 5. STAR PIT Trailer – March 2024 – Wind Data Results

Count of Direction	Column Labels								Grand Total
Row Labels	East	North	Northeast	Northwest	South	Southeast	Southwest	West	Grand Total
0-4	0.33%	0.00%	0.66%	0.33%	0.00%	0.00%	0.33%	0.00%	1.66%
4-8	1.33%	1.00%	1.66%	3.32%	5.65%	1.33%	6.64%	2.33%	23.26%
8-12	5.32%	1.99%	2.33%	3.32%	9.63%	1.00%	15.28%	2.33%	41.20%
12-16	1.99%	1.66%	2.33%	1.66%	0.66%	0.66%	6.31%	4.32%	19.60%
16-20	0.00%	1.00%	0.00%	2.33%	0.00%	0.33%	3.32%	1.66%	8.64%
20-24	0.00%	0.00%	0.00%	1.00%	0.00%	0.33%	3.32%	0.00%	4.65%
>24	0.00%	0.00%	0.00%	0.00%	0.00%	0.66%	0.33%	0.00%	1.00%
Grand Total	8.97%	5.65%	6.98%	11.96%	15.95%	4.32%	35.55%	10.63%	100.00%

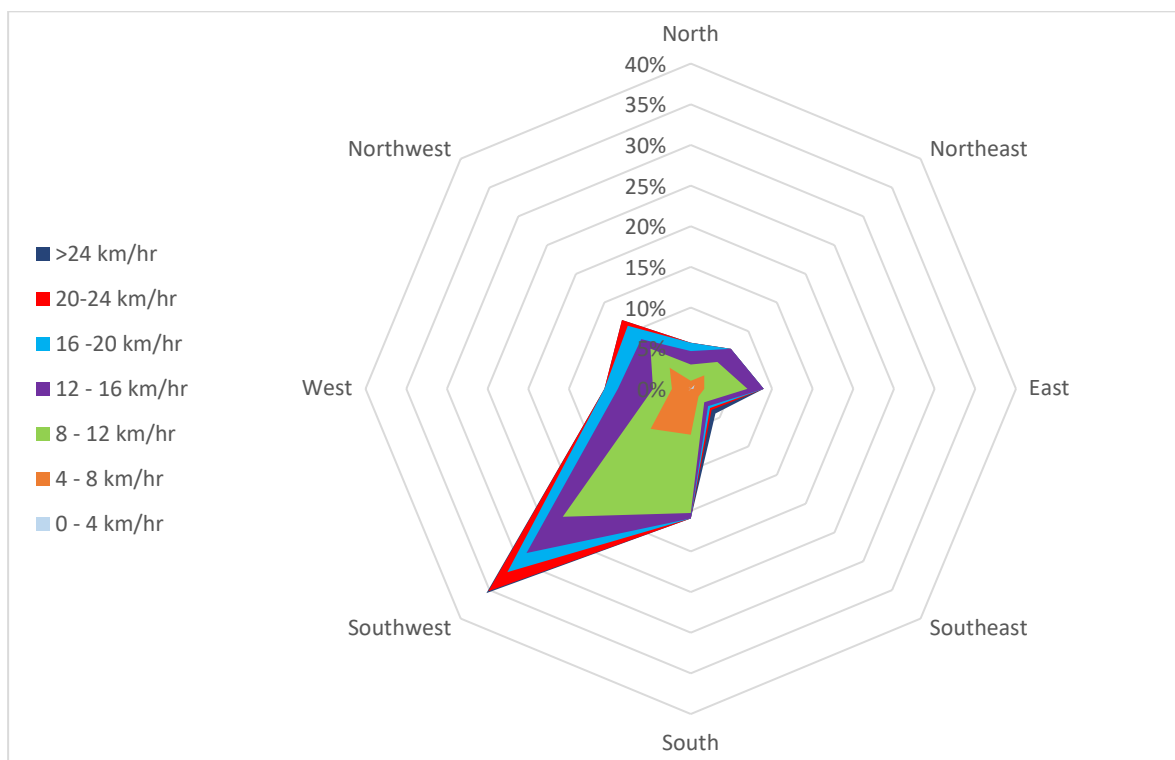


Figure 5. STAR PIT Trailer – March 2024 - Wind Rose

Table 6. STAR PIT Trailer – March 2024 – Wind Data Results

Parameter	Monthly Average	1-Hour	
		Maximum	Minimum
Temperature (°C)	-7.2	9.6	-23.5
Precipitation (mm)	0.0	0.1	0.0
Total Monthly Precipitation (mm)		0.2	

4.2 OFFICE

As indicated in Table 7 & Figure 6, the primary wind direction for March 2024 was from the west and north with moderate to high windspeeds (between 0 and +20 km/hr). The monthly values for the temperature and precipitation can be found in Table 8.

Table 7. STAR PIT Office – March 2024 – Wind Data Results

Count of Direction	Column Labels								Grand Total
Row Labels	East	North	Northeast	Northwest	South	Southeast	Southwest	West	Grand Total
0-4	0.40%	1.34%	0.40%	0.00%	0.13%	0.27%	0.54%	0.27%	3.36%
4-8	2.28%	1.08%	1.88%	0.94%	2.15%	2.28%	4.17%	1.48%	16.26%
8-12	4.84%	2.15%	1.08%	0.81%	3.90%	3.09%	4.70%	1.88%	22.45%
12-16	4.17%	1.61%	1.88%	1.88%	2.69%	4.44%	4.30%	2.55%	23.52%
16-20	0.54%	1.88%	0.40%	1.61%	2.69%	1.61%	2.69%	3.49%	14.92%
20-24	0.00%	2.82%	0.00%	0.27%	1.75%	0.67%	0.13%	5.24%	10.89%
>24	0.00%	1.75%	0.00%	0.54%	1.88%	0.00%	0.00%	4.44%	8.60%
Grand Total	12.23%	12.63%	5.65%	6.05%	15.19%	12.37%	16.53%	19.35%	100.00%

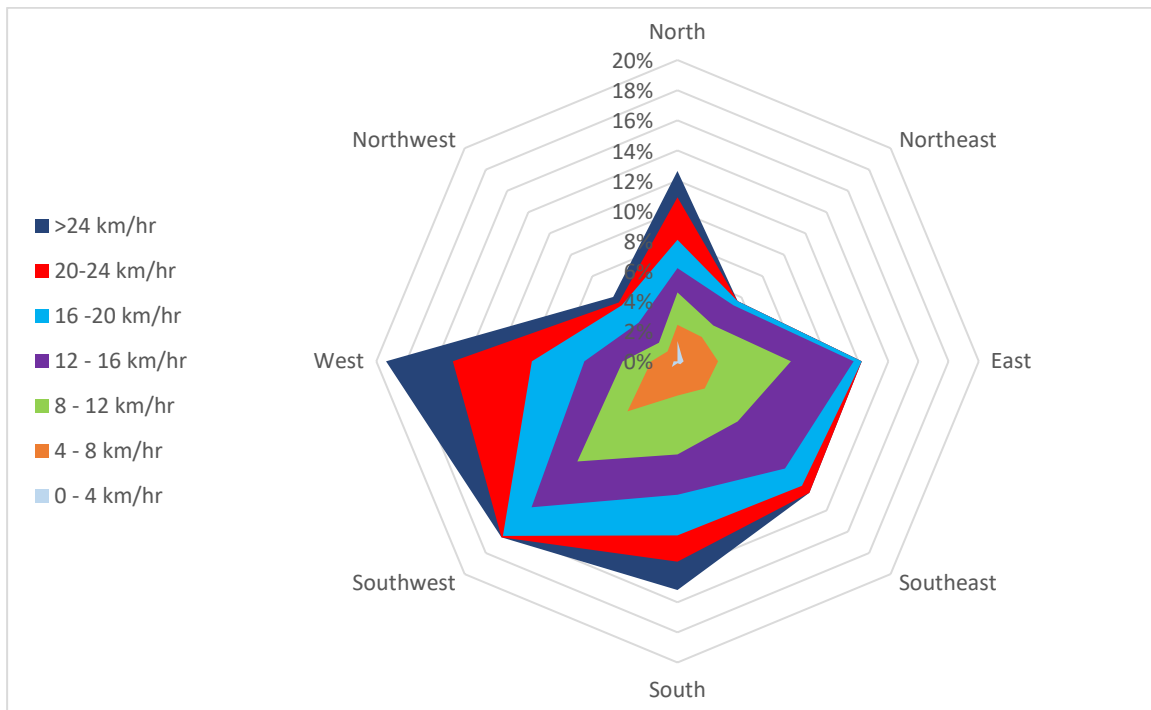


Figure 6. STAR PIT Office – March 2024 - Wind Rose

Table 8. STAR PIT Office – March 2024 – Wind Data Results

Parameter	Monthly Average	1-Hour	
		Maximum	Minimum
Temperature (°C)	-4.0	14.1	-23.7
Precipitation (mm)	0.0	0.1	0.0
Total Monthly Precipitation (mm)		0.1	

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	November 24, 2023	09:00	Post	93.9 dBA	B&K 4231	2575493
Post-Measurement Calibration	STAR PIT	March 7, 2024	09:00	Pre	93.7 dBA	B&K 4231	2575493