Local meteorological conditions – Vecco Critical Minerals Project

The regional climate of the area can be described as sub-tropical with wet season dominated rainfall and mild, dry winter months. Rainfall is highly seasonal and is typically associated with monsoonal, thunderstorm and cyclonic weather patterns.

A long-term representative historical rainfall data set was developed from nearby recorded data from Bureau of Meteorology (the Bureau) rainfall gauging stations and infilled with SILO Data Drill when gauged data was unavailable.

A summary of rainfall gauges operated by the Bureau near the Project, with significant rainfall records, is provided in Table 1. Long-term weather and climate data from the Julia Creek Airport weather station (site number: 029058) are summarised in Table 2. Typical rainfall for the site is presented in Figure 1.

Seasonal wind roses derived from Julia Creek Airport data from January 2015 until December 2021 are provided in Figure 4 and Figure 5.

Daily temperature records are available from the BoM Julia Creek Airport (029058) weather station. For the 2001 to 2023 period, recorded mean daily temperatures range between 17.3°C (min.) to 34.3°C (max.). The regional mean monthly temperature range data is presented in Figure 2.

Monthly pan evaporation data was adopted from the SILO data drill at the location of the Project (DES 2022). The SILO data drill is a derived data set from a combination of interpolated recorded data between weather stations and derived long-term average values. Typical evaporation rates for the site are presented in Figure 3.

Due to poor distribution of evaporation monitoring stations near the Project, the interpolated evaporation data at the location of the Project may be inaccurate. Therefore, the long-term pan evaporation derived from the SILO data drill has been compared against the average monthly recorded data from the weather station at Julia Creek Post Office (29025) (nearest station available) to validate the SILO data. The long-term average data from the SILO data drill matches well with the data recorded at the Julia Creek Post Office (29025) from the period 1970 to 2022.

Table 1: Nearby rainfall gauging stations

Source	Proximity to Site	Data Range
Zonia Downs (029051)	7 km	1924-2017
Crowfels Station (029011)	25 km	1916-2020
Bunda Bunda (029005)	34 km	1889-2022
Millungera Station (029036)	37 km	1890-2022
Manfred Downs (029132)	53 km	1887-2022

Table 2: Climate statistics for Julia Creek Airport for years 2001 to 2020

Month	Mean daily maximum temperature (°C)	Mean daily minimum temperature (°C)	Mean monthly rainfall (mm)	Highest monthly rainfall (mm)	Lowest monthly rainfall (mm)
Jan	37.7	24.1	130.2	572.6	12.8

Month	Mean daily maximum temperature (°C)	Mean daily minimum temperature (°C)	Mean monthly rainfall (mm)	Highest monthly rainfall (mm)	Lowest monthly rainfall (mm)
Feb	37.1	23	109.9	482	2.6
Mar	36.4	21.3	76.9	290.8	0
Apr	34.4	17.8	12.4	113.2	0
May	30.7	13.6	8	69.8	0
Jun	27.1	9.9	16.1	147.2	0
Jul	27.5	9.0	8.5	104.6	0
Aug	29.6	9.7	3.8	19.2	0
Sep	3	14.4	2.9	23	0
Oct	37.5	18.5	10.1	62.6	0
Nov	39.1	21.8	27.7	66	0.2
Dec	39.9	23.9	56.7	166.2	4
Annual	34.2	17.3	455.7	857.6	220.6

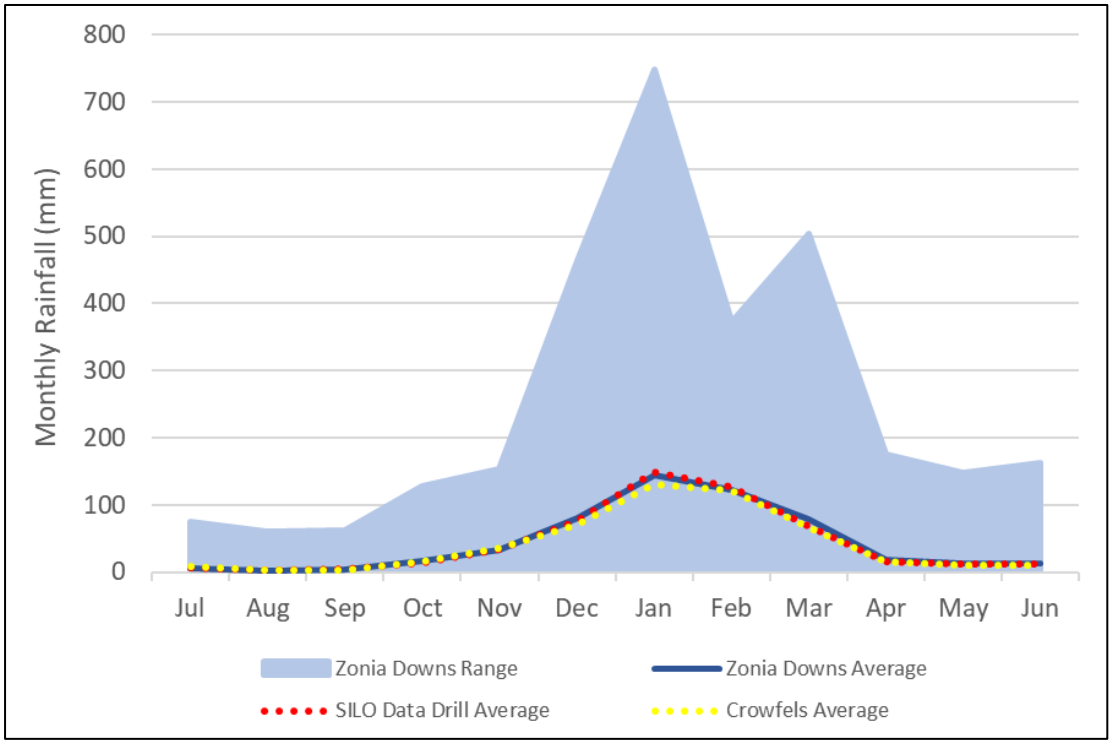

Figure 1: Monthly rainfall (range and mean)

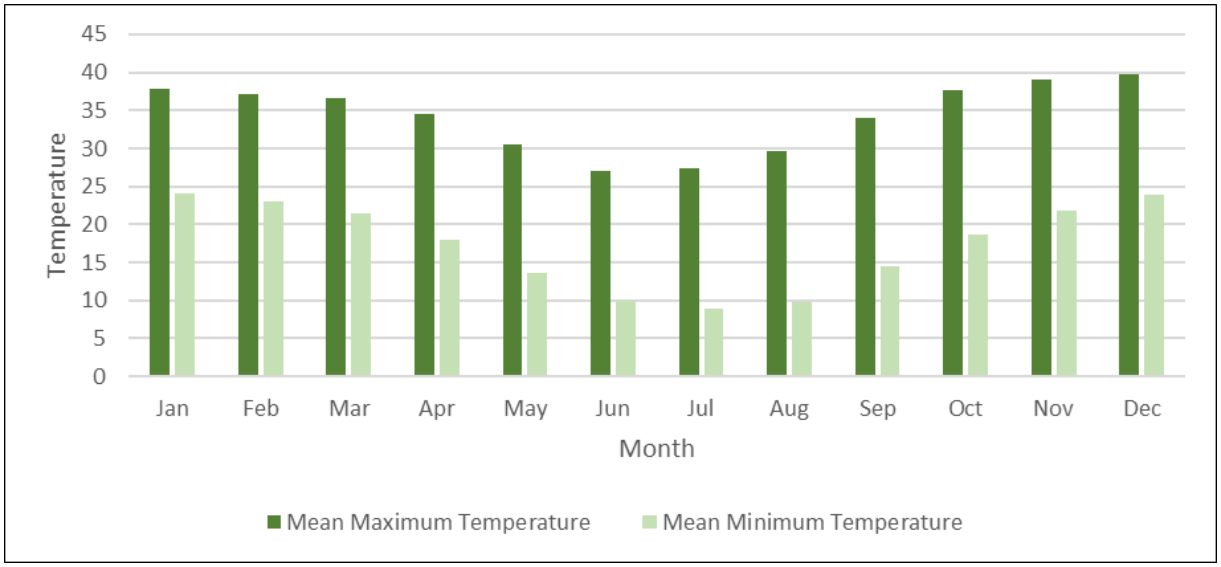

Figure 2: *Mean monthly temperature range in the Project Region (Julia Creek Airport BoM station 029058)*

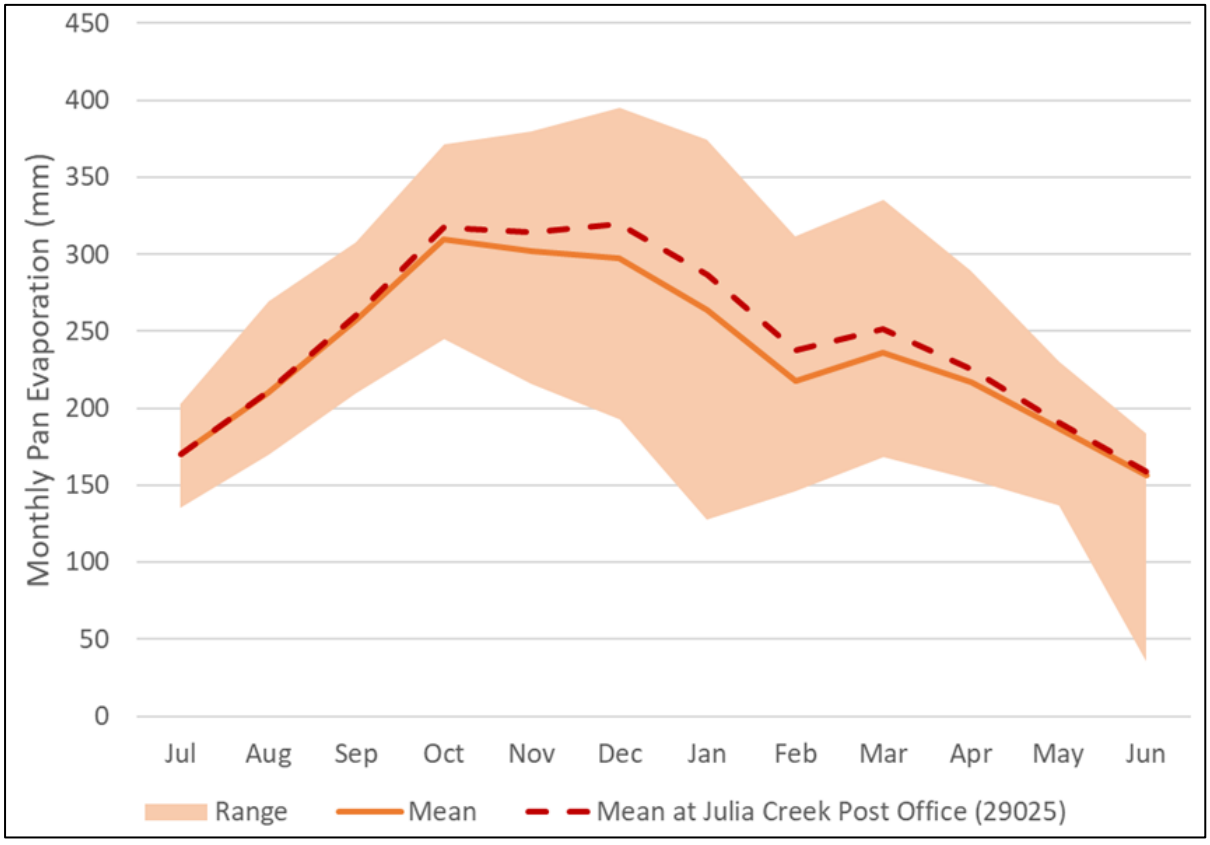

Figure 3: *Monthly evaporation (range and mean)*

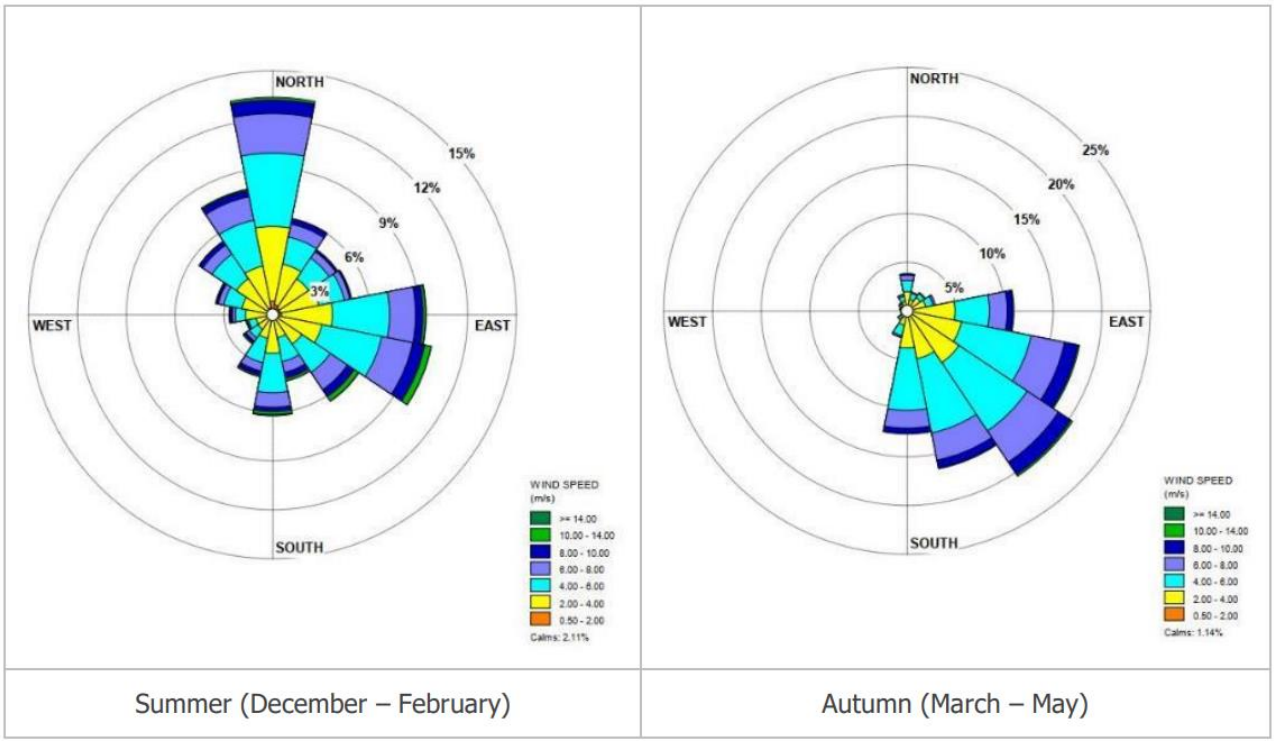

Figure 4: Seasonal wind roses – summer and autumn (2015-2021)

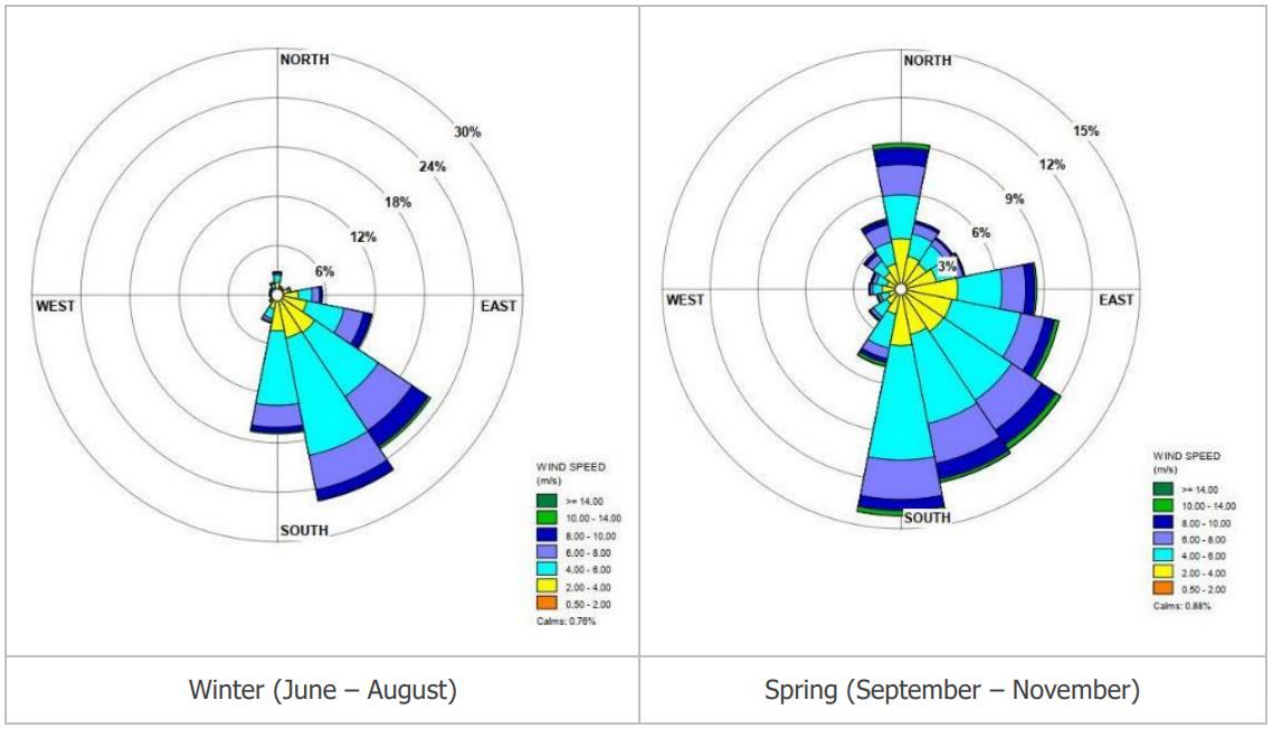

Figure 5: Seasonal wind roses – winter and spring (2015-2021)