Bushfire Risk Management Plan - BP Service Station and Convenience Store Wanneroo Road Tapping

BP Australia

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DOCUMENT TRACKING

Project Name	Bushfire Risk Management Plan - BP Service Station and Convenience Store Wanneroo Road Tapping
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1. Introduction

1.1 Project overview

Eco Logical Australia (ELA) was commissioned by BP Australia to prepare a Bushfire Risk Management Plan (BRMP) to support a development application (DA) being prepared for the development of a service station and convenience store at future Lot 1 Wanneroo Road, Tapping (herein referred to as the subject site, Appendix A).

The proposed development will include:

- Clearing of existing vegetation; and
- Construction of a convenience store fuel, canopies, fuel bowsers, underground fuel tanks, parking areas and access way to future subdivision roads and Wanneroo Road as per Appendix A.

The proposed development will result in an intensification of land use.

The entirety of the subject site is within a designated bushfire prone area as per the *Western Australia State Map of Bush Fire Prone Areas* (DFES 2018), which triggers bushfire planning requirements under *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7; WAPC 2015) and reporting to accompany submission of the development application in accordance with the associated *Guidelines for Planning in Bushfire Prone Areas v 1.3* (the Guidelines; WAPC 2017). It is important to note that vegetation surrounding the subject site will be cleared in the near future as part of an approved subdivision (WAPC approval 156082). Consequently, the bushfire prone status of the subject site and management measures prescribed in the BMP are temporary in nature.

This assessment has been prepared by ELA Bushfire Consultants Ian Mullins and James Leonard with quality assurance undertaken by Senior Bushfire Consultants, Daniel Panickar (FPAA BPAD Certified Practitioner No. BPAD37802-L2) and Bruce Horkings (FPAA BPAD Level 3 Certified Practitioner No. BPAD29962-L3).

1.2 Purpose and application of the plan

The primary purpose of this BRMP is to act as a technical supporting document to inform planning assessment in conjunction with the corresponding Bushfire Management Plan (BMP).

SPP 3.7 (Policy Measure 6.6) requires development applications for high-risk land uses (such as petrol stations) in areas between BAL-12.5 and BAL-29 to be accompanied by a risk management plan for any flammable on-site hazards. The Bushfire Management Plan (BMP) prepared by ELA for the subject site (ELA 2019) identifies all new proposed structures within the subject site as being located within areas subject to a BAL rating of BAL-12.5 or lower.

The Building Code of Australia bushfire construction requirements only apply to residential buildings and associated structures. The Guidelines therefore require the planning process to focus on location and siting of high risk land uses rather than application of bushfire construction requirements.

Under the *Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulations 2007* (the Regulations), the operator will also be required to complete a separate risk assessment that addresses

risks other than bushfire for the proposed development. The Regulations also require operators to prepare an emergency plan for petrol stations. An emergency management plan will be developed for the subject site, which will set guidelines for the management of an emergency, disaster or major incident at the site. The emergency plan for the fuel station will reflect the site layout and bushfire risk post-construction.

2. Bushfire risk assessment methodology

Australian and New Zealand Standard *AS/NZS ISO 31000:2009 Risk Management–Principles and Guidelines* (SA & SNZ 2009) provides an internationally recognised approach to risk management. Methodology for this process is further described in *Risk Management Guidelines: Companion to AS/NZS 4360/2004* (SA & SNZ 2004), which defines the risk assessment process as outlined in Figure 1.

AS/NZS ISO 31000:2009 is adopted by DFES, as documented in the agency's Bushfire Risk Management Framework (DFES 2015), to formalise and communicate the approach of managing bushfire risk across the department in the aim of leading to improved coordination and effectiveness of bushfire risk management processes.

From a bushfire management perspective, this methodology can be useful in determining:

1. The inherent bushfire risk (i.e. the initial level of risk prior to risk treatment and mitigation); and
2. The residual bushfire risk (i.e. the level of risk remaining following risk treatment and mitigation).

Inherent and residual bushfire risk can be determined for individual bushfire events on the basis of the following risk criteria, which is used to inform the likelihood and consequence of such events:

- Likelihood of ignition and bushfire occurrence takes into consideration the bushfire history of the area, risk of ignition, vegetation type, fuel age and load, slope under vegetation and predominant fire weather conditions; and
- Consequence or impact from bushfire on life, property and the environment takes into consideration the degree and severity of potential bushfire scenarios, location of bushfire hazard areas, assets present in the area and the level of management and suppression response available.

The two bushfire scenarios identified in Section 3 have been subject to bushfire risk assessment through determination of likelihood and consequence in accordance with the rating tables outlined in Table 1 and Table 2[1]. This process determines the inherent bushfire risk of the event and informs the level of mitigation or management response required to reduce the risk to an acceptable level. The risk assessment matrix used to determine inherent and residual bushfire risk is outlined in Table 3.

Table 1: Likelihood rating system

Likelihood rating	Description
Almost certain	Consequence expected to occur in most circumstances; may occur once every year or more
Likely	Consequence will probably occur in most circumstances; may occur once every five years
Possible	Consequence might occur at some time; may occur once every twenty years
Unlikely	Consequence is not expected to occur; may occur once every one-hundred years
Rare	Consequence may occur only in exceptional circumstances; may occur once every five hundred or more years

[1] The determined consequence rating is the most likely outcome, not the worst case.

Table 2: Consequence rating system

Consequence	Description
Catastrophic	A large number of severe injuries, widespread damage and displacement of the community, significant impact on the environment
Major	Extensive number of injuries requiring hospitalisation, significant damage and impact on the community, longer term impacts on the environment
Moderate	Some injuries requiring medical treatment but no fatalities, localised damage and short-term impact on the environment
Minor	Small number of injuries but no fatalities, some damage and disruption but no lasting effects
Insignificant	No injuries or fatalities, little damage or disruption

Table 3: Risk assessment matrix

	Consequence				
Likelihood	**Insignificant**	**Minor**	**Moderate**	**Major**	**Catastrophic**
Almost Certain	High	High	Extreme	Extreme	Extreme
Likely	Medium	High	High	Extreme	Extreme
Possible	Low	Medium	High	Extreme	Extreme
Unlikely	Low	Low	Medium	High	Extreme
Rare	Low	Low	Medium	High	High

Risk Level	Risk responses
Low	Acceptable risk. Application of standard management measures will ensure risk level remains low and risk should be eliminated or reduced as time permits.
Medium	Potentially unacceptable risk. Development of site-specific management measures may be required to lower the risk level and risk should be reduced as soon as reasonably practicable.
High	Potentially unacceptable risk. Development of additional site-specific management measures will be required to lower the risk level and requires urgent action as soon as possible.
Extreme	Unacceptable risk. Additional site-specific mitigation will be required to lower the risk level and an immediate mitigation response is required.

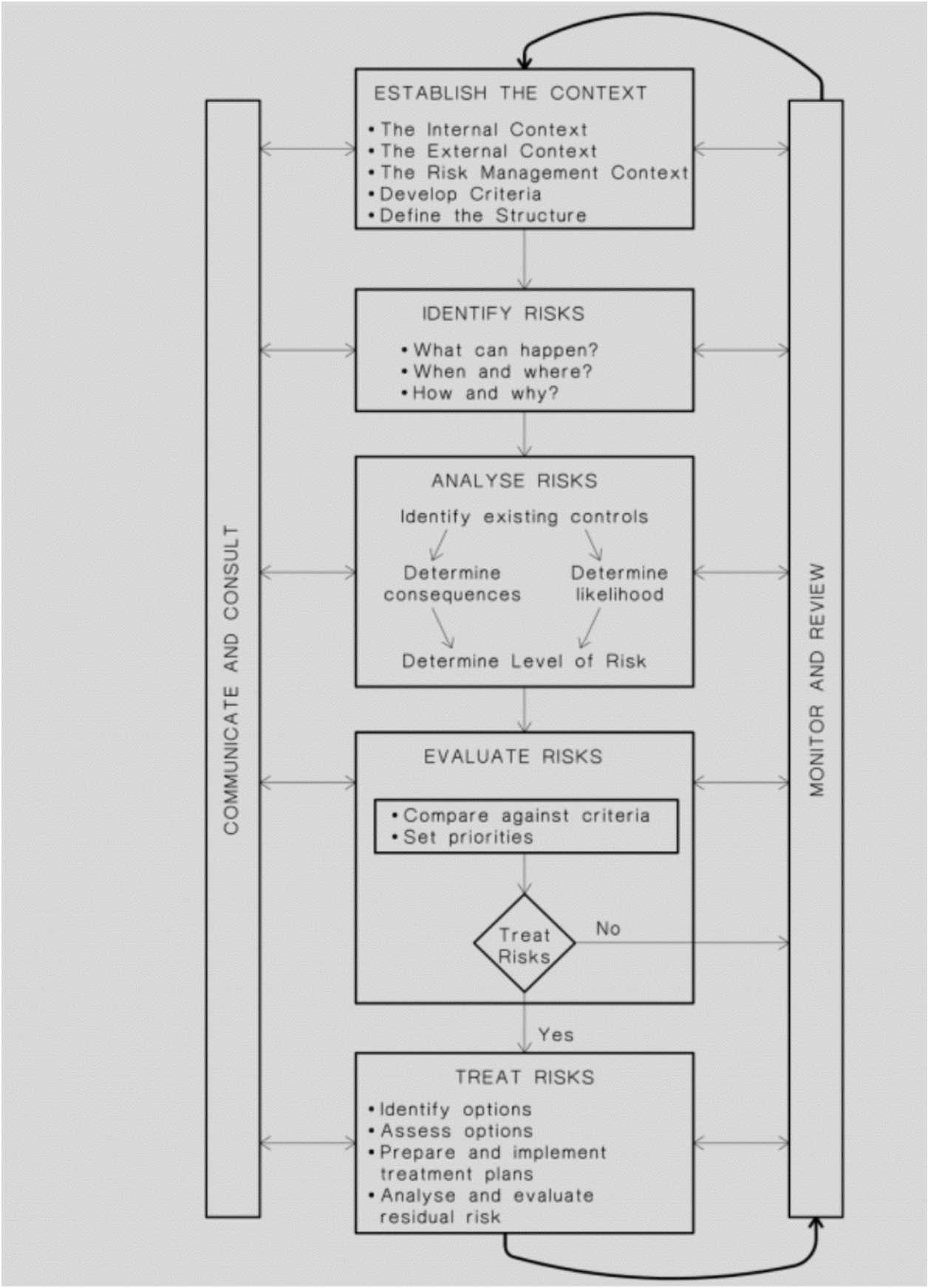

Figure 1: Risk Assessment

3. Identified bushfire scenarios

The BMP (ELA 2019) identifies and classifies the existing bushfire hazards within 150 m of the subject site, based on existing vegetation and slope and separation distance to the vegetation.

Based on this information, ELA has assessed potential bushfire scenarios that could affect the subject site. The potential bushfire scenarios have been used to inform a bushfire risk assessment (refer to Section 4) and assist in development of appropriate bushfire mitigation responses (refer to Section 5). The following bushfire scenarios were assessed:

1. Bushfire approaching the subject site from the west or south; and
2. Bushfire approaching the subject site from the north or east;

A description of each potential bushfire scenario is provided in the following subsections and the October-March wind roses for Perth Airport Weather Station (Station No. 009021, approximately 30 km from the subject site) used to identify potential directions of bushfire attack are provided in Appendix B (BoM 2019).

3.1 Scenario 1: Bushfire approaching the subject site from the west or south

A bushfire may approach the subject site from the west or south through forest and grassland fuel. Predominant wind directions from the east early in the day during the bushfire season (BoM 2019) would push the direction of fire spread away from the subject site however south-westerly winds in the afternoon (BoM 2019) would alter the direction of fire spread towards the subject site.

The vegetation posing a bushfire risk in this scenario is a thin strip between the western boundary of the subject site and Lake Joondalup. Whilst this area could facilitate a bushfire occurrence, its limited size would be unlikely to support a fully-developed bushfire and consequently may pose a lower risk to the subject. It should be noted that the vegetation surrounding Lake Joondalup is classified as wetland vegetation, surrounding an area that has water all year around. The risk assessment has been undertaken based upon the assumption wetland areas contain water even in the height of summer.

The cleared land to the south along the southern border of the subject site, would potentially provide an opportunity for a fire suppression response, which could contain a fire in this area before significant impacts are experienced at the subject site.

3.2 Scenario 2: Bushfire approaching the subject site from the north or east

A bushfire approaching the subject site from the north or east through grassland and woodland/forest vegetation is unlikely given existing urban development in the area which provides a barrier to the subject site; however, would likely be spread by east and north-east winds in the morning which are common throughout the bushfire season (BoM 2019).

The separation between the subject site and these vegetated areas would potentially provide an opportunity for a fire suppression response, which could contain a fire in this area before significant impacts are experienced at the subject site.

4. Bushfire risk assessment results

4.1 Risk context

Risk is being assessed to inform bushfire mitigation for the subject site for the protection of life and property within and adjacent to the site. The risk assessment adopts a broad area and supports a tenure blind approach to ensure wider risk impacts and adjoining lands are captured to suitably address potential risk.

4.2 Risk identification

Bushfire risk is identified in the potential bushfire scenarios outlined in Section 2, which indicate the potential bushfire events that could impact life and property within the subject site and adjacent land. These two scenarios are considered to cover the majority of bushfire events that could occur in order to develop suitable mitigation and manage as much of the bushfire risk as possible.

4.3 Risk analysis and evaluation

Risk analysis and evaluation for each of the two potential bushfire scenarios is provided in Table 4, which specifies the likelihood and consequence of each scenario with and without management measures to determine inherent and residual risks.

Due to the storage and handling of flammable materials within the subject site, the potential consequence of a bushfire entering the site would be greater than if flammable materials were not present.

ELA is of the view that following implementation of management measures, the risk of ignition will not be reduced due to the ongoing level of public access and presence of off-site classified vegetation and on-site flammable goods. Therefore, bushfire risk management measures are likely to reduce the level of consequence resulting from the bushfire event, rather than the likelihood of the event occurring. For example, an evacuation plan will reduce the potential impacts on life; thus reducing the level of consequence received from the bushfire event, but the likelihood of the event occurring will not be reduced.

Table 4: Bushfire risk assessment

Bushfire scenario	Comments	Likelihood	Consequence	Inherent risk	Mitigation	Likelihood	Consequence	Residual risk
1) Bushfire approaching subject site from the west or south	Forest and grassland fuels, adjacent to Lake Joondalup, classified as a wetland (including the surrounding vegetation meaning that the vegetation is inundated with water), short fire run, network of informal sandy tracks throughout the vegetation to limit rate of spread, easily accessible for suppression response. Greatest level of impact would occur under adverse fire weather conditions with a south-westerly wind. Consequence is not expected to occur; may occur once every one-hundred years based on fire history, suppression response capability, fuel types, anticipated rate of spread etc. Some injuries requiring medical treatment but no fatalities, localised damage and short-term impact on the environment based on analysis of assets.	Unlikely	Moderate	Medium	Implementation of management measures identified in Section 5	Unlikely	Minor	Low
2) Bushfire approaching subject site from the north or east	Grassland and woodland/forest fuels, , separated from subject site by Wanneroo Road and proposed cul-de-sac, easily accessible for suppression response. Greatest level of impact would occur under adverse fire weather conditions with a north to north-east wind. Consequence is not expected to occur; may occur once every one-hundred	Unlikely	Moderate	Medium	Implementation of management measures identified in Section	Unlikely	Minor	Low

Bushfire scenario	Comments	Likelihood	Consequence	Inherent risk	Mitigation	Likelihood	Consequence	Residual risk
	years based on fire history, suppression response capability, fuel types, anticipated rate of spread etc. Some injuries requiring medical treatment but no fatalities, localised damage and short-term impact on the environment based on analysis of assets.							

5. Bushfire management measures

Results of the bushfire risk assessment indicate that both bushfire scenarios pose an equal level of inherent risk to life and property.

Implementation of the management measures provided in the following subsections prioritise protection of life and property and will reduce bushfire risk (residual risk) within the subject site.

5.1 Fire protection and detection equipment

The proposed service station will be fitted with a monitored alarm system, which when activated triggers an automatic response to the nominated security company.

Fire extinguishers will be located within the subject site at each fuel dispenser. There will be emergency stop buttons for the fuel system at the Point of Sale and externally on the front of the retail building. Only personnel trained in the use of extinguishers should be utilising this equipment and only if safe to do so.

A Spill Response Kit will be maintained on the subject site at the front apron of the retail building, accessible to the forecourt. Fire services are to be called in the event of a spill that covers more than 2 m^2 and cannot be cleaned with a spill kit at site or it is not considered safe to do so.

5.2 Evacuation plan and assembly points

BP Australia is required to develop an emergency management plan for the subject site in accordance with *Australian Standard 3745-2010 Planning for emergencies in facilities*, identifying evacuation triggers and depicting muster points on-site.

5.3 Personnel Training

All occupants working at the subject site must be trained in responding to and managing all emergency incidents in accordance with the emergency management plan for the site. A record of training must be kept up to date and debrief sessions held after all training exercises or incidents.

An evacuation exercise must be carried out at least annually. All occupants working on the site are required to participate.

5.4 Bushfire suppression

The Joondalup Fire Station (Career) is located north-west, approximately 1.1 km, from the subject site and is expected to provide a conservative emergency suppression response time of 10 minutes in the event of an emergency.

5.5 Landscaping

All landscaping areas within the subject site will be maintained in accordance with Standards for Asset Protection Zones (WAPC 2017).

5.6 Additional measures

5.6.1 Manifest

Dangerous goods sites must maintain a current manifest and a dangerous goods site plan, to allow an appropriate response by Emergency responders in the event of an emergency, such as a fire.

The manifest and dangerous goods site plan for dangerous goods that will be stored and handled at the service station will need to be developed in accordance with the relevant Dangerous Goods Safety Guidance Note (DMP 2014).

The emergency management plan refers to critical information for emergency response being located in the HAZMAT/HAZCHEM emergency boxes which will be located inside the retail building. This information includes the Emergency Plan, Dangerous Goods Manifest, Register of Dangerous Goods and Hazardous Materials, Safety Data Sheets for bulk products kept on site and dangerous goods site layout plan.

5.6.2 Ignition sources

Operators of dangerous goods sites are required to manage potential ignition sources, such as hot works and electrical equipment, within any on-site hazardous areas.

5.6.3 Placard and marking

A placard, readily visual for Emergency responders and providing visual warnings of the hazards associated with storage of fuel, will be required at the subject site in accordance with DMP Storage and handling of dangerous materials Code of Practice (DMP 2010).

Signage and notices will also be required in accordance with *AS 1940-2004 The storage and handling of flammable and combustible liquids* (AS 1940-2004; SA 2004) and any relevant state guidance.

6. Conclusion

ELA expects that through implementation of the management measures outlined in this BRMP, inherent bushfire risk to life and property within and surrounding the subject site can be reduced.

7. References

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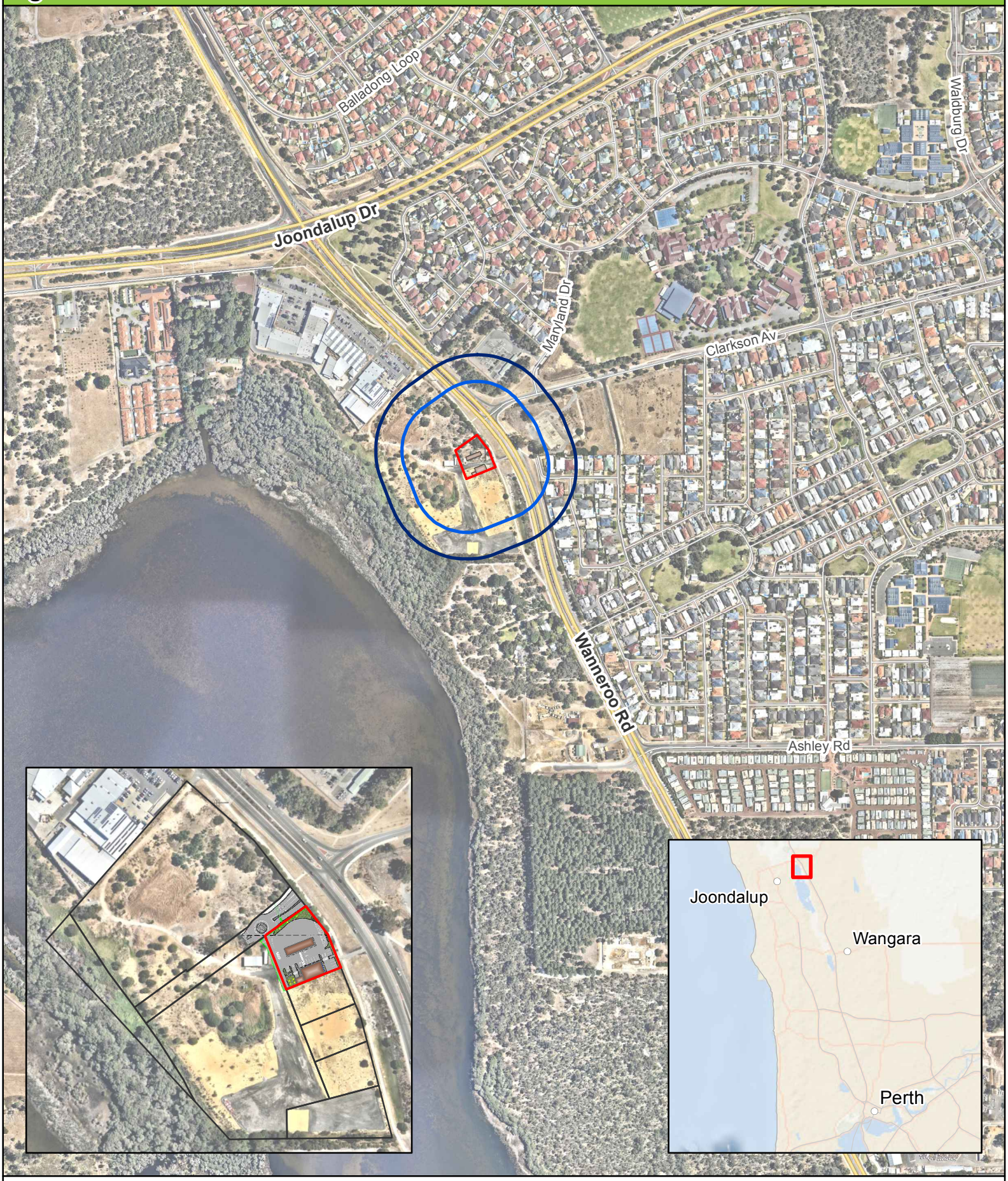
Appendix A Proposed development

Figure 1 - Site Overview



Legend

- Subject site
- 100m site assessment
- 150m site assessment
- WAPC Subdivision Approval No. 156082
- Building / above ground structure

0 75 150 300
Metres
Datum/Projection:
GDA 1994 MGA Zone 50

N

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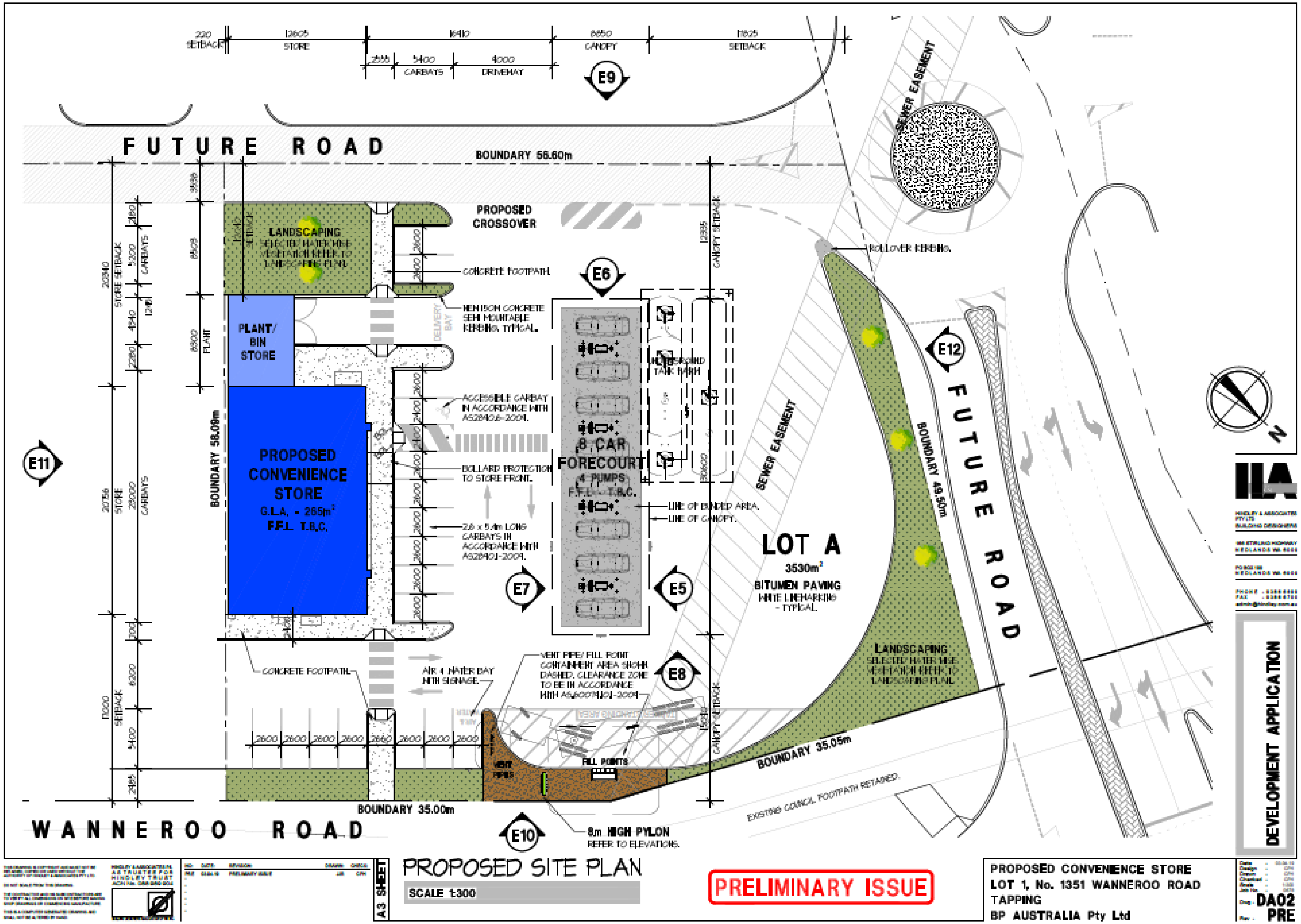
Prepared by: SM Date: 19/11/2019



FUTURE ROAD
BOUNDARY 56.60m
PROPOSED CROSSOVER
LANDSCAPING
PLANT/ BIN STORE
PROPOSED CONVENIENCE STORE
G.L.A. = 265m²
F.F.L. T.B.C.
8 CAR FORECOURT
4 PUMPS
LOT A
3530m²
BITUMEN PAVING
BOUNDARY 49.50m
SEWER EASEMENT
BOUNDARY 35.05m
BOUNDARY 35.00m
WANNEROO ROAD
8m HIGH PYLON
REFER TO ELEVATIONS.
E5
E6
E7
E8
E9
E10
E11
E12
PROPOSED SITE PLAN
SCALE 1:300
PRELIMINARY ISSUE
PROPOSED CONVENIENCE STORE
LOT 1, No. 1351 WANNEROO ROAD
TAPPING
BP AUSTRALIA Pty Ltd
DEVELOPMENT APPLICATION
DA02
PRE

Appendix B Wind roses for Perth Airport Weather Station (Station No. 009021; BOM 2019)

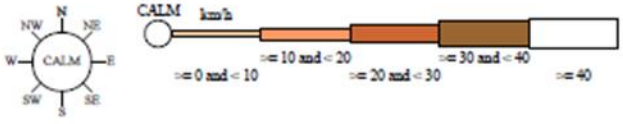
Rose of Wind direction versus Wind speed in km/h (01 May 1944 to 05 Apr 2016)

Custom times selected, refer to attached note for details

PERTH AIRPORT

Site No: 009021 • Opened Jan 1944 • Still Open • Latitude: -31.9275° • Longitude: 115.9764° • Elevation 15.m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



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2232 Total Observations

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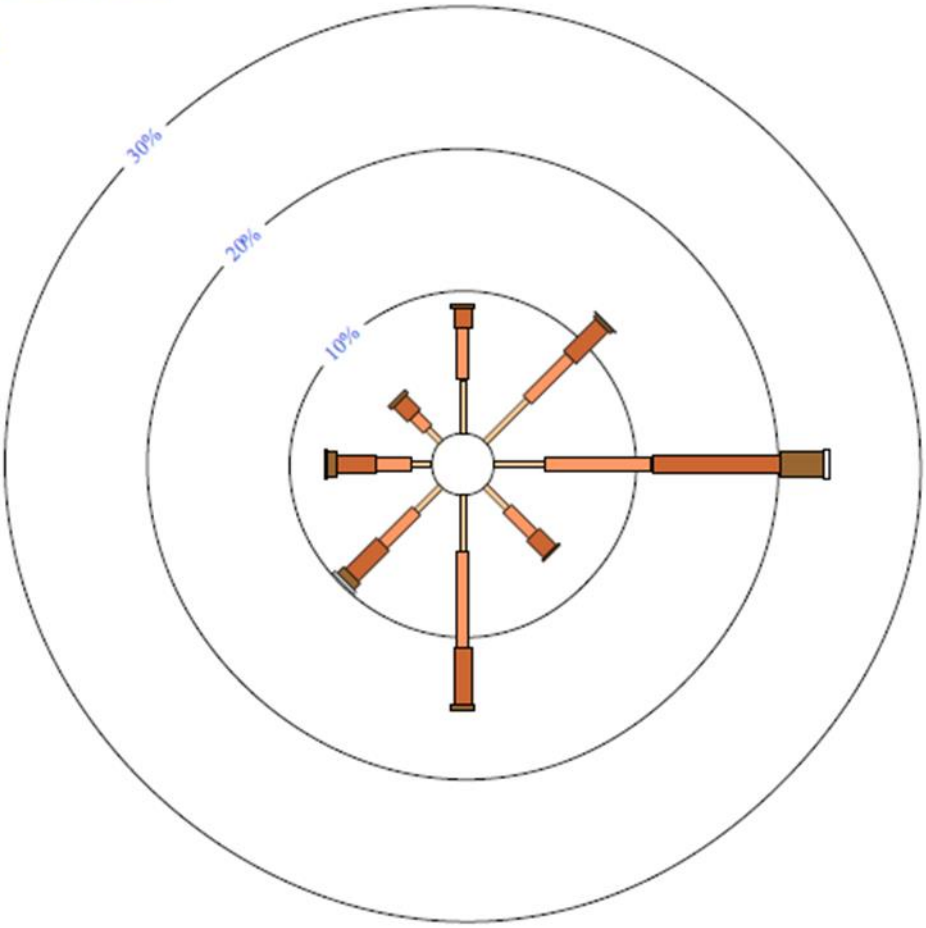

TCZ9178255 Page 1

Rose of Wind direction versus Wind speed in km/h (01 May 1944 to 05 Apr 2016)

Custom times selected, refer to attached note for details

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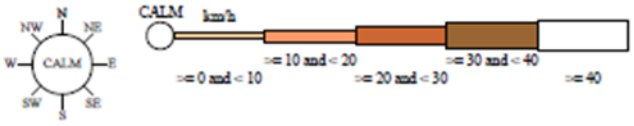
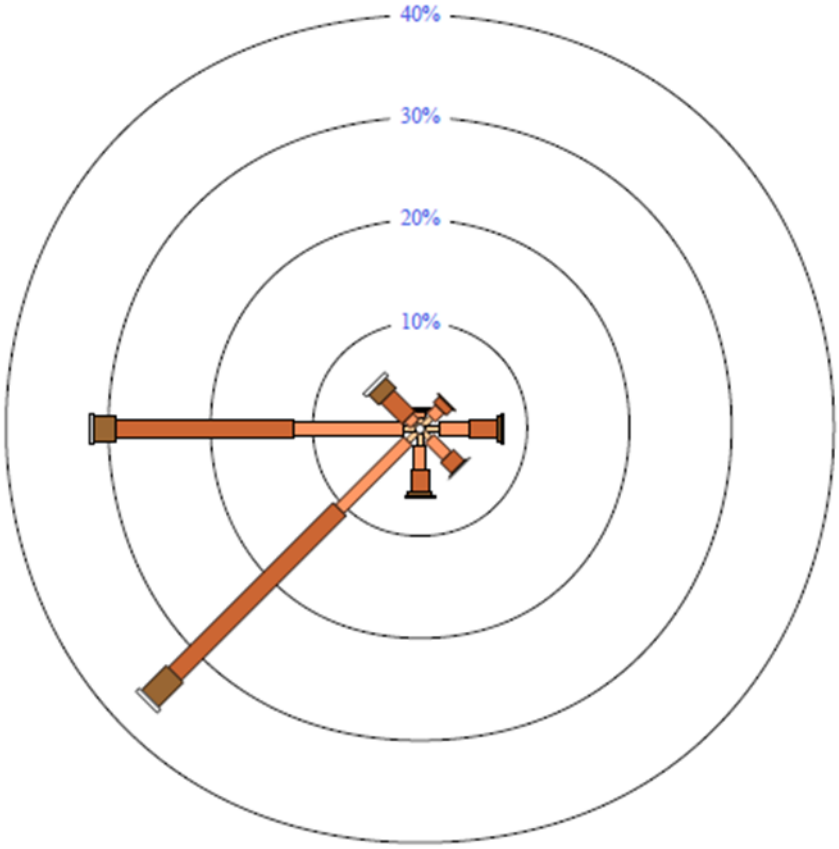


3 pm Oct
2231 Total Observations

Calm 2%



TCZ9178255 Page 1

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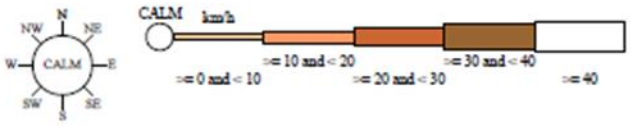
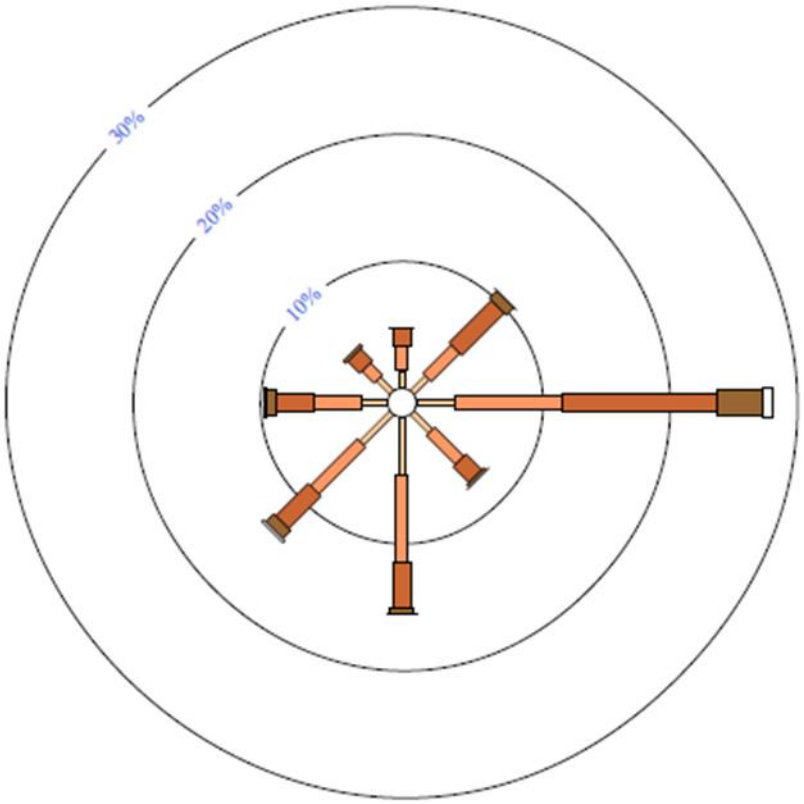


9 am Nov
2159 Total Observations

Calm 6%



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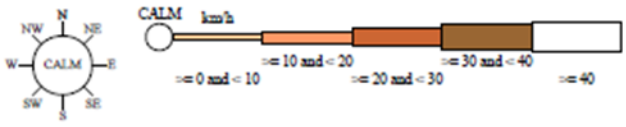

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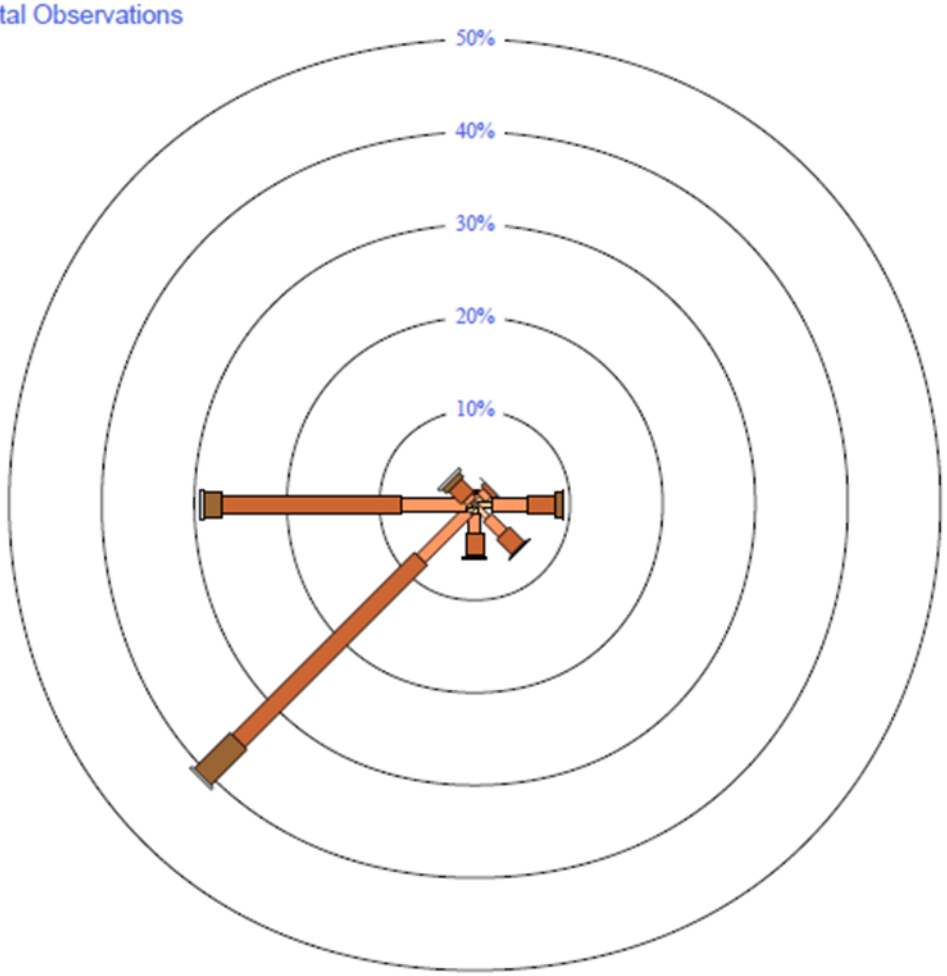
2156 Total Observations

Calm 1%



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Rose of Wind direction versus Wind speed in km/h (01 May 1944 to 05 Apr 2016)

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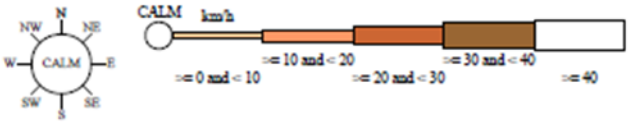
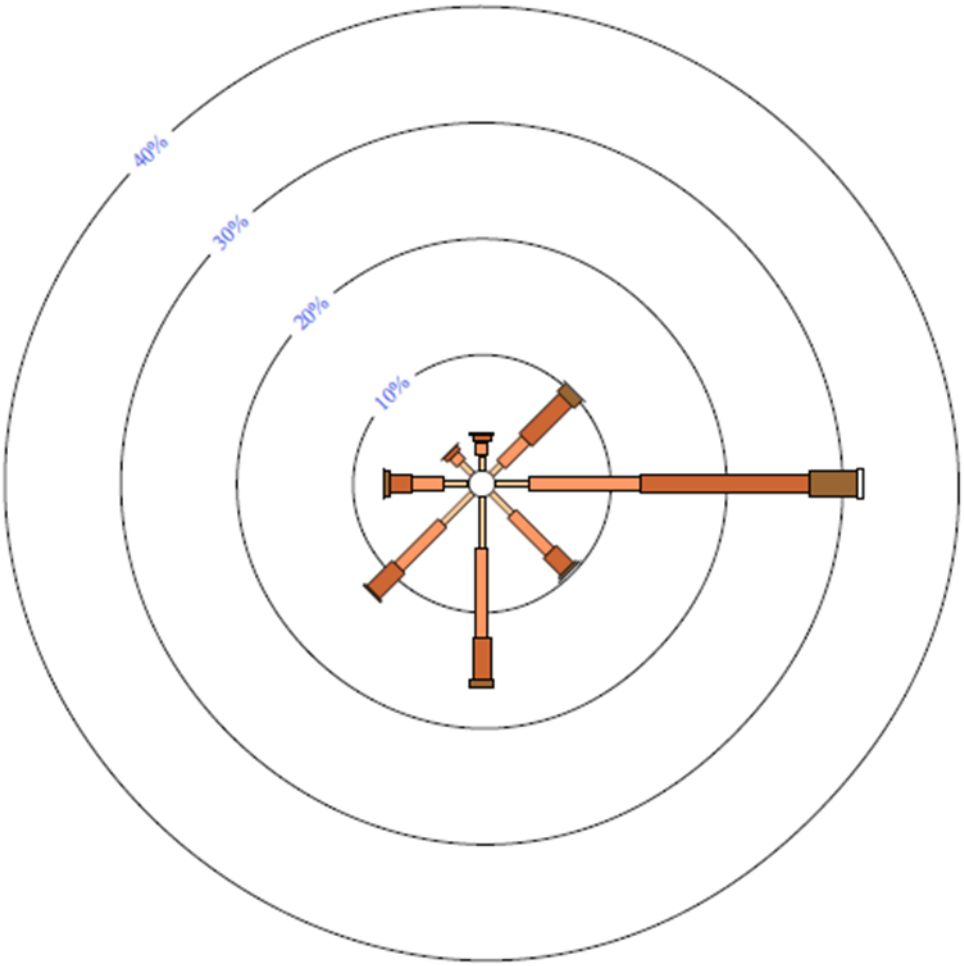


9 am Dec
2231 Total Observations

Calm 6%



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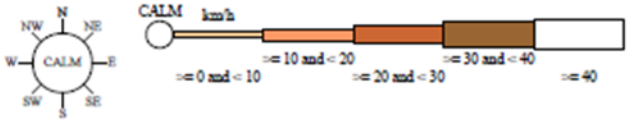
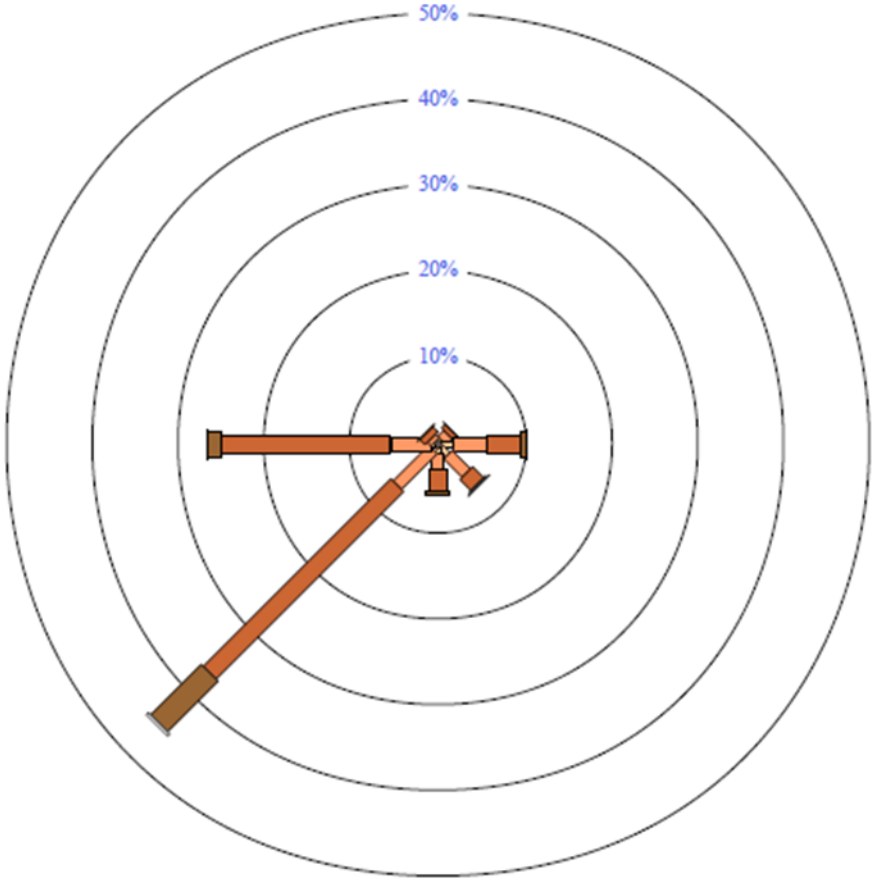


3 pm Dec
2230 Total Observations

Calm 1%



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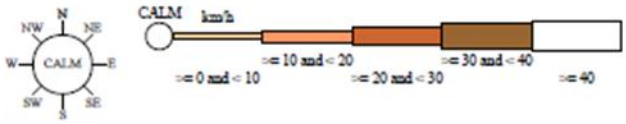
Rose of Wind direction versus Wind speed in km/h (01 May 1944 to 05 Apr 2016)

Custom times selected, refer to attached note for details

PERTH AIRPORT

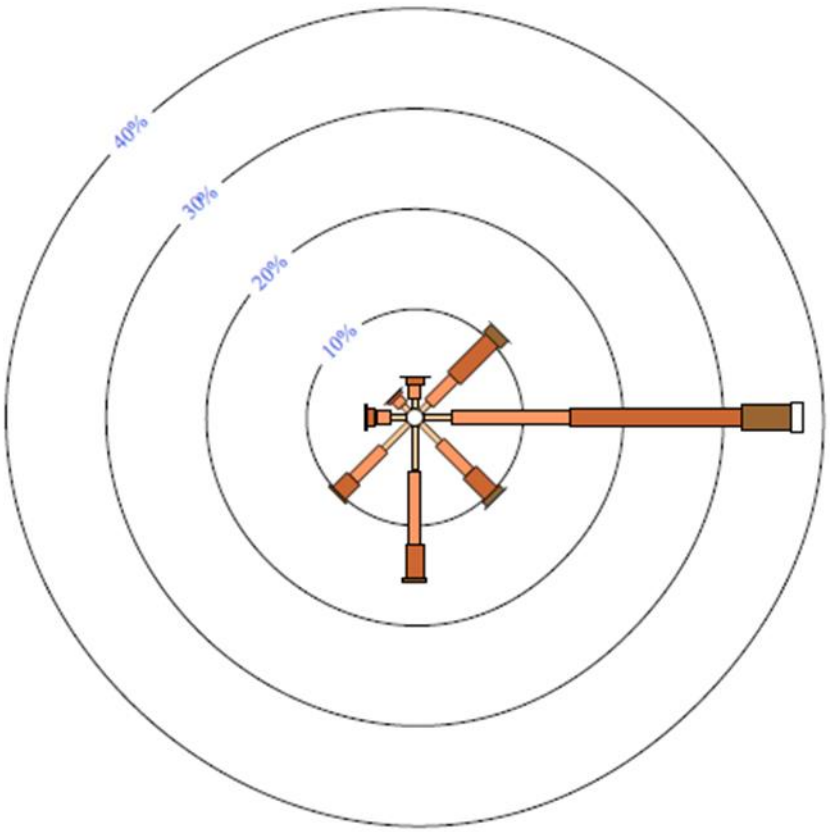
Site No: 009021 • Opened Jan 1944 • Still Open • Latitude: -31.9275° • Longitude: 115.9764° • Elevation 15.m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



9 am Jan
2231 Total Observations

Calm 4%



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Rose of Wind direction versus Wind speed in km/h (01 May 1944 to 05 Apr 2016)

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PERTH AIRPORT

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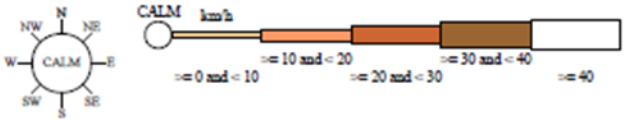
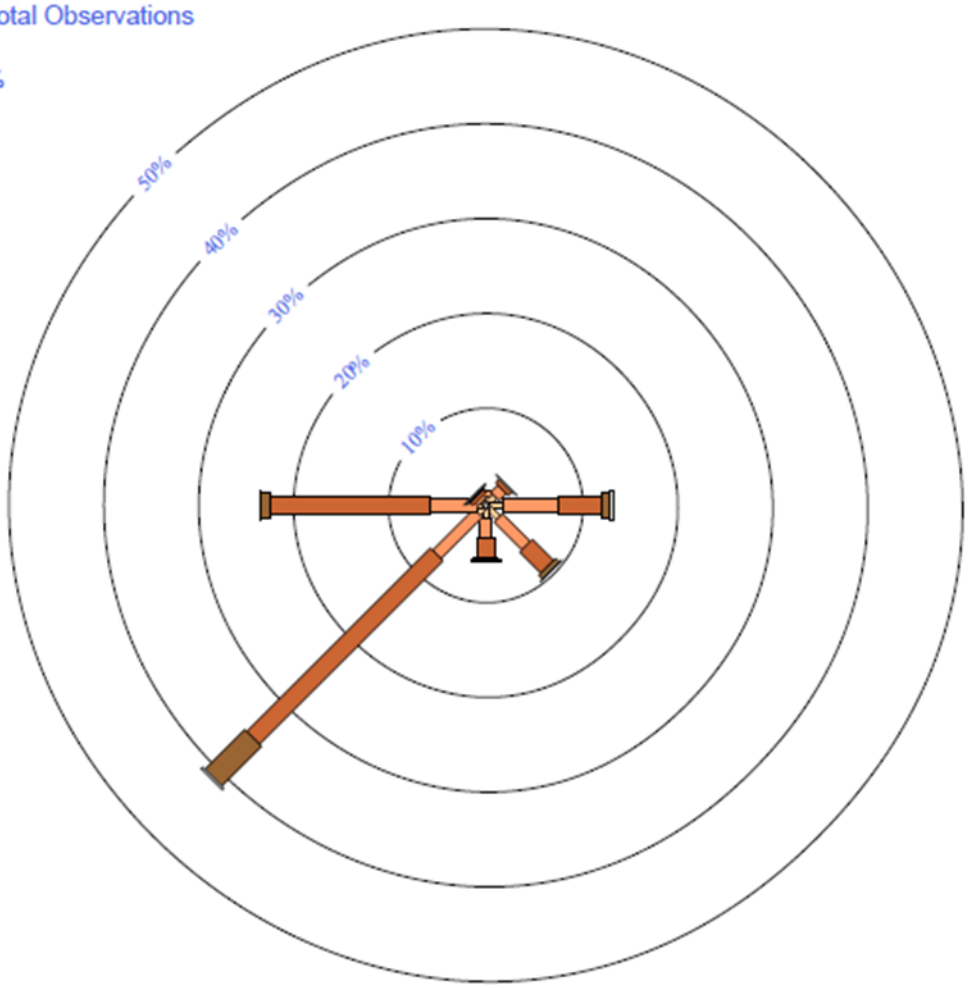


3 pm Jan
2227 Total Observations

Calm 1%



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Rose of Wind direction versus Wind speed in km/h (01 May 1944 to 05 Apr 2016)

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PERTH AIRPORT

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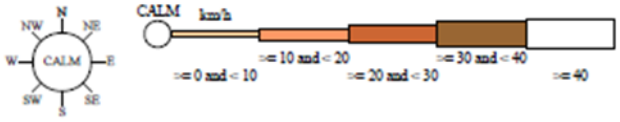
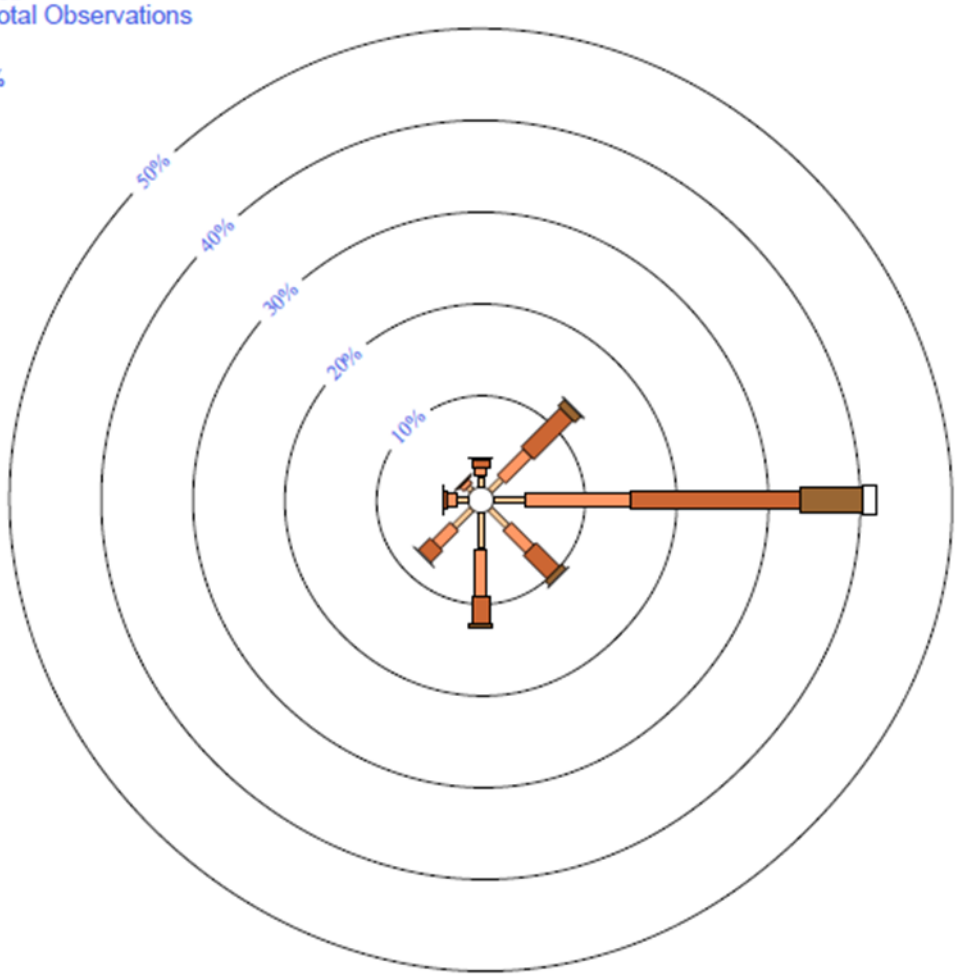


9 am Feb
2033 Total Observations

Calm 7%



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Rose of Wind direction versus Wind speed in km/h (01 May 1944 to 05 Apr 2016)

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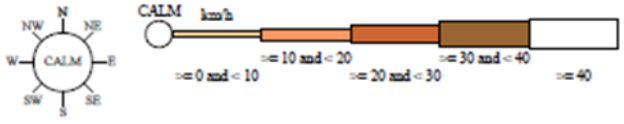
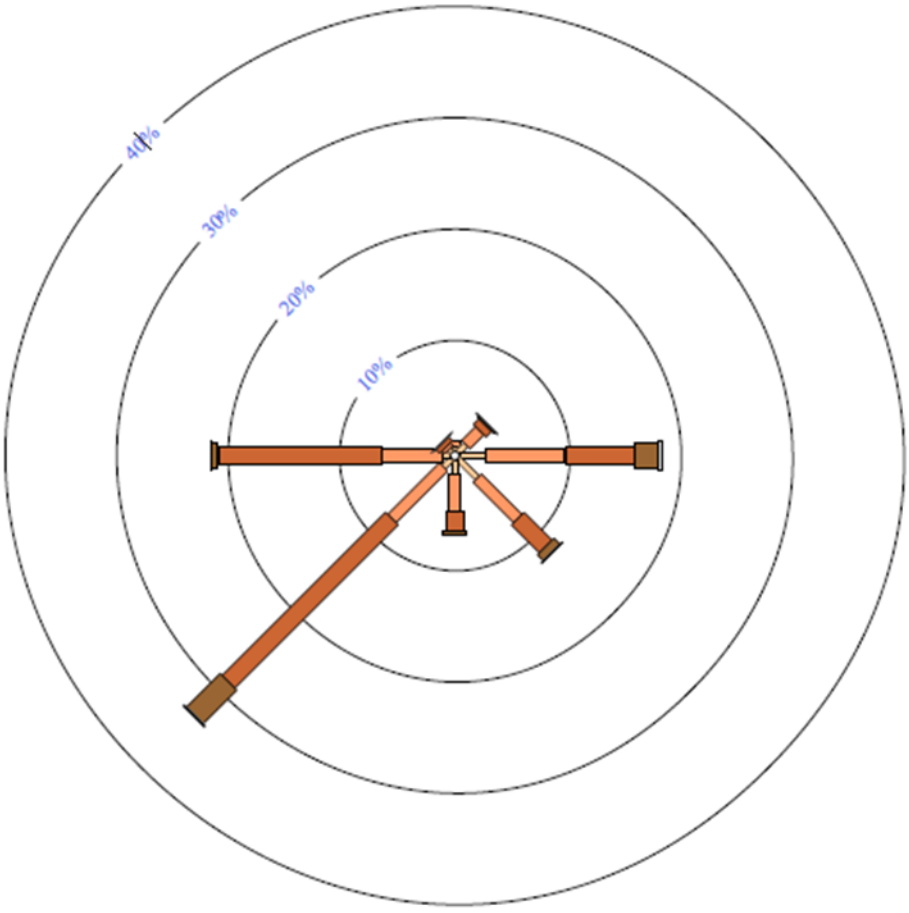


3 pm Feb
2031 Total Observations

Calm 2%



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Rose of Wind direction versus Wind speed in km/h (01 May 1944 to 05 Apr 2016)

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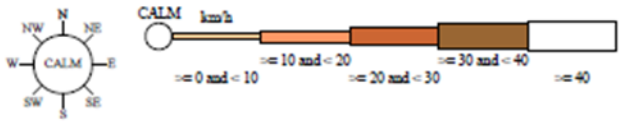
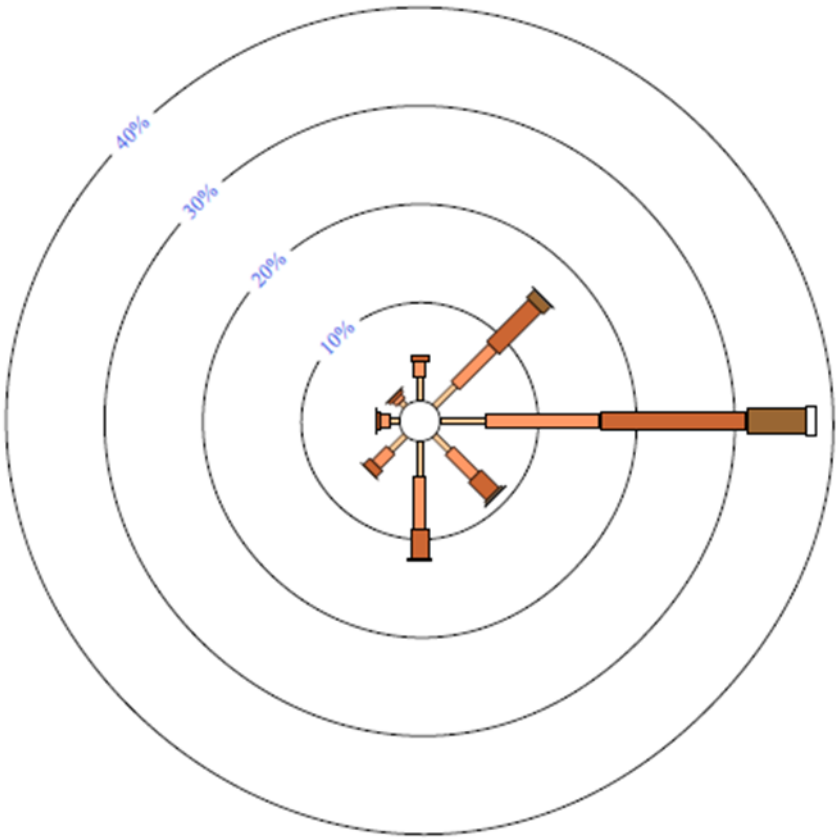


9 am Mar
2231 Total Observations

Calm 10%



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Rose of Wind direction versus Wind speed in km/h (01 May 1944 to 05 Apr 2016)

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PERTH AIRPORT

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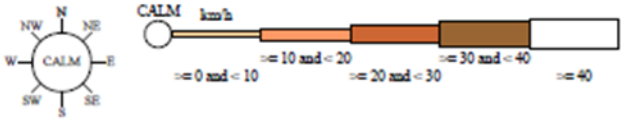
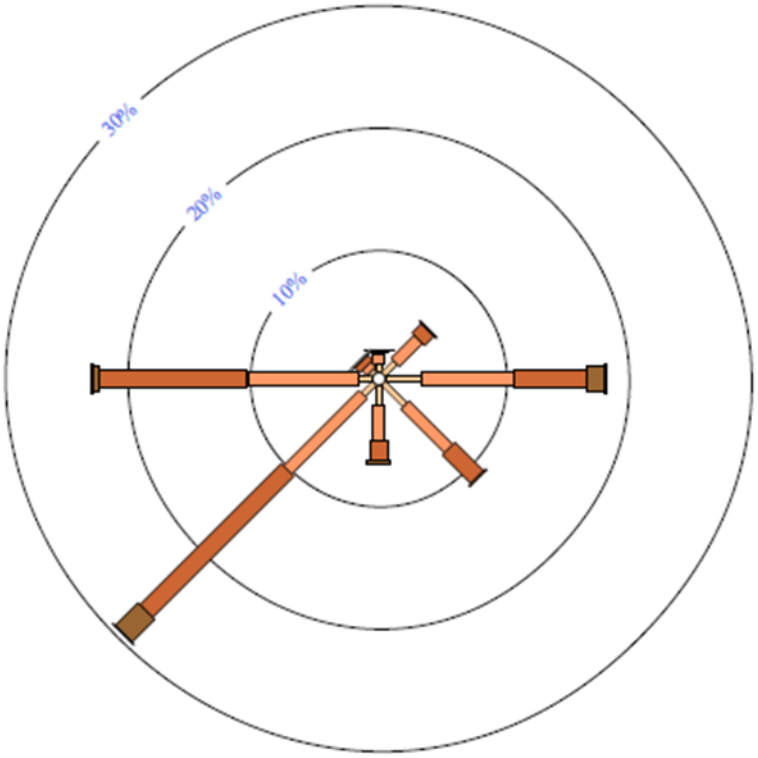


3 pm Mar
2226 Total Observations

Calm 3%



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