

## Bushfire Hazard Assessment

### Project Halogen: Chlor-Alkali Facility Gladstone State Development Area

Prepared for

Grenof Water Technologies Pty Ltd



10 November 2025  
Version 1.2

## Document Tracking:

<b>Project Name:</b>	<b>Bushfire Hazard Assessment - Chlor-Alkali facility</b> <b>Gladstone State Development Area</b>
<b>Client Details:</b>	Grenof Water Technologies Pty Ltd C/o Mr. Scott Lucke Principal Planner CQG Consulting 180 Quay Street, Rockhampton QLD 4700
<b>Project Addresses</b>	Gladstone State Development Area across Lot 1 on MPH32292 and Lot 1 on SP200899
<b>Project Number</b>	J4104
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## Document Control:

Version	Primary Author(s)	Reviewed By	Description	Date Completed
1.2	Lew Short	Lew Short	Final	10 November 2025



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Fire Protection Association of Australia Level 3 BPAD 16373



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# 1. Summary

Table 1 is a summary of compliance with relevant documents and approaches to limit bushfire attack and meet the requirements of the Gladstone Regional Council planning scheme (Version 2) framework for new development in Bushfire Prone Areas.

**Table 1: Summary**

<b>TCP Classification</b>	Material Change of Use Special Industry (chemical manufacturing)
<b>Location</b>	Gladstone State Development Area across Lot 1 on MPH32292 and Lot 1 on SP200899
<b>Local Government Area</b>	Gladstone Regional Council
<b>Can this proposal comply with AS3959:2018</b>	Not applicable
<b>Does this development comply with the purpose of 8.2.4 Bushfire Hazard</b>	Yes
<b>Does this development comply with Section 8.2. Bushfire hazard overlay code</b>	Yes
<b>Assessment Benchmarks</b>	<input checked="" type="checkbox"/> <i>Bushfire hazard overlay code</i>
	<input checked="" type="checkbox"/> Meets the deemed to satisfy provisions
	<input type="checkbox"/> Alternate solution/ performance-based assessment

## 2. Definitions

Definitions are provided as per AS3959:2018.

<b>Asset Protection Zone (APZ)</b>	An area between an asset and a bushfire hazard where bushfire fuel has been reduced significantly to protect the asset.
<b>Bushfire</b>	An unplanned fire burning in forest scrub or grassland vegetation, also referred to as a wildfire.
<b>Bushfire attack</b>	Attack by burning debris, radiant heat or flame generated by a bushfire which might result in ignition and subsequent destruction of a building.
<b>Bushfire Attack Level (BAL)</b>	<p>A means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per metre squared (kWm<sup>2</sup>), and the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire. The following BALs, based on heat flux exposure thresholds are used in this report:</p> <ul style="list-style-type: none"> <li>(a) BAL—LOW</li> <li>(b) BAL—12.5</li> <li>(c) BAL—19</li> <li>(d) BAL—29</li> <li>(e) BAL—40</li> <li>(f) BAL—Flame Zone</li> </ul>
<b>Bushfire hazard</b>	A fuel complex, defined by volume, type condition, arrangement, and location, that determines the degree of ease of ignition and of resistance to control. Bushfire hazards are variable in their severity, with severity levels usually measured in terms of the fire intensity (kW/m <sup>2</sup> ) arising from the hazard.
<b>Bushfire prone area</b>	An area that can support a bushfire or is likely to be subject to bushfire attack including forest, woodland, grassland and scrubland as well as nearby stands of vegetation. Bushfire prone areas do not include maintained lawns, parks or gardens, nature strips, plant nurseries, golf courses, vineyards, orchards or vegetation on land that is used for horticultural purposes.
<b>Classified vegetation</b>	Vegetation that has been classified in accordance with Clause 2.2.3 of AS3959.
<b>Fire Danger Index (FDI)</b>	The chance of a fire starting, its rate of spread, its intensity and the difficulty of its suppression, according to various combinations of air temperature, relative humidity, wind speed and both the long- and short-term drought effects.

### 3. Introduction

Blackash Bushfire Consulting has been engaged by CQG Consulting on behalf of the proponent Grenof Water Technologies Pty Ltd to provide a Bushfire Hazard Assessment for the proposed Major Hazard Facility at Gladstone State Development Area (GSDA) across Lot 1 on MPH32292 and Lot 1 on SP200899 (the site) which is at Figure 1. The proposed development is a Chlor-Alkali facility (Figure 2).

The Project area is approximately 6.9ha which includes plant and ancillary facilities including a chlor-alkali plant and ancillary facilities including office, car parking and utilities (water, power and communications). The plant is proposed to run 24 hours a day, 365 days per year. The Queensland Investment Corporation is a 50% investment partner. The project is critical infrastructure to mitigate sovereign risk associated with essential chemicals vital for Australia's industrial, economic and public health sectors.

The site lies within an area mapped under the Queensland State Planning Policy's Bushfire Prone Area mapping and the Gladstone Regional Council Planning Scheme Bushfire Hazard Overlay as having Medium Potential Bushfire Intensity (Figure 3). The Gladstone Regional Council planning scheme (Version 2) provides a range of bushfire requirements and considerations for new development on bushfire prone land (see Appendix 2). Section 3.7.2 requires that:

*Safety and resilience to natural hazards including flooding, bushfire, landslide and coastal hazards is a focus for the future of the region. Development must avoid or be designed to mitigate the risks of natural hazards for the safety and resilience of the population in flood, bushfire, coastal hazard or steep land areas.*

The proposal will comply with this requirement within this report.

As a MHF, the chlor-alkali facility will be subject to a rigorous, legally enforced framework for identifying, controlling, and continuously improving safety measures to prevent catastrophic incidents. GWT's process design and containment systems will maintain minimal, if any chlorine atmospheric releases during normal operation. A significant accidental release of chlorine from the facility, including in the event of a bushfire, is very unlikely.

Within the Gladstone Regional Council Planning Scheme, the Bushfire Hazard Overlay Code establishes assessment benchmarks to ensure that development maintains the safety of people and property by not exposing them to unacceptable bushfire risk. For land mapped as Medium Potential Bushfire Intensity, development must generally provide a minimum

separation of 10 metres to hazardous vegetation (see A05.3 in Appendix 2), adequate access for emergency services, and a reliable water supply for fire-fighting purposes. These provisions are supported by performance outcomes that require siting, design and management measures to reduce the vulnerability of built assets to bushfire impacts (Gladstone Regional Council Planning Scheme v2, Part 8.2.4 – Bushfire Hazard Overlay Code).

The *State Planning Policy (SPP) 2017* also places emphasis on managing bushfire risk where hazardous materials are stored or handled. It requires that natural hazard impacts, including bushfire, do not exacerbate the risk of hazardous chemicals, flammable substances or toxic releases affecting surrounding communities. In Gladstone, where major industrial activities such as chemical manufacturing and storage are strategically significant, this policy direction is particularly relevant. Developments involving hazardous industries must demonstrate through a Bushfire Hazard Assessment and management measures that the design and operation of facilities will not increase off-site safety risks in the event of bushfire exposure (Queensland Government, *State Planning Policy*, July 2017).

Accordingly, proposals for hazardous industries within areas mapped as Medium Potential Bushfire Intensity must adopt a precautionary approach. This includes incorporating separation from hazardous vegetation, providing defensible space and emergency vehicle access, and ensuring that critical infrastructure such as hazardous material stores, transformers, and control rooms are designed to withstand credible bushfire conditions. By doing so, development can demonstrate compliance with both local planning scheme benchmarks and state policy obligations, and show that risks are reduced to an acceptable or tolerable level consistent with the principle of maintaining public safety.



As such, bushfire has been a key consideration for the project, not just for meeting the requirements of the government documents, but also considering the vulnerability of the assets to bushfire (and consequence of loss), the potential for significant service interruption, the potential for starting bushfires, and the benefits to ongoing bushfire management within the wider area arising from improved infrastructure and the increased presence of a trained workforce.



Although the site is mapped as having Medium Potential Bushfire Intensity (Figure 3), the fire weather severity map is 63 Fire Danger Index (Figure 4) which provides a landscape setting

presenting the potential for large-scale bushfires to develop and impact both the site and the surrounding area, particularly under severe weather conditions. Although the area surrounding the site has a range of existing uses, the connectivity of vegetation across the broader landscape (within Targinie State Forest and surrounding unmanaged natural bushland areas) enables fire to travel rapidly and with intensity, increasing the exposure of the site to ember attack, radiant heat, and potential flame contact. The risk is further compounded by prevailing topography and wind patterns that may drive fire toward the site and could compromise access to and from the site. Accordingly, strategic consideration of bushfire behaviour at the landscape scale is essential to inform development planning and to ensure that appropriate mitigation measures are implemented. As such a conservative approach to site utilisation has been taken.

This assessment has been prepared by Mr. Lew Short, Principal at Blackash Bushfire Consulting (Level 3 FPAA BPAD-A Certified Practitioner No. BPD-PA-16373) who is recognised by the Fire Protection Association of Australia as qualified in bushfire risk assessment in NSW (Queensland does not have an accreditation scheme) and has been accredited by the Fire Protection Association of Australia as a suitably qualified consultant to undertake alternative solution proposals. This assessment is based on a desktop assessment of the study area.



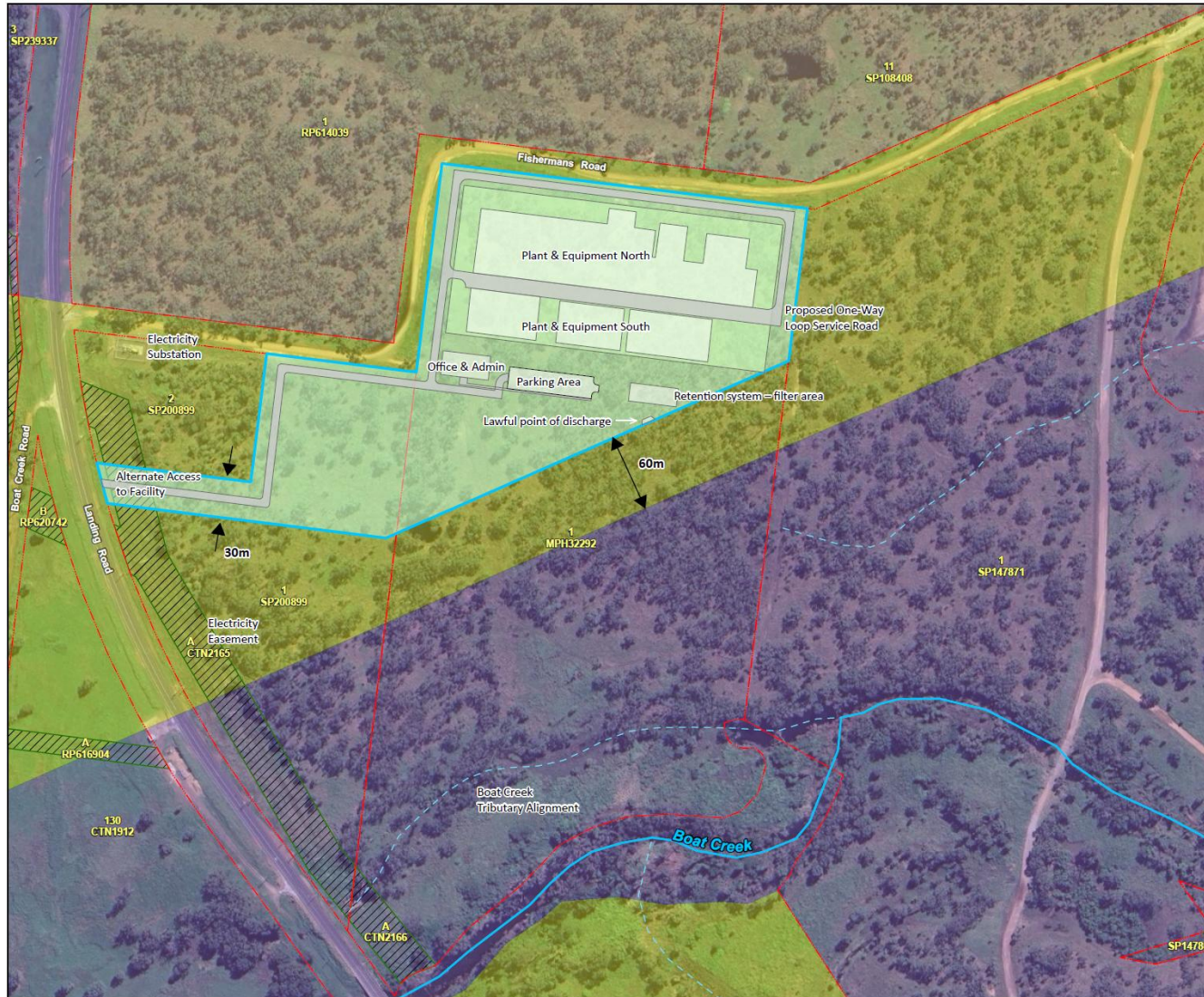
Legend  
 Watercourse  
 Subject Land

N  
  
 Date: 18/09/2025  
  
 Meters  
 Coordinate System: GDA2020 MGA Zone 56  
 Imagery: © Nearmap 3/7/2025

**Figure 1 Site Location**

# BLACKASH

BUSHFIRE CONSULTING



Layer Credits- © OpenStreetMap (and) contributors, CC-BY-SA; QSpatial - Roads, Cadastral Boundaries, Gladstone SDA Precinct; CQG; GRENOF

**Legend**

- Project Area
- Easement
- Lot Type Parcel
- Named Waterways
- Unnamed waterways

**Gladstone SDA Precinct**

- Port Related Industry Precinct
- Industry Investigation Precinct
- Materials Transportation and Services Corridor Precinct (MTSC)

Disclaimer:  
CQG has relied upon data obtained from QSpatial and other public sources, as well as the client (Grenof).  
All internal access, maneuvering areas, and infrastructure are subject to engineering design.

N

Scale 1:2,750 (A3)

0 41 83 124

Metres

Coordinate System: GDA2020 MGA Zone 98

**Project Halogen**

Conceptual Operations Site Layout  
(MCU Submission)



Project No: 25054  
Map No: 25054-02  
Revision: RevA  
6 November 2025

Figure 2 The Proposal

## 4. Bushfire Risk Associated with the facility

The Project Team has confirmed that no dangerous agent-firefighting reactions are expected due to the site following:

- Compliance with all safety data sheet guidance for the chemicals produced/ stored on site;
- All chemicals are appropriately segregated in accordance with Australian standards for incompatible materials;
- All end product aqueous production chemicals will be stored in bunded storage tanks preventing any spillage into the environment in the event of a bushfire;
- None of the chemicals produced by the chlor-alkali plant are flammable except for hydrogen which is vented below LEL;
- All pressure vessels that store liquified chlorine gas will be housed in a building and will be compliant with Australian standards for pressure vessels. This is a key compliance obligation that will form part of Grenof's operating protocols;
- The site will be using piped natural gas onsite for steam production. A small amount of LPG will be stored on site for emergency steam generation only when natural gas is not available.
- An emergency firefighting plan for Project Halogen's site will be developed in conjunction with the local firefighting department.

These measures collectively demonstrate compliance with the State Planning Policy (July 2017), particularly the *State Interest – Emissions and Hazardous Activities*, which requires that developments involving hazardous materials are located, designed and managed to minimise risk to people, property and the environment. The project design ensures that the storage, handling and containment of chemicals will not exacerbate bushfire hazard impacts or result in the release of hazardous materials during a bushfire event. This also satisfies Schedule 8.2.4 of the Gladstone Regional Council Planning Scheme – Bushfire Hazard Overlay Code, which requires that “*the potential for the release of hazardous material as a result of a bushfire event is avoided.*”

The facility's compliance with Australian Standards for chemical storage and pressure vessels, bunded containment systems, hydrogen venting protocols, and the adoption of piped natural gas rather than stored LPG all contribute to a robust and defensible hazard-mitigation framework consistent with both State and local planning policy objectives. A small amount of LPG will be stored on site for emergency steam generation only when natural gas is not available.

## 5. Bushfire Prone Areas

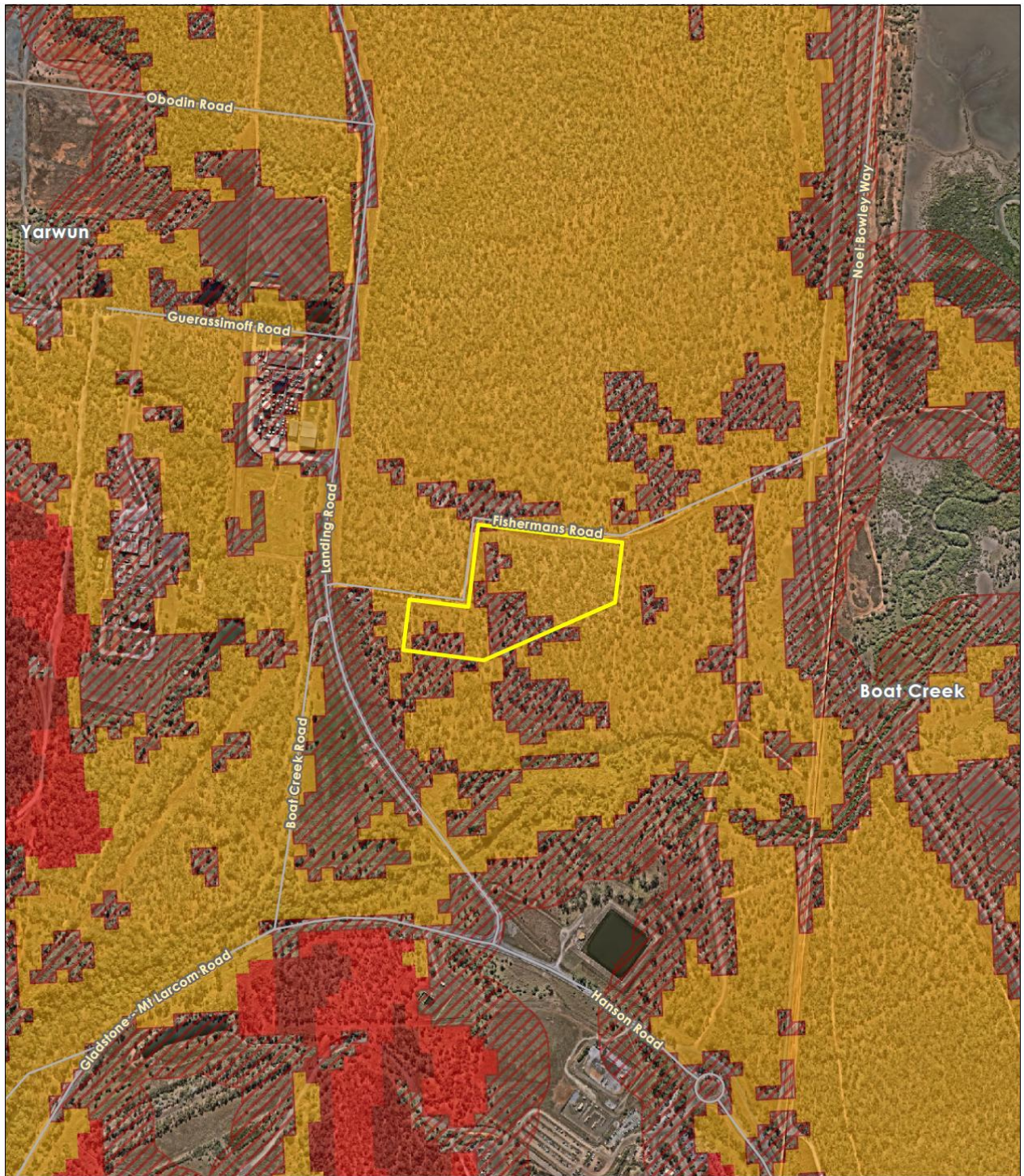
Parts of the site are identified as being within 'bushfire prone Areas' (BFA), refer to Figure 3 for the purposes of Chapter 2, Part 3 of the *Planning Act 2016* and the legislative requirements for development within BFA are applicable to the site.

BFA is land that has been identified by council, which can support a bushfire or is subject to bushfire attack. BFA maps are prepared by Council and included in Schedule 2.5 Overlay maps.

The Development constraints overlay map (Bushfire hazard) provides a trigger for the development assessment benchmarks and consideration of sites that are bushfire prone. BFA maps are an indication of the potential for bushfire attack and are not a risk assessment of land. The Schedule 2.5 Overlay maps (at Figure 3) identifies two (2) categories of BFA; namely:

- **Medium bushfire hazard area:** which is considered to be a lower bushfire risk than High bushfire hazard areas, but higher than the excluded areas and represented as orange on the bushfire prone area map and is subject to a 30 metre buffer. This category has lower combustibility and/or limited potential fire size due to the vegetation area shape and size, land geography and management practices. This category consists of rainforests, lower risk vegetation parcels, Grasslands and remnant vegetation.
- **High bushfire hazard area:** which is considered to be high bush fire risk vegetation. It is higher in bush fire risk than Medium bushfire hazard areas (and the excluded areas) but lower than Very high bushfire hazard areas. It is represented as light red on a Bush Fire Prone Area map and is subject to a 30 metre buffer. This category consists of: woodlands, pine forests and shrublands.

The site is affected by Medium bushfire hazard area and impact buffer (Figure 3).



### Legend

-  Watercourse
-  Subject Land
- Bushfire Prone Area**
-  Very High Potential Bushfire Intensity
-  High Potential Bushfire Intensity
-  Medium Potential Bushfire Intensity
-  Potential Impact Buffer



Meters  
 Coordinate System: GDA2020 MGA Zone 56  
 Imagery: © Nearmap 3/7/2025

**Figure 3 Bushfire Prone Land Map**

## 6. Weather

The bushfire season in Central Queensland, including the Gladstone Region, generally occurs from August through to December, although bushfires can occur at any time of year under suitable conditions. The official bushfire danger period is not fixed annually as it is in some southern states; instead, Queensland Fire and Emergency Services (QFES) may declare local fire danger periods or fire bans when conditions warrant.

Prevailing fire-weather conditions in the Gladstone area are typically associated with dry westerly to north-westerly winds, high temperatures, and low relative humidity. These conditions are often preceded by periods of dry vegetation and limited rainfall following the winter dry season. Dry lightning storms can occur during the transition to the wet season, and multi-day hot, dry spells with strong winds significantly elevate bushfire risk.

The Australasian Fire and Emergency Services Council (AFAC) Bushfires and Community Safety Position Paper (p. 3) outlines nationally agreed positions for the fire services which states that:

*Bushfire loss can be reduced or avoided in some cases but cannot be entirely prevented. A balance needs to be struck between measures taken to reduce or avoid harm and loss due to bushfire, and the protection of other values.*

The position paper (p. 3) recognises that:

*Bushfire is a normal part of Australia's natural environment, particularly in eucalypt forests and grasslands. However, the frequency and intensity of bushfires varies throughout the landscape and the seasons. Bushfires are a common occurrence during the drier periods of the year in most places.*

And that;

*Bushfires of low or moderate intensity often pose little threat to life, property and community assets, but the potential for changes in wind direction can be a significant hazard. However, bushfires that burn in heavy fuels, steep terrain or on hot, dry and windy days often spread rapidly, crown in forests, produce powerful convection columns and create extensive spot fires ahead of the fire front, often making their control impossible until weather conditions moderate.*

*As the Fire Danger Rating reaches 'Extreme', bushfires are often described as 'firestorms' and become impossible to control. When the Fire Danger Rating approaches 'Catastrophic', the risk of serious injury or death to people in the path of a bushfire increases significantly, and many properties and other community infrastructure can become difficult or impossible to defend.*

The QLD planning framework does not seek to stop fires, rather, it recognises the fundamental risk of bushfire affecting new development and puts in place minimum requirements to provide a tolerable approach to risk management. For critical infrastructure, it is up to the asset owner to determine the tolerable risk and meet minimum requirements. The Project's design engineers have performed a detailed assessment on the critical infrastructure.

## 7. Bushfire Hazard Assessment

The bushfire assessment considers the likelihood of a bushfire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape. The likelihood of a bushfire, its severity and intensity, and the potential impact on life and property varies depending on where a site is located in the landscape. There are a number of factors that influence the potential bushfire behaviour at a landscape scale, including:

- extent and continuity of vegetation;
- topography;
- Accessibility of the landscape for fire response and fire suppression. This can greatly influence the potential fire-fighting strategies and their success;
- the potential fire run (potential size of the fire determined by available fuel) and area that is likely to be impacted by the fire. For example, a large bushfire may impact areas many kilometres in front of the main fire;
- the location and exposure of urban areas, townships, and isolated rural areas to a bushfire; and
- the extent of neighbourhood-scale damage the bushfire may produce.

The Project is exposed to both landscape scale risk (broader landscape) and localised bushfire risk. It is located within a landscape comprising areas of relatively complex terrain with a mix of remnant forest and woodland areas, and grassland hazards which are likely to result in varied fire behaviour based upon localised terrain, fuel and wind conditions.

Grassland fires are fast moving fires that often move quickly through the landscape and are highly dependent on curing (dryness of the grass) and the underlying dryness of the landscape. They can generate enormous amounts of heat, with an average flame height from between 2 to 5 metres. The taller and drier the grass, the more intensely it burns.

Blackash have performed an independent assessment and review for the bushfire risk posed to the infrastructure sites, which is demonstrated in the following sections.

## 7.1. Fire Weather

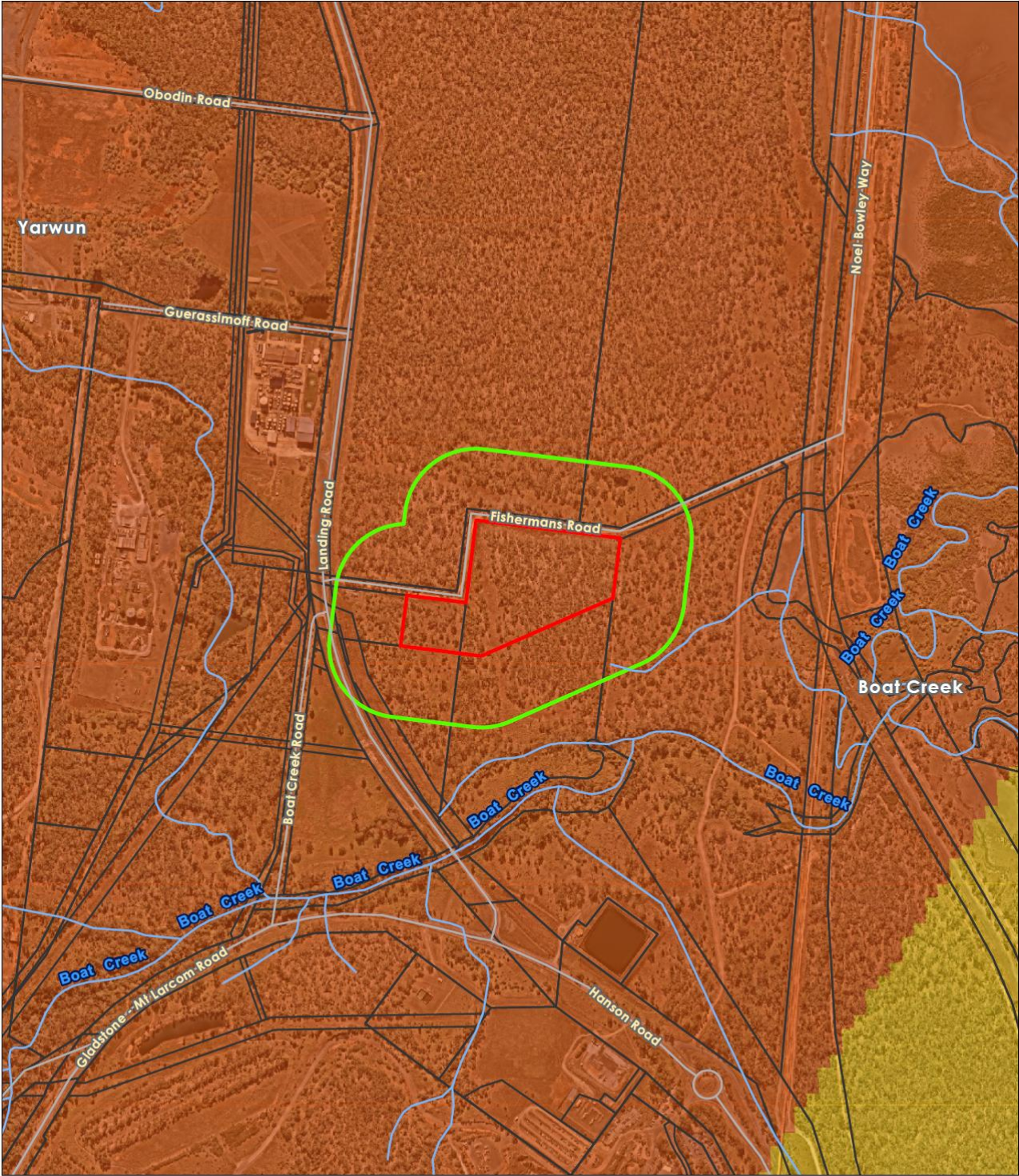
Bushfires are a normal part of the landscape in Central Queensland and are predicted to become more severe, more frequent and an increasingly common part of life. Climate change modelling predicts increasing frequency and severity of fire events correlating with altered rainfall and drought patterns and increasing numbers of severe and intense heat events. As the dryness of more areas increases beyond levels historically considered 'normal', the footprint of areas with a propensity to burn are likely to increase. AS3959:2018 assumes a credible worst-case fire burning under a 1:50 year weather or fire event. This design fire could underrepresent the intensity and frequency of bushfires with climate change.

Fire weather is presented as a Fire Danger Index (FDI), which identifies the chance of a fire starting, its rate of spread, its intensity and the difficulty potential for its suppression, considering various factors such as temperature, humidity, wind and drought effects. As such, a higher FDI equates to a higher bushfire risk profile for an area of vegetation.





Fire weather is dictated by AS3959:2018 and assumes a credible worst-case scenario and an absence of any other mitigating factors relating to aspect or prevailing winds.

Due to advances in the Queensland State and Regional mapping resources, Blackash have provided the site specific FDI for the subject site (refer Figure 4 Fire Weather Severity).

AS3959:2018 does not provide an acceptable solution (Deemed-to Satisfy) for an FDI of 63. Queensland has a Jurisdictional and Regional Value for an FDI 40 in AS3959:2018, which is not supported by the Gladstone Regional Council. As such, for the purpose of the assessment, Blackash have used the acceptable solutions from Table 2.5 of AS3959:2018 for an **FDI 80**.



**Legend**

-  Watercourse
-  Subject Land
-  Cadastre
-  Vegetation Assessment Buffer

**Fire Weather Severity**

-  62
-  63



Date: 18/09/2025



Coordinate System: GDA2020 MGA Zone 56  
Imagery: © Nearmap 3/7/2025

**Figure 4 Fire Weather Severity**

## 7.2. Vegetation Characteristics

Predominant Vegetation is classified by structure or formation using the system adopted by AS3959:2018. The vegetation has been classified in accordance with Table 2.3 of AS3959:2018. Vegetation types give rise to radiant heat and fire behaviour characteristics. There are 12 vegetation formations (with sub-formations) identified in AS3959:2018. The predominant vegetation has been determined over a distance of at least 100 metres in all directions from the proposed work area / structure footprint on the site. Where a mix of vegetation types exist, the type providing the greater hazard is said to predominate. The mapping of vegetation has been completed using available data sets and air photograph interpretation. Modification of vegetation may be completed following vegetation and ecological surveys.

Vegetation is the fundamental physical component of determining bushfire behaviour within a specified region. Vegetation provides the available fuel to be consumed by a bushfire. Fuel load and arrangement represents a considerable component in dictating the behaviour of fire in terms of intensity, rate of spread and flame height.

Vegetation type, density and arrangement can further influence fire behaviour and intensity. Vertical and horizontal continuity (VHC) is also a significant element. Thus, vegetation is a key input to the bushfire risk assessment required by AS3959:2018 which forms a key consideration within this report.

The extent of the mapped VHC within the subject site was reviewed using a combination of recent aerial photography, GIS mapping and data from the Queensland Government data portal, refer to Figure 5. The predominant vegetation affecting the site is woodland.

## 7.3. Slopes Influencing Bushfire Behaviour

AS3959:2018 requires assessment of the effective slopes impacting on a subject site. The slope of the land under the classified vegetation (effective slope) has a direct influence on the rate of fire spread, the intensity of the fire and the ultimate level of radiant heat flux. The effective slope is the slope of the ground under the hazard (vegetation). In identifying the effective slope, it may be found that there are a variety of slopes covering different distances within the vegetation. The effective slope is considered to be the slope under the vegetation which will most significantly influence the bushfire behaviour for each transect. This is usually the steepest slope.

The 'effective slope' influencing fire behaviour has been assessed in accordance with the methodology specified within AS3959:2018. This is conducted by measuring the worst-case scenario slope where the vegetation occurs over a 100 metre transect measured outwards from the development boundary. The slope assessment has been completed to determine the Bushfire Attack Level (BAL) at key project locations. The topography of the study area and surrounds are largely flat (see Figure 6).



**Legend**

- Watercourse
- Contour - 1m
- Subject Land
- Cadastre
- Site Design**
- Fishermans Road
- Proposed One Way Loop Service Road
- Parking Area
- Office & Admin
- Plant & Equip. North
- Plant & Equip. South
- Proposed Plant and Equipment Location
- Project Area Stage 1

**Regional Ecosystem (Structure)**

- 11.3.29/12.11.14/12.3.3 (Woodland)
- 12.3.3/12.11.4 (Woodland)

- 12.3.7 (Forested Wetland)
- Grassland

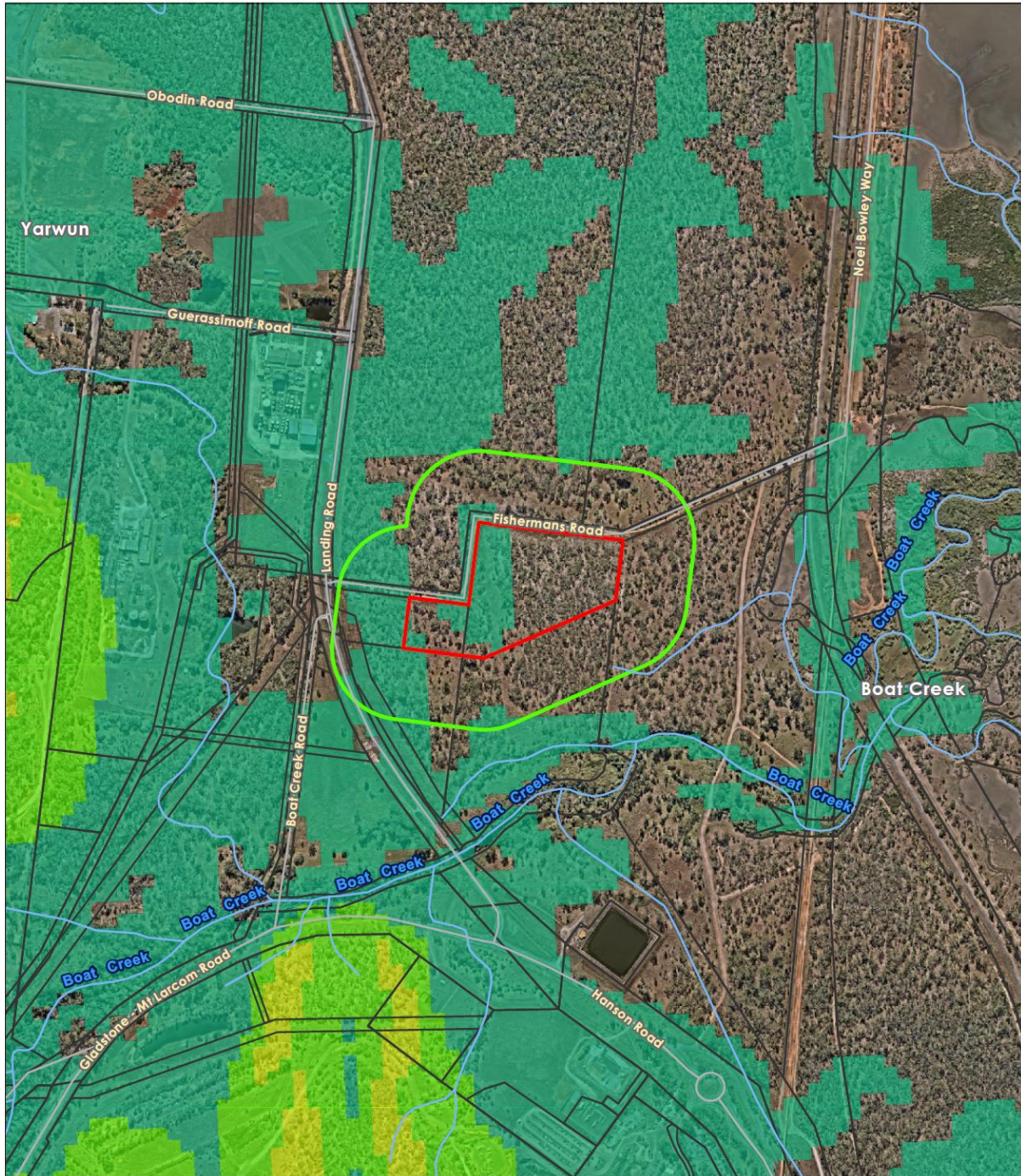
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**DKGIS**  
Date: 18/09/2025








0 80 160  
Meters

Coordinate System: GDA2020 MGA Zone 56  
Imagery: © Nearmap 3/7/2025

**Figure 5 Vegetation & Slope Assessment**



### Legend

- |  |   |
|--|---|
|  Watercourse                  | <b>Landscape Slope Class</b>  |
|  Subject Land                 |  0-5   |
|  Cadastre                     |  5-10  |
|  Vegetation Assessment Buffer |  10-15 |



Date: 18/09/2025

0 200 400  
Meters

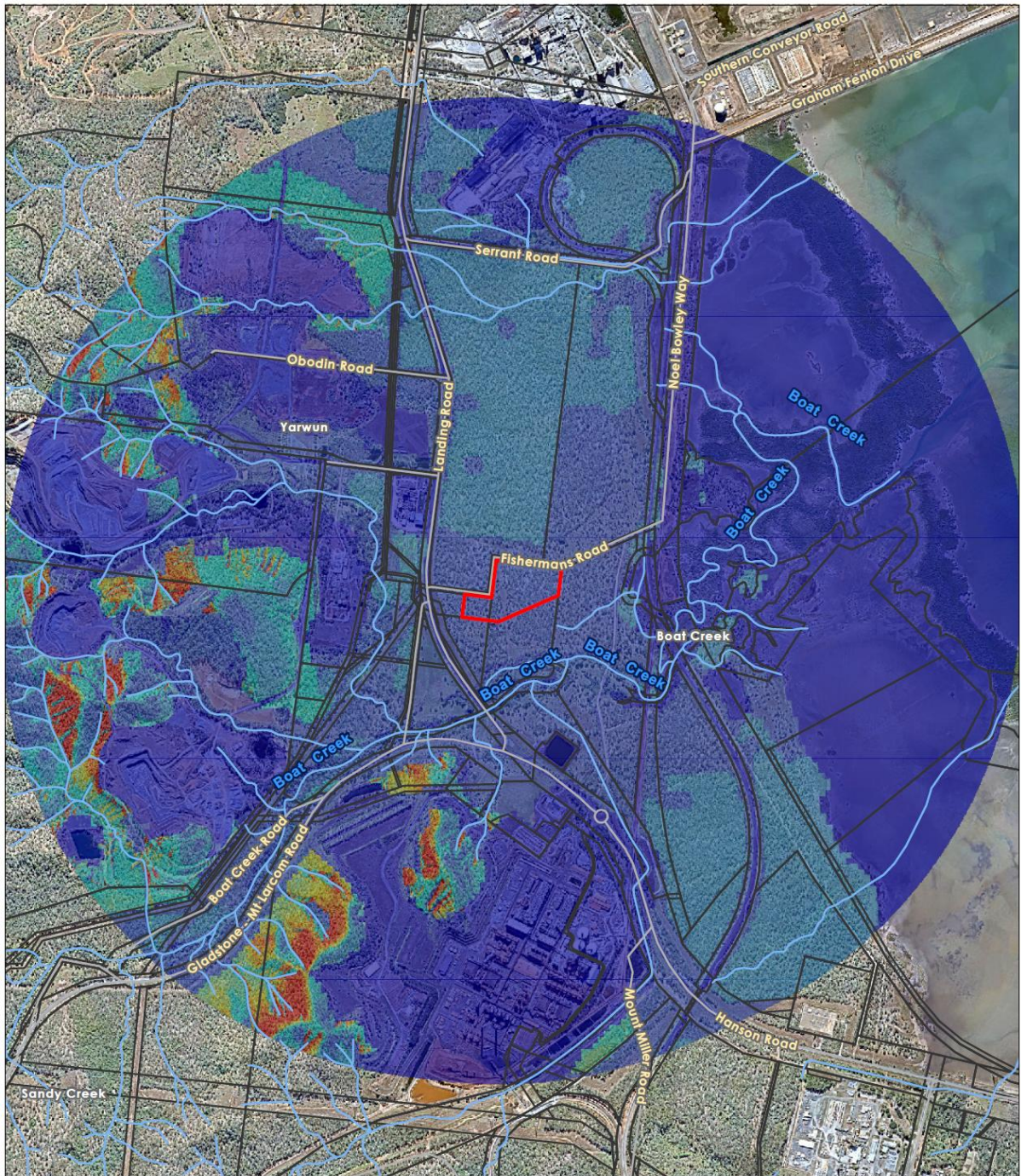
Coordinate System: GDA2020 MGA Zone 56  
Imagery: © Nearmap 3/7/2025

Figure 6 Detailed Slope Assessment

## 7.4. Fire Intensity

The site lies within an area mapped under the Queensland State Planning Policy's Bushfire Prone Area mapping and the Gladstone Regional Council Planning Scheme Bushfire Hazard Overlay as having Medium Potential Bushfire Intensity (Figure 3). This classification indicates that, under severe fire weather, the vegetation, slope, and fuel loads are sufficient to generate a fireline intensity between approximately 1,000 and 15,000 kW/m of fire front (Figure 7). The likely bushfire behaviour includes strong radiant heat, ember attack, possibly flame front spread, though less severe than High or Very High zones.

While the broader setting contains areas of elevated intensity, the immediate site context is predominantly within the lower intensity bands, indicating that with appropriate separation distances, asset protection measures and construction design, future development can be managed to meet the bushfire protection requirements. Careful siting, access design and provision of defendable space will be critical in mitigating radiant heat exposure on the subject land.



**Legend**

- Subject Land
- Y Place name gazetteer
- Roads
- ~ Watercourse
- Cadastre

**Fire Intensity (kW/m<sup>2</sup>) - FDI 100**

	<1,000		90,000 - 120,000
	1,000 - 15,000		120,000 - 150,000
	15,000 - 30,000		150,000 - 180,000
	30,000 - 60,000		180,000 - 250,000
	60,000 - 90,000		> 250,000

Date: 19/09/2025

0      445      890

Meters

Coordinate System: GDA2020 MGA Zone 56  
Imagery: © Nearmap 3/7/2025

**Figure 7 Fire Intensity**

## 7.5. Bushfire Attack Level Assessment

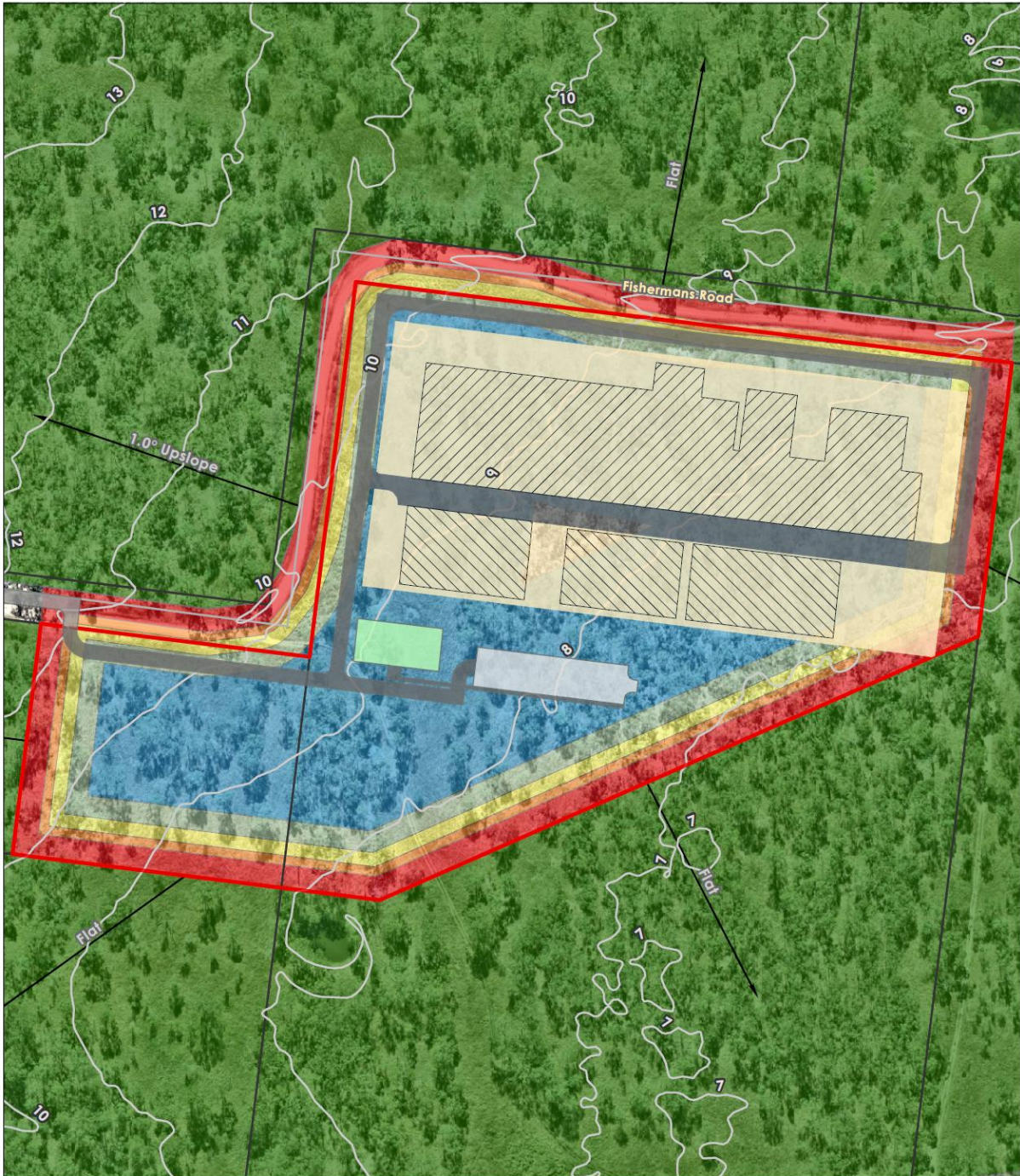
The Bushfire Attack Levels (BAL) is a means of measuring the ability of a building / structure to withstand attack from bushfire. The form of bushfire attack and the severity will vary according to the conditions (FDI, vegetation, slope and setback) on the site.

The BAL assesses the severity of a building or structure's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per square metre, which is the basis for establishing the requirements for construction to improve protection of a building from potential attack by a bushfire, as defined in AS3959:2018.

Due to the industrial nature of the development, which utilises specialist equipment and infrastructure, AS3959:2018 does not strictly apply to the project components. Instead, a risk based approach is required to be applied to the project components based on the tolerable radiant heat flux. As such, the project engineers have performed an independent assessment on bushfire heat tolerance ( $\text{kW}/\text{m}^2$ ) and have confirmed that the potential radiant heat is within thresholds for the development.

The BAL is calculated based on the slope under the vegetation hazard, the vegetation type and the distance of the vegetation to the proposed structure. The BAL determinations have been performed utilising Method 1 of AS3959 (Figure 8). The radiant heat levels and corresponding BALs for the project infrastructure are provided in Figures 8.

The BAL ratings are used as the basis for establishing the requirements for construction and Asset Protection Zones (APZ) to improve protection of a building/structure, or to determine the vulnerability of a building/structure to potential bushfire attack.



### Legend

- Place name gazetteer
- Watercourse
- Contour -1m
- Subject Land
- Development Area
- Cadastre

### Regional Ecosystem (Structure)

- 11.3.29/12.11.14/12.3.3 (Woodland)
- 12.3.3/12.11.4 (Woodland)

### Bushfire Attack Level (BAL)

- BAL - Flame Zone
- BAL - 40
- BAL - 29
- BAL - 19
- BAL - 12.5



Date: 18/09/2025

0 45 90  
Meters  
Coordinate System: GDA2020 MGA Zone 56  
Imagery: © Nearmap 3/7/2025

**Figure 8 Bushfire Attack Level Assessment**

## 8. Asset Protection Zone (APZ)

A key part of managing bushfire risk is the provision of APZs, which is a fuel-reduced, physical separation between an asset and bushfire hazard vegetation, to achieve a prescribed radiant heat level on the relevant building / structure. The APZ also provides a suitable defensible space within which firefighting operations can be carried out.

The critical infrastructure associated with the project should be designed in such a way as to minimise the impact of bushfire on the infrastructure (ignition and propagation) and ensure that critical infrastructure does not cause a bushfire, or that capabilities are not compromised during bushfire emergencies. Bushfire protection measures should be commensurate with the bush fire risk and criticality of the infrastructure. The site should be managed in its entirety as an APZ.

### 8.1. APZ – Vegetation Management

The APZ is required to be managed in compliance with the standards as set out below:

#### Trees

- Tree canopy cover should be less than 15% at maturity;
- Prune or remove trees so that there is not a continuous tree canopy leading from the hazard to the asset.
- Separate tree canopies by two to five metres.
- Trees at maturity should not overhang within two to five metres of a building / structure;
- Lower limbs should be removed up to a height of 2m above the ground;
- Preference should be given to smooth barked and evergreen trees.

#### Shrubs

- Create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings/structures should be provided;
- Shrubs should not be located under trees;
- Shrubs should not form more than 10% ground cover; and
- Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

#### Grass

- Grass should be kept mown (as a guide grass should be kept to no more than 100mm in height);

- Ground fuels such as fallen leaves, twigs (less than 6 mm in diameter) and bark should be removed on a regular basis.
- Keeping areas beneath retained or planted trees and shrubs cleared of fuel. This may include vegetation management measures such as:
  - canopy lifting to reduce near-surface or ladder fuel loads and reduce flame heights;
  - clearing of understorey vegetation;
  - removal of accumulated litter and woody debris; and
  - removal of loose bark and dead limbs from standing trees.

As the APZ provides a fuel-reduced, physical separation between the new buildings/structures and bush fire hazards, it is a key element in the suite of bush fire measures and dictates the type of construction necessary to mitigate bushfire attack. In practical terms, the setback of each building/structure will form part of the APZ and will need to be conditioned to be maintained to the standards prescribed above.

## 9. Access

The following access requirements are applicable to the development:

- The development is designed to allow for efficient emergency access to buildings/structures for firefighting appliances, including by avoiding long, narrow access arrangements.
- An alternative direct access to Landing Road is proposed to provide access to the site.
- All internal access roads, are to be two-wheel drive, all-weather roads;
- Where kerb and guttering is provided on roads adjacent to hazardous vegetation, roll top kerbing should be used to the hazard side of the road;
- the capacity of road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/ causeways are to clearly indicate load rating;
- There is suitable access for a Category 1 fire appliance to within 4m of any static water supply where no reticulated supply is available;
- Minimum 4m carriageway width for all access roads (Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed);
- Internal access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay;
- A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches;
- Provide suitable turning areas for a Category 1 fire appliances at static water supply locations;
- Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress;
- The minimum distance between inner and outer curves is 6m;
- The crossfall is not more than 10 degrees; and
- Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads.

## 10. Water Supply

Reticulated water will be supplied to the site. Fire hose reels are constructed in accordance with AS/NZS 1221:1997 and installed in accordance with the relevant clauses of AS 2441:2005.

## 11. Gas and electrical supplies

Gas services are required to be design and implemented with consideration of the following:

- Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used;
- All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side;
- connections to and from gas cylinders are metal;
- If gas cylinders need to be kept close to the building, safety valves are directed away from the building and at least 2m away from any combustible material, so they do not act as a catalyst to combustion;
- Polymer-sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used; and
- Above-ground gas service pipes external to the building are metal, including and up to any outlets.

Electrical services are required to be design and implemented with consideration of the following:

- Where practicable, electrical transmission lines are underground; and
- Where overhead, electrical transmission lines are proposed as follows:
  - Lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas; and
  - No part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Lines.

## 12. Potential Bushfire Impact

The approach to the assessment of bushfire risk involved:

- an assessment of the risks to public safety, paying particular attention to bushfire risks, emergency egress and evacuation, and demonstrate consideration with the Bushfire hazard overlay code;
- determining the bushfire hazards and risk associated to the project from surrounding areas (i.e. bushfire impacting the project);
- consideration of construction and operational activities that may have the potential to cause risks from the project, staff and public (community) health and safety (i.e. the project starting bushfires);
- identification of recommended bushfire mitigation measures for the construction and operation of the project.

### 12.1. Potential construction impacts

There are a range of activities with the potential to initiate bushfire during construction, such as:

- accidental ignitions (e.g. cigarettes);
- construction vehicles, plant and equipment;
- vegetation removal including mulching/mowing;
- hot works (e.g. welding and grinding);
- activities undertaken at the Laydown Storage Area compound; and
- arson.

During construction of the project, work practices such as complying with Total Fire Ban requirements would assist in minimising the risk posed by these ignition sources. Provision of managed areas in the form of APZs would limit the spread of fires started within the identified works areas. Detailed recommendations relating to construction management measures and relevant work practices have been provided. These construction management measures will form part of the Construction Environmental Management Plan (CEMP).

## 12.2. Potential operational impacts

The operation of the project has a similar risk profile to that of the construction phase with regard to potential to initiate bushfires , such as:

- accidental ignitions (e.g. cigarettes);
- construction vehicles, plant and equipment;
- vegetation removal including mulching/mowing;
- hot works (e.g. welding and grinding); and
- arson.

Strategies related to bushfire mitigation include:

- Identification of hazardous bushfire areas that the development traverses focusing on Bushfire Prone Areas;
- Asset condition monitoring (inspections) - strategy pre-summer inspections of above ground infrastructure locations;
- Vegetation management – within the nominated APZs (Figures 8) and inclusive of the 10-meter APZ within the Project corridor.
- Design and construction standards; and
- Fire start reporting and analysis.

### 13. Management Measures

Environmental management for the project would be carried out in accordance with an approved Construction Environmental Management Plan (CEMP). Hazards and risks would be managed in accordance with Project's Safety Management system, policies and guidelines. This would seek to avoid, to the greatest extent possible, risks to public safety.

A comprehensive *Bushfire Emergency Management and Evacuation Plan* would be prepared as part of the construction emergency response plan for the project, including:

- protocols for the relocation of workers to nominated safe refuge zones during a bushfire emergency, either within or remote to the work zone (Bushfire Emergency and Evacuation Plan);
- protocols for the management of bushfire risk and fuel management during construction and operation. This would include the restriction and/or prevention of certain activities that present bushfire risks on days with a fire danger rating of equal to or greater than 'high', and as directed by relevant state authorities; and
- training to inform construction and operations workers of bushfire risks and preventative actions, including risks associated with the operation (and maintenance) of vehicles, plant and equipment.

The CEMP would also include strategies and measures for:

- management of hazardous materials and dangerous goods; and
- management of other hazards and risks to the general public and the environment.

Detailed mitigation and management measures have been provided in Section 8 - 11.

### 14. Bushfire Risk Assessment – Construction & Operation

This section describes the bushfire risk assessment during construction and operation of the project. Where relevant, the discussion on the bushfire risk assessment has been separated into two parts (with subheadings) as follows:

- 1) Risk posed by bushfire to the project (ie. Where a fire originating from outside the project footprint threatens the Project; and
- 2) Risk posed by bushfire ignited by Project activities.

Where the risk posed by bushfire can be clearly articulated without the need for separate discussion, consolidated commentary has been provided.

## 14.1. Potential Risk Considerations

The landscape potential of fires impacting the site during construction and operation are significant. The broader landscape has significant potential to carry large scale and intense bushfires. Wind and topography of the land create the potential path that a fire would take. The topography of the land through which the project infrastructure is located is typically level or gently undulating within a predominantly open landscape. Fires which occur in this landscape have the potential to spread in the direction of the wind with the dominant fire spread likely from the north-west, west and south-west.

The surrounding area includes designated BFAs, with a history of large-scale bushfire within the bounds of the Project or proximity of the Project. Fires can approach any of the Project infrastructure from any aspect with potential for small fires and large fires impacting the site.

Design and construction standards assist with fire risk management by ensuring appropriate construction specifications are adopted. This builds resilience and reduces the amount of unplanned problems and therefore, fire start risk. This requires consideration during the design, procurement, construction, and commissioning phases.

The potential sources of ignition of bushfires resulting from the construction and operation of the project include:

- Accidental ignitions such as cigarettes;
- construction equipment including bulldozers, excavators and cranes;
- motor vehicles;
- vegetation removal including mulching/mowing;
- hot works such as welding and grinding;
- electrical faults in equipment;
- chemical fires;
- activities undertaken at the Laydown Storage Area compound; and
- arson.

## 14.2. Risk posed by bushfire for project work areas

### 14.2.1. Project Work Areas

Hot works undertaken within the construction work areas including equipment maintenance which includes welding and grinding and vegetation management such as mechanical slashing can produce sparks which have the capacity to spread for some distance on the wind, resulting in an extreme level of risk of ignition of cured (dry) vegetation. To reduce the level of risk, it is recommended that the site would be managed as an APZ in compliance with Section 8.1. Precaution would be used during all external hot works with shielding and a water supply (such as with an appropriately sized water fire extinguisher or fire fighting pumps) provided close to the works.

External cooking fires (such as BBQ), electrical faults and the inappropriate discarding of lit cigarettes can cause ignition of grassland within and external to the construction and operational work areas. This risk can be managed in accordance with the Total Fire Ban requirements and a water supply (such as with an appropriately sized water fire extinguisher) provided. Fuel free areas (hard stand areas) within the site would be provided that would not provide for ignition of materials.

## 14.3. Construction & Operational activities within the project work areas

### 14.3.1. Risk posed by bushfire ignited by project activities

The use of motor vehicles can cause ignition of grass from hot engines and exhaust pipes. Heavy construction equipment used for vegetation removal including bulldozers, and excavators for excavating pads and drilling bore holes can create situations where these activities can give off sparks when steel blades encounter rock, resulting in a high level of risk of ignition of vegetation.

To reduce the level of risk, the use of this equipment in areas where rock is known to occur would be accompanied by a fire-fighting appliance such as a 'slip-on' fire-fighting unit or tanker trailers. This work would also need to include restriction and/or prevention of certain activities that present bushfire risks on days with a fire danger rating of equal to or greater than 'high' based on a risk assessment endorsed by an appropriately qualified person being completed.

Motor vehicle exhaust systems may ignite grassland vegetation through hot engines, exhaust and particle emission. Diesel powered trucks with pollution control devices in the exhaust system have the potential to emit burning diesel particles which ignite grassland vegetation and forest ground fuels, resulting in a high level of risk of ignition of vegetation.

These risks can be managed by water fire extinguishers in vehicles and communications protocols for escalating fires.

The risk of fire starting and spreading following mitigation measures is considered low – moderate.

#### **14.4. External fires and arson**

Significant potential exists for fires to start that are not associated with the project. These fires have potential to run into the construction area, isolating the construction crews and causing bushfire attack on vulnerable assets. During the bushfire danger period, this risk would be managed by a range of actions to monitor the weather and fire starts within proximity to the Project in line with the *Bushfire Emergency Management and Evacuation Plan*. Any fires that have potential to isolate or impact the site would trigger the *Bushfire Emergency Management and Evacuation Plan* for construction and or operation. This risk can be managed.

#### **14.5. Emergency Protocols**

A detailed *Bushfire Emergency Management and Evacuation Plan* would be developed and implemented for the construction areas that would focus on life safety and leaving isolated bushfire prone areas when the fire weather risk is too high (i.e. above high) or when uncontrolled fires are burning in the landscape that could impact construction areas. The risk to personnel in the construction corridor following mitigation measures is considered to be low – moderate.

The *Bushfire Emergency Management and Evacuation Plan* would outline actions to take if fires start on the project to notify emergency services.

## 15. Emergency egress and evacuation

There are no identified difficulties in accessing and suppressing the fires that could occur within the project area.

The national position of fire agencies is that *the safest action to protect life is for people to be away from the bushfire or threat of bushfire*<sup>1</sup>. This is underpinned by comprehensive emergency management arrangements and operational fire management systems that focus on the provision of information, advice, and warnings to assist communities to make informed decisions prior to the impact of bushfire and if necessary be out of Bushfire Prone Areas well before the impact of fire.

Within the QLD planning framework, there is a hierarchy of controls in place to mitigate bushfire risk to communities. The Bushfire Protection Measures work in unison to enhance resilience by the provision of minimum standards for new development while reducing the vulnerability of negative impacts on occupants (including fire fighters) of these areas.

While appreciating these issues, the design team must provide compliant access within the sites that links into existing road infrastructure in a positive way. The road network is capable of sustaining traffic flows in an emergency.

The evacuation options that would be outlined in the *Bushfire Emergency Management and Evacuation Plan* provide flexibility and alternate routes to take if for some reason the primary route to a safer location is blocked.

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<sup>1</sup> Australasian Fire and Emergency Services Authorities Council. (2019) *Bushfires and Community Safety Position* (AFAC Publication No. 2028)

## 16. Outcomes of the Bushfire hazard overlay code

Compliance summary against the Outcomes Schedule 8.2.4 bushfire hazard planning scheme policy. The Gladstone Regional Council planning scheme states that:

*(1) The purpose of the bushfire hazard overlay code is to ensure that:*

*(a) The risks to life, property, community, economic activity and the environment during uncontrolled bushfire events are minimised.*

*(b) Development does not increase the potential for bushfire damage or risk on-site or to other property.*

*(2) The purpose of the code will be achieved through the following overall outcomes:*

*(a) Development is compatible with the nature of the bushfire hazard except where there is an overriding need for the development in the public interest and no other site is suitable and reasonably available for the proposal.*

*(b) Development siting, layout, design and access minimises the risks to personal safety, and damage to property, infrastructure and other assets.*

*(c) Development directly, indirectly and cumulatively avoids an unacceptable increase in severity of bushfires and does not increase the potential for damage on the site or to other properties.*

*(d) The potential for the release of hazardous material as a result of a bushfire event is avoided.*

*(e) Evacuation and disaster management response including firefighting and access for emergency services during bushfire events is facilitated.*

*(f) Community infrastructure is located and designed to function effectively at all times.*

The proposed Chlor-Alkali Facility satisfies the purpose and overall outcomes of Schedule 8.2.4 – Bushfire Hazard Overlay Code of the Gladstone Regional Council Planning Scheme. The development minimises risks to life, property, community, economic activity and the environment through appropriate siting, layout and design that respond to the mapped bushfire hazard.

The facility is located within the Gladstone State Development Area, where its strategic importance and public-interest role justify its location, and no alternative site of comparable suitability is reasonably available.

The design incorporates managed Asset Protection Zones, access provisions suitable for firefighting and emergency response, and non-combustible construction materials that mitigate radiant heat, flame contact and ember attack.

Bushfire risk management measures are integrated with the facility's broader process-safety and emergency-management systems to ensure that the potential for the release of hazardous materials during a bushfire event is avoided.

These measures collectively demonstrate that the proposal will not increase the potential for bushfire damage on-site or to adjoining land, will facilitate effective evacuation and emergency response, and will ensure that critical community infrastructure can function effectively during and after a bushfire event.

## 16.1. Bushfire Hazard Overlay Code: Assessment Benchmarks

Section 8.2.4 of the Gladstone Regional Council Planning Scheme establishes the assessment benchmarks for development assessment for the Bushfire Hazard Overlay Code. Table 8.2.4.3.1 of the Gladstone Regional Council Planning Scheme establishes the assessment benchmarks for development within areas affected by bushfire hazard. These benchmarks set out the performance outcomes and acceptable outcomes that ensure new development is appropriately sited, designed, and managed to minimise the potential risk to people, property, and the environment. The criteria address matters such as site suitability, water supply for firefighting, emergency access and evacuation, vegetation management, and the safe handling or storage of hazardous materials. The following assessment evaluates the proposed Chlor-Alkali Facility against the relevant provisions of Table 8.2.4.3.1 to demonstrate that the development achieves compliance with the Bushfire Hazard Overlay Code and maintains an acceptable level of safety and resilience consistent with the intent of Section 8.2.4 as shown in Table 2.

**Table 2: Accepted development subject to requirements and assessable development from Table 8.2.4.3.1 - Accepted development subject to requirements and assessable development - General — site suitability**

Performance Outcomes		Acceptable Outcomes		Proposal Compliance Summary
<b>PO1</b>	Development maintains the safety of people and property by not exposing them to an unacceptable risk from bushfire.	-	No acceptable outcome is nominated.	<ul style="list-style-type: none"> <li>The development minimises risks to life, property, community, economic activity and the environment through appropriate siting, layout and design that respond to the mapped bushfire hazard.</li> </ul>
<b>PO2</b>	Development does not result in a higher concentration of people living, working or congregating in a high or very high bushfire hazard area unless it can be demonstrated: <ul style="list-style-type: none"> <li>(a) there is an overriding community need in the public interest, and</li> <li>(b) no other site is suitable and reasonably available</li> </ul>	<b>AO2</b>	The following uses are not located on land within a confirmed medium, high or very high bushfire hazard area: <ul style="list-style-type: none"> <li>(a) child care facility</li> <li>(b) community care centre</li> <li>(c) educational establishment</li> <li>(d) rooming accommodation</li> <li>(e) hospital</li> <li>(f) multiple dwelling</li> </ul>	<ul style="list-style-type: none"> <li>No development types for AO2.</li> <li>Complies with AO1.</li> </ul>

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Performance Outcomes		Acceptable Outcomes		Proposal Compliance Summary
			(g) non-resident workforce accommodation (h) residential care facility (i) retirement facility (j) shopping centre (k) short-term accommodation (l) tourist attraction (m) tourist park.	
<b>PO3</b>	Development in areas with a reticulated water supply has adequate flow and pressure for fire-fighting purposes at all times.	<b>AO3</b>	The water supply network has a minimum sustained pressure and flow of at least 10L per second at 200kPa.	<ul style="list-style-type: none"> <li>Water supply can meet these requirements.</li> </ul>
<b>PO4</b>	Development in areas without a reticulated water supply has an appropriate dedicated water supply for fire-fighting purposes that are safely located and freely accessible for fire-fighting purposes at all times.	<b>AO4.1.1</b>	Development involving a gross floor area greater than 50m <sup>2</sup> where a reticulated water supply is not available is: <ul style="list-style-type: none"> <li>(a) provided with an easily accessible fire resistant on-site water storage of not less than 5,000L (e.g. concrete tank with fire brigade fittings, in-ground swimming pool, dam fed by a permanent water source) that is within 100m of each class 1, 2, 3, or 4 building, and</li> <li>(b) has a hard standing area allowing a heavy rigid fire appliance safe access to within 6m of the storage facility.</li> </ul> Note—Plastic water tanks are not considered to be fire resistant unless they are submerged.	<ul style="list-style-type: none"> <li>Not applicable. Reticulated water provided within the site.</li> </ul>
		<b>AO4.2</b>	The location of water supplies is readily identifiable from the street frontage with clear signage directing firefighters to its access point.	

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Performance Outcomes		Acceptable Outcomes		Proposal Compliance Summary
<b>PO5</b>	Roads and fire access trails are designed and constructed to: (a) enable efficient access to buildings and structures for fire-fighting purposes for emergency services, and (b) swift evacuation in emergency situations.	<b>AO5.1</b>	<p><b>AO5.1</b> Roads and fire access trails are designed and constructed to:</p> <ul style="list-style-type: none"> <li>(a) separate the development from the hazardous vegetation</li> <li>(b) have a maximum gradient of 12.5%</li> <li>(c) a minimum cleared width of 6m and a minimum formed width of 4m</li> <li>(d) have adequate drainage and erosion control devices</li> <li>(e) provides passing and turning areas for fire-fighting appliances at intervals of not less than 200m</li> <li>(f) have a vehicular access at each end to roads or a bushfire trail</li> <li>(g) not involve any cul-de-sac</li> <li>(h) have gates locked with a system authorised by QFES, and</li> <li>(i) have suitable arrangements in place to ensure maintenance in perpetuity.</li> </ul> <p><b>AO5.2</b> Development has direct access to an evacuation route with a potential fire intensity exposure no greater than 2kw/m<sup>2</sup>. Note—The distance from hazardous vegetation to achieve 2kw/m<sup>2</sup> is generally:</p> <ul style="list-style-type: none"> <li>• 58m in a very high bushfire hazard areas</li> <li>• 52m in a high bushfire hazard area, and</li> <li>• 44m in a medium bushfire hazard area.</li> </ul> <p><b>AO5.3</b></p>	<ul style="list-style-type: none"> <li>• Access within the site is available for MR vehicles.</li> <li>• Road access within the site will meet the AO5.1 requirements.</li> </ul> <p>Evacuation on existing roads. Emergency management arrangements undertaken in accordance with site emergency management plan and direction from emergency services.</p>

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Performance Outcomes		Acceptable Outcomes		Proposal Compliance Summary
			<p>Development incorporates an area of managed vegetation that separates lot boundaries from hazardous vegetation by a distance of:</p> <p>(a) 20m to a high or very high bushfire risk area, or</p> <p>(b) 10m to a medium risk bushfire area and includes a fire access trail.</p>	<p>10m APZ is provided around the buildings.</p>
<b>PO6</b>	<p>Development provides for adequate fire breaks that minimise bushfire hazard by:</p> <p>(a) separating hazardous vegetation from development areas, and</p> <p>(b) facilitating access for firefighting and emergency vehicles.</p>		<p>No acceptable outcome is nominated</p>	<ul style="list-style-type: none"> <li>• 10m APZ is provided around the buildings.</li> <li>• The site should be managed in its entirety as an APZ in accordance with Section 8.1 of this report.</li> <li>• The development provides for adequate firebreaks consistent with the intent of the Bushfire Hazard Overlay Code.</li> <li>• Firebreaks have been incorporated to effectively separate areas of hazardous vegetation from the proposed development footprint, thereby reducing potential radiant heat and ember exposure. These firebreaks also provide clear and accessible routes for firefighting and emergency service vehicles, ensuring safe and efficient access for suppression activities.</li> <li>• The proposal satisfies the performance outcome by demonstrating that the layout and design minimise bushfire hazard and support</li> </ul>

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Performance Outcomes		Acceptable Outcomes		Proposal Compliance Summary
				operational firefighting requirements.
<b>PO7</b>	The potential for the release of hazardous materials as a result of a bushfire event is avoided. Note—The term 'hazardous material' is defined in the Glossary of the relevant <i>State Planning Policy</i> .	AO7	Development involving the production or storage of hazardous materials in bulk: (a) is not located within a high or very high bushfire hazard area, or (b) complies with a site specific bushfire management plan.	The site is not within a high or very high bushfire hazard area. The site will comply with this Bushfire Hazard Assessment. The project engineers confirmed that smoke release as a result of bushfire impact will not result in a release of hazardous materials.
<b>PO8</b>	NA			
<b>PO9</b>	NA			•
		<b>AO9.2</b>	The separation area mentioned in AO9.1 contains a fire access trail that:  a) has a minimum cleared and formed width of 6m; b) has vehicular access at each end; c) provides passing bays and turning areas for fire-fighting appliances; and d) are either located on public land, or within an access easement that is granted in favour of council and QFRS.	• Access requirements as per Section 13 of this report.
		<b>AO9.3</b>	Roads and trails:  a) have a maximum gradient of 12.5%; and b) do not involve a cul-de-sac.	• Access requirements as per Section 13 of this report.

## 17. Recommendations

The following recommendations have been made within this report to ensure the proposed development appropriately considers the GRC Planning Scheme Bushfire hazard overlay code:

**Recommendation 1** – Asset Protection Zones (APZ) are implemented and managed for the entire site.

**Recommendation 2** – Access is available within the site for a Medium Rigid Vehicle.

**Recommendation 3** – Electricity and gas supplies are to be designed and implemented in consideration with Section 11 of this Bushfire Hazard Assessment.

**Recommendation 4** – A comprehensive Bushfire Emergency Management and Evacuation Plan would be prepared in accordance with the requirements of Australian Standard AS3745-2010 *Planning for Emergencies in facilities*.

## 18. Conclusion

The proposed Chlor-Alkali Facility at Gladstone has been assessed in accordance with the Queensland State Planning Policy (July 2017) and the Gladstone Regional Council Planning Scheme (Version 2), including Schedule 8.2.4 – Bushfire Hazard Overlay Code. The assessment demonstrates that the site is capable of accommodating the proposed development with acceptable and manageable bushfire risk, consistent with the State interest in *Safety and Resilience to Hazards and Emissions and Hazardous Activities*.

Through the implementation of appropriate Asset Protection Zones, site layout design, and construction standards informed by the *Bushfire Considerations and RFI – Chlor-Alkali Facility Gladstone* report (Blackash, 2025), the development will achieve a tolerable level of bushfire exposure. The facility's engineering design ensures that no hazardous material releases or dangerous agent, firefighting interactions will occur under bushfire conditions or fire fighting arrangements for bushfire.

The proposal represents critical infrastructure of strategic economic importance to the Gladstone State Development Area and the broader Central Queensland industrial network. The development will not exacerbate bushfire hazard within the locality and will contribute positively to regional emergency readiness through the establishment of clear access, on-site water supply, and collaboration with emergency services in the preparation of a site-specific Bushfire Management Plan and Emergency Management Plan.

In summary, the proposed development:

- Minimises risks to life, property, and the environment during bushfire events;
- Avoids the release of hazardous materials as a result of bushfire exposure;
- Incorporates design and management measures consistent with the SPP 2017 and Gladstone Regional Council Bushfire Hazard Overlay Code; and
- Ensures that bushfire risk is managed to a level that is as low as reasonably practicable (ALARP).

Accordingly, the proposal is considered to satisfy the intent and outcomes of the relevant planning instruments and provides a robust and compliant framework for bushfire risk mitigation, hazardous-material containment, and emergency response integration for the Chlor-Alkali Facility at Gladstone.



Lew Short | Principal

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Fire Protection Association of Australia BPAD Level 3 BPD-PA 16373

## Appendix 1 References

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