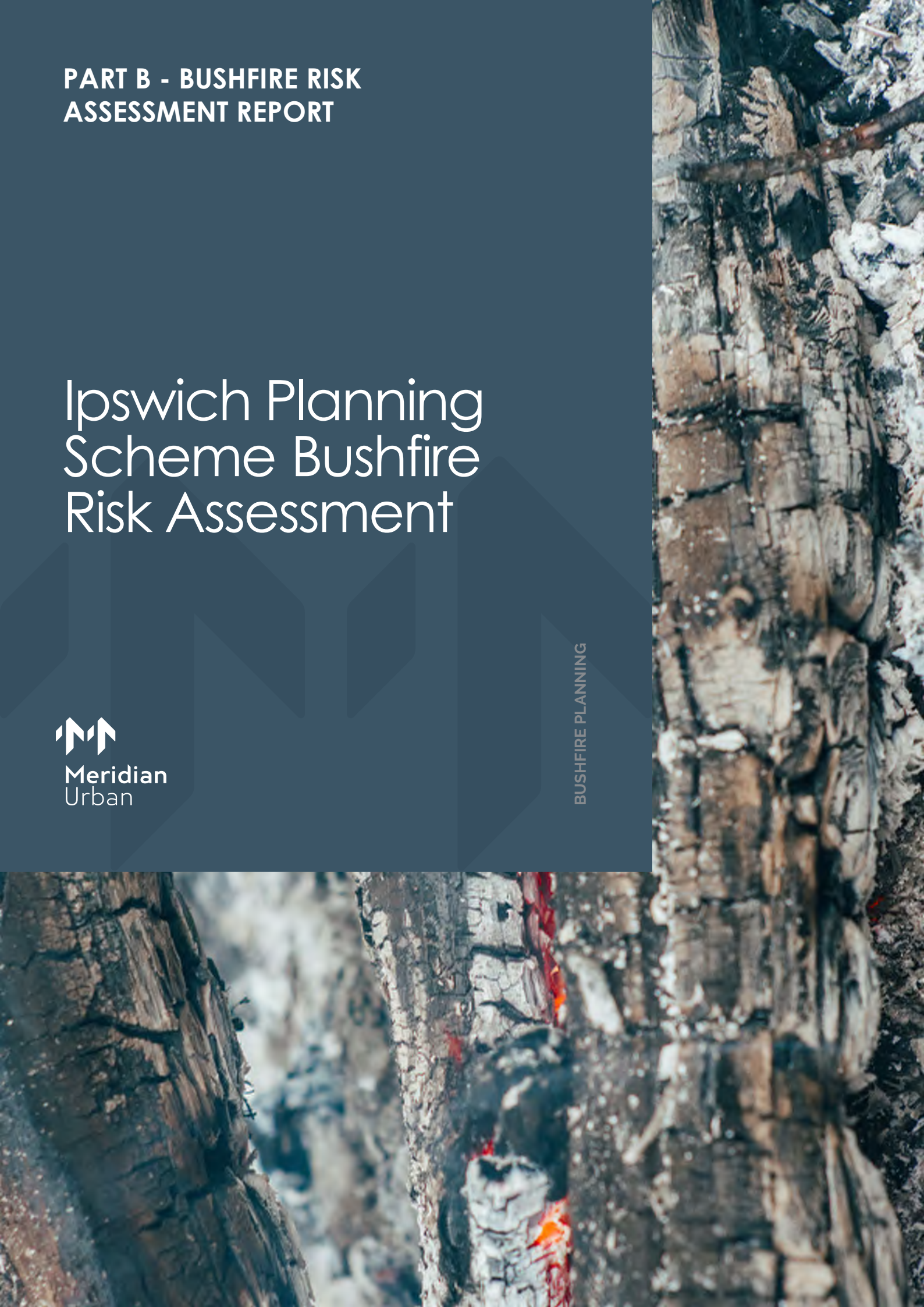
**PART B - BUSHFIRE RISK ASSESSMENT REPORT**

# Ipswich Planning Scheme Bushfire Risk Assessment

Meridian Urban

BUSHFIRE PLANNING



# QUALITY STATEMENT

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| | | | | | | |
| | | | | | | |

FPAA NSW BPAD Accreditation No. 33131

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Member Fire Protection Association of Australia
Member International Association of Wildland Fire
Member Natural Hazard Mitigation Association (USA)
Member Association of Fire Ecology

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

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The client acknowledges and agrees that Meridian Urban has not created or contributed to the creation or existence of this hazard and the Client indemnifies Meridian Urban for claims arising out of or resulting from a bushfire event except to the extent attributable to the negligence of Meridian Urban.

The Client agrees that the Consultant shall have no liability in respect of any damage or loss incurred as a result of bushfire.

# Part B – Ipswich Bushfire Risk Assessment

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# 1 Introduction

The intent of this Part B - Bushfire risk assessment is to examine and understand the potential nature of bushfire risk to people, property and the environment across the Ipswich region now, and into the future.

***This risk assessment focusses on the potential likelihood and consequence of bushfire risk across the Ipswich region, insofar as it relates to strategic land use planning, having regard to factors of exposure, vulnerability and tolerability.***

The Ipswich Bushfire Risk Assessment project comprises five component reports:




This whole-of-region risk assessment seeks to inform Council's strategic land use planning approach to the Ipswich region, adopting a risk-informed evidence base upon which to consider potential strategic land use planning options.

It achieves this by adopting risk-based principles to determine appropriately risk-informed zoning and other strategic planning controls.

This fit-for-purpose risk assessment is prepared pursuant to the current *State Planning Policy July 2017* (SPP), and the State interest guidance materials which are required to be appropriately integrated into a local planning instrument.

The risk assessment process is based upon that set out by the *National Emergency Risk Assessment Guideline* (NERAG) and in accordance with AS/NZS ISO 31000 – Risk Management, having regard to the critical elements of likelihood, exposure, vulnerability, tolerability and consequence with consideration of existing and potential future risk exposure framed by an analysis of:

- Risks to people
- Risks to property
- Risks to infrastructure
- Potential cascading environmental and economic risks.

# 2 Risk assessment scope

The purpose of this landscape-scale strategic risk assessment is to assess the nature of bushfire risk associated with the Ipswich region and to recommend land use planning controls for the area under a new Planning Scheme which responds to the specific bushfire risk profile of the area.

The broader bushfire risk analysis, of which this risk assessment forms part, will develop cutting edge, locally refined and pragmatic land use planning approaches to bushfire risk management to enhance the protection of the Ipswich community from the threat of natural hazard.

This risk assessment forms Part B of the bushfire risk analysis. The planning scheme provisions development forms Part C – Planning issues and options.

This risk assessment adopts a risk-based land use planning lens in the critical analysis of the magnitude of potential risk likelihood, exposure, vulnerability, tolerability and consequence having regard to a range of scenarios to test a variety of risk outcomes, and mitigation and treatment opportunities. This process seeks to inform Council decision making in relation the preparation of a new Planning Scheme, having regard to the risk profile of the Ipswich region.

This approach seeks to satisfy the current State Planning Policy (SPP) and its guidance materials prepared by the State government, which together articulate the suite of bushfire hazard and risk considerations which are required to be appropriately considered as part of strategic planning activities in Queensland.

## 2.1 Assumptions, limitations and exclusions

### 2.1.1 Risk assessment assumptions and exclusions

The following assumptions and exclusions apply to this risk assessment:

- It is assumed the evidence sources utilised to inform this risk assessment are accurate and up-to-date, and can be reasonably relied upon for the purposes of its application.
- This risk assessment is not a bushfire management plan.
- It may offer options or recommendations for Council consideration as part of strategic land use planning processes pursuant to its obligations under the SPP. It does not make any decisions in relation to land use.
- It is assumed a range of other planning-related issues are likely to be taken into account as part of Council's consideration of the observations made by this risk assessment.
- This risk assessment seeks to analyse the extent of bushfire risk relevant to the Ipswich region with respect to the existing situation and potential future risk, based upon a series of defined scenarios. This assessment makes no inference as to the probability of any scenario coming to fruition.
- Any scenarios adopted for the purpose of this assessment are hypothetical only, designed to test a range of potential risk profiles, mitigation options and residual risk profiles to determine potential 'optimal' options having regard to bushfire risk.
- This assessment does not incorporate any traffic modelling or analysis with regard to bushfire emergency evacuation, and remains qualitative in this regard only.

### 2.1.2 Mapping data assumptions and limitations

This risk assessment was undertaken on the basis of the following data assumptions and limitations:

- Data sources are as provided by Council and as made publicly available, refer to **Appendix A** for further detail.
- Where relevant, the analysis considers zoned land only (i.e. unzoned land, such as road reserve, waterways and the like are excluded).
- In order to derive dwelling exposure in urban areas, the following considerations were taken into account:
    - There is no known publicly available dataset that accurately identifies residential buildings within significant urban areas (such as Ipswich city).
    - The state-wide 'Building Points' dataset available from QSpatial provides an indication of residential buildings (with a gross floor area of less than 650m²) however, it is understood this dataset was created in 2014 and lacks significant accuracy within densely populated areas.
    - To establish a measure for number of residential dwellings, a composite of building point data (for non-urban areas) and cadastral data were used
    - The cadastral dataset (state-wide DCDB) was cleaned by removing all non-lot type parcels, underground tenements and common property (by excluding all '0' lot numbers).
    - Lots below 30m² were excluded as to minimise instances where access restriction strips and redundant land parcels formed part of the analysis.
    - Parcels greater than 1 hectare were removed as these were considered to be 'developable' parcels.
    - The cadastral database was aligned to the proposed zoning to identify residential parcels. Parcels that already contained a dwelling identified within the 'Building Points' database were removed to avoid double counting. The remaining parcels were then converted to points an merged with the 'Building Points' dataset to derive residential dwelling location.
    - The dataset included a total of 84,504 dwellings (note, this does not distinguish between occupied and non-occupied).
- Nursing homes are based on geocoded addresses and aligned with the underlying cadastral boundaries to form a cadastral assessment.
- Road exposure is based on a road centreline and considers higher order roads only and does not consider local streets, laneways or other minor roads.

# 3 Guiding methodologies

In order to appropriately inform strategic land use planning controls, a fit-for-purpose bushfire risk assessment is necessary in order to examine potential risk and the nature of potential risk-responsive planning controls to address the various aspects of bushfire risk across the Ipswich region.

## 3.1 Objectives and priorities

The objectives and priorities of this fit-for-purpose risk assessment are:

1. The delivery of ***risk-informed land use planning*** policy, strategy and statutory controls to underpin a new Planning Scheme for the Ipswich region.
2. The ***quantification of risk*** across the Ipswich region to formulate policy and strategy responses across the spectrum of:
    - Avoid
    - Mitigate
    - Accept
    - Transfer.
3. The identification of any ***potential acceptable or tolerable risk opportunities*** where development could be considered subject to statutory provisions. This includes understanding how land management and other bushfire protection measures can be undertaken to facilitate potential development having regard to risk to life and property.
4. Identification of the relevant ***strategic and statutory planning provisions*** which may be considered in response to the above matters.

## 3.2 Principles

The principles of this risk assessment serve as the foundation which guide the approach and implementation of methodologies. This risk assessment is:

- evidence-based
- stakeholder-led, guided by specialist expertise
- locally contextualised
- fit-for-purpose
- both quantitative and qualitative in assessment
- guided by benchmarks to appropriately determine 'acceptable risk'
- transparent to ensure integrity of process
- aligned with the strategic planning requirements of SPP and its guidance materials.

## 3.3 Process

As established above, this risk assessment process is undertaken through the specific lens of risk-based land use planning and using the processes outlined by the *National Emergency Risk Assessment Guidelines* (NERAG) published by the Australian Institute for Disaster Resilience (AIDR) as well as AS/NZS ISO 31000:208 Risk Management: principles and guidelines (ISO 31000).

This process aligns with that required by the SPP and its guidance materials.

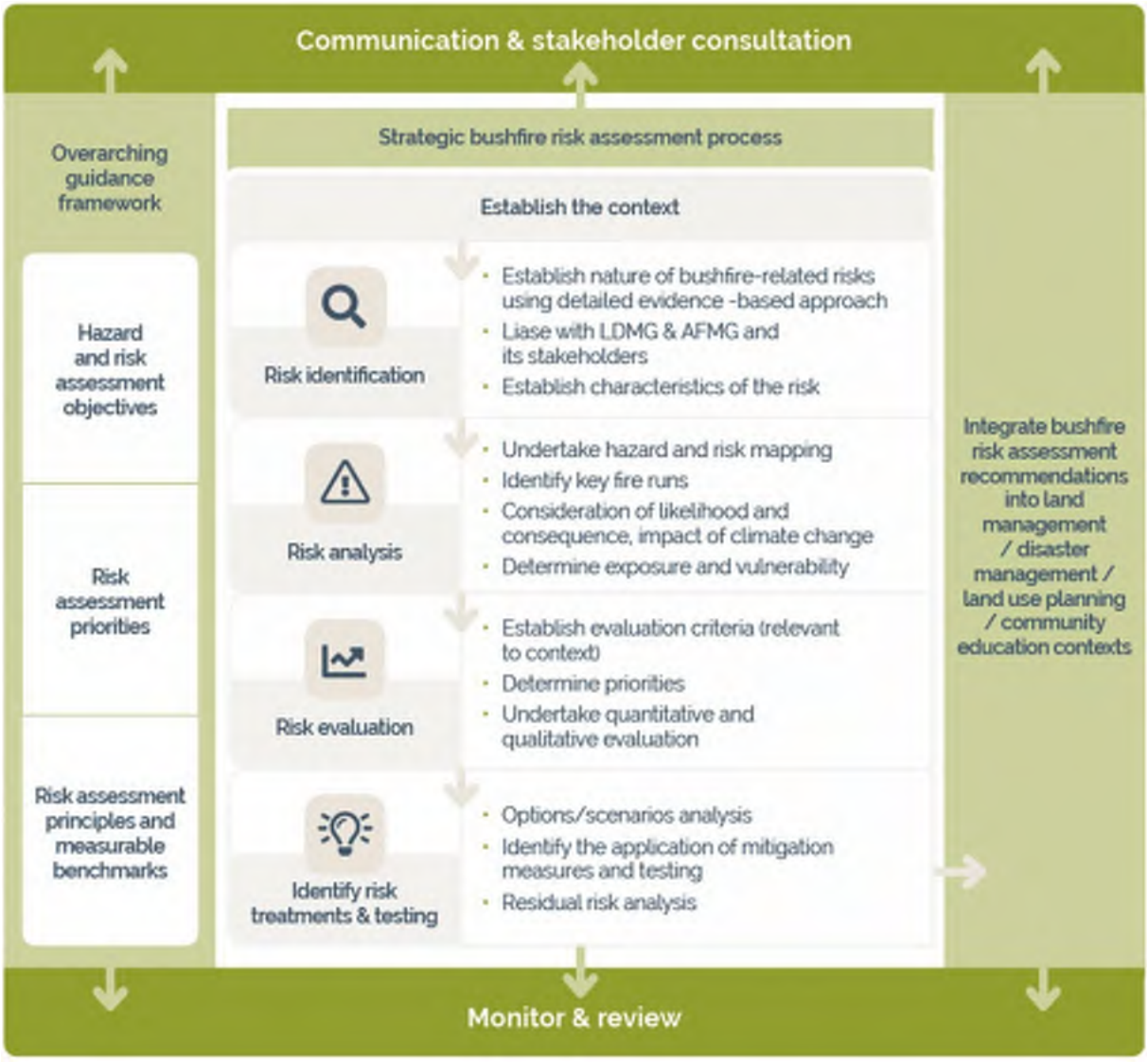



**Figure 3-1 – Fit-for-purpose risk assessment framework in accordance with NERAG**

***Pursuant to NERAG and AS/NZS ISO 31000, the essential first stage of any natural hazard risk assessment process is establishing the context to understand the policy and regulatory environment, the physical environment, weather and climatic trends and event history (AIDR, 2017). The contextual analysis that underpins this risk assessment is contained in Part A.***

How risk is considered by strategic land use planning processes accords with the NERAG framework but attracts different procedures than may otherwise be applied in operational contexts. This is an important distinction to make.

The AIDR Land Use Planning for Disaster Resilient Communities Handbook identifies how risk management procedures are applied in strategic land use planning contexts, outlined below.

**Table 1 – Parallels between land use planning and risk management procedures (Source: AIDR, 2020)**

| Risk management procedure | Land use planning procedure |
|---|---|
| **Establishing the context** | Visioning, overarching desired futures |

| Risk management procedure | Land use planning procedure |
|---|---|
| **Risk assessment** | Analysis of the circumstances and problems / opportunities |
| **Selection of risk treatment options** | Identification of planning alternatives and evaluation and selection of them |
| **Risk treatment implementation** | Planning implementation. |
| **Ongoing communication and consultation** | Communication and consultation |
| **Ongoing monitoring and review** | Monitoring effects and adjusting |

## 3.4 An integrated approach

This risk assessment also incorporates an integrated and multi-disciplinary approach to the consideration and quantification of bushfire risk.

While this risk assessment is planning-based in its focus, it is necessary to consider the multitude of disciplines and mitigation approaches beyond land use planning that combined, enhance overall bushfire resilience.

This approach fundamentally recognises that it is not the role of strategic land use planning to necessarily avoid or reconcile all aspects of risk, but to contemplate the magnitude of risk in varying scenarios to consider how the quantum of mitigation measures may reduce risk exposure, or not, and whether such risk can reasonably be expected to limit risk to life, property and the environment to an acceptable or tolerable level.

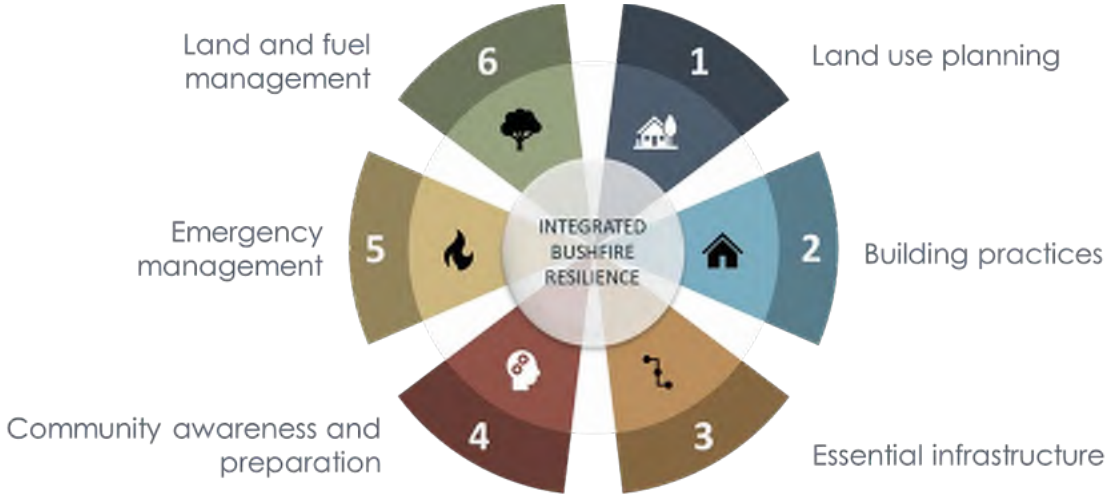



**Figure 3-2 – An integrated approach to bushfire resilience**

As part of this integrated approach, this risk assessment has regard to the Queensland Emergency Risk Management Framework prepared by Queensland Fire and Emergency Services (QFES). This framework is intended to be contemplated by multi-disciplinary approaches, including land use planning activities.

While the framework diverges in certain respects from NERAG, the overarching framework remains similar. This risk assessment has regard to the provisions of the Queensland Emergency Risk Management Framework, to that extent possible.

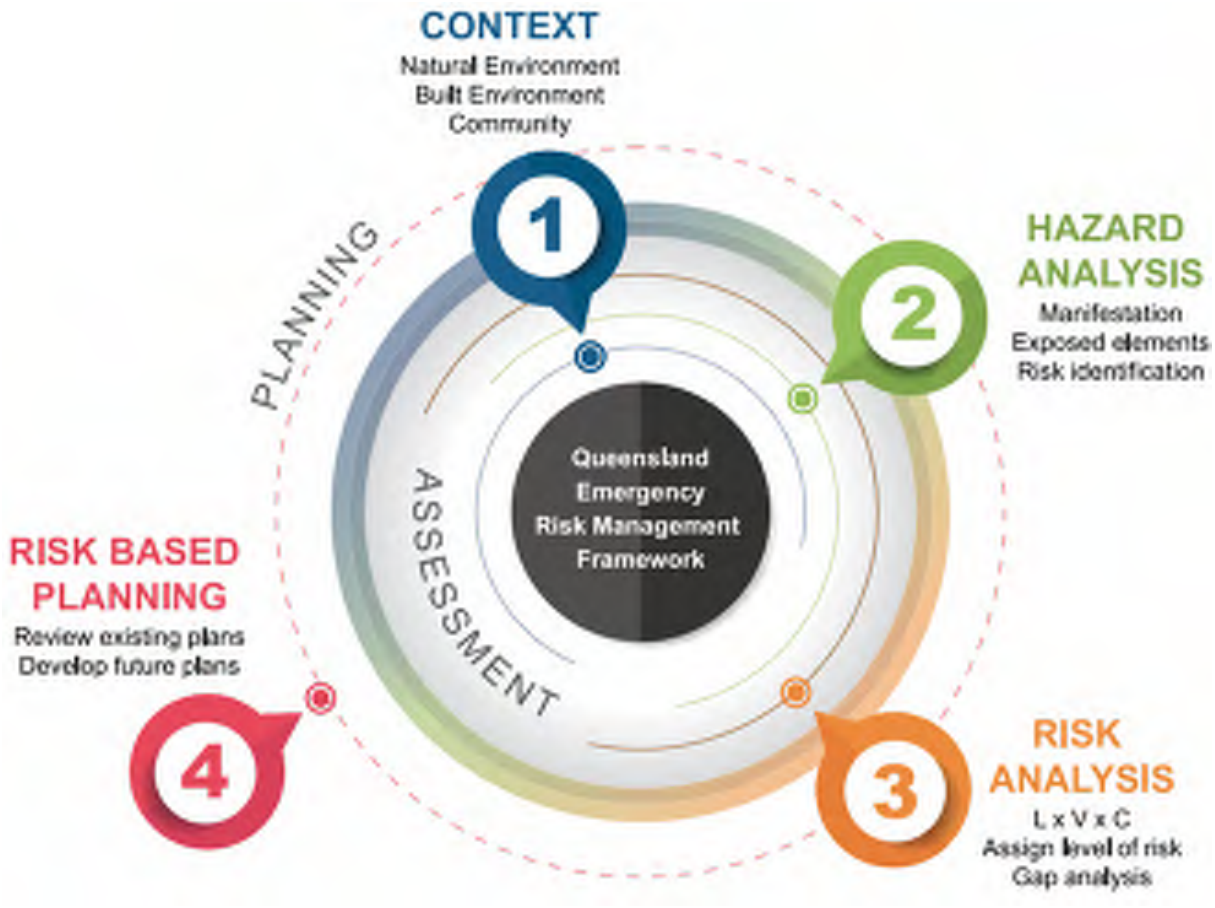



**Figure 3-3 – The Queensland Emergency Risk Management Framework (Source: QFES, 2018)**

## 3.5 Project technical stakeholders

A series of stakeholder engagement activities were undertaken as part of the technical development of this work, alongside Ipswich City Council as the project sponsor.

The purpose of this engagement was to gather the required technical input from various stakeholders in order to prepare the work, and test methodologies and findings.

An overview of the technical stakeholder engagement is outlined below.

**Table 2 – Summary of project stakeholder engagement**

| Engagement | Project stakeholder | Date | Description |
|---|---|---|---|
| **Project inception meeting** | Council | 16 September 2021 | Project inception, project management requirements, objectives and principles, and approaches to engagement. |
| **QFES Ipswich bushfire risk assessment briefing** | Queensland Fire and Emergency Service | 24 September 2021 | State-wide bushfire prone area mapping. |
| **Bushfire hazard identification workshop** | Council strategic planning and disaster management teams | 26 October 2021 | Discussion on previous events and impacts, nature of known risks and |

| Engagement | Project stakeholder | Date | Description |
|---|---|---|---|
| | | | key localities and community preparedness. |
| **Bushfire hazard and risk analysis workshop** | Council strategic planning, land management and disaster management teams | 14 December 2021 | Update on initial findings of the bushfire risk assessment and local risk assessment profiles. |
| **Presentation to Council** | Mayor Harding, Councillors, CEO Sonia Cooper and senior leadership officers | 20 January 2022 | Overview of observations and policy options for discussion |
| **Policy options workshop** | Council strategic planning team | 17 February 2022 | Working group session on the draft land use policy response to bushfire hazards and risk |

## 3.6 State interest compliance

In 2017 the current SPP came into statutory effect. Further to the SPP are the three non-statutory guidance documents:

- Integrating state interests in planning schemes – Guidance for local government (November 2021)
- Natural hazards, risk and resilience state interest – Bushfire – Example planning scheme assessment benchmarks (May 2021) (now repealed)
- Bushfire resilient communities – technical reference guide for the State planning policy State interest 'Natural hazards, risk and resilience – bushfire' (October 2019).

This risk assessment considers the SPP and its guidance material as a consolidated package of State expectations with regard to satisfaction of the State interest for bushfire hazard, risk and resilience.

One of the key additions to the current SPP and its guidance material which sets it apart from previous editions is the requirement for fit-for-purpose risk assessments for the natural hazards which continue a State interest, including bushfire. This process aims to ensure that bushfire risk is appropriately considered as part of strategic planning activities, having regard to the nature of potential risk rather than mere compliance with statutory bushfire protection measures.

State interest policy two (2) for natural hazards, risk and resilience establishes the expectations of a fit-for-purpose risk assessment which guide how the strategic consideration of bushfire risk is to be integrated into strategic planning processes. These include:

- the characteristics of the bushfire hazard in the area
- the relevant fire and fire weather history of the area
- the population and land uses currently exposed to bushfire hazard

- the anticipated growth of the community and the options for accommodating that growth
- the location of current and proposed community infrastructure and services
- the suitability of existing studies to inform the risk assessment
- the potential social, economic and environmental impacts that would result from a bushfire event
- local and district disaster management planning, including emergency response and recovery capacities.

The *Integrating state interests in planning schemes guidance material* establishes three steps for a risk assessment to follow:

- Step 1 – Hazard identification (to address State interest policy 1)
    - Including identification and local refinement of hazard mapping.
    - This risk assessment has identified the State-wide bushfire prone area mapping as being appropriate to meet State interest policy 1.
- Step 2 – Risk analysis (to address State interest policy 2)
    - Including the identification of risk (including the level of exposure, sensitivity and vulnerability) and acceptability of that risk (including whether the risk is acceptable, tolerable or intolerable).
    - This risk assessment includes a risk analysis in the following sections.
- Step 3 – Risk response (to address State interest policies 2 and 4)
    - Based on the outcomes of the risk assessment, preferred land use planning strategies are developed.
    - The risk response forms Part C of this risk assessment.

The *Bushfire Resilient Communities Technical Reference Guide* prepared by QFES articulates a further ten (10) policy positions with regard to land use planning for bushfire hazard in Queensland. These are specifically addressed in the following section.

The risk assessment responds to the requirements of the SPP and state interest guidance materials, with relevant policies of the Bushfire Resilient Communities Technical Reference Guide also functioning as the 'acceptable risk criteria' benchmarks for the assessment, as outlined below.

## 3.7 Acceptable risk criteria and benchmarking

The determination of outcomes which represent 'acceptable' or 'tolerable' risk versus 'intolerable' risk, and those measures, treatments and controls which might assist in achieving mitigated residual risk, must be measured against a set of benchmarks, or risk acceptability criteria. This provides clarity and transparency of assessment against key criteria.

The acceptable risk criteria established for this risk assessment are derived from the Bushfire Resilient Communities Technical Reference Guide policies.

Due to the multiplicity of criteria, this enables a clear measurement of risk across multiple factors, being the core principles which strategic planning outcomes are sought to satisfy. It clearly articulates the suite of standards which strategic planning outcomes are expected to meet.

This risk assessment adopts a principles-based approach to the determination of 'acceptable or tolerable' risk, being that risk which is considered within the risk tolerance appetite of land use planning authorities, or which is considered sufficiently low that it is deemed acceptable.

The approach adopted aligns with that of the 'ALARP' principle relating to risk tolerance levels set out by both the Australian Institute of Disaster Resilience 2020 Land Use Planning for Disaster Resilient Communities Handbook, and the 2016 Planning Institute of Australia publication, the National Land Use Planning Guidelines for Disaster Resilient Communities.

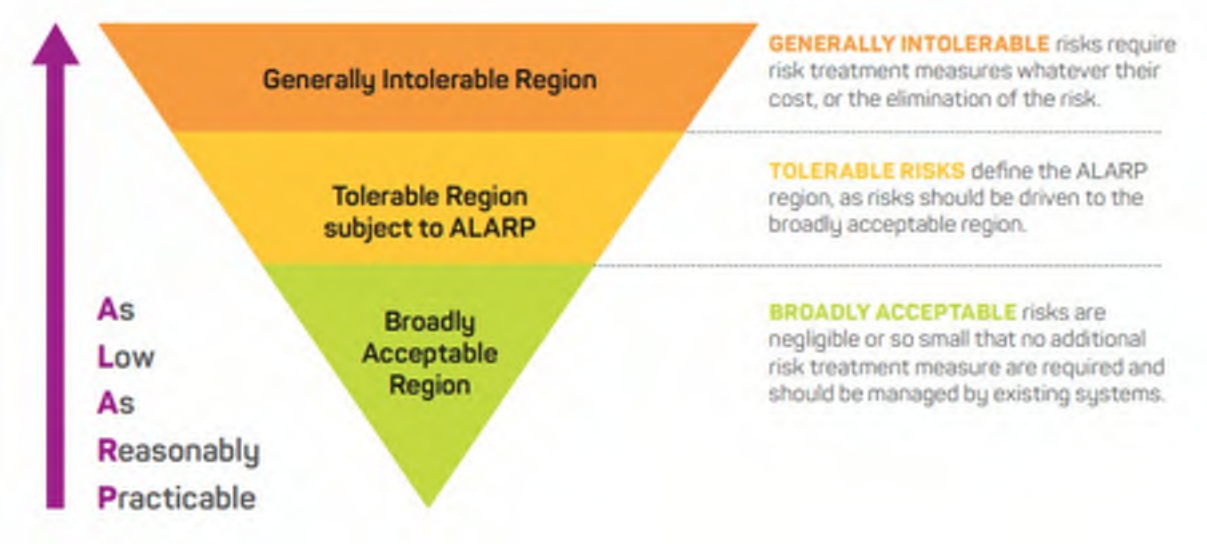



**Figure 3-4 – The 'ALARP' principle for risk tolerance (Source: AIDR, 2020)**

It is likely the assessment of strategic planning options against these benchmarks may not be 'black or white' or a clear 'pass or fail'. This is because qualitative and contextual considerations which extend beyond the contemplation of bushfire risk, relating to other strategic planning matters, are likely to apply.

To this end, this acceptable risk methodology adopts the 'traffic light' methodology of the ALARP approach, where the quantum of quantitative and qualitative aspects of the risk assessment are considered against a system which indicates potential levels of risk acceptability or tolerability.

**Table 3 – Risk acceptance / tolerability benchmark assessment system**

| Risk benchmark | Description as per SPP 2017 |
|---|---|
| **Acceptable** | A risk that, following an understanding of the likelihood and consequences, is sufficiently low to require no new treatments or actions to reduce risk of the natural hazard further. Individuals and society can live with this risk without feeling the necessity to reduce the risk any further. |
| **Tolerable, subject to treatment** | A risk that, following an understanding of the likelihood and consequences, is low enough to allow the exposure to the natural hazard to continue, and at the same time high enough to require new treatments or actions to reduce risk. Society can live with this risk but believes that as much as is reasonably practical should be done to reduce the risks further. |
| **Intolerable** | A risk that, following an understanding of the likelihood and consequences, is so high that it requires actions to avoid or reduce the risk. Individuals and society will not accept this risk, |

| Risk benchmark | Description as per SPP 2017 |
|---|---|
| | and measures are to be put in place to reduce the risk to at least a tolerable level. |

The determination risk acceptability or tolerance is essential in the consideration of appropriate risk-informed strategic planning, land use allocation and development controls which are needed to respond to the nature and potential level of risk, as part of the contemplation of Planning Scheme controls.

It must be noted that risk levels vary across the landscape, thus a place-based approach is required which considers specific locations across the Ipswich region.

The following table outlines the risk acceptability / tolerability benchmarks against which risk is to be analysed and evaluated, relative to different risk treatment options. It is informed by the strategic land use policies set out in the Bushfire Resilient Communities Technical Reference Guide prepared by QFES.

The consideration of policy options represents the final step of the risk assessment process, having regard to the potential risk treatment options, set out in **Part C** of this report.

**Table 4 – Acceptable risk criteria and benchmarks against which residual risk is measured for this assessment**

| BRC Policy | QFES policy approaches which guide acceptable and tolerable risk |
|---|---|
| **Mapping** | Mapping is robust and locally relevant. |
| **Fit-for-purpose risk assessment** | A fit-for-purpose risk assessment informs plan-making or amendments to achieve an acceptable or tolerable level of risk to people and property in bushfire prone areas. |
| **Avoidance, or mitigate to an acceptable or tolerable level** | The planning scheme or amendments following a risk assessment are based on the principle of avoidance as the first priority, and then mitigation of the risk to an acceptable or tolerable level. |
| **Disaster management** | Disaster management capacity and capabilities are maintained to mitigate the risks to people and property to an acceptable and tolerable level. |
| **Urban design** | Lot and neighbourhood layout and design mitigates the risks to people and property to an acceptable and tolerable level. |
| **Vulnerable uses** | Vulnerable uses are not located in bushfire prone areas unless there is an overwhelming community need for the development of a new or expanded service, there is no suitable alternative location and site planning can appropriately mitigate the risk. |
| **Revegetation, rehabilitation and land management** | Revegetation and rehabilitation avoids an increase in the exposure or severity of bushfire hazard. |
| **Hazardous activities and storage** | Development does not locate buildings or structures used for the storage or manufacture of materials that are hazardous in the context of a bushfire within a bushfire prone area unless there is no suitable alternative location. |

| BRC Policy | QFES policy approaches which guide acceptable and tolerable risk |
|---|---|
| **Protective functions** | The protective function of vegetation arrangements that can mitigate bushfire risk are maintained. |
| **Community infrastructure** | Community infrastructure for essential services is not located in bushfire prone areas unless there is an overwhelming community need for the development of a new or expanded service and there is no suitable alternative location, and further, the infrastructure can be demonstrated to function effectively during and immediately after a bushfire event. |

## 3.8 Geographic extent

This risk assessment relates to the Ipswich City local government area, as identified in Part A – Contextual Analysis.

In order to provide alignment between this Risk Assessment and the new Planning Scheme, the 30 Local Area Frameworks referenced in the Statement of Proposals are used as a basis for the analysis to provide contextualisation of how bushfire hazard manifests in different localities across the Ipswich region.

As described in the Statement of Proposals, the Local Area Frameworks are 'based on geographically identifiable communities of interest (areas with identifiable boundaries and within which there are broad land use and planning commonalities).' A map of the Local Area Frameworks is provided below.

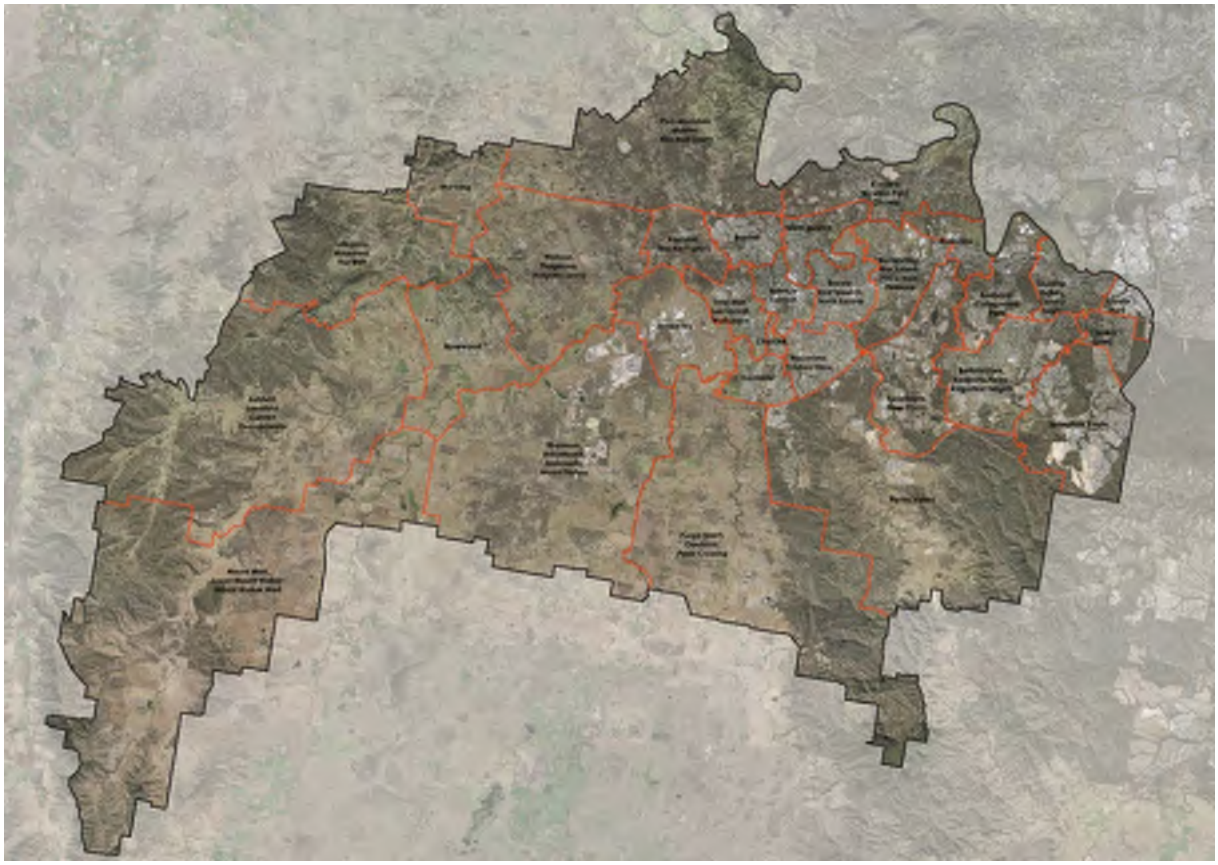


**Figure 3-5 - Ipswich local area framework**

## 3.9 Bushfire prone areas mapping

To inform this risk assessment, the existing state-wide bushfire prone areas (BPA) mapping has been utilised.

The existing state-wide BPA mapping which supports the SPP was prepared in 2015, and updated (for South East Queensland only) in 2017.

The State's current bushfire hazard mapping methodology was released in 2014 and prepared by the CSIRO in conjunction with QFES. The methodology is set out in the following documents:

- *New Methodology for State-wide Mapping of Bushfire Prone Areas in Queensland*
- *Estimating the Potential Bushfire Hazard of Vegetation Patches and Corridors: An enhancement of Queensland's methodology for State-wide mapping of bushfire prone*
- *Bushfire Resilient Communities technical reference guide*.

The mapping methodology is based upon potential fire line intensity using the MacArthur Mk 5 Forest Fire Danger Meter and inputs of total fuel load and effective slope to derive a potential rate of fire spread. A 100m 'buffer' area is also applied under the SPP (replicating the approach under AS3959:2018 – Construction of Buildings in Bushfire Prone Areas), being the zone in which ember attack and radiant heat remain most relevant, adjacent to the actual hazard.

The State-wide mapping methodology comprises four (4) hazard classes:

1. Medium potential bushfire intensity;
2. High potential bushfire intensity;
3. Very high potential bushfire intensity; and
4. Potential impact buffer (100m).

Refer to Part A – Contextual Analysis for region-wide mapping imagery.

### 3.9.1 Verification process

Pursuant to the provisions of the Bushfire Resilient Communities technical reference guide which constitutes guidance material under the SPP, local verification of the current State-wide BPA mapping has been undertaken for the Ipswich region, as part of this Bushfire Risk Analysis.

This process considers the accuracy of data inputs and resultant bushfire hazard class outputs, ostensibly relating to fireline intensity.

**The state-wide BPA mapping is intended to form the bushfire overlay map of the new Ipswich Planning Scheme**

The State-wide BPA mapping is regularly updated by QFES. As such, it may be the case the State-wide BPA mapping is updated following this risk assessment and prior to the adoption of the new planning scheme. Any updates are likely to incorporate the 2021 Regional Ecosystem dataset. Having regard to this risk assessment it is considered unlikely that updated mapping (based on the existing methodology) would result in any significant changes to the risk profiles identified by this risk assessment. This matter was discussed with the Department and QFES during the preparation of this assessment.

A BPA reliability assessment report has been prepared and is attached at **Appendix B**. It confirms the current mapping meets a satisfactory level of accuracy to inform this risk assessment, noting that some discrepancies were identified. Overall however, these discrepancies are limited in number and unlikely to have a material impact on the broader context of the risk assessment.

A recommendation of this risk assessment is that Council works alongside the State government as part of ongoing updates and amendment processes supporting the State-wide BPA mapping.

# 4 Risk identification methodology

This section describes the methodology undertaken for the risk identification component of the Risk Assessment.

The Queensland Disaster Management Arrangements (QDMA), Queensland Emergency Risk Management Framework (QERMF) and Queensland Strategy for Disaster Resilience (QSDR) identify the broad framework for the consideration of risks from natural hazards in Queensland.

This section largely relates to Process 1 of the QERMF.




**Figure 4-1 – Process 1 of the QERMF (Source: QFES, 2018)**

From resilience to recovery, five (5) lines of operation guide the types of risk which are contemplated by formal processes, and which are adopted for the purposes of this risk assessment. This also aligns with the approach adopted by NERAG.




**Figure 4-2 – Resilience and recovery lines of operation (Queensland Government, 2019)**

In order to understand the nature of potential risks associated with bushfire hazard across the region, a quantitative GIS-based analysis of hazard mapping was first performed. This process was conducted using the current 5 per cent annual exceedance probability (AEP) (generally equivalent to a 1 in 20 year annual return interval (ARI)) climate-adjusted state-wide bushfire prone areas mapping prepared by the Queensland Government, contained within the SPP Interactive Mapping System.

The mapping outlined above is based on fireline intensity hazard classes. These classes seek to illustrate, based on specific data inputs, the potential magnitude of bushfire hazard based upon a calculation of fireline intensity.

***Fireline intensity is a measure of fire intensity at the fire front. It is measured as the amount of energy released per metre width of the fire edge (CSIRO, 2013).***

As noted by Leonard et al. (2014) '*at a landscape scale, the preferred metric for indicating the potential severity of these impact mechanisms is fireline intensity. Fireline intensity is a standardised measure of the rate that an advancing head fire would consume fuel energy per unit time per unit length of fire front introduced by Byram (1959)*'.

Pursuant to research conducted by Tolhurst, dwelling loss rates are observed to increase where fireline intensity exceeds 30,000 kW/m. As noted earlier by this Bushfire Risk Analysis, increased house loss is also observed in events where FFDI exceeds 50. Direct firefighting is not possible where fireline intensity exceeds 3,500 kW/m.

As per the State's bushfire prone areas mapping methodology, the potential bushfire intensity classes are:

**Table 5 – Potential bushfire intensity classes and fireline intensity ranges as per the state-wide mapping methodology (Source: CSIRO, 2014)**

| Potential bushfire intensity class | Potential fireline intensity |
|---|---|
| 1. **Very high (potential intensity)** | 40,000+ kW/m |
| 2. **High (potential intensity)** | 20,000 – 40,000 kW/m |
| 3. **Medium (potential intensity)** | 4,000 – 20,000 kW/m |

Where fireline intensity is below 4,000 kW/m (including for grassfire), the potential bushfire intensity is considered low and is removed from consideration for land use planning in Queensland.

For each of the mapping approaches identified above, the GIS-based data analytics has considered:

1. The extent of mapped bushfire hazard relative to the planning cadastre
2. The 100 metre bushfire hazard buffer (area in which radiant heat and ember attack may occur around bushfire hazard areas)
3. A 500 metre and 700 metre hazard buffer extent, based on house loss research from bushfire events across Australia
4. The settlement pattern (zoning) as per the Ipswich Planning Scheme.

Critical to the analysis of risk, existing Australian research reveals that 80-90 per cent of property loss occurs within 100 metres of the bushland interface, and this is the basis for current planning and building policy and regulation across Australia.

Additionally, comprehensive data interrogation performed by CSIRO demonstrates that 85 per cent of bushfire fatalities in 260 events from 1901 to 2011 have occurred within the first 100 metres of the bushland interface, including persons attempting to evacuate (Blanchi et al. 2012).

Recent research finds that dwelling and property loss can and does routinely occur beyond this 100 metre extent.

The findings handed down by the National Natural Disaster Arrangements Royal Commission following the 2019-2020 'Black Summer' fire season identified that almost all of the dwellings lost during those events were located within 500m of bushland.

In the 2003 Canberra bushfires, and other events over time, property and dwelling loss has occurred within circa 700m of the bushland interface in urban contexts (Leonard & Blanchi, 2012; McAneney & Chen, 2004 and Ahern & Chladil, 1999). This is particularly relevant given recent bush fire disasters across the globe which have penetrated urban areas.

To this end, consideration of flame contact, radiant heat flux and ember attack surrounding bushfire hazard sources to 100 metres, 500 metres and 700 metres (representing the full or maximum extent of loss observed to date in Australia) has been considered by this risk assessment.

It is noted the 100 metre extent remains the basis of planning policy in Queensland across Australia. This report does not suggest a change to this but rather, seeks to consider the context of the broader landscape around bushfire prone areas for a fulsome consideration of potential bushfire risk.

**Table 6 – Indicative distances between hazardous vegetation and loss from bushfire for severe events (Source: Leonard et al. 2014, Leonard & Blanchi, 2009, McAneney et al. 2009, Ahern & Chladil, 1999)**

| Bushfire attack mechanism | Typical upper distance for 80% of all house losses (m) | Typical upper distance for house ignition from forest (m) | Maximum reach (km) |
|---|---|---|---|
| **Primary ember attack** | 100 | 500-700 | 10 |
| **Radiant heat exposure** | 70 | 160 | N/A |
| **Flame contact / exposure** | 50 | 100 | N/A |

The above analysis was conducted for the entire Ipswich region and for each Local Area as per Section 3.8, for localised refinement of analysis and observations.

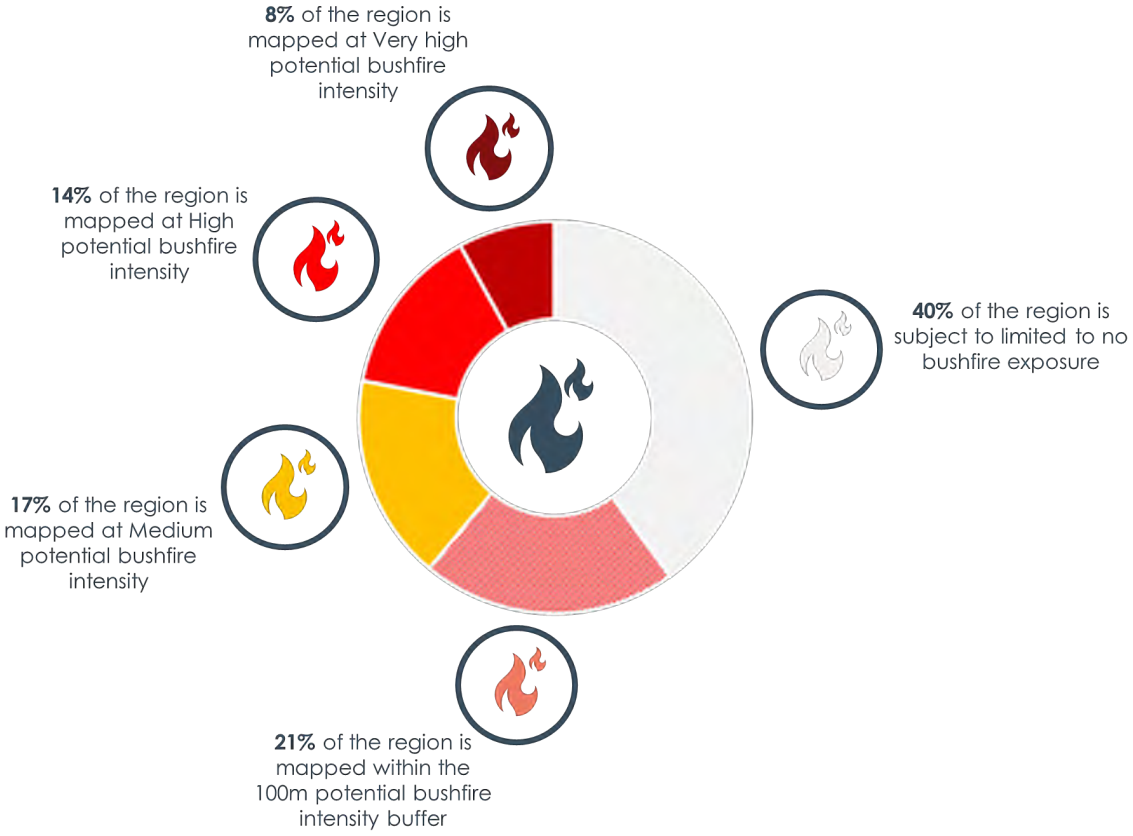
# 5 Region-wide risk identification

This section provides an overview of the key aspects of the spatial analysis which informed this risk assessment. Comprehensive summaries of the data analysis undertaken are provided at **Appendix C** and relevant mapping is provided at **Appendix D**.

A whole-of-region overview of identified bushfire hazard exposure and vulnerability is provided, culminating in the identification of strategic-level risks which are further explored throughout the risk evaluation process.

## 5.1 Ipswich region exposure and vulnerability

Of the 101,627 hectares of zoned land within the Ipswich region, **60 per cent is identified as being subject to potential bushfire hazard**. This is comprised of land within the Very High, High, Medium potential bushfire intensity areas and the 100 metre buffer.




Further analysis of the potential bushfire hazard mapping indicates that 92 per cent of the region is within 500 metres of potential bushfire hazard and 97 per cent is within 700 metres. This is relevant as the 500 metre and 700 metre buffers represent the typical upper distance of for ignition from ember attack as previously explained.

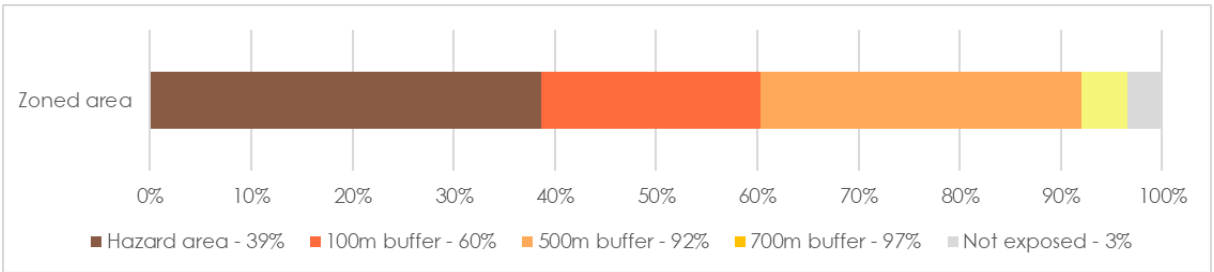



**Figure 5-1 – Zoned land subject to bushfire hazard within Ipswich region**

### 5.1.1 Land use zones

Potential bushfire hazard mapping (including up to the 100 metre potential impact buffer) has been analysed using the proposed Planning Scheme zones. This provides an understanding of where potential bushfire hazard is present within the region as it relates to land uses and gives an insight as to potential risks and vulnerabilities.

The results demonstrate that potential bushfire hazard is highest within environmental and rural zoned land. This level of exposure is to be expected by virtue of the land use intent for these zones.

Notably, a moderate proportion of residential and employment land is also subject to potential bushfire hazard. Of residential lands, High density, New suburban, Low medium density and Large lot zones represent areas of greatest exposure.

Rural living land, limited development and land for community facilities are also subject to moderate levels of exposure.



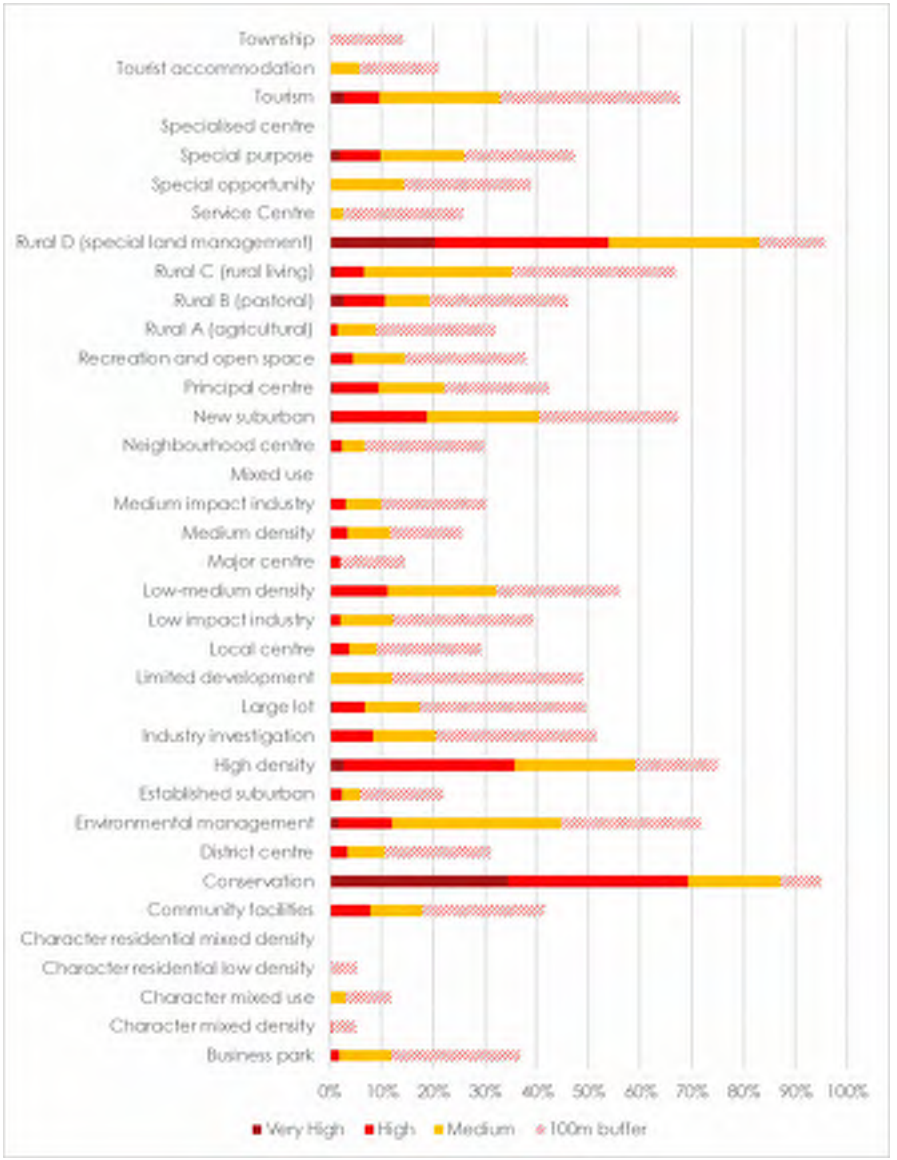




**Figure 5-2 – Exposure of proposed land use zones to potential bushfire hazard**

### 5.1.2 Dwellings and residents

Of the 84,504 residential dwellings considered for this analysis, an estimated 19,629 (23 per cent) are exposed to potential bushfire hazard (including within the 100 metre buffer).

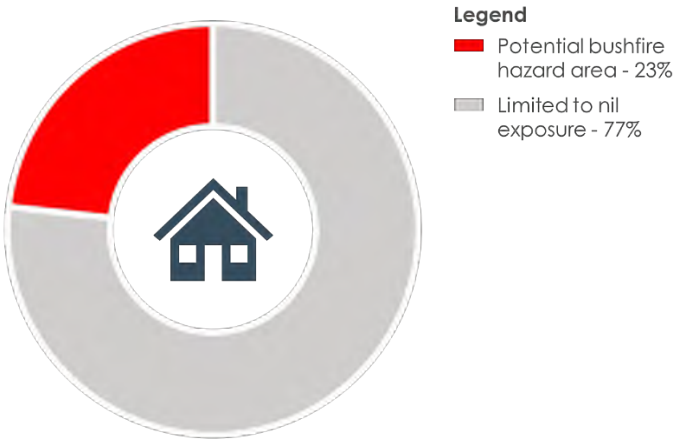



**Figure 5-3 – Residential dwelling exposure within Ipswich region**

### 5.1.3 Vulnerable facilities and essential community infrastructure

Vulnerable facilities (such as nursing homes, childcare centres and schools) may pose increased risk to bushfire hazard due to the nature of the activity, difficulty of evacuation or the facilities occupants. The following table provides an overview of the potential bushfire hazard exposure (including up to the 100 metre buffer) to vulnerable facilities.

**Table 7 – Summary of vulnerable facility exposure within the Ipswich region**

| Vulnerable facility | Number of facilities exposed to potential bushfire hazard |
|---|---|
| **Nursing home** | 3 (of 11 in total) |
| **Childcare facilities** | 25 (of 156 in total) |
| **Schools** | 23 (of 74 in total) |
| **Higher education facilities** | 2 (of 5 in total) |
| **Hospitals** | 2 (of 8 in total) |
| **Correctional facilities** | 1 (of 1 in total) |
| **Unexploded ordnance site** | 9 (of 9 in total) |

Essential community infrastructure (such as services infrastructure) plays an important role in ensuring essential services are provided to the community. The following table provides an overview of the potential bushfire hazard exposure (including up to the 100 metre buffer) to essential community infrastructure. 22

**Table 8 – Summary of essential community infrastructure exposure within the Ipswich region**

| Essential community infrastructure | Number of facilities exposed to potential bushfire hazard |
|---|---|
| **Power generation facility** | 1 (of 1 in total) |

| Essential community infrastructure | Number of facilities exposed to potential bushfire hazard |
|---|---|
| **Electrical substations** | 12 (of 18 in total) |
| **Sewer treatment plants** | 6 (of 6 in total) |
| **Sewer pump stations** | 29 (of 60 in total) |
| **Water treatment plants** | 3 (of 3 in total) |
| **Water pump stations** | 11 (of 30 in total) |
| **Landfill** | 3 (or 4 in total) |

### 5.1.4 Roads and evacuation network

Roads and road connectivity are critical to evacuation of residents and access for emergency services during and after an event. Roads within 100 metres of mapped bushfire hazard may experience reduced visibility due to smoke, dense ember attack and varying levels of potential radiant heat exposure. These effects can also occur beyond 100 metres however, it is largely the threat of potential flame contact and extreme radiant heat which land use planning should consider.



**37%** of the major road network is exposed to potential bushfire hazard

For the purpose of this assessment, the major road network (comprising only the higher order roads) are considered. Of the overall road network, 37 per cent is identified within the potential bushfire hazard exposure area (including up to the 100 metre buffer).

Of the road network, highways are identified as being most exposed with in excess of 60 per cent of all highways mapped within potential bushfire hazard exposure area. Additionally, rural roads are also identified as being subject to moderate to high levels of exposure.

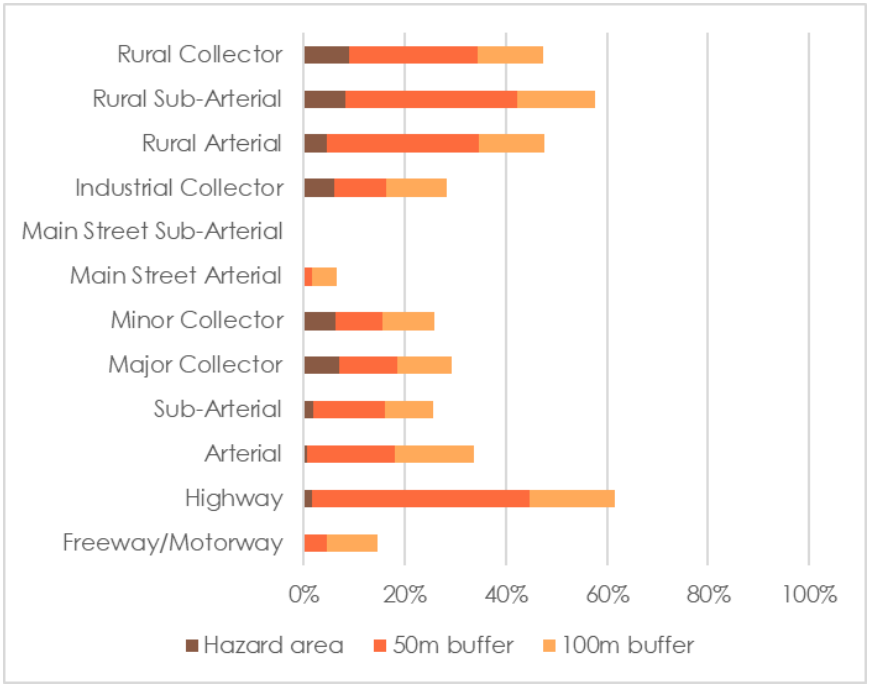



**Figure 5-4 – Exposure of road network to potential bushfire hazard**

### 5.1.5 Summary of existing exposure and vulnerability

Based on the data above, the following observations are relevant to potential bushfire hazard exposure within the Ipswich region:

- The majority of zoned land within the Ipswich region (60 per cent) is identified as being exposed to potential bushfire hazard (including up to the 100 metre buffer). Over 90 per cent of zoned land within the region is within 500 metres of mapped potential bushfire hazard.
- A large portion of residential zoned land (43 per cent) is identified as being exposed to potential bushfire hazard (including up to the 100 metre buffer). This includes the following zones which are overrepresented:
    - High density zoned land (75 per cent)
    - New suburban zoned land (67 per cent)
    - Low medium density zoned land (56 per cent)
    - Large lot zoned land (49 per cent).
- Rural living zoned land is identified as being significantly exposed to potential bushfire hazard with two thirds (67 per cent) of zoned land within 100 metres of potential bushfire hazard.
- The majority of rural zoned land (59 per cent) is exposed to potential bushfire hazard (including up to the 100 metre buffer).
- Almost half of the Limited development zone (49 per cent) is exposed to potential bushfire hazard (including up to the 100 metre buffer).
- Land within the Community facilities zone is also identified as being highly exposed with 42 per cent exposed to potential bushfire hazard (including up to the 100 metre buffer).
- Over one third of all employment zoned land (39 per cent) is exposed to potential bushfire hazard (including up to the 100 metre buffer). This includes he following zones which are overrepresented:
    - Tourism zoned land (67 per cent)
    - Principle centre zoned land (42 per cent)
    - Low impact industry zoned land (40 per cent).
- A moderate portion of recreation and open space zoned land (38 per cent) is identified as being within 100 metres of potential bushfire hazard.
- Almost one quarter (23 per cent) of all residential dwellings and the region's population are within 100 metres of potential bushfire hazard.
- Of the quantum of vulnerable facilities within the Ipswich region, the majority are located outside of the potential bushfire hazard area. Of note, 25 childcare facilities, 23 schools, three nursing homes and two hospitals are identified as being potentially exposed.
- There are nine unexploded ordnance sites within the Ipswich region. All are identified as being exposed to potential bushfire hazard to varying degrees.
- Based on the data available, a high proportion of essential community infrastructure across the region is exposed to potential bushfire hazard including the following:
    - The single power generation facility
    - Two thirds of all electrical substations

  - All sewer treatment plants
  - Almost half of all sewer pump stations
  - All water treatment plants
  - One third of all water pump stations
  - Three of four landfills.
- A moderate portion of the major road network (37 per cent) is identified as being exposed to potential bushfire hazard (including up to the 100 metre buffer). Notably, the following aspects of the road network are overexposed:
  - Highways (61 per cent)
  - Rural sub-arterial roads (58 per cent)
  - Rural arterials roads (48 per cent)
  - Rural collector roads (47 per cent).

### 5.1.6 Summary of identified risks

Based on the analysis of this data, the following risk observations are identified for the Ipswich region. These strategic-level risks form the basis against which further consideration of issues are explored throughout the evaluation component of this risk assessment.

| Risk No. | Identified strategic-level risk | Type of risk |
|---|---|---|
| 1 | Almost one quarter of the existing population and residential dwelling stock is exposed to potential bushfire hazard. Exposure is likely to grow into the future on a cumulative basis, based on existing use rights, as well as the existing and proposed settlement strategy for the region. | Human and social<br>Built environment |
| 2 | Lands zoned for or capable of accommodation future growth are exposed to potential bushfire hazard, particularly the High density, Low medium density and New suburban zones. | Human and social<br>Built environment |
| 3 | Risk from grassfire (including on rural lands and agricultural cropping lands), and short, sharp interface fire events, are prevalent in the region and likely to remain so. | Human and social<br>Built environment<br>Roads and transport |
| 4 | Policy tensions between bushfire hazard protection, as a factor of growth and development, and environmental values have and are likely to continue to generate conflict at the urban bushland interface. | Human and social<br>Built environment |
| 5 | Portions of the region's employment generating zoned land are exposed to potential bushfire hazard including Tourism zone, Principal centre zone and Low impact industry zones. | Economic |
| 6 | A high portion of rural zoned land is exposed to potential bushfire hazard across the region. | Economic |
| 7 | Parts of the recreation and open space network are exposed to potential bushfire hazard across the region. | Human and social |

| | | |
|---|---|---|
| | | Built environment |
| **8** | Some vulnerable facilities are identified as being subject to potential bushfire hazard. | Human and social<br>Built environment |
| **9** | A high portion of essential community infrastructure is exposed to potential bushfire hazard particularly across the electricity, water and sewerage networks. | Built environment<br>Economic |
| **10** | A number of landfill sites are potentially exposed to bushfire hazard. | Economic<br>Environmental |
| **11** | Unexploded ordnance sites are exposed to bushfire hazard and may act as a risk multiplier during certain events. | Environmental |
| **12** | Parts of the evacuation network may be compromised in a fire event and may impact the ability to evacuate in certain locations, under certain conditions. | Human and social<br>Roads and transport |
| **13** | Hazard exposure may change in certain locations over time to higher hazard classes, and increased fire weather as a result of climate change. | Environmental |
| **14** | Existing Bushfire Risk Area mapping under the current planning scheme does not include a 100 metre hazard buffer which may have resulted in a proportion of residential development which is subject to bushfire hazard but not have not triggered assessment or compliance against AS3959. | Built environment |

# 6 Bushfire risk analysis

This section provides a detailed analysis of the identified land use planning related risks relating to bushfire hazard across the Ipswich LGA.

## 6.1 QERMF Analysis

The risk analysis methodology aligns, and indeed follows, the risk analysis methodologies and matrices set out by the QERMF, as illustrated below.




**Figure 6-1 - Process 2 of the QERMF (Source: QFES, 2018)**

### 6.1.1 Analysis of overall risk likelihood

This risk assessment seeks to support long-term land use planning. As such, this approach of this risk assessment assumes bushfire events and impact are expected to occur within the region.

The table below outlines the event likelihood definitions, as per the QERMF.

| Likelihood Table | | |
|---|---|---|
| **Historical Likelihood** | **Likelihood Level** | **Definition** |
| Has occurred 3 or more times in the last year or at least each year over the last 5 years | **Almost Certain** | Almost certain to occur in most cases |
| Has occurred twice in the last 5 years | **Likely** | Likely chance of occurring in most cases |
| Has occurred twice in the last 10 years | **Possible** | Might occur in most cases |
| May occur, and has occurred once in the last 20 years | **Unlikely** | Not expected to occur in most cases |
| May only occur in exceptional circumstances or has occurred only once in the last 50 years or more | **Rare** | Will only occur in exceptional circumstances and has not occurred in most cases |

**Figure 6-2 - QERMF even likelihood table**

Different parts of the region have experienced bushfire events over time. One of the limitations in determining likelihood accurately is the availability of complete event data dating back over decades, and how historical trends may change into the future as a result of climate change. The table below considers the potential for fire impact, rather than fire occurrence.

This acknowledges from a land use planning perspective, it is the likelihood of impact of bushfire on values (people, dwellings, infrastructure assets) that is most critical to consider, rather than the probability of fire occurring at all.

**Table 9 - Likelihood assessment as per QERMF**

| Spatial context | Likelihood of bushfire impact |
|---|---|
| **Ipswich LGA** | Almost certain |

### 6.1.2 Analysis of overall risk vulnerability

In terms of vulnerability, the Ipswich LGA as a whole is typified by housing stock which was constructed prior to the introduction of AS3959 standards in Queensland, and largely prior to current planning provisions.

However, in growth areas (also higher risk locations for bushfire attack), the majority of development is recent, not only constructed to AS3959 standards but adopting bushfire-responsive urban design parameters.

The assessment of vulnerability below considers vulnerability across the entire LGA.

**Table 10 – Vulnerability assessment based on Appendix 2 of the QERMF**

| Spatial context | Vulnerability assessment |
|---|---|
| **Ipswich LGA** | Moderate |

### 6.1.3 Analysis of overall risk consequence

Consequence is considered on balance of the extent of people, dwellings and assets which are exposed. Bushfire events impacting more densely populated communities will sustain immediate impacts such as the loss of property, and possibly life. Bushfire events in the rural areas of the region can also yield high, long term economic losses.

The ability to evacuate to safety is relatively achievable for much of the region though some locations are exposed to challenges in this regard.

**Table 11 - Assessment of risk consequence as per Appendix 3 of the QERMF**

| Consequence typology | Summary of risk consequence aspects | Consequence assessment |
|---|---|---|
| **People** | Life loss has occurred in the region in the past as a result of bushfire, in the late 1990s near Grandchester. | Moderate |
| **Financial and economic** | A high proportion of region's economic / employment lands are subject to potential bushfire and grassfire hazard however, the region's economy is highly diversified and impacts are likely to be point specific rather than widespread. | Minor |
| **Community and social** | There are several community facilities, sporting, and open space zoned lots in the hazard risk area. Whilst built form associated with these land uses may not be intense, often they are high value assets which in some cases, are not covered by DRFA if lost to bushfire. | Moderate |

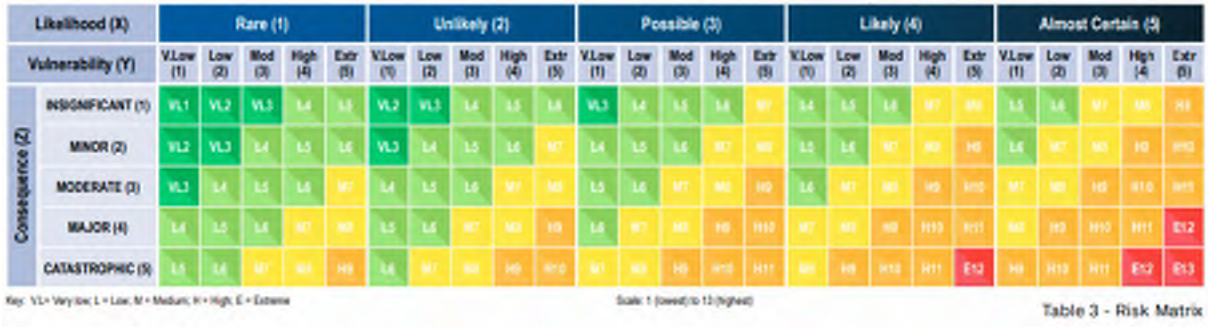
| Consequence typology | Summary of risk consequence aspects | Consequence assessment |
|---|---|---|
| **Governance and infrastructure** | Critical infrastructure and vulnerable facilities exposed to bushfire hazard are limited in number, but may produce a level of community disruption should impact occur. | Moderate |
| **Environment** | Intense, hot bushfires have the potential to impact ecological functions. However, higher risk impacts stem more from inappropriate fire regimes (too frequent or infrequent fire in the landscape) than one-off bushfire events. | Moderate |

### 6.1.4 Level of risk

The QERMF provides a fit-for-purpose risk matrix which incorporates the assessment of vulnerability, in addition to likelihood and consequence factors.

The QERMF risk matrix is as follows:

**Table 12 - Risk matrix as per Appendix 4 of the QERMF**




Having regard to the assessment of likelihood (of impact), vulnerability and consequence for each precinct, the overall risk levels for the Ipswich LGA is outlined below.

**Table 13 – Assessment of risk level in accordance with the risk matrix at Appendix 4 of the QERMF**

| Spatial context | Bushfire risk level |
|---|---|
| **Ipswich LGA** | Moderate (H9) |

This risk assessment relates to bushfire risk for land use planning and relates to matters of planning, settlement and building policy and strategy. The risk analysis has not been prepared for the purposes of disaster management and does not represent an appraisal of asset-based vulnerability or exposure.

The Council QERMF process, captured by Council Local Disaster Management Plan, identifies that bushfire is a clear threat to various parts of the LGA, from a disaster management perspective.

Likelihood and consequence of course various across the LGA. From a land use planning perspective, it is thus important to consider the risk profile of each local area, as per Council's local area framework in order to provide a more clear picture of the land use planning-relate risks relating to different locations of the Ipswich LGA.

## 6.2 Local Area Framework risk analysis

The Local Area Framework referenced in the Statement of Proposals is used as a basis for the localised risk analysis to provide a more granular appraisal of the nature of bushfire hazard and risk relative to each local area across the Ipswich region.

As described in the Statement of Proposals, the Local Area Framework is 'based on geographically identifiable communities of interest (areas with identifiable boundaries and within which there are broad land use and planning commonalities)'.

For each local area within the framework, a series of risk elements has been considered in order to derive a risk rating for land use planning consideration. These include:

- Fuel hazard:
  - Bushfire hazard area (intensity class and extent)
  - Bushfire hazard buffer (relative to intensity class and extent)
- Assets and exposure:
  - Residential
  - Employment lands
  - Vulnerable uses
  - Infrastructure
  - Access and egress
  - QFES risk level
  - Expected growth.

A tiered risk analysis was performed using the matrix methodology set out below, using a qualitative assessment approach drawn from quantitative data.

**Table 14 - Local area framework risk analysis matrix**

| LUP risk criteria inputs | LUP risk score | | | | |
|---|---|---|---|---|---|
| | Low | Moderate | High | Very High | Extreme |
| **Hazard** | Extent less than 10% | Medium | High | Very High | |
| **Buffer** | Extent less than 15% | Moderate | High | Very High | |
| **Residential** | Low | Moderate | High | Very High | Extreme |
| **Employment lands** | Low | Moderate | High | Very High | Extreme |
| **Vulnerable uses** | Low | Moderate | High | Very High | Extreme |
| **Infrastructure** | Low | Moderate | High | Very High | Extreme |
| **Access and egress** | | > Two access roads | Two access roads | One access road | No access roads |

| LUP risk criteria inputs | LUP risk score | | | | |
|---|---|---|---|---|---|
| | Low | Moderate | High | Very High | Extreme |
| **QFES risk level** | | Low | Medium | High | Very High |
| **Expected growth** | Nil | Low | Medium | High | Very High |

Using the tiered risk analysis approach, a risk ranking specifically for land use planning consideration has been identified for each local area within the framework, as per the map overpage and the risk dashboard table which follows.

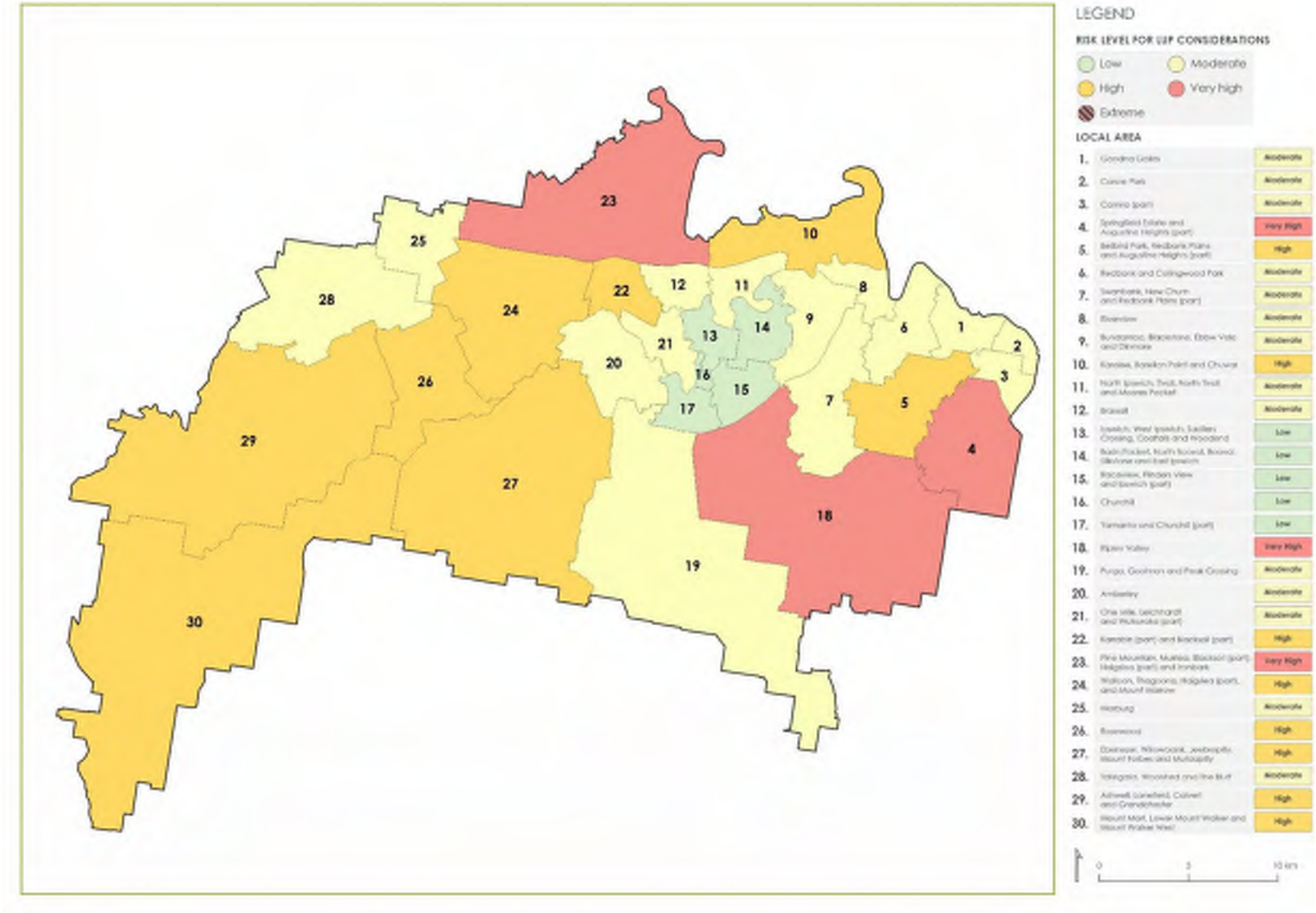



**Figure 6-3 - Map of LAF risk profiles**

Low
Moderate
High
Very high
Extreme

**LEGEND - *Risk level***

| | LOCAL AREA | FUEL HAZARD: Hazard | FUEL HAZARD: Buffer | ASSETS AND EXPOSURE: Residential | ASSETS AND EXPOSURE: Employment lands | ASSETS AND EXPOSURE: Vulnerable uses | ASSETS AND EXPOSURE: Infrastructure | ASSETS AND EXPOSURE: Access and egress | ASSETS AND EXPOSURE: QFES risk level | ASSETS AND EXPOSURE: Expected growth | Risk level for LUP consideration |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Goodna Gailes | High | High | High | Moderate | Low | Low | Moderate | Moderate | Moderate | Moderate |
| 2. | Carole Park | Moderate | Moderate | Low | High | High | Low | Moderate | Moderate | Low | Moderate |
| 3. | Camira (part) | Moderate | Moderate | Moderate | Low | Low | Low | Moderate | Moderate | Low | Moderate |
| 4. | Springfield Estate and Augustine Heights (part) | Very High | Very High | Very High | High | High | High | Moderate | High | Very High | Very High |
| 5. | Bellbird Park, Redbank Plains and Augustine Heights (part) | High | High | High | Low | Moderate | Moderate | Moderate | Moderate | High | High |
| 6. | Redbank and Collingwood Park | Moderate | Moderate | High | High | Moderate | Moderate | Moderate | Moderate | High | Moderate |
| 7. | Swanbank, New Chum and Redbank Plains (part) | Moderate | Moderate | Low | High | Low | Moderate | High | High | Moderate | Moderate |
| 8. | Riverview | Moderate | Moderate | Moderate | High | Moderate | Low | Moderate | Moderate | High | Moderate |
| 9. | Bundamba, Blackstone, Ebbw Vale and Dinmore | High | High | High | Low | Low | Low | Moderate | Moderate | Moderate | Moderate |
| 10. | Karalee, Barellan Point and Chuwar | High | High | High | Low | Low | High | High | High | Moderate | High |
| 11. | North Ipswich, Tivoli, North Tivoli and Moores Pocket | Moderate | Moderate | Moderate | High | Moderate | Low | Moderate | Moderate | High | Moderate |
| 12. | Brassall | High | High | High | Low | Moderate | Low | Moderate | Moderate | Moderate | Moderate |
| 13. | Ipswich, West Ipswich, Sadliers Crossing, Coalfalls and Woodend | Low | Low | Low | Low | Low | Low | Moderate | Moderate | High | Low |
| 14. | Basin Pocket, North Booval, Booval, Silkstone and East Ipswich | Low | Low | Low | Low | Low | Low | Moderate | Moderate | Moderate | Low |
| 15. | Raceview, Flinders View and Ipswich (part) | Moderate | Moderate | Low | Low | Low | Low | Moderate | Moderate | Moderate | Low |
| 16. | Churchill | Moderate | Moderate | Low | Low | Low | Low | Moderate | Moderate | Low | Low |
| 17. | Yamanto and Churchill (part) | Moderate | Moderate | Low | Low | Low | Low | Moderate | Moderate | Moderate | Low |
| 18. | Ripley Valley | Very High | Very High | Very High | High | Moderate | Low | Low | High | Very High | Very High |
| 19. | Purga, Goolman and Peak Crossing | Very High | Very High | Low | Moderate | Moderate | Low | Low | High | Low | Moderate |
| 20. | Amberley | Moderate | Moderate | Low | Moderate | Low | Low | Moderate | Moderate | Moderate | Moderate |
| 21. | One Mile, Leichhardt and Wulkuraka (part) | Moderate | Moderate | Low | Moderate | Low | Low | Moderate | Moderate | Moderate | Moderate |
| 22. | Karrabin (part) and Blacksoil (part) | High | High | High | High | Moderate | Low | Moderate | High | High | High |
| 23. | Pine Mountain, Muirlea, Blacksoil (part), Haigslea (part) and Ironbark | High | High | Very High | Moderate | Low | Low | Very High | High | Moderate | Very High |
| 24. | Walloon, Thagoona, Haigslea (part), and Mount Marrow | Moderate | Moderate | Moderate | Moderate | Low | Low | Moderate | High | High | High |
| 25. | Marburg | Moderate | Moderate | Moderate | Moderate | Low | Low | Moderate | High | Low | Moderate |
| 26. | Rosewood | Moderate | Moderate | Moderate | Moderate | Low | Low | Moderate | High | High | High |
| 27. | Ebenezer, Willowbank, Jeebropilly, Mount Forbes and Mutdapilly | High | High | Moderate | High | Low | Low | Moderate | High | Moderate | High |
| 28. | Tallegalla, Woolshed and The Bluff | Very High | Very High | Low | High | Low | Low | Moderate | High | Low | Moderate |
| 29. | Ashwell, Lanefield, Calvert and Grandchester | Very High | Very High | High | Moderate | Low | Low | High | High | Low | High |
| 30. | Mount Mort, Lower Mount Walker and Mount Walker West | Very High | Very High | Moderate | Moderate | Low | Low | High | High | Low | High |

# 7 Bushfire risk evaluation

The following evaluation of bushfire risk relevant to the Ipswich LGA is explored in two contexts:

1. region-wide strategic risks; and
2. local area risk, aligned with the Local Area Framework.

## 7.1 Region-wide strategic risk evaluation

As outlined at Section 5, a number of regionally-relevant strategic risk factors are identified, relative to land use planning. This section evaluates the context of these issues at the region-wide scale whilst the following section provides detailed local area risk profiles, aligned to the Local Area Framework of the new draft planning scheme.

### 7.1.1 Population and property exposure

**Identified risk:** Almost one quarter of the existing population and residential dwelling stock is exposed to potential bushfire hazard. Exposure is likely to grow into the future on a cumulative basis, based on existing use rights, as well as the existing and proposed settlement strategy for the region.

**Type of risk:** Human and social; Built environment.

A proportion of the region's existing townships and communities are, to some extent, exposed to potential bushfire hazard. Outside of identified growth areas, areas across the region may experience a level of development uplift as a result of existing use rights within legacy subdivisions, or where minimum lot size provisions allow further reconfiguration of existing (largely rural residential) allotments over time, as well as changes in land use.

39 per cent of the region is mapped as potential bushfire hazard, with a further 21 per cent of the region within the 100 metre hazard buffer. As such, 60 per cent of the Ipswich LGA is subject to potential bushfire hazard.

43 per cent of the region's residential zoned land is identified as subject to potential bushfire hazard, accounting for approximately a quarter of the region's current population.

Cumulatively, these figures will continue to grow as the region's urban interface with bushfire hazard expands, as is currently the case. This is discussed in further detail in the following section.

Exposure of persons and property to bushfire hazard is not unique to Ipswich. However, for some locations in the region the nature of exposure has the potential to exacerbate existing demand and burden on emergency services, and land managers. Planning tools (of varying strength) can be deployed to improve outcomes.

Aside from potential risk to life, from a human and social (community) perspective the risk to property is a significant consideration, and protection of property and assets as residual risk is transferred to end users.

The Insurance Council of Australia identifies that approximately 1 in 20 properties across Australia are not insured, approximately 70 per cent of properties are under-insured and about two-thirds of renters do not have contents insurance (Wynne, 2017).

One of the critical issues in this regard is that 'insured value' should not just cover the construction or purchase price, but must take into account current building standards, demolition, potential asbestos removal and site clean-up. The recent 2019-20 New South Wales Bushfire Inquiry identified that costs to re-build to new standards could be as high as an additional $100,000 (Owens & O'Kane, 2020). Many policy holders do not take this into account.

In a recent inquiry directed by the Commonwealth Government, the Australian Competition and Consumer Commission (ACCC) (2020) established that as disaster events continue, insurers are using more refined data and sophisticated pricing techniques which can result in insurance unaffordability for some consumers, over time. It also found that reforms to land use planning and building standards can help reduce risks and costs over the longer term.

### 7.1.2 Exposure of growth areas

**Identified risk:** Lands zoned for or capable of accommodation future growth are exposed to potential bushfire hazard, particularly the High density, Low medium density and New suburban zones.

**Type of risk:** Human and social; Built environment.

The two major growth areas within the LGA are regulated via alternative planning controls which influence the effect of the current and draft planning scheme.

The Springfield and Ripley Valley growth areas are exposed to potential bushfire hazard, including areas of High and Very High potential bushfire intensity. The development of Springfield is regulated by the Springfield Structure Plan (Part 14 of the current planning scheme). There are currently no provisions for bushfire hazard within the structure plan, nor does it identify a relationship with Section 11 Overlays of the current planning scheme, as it does for other relevant sections. Notwithstanding this, the provisions of the State Planning Policy continue to apply and it is noted that bushfire is and has been considered at various stages of the structure planning process for Springfield.

For Ripley, development is regulated under the *Economic Development Act* and the Ripley Valley Priority Development Area (PDA) Development Scheme. The Development Scheme incorporates a bushfire hazard map however, noting the Scheme pre-dates the current BPA mapping methodology, it is not prepared in accordance with the State's current position with respect to bushfire hazard mapping. Council maintains delegated authority for the assessment of development applications in the PDA. The Development Scheme is silent on the instrument's relationship in triggering assessment / compliance with AS3959 – Construction of Buildings in Bushfire Prone Areas. This remains relevant under the Ipswich Planning Scheme, noting the PDA Development Scheme supersedes the local planning instrument but defaults to the scheme on certain matters including bushfire.

Having regard to the above, the strategic planning for and continued growth of population and development in these locations is not exclusively under Council's jurisdiction.

Other areas of the region are also identified for growth under the draft planning scheme, including the Walloon to Rosewood corridor. This remains an area for which the policy, strategic and statutory functions of the draft planning scheme can be exercised to derive risk-responsive development outcomes.

### 7.1.3 Grassfire hazard

Identified risk: Risk from grassfire (including on rural lands and agricultural cropping lands), and short, sharp interface fire events, are prevalent in the region and likely to remain so.

**Type of risk:** Human and social; Built environment; Roads and transport.

Previous grassfire events have led to property loss across South East Queensland, including at Laidley in the neighbouring Lockyer Valley region, and in locations which are not subject to the State-wide BPA mapping. This is because, from a policy perspective, grassfire is not deemed to be a planning consideration in Queensland given its lower fireline intensity and limited ability to generate ember attack of a level likely to pose a risk to property. As grassfire hazard is not mapped, it also does not trigger assessment of AS3959 or the application of building measures.

However, grassfire can be very fast moving, with significant rate of spread. These events can generate short, sharp emergencies and which can be destructive.

The continuity of grassland fuels where it adjoins woodlands or bushland can give rise to the ability for fire to run across paddocks and rural lands. Under more severe weather conditions, even paddock stubble can burn and carry fire.

Community education campaigns may assist to ensure grassfire events are reported quickly to emergency services, ensuring residents and primary producers remain vigilant to the threat of potential grassfire in the region.

### 7.1.4 Competing policy interests

**Identified risk:** Policy tensions between bushfire hazard protection, as a factor of growth and development, and environmental values have and are likely to continue to generate conflict at the urban bushland interface.

**Type of risk:** Human and social; Built environment.

The consideration of bushfire hazard in a planning context is often required on balance with other planning interests which include vegetation management (including vegetation clearing), protection of biodiversity, ecosystem rehabilitation and in South East Queensland, Koala habitat protection.

In the first instance, clear policy positions can assist development assessment processes where vegetation removal is required. In particular, clarity in relation to environmental values and assets which require protection and retention. This may include matters of local and state environmental significance, core Koala habitat areas, etc. Uncertainty can arise where development applications seek clearing for the purpose of bushfire protection. Policy tension can arise between the objectives of bushfire protection and those of biodiversity protection where competing values are present.

Noting the exposure of identified growth areas and proposed zoning of the planning scheme, this policy tension is likely to arise. For incremental development in existing rural residential areas, for example, processes are in place under the State Development Assessment Guidelines to support the navigation of these issues during the development assessment phase. A suite of tools can be implemented by Council to address these matters via strategic planning processes.

### 7.1.5 Exposure of employment-generating land

**Identified risk:** Portions of the region's employment generating zoned land are exposed to potential bushfire hazard including Tourism zone, Principal centre zone and Low impact industry zones.

**Type of risk:** Economic.

Over 10,200 registered businesses exist or operate within the Ipswich region (Australian Bureau of Statistics, 2020). The Ipswich region produces an estimated $10.56 billion of Gross Regional Product, with almost 106,000 employed persons (National Institute of Economic and Industry Research (NIEIR), 2020).

Economic productivity is spread across the region with valuable agricultural production lands generating significant economic activity and employment. These areas are not immune to bushfire for grassfire threat, which can lead to crop loss and loss and damage to property, buildings and equipment.

Agricultural losses from bushfires in Queensland and Australia more broadly is also continuing to grow. These losses come with far-reaching socio-economic impacts which lengthen community recovery timeframes, and can lead to devastating consequences for agricultural businesses which are often family-owned enterprises.

Impact on agricultural enterprises also carries significant cascading economic impacts of associated industries such as transport, logistics and manufacturing. This further extends to other dependant industries.

Pursuant to the Australian Disaster Resilience Index, many primary production districts across Australia are over-exposed to economic risk as a result of disasters, ostensibly related to limited economic diversity and primacy of agricultural activities.

Regulatory exemptions exist for certain works associated with vegetation management to reduce exposure which primary producers can implement without the need for approval.

Beyond agricultural production, areas of the region's industrial and commercial lands are also exposed.

#### 7.1.5.1 Recovery and reconstruction

Geoscience Australia (2021) estimates the current potential reconstruction cost of property loss within the local government area at over $40 billion, with a contents value of almost $6 billion.

This value is likely to increase substantially over time.

The cost of damage or loss to public assets, critical infrastructure and essential services extends beyond the above amount and can translate into extended recovery timeframes which can also extend beyond bushfire impacts to communities.

Queensland's exposure to bushfire threat is changing over time, as climate change influences fire weather and vegetation characteristics, and development as the urban bushland interface continues to expand.

Millions of dollars in recovery costs have been expended by local, State and Commonwealth governments over recent years in response to the past several fire seasons experienced in Queensland.

At 2017, the total cost of disasters across Queensland was $11 billion per year representing 60 per cent of the total economic cost of disaster over the preceding ten years. Under a medium emission scenario, disaster costs from 2020-2060 are estimated to reach $492 billion (Deloitte Access Economics, 2021). Queensland also receives the highest allocation of Commonwealth resilience funding (2013/14 – 2016/17) at $12 million (Deloitte Access Economics, 2017).

Estimates of the costs of the 2019-20 Australian bushfires are at approximately $100 billion, incorporating both tangible and intangible costs (Read & Denniss, 2020).

Deloitte Access Economics (2017) estimated the tangible impact of the Victorian Black Saturday bushfires at $3.1 billion in 2015 dollars, with intangible costs at more than $3.9 billion.

Governments of all levels are increasingly exposed to economic risks stemming from bushfire and other disaster events. Understanding risk exposure and investing in building resilience to reduce disaster risk are key opportunities to reduce the magnitude of potential loss.

It is incumbent upon business owners and operators to take all appropriate steps to mitigate against impact and loss from natural hazard events, protecting business operations and continuity.

The 2020 Royal Commission identified the role of strategic land use planning in considering the risk posed by natural hazards, and the preparation and implementation of settlement policy which seeks to avoid or otherwise limit continued hazard exposure and increase of risk, as part of a shared responsibility approach to project life and property, invest in resilience, and limit future recovery and reconstruction costs and impacts.

### 7.1.6 Rural land exposure

**Identified risk:** A high portion of rural zoned land is exposed to potential bushfire hazard across the region.

**Type of risk:** Economic.

Approximately 59 per cent of rural lands and 67 per cent of rural living lands is exposed to potential bushfire hazard. High levels of exposure across these zones is to be expected however, the potential impacts cannot be discounted. Much of the rural zoned lands is also income generating land, contributing to the economic vitality and diversity of the region. It is also employment-generating lands, helping to support the socio-economic wellbeing of the region's population. Rural living lands are an extension of this however, the nature of risk is more focussed on property loss and potential for life loss.

The relationship with on-property land management in these cases is critical, noting such lands remain in private ownership where fuel management is the responsibility of property owners but for which support can be derived through local rural fire brigades.

### 7.1.7 Exposure of the recreation and open space network

**Identified risk:** Parts of the recreation and open space network are exposed to potential bushfire hazard across the region.

**Type of risk:** Human and social; Built environment.

Council assets including recreation and open space networks are exposed, which similar to rural zoned lands, is to be expected. Where these lands include bushfire hazard, Council maintain detail bushfire management plans and practices to manage fuel loads and interface locations. Council may however benefit from a synthesised and coordinated approach to the fire management of its lands, pursuant to risk.

Public assets in these locations may include community infrastructure, playground equipment and other recreational assets. Cost recovery for reconstruction of some assets in these areas may be constrained under the current Disaster Recovery Funding Arrangements.

### 7.1.8 Vulnerable facilities and occupants

**Identified risk:** Some vulnerable facilities are identified as being subject to potential bushfire hazard.

**Type of risk:** Human and social; Built environment.

The historical settlement policy of the Ipswich region appears to have largely avoided the proliferation of potentially vulnerable facilities within bushfire prone areas. Those that do appear within bushfire prone areas are dominated by educational facilities, child care centres, as well as aged some aged care facilities.

It must be noted that aged care, nursing homes, respite facilities, child care centres and schools are not required to be assessed against AS3959, or be constructed to any bushfire protection standard.

Herein lies a policy issue between planning and building provisions. In the knowledge these facilities do not necessitate any construction specifications to respond to bushfire hazard, the continued location of facilities of this nature is, as outlined by the State interest policy, intended to be avoided in hazard exposed locations.

This aspect must form an area of policy focus as part of the formulation of the new planning instrument.

### 7.1.9 Essential community infrastructure exposure

**Identified risk:** A high portion of essential community infrastructure is exposed to potential bushfire hazard particularly across the electricity, water and sewerage networks.

**Type of risk:** Built environment; economic.

A number of essential infrastructure assets are identified in the bushfire prone area, dominated largely by electricity, water and sewerage networks, many items of which are not under Council's jurisdiction. Exposure of selected water pump stations, coupled with exposure of some electrical substations in the region, may eventuate in cascading impacts during a fire event where power and water supply fail in certain areas. Whilst this remains a disaster management issue, planning controls can support the reliability of essential infrastructure by adopting a policy position, in the first instance, of avoiding such critical assets in bushfire prone areas. This is the expectation of the SPP and State interest for bushfire, and Council has options available to satisfy the SPP requirements in relation to essential infrastructure.

### 7.1.10 Exposure of landfill sites and operations

**Identified risk:** A number of landfill sites are potentially exposed to bushfire hazard.

**Type of risk:** Economic; Environmental.

The region encompasses several landfill, waste and recycling facilities which may present both an ignition risk under certain conditions, and may lead to cascading impacts where the severity of an initial fire event is worsened by these land uses. This may include the emission of toxic smoke or landscape contamination. For existing sites, this remains a disaster management matter however, where expansions of land use or increased intensity is proposed, land use planning responses can anticipate such risks to enable proper assessment.

### 7.1.11 Risk from unexploded ordnance

**Identified risk:** Unexploded ordnance sites are exposed to bushfire hazard and may act as a risk multiplier during certain events.

**Type of risk:** Environmental.

A number of unexploded ordnance (UXO) sites are located throughout the region where the potential consequence of bushfire may lead to the uncovering of previously buried UXOs or their detonation. In these locations, the ability for fire suppression by emergency services may be impacted, as such areas may not be safe for firefighting activities. Additionally, the potential for water-bombing may also be constrained as the force of water may incidentally cause UXO explosion. Where UXOs become uncovered, cascading risks to combat agencies and the communities can emerge.

From and land use planning perspective, the current planning scheme does not mandate any buffer areas to such site but instead requires a site-specific assessment to be undertaken. A number of policy, strategic and statutory planning options are available for Council to consider with regard to the relevant bushfire hazard implications of the risk multiplier effects of UXO sites in bushfire prone areas where development may occur in proximity.

### 7.1.12 Risks to the evacuation network

**Identified risk:** Parts of the evacuation network may be compromised in a fire event and may impact the ability to evacuate in certain locations, under certain conditions.

**Type of risk:** Human and social; Roads and transport.

Planning for bushfire evacuation is an immensely difficult task. Unlike flood and other events, bushfire events are not a 'known quantity'. There is no surety in when or where an ignition may occur, the direction it may spread, the extent of possible ember attack, etc.

The impact of smoke and limited visibility in emergency situations, coupled with wind impact, can lead to issues on the road network as residents attempt to evacuate. The exposure of motorists to potential flame contact and radiant heat are also key considerations.

The extent of warning time and ability to evacuate to safety (including the aspects of access and egress) represent the most fundamental characteristics which determine risk to life in a land use planning context.

There are three key elements of relevance to land use planning:

1. The extent of warning time available (window of evacuation opportunity);
2. How the settlement pattern supports or enables:
    a. separation from hazard sources;
    b. urban intrusion of fire by built form;
    c. the act of community evacuation (processes); and
3. Evacuation destinations (designated evacuation centre or Neighbourhood Safer Place [NSP]).

AIDR Handbook 4: Evacuation Planning provides guidelines and considerations for developing community evacuation plans underpinned by an all-hazards approach. It uses the nationally recognised five stages of the evacuation process as a framework for planning an evacuation (AIDR, 2017).

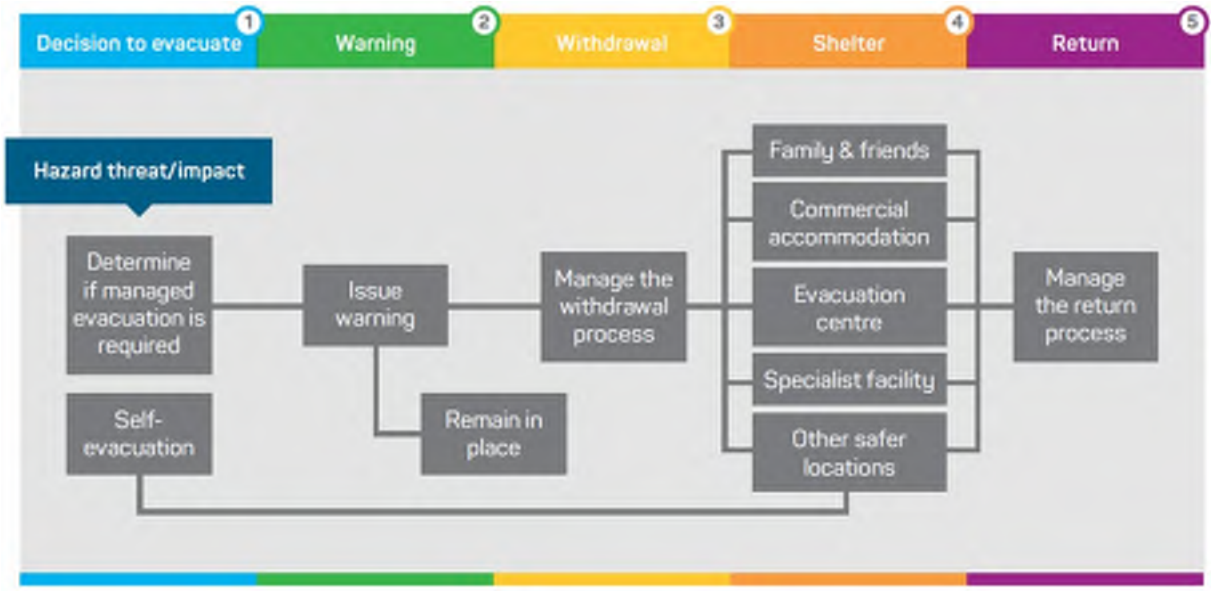



**Figure 7-1 - The five stage evacuation process (Source: AIDR, 2017)**

This risk assessment does not seek to determine specific evacuation windows for any event scenarios. Rather, the focus of this work is to examine the potential exposure of the higher order evacuation route network to inform potential Council decisions in relation to settlement policy and potential growth locations.

Current planning instruments and materials in Queensland do not, at this time, adequately articulate the characteristics of an effective and efficient evacuation network in relation to bushfire hazard. This risk assessment defines an evacuation network as including the following attributes (as a minimum):

- a network with capacity to support surge demand during evacuation (i.e. many residents leaving at once, with multiple vehicles departing from each household);

- a network which provides and support multiple egress options, in the event that one or more routes become non-trafficable;
- potential bottlenecks and pinch points in an emergency situation are identified via strategic processes and able to be mitigated; and
- roads at the interface are sufficiently wide to enable fire appliances to stand on the pavement and be operational (i.e. doors open and equipment deployed), and continue to allow for passing vehicles which may be leaving the area.

Regard for the above in advance of development growth enables the road network to appropriately support emergency evacuation, and mitigate potential risk to life to a tolerable level.

#### 7.1.12.1 Ipswich region evacuation route network

To understand the potential impact of bushfire attack on the road network, to an extent where the evacuation network may become compromised, is largely determined by the potential for exposure to flame contact or extreme radiant heat.

Tree fall and road accidents are a separate issue, and these are difficult to model. However, there may be specific locations where risk of tree fall and accidents may present a risk to the evacuation capacity of the wider network. In terms of exposure of the key evacuation route network, the following table outlines the proportion of exposure across the LGA, with individual analysis of each local area included at Section 7.2.

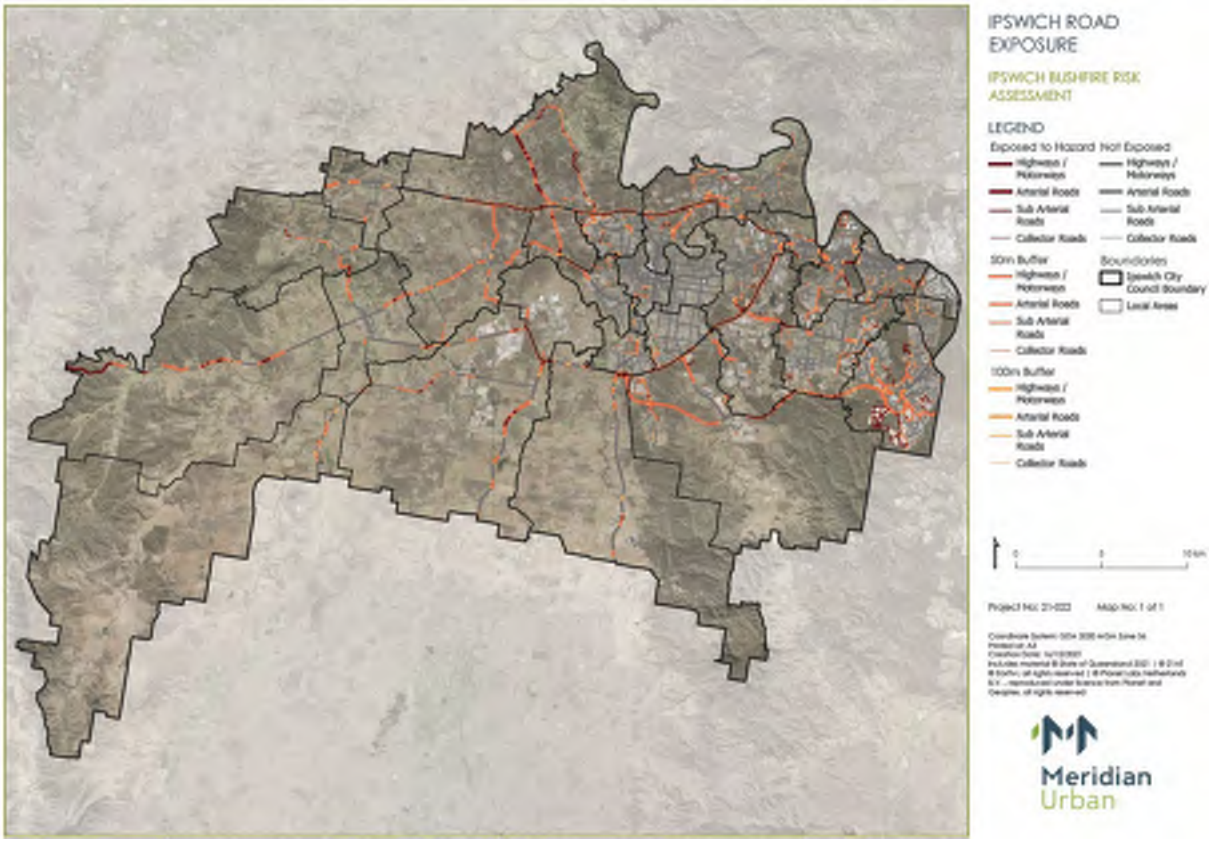
**Table 15 - Summary of bushfire attach exposure to key evacuation routes**

| Region | Percentage of length of key evacuation route network | | |
|---|---|---|---|
| | Flame contact | Radiant heat | Total |
| **Ipswich LGA** | 4.36 | 19.84 | 24.20 |

NOTE: For the purposes of the above table, 'flame contact' relates to roads which traverse bushfire hazard and 'radiant heat' extends a distance of 50m from bushfire hazard. To this end, it is indicative only.

Most of the key routes across the region are subject to potential bushfire attack, with approximately one quarter of the region's higher order road network potentially exposed. Those local areas where exposure to potential flame contact and radiant heat exceeds 30 per cent of the higher order road network include:

- Ashfield (54.25%)
- Pine Mountain, Muirlea, Blacksoil (53.55%)
- Swanbank, New Chum (50.19%)
- Karrabin, Blacksoil (48.05%)
- Ripley Valley (38.26%)
- Ebenezer, Willowbank, Jeebropil (37.37%)
- Amberley (33.16%)
- Springfield Estate (31.63%)
- Walloon, Thagoona, Haigslea (30.34%).




Overall, the region shows localised exposure for short stretches of the road network. Whilst these locations may be impacted in an event, alternative access and egress routes tend to be available.

Despite the above, there are communities which is reliant on one route in and out, and other localities which are continuing to grow with limited strategic consideration of the evacuation route network through planning processes. In addition to strategic planning considerations, statutory options can also be considered to design with evacuation in mind from a grassroots perspective, and able to be embedded as part of the development controls included in the new planning scheme.

### 7.1.13 Climate change impacts

**Identified risk:** Hazard exposure may change in certain locations over time to higher hazard classes, and increased fire weather as a result of climate change.

**Type of risk:** Environmental.

Hazard exposure may change in certain locations over time to higher hazard classes, and increased fire weather, as a result of climate change. This risk relates to risk types which involve the environment.

Changes to vegetation attributes and overall fuel loads across the region are likely as the landscape responds to climatic and weather changes over time. This may mean that hazard classes may escalate, and fire weather conditions grow in frequency and intensity.

This may result in larger areas of the region being exposed to higher levels of hazard than compared with current conditions, as a result of increased or altered fuel loads and fire weather characteristics. Monitoring of these conditions will be required.

### 7.1.14 Bushfire buffer as trigger for building compliance

**Identified risk:** Existing Bushfire Risk Area mapping under the current planning scheme does not include a 100 metre hazard buffer which may have resulted in a proportion of residential development which is subject to bushfire hazard but not have not triggered assessment or compliance against AS3959.

**Type of risk:** Built environment.

The currently planning scheme bushfire risk overlay mapping includes a risk area and transitional risk area. The transitional risk area comprises those areas which are intended to transition from non-urban land uses over time and as such, see a likely change to the nature of bushfire threat in specific locations.

The current overlay map, which has been in place for a lengthy period, does not incorporate a 100 metre hazard buffer surrounding mapped bushfire hazard. The buffer area is an area where bushfire attack extends beyond the mapped hazard to account for flame contact in high winds, radiant heat flux and ember attack, noting that most dwellings which are lot or damaged due to bushfire are located within 100 metre of hazard.

In the absence of this buffer, over time it may be the case that development applications have avoided the need for bushfire assessment, or the trigger of building provisions pursuant to AS3959. As an indicator, there is an estimated 12,900 residential buildings located within the State-wide BPA mapping buffer in the Ipswich region, which are not mapped under Council's current overlay. It is expected that a proportion of these will have triggered assessment and will be constructed in accordance with AS3959 relative to large-lot subdivisions. However, it may be the case that a high number of dwellings in these areas are not constructed in accordance with AS3959, recognising that the local planning instrument and overlay mapping generally forms the trigger for AS3959 assessment and compliance.

## 7.2 Local area risk evaluation profiles

A detailed analysis of each of the 30 local areas, supported by the Local Area Framework, has been undertaken, and summaries for each is provided as follows.

The summaries include the following detail:

- context of zone exposure
- residential exposure
- road (evacuation route) exposure
- vulnerable facilities and essential infrastructure
- growth management considerations relative to the proposed draft planning scheme and *ShapingSEQ* Regional Plan
- qualitative exposure narrative
- qualitative risk narrative.

These summaries are expanded upon in **Part C – Land Use Planning Policy Analysis** with regard to the planning pathways available to each LAF, based on their respective risk profiles.

# Area 1 – Goodna Gailes

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 768 | 1 | 6 | 10 | 2 | 7 | 14 |
| Residential | 412 | 1 | 4 | 5 | 2 | 6 | 13 |
| Employment | 60 | 0 | 2 | 0 | 0 | 15 | 1 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 0 | NA | NA | NA | NA | NA | NA |
| Environmental | 181 | 4 | 16 | 28 | 4 | 6 | 19 |
| Community facility | 41 | 3 | 2 | 15 | 2 | 6 | 16 |
| Limited development | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| Recreation & open space | 37 | 0 | 0 | 2 | 0 | 0 | 21 |
| Special purpose | 27 | 0 | 0 | 1 | 0 | 9 | 22 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 4,368 | 0 | 0.6 | 0 | 1 | 5 | 10 |

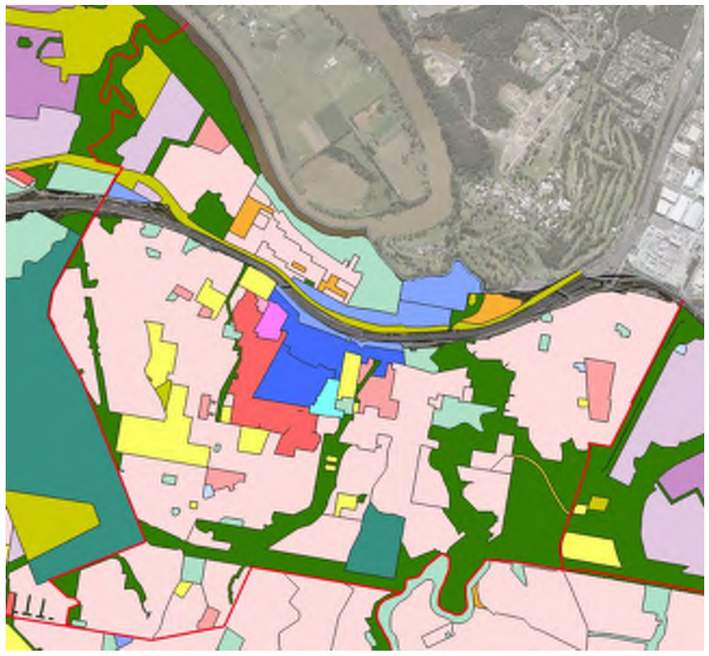
## Road exposure

| | |
|---|---|
| Total length | 44.3km |
| Exposed to hazard | 1.28% |
| Within 50m of hazard | 9.53% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 20 | 1 |
| Essential community infrastructure | 6 | 1 |

## Growth management



Areas of significant development (urban consolidation) to occur south of Ipswich Motorway, including:

- Goodna major centre with range of commercial, residential and mixed use buildings.
- Significant capacity to accommodate mix housing types and density.

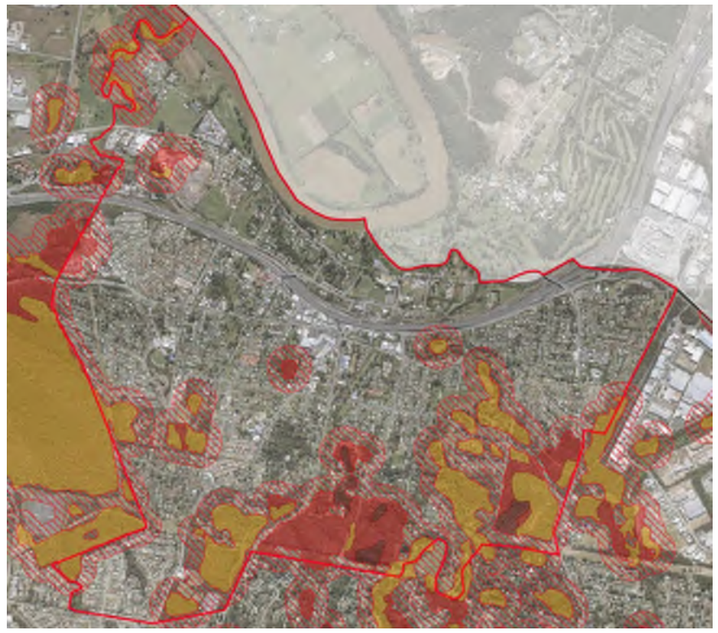
## Place typologies

- Centres
- Established suburban neighbourhoods.

## ShapingSEQ

- South West Industrial Corridor Regional Economic Cluster (REC)
- Urban (consolidation) areas.

## Exposure summary



The southern extent of the local area comprises considerable areas of vegetation held in reserve, providing a significant corridor through the LGA. This links with a large area of hazard to the immediate west, adjoining the local area.

Despite the above, the exposure of vulnerable uses and infrastructure is quite limited. Whilst the Goodna Sewerage Treatment Plant is within the hazard buffer, the extent of exposure is limited.

## Bushfire risk summary

The majority of risk is largely associated with existing larger lot residential development. This area is poised to accommodate future growth, including a mix of densities. This will increase the extent of people and property within the exposure area, noting also that it is likely to see a reduction in bushfire hazard as land is cleared to accommodate growth. However, the zoning rationale does indicate that the residential interface will grow. Thus, appropriate planning controls to direct this, including avoidance of higher risk localities within the local area, and provisions to effectively mitigate risk to a tolerable or acceptable level is required.

# Area 2 – Carole Park

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 360 | 0 | 1 | 19 | 0 | 3 | 16 |
| Residential | 0 | 0 | 0 | 38 | 0 | 0 | 10 |
| Employment | 230 | 0 | 0 | 4 | 0 | 1 | 13 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 0 | NA | NA | NA | NA | NA | NA |
| Environmental | 119 | 0 | 3 | 50 | 0 | 6 | 19 |
| Community facility | 7 | 0 | 0 | 0 | 0 | 33 | 35 |
| Limited development | 0 | NA | NA | NA | NA | NA | NA |
| Recreation & open space | 3 | 0 | 0 | 17 | 0 | 6 | 64 |
| Special purpose | 1 | 0 | 0 | 9 | 0 | 28 | 63 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

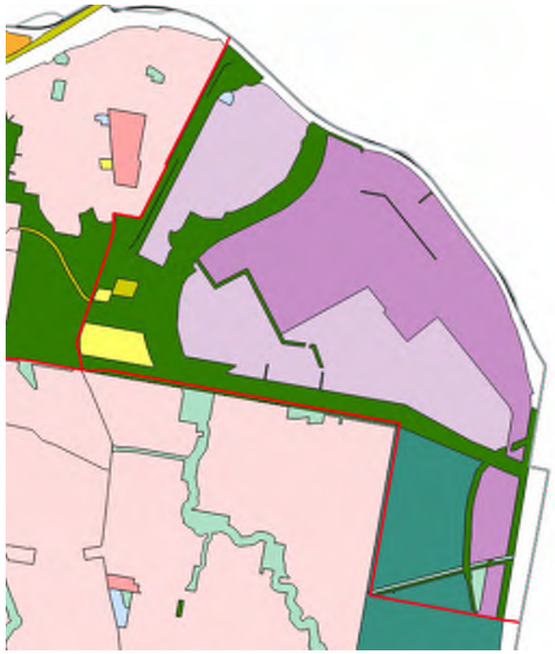
## Road exposure

| | |
|---|---|
| Total length | 11.9km |
| Exposed to hazard | 1.32% |
| Within 50m of hazard | 14.40% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 3 | 2 |
| Essential community infrastructure | 4 | 3 |

## Growth management



Largely developed for low and medium impact, high value industrial uses and associated employment opportunities

Significant opportunity for infill or vacant industrial lots and redevelopment of older and underutilised sites.

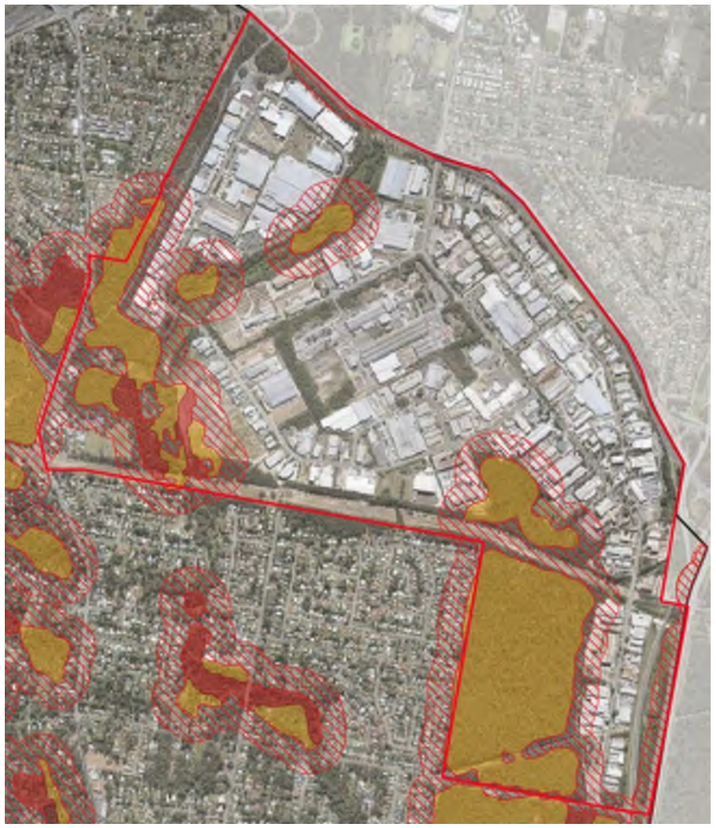
## Place typologies

- Special use place.

## ShapingSEQ

- South West Industrial Corridor Regional Economic Cluster (REC).

## Exposure summary



A larger area of bushfire hazard is located to the rear of the Cobalt Street industrial precinct, which extends further to the south and east, outside the local area. Hazard becomes more fragmented to the north and to the west where Sandy Creek traverses the local area. A buffer strip of vegetation along Formation Street merges with the Sandy Creek corridor to the north, outside the local area.

Camira State School is located in the western extent of the local area, buffered from the nearby industrial activities by bushland. Immediate neighbouring the school is the Camira Fire and Rescue Station. A zone substation is also located nearby, along with another near the Cobalt Street bushland buffer, and a water pump station.

## Bushfire risk summary

Exposure to the industrial precinct is relevant. Whilst egress opportunities to the north are available, potential bushfire attack is possible. Fire trails skirt the bushland areas, which are also fragmented by a high voltage powerline easement corridor.

Camira State School is exposed, with north and south evacuation options available.

# Area 3 – Camira

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 605 | 0 | 7 | 27 | 1 | 12 | 13 |
| Residential | 391 | 0 | 5 | 5 | 1 | 17 | 17 |
| Employment | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 0 | NA | NA | NA | NA | NA | NA |
| Environmental | 152 | 0 | 9 | 83 | 0 | 2 | 4 |
| Community facility | 0 | NA | NA | NA | NA | NA | NA |
| Limited development | 1 | 0 | 0 | 25 | 0 | 6 | 69 |
| Recreation & open space | 61 | 0 | 12 | 29 | 1 | 9 | 15 |
| Special purpose | 0 | NA | NA | NA | NA | NA | NA |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 2,383 | 0 | 0.1 | 0.4 | 0.4 | 10 | 16 |

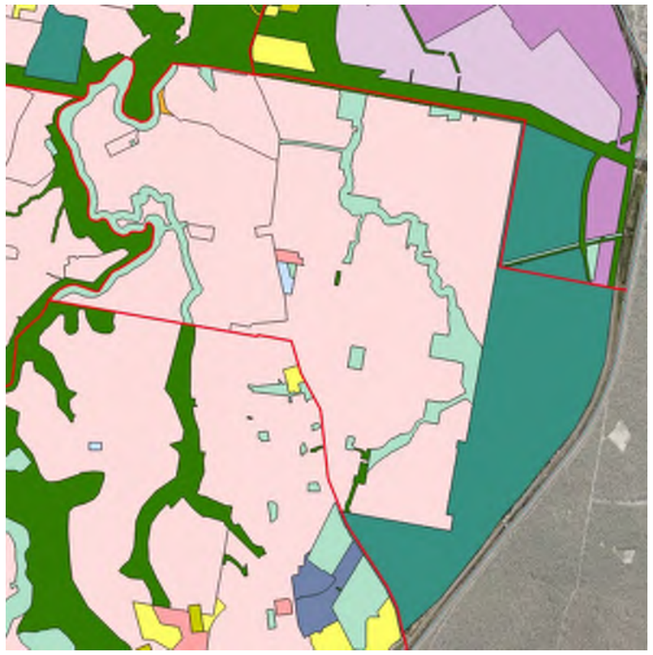
## Road exposure

| | |
|---|---|
| Total length | 12.2km |
| Exposed to hazard | 2.28% |
| Within 50m of hazard | 9.36% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 3 | 0 |
| Essential community infrastructure | 0 | NA |

## Growth management



Existing suburban area with larger lot sizes.

Existing character to be maintained with terraces, townhouses and concentrations of duplexes to be avoided.

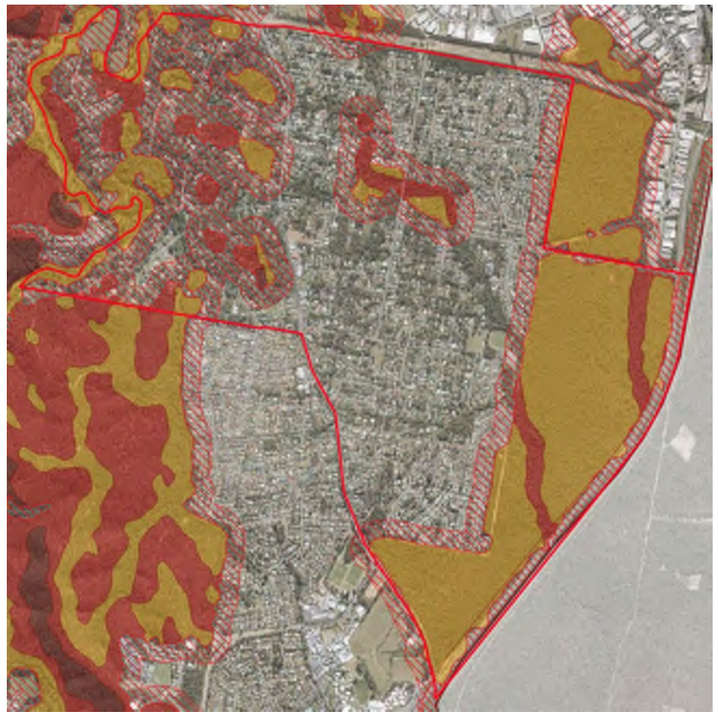
## Place typologies

- Established suburban neighbourhood.

## ShapingSEQ

- Urban (consolidation) areas.

## Exposure summary



Exposure within the Camira Local area is defined by the Sandy Creek reserve in the east, and fragmented patches and corridors in the western area flanking Sandy Creek and extending across residential properties. Residences in the western extent are on larger allotments, with more extensive vegetation cover.

There are no instances of vulnerable facilities or essential community infrastructure assets identified as subject to potential bushfire hazard.

## Bushfire risk summary

This suburb is an established suburb, with limited growth potential as per the proposed zoning rationale for the local area.

Bushfire risk is largely associated with the interface with existing residential development in the east and in the west. However, in the east the reserve and buffer areas are surrounded by fire trails to separate dwellings from vegetation, whilst larger lot residential development in the west is a mix of vegetation and managed environments, fragmenting bushfire connectivity. Notwithstanding, the local area is subject to a moderate level of existing bushfire risk.

# Area 4 – Springfield Estate and Augustine Heights

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 2667 | 6 | 33 | 17 | 2 | 7 | 7 |
| Residential | 1149 | 2 | 32 | 14 | 1 | 7 | 5 |
| Employment | 208 | 1 | 13 | 18 | 1 | 13 | 14 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 0 | NA | NA | NA | NA | NA | NA |
| Environmental | 973 | 13 | 45 | 21 | 3 | 5 | 5 |
| Community facility | 90 | 0 | 9 | 4 | 1 | 7 | 12 |
| Limited development | 0 | NA | NA | NA | NA | NA | NA |
| Recreation & open space | 228 | 3 | 12 | 18 | 1 | 13 | 14 |
| Special purpose | 18 | 0 | 18 | 24 | 6 | 19 | 10 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 13,069 | 2 | 17 | 5 | 2 | 10 | 5 |

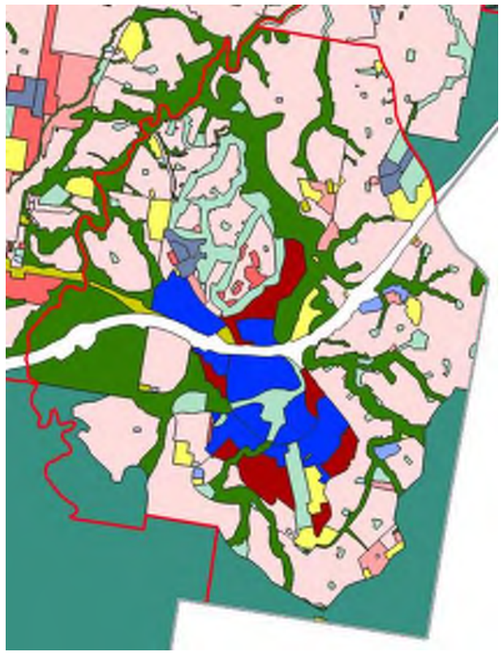
## Road exposure

| | |
|---|---|
| Total length | 119.8km |
| Exposed to hazard | 14.53% |
| Within 50m of hazard | 17.10% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 41 | 19 |
| Essential community infrastructure | 9 | 3 |

## Growth management



Intended to continue to grow as an integrated community:

- Springfield principal centre
- mixed density.

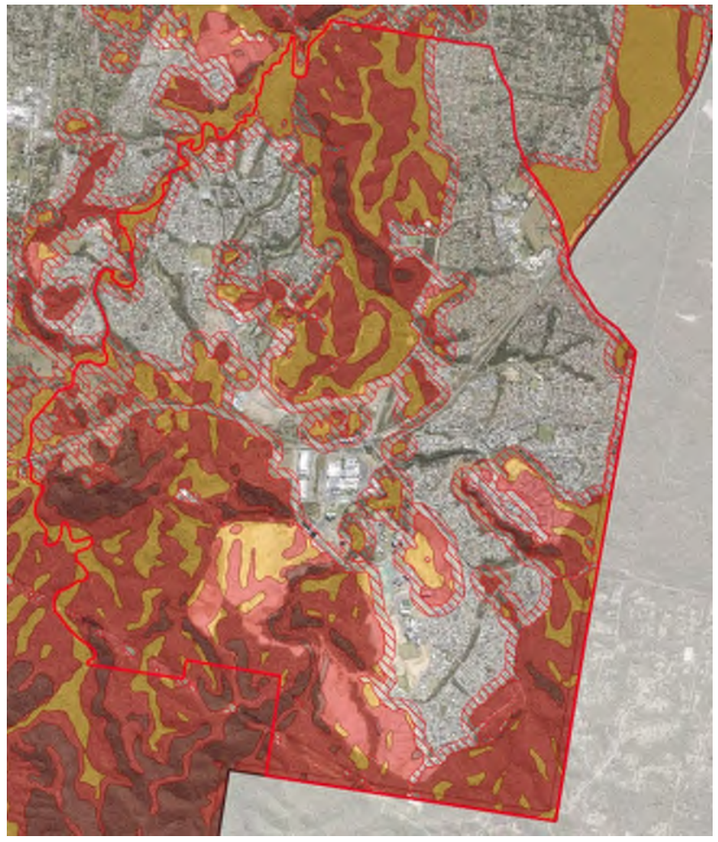
## Place typologies

- Urban neighbourhood.

## ShapingSEQ

- Springfield Regional Economic Cluster (REC).

## Exposure summary



Springfield is one of Queensland's newest cities and is a principal centre within the Ipswich LGA. Similar to Ripley Valley to the west. Springfield is also exposed to a considerable extent of bushfire hazard owing to the convergence of the Opossum Creek corridor, White Rock Conservation Park (including unexploded ordnance areas), Spring Mountain Forest Park and the neighbouring Greenbank Military Training Area which is adjacent to Springfield, outside of the Ipswich LGA.

A number of schools, child care centres, university, are located within the hazard buffer, along with substations, reservoirs and pump stations.

## Bushfire risk summary

Development within bushfire prone areas will continue, resulting in both interim and long term risk exposure. Development in Springfield is subject to alternate planning controls under historic legislative instruments, rather than the local planning scheme. Notwithstanding, this risk assessment must contemplate the risk context of Springfield moving forward.

# Area 5 – Bellbird Park, Redbank Plains, Augustine heights (part)

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area | 2016 | 3 | 9 | 10 | 4 | 8 | 11 |
| Residential | 1250 | 1 | 7 | 5 | 2 | 9 | 11 |
| Employment | 31 | 0 | 0 | 2 | 0 | 1 | 11 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 0 | NA | NA | NA | NA | NA | NA |
| Environmental | 505 | 11 | 17 | 27 | 7 | 7 | 12 |
| Community facility | 69 | 0 | 1 | 3 | 0 | 7 | 16 |
| Limited development | 0 | NA | NA | NA | NA | NA | NA |
| Recreation & open space | 119 | 0 | 2 | 4 | 1 | 6 | 6 |
| Special purpose | 42 | 4 | 10 | 1 | 10 | 13 | 2 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 12,289 | 0.2 | 4 | 2 | 2 | 7 | 8 |

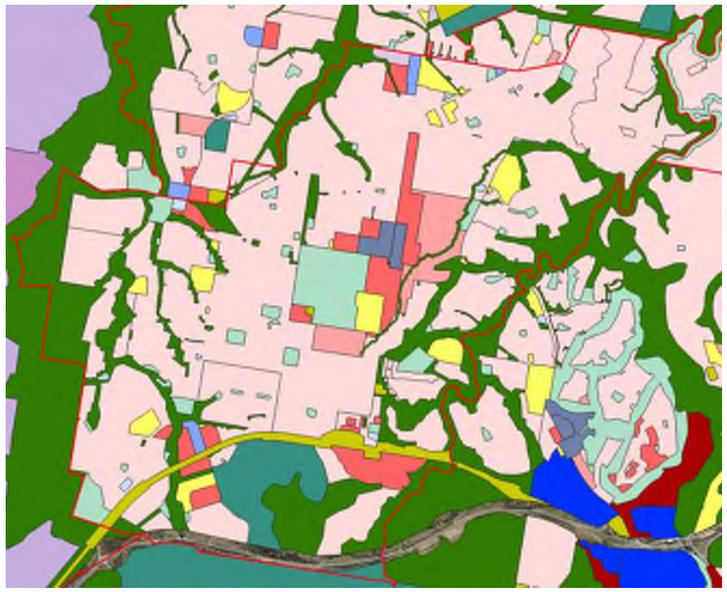
## Road exposure

| | |
|---|---|
| Total length | 73.6km |
| Exposed to hazard | 1.84% |
| Within 50m of hazard | 12.37% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 33 | 10 |
| Essential community infrastructure | 6 | 5 |

## Growth management



Mixture of urban expansion areas that have largely been constructed with only southern parts of Redbank Plains and Augustine Heights still to be developed.

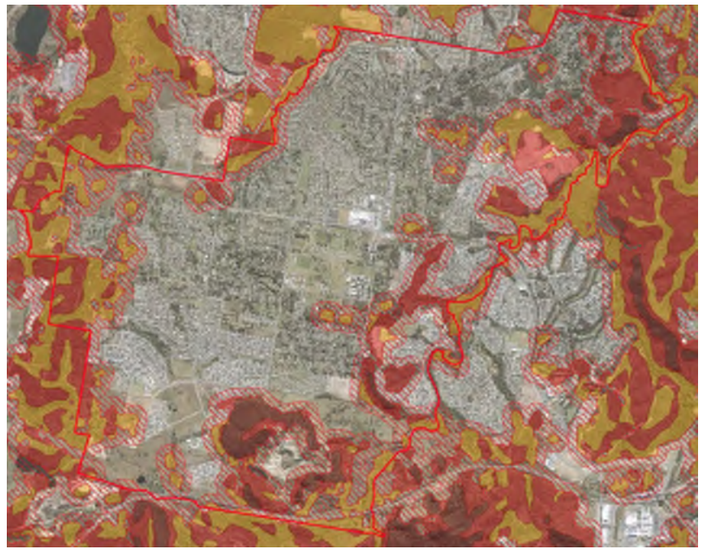
## Place typologies

- New suburban neighbourhood.

## ShapingSEQ

- Urban (consolidation) areas.

## Exposure summary



Bushfire hazard is present surrounding the local area. In the east, bushfire hazard follows the Woogaroo Creek corridor, and Goodna Creek in the north-west. Extensive vegetation bounds the western extent of the local area, providing a buffer between the largely residential uses of Bellbird Park and Redbank Plains, and the adjacent Swanbank industrial area to the west.

To the south, the local area is bound by the Centenary Highway, and the White Rock Conservation Park which presents as landscape-scale fire hazard.

A number of schools and child care facilities are within the hazard buffer, including St Ann's School, Staines Memorial College, Augusta State School, St Augustine's College and Bellbird Park State Secondary College. Several water and sewer pump stations are exposed, most located within the hazard buffer and one at the rear of Fiona Street in Bellbird Park within the High Hazard Intensity area.

## Bushfire risk summary

Potential bushfire threat from adjoining areas is the key element of risk for this local area, owing to the extent of surrounding vegetation and fingers of bushland corridors which pervade residential areas, particularly in the area of Bellbird Park and towards Camira.

Fire in the White Rock Conservation Park has the potential, depending on prevailing winds, to drive north through the green buffer that separates this local area from Swanbank but also the creek bushland reserves around Augustine Heights.

The residential area of Bellbird Park is extensively vegetated, amplifying potential risk to people and property. However, a lower percentage of roads are exposed, supporting evacuation needs.

# Area 6 – Redbank and Collingwood Park

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 1306 | 0 | 4 | 30 | 0 | 4 | 21 |
| Residential | 414 | 0 | 4 | 21 | 0 | 8 | 16 |
| Employment | 223 | 0 | 0 | 13 | 0 | 0 | 21 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 0 | NA | NA | NA | NA | NA | NA |
| Environmental | 428 | 0 | 6 | 57 | 0 | 3 | 19 |
| Community facility | 68 | 0 | 0 | 32 | 0 | 2 | 41 |
| Limited development | 12 | 0 | 0 | 0 | 0 | 0 | 20 |
| Recreation & open space | 88 | 0 | 3 | 12 | 0 | 9 | 32 |
| Special purpose | 73 | 0 | 0 | 11 | 0 | 3 | 36 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 4,082 | 0 | 4 | 8 | 0 | 7 | 14 |

## Road exposure

| | |
|---|---|
| Total length | 45.4km |
| Exposed to hazard | 4.71% |
| Within 50m of hazard | 16.66% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 13 | 4 |
| Essential community infrastructure | 8 | 5 |

## Growth management



A mix of uses with the northern part between the Ipswich Motorway and Brisbane River incorporating:

- the Redbank regionally significant major enterprise and industrial area
- Redbank Plaza with retail, commercial, community and entertainment uses
- existing established suburban areas to the north and south of Redbank Plaza include a mixture of housing types and densities with supporting facilities and services
- new urban expansion areas at Collingwood Park.

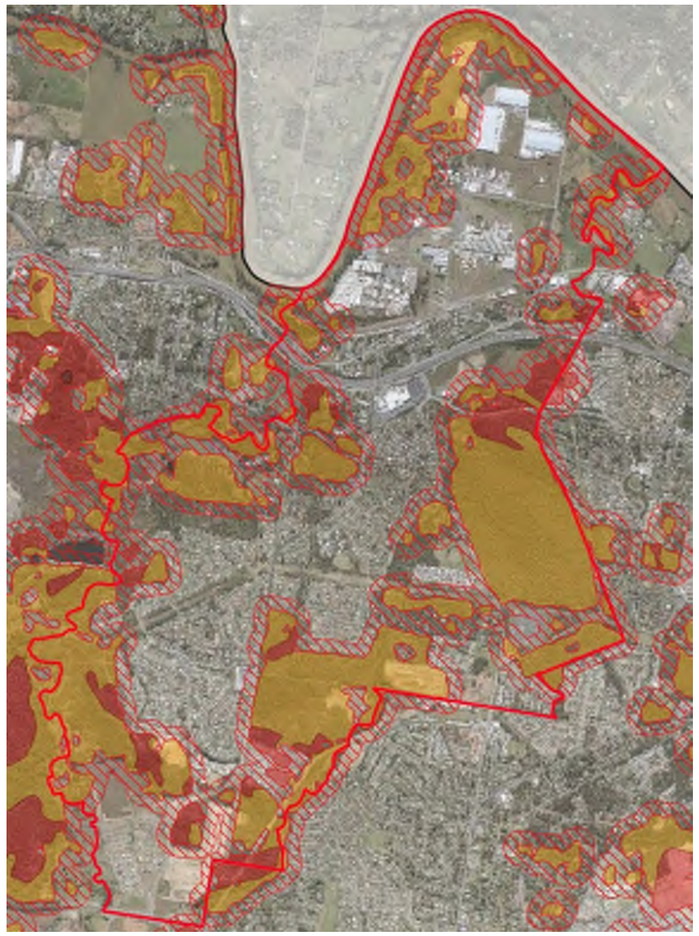
## Place typologies

- Special use place
- Centre
- Established suburban neighbourhoods
- New suburban neighbourhood.

## ShapingSEQ

- South West Industrial Corridor Regional Economic Cluster (REC)
- Urban (consolidation) areas.

## Exposure summary



Bushfire hazard in this local area is largely characterised by the vegetated buffer area to the adjoining New Chum landfill and the Goodna Creek corridor which opens to a reserve in the eastern extent of the local area. Other patches and corridors of vegetation are also present.

Woodlinks State School, the Rising Starts Early Learning Centre in Redbank and an unexploded ordnance area are within the hazard buffer.

## Bushfire risk summary

This area is poised for further development which will result in implications for the bushfire interface, both in the interim and in perpetuity. Planning provisions to direct the settlement pattern and growth management context to avoid unacceptable risk is necessary.

# Area 7 – Swanbank, New Chum, Redbank Plains (part)

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 2500 | 1 | 13 | 19 | 2 | 15 | 14 |
| Residential | 22 | 0 | 34 | 47 | 0 | 2 | 17 |
| Employment | 1466 | 0 | 9 | 12 | 2 | 18 | 12 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 0 | NA | NA | NA | NA | NA | NA |
| Environmental | 928 | 1 | 20 | 31 | 2 | 11 | 16 |
| Community facility | 0 | NA | NA | NA | NA | NA | NA |
| Limited development | 0 | NA | NA | NA | NA | NA | NA |
| Recreation & open space | 46 | 0 | 0 | 2 | 0 | 11 | 34 |
| Special purpose | 37 | 0 | 20 | 16 | 0 | 8 | 20 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 6 | 0 | 0 | 0 | 0 | 33 | 67 |

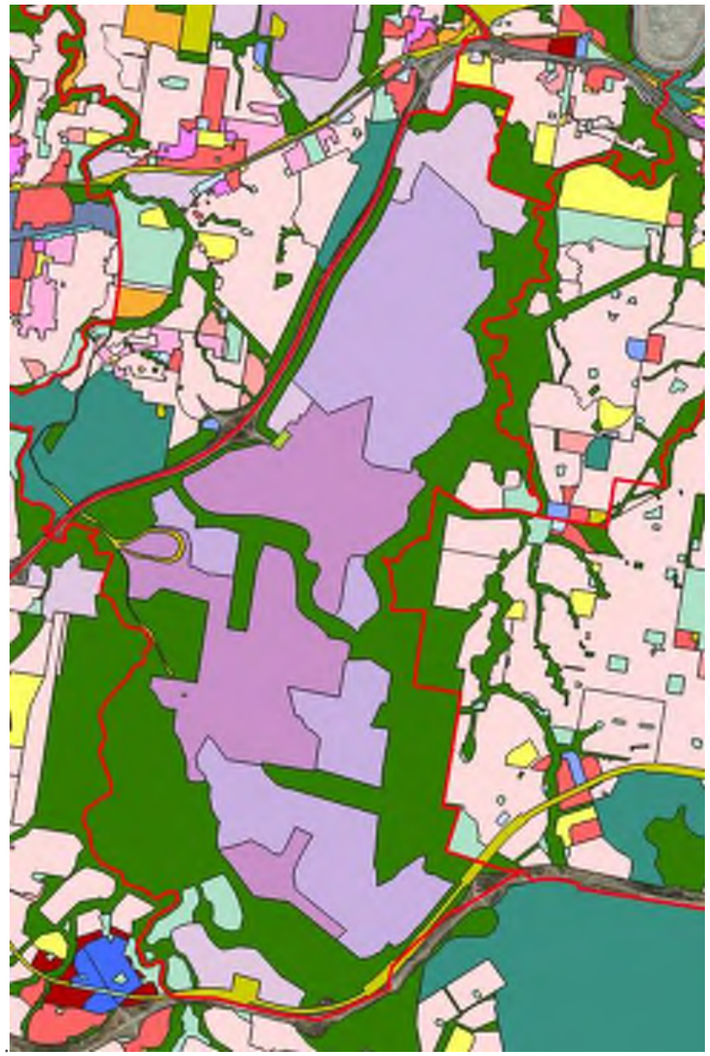
## Road exposure

| | |
|---|---|
| Total length | 19.3km |
| Exposed to hazard | 1.72% |
| Within 50m of hazard | 48.47% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 1 | 1 |
| Essential community infrastructure | 6 | 5 |

## Growth management



A regionally significant employment area, providing for a mix of low to medium impact industry uses, land-extensive activities, recreational and environmental management.

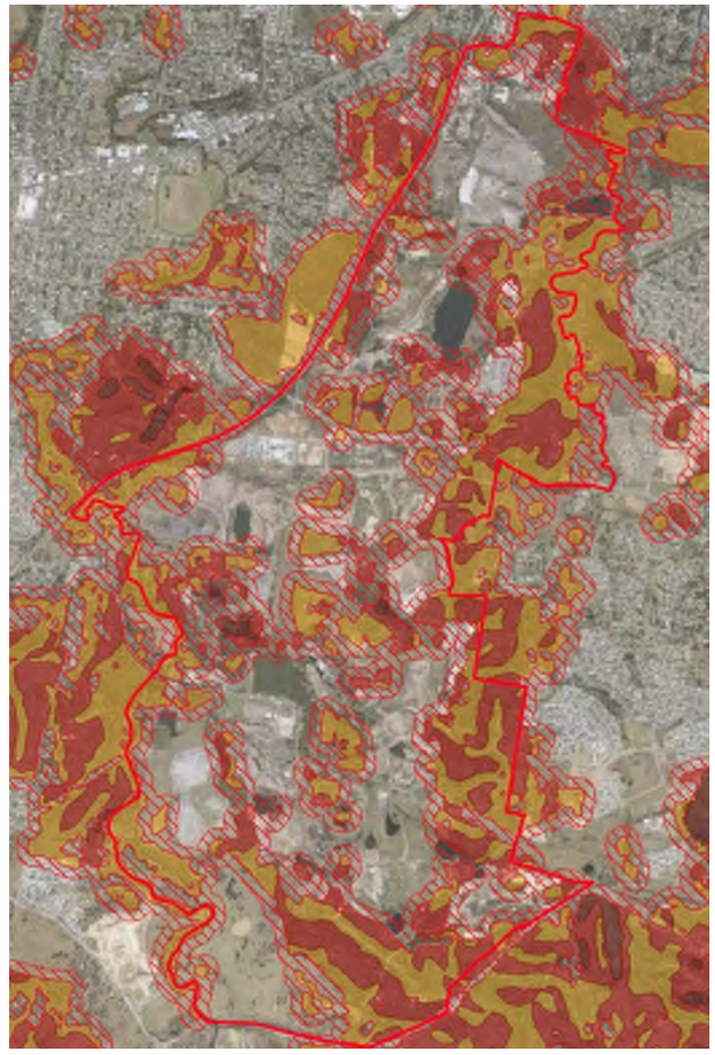
## Place typologies

- Special use place.

## ShapingSEQ

- South West Industrial Corridor Regional Economic Cluster (REC).

## Exposure summary



This local area is dominated by non-residential land uses including landfills and waste disposal activities, and industrial activities. These uses are flanked by environmental management land, providing a buffer between the land uses in the area and surrounding sensitive uses. No vulnerable uses are identified in the area.

## Bushfire risk summary

The fire risk to the land uses in this local area is of a reasonable scale, noting the need for expansive land use buffers to surrounding environments. This may present a level of environmental / contamination concerns, and risk of toxic smoke emissions and explosion.

# Area 8 – Riverview

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| **Local Area Total** | 665 | 0 | 5 | 17 | 0 | 4 | 25 |
| **Residential** | 111 | 0 | 5 | 4 | 0 | 4 | 13 |
| **Employment** | 175 | 0 | 2 | 10 | 0 | 3 | 24 |
| **Rural Living** | 0 | NA | NA | NA | NA | NA | NA |
| **Township** | 0 | NA | NA | NA | NA | NA | NA |
| **Rural** | 0 | NA | NA | NA | NA | NA | NA |
| **Environmental** | 257 | 0 | 8 | 29 | 0 | 4 | 29 |
| **Community facility** | 21 | 0 | 7 | 14 | 0 | 36 | 17 |
| **Limited development** | 1 | 0 | 0 | 0 | 0 | 0 | 54 |
| **Recreation & open space** | 65 | 0 | 0 | 6 | 0 | 0 | 32 |
| **Special purpose** | 34 | 0 | 0 | 22 | 0 | 0 | 28 |
| **Special opportunity** | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| **Residential dwellings** | 1,087 | 0 | 0 | 0 | 0 | 6 | 13 |

## Road exposure

| | |
|---|---|
| **Total length** | 21.3km |
| **Exposed to hazard** | 0.4% |
| **Within 50m of hazard** | 10.56% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| **Vulnerable facilities** | 5 | 3 |
| **Essential community infrastructure** | 5 | 3 |

## Growth management



Mix of uses including:

- established suburban low density residential development and supporting facilities and services to the south of the Ipswich Motorway
- Riverview railway station and local centre and opportunity for transition into an urban village
    - o Riverview regionally significant major enterprise and industrial area in northern extent.

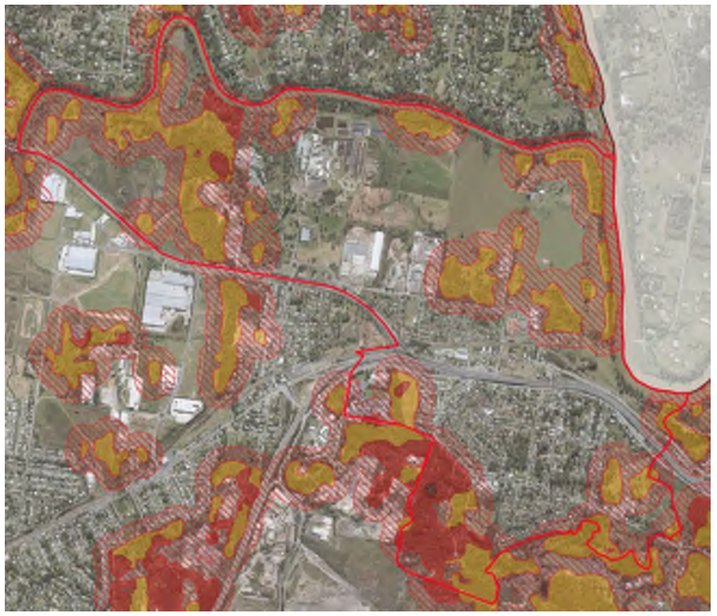
## Place typologies

- Established suburban neighbourhood
- Special use place.

## ShapingSEQ

- South West Industrial Corridor Regional Economic Cluster (REC)
- Urban (consolidation) areas.

## Exposure summary



Bushfire hazard in the Riverview local area is associated with fragmented patches of vegetation ranging between woodland to open forest, and a vegetated buffer to landfill uses to the south-west.

Residential development is limited to the southern extent of the local area, south of the Ipswich Motorway. The majority of the area largely accommodates industrial development.

St Peter Claver College, Riverview State School and Riverview Gardens Aged Care are within the hazard buffer as are two sewer pump stations and one water pump station.

## Bushfire risk summary

The extent of bushfire risk in this local area is highly fragmented, with the extension of the landfill buffer which extends into Riverview from the White Rock Conservation Park.

Most future development is poised to occur north of the Ipswich Motorway, as part of the industrial major enterprise area.

# Area 9 – Bundamba, Blackstone, Ebbw Vale and Dinmore

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 1477 | 1 | 8 | 15 | 0 | 6 | 18 |
| Residential | 629 | 0 | 3 | 16 | 0 | 5 | 15 |
| Employment | 212 | 0 | 0 | 6 | 0 | 3 | 18 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 0 | NA | NA | NA | NA | NA | NA |
| Environmental | 410 | 4 | 22 | 25 | 1 | 10 | 20 |
| Community facility | 21 | 0 | 0 | 0 | 0 | 0 | 0 |
| Limited development | 67 | 0 | 0 | 15 | 0 | 0 | 41 |
| Recreation & open space | 74 | 0 | 0 | 3 | 0 | 5 | 16 |
| Special purpose | 63 | 0 | 2 | 2 | 1 | 7 | 11 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 3,778 | 0 | 0 | 1 | 0 | 4 | 14 |

## Road exposure

| | |
|---|---|
| Total length | 45.7km |
| Exposed to hazard | 1.16% |
| Within 50m of hazard | 20.64% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 9 | 0 |
| Essential community infrastructure | 12 | 6 |

## Growth management



Established suburban neighbourhoods including:

- mixture of housing types and densities with supporting facilities and services
- Bundamba regionally significant industrial area between the Warrego Highway and the Ipswich to Brisbane railway line.

Development to occur in:

- Bundamba regional business and industry area
- existing urban (consolidation) areas with continued infill and intensification of established suburban neighbourhoods.

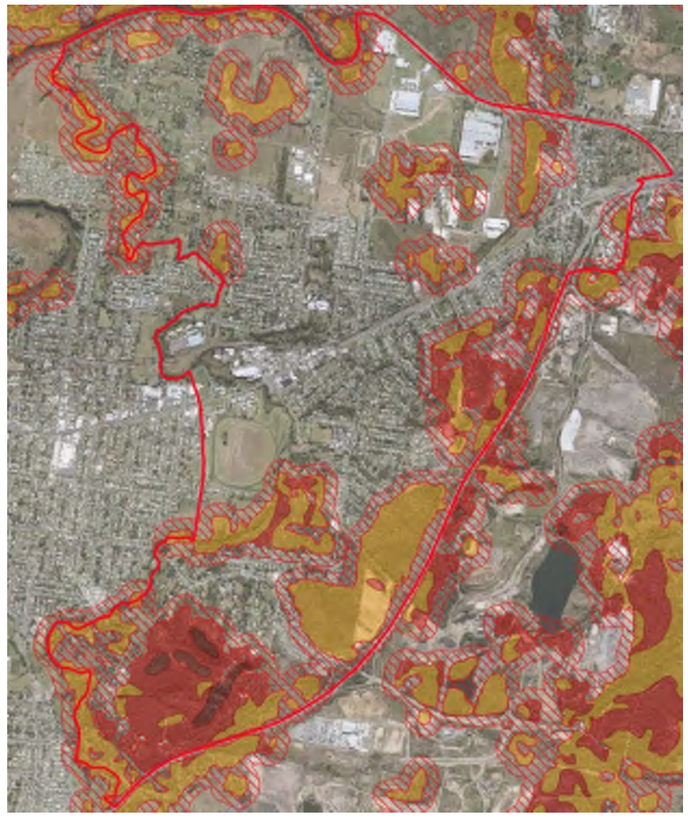
## Place typologies

- Rural living areas
- Established suburban neighbourhood
- Special use place.

## ShapingSEQ

- South West Industrial Corridor Regional Economic Cluster (REC)
- Urban (consolidation) areas.

## Exposure summary



The majority of hazard exposure in this local area is located in the southern and eastern areas, associated with Castle High Blackstone Reserve, Evelyn Dodds Cultural Reserve, Cunningham Highway Reserve, Tom Eastbrook Park, the Bundamba Creek corridor and private landholdings. Additional small patches and corridors of bushland throughout the local area are also identified.

No vulnerable facilities are currently exposed, however several water and sewer pump stations are exposed to potential bushfire attack, along with two substations.

## Bushfire risk summary

The main areas of potential growth in this local area are not exposed to potential bushfire hazard. Area which are currently identified as subject to hazard may be cleared for urban residential development into the future, based on proposed zoning. Thus, growth in this local area may see an general increase in persons and property likely to be exposed, however the implication of planning and building controls are likely to provide effective mitigation having regard to the nature of hazard in this location, and existing road network and settlement pattern.

# Area 10 – Karalee, Barellan Point, Chuwar

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 2475 | 1 | 12 | 18 | 1 | 10 | 18 |
| Residential | 1548 | 0 | 6 | 11 | 1 | 10 | 19 |
| Employment | 45 | 0 | 9 | 16 | 0 | 22 | 31 |
| Rural Living | 0 | 0 | 0 | 63 | 0 | 21 | 0 |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 0 | 0 | 0 | 95 | 1 | 4 | 0 |
| Environmental | 649 | 2 | 27 | 36 | 1 | 12 | 13 |
| Community facility | 29 | 6 | 17 | 4 | 15 | 20 | 4 |
| Limited development | 56 | 0 | 0 | 16 | 0 | 0 | 39 |
| Recreation & open space | 72 | 0 | 4 | 10 | 4 | 12 | 12 |
| Special purpose | 76 | 0 | 16 | 23 | 0 | 8 | 19 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 3,291 | 0.2 | 4 | 4 | 1 | 10 | 18 |

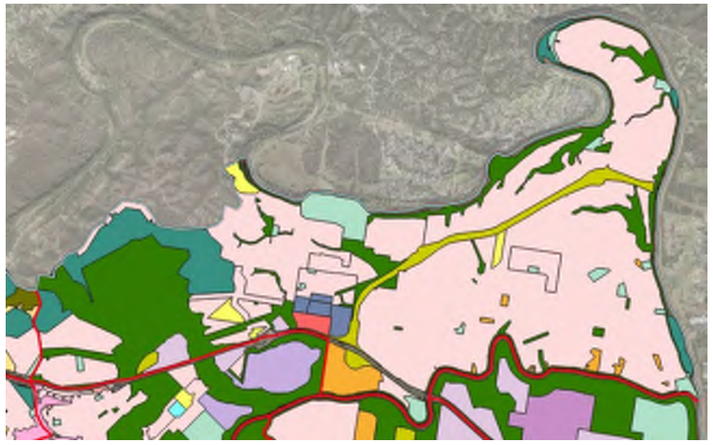
## Road exposure

| | |
|---|---|
| Total length | 52.5km |
| Exposed to hazard | 5.15% |
| Within 50m of hazard | 22.25% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 7 | 0 |
| Essential community infrastructure | 6 | 5 |

## Growth management



Largest concentration of large lot residential development with a predominantly semi-rural development pattern, centred on the Karalee district centre and supported by a variety of housing options including medium density residential development.

Urban expansion areas comprising large lot residential and low density residential.

## Place typologies

- Established suburban neighbourhood.

## ShapingSEQ

- Urban (consolidation) areas.

## Exposure summary



This area subject to a considerable extent of Medium to High Potential Hazard, with high level of fuel connectivity across the landscape. This area is defined by the Brisbane River corridor to the north and east, and the Bremer River to the south which has implications for the evacuation network.

It does appear that areas of new development have likely reduced the extent of mapped bushfire hazard since the State-wide mapping was (above) was prepared.

A number of bushland reserves are located in the western extent of the local area with a high level of connectivity further to the west. This presents a key vegetation and wildlife corridor in the LGA.

No vulnerable uses are exposed in this area, however several zone substations and water pump stations are exposed.

## Bushfire risk summary

Bushfire exposure is highest in the western and central areas of the precinct, but has been modified over time by recent development. The character and density of the area is unlikely to change significantly over time based on the proposed zoning rationale however, a level of infill development is anticipated along with some expansion, requiring appropriate bushfire planning controls. Evacuation of this area could be challenging under some circumstances, particularly where fire driven on a westerly has the potential to limit access and egress options.

The exposure of zone substations could have flow on effects for property protection and fire fighting in this area.

# Area 11 – North Ipswich, Tivoli, North Tivoli and Moores Pocket

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area | 782 | 0 | 0 | 24 | 0 | 0 | 25 |
| Residential | 320 | 0 | 0 | 11 | 0 | 0 | 17 |
| Employment | 138 | 0 | 0 | 28 | 0 | 0 | 31 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 0 | NA | NA | NA | NA | NA | NA |
| Environmental | 207 | 0 | 0 | 49 | 0 | 0 | 33 |
| Community facility | 18 | 0 | 0 | 5 | 0 | 0 | 16 |
| Limited development | 4 | 0 | 0 | 0 | 0 | 0 | 22 |
| Recreation & open space | 95 | 0 | 0 | 13 | 0 | 0 | 26 |
| Special purpose | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 2,658 | 0 | 0 | 0.4 | 0 | 0 | 13 |

## Road exposure

| | |
|---|---|
| Total length | 29.5km |
| Exposed to hazard | 1.54% |
| Within 50m of hazard | 21.55% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 9 | 2 |
| Essential community infrastructure | 10 | 6 |

## Growth management



The area is home to the Historic Workshops Rail Museum and a mix of commercial, retail, entertainment, sporting and residential uses.

It is intended to grow as an integrated community with connectivity to the Ipswich City Centre and the Warrego Highway.

The southern part is the focus of intense development, and existing well established suburban areas to the north that include a mixture of housing types and densities, with supporting facilities and services.

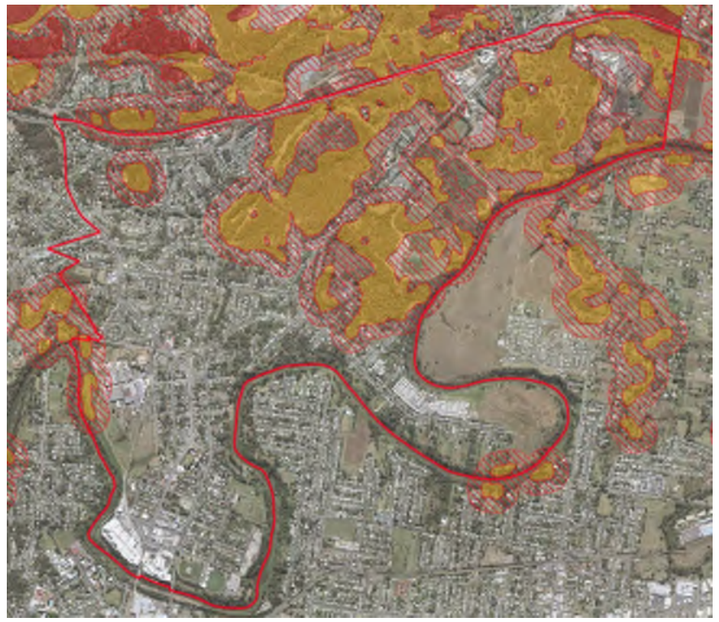
## Place typologies

- Centres
- Established suburban neighbourhoods
- Urban neighbourhood.

## ShapingSEQ

- Urban (consolidation) areas.

## Exposure summary



The North Ipswich local area is characterised by open forest bushland reserves to the north-east. Whilst fragmented to an extent, the fuel hazard in this area maintains a level of connectivity, increasing the level of exposure.

Tivoli State School is subject to both bushfire hazard, and is within the 100 metre hazard buffer. The Bundaleer Lodge Nursing Home is also within the hazard buffer.

Sewer pump stations and zone substations are also identified as potentially exposed.

## Bushfire risk summary

The nature of bushfire hazard in this location incorporates an extensive urban interface, with pockets of reasonable fuel loads. Access and egress is generally available to the Warrego Highway, but may be constrained in certain locations during an event.

Further development is intended in this location, and appropriate risk-based planning tools are required early in the process to guide settlement planning and growth management to balance the extent of exposure and prioritise evacuation given the constraint of the Brisbane River to the south and limited on-ramps to the Warrego Highway to the north.

# Area 12 – Brassall

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| **Local Area Total** | 646 | 0 | 7 | 10 | 1 | 7 | 16 |
| **Residential** | 430 | 0 | 4 | 5 | 1 | 8 | 12 |
| **Employment** | 18 | 0 | 8 | 8 | 0 | 19 | 11 |
| **Rural Living** | 0 | NA | NA | NA | NA | NA | NA |
| **Township** | 0 | NA | NA | NA | NA | NA | NA |
| **Rural** | 0 | 0 | 0 | 50 | 0 | 0 | 0 |
| **Environmental** | 127 | 0 | 19 | 27 | 1 | 5 | 26 |
| **Community facility** | 29 | 0 | 0 | 2 | 0 | 0 | 14 |
| **Limited development** | 0 | NA | NA | NA | NA | NA | NA |
| **Recreation & open space** | 39 | 0 | 1 | 14 | 0 | 2 | 38 |
| **Special purpose** | 4 | 0 | 17 | 6 | 0 | 39 | 33 |
| **Special opportunity** | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| **Residential dwellings** | 4,605 | 0 | 1 | 2 | 0.1 | 7 | 11 |

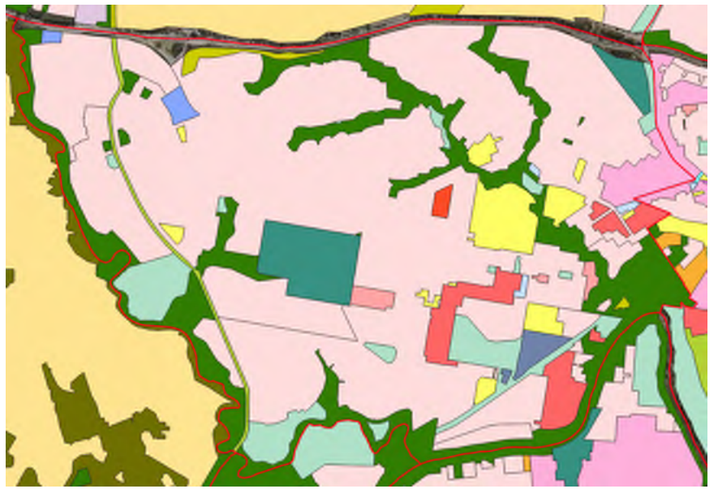
## Road exposure

| | |
|---|---|
| **Total length** | 30.4km |
| **Exposed to hazard** | 0.97% |
| **Within 50m of hazard** | 17.63% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| **Vulnerable facilities** | 10 | 4 |
| **Essential community infrastructure** | 4 | 2 |

## Growth management



Mixture of well-established suburban low density residential development with areas of medium density residential development and supporting facilities and services focussed around the Brassall district centre and local neighbourhood centres

Development to occur in existing urban (consolidation) areas including:

- areas with low density residential consisting of mixture dwelling houses, duplexes, terraces and townhouses
- areas with low-medium density residential development
- further development of established suburban neighbourhoods.

## Place typologies

- Centre
- Established suburban neighbourhood.

## ShapingSEQ

- Urban (consolidation) areas.

## Exposure summary



The Haigh Street Quarry Bush Reserve presents an area of high potential hazard within the local area, which is otherwise exposed by a series of bushland corridors which follow waterway corridors.

Hazard to the west presents a combination of potential grassfire (unmapped) hazard as well as bushfire hazard, with vegetation becoming more dense at the immediate western interface of this local area, and connecting with the Haigh Street Quarry Bush Reserve.

An aged care residence is located to the immediate east of Haigh Street Quarry Bush Reserve. Ipswich State High School and Brassall State School are within the hazard buffer, along with a small number of water and sewer pump stations.

## Bushfire risk summary

The Haigh Street Quarry Bush Reserve is a significant area of focus for Council's bushfire management program, with annual mitigation works undertaken.

Residential development continues in the north-western extent of the local area, adjoining bushfire hazard either on an interim basis or in perpetuity. The majority of these locations are supposed by perimeter roads, where bushfire-responsive urban design approaches have been adopted.

# Area 13 – Ipswich, West Ipswich, Sadliers Crossing, Coalfalls and Woodend

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 579 | 0 | 2 | 2 | 0 | 2 | 8 |
| Residential | 221 | 0 | 0 | 0 | 0 | 3 | 8 |
| Employment | 118 | 0 | 0 | 0 | 0 | 1 | 4 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 0 | NA | NA | NA | NA | NA | NA |
| Environmental | 64 | 0 | 18 | 20 | 0 | 3 | 29 |
| Community facility | 56 | 0 | 0 | 0 | 0 | 0 | 0 |
| Limited development | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Recreation & open space | 99 | 0 | 0 | 0 | 0 | 1 | 2 |
| Special purpose | 20 | 0 | 0 | 0 | 0 | 6 | 2 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 2,406 | 0 | 0.2 | 0 | 0 | 3 | 7 |

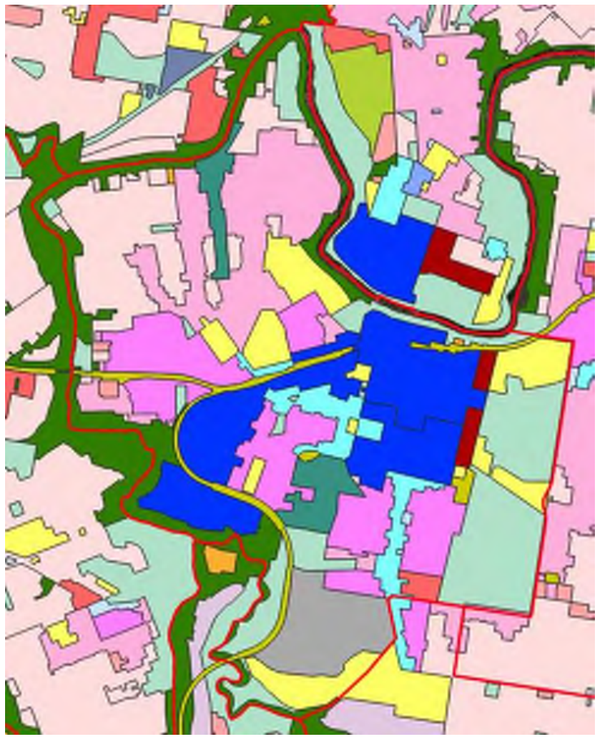
## Road exposure

| | |
|---|---|
| Total length | 34.7km |
| Exposed to hazard | 0% |
| Within 50m of hazard | 2.21% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 31 | 0 |
| Essential community infrastructure | 5 | 2 |

## Growth management



Mixed urban form comprising existing established urban and suburban areas including a mixture of housing types and densities, with supporting facilities and services, that transition to high-order regional activities concentrated towards the city centre.

Ipswich City Centre is intended to grow as principal regional activity centre.

## Place typologies

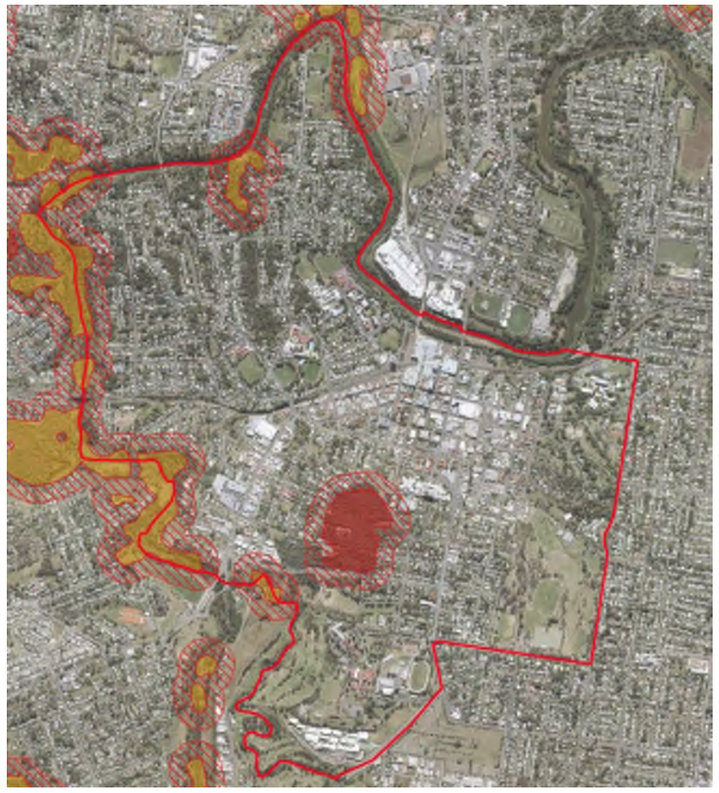
- Centre
- Urban neighbourhood
- Established suburban neighbourhoods.

## ShapingSEQ

University of Southern Queensland Ipswich Campus, Ipswich Hospital and St Andrew's Hospital is a knowledge and technology precinct.

Urban (consolidation) areas.

## Exposure summary



Denmark Hill Conservation Reserve presents an area of High Potential Hazard, along with patches and corridors of vegetation flanking the Bremer River.

One water and one sewer pump station are located within the 100 metre hazard buffer.

## Bushfire risk summary

The extent of bushfire risk in the Ipswich Central local area is limited. Denmark Hill is subject to prioritised bushfire management activities by Council. It is surrounded by residential development, much of which is supported by perimeter roads. Whilst ignitions may certainly occur, the reserve does not form part of a broader corridor of vegetation, and ignitions are likely to be noticed and reported in a short timeframe given the extent of surrounding development and opportunities for casual situational awareness from residents.

The same applies to the Bremer River corridor.

Development into the future is likely to be capable of occurring in a bushfire resilient manner, having regard to the fragmented, and localised scale of hazard present in this area.

# Area 14 – Basin Pocket, North Booval, Booval, Silkstone, East Ipswich, Eastern Heights and Newtown

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 914 | 0 | 0 | 2 | 0 | 0 | 7 |
| Residential | 610 | 0 | 0 | 0 | 0 | 0 | 4 |
| Employment | 36 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 0 | NA | NA | NA | NA | NA | NA |
| Environmental | 157 | 0 | 0 | 8 | 0 | 0 | 20 |
| Community facility | 28 | 0 | 0 | 0 | 0 | 0 | 7 |
| Limited development | 2 | 0 | 0 | 0 | 0 | 0 | 92 |
| Recreation & open space | 68 | 0 | 0 | 1 | 0 | 0 | 5 |
| Special purpose | 13 | 0 | 0 | 0 | 0 | 0 | 1 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 7,553 | 0 | 0 | 0 | 0 | 0 | 1 |

## Road exposure

| | |
|---|---|
| Total length | 32.1km |
| Exposed to hazard | 0% |
| Within 50m of hazard | 0% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 17 | 2 |
| Essential community infrastructure | 5 | 0 |

## Growth management



Established suburban residential area, with supporting facilities and services including local business, entertainment, and sport and recreational uses, with a particular focus on the Booval district centre, and Booval and East Ipswich railway stations

Consolidation, intensification and diversification of the Booval district centre and surrounds by supporting a mixed use main street connecting the Booval Shopping Centre precinct to the Booval railway station

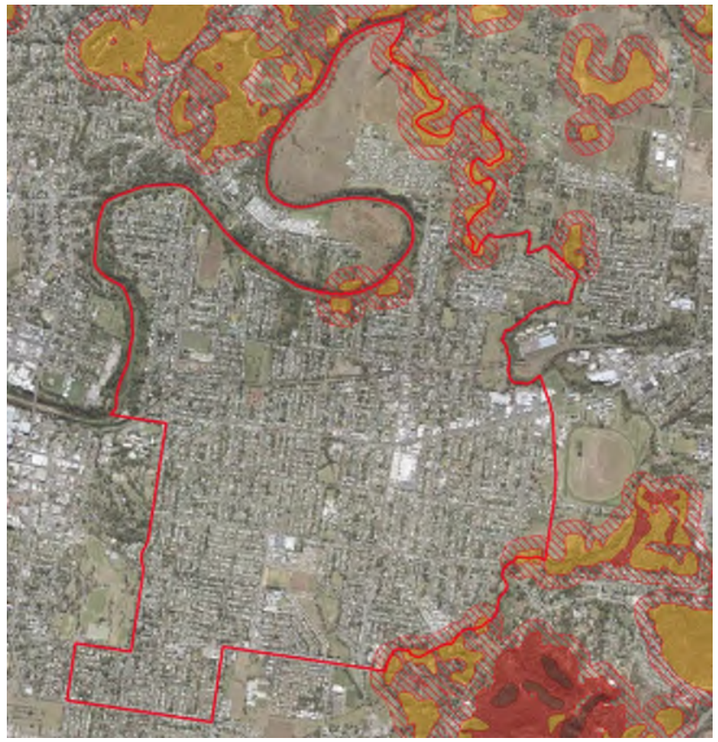
## Place typologies

- Centre
- Urban neighbourhood.

## ShapingSEQ

- Urban (consolidation) areas.

## Exposure summary



Exposure to this local area is relatively limited, as a largely developed urban environment. Bushfire hazard along the Bundamba Creek corridor in the east and flanking the Bremer River in the north is present however, these are highly fragmented environments. Whilst ignitions may occur, the ability to sustain fire to a maximum rate of spread is limited on the basis of corridor width and the meandering direction of the corridor itself.

## Bushfire risk

Bushfire risk in this local area is minimal. With limited residential, vulnerable use, infrastructure, road and employment land exposure.

# Area 15 – Raceview, Flinders View, Ipswich (part)

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 782 | 0 | 0 | 6 | 0 | 2 | 10 |
| Residential | 484 | 0 | 0 | 0 | 0 | 1 | 4 |
| Employment | 91 | 0 | 1 | 6 | 0 | 4 | 16 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 0 | NA | NA | NA | NA | NA | NA |
| Environmental | 92 | 0 | 2 | 35 | 0 | 3 | 25 |
| Community facility | 33 | 0 | 0 | 0 | 0 | 0 | 1 |
| Limited development | 1 | 0 | 0 | 0 | 0 | 0 | 70 |
| Recreation & open space | 76 | 0 | 0 | 9 | 0 | 0 | 28 |
| Special purpose | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 5,812 | 0 | 0 | 0.1 | 0 | 1 | 4 |

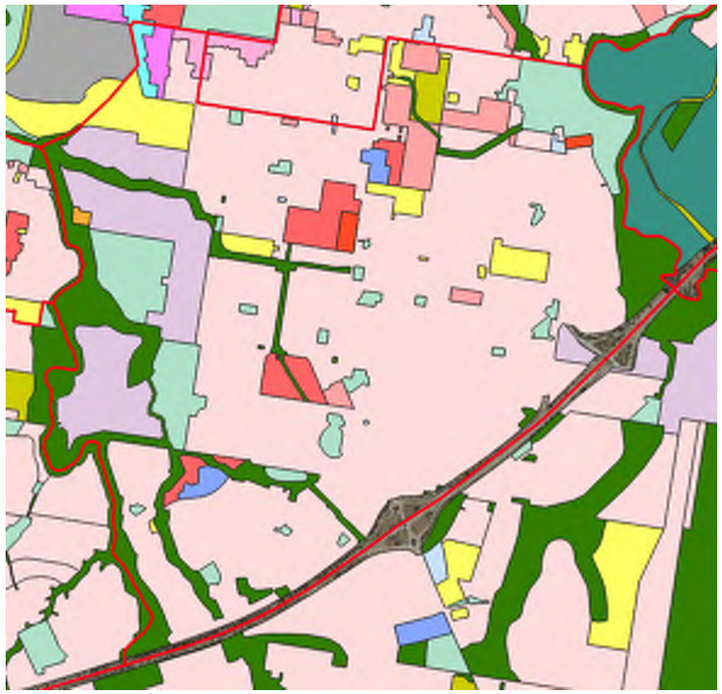
## Road exposure

| | |
|---|---|
| Total length | 36.26 |
| Exposed to hazard | 0% |
| Within 50m of hazard | 8.76% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 15 | 1 |
| Essential community infrastructure | 5 | 1 |

## Growth management



An established suburban area, including a mixture of housing types and densities, with supporting facilities and services including local business and industry, entertainment, and sport and recreational uses.

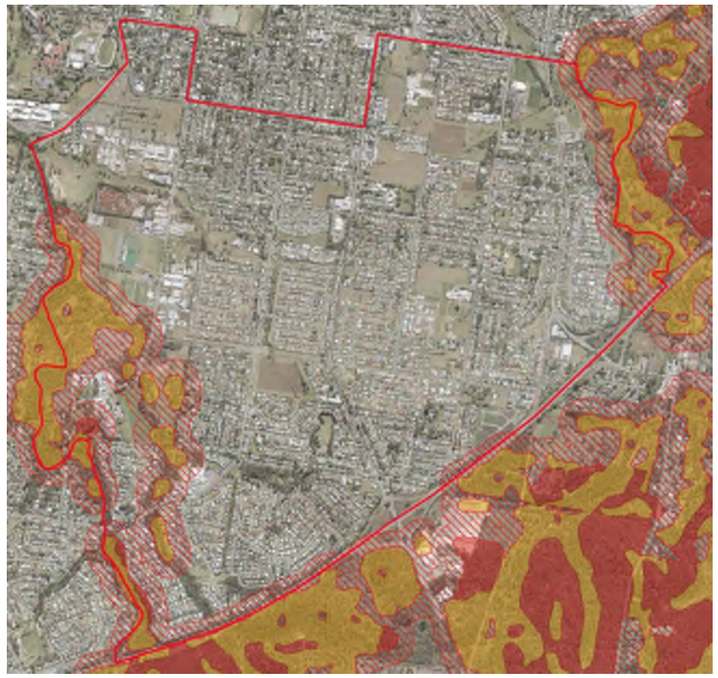
## Place typologies

- Established suburban neighbourhoods.

## ShapingSEQ

- Urban (consolidation) areas.

## Exposure summary



Bushfire hazard in this local area is largely associated with the bushland corridors which flank Deebing Creek and Bundamba Creek.

A child care centre is located within the bushfire hazard buffer, along with a sewer pump station.

## Bushfire risk summary

Exposure in this precinct is relatively limited, and associated with fragmented patch and corridor vegetations flanking waterways. Whilst ignitions can occur in these locations, the ability for significant conflagration is limited.

The area is not identified for significant growth or change though some infill development may occur.

# Area 16 – Churchill

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 107 | 0 | 5 | 6 | 0 | 6 | 17 |
| Residential | 38 | 0 | 0 | 0 | 0 | 3 | 11 |
| Employment | 11 | 0 | 0 | 0 | 0 | 9 | 32 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 0 | NA | NA | NA | NA | NA | NA |
| Environmental | 28 | 0 | 15 | 17 | 0 | 14 | 28 |
| Community facility | 4 | 0 | 0 | 0 | 0 | 0 | 29 |
| Limited development | 2 | 0 | 0 | 1 | 0 | 0 | 49 |
| Recreation & open space | 20 | 0 | 0 | 0 | 0 | 3 | 0 |
| Special purpose | 4 | 0 | 36 | 29 | 0 | 1 | 13 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 472 | 0 | 0 | 0 | 0 | 2 | 11 |

## Road exposure

| | |
|---|---|
| Total length | 3.9km |
| Exposed to hazard | 0% |
| Within 50m of hazard | 1.07% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 3 | 1 |
| Essential community infrastructure | 1 | 1 |

## Growth management



Largely developed and includes a mixture of housing types and densities, local business and industry, a special opportunity area and the Churchill State Primary School.

## Place typologies

- Established suburban neighbourhoods.

## ShapingSEQ

- Urban (consolidation) areas.

## Exposure summary



Exposure is largely associated with fragmented patches and corridors which flank the Bremer River and Deebing Creek.

Churchill State School is within the 100 metre bushfire hazard buffer, as is a water pump station.

## Bushfire risk summary

Exposure in this precinct is relatively limited, and associated with fragmented patch and corridor vegetations flanking waterways. Whilst ignitions can occur in these locations, the ability for significant conflagration is limited.

A small amount of industrial activity is located on Lobb Street, including a sawmill which may act as a source of potential ignition given its proximity to nearby vegetation.

The area is not identified for significant growth or change.

# Area 17 – Yamanto, Churchill (part)

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 667 | 0 | 1 | 10 | 0 | 3 | 21 |
| Residential | 232 | 0 | 2 | 4 | 0 | 3 | 12 |
| Employment | 85 | 0 | 1 | 5 | 0 | 9 | 18 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 137 | 0 | 0 | 9 | 0 | 0 | 26 |
| Environmental | 98 | 0 | 1 | 30 | 0 | 8 | 24 |
| Community facility | 10 | 0 | 0 | 0 | 0 | 2 | 0 |
| Limited development | 61 | 0 | 0 | 13 | 0 | 0 | 41 |
| Recreation & open space | 26 | 0 | 0 | 2 | 0 | 0 | 17 |
| Special purpose | 19 | 0 | 0 | 17 | 0 | 1 | 30 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 2,135 | 0 | 0 | 0 | 0 | 2 | 9 |

## Road exposure

| | |
|---|---|
| Total length | 25.9km |
| Exposed to hazard | 0.22% |
| Within 50m of hazard | 11.39% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 7 | 0 |
| Essential community infrastructure | 6 | 2 |

## Growth management



A mix of established suburban low density residential development and supporting facilities and services, focused on the Yamanto district centre and local business and industry areas, which are continuing to develop.

Consolidation, intensification and diversification of uses are intended to capitalise on the delivery of the future Yamanto railway station with a main street and plaza that connects to the future railway station.

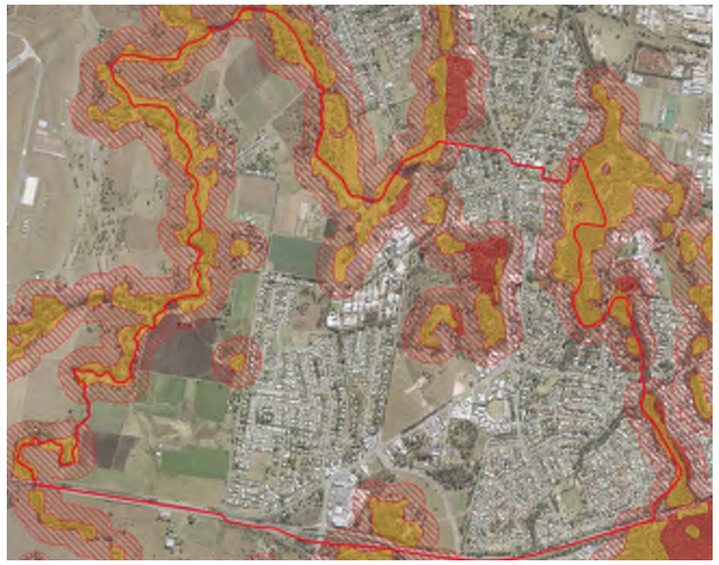
## Place typologies

- Established suburban neighbourhoods.

## ShapingSEQ

- Urban (consolidation) area.

## Exposure summary



Bushfire hazard in the Yamanto local area is largely attributed to the Bremer River and Deebing Creek corridors. Several small isolated patches of vegetation within the local area, north of Saleyards Road, and is characterised by woodland vegetation.

No vulnerable uses are identified as subject to bushfire exposure and two sewer pump stations are located within the buffer area.

## Bushfire risk summary

Exposure in this precinct is relatively limited, and associated with fragmented patch and corridor vegetations flanking waterways. Whilst ignitions can occur in these locations, the ability for significant conflagration is limited.

The area is identified for some urban growth through revitalisation projects.

# Area 18 – Ripley Valley

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 10027 | 20 | 28 | 19 | 1 | 5 | 9 |
| Residential | 2544 | 0 | 16 | 21 | 1 | 12 | 15 |
| Employment | 96 | 0 | 3 | 11 | 0 | 7 | 23 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 204 | 1 | 0 | 2 | 5 | 2 | 11 |
| Environmental | 6792 | 29 | 35 | 20 | 1 | 3 | 6 |
| Community facility | 99 | 0 | 28 | 15 | 0 | 10 | 8 |
| Limited development | 0 | NA | NA | NA | NA | NA | NA |
| Recreation & open space | 260 | 0 | 4 | 12 | 0 | 3 | 19 |
| Special purpose | 31 | 0 | 22 | 30 | 0 | 10 | 13 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 5,676 | 0 | 4 | 10 | 0.1 | 8 | 17 |

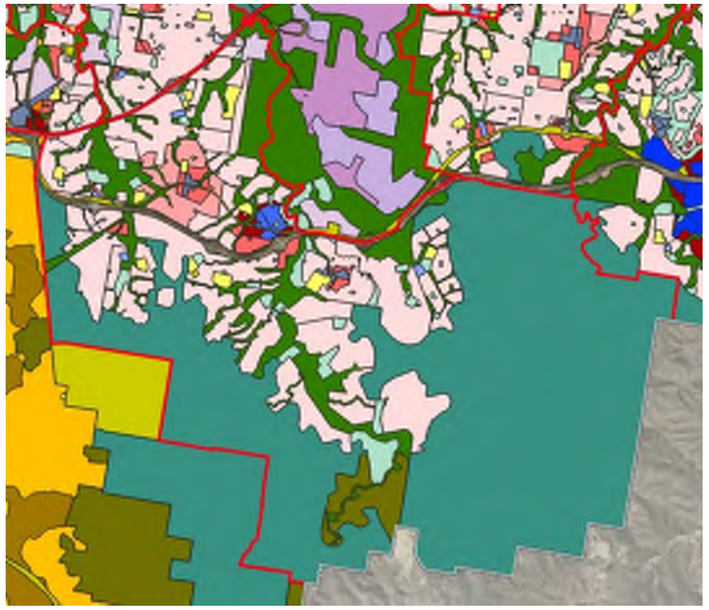
## Road exposure

| | |
|---|---|
| Total length | 53.9km |
| Exposed to hazard | 3.71% |
| Within 50m of hazard | 34.55% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 10 | 8 |
| Essential community infrastructure | 2 | 1 |

## Growth management



Majority of the Area (4,680 hectares) is included within a Priority Development Area.

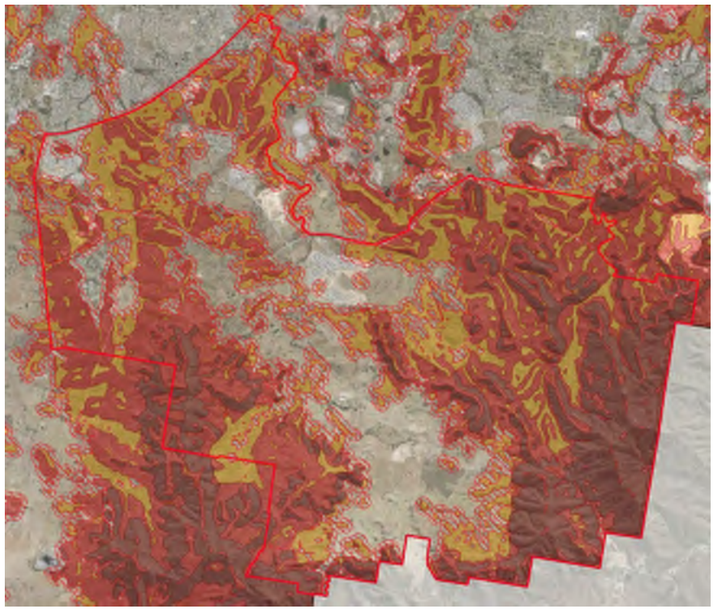
## Place typologies

- New suburban neighbourhood.

## ShapingSEQ

- NA.

## Exposure summary



The Ripley Valley is undergoing significant transition to urban residential under the Ripley Valley Priority Development Area Development Scheme. The area is exposed to considerable bushfire hazard, however the extent to which continues to evolve as development gives rise to increase vegetation clearing in the area.

Notwithstanding, bushfire hazard will remain in perpetuity associated with the White Rock Conservation Park and Flinders Peak Conservation Park.

## Bushfire risk summary

The extent of urban development interfaced with bushfire hazard, including areas of landscape-scale hazard escalates the risk profile of Ripley Valley. Whilst development can co-exist, it must be implemented in a coordinated and risk-responsive manner. The Development Scheme for the area currently does not advance a strategic approach to risk-responsive land use planning practices. However, it is taken to have addressed unacceptable risk as part of the conception of the Development Scheme.

This area is identified as a particular area of focus for risk-based land use planning responses, from policy, strategic and statutory perspectives, irrespective of the Ripley Valley Priority Development Area Development Scheme.

# Area 19 – Purga, Goolman and Peak Crossing

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 10828 | 18 | 14 | 11 | 1 | 2 | 12 |
| Residential | 0 | NA | NA | NA | NA | NA | NA |
| Employment | 300 | 3 | 8 | 50 | 5 | 6 | 27 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 7168 | 4 | 7 | 10 | 0 | 3 | 16 |
| Environmental | 2774 | 57 | 28 | 7 | 3 | 1 | 2 |
| Community facility | 1 | 0 | 0 | 0 | 0 | 64 | 33 |
| Limited development | 0 | NA | NA | NA | NA | NA | NA |
| Recreation & open space | 20 | 0 | 5 | 20 | 0 | 1 | 37 |
| Special purpose | 565 | 13 | 43 | 20 | 0 | 1 | 2 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 255 | 0.4 | 1 | 0.4 | 2 | 5 | 15 |

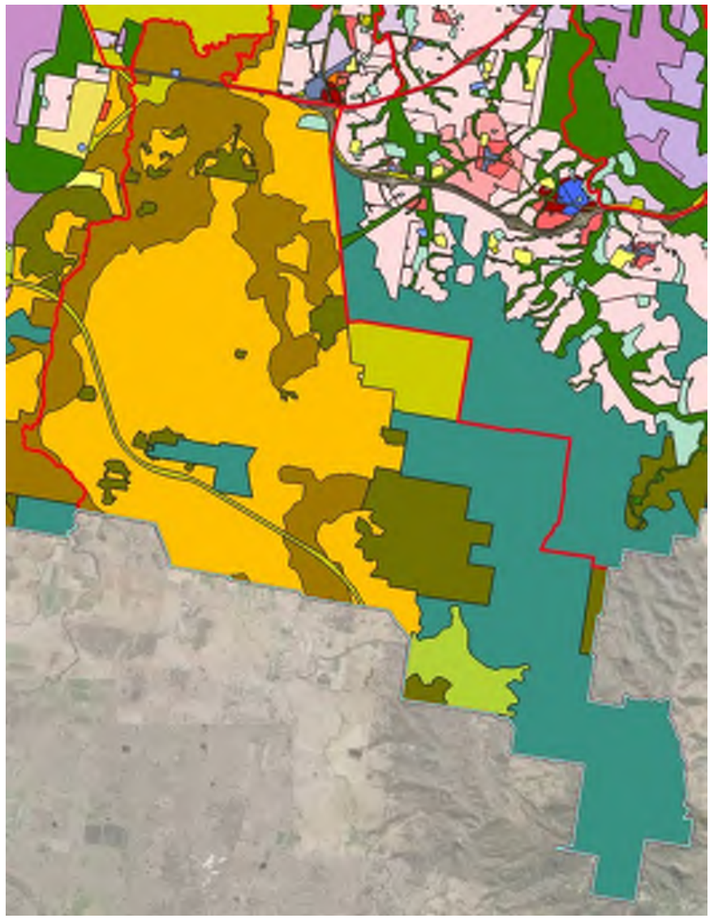
## Road exposure

| | |
|---|---|
| Total length | 31.9km |
| Exposed to hazard | 0.54% |
| Within 50m of hazard | 15.76% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 1 | 1 |
| Essential community infrastructure | 2 | 1 |

## Growth management



Area intended to be largely maintained as a sustainable rural area.

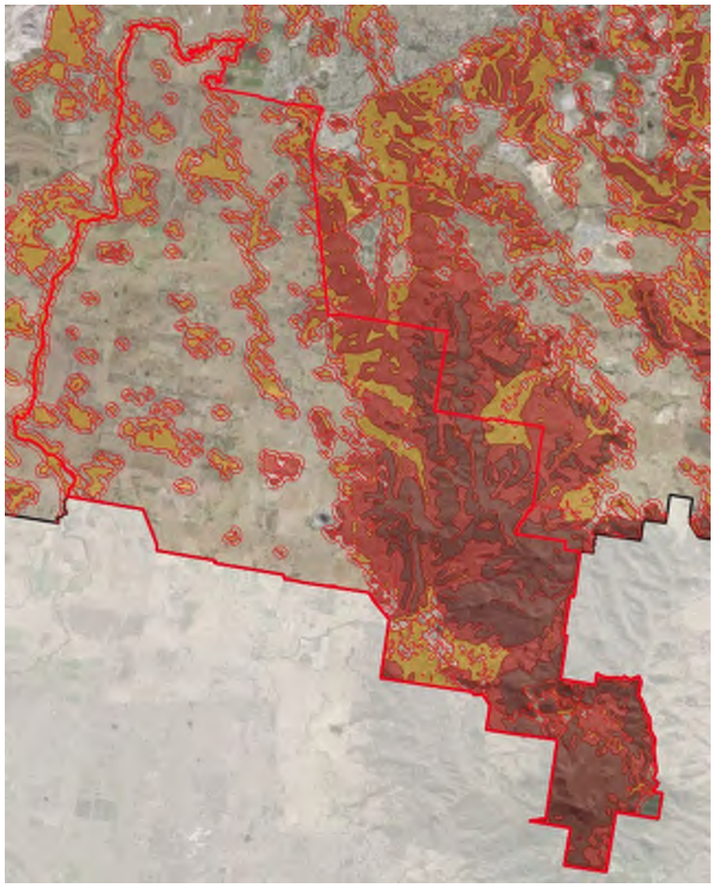
## Place typologies

- Agricultural and pastoral land.

## ShapingSEQ

Urban Footprint extends to the north of the Cunningham Highway, with land to the south within Regional Landscape and Rural Production Area.

## Exposure summary



Bushfire risk in this local area is dominated by the Flinders Peak Conservation Park in the south-east. Corridors of bushland which flank the Purga Creek Reserve and Warrill Creek are also identified, along with small patches of vegetation both held in reserve and on private land.

No vulnerable facilities are identified, but unexploded ordnance areas are identified across the Flinders Peak Conservation Park. A military rifle range is also located at Purga, adjoining the Flinders Peak Conservation Park.

## Bushfire risk summary

Outside the Flinders Peak Conservation Park, exposure of bushfire and (unmapped) grassfire to rural and agricultural activities is significant. This exposes this area to fire under any prevailing wind condition, depending upon location of ignition.

# Area 20 – Amberley

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) VH | H | M | Buffer Area (%) VH | H | M |
|---|---|---|---|---|---|---|---|
| **Local Area Total** | 2091 | 0 | 0 | 16 | 0 | 0 | 21 |
| **Residential** | 0 | NA | NA | NA | NA | NA | NA |
| **Employment** | 24 | 0 | 0 | 15 | 0 | 0 | 29 |
| **Rural Living** | 0 | NA | NA | NA | NA | NA | NA |
| **Township** | 0 | NA | NA | NA | NA | NA | NA |
| **Rural** | 2 | 0 | 0 | 0 | 0 | 0 | 51 |
| **Environmental** | 32 | 0 | 0 | 25 | 0 | 0 | 32 |
| **Community facility** | 0 | NA | NA | NA | NA | NA | NA |
| **Limited development** | 0 | NA | NA | NA | NA | NA | NA |
| **Recreation & open space** | 16 | 0 | 0 | 1 | 0 | 0 | 29 |
| **Special purpose** | 2016 | 0 | 0 | 16 | 0 | 0 | 21 |
| **Special opportunity** | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) VH | H | M | Buffer Area (%) VH | H | M |
|---|---|---|---|---|---|---|---|
| **Residential dwellings** | 14 | 0 | 0 | 0 | 0 | 0 | 21 |

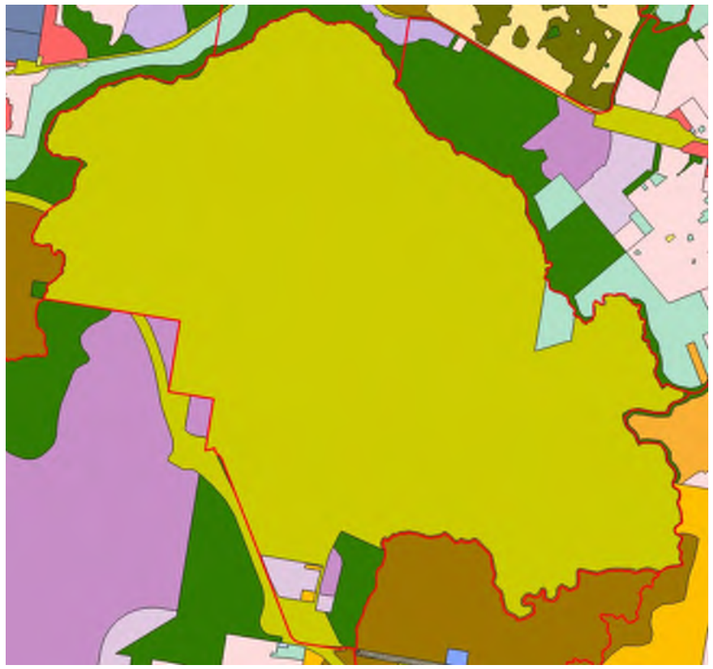
## Road exposure

| | |
|---|---|
| **Total length** | 3.9km |
| **Exposed to hazard** | 0.0% |
| **Within 50m of hazard** | 33.16% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| **Vulnerable facilities** | 0 | NA |
| **Essential community infrastructure** | 3 | 3 |

## Growth management



Accommodates RAAF Base Amberley which is intended to:

a. continue to grow as required for defence and national security requirements including for associated industries; and

b. be largely unimpeded by the development of surrounding land, to avoid direct or indirect conflict with the base's safety and operational efficiency.

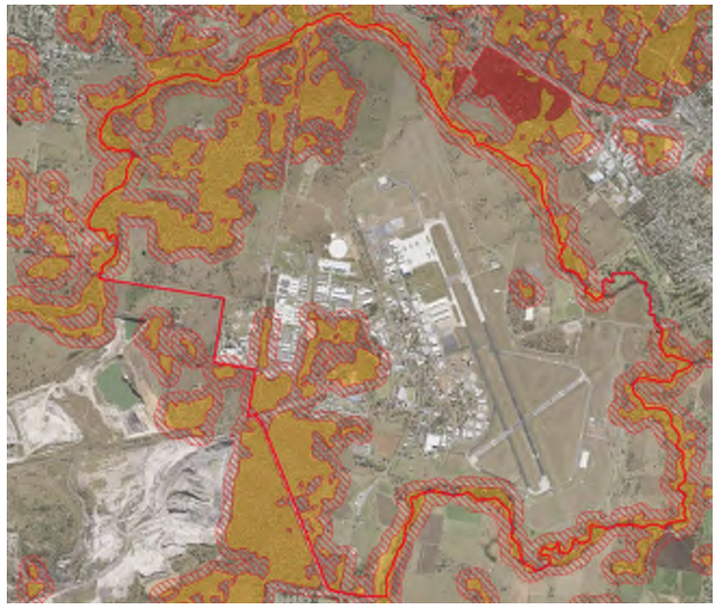
## Place typologies

- Special use place.

## ShapingSEQ

Urban Footprint.

## Exposure summary



Residential dwellings are located in the Special Purpose Zone and are within the 100 metre buffer area to bushfire hazard. Areas of the RAAF Base, including areas in immediate proximity to built form, are exposed to medium potential bushfire hazard and the 100 metre hazard buffer. Hazard is highly fragmented.

The Amberley sewerage treatment plant, sewer pump station and a zone substation are within the 100 metre hazard buffer.

## Bushfire risk summary

The main fire risks to the Amberley local area are associated with bushfire and grassfire hazard. It must be noted the State-wide BPA mapping does not map potential grassfire hazard.

Bushfire and grassfire in and around RAAF Base Amberley has the potential to lead to poor visibility due to smoke which may effect Base operations including runway operations. This is considered a low-level risk given the largely fragmented nature of hazard in the area.

It is understood the Department of Defence maintains comprehensive bushfire management plans for its assets, including RAAF Base Amberley. This includes annual mitigation and hazard reduction works to protect its infrastructure and operations, as well as those which surround the Base.

# Area 21 – One Mile, Leichhardt and Wulkuraka (part)

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 818 | 0 | 5 | 19 | 0 | 3 | 23 |
| Residential | 280 | 0 | 0 | 10 | 0 | 2 | 18 |
| Employment | 76 | 0 | 0 | 21 | 0 | 1 | 29 |
| Rural Living | 0 | 0 | 0 | 0 | 0 | 0 | 100 |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 0 | NA | NA | NA | NA | NA | NA |
| Environmental | 278 | 0 | 15 | 38 | 0 | 6 | 22 |
| Community facility | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| Limited development | 3 | 0 | 0 | 1 | 0 | 0 | 26 |
| Recreation & open space | 144 | 0 | 0 | 5 | 0 | 0 | 29 |
| Special purpose | 29 | 0 | 0 | 3 | 0 | 8 | 49 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 3,106 | 0 | 0 | 1 | 0 | 1 | 11 |

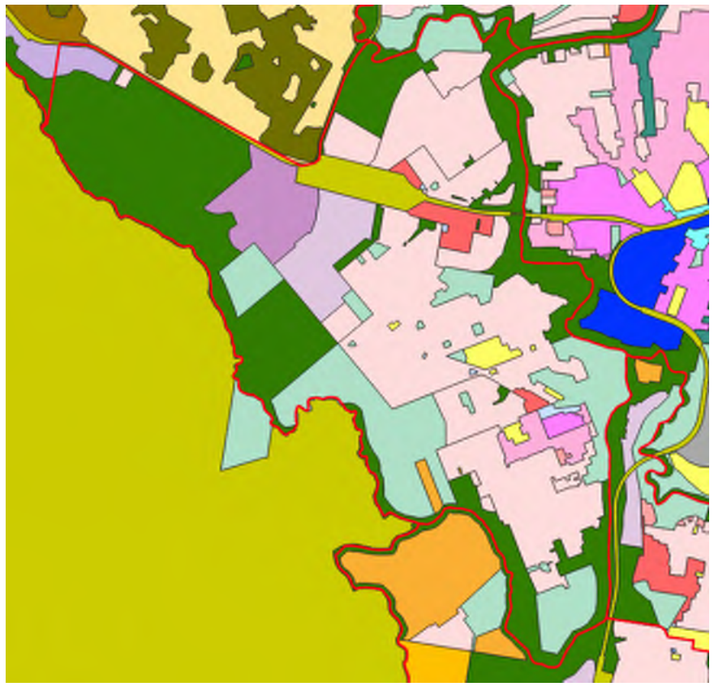
## Road exposure

| | |
|---|---|
| Total length | 19.9km |
| Exposed to hazard | 0% |
| Within 50m of hazard | 15.23% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed (%) |
|---|---|---|
| Vulnerable facilities | 6 | 1 |
| Essential community infrastructure | 6 | 2 |

## Growth management



Mixture of suburban low density residential development, character housing and medium density residential development, with areas of light and medium impact industry, significant sport and recreation facilities and environmental areas.

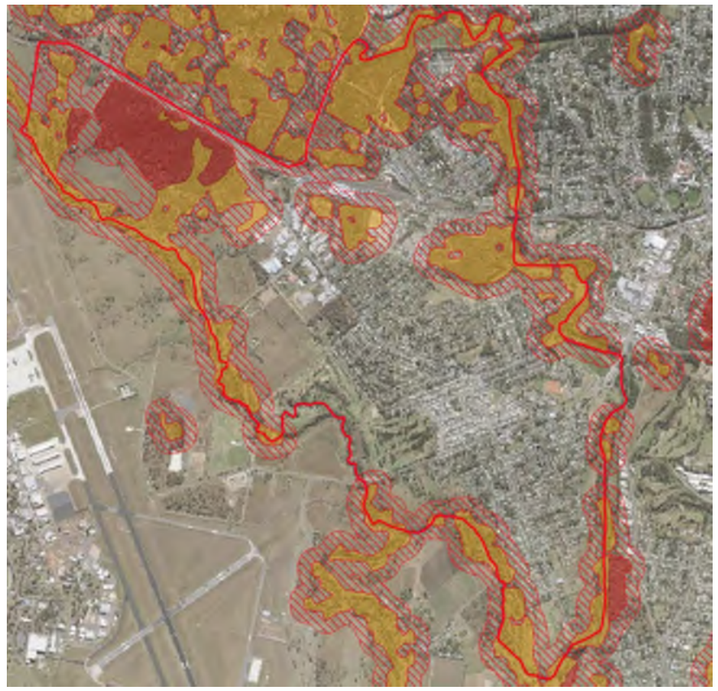
## Place typologies

- Established suburban neighbourhood.

## ShapingSEQ

- Urban (consolidation) areas.

## Exposure summary



Bushfire exposure in this local area is largely dominated by the Bremer River corridor which flows south-easterly before changing direction to flow north-easterly, bounding the local area. A small number of reasonably-sized bushland reserves are located in the northern extent of the local area.

A child care centre is located withing the 100 metre hazard buffer, on Phillip Street. A sewer pump station and zone substation are also located within the hazard buffer extent.

RAAF Base Amberley is located to the immediate west, on the opposite side of Bremer River.

## Bushfire risk summary

Exposure in this precinct is relatively limited, and associated with fragmented patch and corridor vegetations flanking waterways. Whilst ignitions can occur in these locations, the ability for significant conflagration is limited though the risk is somewhere elevated in the western area.

This local area is largely developed but may attract a level of urban infill into the future, likely to see increased residential density in pockets across the area. Some industrial and commercial expansion is also reflected by the proposed zoning rationale.

# Area 22 – Karrabin (part), Blacksoil (part)

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| **Local Area Total** | 963 | 0 | 1 | 51 | 0 | 1 | 38 |
| **Residential** | 0 | NA | NA | NA | NA | NA | NA |
| **Employment** | 24 | 0 | 0 | 2 | 0 | 0 | 51 |
| **Rural Living** | 550 | 0 | 0 | 43 | 0 | 2 | 47 |
| **Township** | 0 | NA | NA | NA | NA | NA | NA |
| **Rural** | 262 | 0 | 2 | 81 | 0 | 0 | 14 |
| **Environmental** | 70 | 0 | 0 | 58 | 0 | 0 | 40 |
| **Community facility** | 38 | 0 | 0 | 6 | 0 | 0 | 36 |
| **Limited development** | 0 | NA | NA | NA | NA | NA | NA |
| **Recreation & open space** | 9 | 0 | 0 | 17 | 0 | 0 | 77 |
| **Special purpose** | 10 | 0 | 0 | 6 | 0 | 12 | 56 |
| **Special opportunity** | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| **Residential dwellings** | 152 | 0 | 0 | 0.7 | 0 | 3 | 82 |

## Road exposure

| | |
|---|---|
| **Total length** | 15.9km |
| **Exposed to hazard** | 1.57% |
| **Within 50m of hazard** | 46.48% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| **Vulnerable facilities** | 2 | 2 |
| **Essential community infrastructure** | 1 | 1 |

## Growth management



Karrabin and Blacksoil are maintained primarily as rural living areas.

Industrial areas are located to the south, including an industry investigation designation.

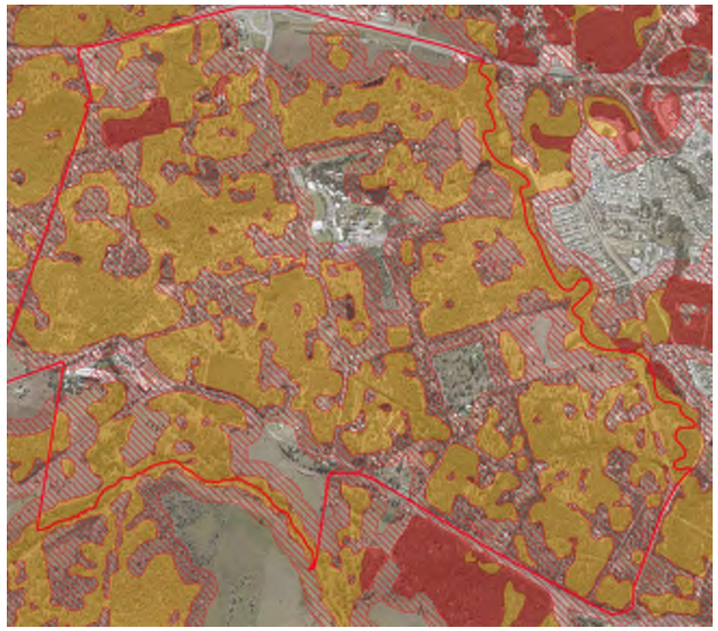
## Place typologies

- Rural living area
- Special use place.

## ShapingSEQ

Urban Footprint extends to the south of Karrabin Rosewood Road, with the remainder included Regional Landscape and Rural Production Area.

## Exposure summary



This local area is subject to a considerable extent of Medium Potential Hazard, as well as (unmapped) grassfire hazard). West Moreton Anglican College is located toward the centre of the local area. Whilst the fuel loads may be characteristic of woodland, the potential for fast-moving fire is a consideration in this area.

A small industrial area is located in the south-western extent of the local area and is largely exposed from the north and west. A substation in this area is also exposed.

## Bushfire risk summary

The local area is not anticipated to change in its character to any significant extent based on the proposed zoning rationale. A large proportion of rural living is current subject to potential bushfire hazard in this area, which could be characterised by short, sharp and fast-moving events under certain conditions.

Consideration of bushfire exposure as part of the industry investigation designation is warranted, ensuring compatible land uses are identified, and those which are inappropriate relative to hazard exposure are avoided. This should also include an appropriate suite of risk-response planning provisions which seek to protect the economic and employment (including occupants) aspects of future uses.

# Area 23 – Pine Mountain, Muirlea, Blacksoil (part), Haigslea (part), Ironbark

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| **Local Area Total** | 6653 | 0 | 10 | 35 | 1 | 6 | 22 |
| **Residential** | 258 | 0 | 5 | 16 | 0 | 13 | 33 |
| **Employment** | 9 | 0 | 0 | 2 | 0 | 26 | 50 |
| **Rural Living** | 4870 | 0 | 7 | 39 | 0 | 5 | 24 |
| **Township** | 0 | NA | NA | NA | NA | NA | NA |
| **Rural** | 843 | 2 | 22 | 26 | 4 | 8 | 16 |
| **Environmental** | 496 | 0 | 14 | 23 | 1 | 5 | 12 |
| **Community facility** | 95 | 0 | 23 | 24 | 0 | 19 | 14 |
| **Limited development** | 0 | NA | NA | NA | NA | NA | NA |
| **Recreation & open space** | 57 | 4 | 46 | 32 | 5 | 5 | 5 |
| **Special purpose** | 25 | 0 | 11 | 32 | 0 | 25 | 31 |
| **Special opportunity** | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| **Residential dwellings** | 853 | 0 | 0.5 | 5 | 0.1 | 16 | 45 |

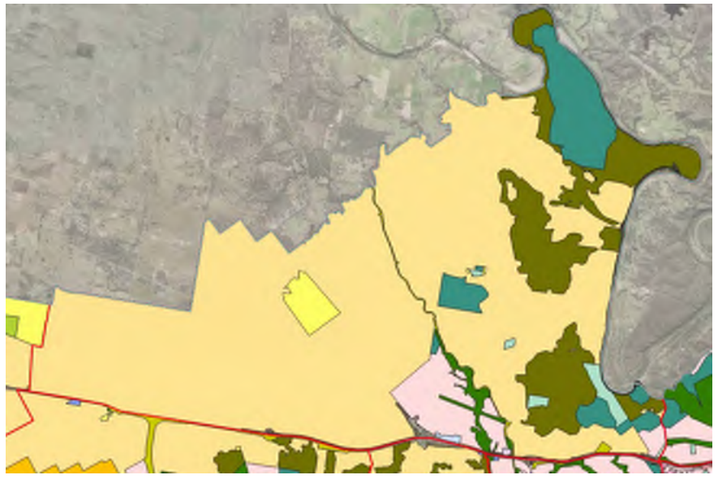
## Road exposure

| | |
|---|---|
| **Total length** | 48.8km |
| **Exposed to hazard** | 12.94% |
| **Within 50m of hazard** | 40.61% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| **Vulnerable facilities** | 2 | 2 |
| **Essential community infrastructure** | 2 | 2 |

## Growth management



Pine Mountain and Blacksoil residential areas are planned to grow as an integrated community, retaining the existing large lot character and maintaining ecological sustainability.

Haigslea, Ironbark, Muirlea and rural areas of Pine Mountain are intended to be maintained as rural living areas.

Opportunities for the establishment of rural living on lots of a minimum of 6 hectares by using a transferable dwelling entitlement resulting from the amalgamation of lots elsewhere in the rural area.

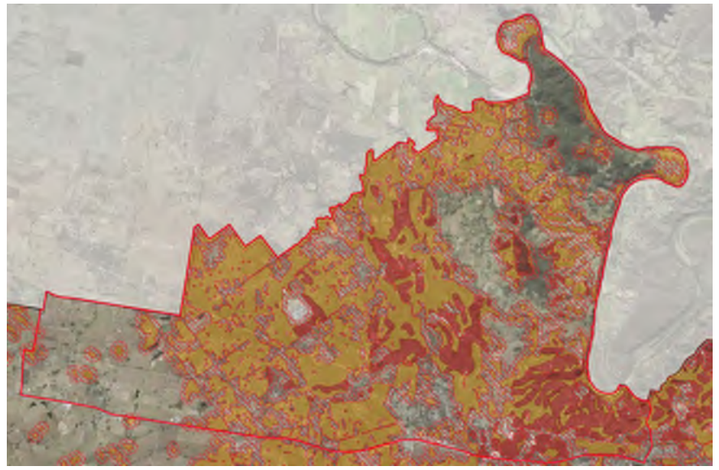
## Place typologies

- Rural living areas.

## ShapingSEQ

- Majority within Regional Landscape and Rural Production Area, with the southern part of Pine Mountain and the part of Blacksoil included in the Urban Footprint.

## Exposure summary



The landscape of this local area is extensively vegetated, interspersed with cleared areas largely used for pastoral grazing. The area is also subject to areas of steep terrain. Almost half of the local area is subject to bushfire hazard, with almost a further 30 per cent subject to potential bushfire attack identified by the hazard buffer.

The Borallon Prison Wastewater Treatment Plant is surrounded by mapped hazard, along with a child care centre in Pine Mountain.

A high proportion of the road network in the area is exposed to hazard.

Approximately 60 per cent of dwellings in the local area are exposed to potential bushfire hazard.

## Bushfire risk summary

The risk profile of this local area is elevated due to several factors which combined, influence the quantum of bushfire risk exposure. The extent of vegetation, its classification and connectivity across large parts of the area is primary. In addition, the road network is limited in terms of available route options for emergency access and egress, and many of these are not sealed roads.

The nature of the terrain in the area is likely to drive localised bushfire behaviour, and may be intense and erratic in some locations as local wind factors are driven by topography rather than broader weather conditions. The extent of residential exposure is high, coupled with the potential for constrained water supplies for fire fighting.

Further growth in this area should be avoided in the absence of risk-response master planning and structure planning processes.

# Area 24 – Walloon, Thagoona, Haigslea (part) and Mount Marrow

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 4827 | 0 | 2 | 22 | 0 | 4 | 25 |
| Residential | 1383 | 0 | 2 | 14 | 0 | 6 | 24 |
| Employment | 69 | 0 | 0 | 24 | 0 | 0 | 32 |
| Rural Living | 814 | 0 | 0 | 17 | 0 | 0 | 23 |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 1798 | 0 | 4 | 27 | 0 | 6 | 26 |
| Environmental | 406 | 0 | 1 | 46 | 0 | 2 | 23 |
| Community facility | 11 | 0 | 0 | 5 | 0 | 0 | 29 |
| Limited development | 0 | NA | NA | NA | NA | NA | NA |
| Recreation & open space | 191 | 0 | 1 | 14 | 0 | 2 | 19 |
| Special purpose | 125 | 0 | 2 | 8 | 0 | 5 | 34 |
| Special opportunity | 30 | 0 | 0 | 21 | 0 | 0 | 27 |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 1,401 | 0 | 0 | 0.1 | 0 | 4 | 20 |

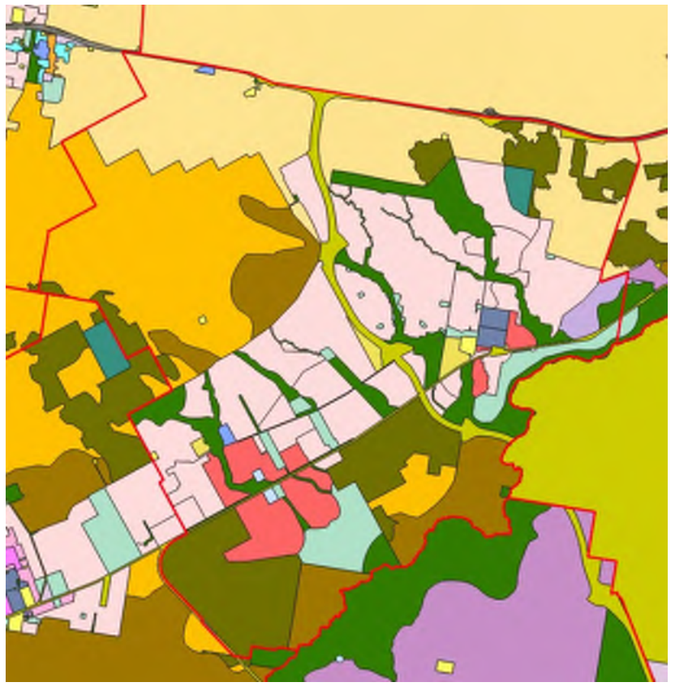
## Road exposure

| | |
|---|---|
| Total length | 44.3km |
| Exposed to hazard | 0% |
| Within 50m of hazard | 30.24% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 5 | 2 |
| Essential community infrastructure | 4 | 1 |

## Growth management



Part of a significant urban growth corridor able to accommodate in excess of 50,000 people, extending from Walloon in the east to Rosewood in the west.

Rosewood and Walloon are proposed to develop as district centres.

Thagoona is intended to develop with a local centre.

Development to occur around Walloon district centre.

Urban expansion areas comprising new suburban neighbourhoods with low density residential development with a mix of dwelling houses, duplexes, terraces and townhouses.

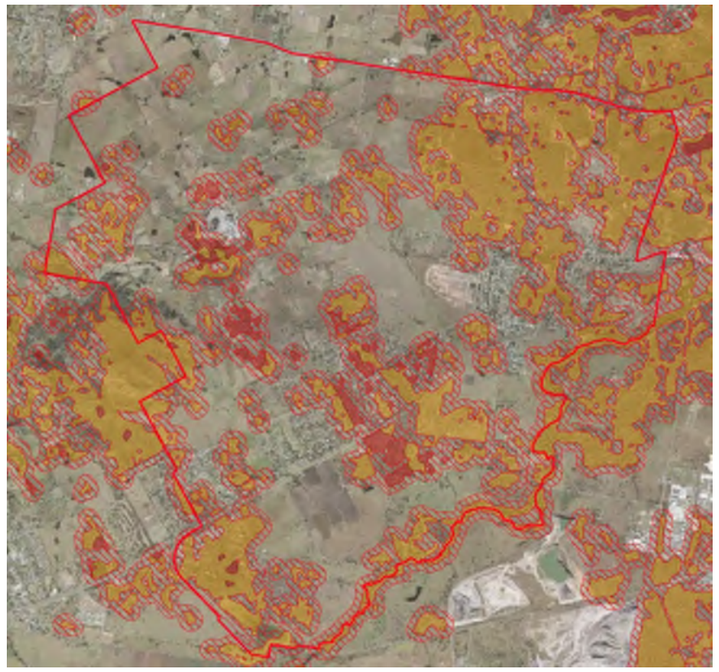
## Place typologies

- Centre
- New suburban neighbourhood.

## ShapingSEQ

- South West Industrial Corridor Regional Economic Cluster (REC)
- Urban (consolidation) areas.

## Exposure summary



This local area is subject to fragmented pockets of bushland, interspersed with grassfire hazard which is unmapped. Vegetation classifications in the north-east give rise to higher fuel loads than in the west of the local area, dominated by open forests in the east and woodland in the west. The Bremer River corridor is also identified as hazardous, spanning the southern boundary of the local area.

Small pockets of high hazard is located through the central area, by virtue of vegetation type (fuel load) and topography.

Walloon State School and a water pump station are both located within the 100 metre hazard buffer.

## Bushfire risk summary

Urban growth between Walloon, Thagoona and Rosewood is expected to expand into the future. Whilst the hazard is fragmented, the convergence of woodland, open forest and grassland can give rise to fast-moving fire events and localised increase fire behaviour.

Planning provisions for this area should contemplate a risk-responsive approach to any master planning or structure planning activities, to limit risk to a tolerable level.

# Area 25 – Marburg

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 1692 | 3 | 8 | 6 | 4 | 8 | 13 |
| Residential | 121 | 0 | 0 | 0 | 0 | 2 | 3 |
| Employment | 99 | 0 | 6 | 9 | 0 | 17 | 26 |
| Rural Living | 953 | 3 | 6 | 6 | 7 | 11 | 14 |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 402 | 6 | 18 | 7 | 1 | 1 | 6 |
| Environmental | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Community facility | 88 | 0 | 0 | 9 | 0 | 0 | 35 |
| Limited development | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Recreation & open space | 14 | 0 | 0 | 0 | 0 | 0 | 0 |
| Special purpose | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 392 | 0 | 0 | 0 | 2 | 1 | 5 |

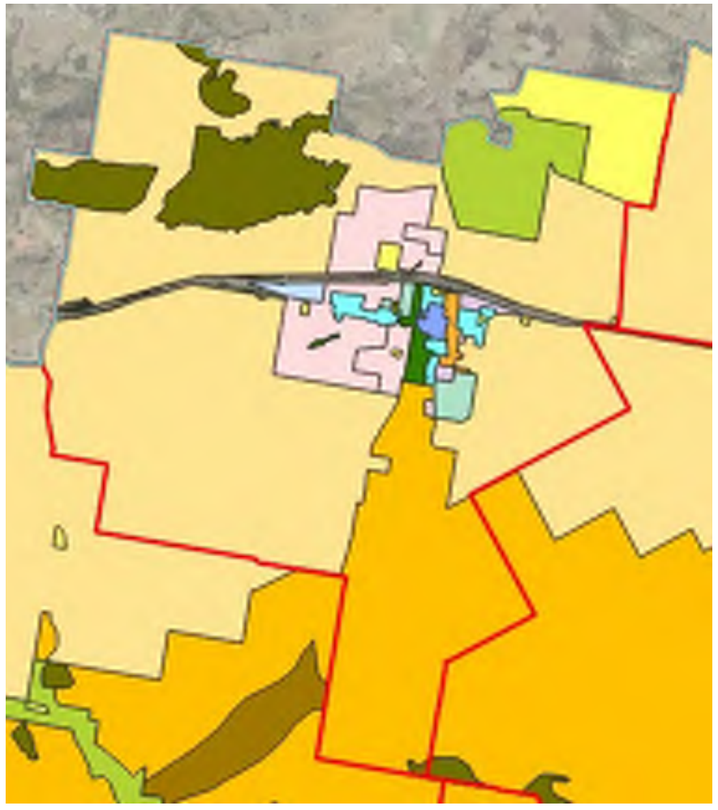
## Road exposure

| | |
|---|---|
| Total length | 18.2km |
| Exposed to hazard | 0% |
| Within 50m of hazard | 13.58% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 1 | 0 |
| Essential community infrastructure | 3 | 0 |

## Growth management



Development within the township is constrained due to flooding of Black Snake Creek and limitations set by the need for on-site sewerage treatment and the requirements for managing microbes in Black Snake Creek and salinity in the catchment.

Marburg continues to develop as a rural township and rural area.

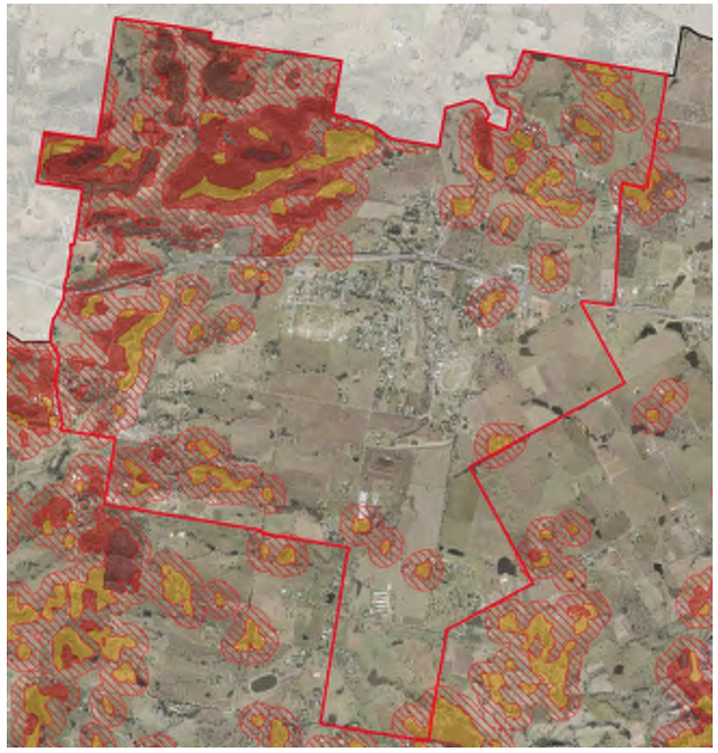
## Place typologies

- Rural township
- New suburban neighbourhood
- Agricultural and pastoral lands.

## ShapingSEQ

Majority within Regional Landscape and Rural Production Area, with the township of Marburg located in Urban Footprint, however growth is limited whilst it remains unsewered.

## Exposure summary



Growth of Marburg township is constrained by flood hazard.

Bushfire hazard is present in the north-west and western extent of the local area, where steeper terrain is also present.

No vulnerable facilities or essential community infrastructure assets are identified as subject to bushfire hazard.

## Bushfire risk summary

The majority of bushfire risk to Marburg is associated with vegetation in terrain area to the north-west and west, as well as pockets of woodland and general grassfire (unmapped) hazard.

# Area 26 – Rosewood

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 2958 | 0 | 1 | 14 | 0 | 4 | 21 |
| Residential | 341 | 0 | 1 | 8 | 0 | 2 | 14 |
| Employment | 20 | 0 | 1 | 1 | 0 | 7 | 7 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 2369 | 0 | 2 | 15 | 0 | 4 | 22 |
| Environmental | 69 | 0 | 0 | 46 | 0 | 3 | 25 |
| Community facility | 24 | 0 | 0 | 3 | 0 | 0 | 11 |
| Limited development | 0 | NA | NA | NA | NA | NA | NA |
| Recreation & open space | 79 | 0 | 0 | 0 | 0 | 5 | 8 |
| Special purpose | 56 | 0 | 0 | 6 | 0 | 4 | 23 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 1,410 | 0 | 0 | 0 | 0 | 0.5 | 4 |

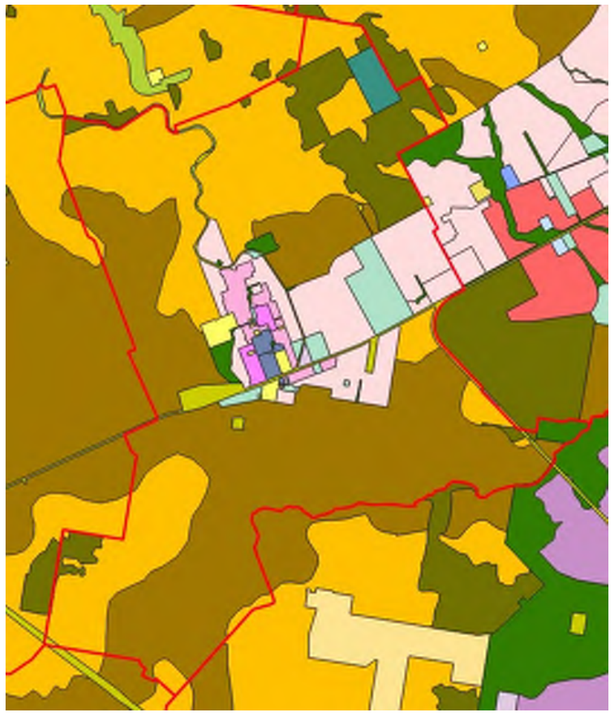
## Road exposure

| | |
|---|---|
| Total length | 20.6km |
| Exposed to hazard | 0.6% |
| Within 50m of hazard | 13.22% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 8 | 1 |
| Essential community infrastructure | 5 | 2 |

## Growth management



Rosewood is developing as a district centre supporting an integrated community, and is part of a broader urban growth corridor.

Intensive development such as terraces, townhouses and concentrations of duplexes to be avoided.

Areas outside the town are maintained as rural areas.

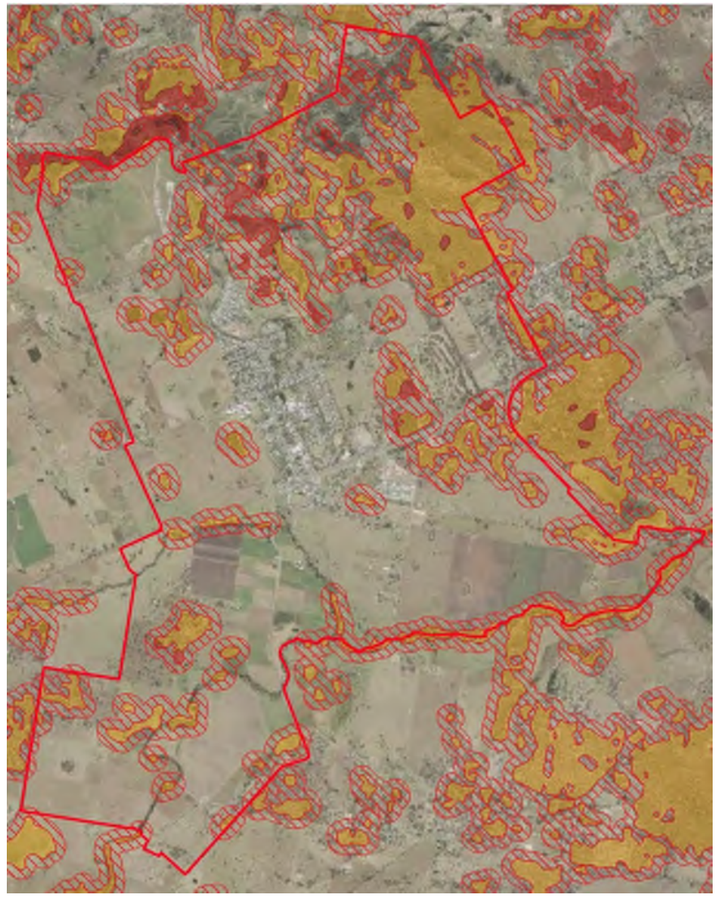
## Place typologies

- Rural township
- Centres
- Established suburban neighbourhood
- New suburban neighbourhoods
- Agricultural and pastoral lands.

## ShapingSEQ

- Majority within Regional Landscape and Rural Production Area, with Rosewood located in the Urban Footprint
- Urban (consolidation) areas.

## Exposure summary



Rosewood is largely surrounded by pastoral and other agricultural lands, with Stirling Road Reserve located to the north-east as well as vegetation on private landholdings. Vegetation in this location is classified as open forest, transitioning to woodland elsewhere in the local area. Grassfire hazard is unmapped but also a consideration.

The Rosewood Sewerage Treatment Plant is located in the hazard buffer, along with Rosewood State High School and the recycling and refuse centre.

## Bushfire risk summary

The nature of the bushfire risk relevant to Rosewood is fragmented however the quantum of grassland and bushland fuels can lead to fast-moving fires, with fluctuating intensity and behaviour. Exposure is largely associated rural and agricultural activities, which are important sources of employment/income for the local community.

# Area 27 – Ebenezer, Willowbank, Jeebropilly, Mount Forbes, Mutdapilly

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 10339 | 0 | 1 | 20 | 0 | 1 | 21 |
| Residential | 89 | 0 | 0 | 1 | 0 | 0 | 25 |
| Employment | 2716 | 0 | 2 | 5 | 0 | 3 | 15 |
| Rural Living | 215 | 0 | 0 | 9 | 0 | 0 | 35 |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 4927 | 0 | 0 | 24 | 0 | 0 | 24 |
| Environmental | 1841 | 0 | 1 | 32 | 0 | 1 | 22 |
| Community facility | 22 | 0 | 0 | 13 | 0 | 0 | 35 |
| Limited development | 0 | NA | NA | NA | NA | NA | NA |
| Recreation & open space | 9 | 0 | 0 | 0 | 0 | 0 | 22 |
| Special purpose | 385 | 0 | 2 | 23 | 0 | 4 | 24 |
| Special opportunity | 135 | 0 | 0 | 13 | 0 | 0 | 24 |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 608 | 0 | 0.2 | 1 | 0 | 0 | 37 |

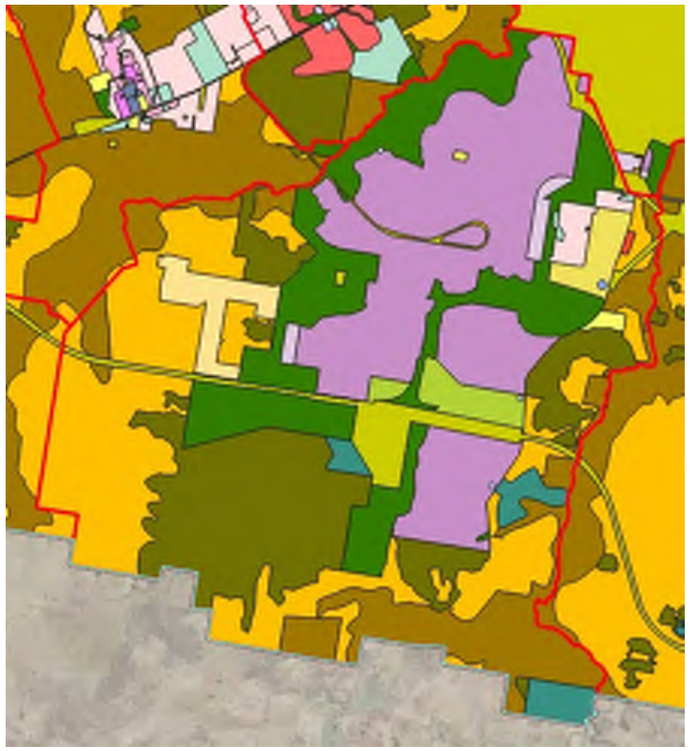
## Road exposure

| | |
|---|---|
| Total length | 39.3km |
| Exposed to hazard | 1.9% |
| Within 50m of hazard | 35.47% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 0 | NA |
| Essential community infrastructure | 3 | 1 |

## Growth management



Urban Footprint includes Willowbank Township and existing large lot residential area, the Willowbank motorsports and events precinct and the emerging regionally significant major enterprise and industrial area at Ebenezer.

Parts in the Regional Landscape and Rural Production Area are predominantly rural in character including rural living.

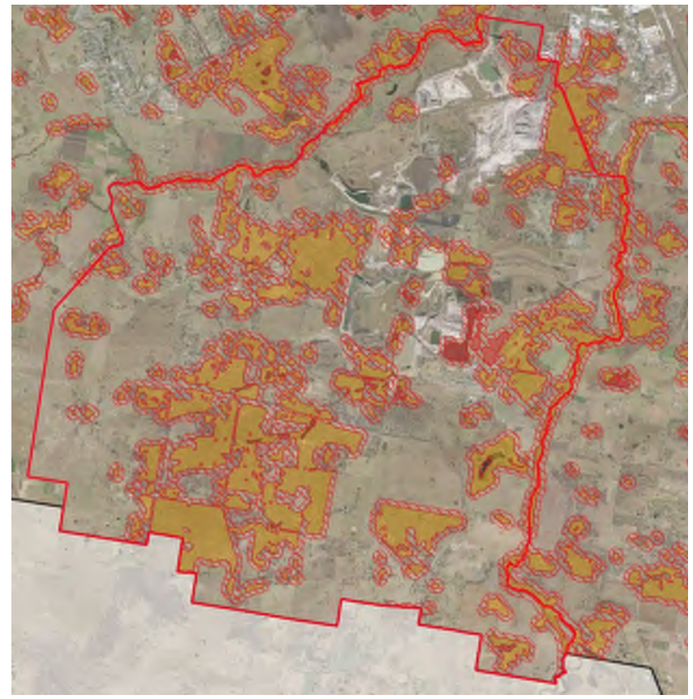
## Place typologies

- Special use place
- Rural township
- Rural living areas
- Agricultural and pastoral land.

## ShapingSEQ

- Included in Urban Footprint and Regional Landscape and Rural Production Area
- Ipswich Regional Economic Cluster (REC).

## Exposure summary



Over 20 per cent of this local area is subject to bushfire hazard, with a further 22 per cent also subject bushfire attack mechanisms such as radiant heat and ember attack. Whilst not mapped, grassfire hazard also present in this area and likely to act in concert with bushfire attack.

The fuel connectivity of this area is generally high.

## Bushfire risk summary

There are a number of large-scale and regionally-significant economic activities occurring within the local area, with a corresponding level of exposure to potential risk. The combination of grassland and woodland fuels may give rise to fast-moving fire behaviour. The extent of fuel also indicates a potential for large-scale events.

Whilst a third of the road network is within 50 metre of hazard and may be therefore subject to bushfire attack, or limited visibility, the threat to road network is likely to be more targeted than wide scale, such that general evacuation and access for emergency service across the area should continue to remain available via multiple routes.

Growth in the area is expected to remain limited and constrained to certain locations in the area due to the need for buffering to certain land uses in the area.

# Area 28 – Tallegalla, Woolshed and The Bluff

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 4557 | 11 | 23 | 15 | 5 | 12 | 11 |
| Residential | 0 | NA | NA | NA | NA | NA | NA |
| Employment | 60 | 0 | 15 | 6 | 1 | 17 | 27 |
| Rural Living | 1408 | 4 | 6 | 11 | 7 | 15 | 15 |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 3083 | 15 | 30 | 17 | 4 | 10 | 9 |
| Environmental | 0 | 0 | 0 | 100 | 0 | 0 | 0 |
| Community facility | 6 | 0 | 42 | 20 | 1 | 31 | 5 |
| Limited development | 0 | NA | NA | NA | NA | NA | NA |
| Recreation & open space | 0 | NA | NA | NA | NA | NA | NA |
| Special purpose | 0 | NA | NA | NA | NA | NA | NA |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 158 | 0 | 0 | 0 | 8 | 25 | 22 |

## Road exposure

| | |
|---|---|
| Total length | 10.5km |
| Exposed to hazard | 2.56% |
| Within 50m of hazard | 22.44% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 0 | NA |
| Essential community infrastructure | 0 | NA |

## Growth management



Area to be maintained as rural. Proximity to existing and future urban areas and the Regional Recreation Trail between Rosewood and Marburg provides opportunities for the development of rural, eco and other tourism uses.

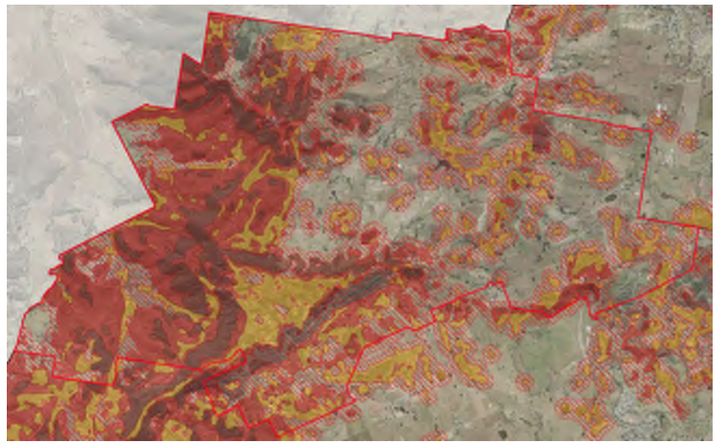
## Place typologies

- Agricultural and pastoral land.

## ShapingSEQ

- Regional Landscape and Rural Production Area.

## Exposure summary



Bushfire hazard is pronounced in the western half of this local area, associated with the Little Liverpool Range, becoming more fragmented in the east. This is also consistent with a change in vegetation from more open forest areas on the Range to woodland areas on the lower plains. Much of the lower plains is utilised for the purposes of rural and agricultural activities.

No vulnerable uses or essential community infrastructure is identified as exposed.

## Bushfire risk summary

The extent of hazard in this area is elevated, and risk is largely associated with rural and agricultural activities which are also key income generating ventures in the region. A number of rural homesteads are also identified as potentially exposed to bushfire attack.

Whilst urban growth is not identified for this area. future eco and tourism development is a key economic opportunity. Thus, it is important the statutory controls of the new planning scheme consider the issues associated with such uses in order to determine their level of appropriateness or otherwise against the extent of bushfire hazard and risk.

# Area 29 – Ashwell, Lanefield, Calvert and Grandchester

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 11993 | 9 | 24 | 13 | 2 | 8 | 11 |
| Residential | 0 | NA | NA | NA | NA | NA | NA |
| Employment | 235 | 7 | 9 | 10 | 10 | 13 | 12 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 20 | 0 | 0 | 0 | 0 | 0 | 14 |
| Rural | 10848 | 9 | 23 | 13 | 2 | 9 | 12 |
| Environmental | 751 | 20 | 48 | 23 | 3 | 5 | 2 |
| Community facility | 17 | 0 | 5 | 14 | 0 | 10 | 7 |
| Limited development | 0 | NA | NA | NA | NA | NA | NA |
| Recreation & open space | 4 | 0 | 15 | 5 | 0 | 0 | 4 |
| Special purpose | 118 | 3 | 6 | 7 | 5 | 4 | 20 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 374 | 0 | 4 | 1 | 5 | 20 | 12 |

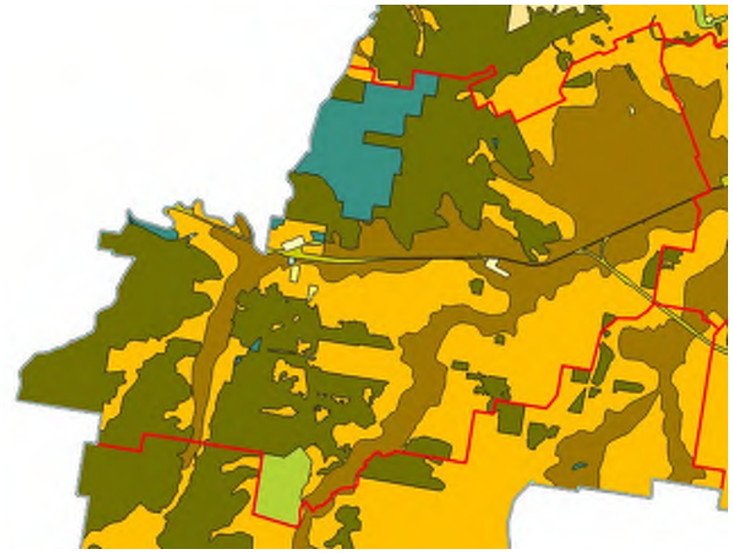
## Road exposure

| | |
|---|---|
| Total length | 24.6km |
| Exposed to hazard | 23.80% |
| Within 50m of hazard | 30.45% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 2 | 0 |
| Essential community infrastructure | 0 | NA |

## Growth management



Predominantly rural in character with a dispersed pattern of farms and houses reflecting past and ongoing agricultural, pastoral and other rural activities and the townships of Grandchester and Calvert.

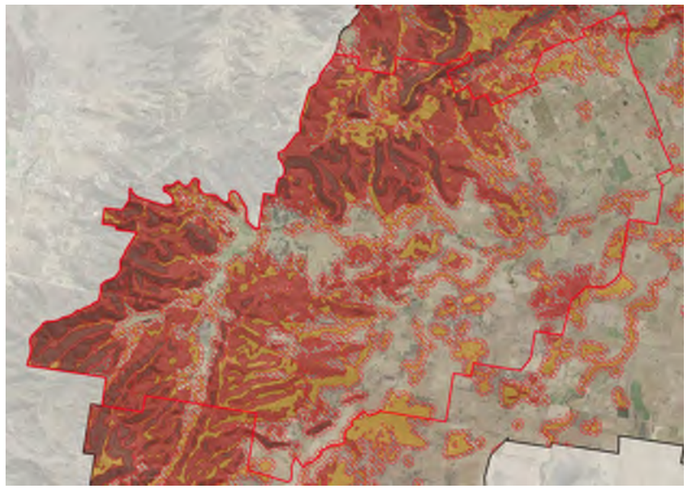
## Place typologies

- Agricultural and pastoral land
- Rural township.

## ShapingSEQ

- Regional Landscape and Rural Production Area.

## Exposure summary



The western extent of this local area adjoins the Little Liverpool Range. Bushfire hazard in this local area is elevated and presents as landscape-scale hazard owing to the classification of vegetation, its connectivity and terrain. This hazard profile exists in both the western and northern extents of the local area. The balance is largely cleared and used for agricultural, pastoral and other rural activities, interspersed with fragmented pockets and corridors of bushland. The hazard profile in the eastern extent of the local area is much lower than other areas.

There are no instances of vulnerable facilities or essential community infrastructure identified as exposed to potential bushfire hazard.

## Bushfire risk summary

The majority of the local area is zoned for rural purposes, with the communities of Grandchester and Calvert zoned as Township. Road networks in the area are exposed to potential bushfire hazard, with over 23 per cent mapped within the hazard extent, and a further 30 per cent within 50 metres of hazard. From a risk perspective, depending on the circumstances that prevail, road closures and dangerous conditions could occur on roads within this local area. This is more pronounced in the western extent of the local area, and particularly between Grandchester and Laidley, but also between Gandchester and Rosewood, and for landholdings south of Grandchester, including Spicers Hidden Vale.

Exposure of fire to township, rural activities and tourism activities in this area is present.

Grandchester is exposed to landscape-scale fire risk.

Whilst the area is not projected to grow substantially, land use planning considerations must contemplate the access and egress and township zone exposure in this local area.

# Area 30 – Mount Mort, Lower Mount Walker and Mount Walker West

## Zone exposure

| Zones and zone groups | Area (ha) | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Local Area Total | 14564 | 14 | 18 | 13 | 3 | 5 | 11 |
| Residential | 0 | NA | NA | NA | NA | NA | NA |
| Employment | 0 | 5 | 78 | 15 | 0 | 2 | 0 |
| Rural Living | 0 | NA | NA | NA | NA | NA | NA |
| Township | 0 | NA | NA | NA | NA | NA | NA |
| Rural | 14388 | 13 | 18 | 13 | 3 | 5 | 11 |
| Environmental | 160 | 91 | 4 | 4 | 0 | 0 | 1 |
| Community facility | 0 | NA | NA | NA | NA | NA | NA |
| Limited development | 0 | NA | NA | NA | NA | NA | NA |
| Recreation & open space | 0 | NA | NA | NA | NA | NA | NA |
| Special purpose | 16 | 0 | 0 | 3 | 0 | 0 | 39 |
| Special opportunity | 0 | NA | NA | NA | NA | NA | NA |

## Residential exposure

| | Total | Hazard Area (%) | | | Buffer Area (%) | | |
|---|---|---|---|---|---|---|---|
| | | VH | H | M | VH | H | M |
| Residential dwellings | 111 | 0 | 1 | 3 | 2 | 5 | 23 |

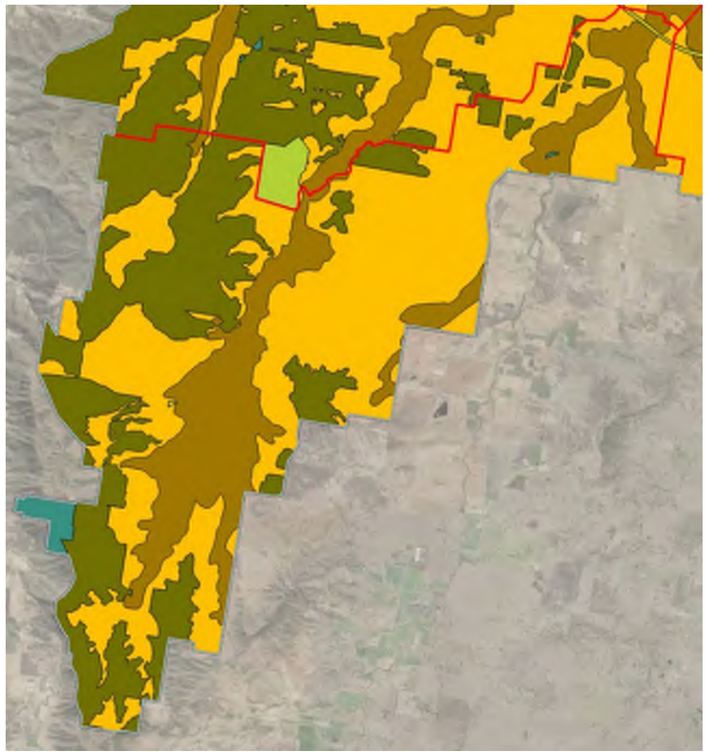
## Road exposure

| | |
|---|---|
| Total length | 18.7km |
| Exposed to hazard | 5.73% |
| Within 50m of hazard | 16.73% |

## Vulnerable facilities & essential infrastructure

| | Total | Exposed |
|---|---|---|
| Vulnerable facilities | 0 | NA |
| Essential community infrastructure | 0 | NA |

## Growth management



Predominantly rural in character with, a dispersed pattern of farms and houses, reflecting past and ongoing agricultural, pastoral and other rural activities.

Proximity to the major conservation estate areas in the Little Liverpool Range provides opportunities for the development of rural, eco and other tourism uses.

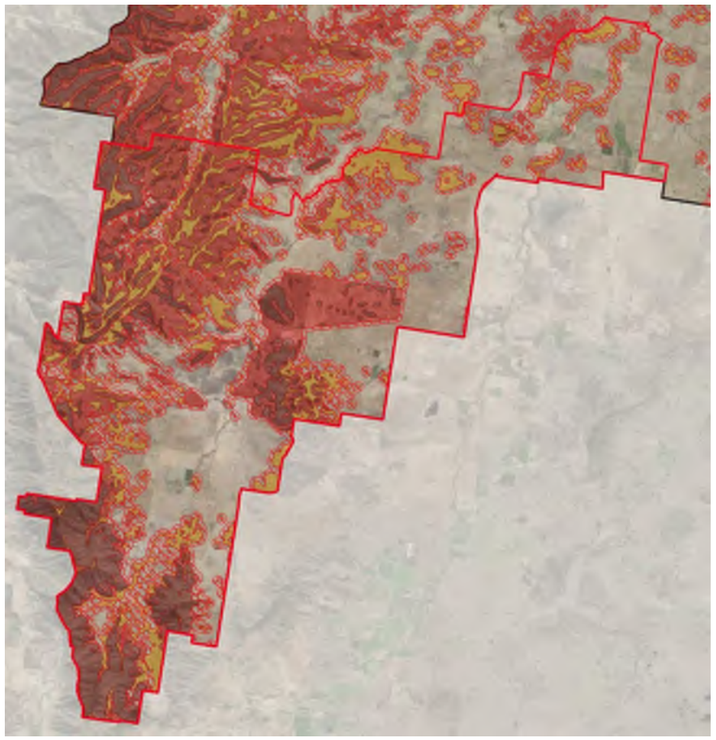
## Place typologies

- Agricultural and pastoral land.

## ShapingSEQ

- Regional Landscape and Rural Production Area.

## Exposure summary



The western extent of this local area adjoins the Little Liverpool Range, as well as the Proctor Range. Bushfire hazard in this local area is elevated and presents as landscape-scale hazard owing to the classification of vegetation, its connectivity and terrain. This hazard profile exists in both the western and northern extents of the local area, as well as around the Proctor Range in the central area. The balance is largely cleared and used for agricultural, pastoral and other rural activities, interspersed with fragmented pockets of bushland. The hazard profile in the eastern extent of the local area is lower than other areas.

There are no instances of vulnerable facilities or essential community infrastructure identified as exposed to potential bushfire hazard.

## Bushfire risk summary

The majority of the local area is zoned for rural purposes. Road networks in the area are exposed to potential bushfire hazard, with limited route options available. From a risk perspective, depending on the circumstances that prevail, road closures and dangerous conditions could occur on roads within this local area. This is more pronounced in the western extent of the local area.

Exposure of fire to rural activities and homesteads in this area is present.

# 8 Observations and recommendations

This section summarises the key observations and recommendations of this strategic land use planning-based risk assessment.

## 8.1 Risk assessment observations

The key observations drawn from the analysis and evaluation of potential bushfire related risks across the Ipswich region are summarised as follows:

- Overall, this risk assessment identifies areas of overrepresentation of potential bushfire hazard under the current State-wide bushfire prone areas mapping, particularly in relation to locations of steep topography in high fuel load environments. However, these tend to be located away from any areas of population or development. This is likely to be addressed by forthcoming amendments to the mapping, undertaken by the State government.
- Areas of the Ipswich region incorporate fire-prone landscapes, and its characteristics including fire weather and vegetation communities are continuing to evolve, translating to a higher likelihood of fire into the future as a result of climate change factors.
- Grassfire hazard is a particular threat across the western half of the LGA however, grassfire is not a mapped hazard. Where grassfire interacts with woodland environments (which are mapped), fire hazard is likely to occur in areas outside of mapped locations. These areas also do not trigger a building response. Whilst grassfire hazard is not deemed a relevant planning matter by the State, it is a building matter however, the lack of grassfire hazard mapping disables the ability to trigger building construction requirements pursuant to AS3959.
- No areas of the Ipswich region were identified as subject to 'Extreme' potential risk under this risk assessment.
- The local areas of the Ipswich region identified as subject to a higher bushfire risk profile, pursuant to the QERMF risk analysis matrices, include:
    - Pine Mountain, Muirlea, Blacksoil
    - Springfield Estate
    - Ripley Valley.
- These locations experience an elevated fire frequencies owing to surrounding landscape hazard (i.e. Spring Mountain, White Rock Conservation Park, etc) coupled with the risk multipliers of exposed evacuation networks and extensive growth (for Springfield and Ripley), increasing the exposure of persons and property in these locations, over time.
- Both Springfield and Ripley are subject to external planning factors from a legislative and regulatory perspective which guide the strategic planning outcomes in these locations. This includes the Springfield Structure Plan Area provisions (initially established as a Development Control Plan under the superseded *Local Government (Planning and Environment) Act 1990*, and the Ripley Valley Priority Development Area Development Scheme under the *Economic Development Act 2012*.
- Both Springfield and Ripley are among the region's largest growth areas.

- The topography surrounding these areas includes steep terrain, likely to alter localised fire behaviour. For example, fires in the Spring Mountain and White Rock areas tend to spread in northerly directions, rather than be driven from the west.
- The existing vulnerability to fire in the above locations and more broadly across the LGA is likely to be elevated, acknowledging the current planning scheme overlay mapping was prepared well over a decade ago, during which time great advances in fire science has led to enhance bushfire hazard mapping methodologies. It also does not incorporate a hazard buffer which may have given rise, over time, to development applications which were not triggered for bushfire assessment, despite being located in bushfire prone areas.
- The housing stock across the region is relatively aged, on proportion, and the majority are not constructed to AS3959 standard or current planning provisions having regard to point above. Many locations also do not include observable asset protection zones separating dwellings from the source of hazard, though this is a relatively common issue on private properties across the state.
- The consequence of fire in the above locations is identified as 'Moderate' having regard to the potential risks to life, property, infrastructure, environmental and economic values, pursuant to the QERMF methodology. This is consistent with the risk rating applied to bushfire under Council's Local Disaster Management Plan.
- Notwithstanding the above, the South East Queensland region has experienced the largest extent of change to fire weather than elsewhere in Queensland over the past 70 years, as analysed by the Bureau of Meteorology. Into the future, the intensity and frequency of fire weather in the region will continue to grow as a result of climate change including lower rainfall, higher temperatures, more frequent drought conditions, more frequent hot nights and altered vegetation classifications (i.e. higher fuel loads).
- Over 40 per cent of the region's existing residential zoned lands (approximately a quarter of the region's population) are exposed to bushfire hazard, and this will continue to grow as a result of development in Ripley Valley, Springfield Estate and in the Walloon to Rosewood corridor. Almost 70 per cent of the region's rural living zoned land is also exposed.
- Across these areas, exposure of the key evacuation route network, consisting of the region's higher order roads, is also observed. In some locations, more than 50 per cent of the higher order road network is exposed to potential bushfire attack, including Ashfield and Pine Mountain. In Springfield and Ripley, between 30 and 40 per cent of the evacuation network is exposed.
- A spectrum of planning options exist to consider the hazard and risk profile for the local areas of the region, to be considered by Council as part of its settlement policy formulation underpinning the preparation of the new planning scheme.
- Whilst some vulnerable facilities and essential community infrastructure assets are exposed across the region, the proportion is relatively low to moderate. Efforts to ensure this does not inadvertently increase as part of the continued growth of the region should be considered.
- The region incorporates a number of risk multiplier considerations such as the risk to and from bushfire and grassfire relative to landfill and unexploded ordnance sites. These land uses can amplify bushfire and grassfire threat, and lead to cascading and compounding risk issues.

## 8.2 Risk assessment recommendations

The following table outlines the extent of recommendations identified by this risk assessment for further consideration as part of the preparation of the draft planning scheme.

**Table 16 - Summary of risk assessment recommendations to inform policy, strategic and statutory planning approaches**

| ID | Recommendation |
|---|---|
| **01** | Work with the State government as part of ongoing updates and amendment processes supporting the State-wide BPA mapping to inform Council's overlay mapping. |
| **02** | Ensure all aspects of the draft planning scheme maximise the linkages between planning and building processes. |
| **03** | Work with the State government (Economic Development Queensland) and Springfield City Group with respect to strategic planning for new development in bushfire prone areas, ensuring streamlined and appropriate policy and statutory controls are applied across all relevant instruments. |
| **04** | Incorporate bushfire risk considerations as part of the Local Area Framework. Using this framework, localised risk-responsive approaches can be adopted which move away from standardised / uniform hazard provisions. |
| **05** | Ensure zoning and other settlement policy decisions are informed by considerations for evacuation, having regard to:<br>• the existing and potential exposure of the road network to bushfire attack<br>• the ability to provide / retain multiple egress route options<br>• the capacity of the road network to support emergency evacuation<br>• road network design and construction<br>• identifying and mitigating potential route bottlenecks during emergency evacuation. |
| **06** | Consider the implementation of statutory controls to regulate reconfiguring thresholds relative to the number of evacuation routes to ensure a grassroots approach to evacuation planning can be contemplated at development assessment stage. |
| **07** | Consider the integration of statutory controls which focus on mitigating the risk of urban fire intrusion for new settlement at the urban bushland / grassland interface. |
| **08** | Consider the integration of statutory controls which focus on mitigating the risk of bushfire and grassfire to existing and/or future landfill, hazardous facilities and unexploded ordnance sites. |
| **09** | Consider a policy of avoidance of vulnerable and sensitive facilities in the bushfire prone area across the region. Where such uses are necessary, contemplate the strength of statutory controls which acknowledges these uses rarely require a bushfire building response under AS3959. |

| ID | Recommendation |
|---|---|
| 10 | Explore the opportunity to align the definition of vulnerable uses (defined by the SPP guidance materials) with that which applies to flood, to aid in consistency. |
| 11 | Explore opportunities for statutory planning provisions to appropriately address the bushfire resilience of land uses and activities not subject to AS3959 including short term accommodation, tourist activities, fuel stations, sensitive uses, industrial activities, hazardous activities, vulnerable facilities and critical infrastructure where these cannot be avoided in a bushfire prone area. |
| 12 | Ensure the new planning scheme appropriately balances the competing planning policy issues of biodiversity and environmental protection with bushfire protection and mitigation. |
| 13 | Ensure any future master planning or structure planning processes for emerging community zoned land or growth areas are undertaken in line with bushfire resilient urban design principles which guide outcomes, on balance with ecological values. |
| 14 | Ensure strong and calibrated consideration of bushfire hazard and risk across all parts of the draft planning scheme. |

# 9 Policy development considerations summary

To advance the identification of policy pathways and directions, established by the specific risk profiles established by this risk assessment report, a number of considerations are required. These include:

- the recommendations of this bushfire risk assessment (Part B)
- the legislative and regulatory environment and relevant requirements for plan-making
- the State interests identified by the SPP and guidance materials, including the Bushfire Resilient Communities technical reference guide and example code. This includes:
    - the ten (10) policy positions established by the technical reference guide, which support an assessment of risk tolerability
    - section 13.1.4 Approach to plan-drafting under the 'Integrating state interests in a planning scheme' non-statutory guidance material
    - relevant content contained in the 'Drafting a planning scheme – Guidance for local governments' document.

The above considerations are set out in further detail in Part C of the Bushfire Risk Assessment project reporting.

# APPENDICES



Meridian Urban

# Appendix A - Spatial Analysis Methodology and Data Sources

# 1 Spatial Analysis Process

Spatial analysis was used in order to determine the exposure of bushfire hazard within the region. Exposure was measured utilising the State-wide bushfire prone areas mapping. Additional metrics to the mapping were incorporated including:

- Additional buffers around each hazard class of 50m, 70m and 100m
- Additional buffers around the bushfire prone area of 100m, 500m and 700m
- Breakdown of the 'potential impact buffer area' to identify the relevant hazard class of which the buffer relates to.

The above metrics were used to gain a greater appreciation of the relevant aspects of exposure within the region.

A number of different measures were used to determine the level of exposure including zoned land, vulnerable facilities, essential community infrastructure and residential dwellings.

For the purposes of zoned land, this was broken down into the following categories based off the proposed planning scheme zoning:

| Residential land | Employment land | Rural land | Recreation and open space land |
|---|---|---|---|
| • Character mixed density<br>• Character mixed use<br>• Character residential low density<br>• Character residential mixed density<br>• Established suburban<br>• High density<br>• Large lot<br>• Low-medium density<br>• Medium density<br>• New suburban | • District centre<br>• Local centre<br>• Major centre<br>• Neighbourhood centre<br>• Principal centre<br>• Specialised centre<br>• Business park<br>• Industrial investigation<br>• Low impact industry<br>• Medium impact industry<br>• Service Centre<br>• Tourism<br>• Tourist accommodation<br>• Mixed use | • Rural A (agricultural)<br>• Rural B (pastoral)<br>• Rural D (special land management) | • Recreation and open space |
| **Rural living land** | **Environmental land** | **Land for community facilities** | **Limited development land** |
| • Rural C (rural living) | • Conservation | • Community facilities | • Limited development |

| Residential land | Employment land | Rural land | Recreation and open space land |
|---|---|---|---|
| • Township | • Environmental management | | |

The analysis of vulnerable facilities included the facilities:

- Nursing home
- Childcare facilities
- Schools
- Higher education facilities
- Hospitals
- Correctional facilities
- Unexploded ordnance sites (while unexploded ordnance sites are not necessarily 'vulnerable facilities' they act as risk multipliers in the consideration of bushfire risk).

The analysis of essential community infrastructure included the following assets:

- Power generation facilities
- Electrical substations
- Sewer treatment plants
- Sewer pump stations
- Water treatment plants
- Water pump stations
- Landfill.

Relevant data sources are outlined in the following section.

# 2 Spatial Analysis Data Sources

| Data Layer | Source | Comments |
|---|---|---|
| **Bushfire risk areas overlay** | Ipswich City Council (supplied) | |
| **Statewide Bushfire Prone Area** | Bushfire prone area – SEQ (QSpatial) | |
| **Local Area Framework** | Ipswich City Council (supplied) | |
| **Zones** | Ipswich City Council (supplied) | |
| **Residential Dwellings** | Various | Refer to report |
| **Nursing homes** | Aged care service list: 30 June 2021 from the Australian Institute of Health and Welfare Aged Care dataset. | Excluding 'home care only' providers, the coordinates were plotted and aligned with the underlying land parcel. |
| **Child care facilities** | Queensland State register of approved services from the Australian Children's Education & Care Quality Authority. | The address was geocoded to create coordinates, the coordinates were plotted and aligned with the underlying land parcel. |
| **Correctional centre** | Landmark areas (QSpatial) | All facilities identified as 'correctional centre' were selected. |
| **Educational establishment** | Landmark areas (QSpatial) | All facilities identified as 'educational institution' were selected. |
| **Hospitals** | Landmark areas (QSpatial) | All 'private hospital' and 'public hospital' facilities were selected. |
| **Landfill** | National Waste Management Database (data.gov.au) | Landfill locations within Ipswich City Council were identified and then aligned with the cadastral extent of each facility. |
| **Unexploded Ordnance** | Ipswich City Council (supplied) | |
| **Power generation facilities** | Landmark areas (QSpatial) | All 'power generation facilities' were selected. |
| **Electrical substations** | Ergon Energy – zone substations (QSpatial) | All 'zone substations' and 'bulk supply substations' were selected. |
| **Water pumping stations** | Urban Utilities | |

| Data Layer | Source | Comments |
|---|---|---|
| **Water treatment plant** | Landmark areas (QSpatial) | All 'water treatment plants' were selected. |
| **Wastewater treatment plants** | Landmark areas (QSpatial) | All 'sewage treatment plants' were selected. |
| **Sewer pump stations** | Urban Utilities | |
| **Roads** | Ipswich City Council (supplied) | The following road types were utilised:<br>Arterial, Freeway/Motorway, Highway, Industrial Collector, Main Street Arterial, Main Street Sub-Arterial, Major Collector, Minor Collector, Rural Arterial, Rural Collector, Rural Sub-Arterial, Sub-Arterial |

# Appendix B - Bushfire Prone Area Reliability Assessment

REPORT

# Bushfire Prone Area Reliability Assessment

PREPARED FOR
IPSWICH CITY COUNCIL

November 2021



Meridian Urban

# QUALITY STATEMENT

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# REVISION SCHEDULE

| Rev No. | Date | Description | Prepared by | Checked by | Reviewed by | Approved by |
|---|---|---|---|---|---|---|
| A | 09/11/2021 | Draft Report | FR | SE | LG | LG |
| B | 23/11/2021 | Final Report | FR | SE | LG | LG |
| | | | | | | |
| | | | | | | |
| | | | | | | |

FPAA NSW BPAD Accreditation No. 33131

Member Planning Institute of Australia
Member Fire Protection Association of Australia
Member International Association of Wildland Fire
Member Natural Hazard Mitigation Association (USA)
Member Association of Fire Ecology

DISCLAIMER

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This report is prepared for the benefit of the named Client only. No third party may rely upon any advice or work completed by Meridian Urban in relation to the services, including this report, except to the extent expressly agreed in writing by Meridian Urban.

The client acknowledges and agrees that Meridian Urban has not created or contributed to the creation or existence of any bushfire hazard and the Client indemnifies Meridian Urban for claims arising out of or resulting from a bushfire event except to the extent attributable to the negligence of Meridian Urban.

The Client agrees that the Consultant shall have no liability in respect of any damage or loss incurred as a result of bushfire.

# Ipswich City Council

## Bushfire Prone Area Reliability Assessment

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# 1 Introduction

This Bushfire Prone Area Reliability Assessment (herein referred to as the 'Reliability Assessment') has been commissioned by Ipswich City Council and is being completed in conjunction with the Ipswich Planning Scheme Bushfire Risk Assessment, in support of the preparation of the new Ipswich Planning Scheme.

The intent of the bushfire risk assessment is to examine and understand the potential nature of bushfire risk to people, property, infrastructure and the environment across the Ipswich region both at present, and into the future.

In support of the risk assessment, the intent of this Reliability Assessment is to ascertain the reliability of the state-wide Bushfire Prone Area (BPA) mapping within the Ipswich City Council area as per the requirements of State Interest Policy 1 of the Natural hazards, risk and resilience State Interest as it relates to bushfire hazard. The state-wide BPA mapping was prepared for the South East Queensland Region in July 2017.

This Reliability Assessment has been undertaken in accordance with the approved methodology established at Part 4 of the *Bushfire Resilient Communities* technical reference guide prepared by Queensland Fire and Emergency Services (QFES) and which forms part of the State Planning Policy guidance materials.

# 2 Background

The State Planning Policy identifies natural hazards (including bushfire) as a state interest and seeks to 'ensure natural hazards are properly considered in all levels of the planning system'. State Interest Policy 1 (under the natural hazards, risk and resilience State interest) requires that bushfire prone areas be identified in planning and development outcomes.

In 2014 the CSIRO in conjunction with QFES, released the '*New Methodology for State-wide Mapping of Bushfire Prone Areas in Queensland*'. An addendum to this was released in 2017, '*Estimating the Potential Bushfire Hazard of Vegetation Patches and Corridors: An enhancement of Queensland's methodology for State-wide mapping of bushfire prone areas*'. This methodology underpins the fire science which is incorporated into current state-wide BPA mapping. This mapping is also regularly updated, including most recently in 2017 for the South East Queensland region.

The state-wide mapping methodology has been subject to peer review processes and has been found to be highly accurate, yielding an estimated 85 per cent level of accuracy. The methodology maps and categorises bushfire prone areas based upon potential fireline intensity (kW/m). To determine the potential-fire line intensity, the Potential Fuel Load (PFL) (derived from the Vegetation Hazard Class (VHC)), landscape slope and MacArthur Mk 5 Forest Fire Danger Meter (FFDI) are used as inputs (refer to Figure 1).




**Figure 1: Mapped inputs required to determine potential fireline intensity (Source: adapted from Leonard et al., 2014)**

The mapping is categorised bushfire prone areas into three hazard classes: medium, high and very high potential bushfire intensity based on their potential fireline intensity (Table 1). In addition, a 100 metre 'potential impact buffer area' is included around all land mapped as medium, high or very high potential impact buffer. This 100m buffer replicates the approach under *AS3959:2018 – Construction of Buildings in Bushfire Prone Areas* as being the zone in which ember attack and radiant heat remain most relevant, adjacent to the actual hazard.

**Table 1: Potential bushfire intensity classes and corresponding potential fireline intensity ranges (Source: Leonard et al., 2014)**

| Potential Bushfire Intensity Class | Potential Fireline Intensity |
|---|---|
| Very high (potential intensity) | 40,000+kW/m |
| High (potential intensity) | 20,000 – 40,000kW/m |
| Medium (potential intensity) | 4,000 – 20,000lW/m |

In order to satisfy the requirements of State Interest Policy 1 of the Natural hazards, risk and resilience State interest, this Reliability Assessment seeks to verify the suitability of the state-wide BPA mapping for the Ipswich City Council area. The Reliability Assessment will consider the above identified inputs when determining the reliability of the existing mapping.

# 3 Methodology

Section 4.3 of *Bushfire Resilient Communities* provides guidance for undertaking a review of the bushfire prone area mapping. This Reliability Assessment has been undertaken in accordance with that guidance. The following section provides an overview of the methodology used to undertake the assessment.

## 3.1 Reliability Assessment

**Step 1 – Selection of 'cells of interest'**

A total of 55 1 kilometre x 1 kilometre 'cells of interest' were selected across the local government area. The cells of interest were randomly and subjectively selected to form the following two sample sets:

- Sample set (a) – randomly selected cells to confirm the reliability of mapping across the local government area (35 cells of interest in total)
- Sample set (b) – subjectively selected (non-random) cells in the following 'focus areas' (20 cells of interest in total):
    - Pine Mountain
    - Springfield
    - Ripley Valley
    - Denmark Hill
    - Blackstone
    - Bundamba Plantation
    - Grandchester
    - Willowbank
    - Areas of very high potential bushfire intensity

Four 200 metre diameter circular assessment areas were identified within each 'cell of interest'. Through the selection process, it was ensured that all bushfire prone area sub-categories formed part of the assessment, including:

- Very high potential bushfire intensity
- High potential bushfire intensity
- Medium potential bushfire intensity

**Step 2 – Assess and record the reliability of the bushfire prone area and VHC mapping**

The reliability of the BPA and VHC mapping was assessed within each circular assessment area by a desktop assessment. The desktop assessment considered the comparison of mapped inputs and verified fireline intensity. For the purposes of this assessment, mapped inputs refers to original data inputs that were utilised to develop the state-wide BPA mapping and verified fireline intensity refers to the calculated fireline intensity using the mapped niputs.

The table below provides a summary of data inputs and sources utilised as part of the Reliability Assessment.

**Table 2: Reliability Assessment data inputs and sources**

| Data Input | Source |
|---|---|
| Vegetation Hazard Class (VHC) | Provided directly from QFES and based off updated Regional Ecosystem mapping. |
| Potential Fuel Load (PFL) | Calculated based off the VHC and by referring to 'Vegetation hazard class descriptions and 80th percentile potential fuel load' within Section 6 of the *Bushfire Resilient Communities* technical reference guide. |
| Maximum Landscape Slope (MLS) | QSpatial catalogue "Bushfire prone area – South East Queensland" |
| Fire weather severity (FFDI) | QSpatial catalogue "Bushfire hazard area – Bushfire prone area – inputs – Queensland" |
| Verified fireline intensity | QFES APZ and fireline intensity calculator<br>FPAA FLAMESOL calculator |
| Mapped Bushfire Prone Area (BPA) | QSpatial catalogue "Bushfire prone area – South East Queensland" |

To determine the reliability of the mapped BPA, the assessment considered the accuracy of the mapped inputs as well as the resulting fireline intensity which was calculated for each assessment area. It is noted that different calculators derive slightly different fireline intensity outputs however, these do not change the overall hazard classification.

Furthermore, the spatial accuracy of the BPA and VHC mapping was also reviewed by utilising aerial photography obtained from Queensland Globe to determine the extent to which mapped boundaries coincided with the extent of vegetation and land uses.

In order to record the reliability of the mapping, each assessment area was assessed as either being satisfactory (S) or not satisfactory (N). This assessment was based on the following criteria:

- Satisfactory (S):
    - Mapped boundaries coincide with the extent of vegetation or land use boundaries evident on aerial photography to within 25 metres (and occasionally 50 metres); and
    - The quantified fireline intensity (based on the spatial information) matched the mapped potential bushfire intensity class.
- Not satisfactory (N):
    - Mapped boundaries differ from current vegetation and land use boundaries by greater than 50 metres; and
    - The quantified fireline intensity (based on the spatial information) does not match the mapped potential bushfire intensity class.

It should be noted that as the BPA mapping is completed at the 'landscape' scale it should be expected that a level of 'smoothing' of the data would occur to account for local/discreet variances. As the reliability assessment is conducted within 200 metre diameter areas it may not necessarily account for this 'smoothing' and therefore differences in the resultant fireline intensity may occur. Accordingly, further assessment was undertaken to consider such matters

where differences occurred and this was taken in to account when determining the reliability of the BPA mapping.

**Step 3 – Tally of reliability results**

Based off the above assessment, the reliability of the mapping was tallied. This is provided in Section 3 of this report.

**Step 4 – Suitability of mapping**

In order to determine the suitability of the bushfire prone area mapping, *Bushfire Resilient Communities* provides guidance that, generally, a reliability of 90 per cent or greater is considered suitable. The suitability of the mapping is considered in Section 3 of this report.

## 3.2 Limitations and Assumptions

The following assumptions and limitations apply to this Reliability Assessment:

- The Reliability Assessment has been conducted using a desktop assessment only. No field assessment was undertaken.
- The assessment is based off spatial information that has been obtained from the Queensland Spatial Catalogue, Queensland Fire and Emergency Service (QFES). A detailed list of data sources is provided at Table 2 above. As this assessment has been completed as a desktop assessment only, the outcomes of the assessment rely upon the reliability of the spatial information made available at the time of completing the assessment.
- The Reliability Assessment utilises static Fire Weather Severity (Forest Fire Danger Index (FFDI)) data. It is noted that locations within the local government area may experience days of higher fire weather severity than that utilised in the assessment.

# 4 Reliability and Suitability Assessment

## 4.1 Reliability Assessment

The Reliability Assessment considered a total of 55 1 kilometre x 1 kilometre 'cells of interest' comprising 35 randomly selected (sample set (a)) and 20 subjectively selected (sample set (b)) cells. It is noted that this exceeds the minimum requirement as specified under the *Bushfire Resilient Communities* guidance material. The additional cells of interest were undertaken due to the urban interface character of the Ipswich LGA.

Within each cell four 200 metre diameter circular assessment areas were identified resulting in a total of 220 assessment areas being considered as part of this assessment. A detailed copy of the reliability assessment is provided at **Appendix A**. Mapping, identifying the location of the 'cells of interest' is provided at **Appendix B**.

Of the 180 randomly selected cells (sample set (a)), 18 were determined to be not satisfactory (N) (10 per cent). When considered in their entirety, of the 220 assessment areas, 20 were determined to be not satisfactory (N) (9.1 per cent). A closer inspection of the not satisfactory assessment areas indicates that these are generally located in vegetated areas away from urban settlements and occur where the BPA mapping appears to over-estimate the verified BPA hazard class. Based on this assessment, the weighting applied to topography may be a key element for consideration in the locations where the verified BPA hazard class, based on fireline intensity assessment, is lower than the mapped BPA hazard class.

Overall, the over-estimation of a small number of cells is not considered significant. In four (4) of the assessment areas, the slope exceeds more than 20 degrees which may disrupt the accuracy of fireline intensity calculations. These cells are identified as 'not satisfactory' however it is noted this may be due to the calculation of fireline intensity rather then the BPA mapping itself.

It is noted there are a small number of instances where the BPA mapping over-estimates the hazard class however, where this is observed this is generally due to minor variations in fireline intensity and the likely impact of geo-spatial smoothing between hazard classes.

## 4.2 Suitability Assessment

As identified above, the assessment has determined that the state-wide Bushfire Prone Area mapping within the Ipswich City Council area has a reliability of 90 per cent or, 90.9 per cent when considering the assessment of both sample sets. With reference to the guidance provided in the *Bushfire Resilient Communities* technical reference guide, where a reliability of 90 per cent or greater is returned, the Bushfire Prone Area mapping is considered suitable for the preparation of local government planning schemes and other strategic planning decisions.

Accordingly, based on the Reliability Assessment and with reference to the *Bushfire Resilient Communities* technical reference guide, the **state-wide Bushfire Prone Area mapping is considered suitable**.

# 5 Conclusion

This Bushfire Prone Area Reliability Assessment has been undertaken to determine the suitability of the state-wide Bushfire Prone Area mapping for the preparation of the new Ipswich Planning Scheme in accordance with the requirements of State Interest Policy 1 of the Natural hazards, risk and resilience State Interest as it relates to bushfire hazard.

The Reliability Assessment was undertaken in accordance with the approved methodology established at Part 4 of the *Bushfire Resilient Communities* technical reference guide. The Reliability Assessment determined that the state-wide mapping had a reliability of 90.9 per cent and is therefore suitable for the preparation of local government planning schemes and other strategic planning decisions.