Technical Assessment Guide

Bushfire reporting

Overlays are provided in Council's planning scheme (City Plan 2014) to indicate areas that are subject to a natural hazard such as bushfire, flooding or landslide, a value such as biodiversity or heritage or a constraint such as proximity to high impact industry or an airport.

The bushfire overlay mapping aims to identify high and medium bushfire hazard and buffer areas within the Brisbane City Council Local Government Area. This mapping acts as a trigger for assessment against the Bushfire Overlay Code within City Plan 2014.

For the purposes of section 12 of the Building Regulation 2006 the land identified within the Bushfire overlay is designated as a bushfire prone area.

The Queensland Government State Planning Policy mapping for Natural Hazards, Risk and Resilience (Bushfire) also identifies Bushfire Prone Areas at a state level. This mapping acts as a trigger for assessment against the State Planning Policy Assessment Benchmarks.

If your property is identified in the City Plan Bushfire Overlay, or the SPP Bushfire Prone Area mapping and assessable development is proposed, a Bushfire Hazard Assessment will be required to demonstrate compliance with the relevant assessment benchmarks.

Bushfire Hazard Assessment requirements

Queensland Fire and Emergency Services (QFES) have prepared technical documents and guidelines in support of the State Planning Policy (SPP). The following tables identify the acceptable methodologies for Bushfire Hazard Assessment and notes on use of each methodology.

Note: Future bushfire hazard must be assessed (i.e. vegetation in its mature state) for the following areas:

- Areas subject to revegetation under the same Development Application;
- Areas subject to revegetation under an existing Development Application / Approval (on site or adjoining);
- Council bushland subject to revegetation or within an area likely to be revegetated in the future (e.g. bushland park / Reserves / Habitat Brisbane site / linear linkage park along waterway); or
- Areas specifically identified for rehabilitation under a Neighbourhood Plan.

The existing hazard may be assessed in all other circumstances.

This approach is considered to strike a balance between assessing future bushfire hazard and facilitating development. All development applications will still be required to be assessed on their merits on a case-by-case basis, however these guidelines are intended to clarify how the methodologies are to be used by applicants in the application process.

Methodologies	Use notes
Bushfire Planning Scheme Policy (PSP) – City Plan 2014	Derive Vegetation Code (Table 1) from Regional Ecosystem (RE)/Pre-Clear RE in the Queensland Government Regional Ecosystem Description Supplementary Description. E.g. RE 12.3.5 = Veg Code C2 Note: RE data can be found at the Queensland Government website: (https://environment.ehp.qld.gov.au/regional-ecosystems/).
Fireline Intensity Calculator	Identify RE / Pre-clear RE or appropriate modified vegetation community. Use the 'QFES Vegetation Hazard Class (VHC) Fuel Load' table to determine potential fuel loads[1]. Determine FDI 1:20 AEP (annual exceedance probability) (QFES Catalyst Portal). Where practitioner does not have access to QFES Catalyst Portal the relevant fire weather severity value can be derived from Figure 1 below.
State 'Fit for purpose' guidelines	Data and inputs must accompany submission of 'Fit for Purpose' Bushfire Hazard assessment report Detailed step-by-step methodology and figures must be included in submission Patch and Corridor Filtering as per Step B.2.1, Step 1 of the Fit for Purpose must be in accordance with *Estimating the Potential bushfire hazard of vegetation patches and corridors - Leonard & Opie, 2017*. Note: This is a GIS-driven exercise, manual assessment of patch and corridor filtering is unlikely to be accepted.

[1]: QFES VHC Fuel load table adapted from the information provided in *Bushfire Resilient Communities* (QFES, 2019)

Note: State Planning Policy 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide, and associated Guidelines is no longer legislated SPP under the *Planning Act 2016* (Qld) and therefore is no longer considered an acceptable methodology.

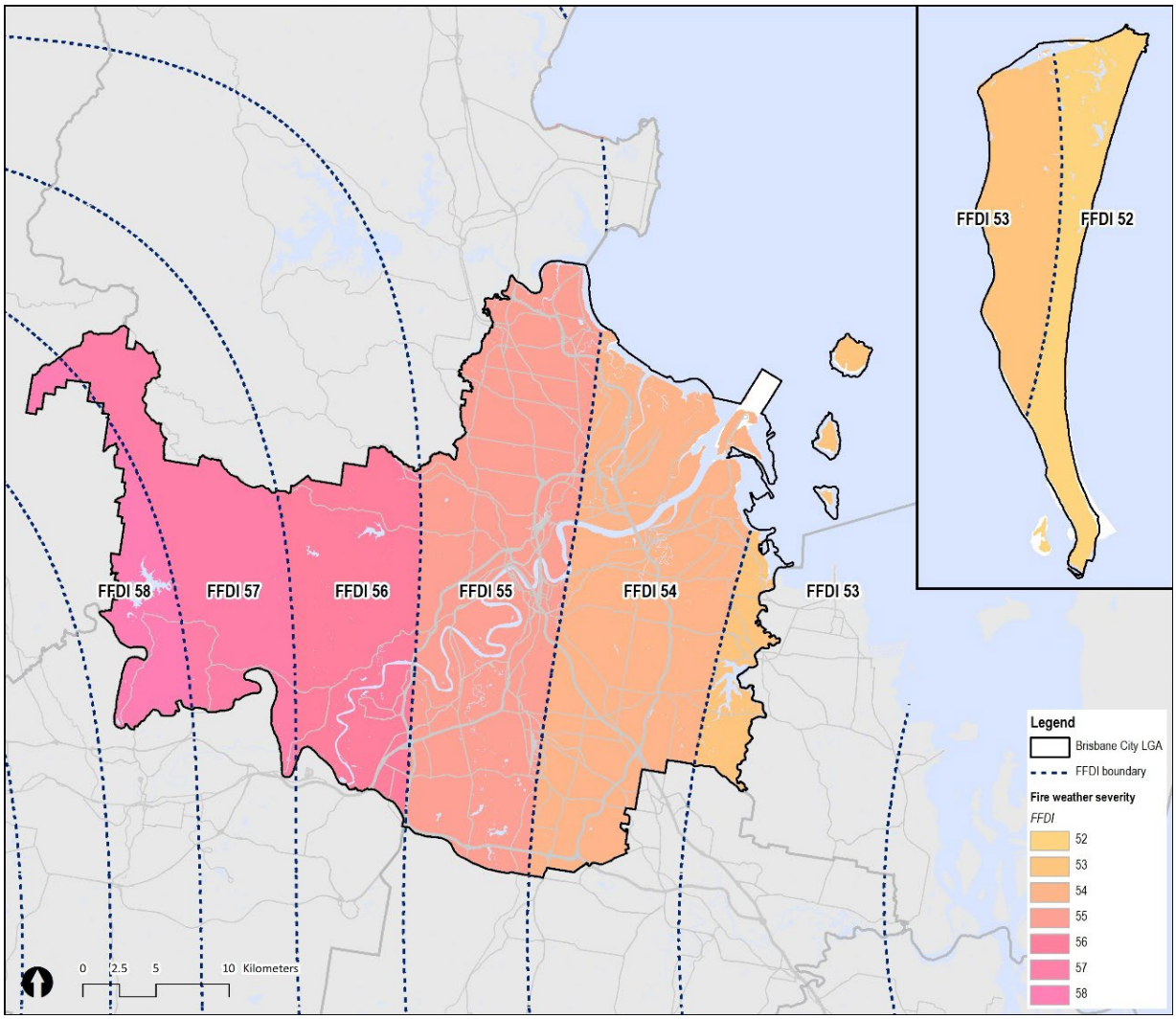

Figure 1: Fire weather severity values for Brisbane (5% Annual exceedance probability).

Please see below for information on the following:

- Low threat vegetation
- Small and/or isolated patches
- Separation Distance assessment

Low Threat Vegetation Assessment

The following table identifies the acceptable methodologies for identifying low threat vegetation notes on use of each methodology.

Low Threat Vegetation and Non-Vegetated Areas
Where the vegetation is one or a combination of any of the following, the vegetation is considered to be Low Threat Vegetation: (a) Vegetation of any type that is more than 100 m from the site. (b) Single areas of vegetation less than 1 ha in area and not within 100 m of other areas of vegetation being classified. (c) Multiple areas of vegetation less than 0.25 ha in area and not within 20 m of the site, or each other. (d) Strips of vegetation less than 20 m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 m of the site or each other, or other areas of vegetation being classified. (e) Non-vegetated areas, including waterways, roads, footpaths, buildings and rocky outcrops. (f) Low threat vegetation, including grassland managed in a *minimal fuel condition*, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks. *Minimal fuel condition* means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognizable as short-cropped grass for example, to a nominal height of 100 mm). Where vegetation exceeds this height, it is not considered Low Threat Vegetation, and Grassland or Shrubland vegetation classification must be used.

Small and/or Isolated Patches

The following table identifies the acceptable methodologies for filtering small and/or isolated patches, and notes on use of each methodology. For the purposes of small or isolated patch assessment a ‘patch’ is defined as an area of continuous fuel (e.g. woodland, forest, grassland) surrounded by discontinuous fuel (e.g. mown parklands, roads or very scattered trees/shrubs with well-managed understorey) which is not capable of carrying a fire front.

Methodologies	Use notes
Small / Isolated Patches	If less than 1ha of continuous fuel and more than 100m from other continuous fuel = LOW HAZARD
Patch is 0.5- 2 Hectares (surrounded by either no fuel or by discontinuous fuel further than 100m from any other continuous-fuel vegetation patch greater than 2 ha in size)	Patches less than 3 ha are less likely to develop into a fully developed fire front due to the size and distance required for a significant fire front of high intensity. Where 0.5-2 ha, the effective fuel load is assumed to be decreased by 66% i.e. Fuel load (t/ha) X 0.34 If fireline intensity <4,000 kW/m, LOW HAZARD **Note:** Fireline Intensity (kW/m) = $H*w*R_{slope}/36$ Where: H = Heat of combustion (18600 kJ/kg) w = QFES fuel load (t/ha) R_{slope} = forward rate of spread (km/h) adjusted for slope Refer to AS3959 for further guidance on calculating forward rate of spread.

Methodologies	Use notes
Patch is 2-3 hectares (surrounded by either no fuel or by discontinuous fuel further than 100 m from any other continuous-fuel vegetation patch greater than 2 ha in size)	Patches less than 3 ha are less likely to develop into a fully developed fire front due to the size and distance required for a significant fire front of high intensity. Where 2-3 ha, the effective fuel load is assumed to be decreased by 50% i.e. fuel load (t/ha) X 0.5 If fireline intensity <4,000 kW/m, LOW HAZARD **Note:** Fireline Intensity (kW/m) = $H*w*R_{slope}/36$ Where: H = Heat of combustion (18600 kJ/kg) w = QFES fuel load (t/ha) R_{slope} = forward rate of spread (km/h) adjusted for slope Refer to AS3959 for further guidance on calculating forward rate of spread.

Separation Distance Assessment Requirements

The following table identifies the acceptable methodologies for determining separation distance requirements (based on radiant heat exposure) and notes on use of each methodology.

Methodologies	Use notes
AS3959-2018 (Australian Standard - Construction of Buildings in Bushfire Prone Areas) Method 1	Use in accordance with AS3959-2018 Simplified Procedure (Method 1)

Methodologies	Use notes
AS3959-2018 (Australian Standard - Construction of Buildings in Bushfire Prone Areas) Method 2 – using **all** parameters set out in AS3959-2018 (including FDI and fuel loads)	Use in accordance with AS3959-2018 Appendix B with standard parameters (i.e. FDI in accordance with Clause 2.2.2 and Fuel Loads in accordance with Table B3).
QFES SPP Asset Protection Zone Width Calculator See *Bushfire Resilient Communities* (QFES, 2019) for detailed guidance.	To obtain a copy of the SPP Bushfire Asset Protection Zone Width Calculator, please email sdu@qfes.qld.gov.au FDI: Identified from QFES Catalyst Portal or as identified in Figure 1 Vegetation Hazard Class: Identify appropriate vegetation hazard class (VHC) in accordance with section 6 of *Bushfire Resilient Communities* (QFES, 2019). Slope Identify site slope and effective slope in in accordance with section 5.4.2 of *Bushfire Resilient Communities* (QFES, 2019).

Methodologies	Use notes
AS3959-2018 (Australian Standard - Construction of Buildings in Bushfire Prone Areas) Method 2 – using an FDI and fuel loads *other than* those identified in Table B2	Follow Method 2 (AS3959-2018) using alternative dataset (i.e. QFES datasets) for: Fuel loads: › Identify RE / Pre-clear RE or appropriate modified class. › Use RE to VHC Table to determine VHC and associated QFES vegetation hazard class fuel loads. ›Understorey or surface fuel loads (w) are the sum of surface and near-surface fuel loads for the purposes of calculating the rate of spread in Step 6 of Method 2 in AS3959-2018. Fuel loads to be derived for the relevant VHC in *Bushfire Resilient Communities* (QFES 2019). › Overstorey or total fuel loads (W) should represent the total potential fuel load identified for the relevant VHC in *Bushfire Resilient Communities* (QFES 2019). *Note:* Fuel loads assessed using the Overall Fuel Hazard Assessment Guide are not admissible. FDI: › Identified from QFES Catalyst Portal or as identified in Figure 1 Other parameters to be used as standard: Ambient temperature: 308K (35^0C) Heat of combustion: 18,600 kJ/kg Flame temperature: 1200K Flame emissivity: 0.95

Methodologies	Use notes
Short Fire Run Methodology for Assessing Bush Fire Risk for Low Risk Vegetation - (Delany, Boverman and Matthews, 2017)	A proposed short fire run (SFR) must not have connectivity with any other parcels of land containing vegetation capable of supporting a fully developed fire that would directly impact the asset from the same direction as the proposed SFR. This methodology is only appropriate to use in areas where fire is likely to be generated from a single point of ignition. Both the Forest and Heath formation models have the following limitations: › Limited to 30 degrees for downslope inputs. › Limited to 20 degrees for the site slope › Limited to 15 degrees for upslope; › Limited to 150 metre fire run length, measured on the effective slope › Limited to maximum input of 2 metres in height for elevated fuel in forest formations only. For heath formations the height of the vegetation is measured on site Practice Note: The use of the Short-fire run (SFR) head width can be calculated (flame width) and be input into Method 2 calculations as flame width. SFR Head width (B) = SFR length (m) / LB ratio LB ratio = $1.0 + (0.0012*(V^{2.154}))$ V = wind speed (30 km/h)

References:

Brisbane City Council, 2014, *Brisbane City Plan 2014*, Brisbane.
http://eplan.brisbane.qld.gov.au/

Leonard, J and Opie, K, 2017, *Estimating the potential bushfire hazard of vegetation patches and corridors.* CSIRO. https://publications.csiro.au/rpr/pub?pid=csiro:EP167343

Delany, John; Boverman, David and Matthews, Stuart. 2017, Short fire runs: Assessing bush fire risk from small areas of vegetation [online]. In: Fire Safety Engineering Stream Conference: Quantification of Fire Safety: Fire Australia 2017. Sydney: Engineers Australia, 2017: 260-266.
https://www.researchgate.net/publication/316281728_Short_Fire_Runs_Assessing_Bush_Fire_Risk_From_Small_Areas_Of_Vegetation

New South Wales Government, 2017, *Short Fire Run - Methodology for assessing bush fire risk for low risk vegetation*, NSW Rural Fire Service.
https://www.rfs.nsw.gov.au/__data/assets/pdf_file/0014/103064/Short-Fire-Run-Fact-Sheet-V6.pdf

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Standards Australia Online, 2018, *Building in Bushfire Prone Areas, AS 3959-2018*, viewed 23 August 2017, SAI Global database. https://infostore.saiglobal.com/en-au/Standards/AS-3959-2018-122340_SAIG_AS_AS_2685241/