

## Appendix C - Exposure mapping per precinct

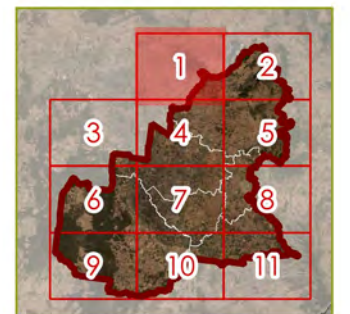


# BUSHFIRE PRONE AREA ZONE EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Bushfire Prone Area Zone	
Very High	Township
High	Rural Residential
Medium	Rural
100m Buffer	Open Space
500m Buffer	Limited Development (Constrained Land)
700m Buffer	Community Facilities



Project No: 20-017 Map No: 1 of 11

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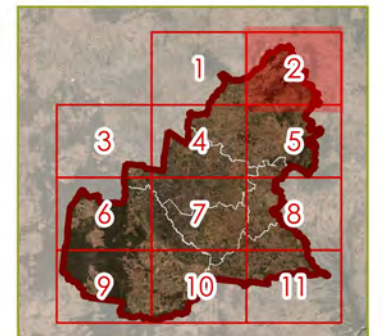


# BUSHFIRE PRONE AREA ZONE EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

- |                      |  |
|----------------------|--|
| Bushfire Prone Area  | Medium Impact Industry                 |
| Very High            | Low-Medium Density Residential         |
| High                 | Low Impact Industry                    |
| Medium               | Low Density Residential                |
| 100m Buffer          | Local Centre                           |
| 500m Buffer          | Limited Development (Constrained Land) |
| 700m Buffer          | Extractive Industry                    |
| Zone                 | Community Facilities                   |
| Township             |  |
| Sport and Recreation |  |
| Rural Residential    |  |
| Rural                |  |
| Open Space           |  |



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# BUSHFIRE PRONE AREA ZONE EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Bushfire Prone Area

Medium

100m Buffer

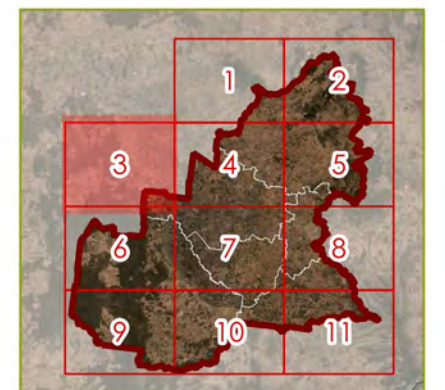
500m Buffer

700m Buffer

Zone

Rural

Community Facilities



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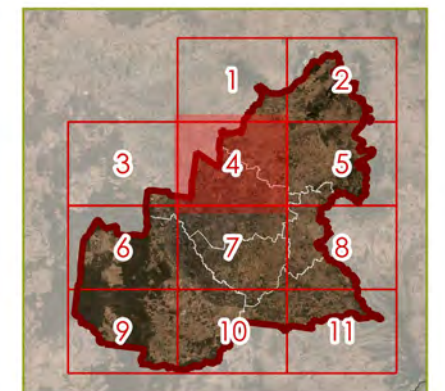


# BUSHFIRE PRONE AREA ZONE EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Bushfire Prone Area	Rural
Very High	Open Space
High	Medium Impact Industry
Medium	Major Centre
100m Buffer	Low-Medium Density Residential
500m Buffer	Low Density Residential
700m Buffer	Limited Development (Constrained Land)
Zone	Extractive Industry
Township	Community Facilities
Sport and Recreation	
Specialised Centre	
Rural Residential	



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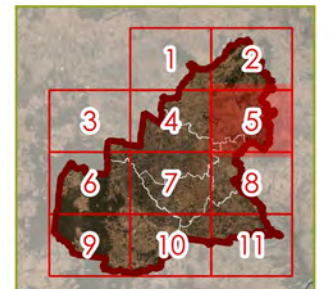


# BUSHFIRE PRONE AREA ZONE EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Bushfire Prone Area	Medium Impact Industry
Very High	Major Centre
High	Low-Medium Density Residential
Medium	Low Impact Industry
100m Buffer	Low Density Residential
500m Buffer	Local Centre
700m Buffer	Limited Development (Constrained Land)
Zone	Extractive Industry
Township	Emerging Community
Sport and Recreation	District Centre
Specialised Centre	Community Facilities
Rural Residential	
Rural	
Open Space	



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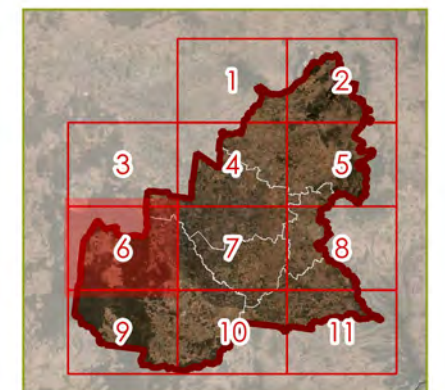


# BUSHFIRE PRONE AREA ZONE EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Bushfire Prone Area Zone	
Very High	Township
High	Rural Residential
Medium	Rural
100m Buffer	Open Space
500m Buffer	Extractive Industry
700m Buffer	Community Facilities



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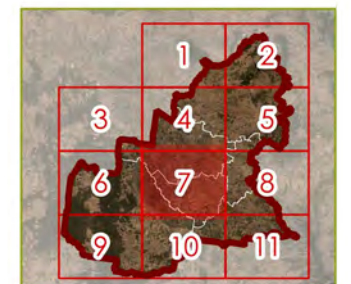


# BUSHFIRE PRONE AREA ZONE EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Bushfire Prone Area	Medium Impact Industry
Very High	Major Centre
High	Low-Medium Density Residential
Medium	Low Impact Industry
100m Buffer	Low Density Residential
500m Buffer	Limited Development (Constrained Land)
700m Buffer	High Impact Industry
Zone	Extractive Industry
Township	Community Facilities
Sport and Recreation	
Specialised Centre	
Rural Residential	
Rural	
Open Space	



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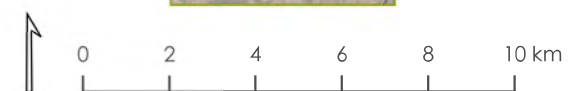


# BUSHFIRE PRONE AREA ZONE EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Bushfire Prone Area		Medium Impact Industry
Very High		Major Centre
High		Low-Medium Density Residential
Medium		Low Impact Industry
100m Buffer		Low Density Residential
500m Buffer		Local Centre
700m Buffer		Limited Development (Constrained Land)
Zone		High Impact Industry
Township		Extractive Industry
Sport and Recreation		Emerging Community
Specialised Centre		District Centre
Rural Residential		Community Facilities
Rural		
Principal Centre		
Open Space		
Mixed Use		



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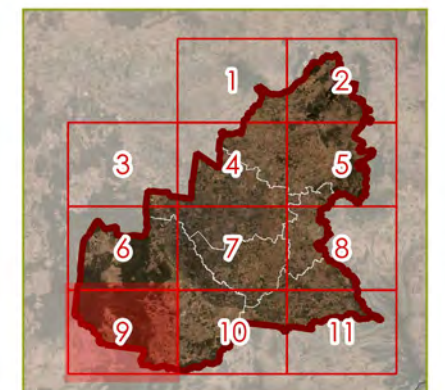


# BUSHFIRE PRONE AREA ZONE EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Bushfire Prone Area Zone	
Very High	Rural Residential
High	Rural
Medium	Open Space
100m Buffer	Extractive Industry
500m Buffer	Community Facilities
700m Buffer	



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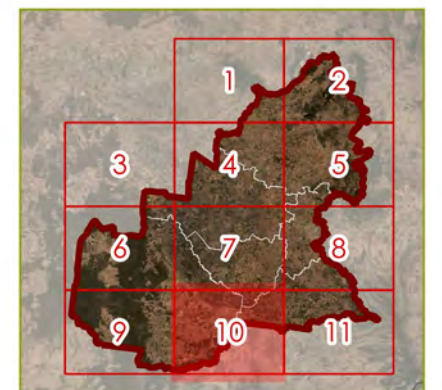


# BUSHFIRE PRONE AREA ZONE EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

- |                      |  |
|----------------------|--|
| Bushfire Prone Area  | Open Space                             |
| Very High            | Medium Impact Industry                 |
| High                 | Major Centre                           |
| Medium               | Low-Medium Density Residential         |
| 100m Buffer          | Limited Development (Constrained Land) |
| 500m Buffer          | High Impact Industry                   |
| 700m Buffer          | Extractive Industry                    |
| Zone                 | Community Facilities                   |
| Sport and Recreation |  |
| Rural Residential    |  |
| Rural                |  |



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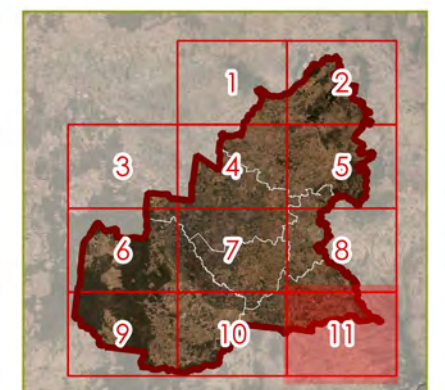


# BUSHFIRE PRONE AREA ZONE EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Bushfire Prone Area	Open Space
Very High	Medium Impact Industry
High	Major Centre
Medium	Low-Medium Density Residential
100m Buffer	Low Impact Industry
500m Buffer	Limited Development (Constrained Land)
700m Buffer	Extractive Industry
Zone	Community Facilities
Township	
Sport and Recreation	
Rural	



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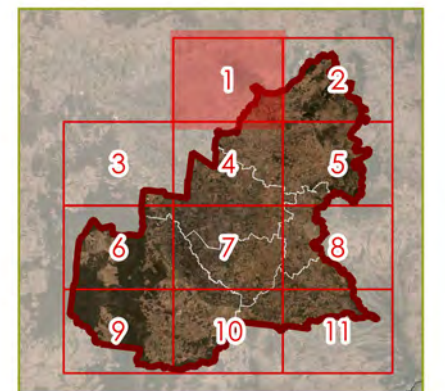


# EXPOSURE OF VULNERABLE FACILITIES

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Road Exposure	Child care
— Not exposed	Education
— Within 100m	Hospital
— Within 500m	Power generation
— Within 50m	Electrical substation
— Within 700m	Fuel station
Exposed	Water pumping station
Facilities	Sewer treatment plant
Not exposed	Water treatment plant
Exposed	
Nursing homes	



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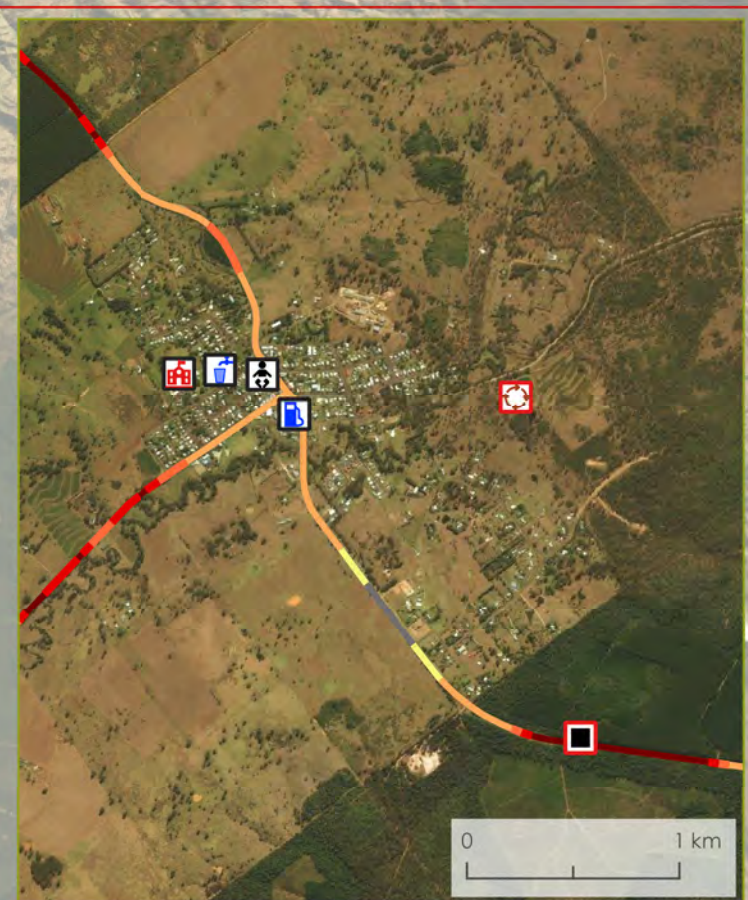


# EXPOSURE OF VULNERABLE FACILITIES

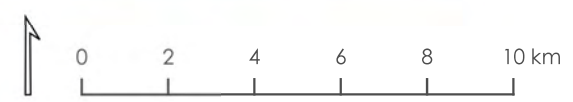
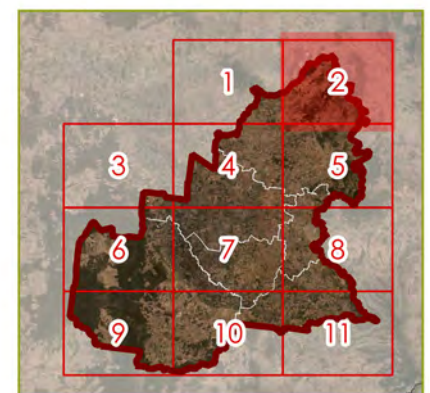
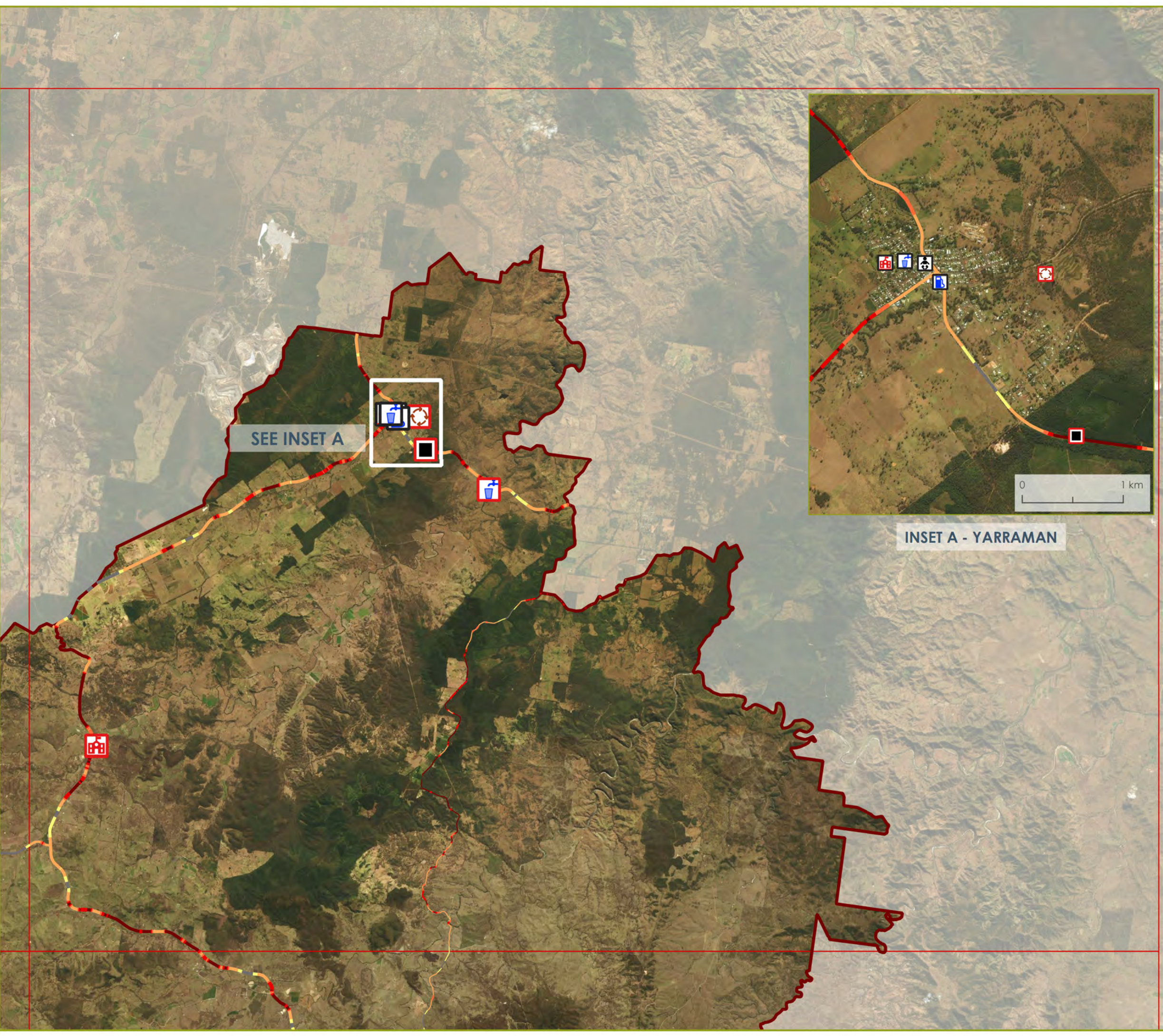
## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

- |               |                       |
|---------------|-----------------------|
| Road Exposure | Child care            |
| — Not exposed | Education             |
| — Within 100m | Hospital              |
| — Within 500m | Power generation      |
| — Within 50m  | Electrical substation |
| — Within 700m | Fuel station          |
| Exposed       | Water pumping station |
| Facilities    | Sewer treatment plant |
| Not exposed   | Water treatment plant |
| Exposed       | Nursing homes         |



INSET A - YARRAMAN



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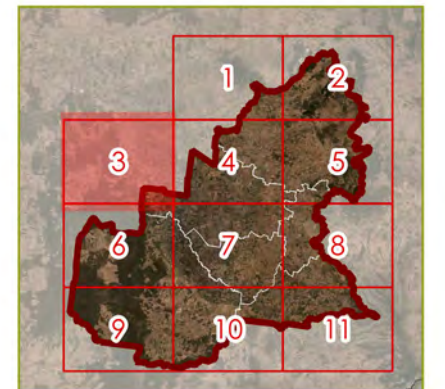


# EXPOSURE OF VULNERABLE FACILITIES

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Road Exposure	 Child care
— Not exposed	 Education
— Within 100m	 Hospital
— Within 500m	 Power generation
— Within 50m	 Electrical substation
— Within 700m	 Fuel station
Exposed	 Water pumping station
Facilities	 Sewer treatment plant
 Not exposed	 Water treatment plant
 Exposed	
 Nursing homes	



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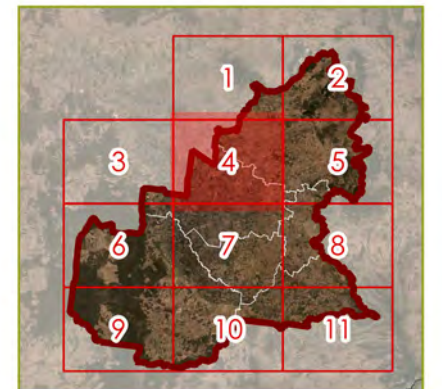


# EXPOSURE OF VULNERABLE FACILITIES

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Road Exposure	Child care
— Not exposed	Education
— Within 100m	Hospital
— Within 500m	Power generation
— Within 50m	Electrical substation
— Within 700m	Fuel station
— Exposed	Water pumping station
Facilities	Sewer treatment plant
□ Not exposed	Water treatment plant
□ Exposed	
□ Nursing homes	



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INSET A - Oakey

SEE INSET A

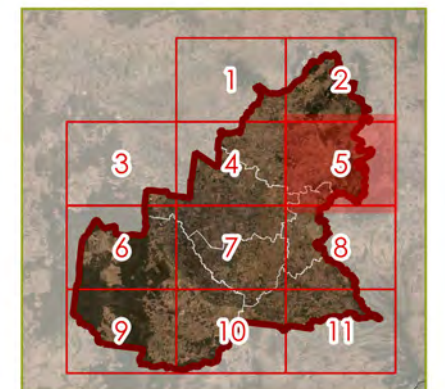


# EXPOSURE OF VULNERABLE FACILITIES

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

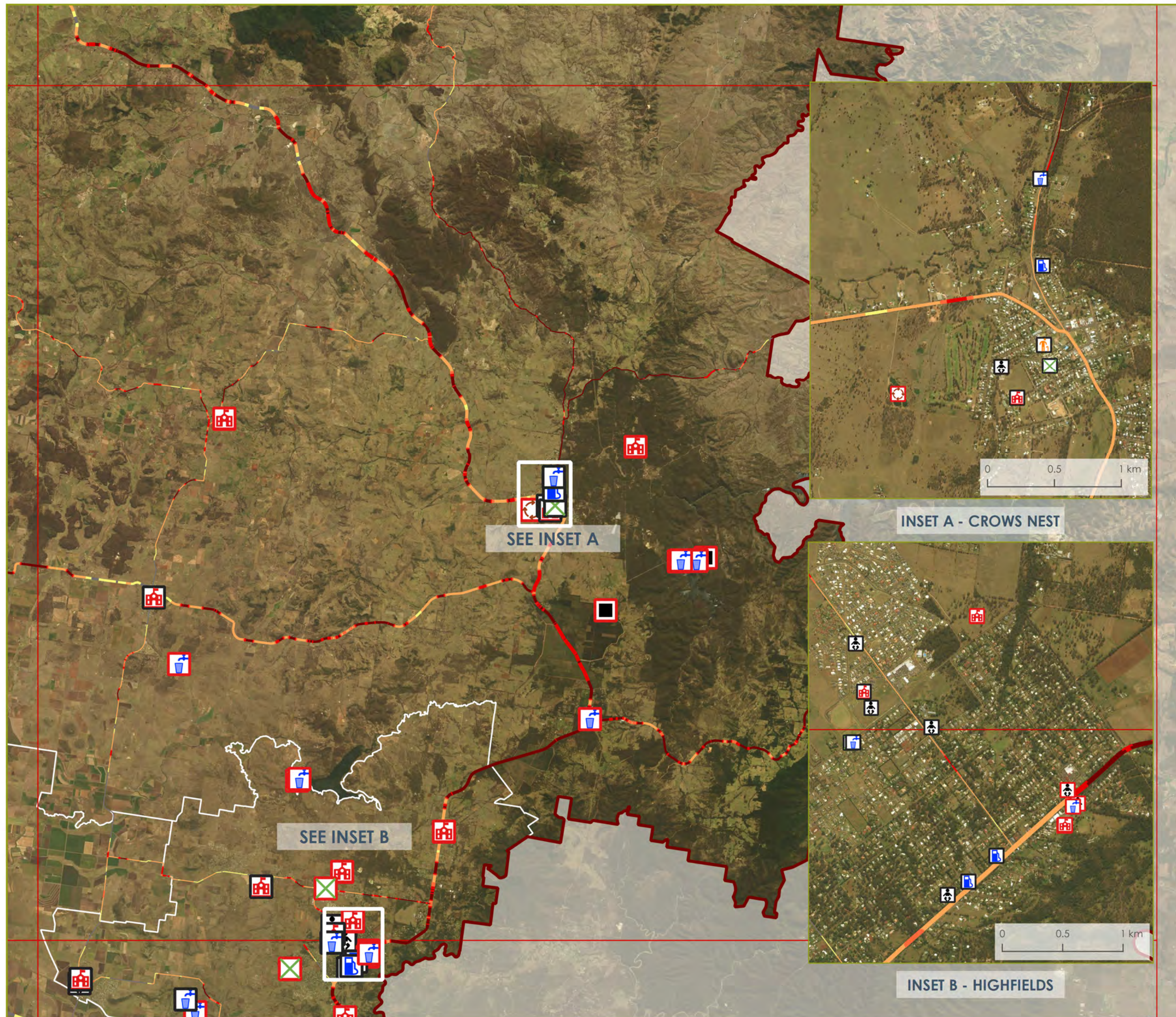
### LEGEND

Road Exposure	Child care
— Not exposed	Education
— Within 100m	Hospital
— Within 500m	Power generation
— Within 50m	Electrical substation
— Within 700m	Fuel station
Exposed	Water pumping station
Facilities	Sewer treatment plant
Not exposed	Water treatment plant
Exposed	
Nursing homes	



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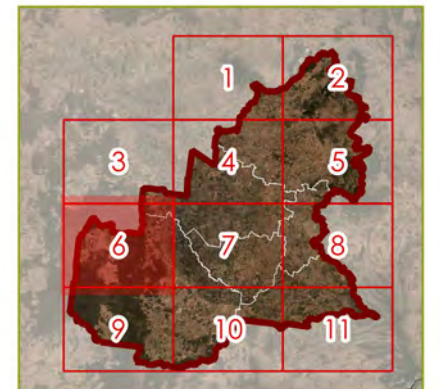


# EXPOSURE OF VULNERABLE FACILITIES

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Road Exposure	 Child care
— Not exposed	 Education
— Within 100m	 Hospital
— Within 500m	 Power generation
— Within 50m	 Electrical substation
— Within 700m	 Fuel station
Exposed	 Water pumping station
Facilities	 Sewer treatment plant
 Not exposed	 Water treatment plant
 Exposed	
 Nursing homes	



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INSET A - CECIL PLAINS

SEE INSET A

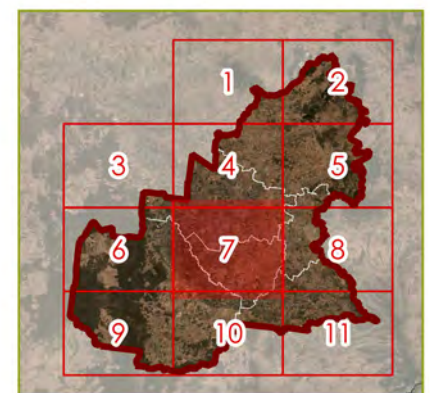


# EXPOSURE OF VULNERABLE FACILITIES

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

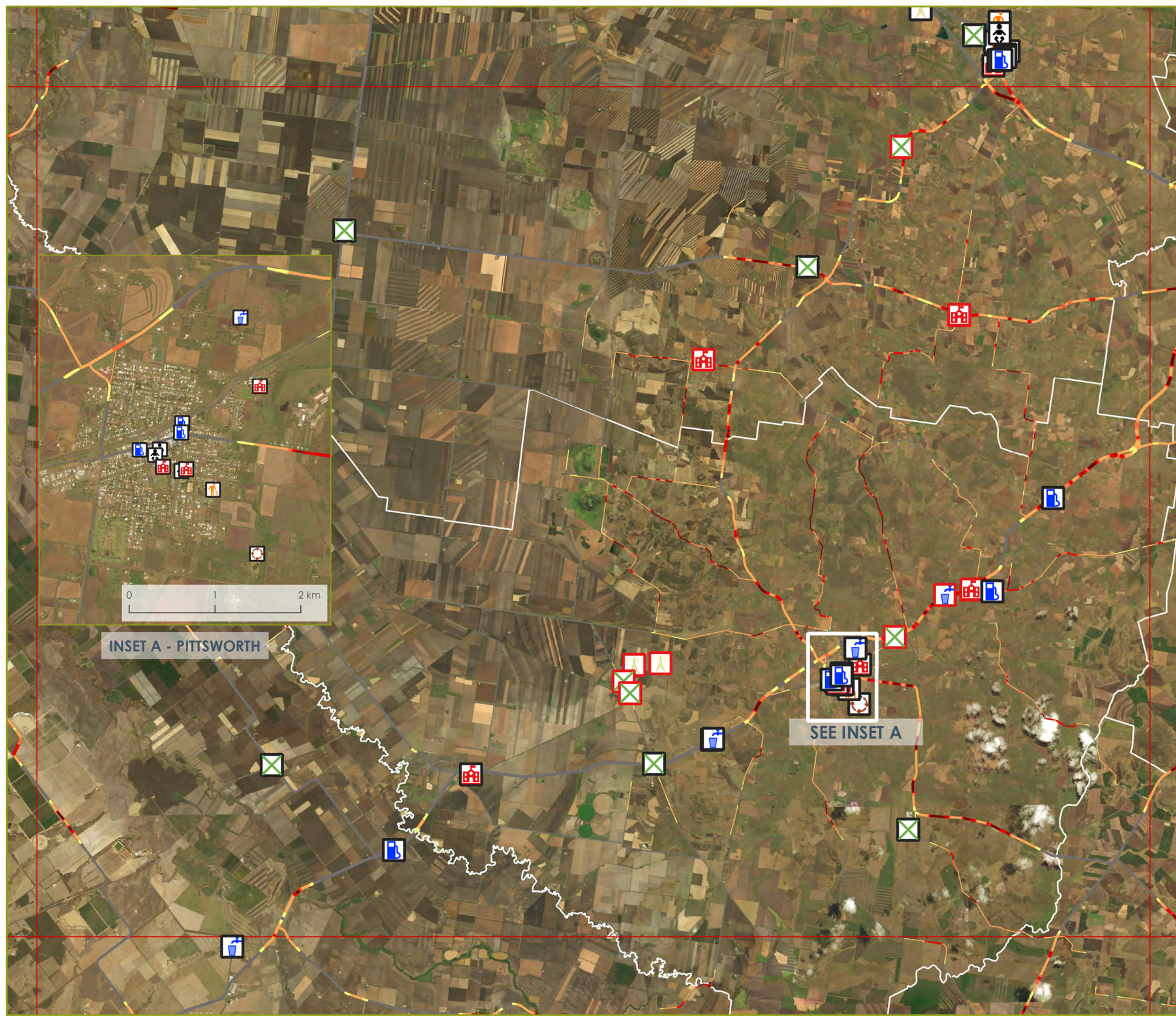
### LEGEND

- |                      |                       |
|----------------------|-----------------------|
| <b>Road Exposure</b> | Child care            |
| — Not exposed        | Education             |
| — Within 100m        | Hospital              |
| — Within 500m        | Power generation      |
| — Within 50m         | Electrical substation |
| — Within 700m        | Fuel station          |
| — Exposed            | Water pumping station |
| <b>Facilities</b>    | Sewer treatment plant |
| Not exposed          | Water treatment plant |
| Exposed              |                       |
| Nursing homes        |                       |



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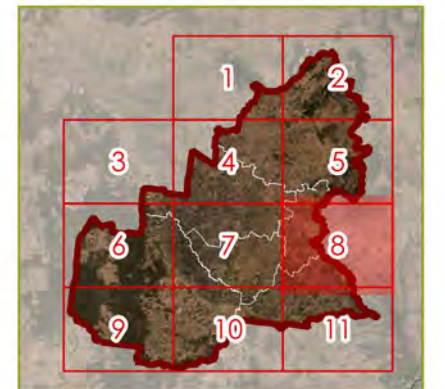


# EXPOSURE OF VULNERABLE FACILITIES

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

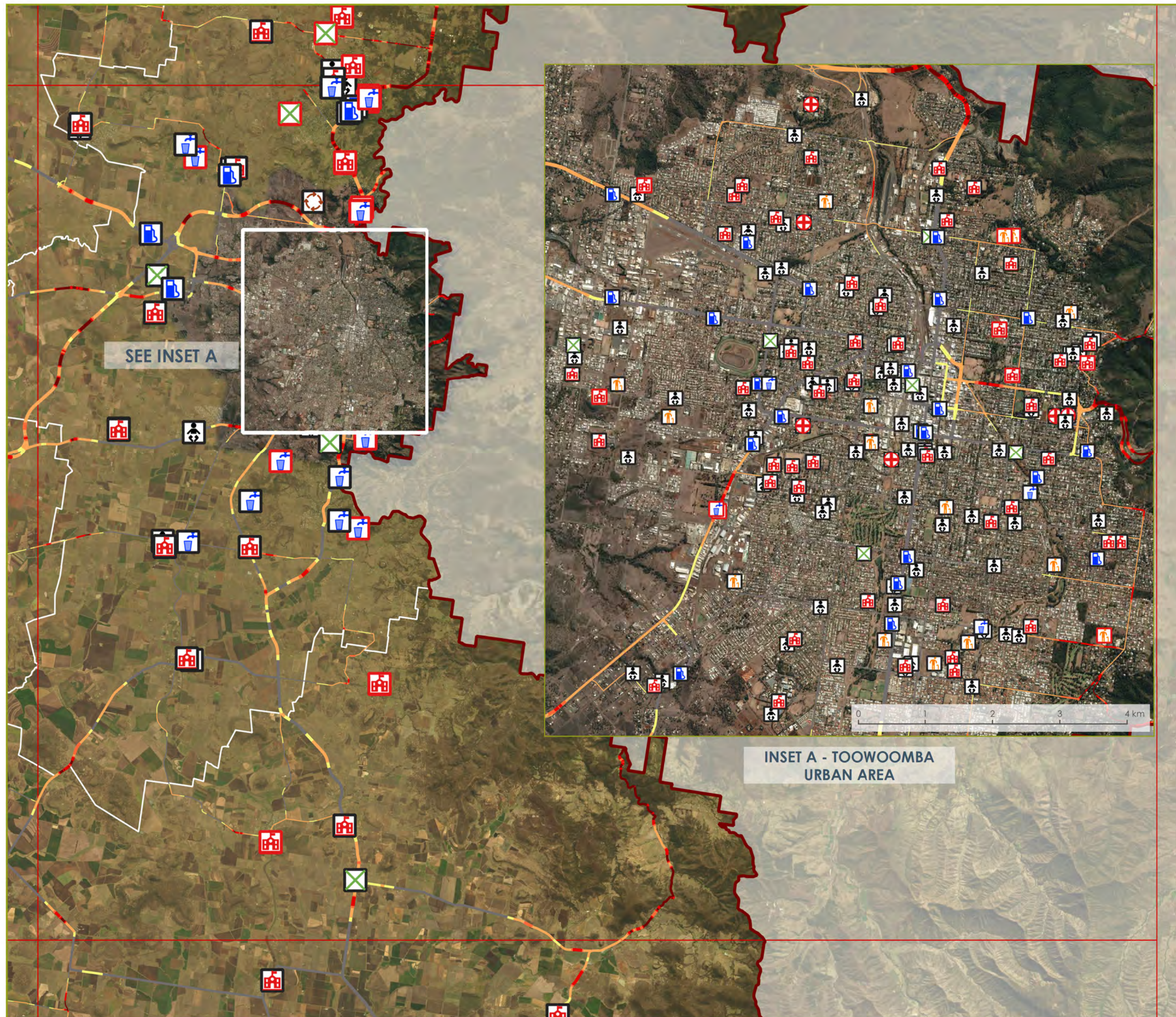
### LEGEND

Road Exposure	Child care
— Not exposed	Education
— Within 100m	Hospital
— Within 500m	Power generation
— Within 50m	Electrical substation
— Within 700m	Fuel station
— Exposed	Water pumping station
Facilities	Sewer treatment plant
Not exposed	Water treatment plant
Exposed	
Nursing homes	



Project No: 20-017 Map No: 8 of 11

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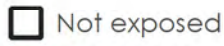

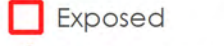
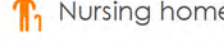


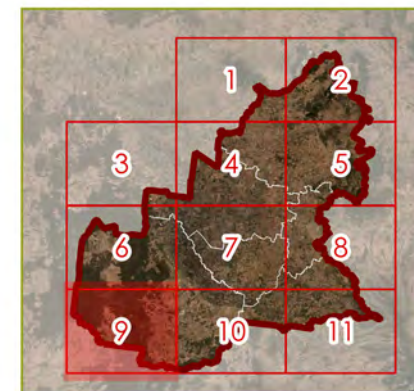


# EXPOSURE OF VULNERABLE FACILITIES

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Road Exposure	 Child care
— Not exposed	 Education
— Within 100m	 Hospital
— Within 500m	 Power generation
— Within 50m	 Electrical substation
— Within 700m	 Fuel station
— Exposed	 Water pumping station
Facilities	 Sewer treatment plant
 Not exposed	 Water treatment plant
 Exposed	
 Nursing homes	



Project No: 20-017 Map No: 9 of 11

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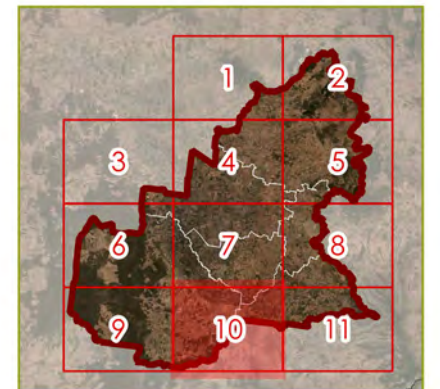


# EXPOSURE OF VULNERABLE FACILITIES

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

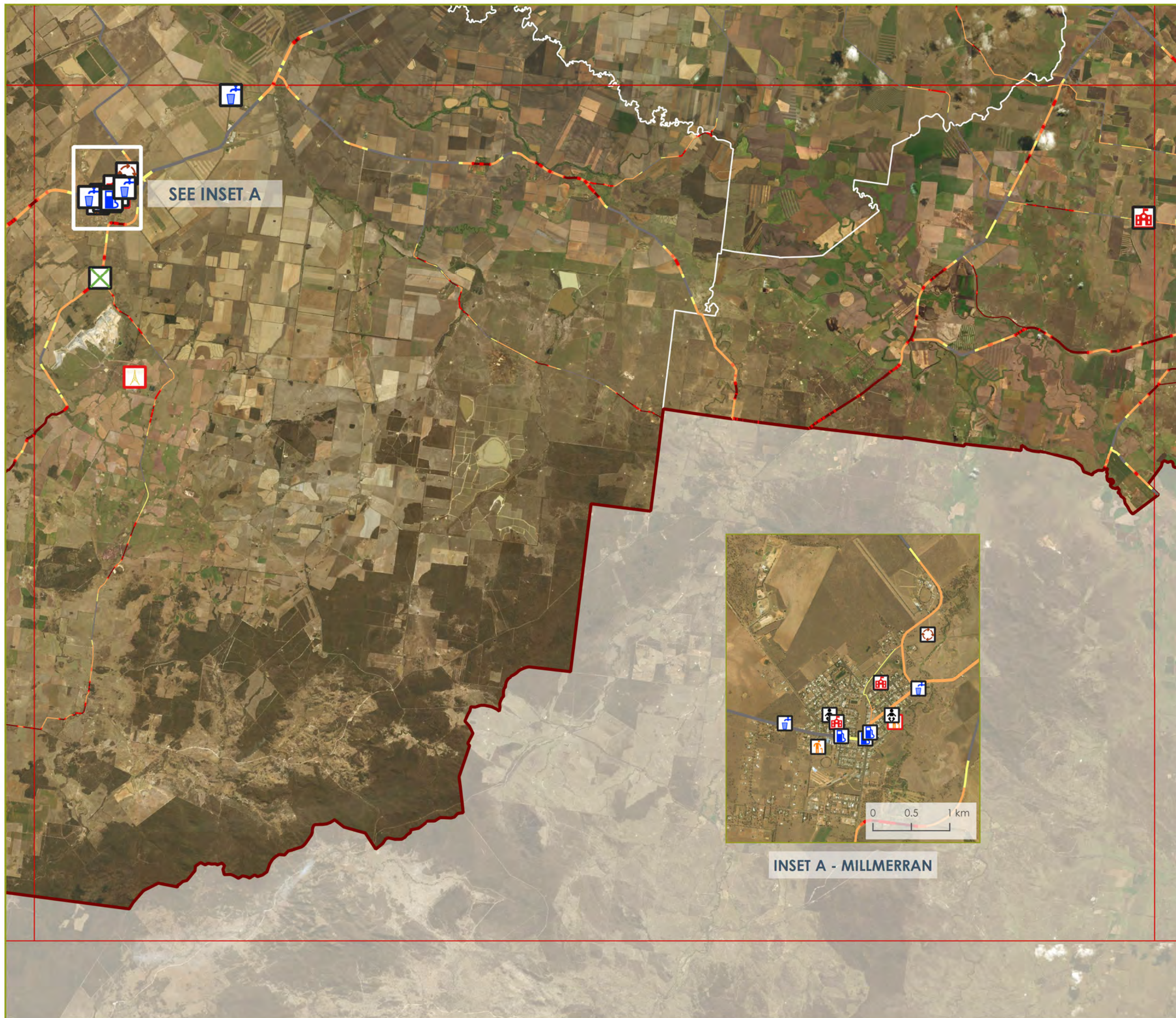
### LEGEND

Road Exposure	Child care
— Not exposed	Education
— Within 100m	Hospital
— Within 500m	Power generation
— Within 50m	Electrical substation
— Within 700m	Fuel station
Exposed	Water pumping station
Facilities	Sewer treatment plant
Not exposed	Water treatment plant
Exposed	
Nursing homes	



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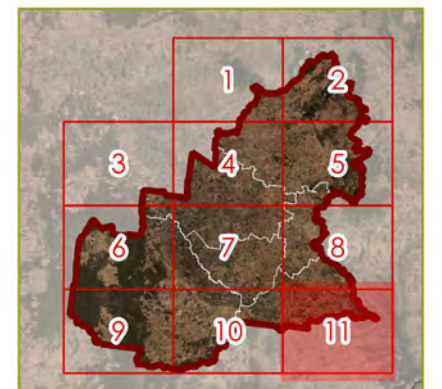


# EXPOSURE OF VULNERABLE FACILITIES

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

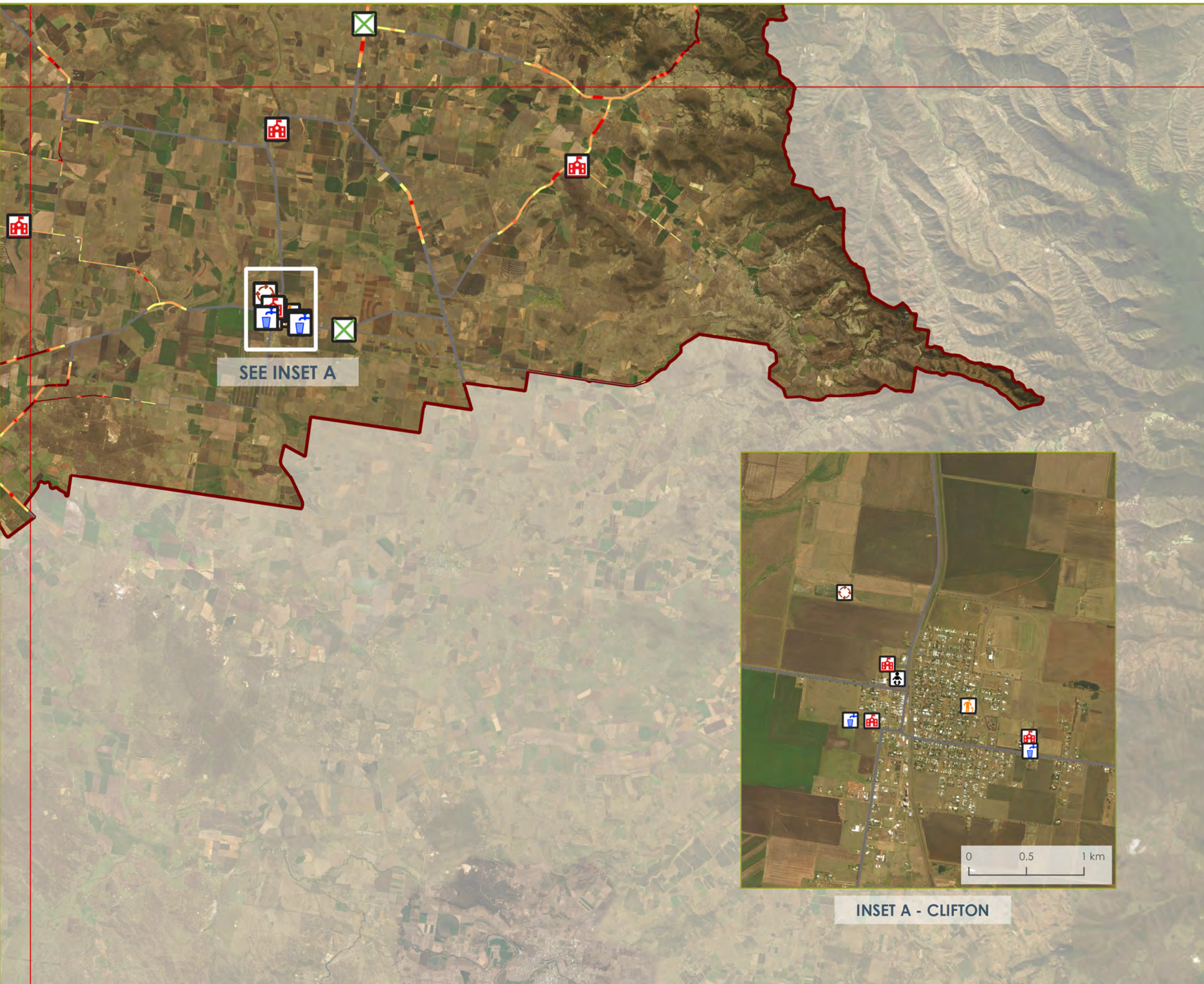
### LEGEND

Road	 Child care
Exposure	 Education
— Not exposed	 Hospital
— Within 100m	 Power generation
— Within 500m	 Electrical substation
— Within 50m	 Fuel station
— Within 700m	 Water pumping station
— Exposed	 Sewer treatment plant
Facilities	 Water treatment plant
 Not exposed	
 Exposed	
 Nursing homes	



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INSET A - CLIFTON

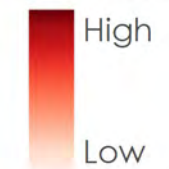


# RESIDENTIAL EXPOSURE - MILLMERRAN PRECINCT

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

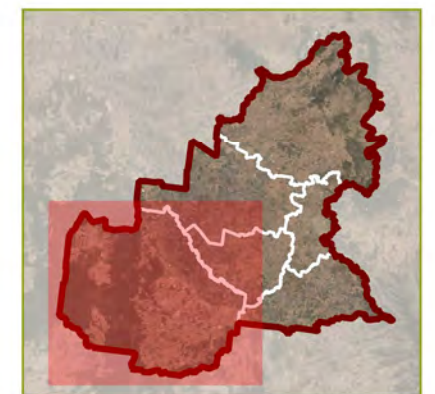
### LEGEND

Residential  
Exposure



Road  
Exposure

- Exposed
- Within 50m
- Within 100m
- Within 500m
- Within 700m
- Not exposed



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RESIDENTIAL EXPOSURE -  
PITTSWORTH PRECINCT

TOOWOOMBA BUSHFIRE RISK  
ASSESSMENT

LEGEND

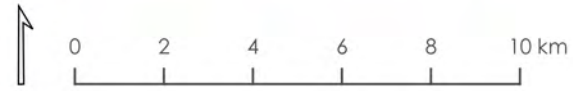
- Residential Exposure



High

Low
- Road Exposure

  - Exposed
  - Within 50m
  - Within 100m
  - Within 500m
  - Within 700m
  - Not exposed



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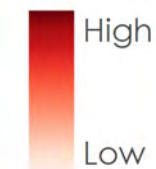


# RESIDENTIAL EXPOSURE - CLIFTON - GREENMOUNT PRECINCT

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

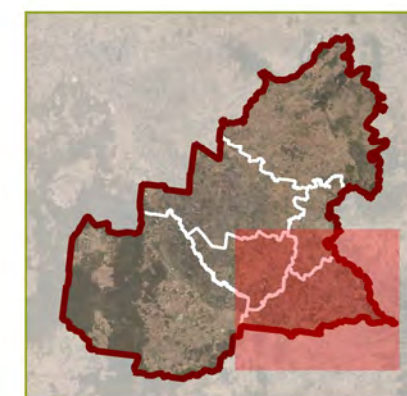
### LEGEND

Residential  
Exposure



Road  
Exposure

- Exposed
- Within 50m
- Within 100m
- Within 500m
- Within 700m
- Not exposed



Project No: 20-017

Map No: 3 of 6

Coordinate System: GDA 2020 MGA Zone 56  
Printed at: A3  
Creation Date: 13/08/2021  
Credits: © CNES / Airbus Maxar Technologies Landsat /  
Capernicus

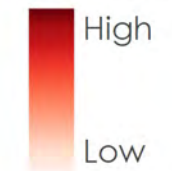


# RESIDENTIAL EXPOSURE - TOOWOOMBA URBAN AREA PRECINCT

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

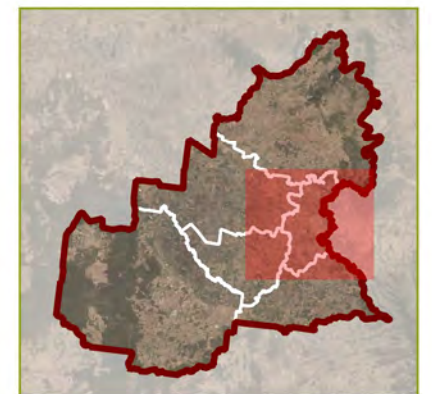
### LEGEND

Residential  
Exposure



Road  
Exposure

- Exposed
- Within 50m
- Within 100m
- Within 500m
- Within 700m
- Not exposed



Project No: 20-017

Map No: 4 of 6

Coordinate System: GDA 2020 MGA Zone 56

Printed at: A3

Creation Date: 13/08/2021

Credits: © CNES / Airbus Maxar Technologies Landsat /  
Capernicus

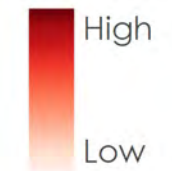


# RESIDENTIAL EXPOSURE - JONDARYAN PRECINCT

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

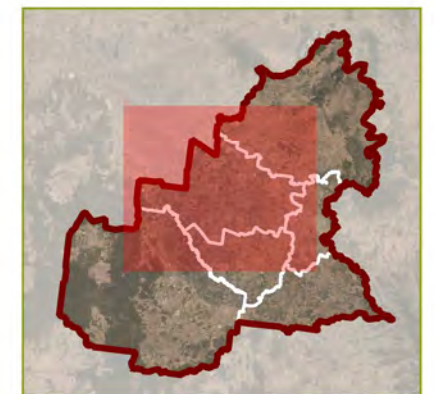
### LEGEND

Residential Exposure



Road Exposure

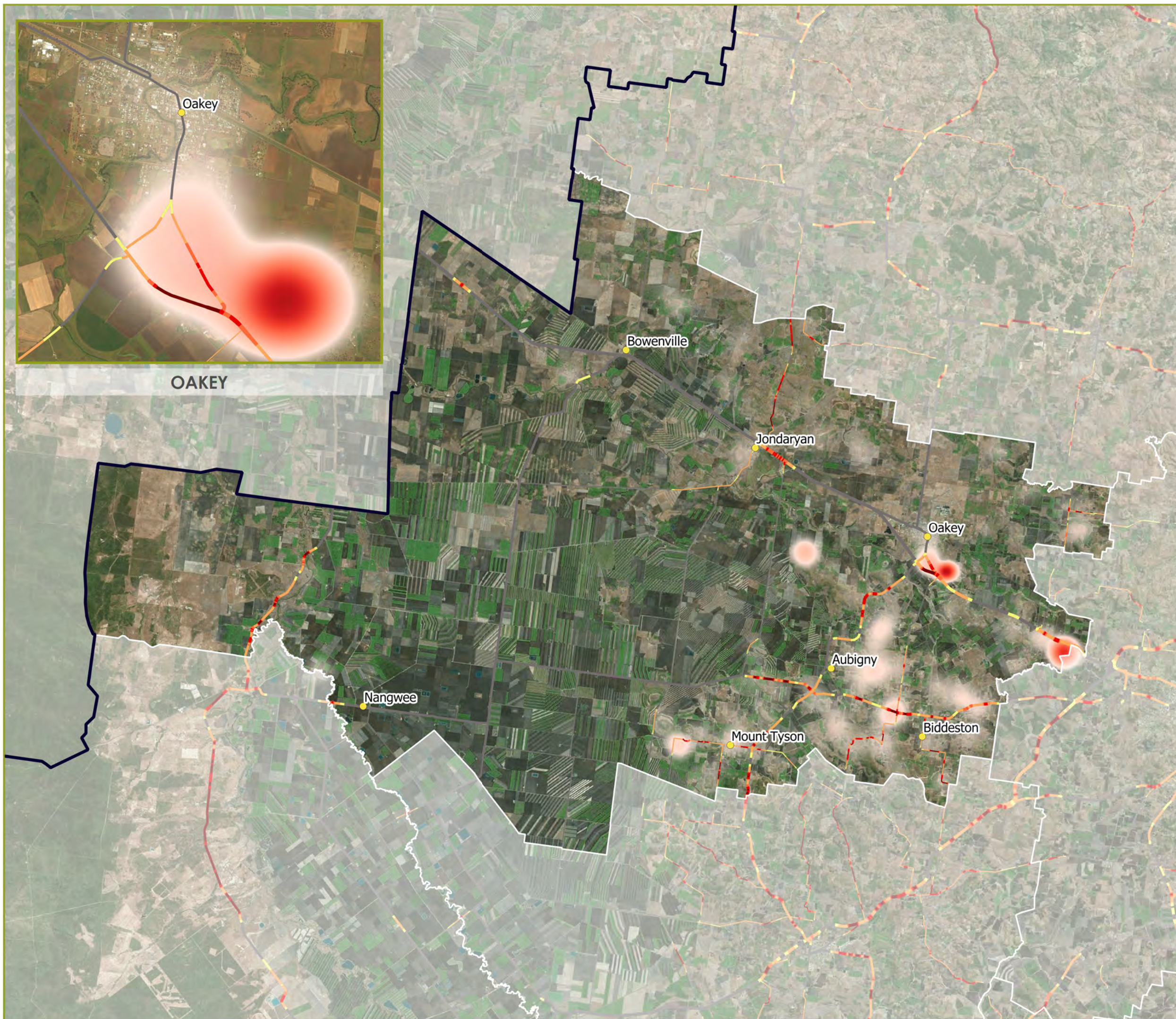
- Exposed
- Within 50m
- Within 100m
- Within 500m
- Within 700m
- Not exposed



Project No: 20-017

Map No: 5 of 6

Coordinate System: GDA 2020 MGA Zone 56  
Printed at: A3  
Creation Date: 13/08/2021  
Credits: © CNES / Airbus Maxar Technologies Landsat / Capernicus



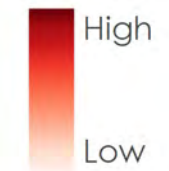


# RESIDENTIAL EXPOSURE - CROWS NEST - ROSALIE PRECINCT

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

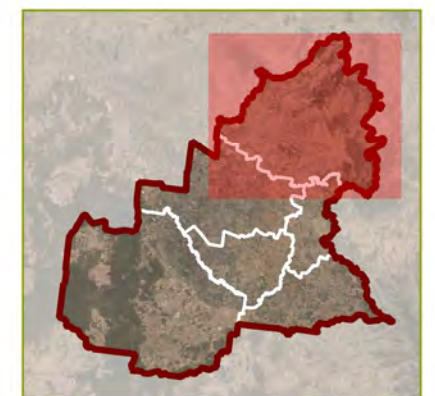
### LEGEND

Residential Exposure



Road Exposure

- Exposed
- Within 50m
- Within 100m
- Within 500m
- Within 700m
- Not exposed



Project No: 20-017

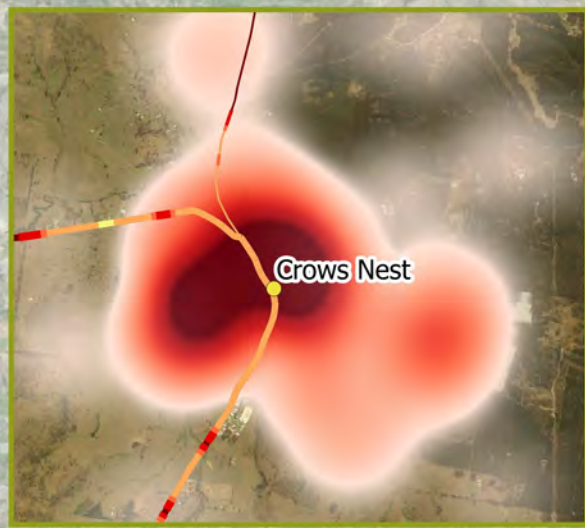
Map No: 6 of 6

Coordinate System: GDA 2020 MGA Zone 56

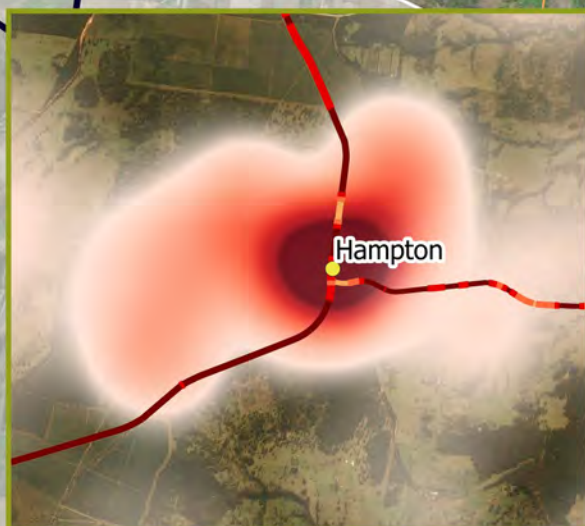
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Creation Date: 13/08/2021

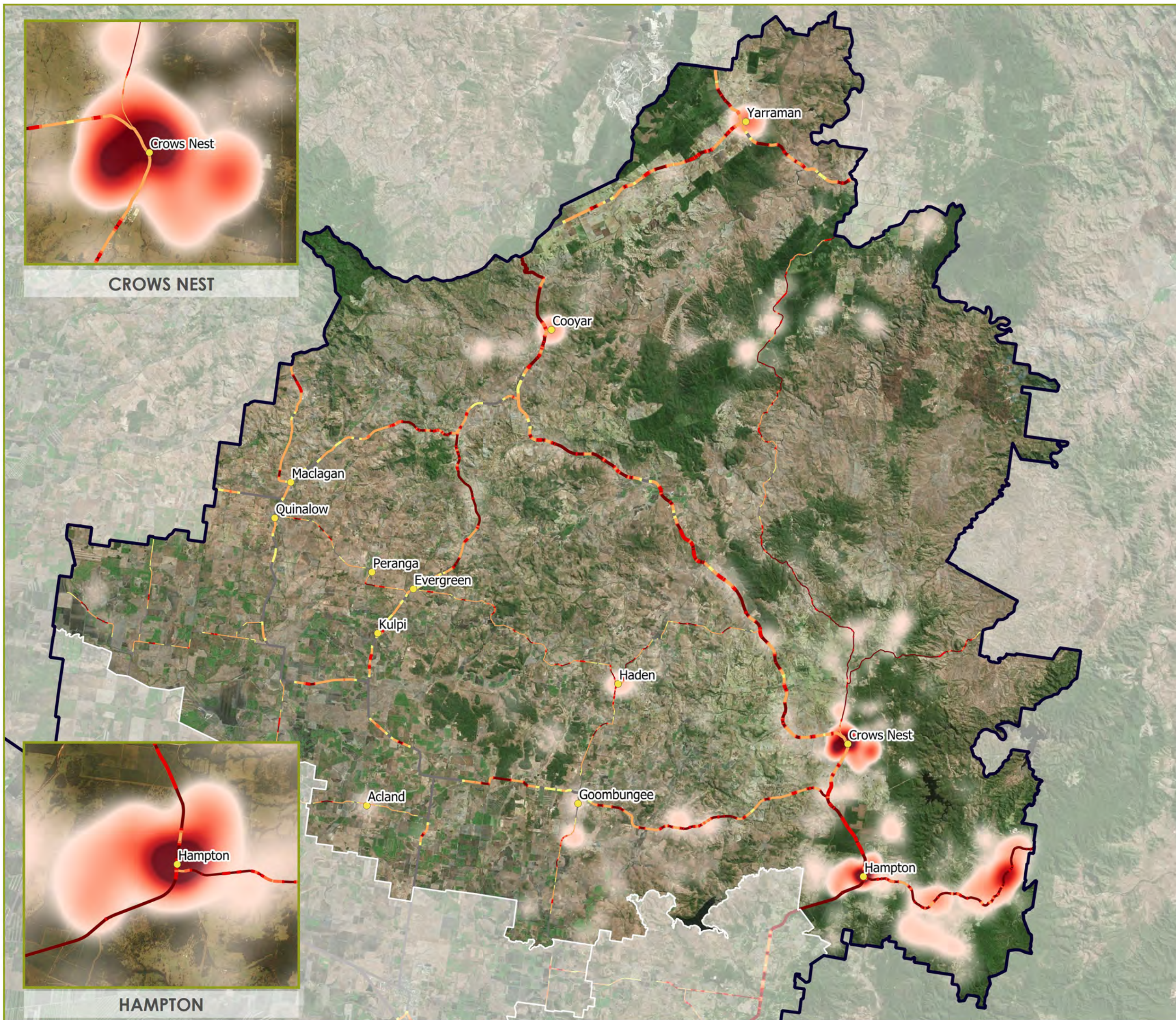
Credits: © CNES / Airbus Maxar Technologies Landsat / Capernicus



CROWS NEST



HAMPTON





## Appendix D - Zoning-based analysis of hazard exposure (data summary)



## Overview

A geospatial analysis of each precinct within the Toowoomba Region has been undertaken on the basis of:

- the existing planning cadastre for the Toowoomba Region
- existing Toowoomba Regional Planning Scheme zoning
- the bushfire hazard overlay contained within the existing Toowoomba Regional Planning Scheme
- the State-wide bushfire prone areas mapping as per the existing SPP IMS

The following data tables are a selected snapshot of the geospatial data analysis undertaken, providing key indicators of potential bushfire hazard and risk exposure across each precinct of the Toowoomba Region, commencing with a whole-of-region snapshot.

## Toowoomba Region

The Toowoomba Region comprises the entire local government area. The region is divided into SA2 precincts which provides for a more specific analysis of hazard and exposure relative to different areas of the region. These tables follow this whole-of-region snapshot.

Snapshot of zoning-based hazard analysis for the Toowoomba Region

Toowoomba Region zoning-based hazard analysis													
Existing planning scheme zoning	Hazard mapping	Key bushfire loss indicators			Very High Potential Hazard Area			High Potential Hazard Area			Medium Potential Hazard Area		
		% of zone within 100m	% of zone within 500m	% of zone within 700m	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat
Emerging community	Overlay	40.72	82.8	93.67	n/a	n/a	n/a	1.07	2.53	3.89	16.61	30.45	51.53
	State-wide BPA	34.45	79.82	90.42	0.19	0.81	1.8	3.99	8.07	11.86	11.88	22.74	32.88
	Overlay	29.68	68.26	78.43	n/a	n/a	n/a	0.57	2.65	5.03	11.49	21.3	39.17



Toowoomba Region zoning-based hazard analysis

Low density residential	State-wide BPA	20.64	60.94	73.61	2.97	6.02	9.08	1.67	4.96	8.92	2.7	5.99	10.22
Rural residential	Overlay	61.59	93.34	96.49	n/a	n/a	n/a	0.82	2.77	4.63	31.04	49.45	72.64
	State-wide BPA	44.61	85.07	91.39	5.23	10.2	14.61	5.41	13.66	21.92	10.7	20.94	30.71
Rural	Overlay	18.3	41.37	49.72	n/a	n/a	n/a	0.14	0.34	0.51	8.94	14.2	23.29
	State-wide BPA	30.09	52.84	59.83	1.23	2.01	2.62	1.60	2.6	4.23	17.55	23.58	28.67
Township	Overlay	14.19	48.29	61.26	n/a	n/a	n/a	0	0	0	4.37	9.41	20.81
	State-wide BPA	13.94	49.62	62.7	0	0	0	0.49	1.25	2.41	5.39	9.37	13.59
Community facilities	Overlay	31.73	58.86	68.06	n/a	n/a	n/a	1.19	3.46	5.54	17.60	25.84	37.59
	State-wide BPA	24.23	52.12	61.14	5.53	9.23	11.86	4.22	9.5	13.63	8.81	16.02	22.93
Low impact industry	Overlay	8.54	34.1	44.39	n/a	n/a	n/a	0	0	0	2.24	5.2	12.72
	State-wide BPA	11.36	41.76	51.91	0	0	0	0	0	0	5.79	9.12	11.4
Medium impact industry	Overlay	8.61	28.9	40.17	n/a	n/a	n/a	0	0	0	3.52	6.43	11.67
	State-wide BPA	9.3	29.83	41.16	0	0	0	0.04	0.1	0.11	4.48	6.97	9.2
Limited development	Overlay	83.65	86.78	87.38	n/a	n/a	n/a	17.62	41.19	47.72	62.26	82.68	84.41
	State-wide BPA	82.76	85.96	86.16	44.38	69.85	78.25	23.46	46.48	73.65	3.26	14.37	27.38
Key roads	Overlay				n/a	n/a	n/a						
	State-wide BPA												



## Toowoomba urban area precinct

The Toowoomba urban area precinct comprises a series of SA2 areas which encompass the majority of urban lands in and around the Toowoomba centre.

Snapshot of zoning-based hazard analysis for the Toowoomba urban area precinct

Toowoomba urban area precinct zoning-based hazard analysis													
Existing planning scheme zoning	Hazard mapping	Key bushfire loss indicators			Very High Potential Hazard Area			High Potential Hazard Area			Medium Potential Hazard Area		
		% of zone within 100m	% of zone within 500m	% of zone within 700m	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat
Emerging community	Overlay	40.72	82.8	93.67	n/a	n/a	n/a	1.07	2.53	3.89	16.61	30.45	51.53
	State-wide BPA	34.45	79.82	90.42	0.19	0.81	1.8	3.99	8.07	11.86	11.88	22.74	32.88
Low density residential	Overlay	24.39	62.87	72.36	n/a	n/a	n/a	0.60	2.79	5.29	11.76	21.82	39.99
	State-wide BPA	21.26	62.28	74.91	3.12	6.33	9.55	1.74	5.16	9.28	2.64	5.99	10.32
Rural residential	Overlay	64.65	96.28	98.74	n/a	n/a	n/a	0.89	3.02	5.05	32.85	52.06	75.87
	State-wide BPA	46.51	90.01	96.41	5.72	11.16	15.98	5.9	14.86	23.78	9.88	20.82	31.3
Rural	Overlay	35.34	62.5	71.1	n/a	n/a	n/a	1.01	2.64	3.86	18.04	28.54	42.2
	State-wide BPA	33.0	61.07	70.15	4.17	7.06	9.32	4.49	9.77	14.4	10.99	18.18	24.49
Township	Overlay	16.28	50.17	60.07	n/a	n/a	n/a	0	0	0	5.48	10.51	22.99
	State-wide BPA	11.41	46.28	57.92	0	0	0	0.18	0.97	2.37	4.42	7.9	11.21
Community facilities	Overlay	43.33	71.18	79.75	n/a	n/a	n/a	1.89	5.51	8.84	24.73	35.58	50.13
	State-wide BPA	27.09	55.78	65.33	8.82	14.71	18.9	6.72	14.84	21.4	8.59	16.9	25.02
Low impact industry	Overlay	10.42	41.62	54.18	n/a	n/a	n/a	0	0	0	2.73	6.34	15.52
	State-wide BPA	13.86	50.97	63.34	0	0	0	0	0	0	6.82	10.88	13.66
	Overlay	8.12	30.98	42.53	n/a	n/a	n/a	0	0	0	2.27	5.56	11.72



## Toowoomba urban area precinct zoning-based hazard analysis

Medium impact industry	State-wide BPA	9.29	32.96	45.47	0	0	0	0.05	0.13	0.15	4.23	6.66	9.17
Limited development	Overlay	100	n/a	n/a	n/a	n/a	n/a	21.27	49.72	57.6	75.11	99.41	99.71
	State-wide BPA	99.02	0.8	n/a	53.58	84.33	94.47	28.33	68.19	88.91	3.81	16.81	32.19
Key roads	Overlay				n/a	n/a	n/a						
	State-wide BPA												



## Crows Nest – Rosalie

The Crows Nest – Rosalie precinct comprises the north-eastern portion of the Toowoomba Region.

Snapshot of zoning-based hazard analysis for the Crows Nest – Rosalie precinct

Crows Nest – Rosalie precinct zoning-based hazard analysis													
Existing planning scheme zoning	Hazard mapping	Key bushfire loss indicators			Very High Potential Hazard Area			High Potential Hazard Area			Medium Potential Hazard Area		
		% of zone within 100m	% of zone within 500m	% of zone within 700m	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat
Emerging community	Overlay	0	44.74	100	n/a	n/a	n/a	0	0	0	0	0	0
	State-wide BPA	0	100	100	0	0	0	0	0	0	0	0	0
Low density residential	Overlay	42.2	95.29	99.51	n/a	n/a	n/a	2.72	4.69	6.53	13.01	29.26	56.11
	State-wide BPA	32.02	99.8	100	4.91	8.85	14.62	1.52	4.03	7.3	0.96	6.17	14.19
Rural residential	Overlay	70.18	91.31	96.77	n/a	n/a	n/a	3.94	9.84	14.35	44.55	61.93	77.2
	State-wide BPA	63.55	87.9	92.16	15.62	26.8	35.05	4.5	12.48	20.16	12.51	25.62	35.01
Rural	Overlay	56.16	85.43	91.1	n/a	n/a	n/a	0	0	2.82	33.73	33.73	50.93
	State-wide BPA	47.82	81.55	88.52	7.03	12.02	16.04	7.09	16.61	24.11	12.19	25.01	35.82
Township	Overlay	11.77	38.62	69.12	n/a	n/a	n/a	0.3	0.97	1.82	11.47	25.4	47.47
	State-wide BPA	30.23	71.46	87.95	5.13	7.21	8.61	0	0.17	1.08	5.47	15.06	24.13
Community facilities	Overlay	81.81	91.4	93.98	n/a	n/a	n/a	6.54	17.01	24.29	63.26	76.6	85.95
	State-wide BPA	77.84	92.8	95.3	35.7	51.48	59.56	19.7	43.84	59.33	6.39	18.65	31.49
Low impact industry	Overlay	3.03	66.66	75.35	n/a	n/a	n/a	0	0	0	0	0.3	18.34
	State-wide BPA	0.90	66.66	69.05	0	0	0	0	0	0	0	0	0.90
Medium impact industry	Overlay	29.85	89.44	100	n/a	n/a	n/a	0	0	0	8.26	22.24	43.13
	State-wide BPA	42.73	100	100	0	0	0	2.9	6.74	10.31	9.38	20.94	32.41



## Crows Nest – Rosalie precinct zoning-based hazard analysis

Limited development	Overlay	41.85	86.5	95.09	n/a	n/a	n/a	0	0.21	1.2	14.55	29.45	55.27
	State-wide BPA	48.34	93.35	95.65	11.95	20.48	27.33	1.23	7.2	15.78	3.29	12.06	21.4
Key roads	Overlay				n/a	n/a	n/a						
	State-wide BPA												



## Clifton – Greenmount

The Clifton – Greenmount precinct comprises the south-eastern portion of the Toowoomba Region.

Snapshot of zoning-based hazard analysis for the Clifton – Greenmount precinct

Clifton – Greenmount precinct zoning-based hazard analysis													
Existing planning scheme zoning	Hazard mapping	Key bushfire loss indicators			Very High Potential Hazard Area			High Potential Hazard Area			Medium Potential Hazard Area		
		% of zone within 100m	% of zone within 500m	% of zone within 700m	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat
Emerging community	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Low density residential	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Rural residential	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Rural	Overlay	31.28	52.01	59.23	n/a	n/a	n/a	0.49	1.16	1.75	19.39	26.7	36.17
	State-wide BPA	34.27	57.23	65.12	5.84	9.26	11.83	4.95	12.8	17.6	13.08	22.45	30.01
Township	Overlay	7.78	40.63	61.79	n/a	n/a	n/a	0	0	0	2.36	5.07	12.25
	State-wide BPA	8.85	45.8	68.96	0	0.78	2.5	0	0	0	0.52	3.47	7.16
Community facilities	Overlay	25.24	40.12	45.71	n/a	n/a	n/a	0	0	0	14.69	22.32	28.65
	State-wide BPA	19.3	40.22	45.41	0	0	0	0	0	0	8.62	15.51	19.48
Low impact industry	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Medium impact industry	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a



## Clifton – Greenmount precinct zoning-based hazard analysis

Limited development	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Key roads	Overlay				n/a	n/a	n/a						
	State-wide BPA												

NOTE: Zones which feature 'n/a' values mean the relevant zones do not exist in this precinct, or are of a very small scale.



## Pittsworth

The Pittsworth precinct comprises the central area of the Toowoomba Region.

Snapshot of zoning-based hazard analysis for the Pittsworth precinct

Pittsworth precinct zoning-based hazard analysis													
Existing planning scheme zoning	Hazard mapping	Key bushfire loss indicators			Very High Potential Hazard Area			High Potential Hazard Area			Medium Potential Hazard Area		
		% of zone within 100m	% of zone within 500m	% of zone within 700m	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat
Emerging community	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Low density residential	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Rural residential	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Rural	Overlay	19.63	44.02	51.43	n/a	n/a	n/a	0	0	0	8.36	14.6	25.54
	State-wide BPA	22.31	47.56	54.76	0.07	0.19	0.34	0.96	2.2	3.51	11.31	17.05	22.08
Township	Overlay	9.01	36.29	36.74	n/a	n/a	n/a	0	0	0	0.86	4.27	13.42
	State-wide BPA	11.43	36.71	36.71	0	0	0	0	0	0	2.06	5.93	11.43
Community facilities	Overlay	7.33	50.05	65.32	n/a	n/a	n/a	0	0	0	1.12	4.23	13.77
	State-wide BPA	23.83	68.64	79.79	0	0	0	0	0	0	10.09	16.51	23.83
Low impact industry	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Medium impact industry	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a



Pittsworth precinct zoning-based hazard analysis													
Limited development	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Key roads	Overlay				n/a	n/a	n/a						
	State-wide BPA												

NOTE: Zones which feature 'n/a' values mean the relevant zones do not exist in this precinct, or are of a very small scale.



## Jondaryan

The Jondaryan precinct comprises the central north area of the Toowoomba Region which forms part of the Condamine floodplain.

Snapshot of zoning-based hazard analysis for the Jondaryan precinct

Jondaryan precinct zoning-based hazard analysis													
Existing planning scheme zoning	Hazard mapping	Key bushfire loss indicators			Very High Potential Hazard Area			High Potential Hazard Area			Medium Potential Hazard Area		
		% of zone within 100m	% of zone within 500m	% of zone within 700m	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat
Emerging community	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Low density residential	Overlay	15.81	56.35	79.63	n/a	n/a	n/a	0	0	0	6.18	11.32	23.5
	State-wide BPA	8.67	35.22	48.79	0	0	0	0.23	1	1.91	3.95	6.05	8.16
Rural residential	Overlay	42.02	67.53	70.29	n/a	n/a	n/a	0	0	0	17.25	32.05	52.16
	State-wide BPA	45.21	55.47	59.2	0	0	0	0.35	1.68	3.75	36.52	41.35	45.21
Rural	Overlay	7.92	23.75	29.96	n/a	n/a	n/a	0	0	0	2.94	5.55	11.05
	State-wide BPA	11.47	25.59	30.79	0.02	0.05	0.08	0.15	0.34	0.54	6.73	9.19	11.43
Township	Overlay	1.11	24.22	56.4	n/a	n/a	n/a	0	0	0	0	0.28	3.42
	State-wide BPA	4.37	44.55	66.85	0	0	0	0	0	0	1.06	2.26	4.36
Community facilities	Overlay	7.63	27.16	35.73	n/a	n/a	n/a	0	0	0	3.65	5.7	10.19
	State-wide BPA	8.25	25.05	30.95	0	0	0	0	0.01	0.04	1.58	4.31	8.26
Low impact industry	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Medium impact industry	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a



Jondaryan precinct zoning-based hazard analysis													
Limited development	Overlay	30.54	62.36	99.59	n/a	n/a	n/a	0	0	0	2.87	19.09	43.69
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Key roads	Overlay				n/a	n/a	n/a						
	State-wide BPA												

NOTE: Zones which feature 'n/a' values mean the relevant zones do not exist in this precinct, or are of a very small scale.

NOTE: The State-wide BPA mapping does not cover any limited development zoned land in the Jondaryan precinct.



## Millmerran

The Millmerran precinct comprises the western area of the Toowoomba Region.

Snapshot of zoning-based hazard analysis for the Millmerran precinct

Millmerran precinct zoning-based hazard analysis													
Existing planning scheme zoning	Hazard mapping	Key bushfire loss indicators			Very High Potential Hazard Area			High Potential Hazard Area			Medium Potential Hazard Area		
		% of zone within 100m	% of zone within 500m	% of zone within 700m	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat	% of zone	% of zone subject to flame contact	% of zone subject to radiant heat
Emerging community	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Low density residential	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Rural residential	Overlay	15.88	63.15	85.01	n/a	n/a	n/a	0	0	0	5.93	10.7	24.56
	State-wide BPA	0.66	6.67	13.5	0	0	0	0	0	0	0	0.32	0.65
Rural	Overlay	16.66	44.18	54.59	n/a	n/a	n/a	0	0	0	7.32	12.33	22.27
	State-wide BPA	42.04	68.54	75.93	0.07	0.16	0.26	0.94	1.87	2.76	29.04	36.16	41.85
Township	Overlay	39.78	99.86	100	n/a	n/a	n/a	0	0	0	8.71	26.81	52.15
	State-wide BPA	60.37	100	100	0	0	0	0	0	0	31.12	45.55	60.37
Community facilities	Overlay	14.25	34.8	44.91	n/a	n/a	n/a	0	0	0	6.45	10.46	18.8
	State-wide BPA	34.55	52.67	63.52	0	0	0	0	0	0	24.63	31.43	34.55
Low impact industry	Overlay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	State-wide BPA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Medium impact industry	Overlay	29.34	63.18	88.0	n/a	n/a	n/a	0	0	0	21.37	26.49	33.41
	State-wide BPA	27.16	56.99	76.75	0	0	0	0	0	0	15.27	23.04	27.1



Millmerran precinct zoning-based hazard analysis													
Limited development	Overlay	10.68	52.81	52.81	n/a	n/a	n/a	0	0	0	0	2.48	25.47
	State-wide BPA	19.7	52.81	52.81	0	0	0	0	0	0	2.91	12.14	19.69
Key roads	Overlay				n/a	n/a	n/a						
	State-wide BPA												

NOTE: Zones which feature 'n/a' values mean the relevant zones do not exist in this precinct, or are of a very small scale.



## Appendix E - Land use planning risk register



FIT-FOR-PURPOSE BUSHFIRE RISK REGISTER

NOTE: This risk register is in accordance with the Queensland Emergency Risk Management Framework Workbook however, it is adapted to inform the fit-for-purpose land use planning risk assessment for bushfire hazard as part of the scheme preparation process. It is not prepared for disaster management purposes, but may be used to inform disaster management processes.

The Workbook is adapted to have regard to potential future land use planning risk (rather than existing risk, which is the realm of disaster management)

EVENT / SCENARIO: 5% Bushfire

LIKELIHOOD: [5% Unlikely]

REGIONAL STRATEGIC RISKS

ID	Identified risk	Vulnerability Notes	Vulnerability	Likelihood	Consequences	Unmitigated risk level		Mitigation options*	Effectiveness	Residual risk	
						QERMF	ALARP			QERMF	ALARP
1	Hazard exposure may change in certain locations over time to a higher hazard class, as a result of climate change.	The region comprises substantial fuel loads in parts, and other areas where vegetation communities may be susceptible to changes in temperature and rainfall.	Low	Likely	Moderate	Medium (M7)	Intolerable	<p>The likelihood of occurrence of this risk cannot be modified.</p> <p>Planning processes consider climate change effects and adopt maximum fuel loads and highest relevant FFDI to account for future fire risk.</p> <p>Outcomes of the Temperate Climate Study are used by Council to understand potential impacts on fire weather over time across the region.</p> <p>Development is contemplated in locations where hazard exposure is lowest possible.</p>	<p>Approaches will reduce potential increased risk into the future.</p> <p>Infill development opportunities may over time address a portion of existing building risk, however this must not increase population exposure.</p> <p>Existing risk will require treatment via continued land and fire management practices, disaster management arrangements, community education and household preparation.</p>	Low (L6)	Tolerable
2	Certain parts of the evacuation network may be compromised in a fire event, and may impact the ability to evacuate.	Parts of the key evacuation route network are exposed to potential flame contact and radiant heat. This includes almost 40 per cent of network in the Crows Nest – Rosalie precinct, almost 30 per cent in the Millmerran precinct and almost 15 per cent in the Toowoomba urban area. 20 per cent of the region’s key evacuation network may be exposed.	High	Likely	Major	High (H10)	Intolerable	<p>The key evacuation route network is identified (via this risk assessment and per future planning activities), enabling the identification of road corridor treatments where possible.</p> <p>Liaison with DTMR in relation to road reserve maintenance.</p> <p>Council liaison with regard to local road reserve maintenance.</p> <p>Identification of new road connections to facilitate growth which aid evacuation opportunities, providing increased route options.</p> <p>Use of NSPs in key townships where evacuation may be challenged.</p> <p>Focus future growth expansion in locations where additional road network connections can be facilitated to support development.</p> <p>Identify potential key existing pinch points in the urban network where</p>	<p>Road reserve maintenance is resource intensive. Focus should be on key locations where maximum benefit can be achieved.</p> <p>Ongoing strategic planning has the opportunity to orient growth to locations where new road infrastructure can appropriately service development, providing multiple egress options.</p> <p>Planning can also alleviate existing pinch point locations across the urban (and broader network) by including works in the LGIP, or seeking State or Federal road, regions, resilience funding.</p>	Medium (M8)	Tolerable



								opportunities exist to add works into the LGIP to achieved improve evacuation potential.			
3	Grassfire hazard in cropping and grazing lands exists, presenting a risk for agricultural losses and economic impact.	Large expanses of the region incorporate high-value cropping and agricultural activities. Many do not include asset protection zones, as productive land is maximized. Cropping and grasslands are interspersed with small pockets of bushland which could propagate and carry fire.	Moderate	Possible	Moderate	Medium (M7)	Tolerable	<p>Business continuity plans development via disaster management arrangements may assist to generate appetite for asset protection zones, and water supply for fire fighting.</p> <p>Many rural landholders have farm fire units.</p> <p>Roads and infrastructure corridors maintained in low fuel condition can help to establish control lines.</p> <p>Statutory planning controls can incorporate provisions for feedlots and intensive animal husbandry activities.</p>	<p>These measures can be less effective during period of persistent drought.</p> <p>Cropping areas are generally irrigated and may not support fire of any significant intensity.</p> <p>Large-scale feedlots and similar activities can reasonably accommodate reasonable asset protection zones and water supplies for firefighting.</p>	Low (6)	Tolerable
4	Considerable risk to community facilities, services and infrastructure within the community facilities zone is present.	A number of community facilities and critical infrastructure assets and networks are located within bushfire prone areas across the region. However, the scale is limited.	Moderate	Likely	Major	High (H9)	Intolerable	<p>Historical settlement planning has limited the extent of community facilities and critical infrastructure assets within the bushfire prone area. This policy position should be retained.</p> <p>However, there are a number of assets which are potentially exposed. This is dominated by educational facilities and followed by water and sewerage facilities and electricity substation assets.</p> <p>Infrastructure assets may benefit from asset protection zones. Where network vulnerabilities exist, these should be identified and mitigated with infrastructure providers.</p> <p>New community facilities and critical infrastructure assets should ideally be located out of the bushfire prone area. Statutory provisions can assist to achieve this outcome, noting some infrastructure approvals processes need not apply to Council.</p>	<p>The most effective opportunity to limit risk is to avoid these land uses in bushfire prone areas.</p> <p>Where this cannot be achieved, strong statutory provisions which guide resilient siting, design and construction of critical infrastructure can be implemented via the new planning scheme.</p>	Medium (M8)	Tolerable
5	Recovery and reconstruction may be long and costly.	Almost 7,000 dwellings in the region are within 100 metres of bushfire hazard, and almost 17,000 persons. Most of these are within the Toowoomba urban area. Housing stock in the region largely pre-dates AS3959 construction requirements, or bushfire planning provisions. Housing loss may lead to population displacement	Moderate	Possible	Major	Medium (M8)	Tolerable	<p>This is largely a legacy of existing development.</p> <p>Preparedness and mitigation measures identified by the USQ study into preparedness of communities on the Toowoomba Escarpment should be implemented.</p> <p>Council may encourage property owners to retrofit existing dwellings in-line with the Queensland Government's Bushfire Resilient</p>	<p>Mitigation measures are long-term community-focused treatments. Thus overall, the risk level is unlikely to change in the short-term.</p> <p>Infill development targets should avoid uses which increase the resident population in bushfire prone areas.</p>	Medium (M8)	Tolerable



		and extreme reliance on recovery services. Reconstruction may extend into years.						Building Guidance for Queensland Homes.  Home-owners may be encouraged to ensure they have adequate insurance cover, including cost of demolition, debris and asbestos, and construction to new building standards.  Infill development should not increase the extent of exposed population.			
6	A proportion of residents and businesses do not have adequate insurance cover.	The ICA estimates that 1 in 20 properties are not insured, and up to 70 per cent are under insured. Two thirds of renters do not have contents insurance.	Moderate	Possible	Moderate	Medium (M7)	Tolerable	Home-owners may be encouraged to ensure they have adequate insurance cover, including cost of demolition, debris and asbestos, and construction to new building standards.  Preparedness and mitigation measures identified by the USQ study into preparedness of communities on the Toowoomba Escarpment should be implemented.  Community education programs are currently geared to dealing with this matter, including Get Ready Queensland. Many resources are available.  Business continuity plans development via disaster management arrangements may assist.	Mitigation measures are long-term community-focused treatments. Thus overall, the risk level is unlikely to change in the short-term.  In the longer term, insurers may stop insuring in high risk locations. Thus, land use planning must ensure future growth is oriented away from these locations to ensure unacceptable residual risk is not transferred to home-owners who have the least amount of resources to mitigate.	Medium (M7)	Tolerable
7	Certain land uses within interface locations may inadvertently impact on the ability to implement certain forms of hazard reduction, due to the risk magnitude of mitigation activities.	The types of land uses establishing within bushfire prone areas can inadvertently impact on the ability for prescribed burning to be conducted, due to the impact of smoke on vulnerable persons.	Low	Possible	Moderate	Low (L6)	Tolerable	Planning policy and statutory controls which avoid vulnerable facilities within bushfire prone areas will effectively alleviate this inadvertent outcome from occurring.  Where such a facility may be necessary, Council's disaster management team should be consulted as part of the development assessment process.	This is a highly effective measure to prevent inadvertent impacts on the implementation of hazard reduction activities which benefit the broader community.	Low (L4)	Acceptable
8	Land and fire management activities may face added pressure from expanding development in interface areas. Ecological assets may be impacted.	Expansion of development at the urban bushland interface may generate increased land and management requirements for adjoining lands, noting those stakeholders are rarely informed or consulted as part of development assessment processes.	Moderate	Possible	Major	Medium (M8)	Intolerable	Irrespective of planning and building measures, adjoining land managers can have increased liability thrust upon them involuntarily by adjoining development, irrespective of whether development complies with planning and building provisions.  Growth expansion should consider the impact on adjoining land managers in managing hazard and risk.	Strategic planning measures to orient growth in risk-responsive locations and in a risk-responsive manner can alleviate unintended consequences for land managers.  Statutory planning provisions should be more than capable of managing risk exposure as part of the development.	Low (L6)	Acceptable



								Growth expansion should orient away from areas of higher risk (such as national parks and state forests, public bushlands, and consider surrounding fuel loads.			
9	Emergency services may face increased burden from expanded development in interface areas.	Expansion of development at the urban bushland interface may generate increased demand on emergency services for asset defence, and assistance to evacuate. This can place strain on emergency services, can place emergency services in harm's way and can increase response costs.	Moderate	Possible	Major	Medium (M8)	Intolerable	<p>Growth expansion should consider how to effectively plan for the safe operation of emergence services.</p> <p>Orienting development away from higher risk locations is a key opportunity.</p> <p>Statutory planning measures which provide for asset protection may alleviate demand on emergency services, and enable more time, and provide emergency services with more options during an event.</p> <p>Community education in relation to expectation is critical. Assistance from emergency services during an event cannot be guaranteed and households need to have a bushfire survival plan in place.</p>	<p>Strategic planning measures to orient growth in risk-responsive locations and in a risk-responsive manner can alleviate unintended consequences for emergency services.</p> <p>Statutory planning provisions can assist emergency services by contemplating asset protection, water supply and building construction elements to provide options and enhance emergency services safety during defence operations.</p>	Low (L6)	Acceptable
10	Lands zoned for future development growth are highly exposed to potential bushfire hazard, particularly the rural residential and emerging community zones.	<p>Transitional zones at the urban bushland interface are exposed to bushfire hazard. However, the combination of strategic and statutory planning coupled with building provisions can enhance the resilience of development in these zones.</p> <p>Current development within zones may be relatively vulnerable where developed prior to planning and building requirements for bushfire.</p>	Moderate	Possible	Major	Medium (M8)	Intolerable	<p>Clarity for landholders on what can and cannot be undertaken on property without approach in terms of vegetation management will empower some residents to increase preparedness in existing rural residential and township areas.</p> <p>Some rural residential zoned land in the Toowoomba urban area is capable of accommodating further development within the bushfire prone area of the Toowoomba Escarpment. The zoning rationale of these allotments should be revisited.</p> <p>Statutory planning controls and building requirements may mitigate risk for existing zoning and subdivisions.</p>	<p>The risk legacy of existing development can be mitigated by property based and household preparedness. Community education programs may assist however, this is likely to be a long-term approach.</p> <p>For zoning where additional density may occur and approved subdivisions, statutory planning controls may be effective in mitigating a level of risk.</p> <p>Back-zoning is a measure which may also be available.</p>	Medium (M7)	Tolerable
11	The low density residential zone is relatively exposed, incorporating a high percentage of existing housing stock within the Toowoomba Region.	Current development within zones may be relatively vulnerable where developed prior to planning and building requirements for bushfire.	Moderate	Possible	Major	Medium (M8)	Intolerable	<p>Clarity for landholders on what can and cannot be undertaken on property without approach in terms of vegetation management will empower some residents to increase preparedness in existing low density residential and township areas.</p> <p>Infill development may replace some existing development over time however, activities where population density may increase should not be encouraged within the bushfire prone area.</p>	<p>The risk legacy of existing development can be mitigated by property based and household preparedness. Community education programs may assist however, this is likely to be a long-term approach.</p> <p>Planning policy should actively mitigate increased density activities (i.e. multi unit dwellings, etc.) within the bushfire prone area, as part of infill development opportunities.</p>	Medium (M7)	Tolerable



12	Vulnerable facilities exist in locations subject to bushfire hazard and which may require evacuation.	Current vulnerable developments are exposed to potential bushfire hazard including educational facilities, nursing homes, child care centres, etc. However, the scale of exposure is limited.	Moderate	Likely	Major	High (H9)	Intolerable	<p>Historical settlement planning has limited the extent of vulnerable facilities within the bushfire prone area. This policy position should be retained.</p> <p>However, there are a number of assets which are potentially exposed. This is dominated by educational facilities.</p> <p>New facilities should ideally be located out of the bushfire prone area. Statutory provisions can assist to achieve this outcome, noting some discretion may be achieved if there are no other options and need is demonstrated.</p>	<p>The most effective opportunity to limit risk is to avoid these land uses in bushfire prone areas.</p> <p>Where this cannot be achieved, strong statutory provisions which guide resilient siting, design and construction of such facilities can be implemented via the new planning scheme.</p>	Medium (M8)	Tolerable
13	Ability to evacuate may be complicated by exposure of the road network to bushfire attack, fragmented vegetation, land parcels, zoning, and limited route options.	Parts of the key evacuation route network are exposed to potential flame contact and radiant heat. This includes almost 40 per cent of network in the Crows Nest – Rosalie precinct, almost 30 per cent in the Millmerran precinct and almost 15 per cent in the Toowoomba urban area. 20 per cent of the region's key evacuation network may be exposed.	High	Likely	Major	High (H10)	Intolerable	<p>The key evacuation route network is identified (via this risk assessment and per future planning activities), enabling the identification of road corridor treatments where possible.</p> <p>Liaison with DTMR in relation to road reserve maintenance.</p> <p>Council liaison with regard to local road reserve maintenance.</p> <p>Identification of new road connections to facilitate growth which aid evacuation opportunities, providing increased route options.</p> <p>Use of NSPs in key townships where evacuation may be challenged.</p> <p>Focus future growth expansion in locations where additional road network connections can be facilitated to support development.</p> <p>Identify potential key existing pinch points in the urban network where opportunities exist to add works into the LGIP to achieved improve evacuation potential.</p>	<p>Road reserve maintenance is resource intensive. Focus should be on key locations where maximum benefit can be achieved.</p> <p>Ongoing strategic planning has the opportunity to orient growth to locations where new road infrastructure can appropriately service development, providing multiple egress options.</p> <p>Planning can also alleviate existing pinch point locations across the urban (and broader network) by including works in the LGIP, or seeking State or Federal road, regions, resilience funding.</p>	Medium (M8)	Tolerable
14	Township zoned land, and urban interface land, is exposed to potential urban/township fire intrusion.	Current development at the urban or township / bushland interface may be relatively vulnerable to the impact of urban fire intrusion.	Moderate	Possible	Major	Medium (M8)	Intolerable	<p>The effect of both strategic planning, to orient development away from higher risk locations, and statutory provisions which address the potential for urban fire intrusion can be implemented.</p> <p>This should focus on larger lots at the bushland interface, to separate dwellings, use of non-combustible fencing, avoiding built to boundary outcomes within the bushfire prone area, and landscaping provisions.</p>	<p>Effective strategic and statutory planning have the ability to considerably mitigate this risk for growth areas.</p> <p>This is most effective where development is located away from higher risk areas.</p>	Low (L6)	Acceptable



								Consideration for on-going compliance is also an option, however compliance of bushfire management plans is a challenging matter. A local law in this regard may assist.			
15	Evacuation of some townships with limited road connectivity may experience evacuation challenges.	Parts of the key evacuation route network are exposed to potential flame contact and radiant heat. This includes almost 40 per cent of network in the Crows Nest – Rosalie precinct, almost 30 per cent in the Millmerran precinct and almost 15 per cent in the Toowoomba urban area. 20 per cent of the region’s key evacuation network may be exposed.	High	Likely	Major	High (H10)	Intolerable	<p>The key evacuation route network is identified (via this risk assessment and per future planning activities), enabling the identification of road corridor treatments where possible.</p> <p>Liaison with DTMR in relation to road reserve maintenance.</p> <p>Council liaison with regard to local road reserve maintenance.</p> <p>Identification of new road connections to facilitate growth which aid evacuation opportunities, providing increased route options.</p> <p>Use of NSPs in key townships where evacuation may be challenged.</p> <p>Focus future growth expansion in locations where additional road network connections can be facilitated to support development.</p> <p>Identify potential key existing pinch points in the urban network where opportunities exist to add works into the LGIP to achieved improve evacuation potential.</p>	<p>Road reserve maintenance is resource intensive. Focus should be on key locations where maximum benefit can be achieved.</p> <p>Ongoing strategic planning has the opportunity to orient growth to locations where new road infrastructure can appropriately service development, providing multiple egress options.</p> <p>Planning can also alleviate existing pinch point locations across the urban (and broader network) by including works in the LGIP, or seeking State or Federal road, regions, resilience funding.</p>	Medium (M8)	Tolerable

\* NOTE: Land use planning mitigation policy options and effectiveness are further explored by the land use planning policy table in Part C – Planning Issues and Options Analysis



## Appendix F - Road network exposure maps



## Summary of bushfire attack exposure to key evacuation routes

Precinct	Bushfire attack mechanism	Level 1 Freeways and motorways	Level 2 Highways	Level 3 Secondary roads	Level 4 Local connector roads	Sub-total	Total
		Kilometres of road					
Toowoomba urban area	Flame contact	N/A	20,179	5,708	5,842	31,730	58,072
	Radiant heat	N/A	11,354	6,570	8,413	26,342	
Crows Nest - Rosalie	Flame contact	N/A	33,345	30,089	49,824	113,254	163,409
	Radiant heat	N/A	20,252	13,085	16,817	50,155	
Clifton - Greenmount	Flame contact	N/A	5.0	22,386	10,010	32,401	45,902
	Radiant heat	N/A	689	9,762	3,049	13,501	
Pittsworth	Flame contact	N/A	2,911	4,203	19,081	26,197	47,907
	Radiant heat	N/A	3,552	4,290	13,867	21,710	
Jondaryan	Flame contact	N/A	1,156	3,792	6,175	11,125	29,794
	Radiant heat	N/A	2,298	7,129	9,242	18,669	
Millmerran	Flame contact	N/A	28,147	21,856	9,234	59,235	84,441
	Radiant heat	N/A	5,115	12,644	7,447	25,206	
Total Toowoomba Region	Flame contact	N/A	85,741	88,038	100,169	273,949	429,535
	Radiant heat	N/A	43,265	53,483	58,837	155,586	

NOTE: For the purposes of the above table, 'radiant heat' extends a distance of 50m from potential bushfire hazard sources, irrespective of hazard class. To this end, it is indicative only.

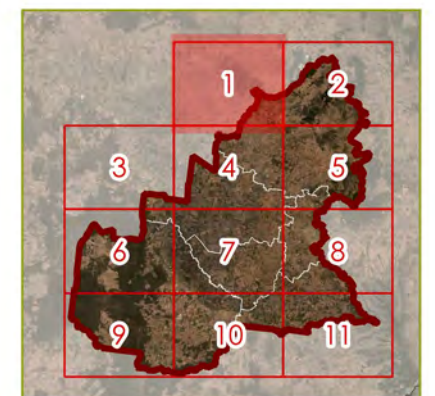


# ROAD EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Exposed to Hazard	500m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
50m Buffer	700m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
100m Buffer	Not Exposed
Highway	Highway
Secondary	Secondary
Connector	Connector



Project No: 20-017 Map No: 1 of 11

Coordinate System: GDA 2020 MGA Zone 56  
Printed at: A3  
Creation Date: 02/03/2021  
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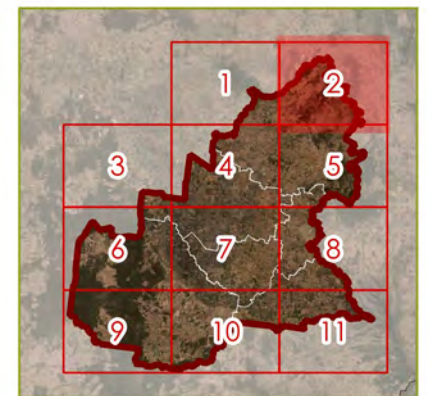


# ROAD EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Exposed to Hazard	500m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
50m Buffer	700m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
100m Buffer	Not Exposed
Highway	Highway
Secondary	Secondary
Connector	Connector



Project No: 20-017 Map No: 2 of 11

Coordinate System: GDA 2020 MGA Zone 56  
Printed at: A3  
Creation Date: 02/03/2021  
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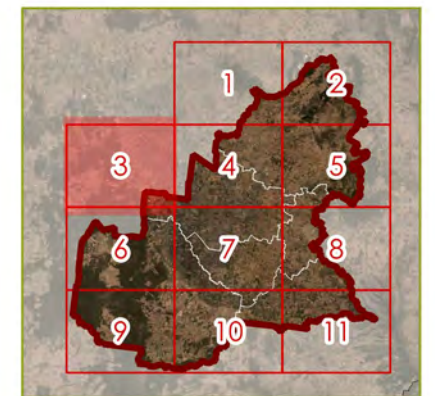


# ROAD EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Exposed to Hazard	500m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
50m Buffer	700m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
100m Buffer	Not Exposed
Highway	Highway
Secondary	Secondary
Connector	Connector



Project No: 20-017 Map No: 3 of 11

Coordinate System: GDA 2020 MGA Zone 56  
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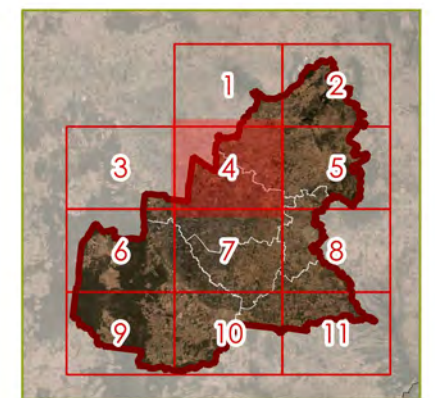


# ROAD EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Exposed to Hazard	500m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
50m Buffer	700m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
100m Buffer	Not Exposed
Highway	Highway
Secondary	Secondary
Connector	Connector



Project No: 20-017 Map No: 4 of 11

Coordinate System: GDA 2020 MGA Zone 56  
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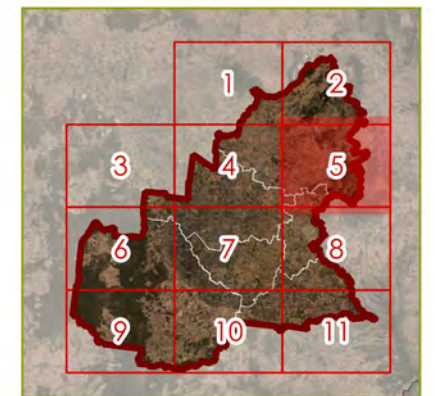


# ROAD EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Exposed to Hazard	500m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
50m Buffer	700m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
100m Buffer	Not Exposed
Highway	Highway
Secondary	Secondary
Connector	Connector



Project No: 20-017 Map No: 5 of 11

Coordinate System: GDA 2020 MGA Zone 56  
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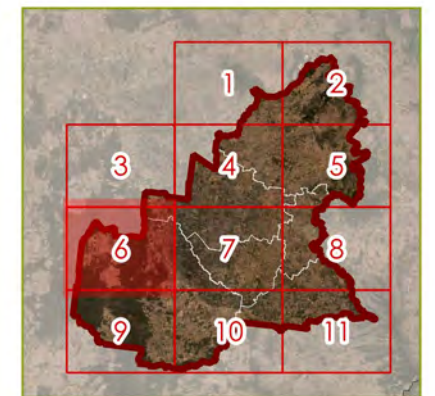


# ROAD EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Exposed to Hazard	500m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
50m Buffer	700m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
100m Buffer	Not Exposed
Highway	Highway
Secondary	Secondary
Connector	Connector



Project No: 20-017

Map No: 6 of 11

Coordinate System: GDA 2020 MGA Zone 56

Printed at: A3

Creation Date: 02/03/2021

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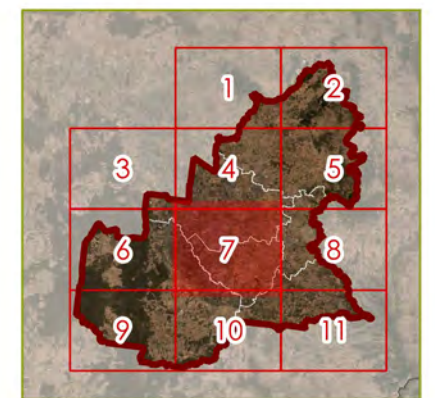


# ROAD EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Exposed to Hazard	500m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
50m Buffer	700m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
100m Buffer	Not Exposed
Highway	Highway
Secondary	Secondary
Connector	Connector



Project No: 20-017 Map No: 7 of 11

Coordinate System: GDA 2020 MGA Zone 56  
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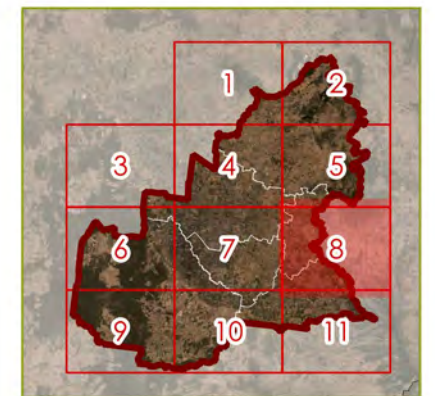


# ROAD EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Exposed to Hazard	500m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
50m Buffer	700m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
100m Buffer	Not Exposed
Highway	Highway
Secondary	Secondary
Connector	Connector



Project No: 20-017 Map No: 8 of 11

Coordinate System: GDA 2020 MGA Zone 56  
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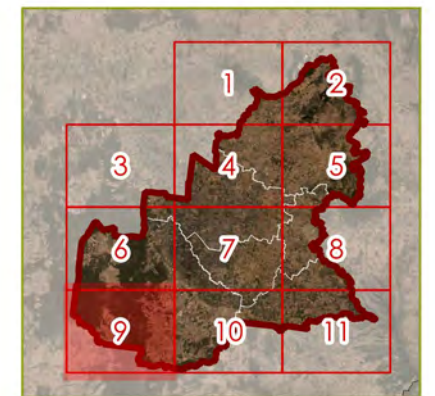


# ROAD EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Exposed to Hazard	500m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
50m Buffer	700m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
100m Buffer	Not Exposed
Highway	Highway
Secondary	Secondary
Connector	Connector



Project No: 20-017 Map No: 9 of 11

Coordinate System: GDA 2020 MGA Zone 56  
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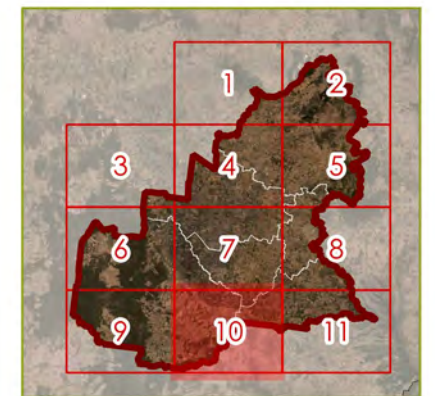


# ROAD EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Exposed to Hazard	500m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
50m Buffer	700m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
100m Buffer	Not Exposed
Highway	Highway
Secondary	Secondary
Connector	Connector



Project No: 20-017 Map No: 10 of 11

Coordinate System: GDA 2020 MGA Zone 56  
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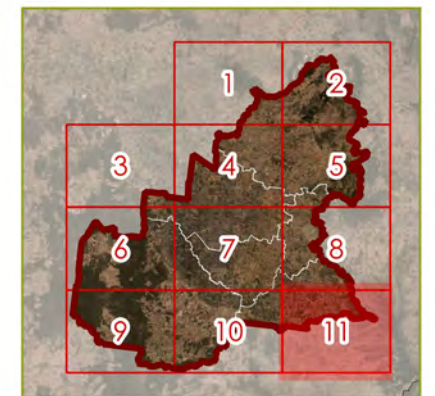


# ROAD EXPOSURE

## TOOWOOMBA BUSHFIRE RISK ASSESSMENT

### LEGEND

Exposed to Hazard	500m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
50m Buffer	700m Buffer
Highway	Highway
Secondary	Secondary
Connector	Connector
100m Buffer	Not Exposed
Highway	Highway
Secondary	Secondary
Connector	Connector



Project No: 20-017      Map No: 11 of 11

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## Appendix G - State planning framework policy benchmarks



Current policy requirements and guidance related to bushfire protection through the Queensland land use planning framework

Hazard risk reduction and disaster management policy setting		SPP 2017	SPP bushfire guidance 2021	'Bushfire Resilient Communities' technical reference guide	Benchmarks
Identification (mapping)	<ul style="list-style-type: none"> <li>The risk relating to bushfire is increasing in frequency and intensity and there is a need for improved understanding of local and regional disaster risk and the consideration of contemporary information and data intelligence and technology.</li> <li>The approach used to map bushfire prone areas should combine spatial information on potential fire weather severity, landscape slope and potential fuel load.</li> </ul>	Policy 1 – Bushfire prone areas to be identified.	<ul style="list-style-type: none"> <li>Use state-wide mapping in first instance.</li> <li>Where resources permit, locally verify the mapping by applying the state-wide mapping methodology using local scale inputs (i.e. locally verified vegetation and slope) and undertaking a detailed study based on the approved methodology outline in the 'Bushfire Resilient Communities' technical reference guide.</li> <li>The local refinement of mapping can address small isolated pockets of bushfire prone areas in urban and established locations.</li> <li>It is noted that the building code requirements (i.e. AS3959-2018 which relates to materials and construction methodology of certain buildings) for bushfire protection will only be triggered if the land is mapped as a bushfire prone area (and subsequently identified within Part 1 of the planning scheme as the regulatory trigger).</li> </ul>	<p>Policy 1 – Mapping is robust and locally relevant</p> <ul style="list-style-type: none"> <li>As a minimum, the state-wide mapping should be applied and then local governments should refine the state-wide mapping using the refinement process which is outlined in the 'Bushfire Resilient Communities' technical reference guide.</li> <li>The methodology used for the state-wide mapping has improved upon the previous SPP 1/03 bushfire hazard mapping methodology approach by providing more in-depth consideration of regional differences in fire weather severity and diversity of vegetation types. The state-wide mapping is informed by a consideration of the fuel load, slope and fire weather severity.</li> </ul>	<p>Bushfire prone areas are identified</p> <ul style="list-style-type: none"> <li>State-wide mapping has been adopted in the first instance, and then locally verified.</li> </ul>
Risk assessment	<ul style="list-style-type: none"> <li>Analysis of bushfire risk to inform strategic planning is essential and should include the consideration of contemporary information with a focus on data intelligence and technology, including predicative scenario modelling, traffic evacuation modelling, etc.</li> <li>In understanding the consequences of a potential bushfire event, the risk assessment should consider the exposure,</li> </ul>	Policy 2 – A fit for purpose risk assessment is undertaken.	<ul style="list-style-type: none"> <li>The risk assessment should be consistent with <i>AS/NZS ISO 31000:2018 Risk Management – Principles and Guidelines</i>, and be undertaken by a suitably qualified person.</li> <li>Key matters that should be considered as part of the risk assessment include the: <ul style="list-style-type: none"> <li>characteristics of the bushfire hazard in the area;</li> <li>relevant fire and fire weather history of the area;</li> <li>population and land uses currently exposed to bushfire hazard;</li> <li>anticipated growth of the community and the options for accommodating that growth;</li> <li>location of current and proposed community infrastructure and services;</li> <li>suitability of existing studies to inform the risk assessment;</li> <li>potential social, economic and environmental impacts that would result from a bushfire event; and</li> </ul> </li> </ul>	<p>Policy 2 – 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</p> <ul style="list-style-type: none"> <li>A risk assessment should be undertaken when making or amending a planning scheme, which considers the exposure, vulnerability and resilience of communities and their assets to a bushfire.</li> <li>QFES can provide advice to local governments early to scope a risk assessment that is suited to the nature of the proposed planning scheme amendment.</li> </ul> <p>Bushfire hazard assessment</p> <ul style="list-style-type: none"> <li>A local government may provide applicants with the ability to verify the precision, accuracy or currency of the bushfire prone area mapping, or map inputs, or modify any map input variables to reflect changes that have occurred.</li> <li>The 'Bushfire Resilient Communities' technical reference guide sets out the process for</li> </ul>	<p>A risk assessment has been undertaken</p> <ul style="list-style-type: none"> <li>A fit for purpose risk assessment has been undertaken for bushfire prone areas.</li> <li>At an individual site level, provisions are included requiring an applicant to prepare a bushfire hazard assessment where an applicant decides to verify the land as a bushfire prone area, or the risk to the land of bushfire.</li> </ul>



Hazard risk reduction and disaster management policy setting		SPP 2017	SPP bushfire guidance 2021	'Bushfire Resilient Communities' technical reference guide	Benchmarks
	vulnerability and resilience of communities and their assets to a bushfire event		<ul style="list-style-type: none"> <li>local and district disaster management planning, including emergency response and recovery capacities.</li> <li>A full risk assessment is not required for every planning instrument or amendment proposed and depends on the circumstances (i.e. a change to zoning that results in the intensification of development in a bushfire prone area would warrant a risk assessment whereas a change to refine the range of non-vulnerable land uses envisaged in a zone included in a bushfire prone area may not).</li> </ul>	undertaking a bushfire hazard assessment to determine or review the extent of bushfire prone area and level of risk to which a site is exposed, for an individual assessment area. A local government may wish to refer applicants to the 'Bushfire Resilient Communities' technical reference guide for the methodology an applicant is required to follow, or provide information in a planning scheme policy.	
Policy principle of avoid first, and if not possible to avoid, mitigate		Policy 4 – Development avoids the natural hazard area, and where it is not possible to avoid, mitigates the risks to an acceptable or tolerable level.	<ul style="list-style-type: none"> <li>The outputs of the risk assessment should inform the drafting of the strategic framework and assessment requirements, based on avoiding the risk in the first instance, and where it cannot be avoided, achieving an acceptable or tolerable level of risk for both existing and new development in bushfire prone areas.</li> <li>Growth and/or the intensification of development in mapped higher risk bushfire prone areas should be avoided, unless appropriate controls are implemented to mitigate those risks (i.e. through subdivision layout or asset protection zones) or removing the hazard (i.e. approved clearing).</li> </ul> <p>Valued vegetation</p> <ul style="list-style-type: none"> <li>In certain circumstances planning approaches that encourage the clearing of hazardous vegetation to support new development may not be desirable or possible due to the characteristics of the land or values of the vegetation (i.e. bushfire outcomes may be constrained in areas containing vegetation that has national, state or local environmental significance, or clearing of vegetation may also be undesirable in areas vulnerable to land degradation or on steep slopes, which are susceptible to erosion and/or landslide risk).</li> <li>When a local government is identifying future corridors or areas for vegetation or rehabilitation, their relationship with bushfire prone areas should also be considered, to minimise tensions that may exist at the development assessment stage, particularly where these corridors pass through or adjoin areas intended for future urban development.</li> <li>In general, limiting development in areas where clearing of valuable vegetation would be required to reduce exposure to bushfires will reduce tension between state interests.</li> </ul>	<p>Policy 3 – 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</p> <ul style="list-style-type: none"> <li>Avoidance of the risk includes minimising the expansion or increased density of existing development in mapped bushfire prone areas, particularly for vulnerable uses, community infrastructure for essential services, or materials that are hazardous in the context of a bushfire hazard.</li> </ul>	<p>The principle of avoid first, and if it is not possible to avoid, mitigate is adopted</p> <ul style="list-style-type: none"> <li>Growth, or the intensification of development, in higher risk bushfire prone areas is avoided.</li> </ul> <p>The planning scheme is calibrated</p> <ul style="list-style-type: none"> <li>The strategic framework: <ul style="list-style-type: none"> <li>avoids allocating growth or more intense forms of development in higher risk bushfire prone areas;</li> <li>recognises the potential risk to human life and property of bushfire;</li> <li>protects essential community infrastructure and vulnerable uses from the risk, or the increase of risk.</li> </ul> </li> <li>The zoning of land in mapped bushfire prone areas: <ul style="list-style-type: none"> <li>aligns with the settlement pattern and avoids zoning land for new or more intense development; and</li> </ul> </li> </ul>



Hazard risk reduction and disaster management policy setting	SPP 2017	SPP bushfire guidance 2021	'Bushfire Resilient Communities' technical reference guide	Benchmarks
			<p>Greenfield development</p> <ul style="list-style-type: none"> <li>Where land is zoned for urban or emerging community purposes, the planning scheme needs to carefully calibrate assessment benchmarks to provide a balance of considerations. For instance, small lot housing may be proposed on land that does not contain valuable vegetation (which can be cleared). Given the land is likely to be cleared, the site is unlikely to meet the criteria of being a bushfire prone area in the future. As such, planning provisions may only need to focus on subdivision design at the interface with any adjoining bushfire prone areas. Where the land contains valuable vegetation (which is to be protected), the site may be developed for houses within development footprint plans on large lots and the planning provisions will need to mitigate risks to an acceptable or tolerable level.</li> </ul> <p>Strategic framework</p> <ul style="list-style-type: none"> <li>The settlement pattern avoids growth, or the intensification of development, in mapped higher risk bushfire prone areas.</li> <li>The strategic outcomes recognise the potential risk to human life and property of bushfire, minimising and not worsening the impacts of bushfire on existing and new development through first avoiding and then otherwise mitigating the risk through neighbourhood layout and management measures, and protecting essential community infrastructure, and vulnerable land uses from the risk or an increase in the risk.</li> </ul> <p>Zoning</p> <ul style="list-style-type: none"> <li>Aligns with the settlement pattern and avoids zoning land for new or more intense development in higher risk bushfire hazard areas.</li> <li>In bushfire hazard areas, the land is zoned for uses which result in low levels of population and economic investment.</li> </ul> <p>Categories of assessment</p> <ul style="list-style-type: none"> <li>The level of assessment is relative to the level of risk identified through the risk assessment.</li> <li>In allocating categories of development and assessment, the table of assessment should act to minimise accepted development and make Reconfiguring a Lot (RaL) and Material Change</li> </ul>	<ul style="list-style-type: none"> <li>is included in a zone that limits development potential.</li> <li>Land included in bushfire prone areas, and areas and corridors of environmental significance are included in an appropriate zone to limit development potential.</li> <li>Land zoned for urban or emerging community purposes that is included in a bush fire prone area is considered, and planning provisions take into account the likelihood of the land being in a bushfire prone area in the future.</li> <li>The level of assessment is relative to the level of risk identified through the risk assessment (i.e. code or impact assessment).</li> <li>Provisions are included to mitigate the risk to development in a bushfire prone area to an acceptable or tolerable level (i.e. neighbourhood layout and management measures).</li> </ul>



Hazard risk reduction and disaster management policy setting		SPP 2017	SPP bushfire guidance 2021	'Bushfire Resilient Communities' technical reference guide	Benchmarks
			<p>of Use (MCU) development in a bushfire prone area subject to code or impact assessment, depending on the level of risk and the scale and vulnerability of the proposed development.</p> <p>Development requirements</p> <ul style="list-style-type: none"> <li>The development requirements, set out as code provisions, should work together with the strategic framework outcomes to ensure that the risk of bushfire that may affect proposed development is mitigated to an acceptable or tolerable level. For instance, consideration should be given to whether sites within the potential impact buffer area are separated from areas with a medium, high or very high potential bushfire intensity by a road or by spaces where vegetation is highly managed in perpetuity.</li> </ul>		
Development requirements	<ul style="list-style-type: none"> <li>There is a need for a stronger focus on mitigation through land use planning particularly at the rural-urban interface, with fuel and the management of fuel loads being one of the key areas for bushfire mitigation. However, this goes hand in hand with the need for a more fulsome and informed appreciation of compliance issues, whether in relation to private land management, landscaping or asset protection zones and fire trails.</li> <li>The consideration of evacuation processes (i.e. safe evacuation routes and safe access and egress for emergency</li> </ul>	<p>Policy 5 –</p> <ul style="list-style-type: none"> <li>Development supports and does not hinder disaster management capacity and capabilities.</li> <li>Development avoids an increase in exposure or severity of the natural hazard.</li> <li>Development avoids risks to public safety and the environment from the location of the storage of hazardous materials and the release of these materials as a result of a natural hazard.</li> <li>Development maintains or enhances the protective function of landforms and vegetation that can mitigate the risks.</li> </ul>	<ul style="list-style-type: none"> <li>Key planning responses that can reduce the impact from sources of bushfire attack include: <ul style="list-style-type: none"> <li>a subdivision layout that includes access for firefighters and vehicles between assets and vegetation, to allow for vegetation management and wildfire response. These areas also provide opportunities to establish control lines from which to conduct hazard reduction or back-burning operations;</li> <li>a subdivision layout that locates low fuel buffer areas such as roads and managed open spaces to reduce radiant heat exposure and exposure to wind-borne embers for emergency services personnel suppressing fires and protecting property and allow for safer evacuation of people away from fire fronts; and</li> <li>landscape design and sustained vegetation management near people to reduce the available fuel load and fuel structure between people and property and hazardous vegetation. This will reduce the level of radiant heat exposure and likelihood of ember attack.</li> </ul> </li> </ul> <p>Disaster management capacity</p> <ul style="list-style-type: none"> <li>Safe access to property is necessary for evacuation of occupants as well as for emergency services. Well-designed and located access to and from sites which are at risk of bushfire attack reduces vulnerability. Planning measures primarily involve:</li> </ul>	<p>Policy 4 – Disaster management capacity and capabilities are maintained to mitigate the risks to people and property to an acceptable and tolerable level</p> <ul style="list-style-type: none"> <li>Subdivision layout locates low fuel separation areas (i.e. roads, managed open spaces and large lots) to separate people from the hazard, enables emergency service access and functions through sufficient access areas (i.e. perimeter roads or fire trail and working areas) for firefighters and vehicles between assets and vegetation, allowing for vegetation management and wildfire response to provide opportunities to establish control lines from which hazard reduction or back-burning operations can occur, allows safe access and egress routes, and ensures water supply in both reticulated and non-reticulated.</li> <li>Bushfire management plans are required for the ongoing vegetation management that maintains identified low fuel separation areas.</li> </ul> <p>Policy 5 – Lot and neighbourhood layout and design mitigates the risks to people and property to an acceptable and tolerable level</p> <ul style="list-style-type: none"> <li>New subdivision design minimises the interface with bushfire prone areas and facilitates connections to safe evacuation routes.</li> </ul>	<p>Disaster management capacity and capabilities are maintained</p> <ul style="list-style-type: none"> <li>Provisions require: <ul style="list-style-type: none"> <li>safe access and egress routes within and from the development site;</li> <li>asset protection zones are provided between the development and hazardous vegetation in urban areas;</li> <li>fire trail and working areas are provided to facilitate fuel load management; and</li> <li>water supply for firefighting purposes is provided in both reticulated and non-reticulated areas.</li> </ul> </li> <li>The layout and design of new subdivisions is required to minimise the interface with bushfire prone areas and facilitate connections to safe evacuation routes (i.e. low fuel separation areas such as permitter roads, emergency</li> </ul>



Hazard risk reduction and disaster management policy setting	SPP 2017	SPP bushfire guidance 2021	'Bushfire Resilient Communities' technical reference guide	Benchmarks
<p>services and vehicles) in a more sophisticated manner for both existing and new communities is necessary, ideally at the strategic planning level, and through the assessment of development applications.</p>		<ul style="list-style-type: none"> <li>providing easy and safe movement away from any encroaching bushfire for both occupants and emergency services;</li> <li>providing emergency services with easy access to a safe working area close to dwellings and water supply to suppress fires;</li> <li>allowing for alternative safe access and evacuation routes should access in one direction be blocked in the event of a bushfire; and</li> <li>providing opportunities to establish control lines from which to conduct hazard reduction or back-burning operations.</li> </ul> <p>As such, provisions in RaL and other codes should provide for:</p> <ul style="list-style-type: none"> <li>safe access and egress routes within and from each lot;</li> <li>asset protection zones between development and hazardous vegetation in urban areas;</li> <li>fire trail and working areas to facilitate fuel load management; and</li> <li>water supply in both reticulated and non-reticulated areas.</li> </ul> <p>Vulnerable uses</p> <ul style="list-style-type: none"> <li>Specify the uses that constitute vulnerable uses for the purposes of the bushfire planning provisions. This could include childcare centre, community care centre, detention facility, educational establishment, hospital, residential care facility, retirement facility, and other like uses.</li> <li>Articulate the policy position on the location of vulnerable uses within bushfire prone areas. To reduce community exposure to and vulnerability to bushfire attack and enhance community resilience, the location of vulnerable uses in bushfire prone areas should be avoided.</li> <li>However, the location of vulnerable uses within a bushfire prone area may be justifiable where there is an overriding need in the public interest for the new or expanded service the development provides and there is no suitable alternative location.</li> <li>Ensure these uses (and expansion of them) are code or impact assessable where the use is within a bushfire prone area.</li> </ul>	<ul style="list-style-type: none"> <li>Landscape design and management does not increase the level of bushfire risk or mechanisms of bushfire attack.</li> <li>The key mitigation approach for houses involve a local government defining all or part of its area as a designated bushfire prone area in accordance with section 12 of the Building Regulation 2006. This in turn triggers the requirement for adherence to <i>Australian Standard 3959–2018 Construction of buildings in bushfire prone areas</i> at the building development application stage.</li> </ul> <p>Policy 6 – 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</p> <p>Policy 7 – Revegetation and rehabilitation avoids an increase in the exposure or severity of bushfire hazard</p> <p>Policy 8 – 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</p> <ul style="list-style-type: none"> <li>If located in a bushfire prone area, the risks to public safety and the environment from the release of these materials during and after a bushfire event must be mitigated by positioning it outside any asset protection zone applying to other buildings or structures on the site, and as close to the edge of the bushfire prone area as possible.</li> <li>The 'Bushfire Resilient Communities' technical reference guide sets out the process for calculating asset protection zones. A local government may wish to refer applicants to the 'Bushfire Resilient Communities' technical reference guide, or provide information about the calculator in a planning scheme policy.</li> </ul> <p>Policy 9 – The protective function of vegetation arrangements that can mitigate bushfire risk are maintained</p>	<p>service access between assets and vegetation, areas for vegetation management and wildfire response, safe access and egress routes, appropriate water supply for firefighting).</p> <ul style="list-style-type: none"> <li>Bushfire management plans are required to ensure design and management measures of development avoid, minimise or mitigate bushfire attack risk to an acceptable or tolerable level.</li> </ul> <p>Development does not increase the risk of bushfire attack</p> <ul style="list-style-type: none"> <li>Areas identified for revegetation and rehabilitation as part of a proposed development do not result in the expansion of a bushfire prone area or the increase in bushfire intensity levels.</li> </ul> <p>Sensitive uses are not located in bushfire prone areas</p> <ul style="list-style-type: none"> <li>Vulnerable uses (including childcare centres, community care centres, detention facilities, educational establishments, hospitals, residential care facilities, retirement facilities) 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</li> </ul>



Hazard risk reduction and disaster management policy setting	SPP 2017	SPP bushfire guidance 2021	'Bushfire Resilient Communities' technical reference guide	Benchmarks
		<p>Areas identified for revegetation or rehabilitation</p> <ul style="list-style-type: none"> <li>Ensure that areas identified for revegetation and rehabilitation as part of a proposed development does not result in the expansion of a bushfire prone area or the increase in bushfire intensity levels.</li> </ul> <p>Landscape design</p> <ul style="list-style-type: none"> <li>Include provisions in codes describing acceptable protective landscape treatments within any asset protection zones.</li> </ul> <p>Hazardous materials in the context of bushfire</p> <ul style="list-style-type: none"> <li>Identify what constitutes hazardous materials in the context of bushfire hazard.</li> <li>To avoid risks to public safety and the environment from the location of hazardous materials and the release of these materials, the storage or manufacture of these hazardous materials should be avoided within a bushfire prone area.</li> <li>Ensure the manufacture or storage of these materials is code or impact assessable and linked to assessment benchmarks for siting of facilities involving the manufacture or storage of hazardous materials, that will mitigate risks and impacts during and after a bushfire event to an acceptable or tolerable level.</li> </ul> <p>Maintenance of asset protection zones</p> <ul style="list-style-type: none"> <li>Require bushfire management plans for maintenance of any asset protection zones, including through vegetation and landscape management to ensure the fuel load can be practically maintained at or below an acceptable level.</li> </ul> <p>Example planning scheme provisions</p> <ul style="list-style-type: none"> <li>The SPP bushfire guidance 2021 ci example planning scheme provisions, including an example bushfire overlay code and example revegetation / rehabilitation provisions, which a local government may choose to adopt or otherwise adapt, when making or amending their planning scheme. These planning scheme provisions meet the development requirements of the SPP 2017. It is noted that variations are still required to reflect local circumstances, opportunities or aspirations.</li> </ul>	<ul style="list-style-type: none"> <li>Require bushfire management plans that uphold the protective function of vegetation arrangements, such as species selection, landscape design and ongoing vegetation management.</li> <li>A planning scheme may also include provisions for the preparation of a vegetation management plan or landscape management plan.</li> <li>The 'Bushfire Resilient Communities' technical reference guide sets out the process for preparing a bushfire management, vegetation management or landscape maintenance plan. A local government may wish to refer applicants to the 'Bushfire Resilient Communities' technical reference guide for the methodology an applicant is required to follow, or provide information in a planning scheme policy.</li> </ul> <p>Development conditions</p> <ul style="list-style-type: none"> <li>Information that may inform development conditions including: <ul style="list-style-type: none"> <li>ensuring an appropriate static water supply (in bushfire prone areas where reticulated supply is not provided) is provided to support effective emergency services (i.e. a water tank solely for firefighting and provided within 10 metres of each building (other than class 10 buildings);</li> <li>consideration of safe assembly or evacuation areas (as an alternative to an evacuation route) where the site is in an isolated locations and any evacuation route would be long or pass through bushfire prone areas;</li> <li>landscaping and open space areas to comprise protective landscape treatments with a potential available fuel load of less than 8 tonnes/hectare on aggregate, and fuel structure that remains discontinuous; and</li> <li>site planning which forms part of the risk mitigation approach for development that is unavoidable in a bushfire prone area and incorporates asset protection zones for vulnerable uses, storage or manufacture of materials that are hazardous and community infrastructure for essential services i.e. require a</li> </ul> </li> </ul>	<p>appropriately mitigate the risk.</p> <ul style="list-style-type: none"> <li>Buildings or structures used for the storage or manufacture of materials that are hazardous in the context of a bushfire cannot locate within a bushfire prone area unless there is no suitable alternative location. If located in a bushfire prone area, provisions require the risks to public safety and the environment from the release of these materials during and after a bushfire event to be mitigated by positioning it outside any asset protection zone applying to other buildings or structures on the site, and as close to the edge of the bushfire prone area as possible.</li> </ul> <p>The protective function of vegetation arrangements are maintained and enhanced</p> <ul style="list-style-type: none"> <li>Landscape design does not increase the level of bushfire risk.</li> <li>Bushfire management plans, vegetation management plans or landscape management plans are required to ensure the protective function of vegetation arrangements.</li> <li>Provisions are included describing acceptable protective landscape treatments within asset protection zones.</li> </ul>



Hazard risk reduction and disaster management policy setting		SPP 2017	SPP bushfire guidance 2021	'Bushfire Resilient Communities' technical reference guide	Benchmarks
				development footprint plan that is separated from the closest edge to the adjacent mapped medium, high or very high potential bushfire intensity area by a distance (APZ width) that achieves a radiant heat flux level of 10 kilowatt/square metre or less at all development footprint boundaries.	
		Policy 6 – Community infrastructure to be located and designed to maintain the required level of functionality during and immediately after an event.	<ul style="list-style-type: none"> <li>In most instances, development of new community infrastructure of any kind should be avoided within bushfire prone areas.</li> <li>Specify the use terms that constitute community infrastructure for essential services (i.e. education establishment, emergency services, hospital, and identify the function of the community infrastructure during or immediately after a bushfire event.</li> <li>However, community infrastructure may be justified where there is an overriding need in the public interest for the new or expanded service and there is no suitable alternative location. In this situation, provisions to mitigate the risk to an acceptable or tolerable level are required, including demonstrating that the infrastructure can function effectively during and immediately after a bushfire event and site planning can appropriately mitigate the risk.</li> </ul> <p>Example planning scheme provisions</p> <ul style="list-style-type: none"> <li>The SPP bushfire guidance 2021 cites example planning scheme provisions, including an example bushfire overlay code and example revegetation / rehabilitation provisions, which a local government may choose to adopt or otherwise adapt, when making or amending their planning scheme. These planning scheme provisions meet the development requirements of the SPP 2017. It is noted that variations are still required to reflect local circumstances, opportunities or aspirations.</li> </ul>	Policy 10 – Community infrastructure for essential services are 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	<p>Sensitive uses are not located in bushfire prone areas</p> <ul style="list-style-type: none"> <li>Community infrastructure for essential services are 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.</li> </ul>



