

Penrith

Local Emergency Management Plan

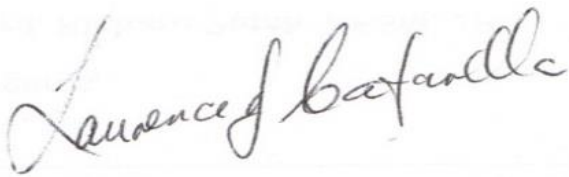


Part 1 – Administration

Authority

The Penrith Local Emergency Management Plan (EMPLAN) has been prepared by the Penrith Local Emergency Management Committee in compliance with the *State Emergency & Rescue Management Act 1989*.

APPROVED



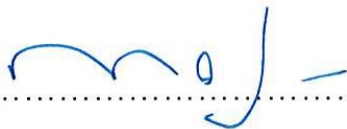
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Chair

Penrith Local Emergency Management Committee

Dated: 24 January 2021

ENDORSED



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Chair

North West Metropolitan Regional Emergency Management Committee

Dated: 27.01.21

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Purpose

Details arrangements for, prevention of, preparation for, response to and recovery from emergencies within the Local Government Area(s) covered by this plan.

It encompasses arrangements for:

- emergencies controlled by combat agencies;
- emergencies controlled by combat agencies and supported by the Local Emergency Operations Controller (LEOCON);
- emergency operations for which there is no combat agency; and
- circumstances where a combat agency has passed control to the LEOCON.

Objectives

The objectives of this plan are to:

- define participating organisation and Functional Area roles and responsibilities in preparation for, response to and recovery from emergencies;
- set out the control, co-ordination and liaison arrangements at the Local level;
- detail activation and alerting arrangements for involved agencies; and
- detail arrangements for the acquisition and co-ordination of resources.

Scope

The plan describes the arrangements at Local level to prevent, prepare for, respond to and recover from emergencies and provides policy direction for the preparation of Sub Plans and Supporting Plans:

- Arrangements detailed in this plan are based on the assumption that the resources upon which the plan relies are available when required; and
- The effectiveness of arrangements detailed in this plan are dependent upon all involved agencies preparing, testing and maintaining appropriate internal instructions, and/or standing operating procedures.

Principles

The following principles are applied in this plan:

- a) The Emergency Risk Management (ERM) process is to be used as the basis for emergency planning in New South Wales. This methodical approach to the planning process is to be applied by Emergency Management Committees at all levels.
- b) Responsibility for preparation, response and recovery rests initially at Local level. If Local agencies and available resources are not sufficient they are augmented by those at Regional level.
- c) Control of emergency response and recovery operations is conducted at the lowest effective level.
- d) Agencies may deploy their own resources from their own service from outside the affected Local area or Region if they are needed.
- e) The Local Emergency Operations Controller (LEOCON) is responsible, when requested by a combat agency, to co-ordinate the provision of resources support. EOCs would not normally assume control from a combat agency unless the situation can no longer be contained. Where necessary, this should only be done after consultation with the Regional Emergency Operations Controller (REOCON) and agreement of the combat agency and the appropriate level of control.
- f) Emergency preparation, response and recovery operations should be conducted with all agencies carrying out their normal functions wherever possible.
- g) Prevention measures remain the responsibility of authorities/agencies charged by statute with the responsibility.

Test and Review Process

The Penrith Local Emergency Management Committee (LEMC) will conduct exercises annually to test the Plan, and will review the Plan every three (3) years, or following any:

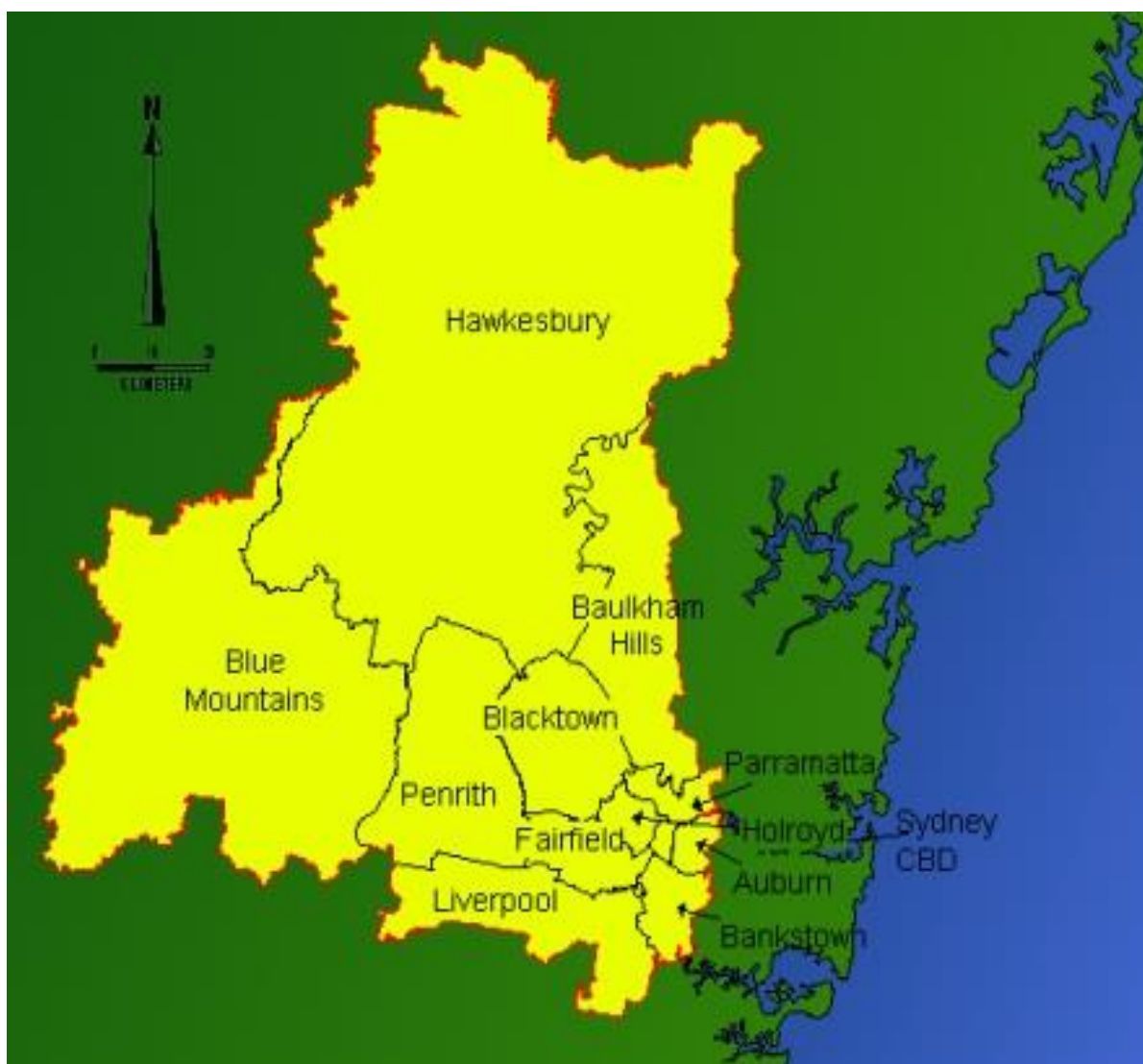
- activation of the Plan in response to an emergency;
- legislative changes affecting the Plan; and
- exercises conducted to test all or part of the Plan.

Part 2 – Community Context

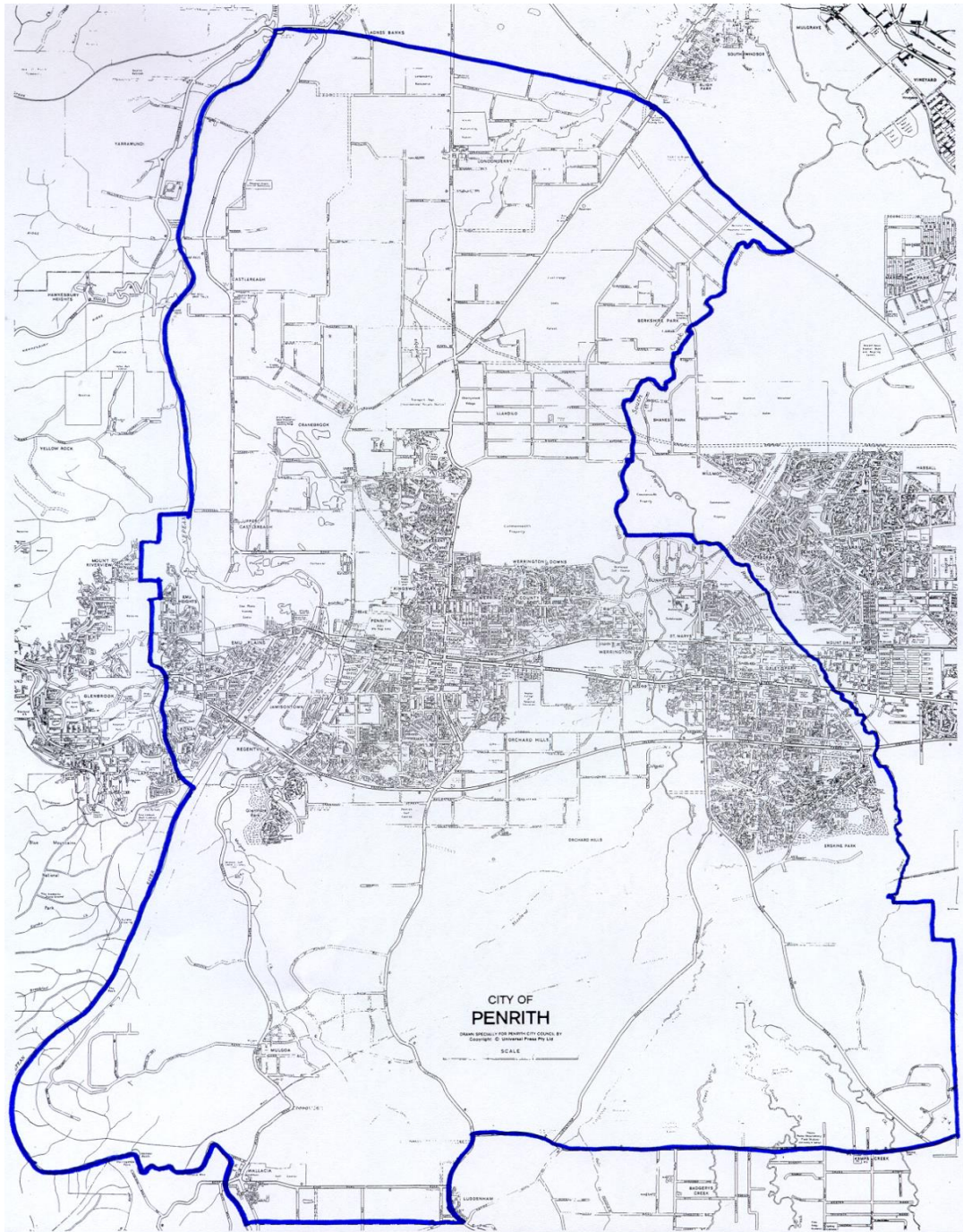
Annexure A – Community Profile

General

Penrith City is located at the western fringe of the Sydney metropolitan area - approximately 54 kilometres from the Sydney GPO. Penrith City is bounded by Hawkesbury City in the north, Blacktown City and Fairfield City in the east, Liverpool City and Wollondilly Shire in the south and Blue Mountains City in the west



Penrith City contains a blend of urban and rural communities which include Agnes Banks (part), Badgerys Creek (part), Berkshire Park, Caddens, Cambridge Gardens, Cambridge Park, Castlereagh, Claremont Meadows, Colyton, Cranebrook, Emu Heights, Emu Plains, Erskine Park, Glenmore Park, Jamisontown, Jordan Springs, Kemps Creek (part), Kingswood, Kingswood Park, Leonay, Llandilo, Londonderry, Luddenham (part), Mount Vernon, Mulgoa, , Mulgoa Rise, North Penrith, North St Marys, Orchard Hills, Oxley Park, Penrith, Regentville, South Penrith, St Clair, St Marys, Wallacia (part), Werrington, Werrington County and Werrington Downs.



Landform and Topography

Topography of the Penrith LGA is variable with elevations of between 20m and 240m AHD.

The Penrith area forms part of the physiographic unit commonly referred to as the Cumberland Plain. The following general description broadly describes the topography, although local variations do exist.

The highest and steepest areas occur on the Blue Mountains Escarpment at Emu Plains and along the Nepean Gorge, south of the M4 Motorway Bridge. Flat alluvial plains are associated with the Nepean River north of the Penrith Town Centre and along the middle to lower section of South, Ropes and Mulgoa Creeks. Gently to moderately undulating land is located in the central and southern parts of the LGA. The northern portion of the LGA is slightly undulating.

Climate

Penrith City is a growing Regional City with projections of an additional 60,000 residents over the next 20 years.

The Nepean River runs through the City and is a strong part of its identity and a significant natural asset.

Penrith is part of the Sydney Basin, which covers a significant portion of the central east coast of NSW, sitting within the lower altitude part of the basin, with the elevated terrain of the Blue Mountains to the west. The basin has significant effects on the climate of Penrith.

The topography of the area means that sea breezes from the east don't reach much of Western Sydney, including Penrith. This leads to consistently higher temperatures and lower rainfall in Penrith than in the more coastal parts of Sydney.

Penrith also sits on the Cumberland Plain, which comprises gently undulating plains and low hills formed on sediments of the Wiannamatta group of shales, as well as alluvial deposits along rivers and floodplains. These soils support eucalypt woodland with a grassy understorey including the Cumberland Plain Woodland, which is listed as critically endangered, with only 8.5% of its original extent remaining.

Penrith has some large areas of native bushland remaining, supporting around 17% of the remaining bushland on the Cumberland Plain in Western Sydney. Some of these areas are part of the national reserve system, however significant areas of bushland are also found on private land.

Cujrrrent Climate and weather events

Penrith's climate has a warm to hot summers and cool to mild winter based on historical temperature and humidity (Refer to Table X - BoM website).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Max Temp	30.7	29.4	27.6	24.5	21.1	18.1	17.7	19.8	23.2	25.9	27.3	29.2	24.5
Mean No. days >=													
35C	6.8	3.2	0.9	0	0	0	0	0	0.1	1.2	3.1	4	19.3
Mean Min Temp	18.5	18.5	16.7	13.2	9.3	6.9	5.5	6.2	9.4	12.1	15	16.9	12.4
Mean Rainfall (mm)	100.8	121.4	69.2	51.1	38.8	59.9	30.6	31.4	32	53.4	85.7	62.4	728.1
Mean No. days of													
Rain	11.7	11.4	11.5	10.6	11.2	15.1	12.1	8.6	7.9	9.3	12.3	10.8	132.5
Mean No. days of													
Rain >= 25mm	1.3	1.5	0.6	0.5	0.4	0.6	0.1	0.3	0.2	0.5	0.9	0.6	7.5

Table X - Penrith Lakes Weather Station Data (1995 – 2016)

Temperature

Long term temperature records show an increase across the whole Sydney Metropolitan area since the 1960's. The most sustained period of warming has occurred in the most recent decades. This is borne out by data from local weather stations at Orchard Hills and Penrith Lakes.

The mean annual maximum temperature between 1995 and 2016 recorded at Penrith Lakes was 24.5°C compared with a mean annual maximum temperature of 23.4°C recorded between 1970 and 1989 at Orchard Hills. Mean annual minimum temperature for the same time period at Penrith Lakes is 12.4°C compared with 11.6°C at Orchard Hills.

Average maximum temperatures in summer range from 28 to 30°C while in winter average minimum temperatures range from 5 to 10°C. There are on average 19 hot days (>35°C) each year.

Rainfall

Rainfall can vary considerably from year to year in Penrith due to the influence of larger scale climate patterns such as the El Nino Southern Oscillation. Annual average rainfall in Penrith is 728 mm, with more rainfall generally experienced in summer and autumn than winter and spring. Thunderstorm activity during summer in Penrith usually occur between January and March and show an increase in severity that was experienced particularly during the 2019 summer season.

Flooding

Penrith City lies within the Hawkesbury-Nepean Catchment and is dominated by rivers, creeks, waterways and associated tributaries, the most significant being the Nepean River and South Creek. Both systems are accompanied by wide open floodplains and generally

drain from south to north. There are 40 creek systems and associated catchment areas, all draining into either the Nepean River or South Creek.

The natural landscape of the Hawkesbury-Nepean River system makes it prone to flooding, as floodwaters are trapped by the topography. Flooding of the river has a high level of risk as water levels are prone to rising quickly, with low lying exit routes and development of low lying areas.

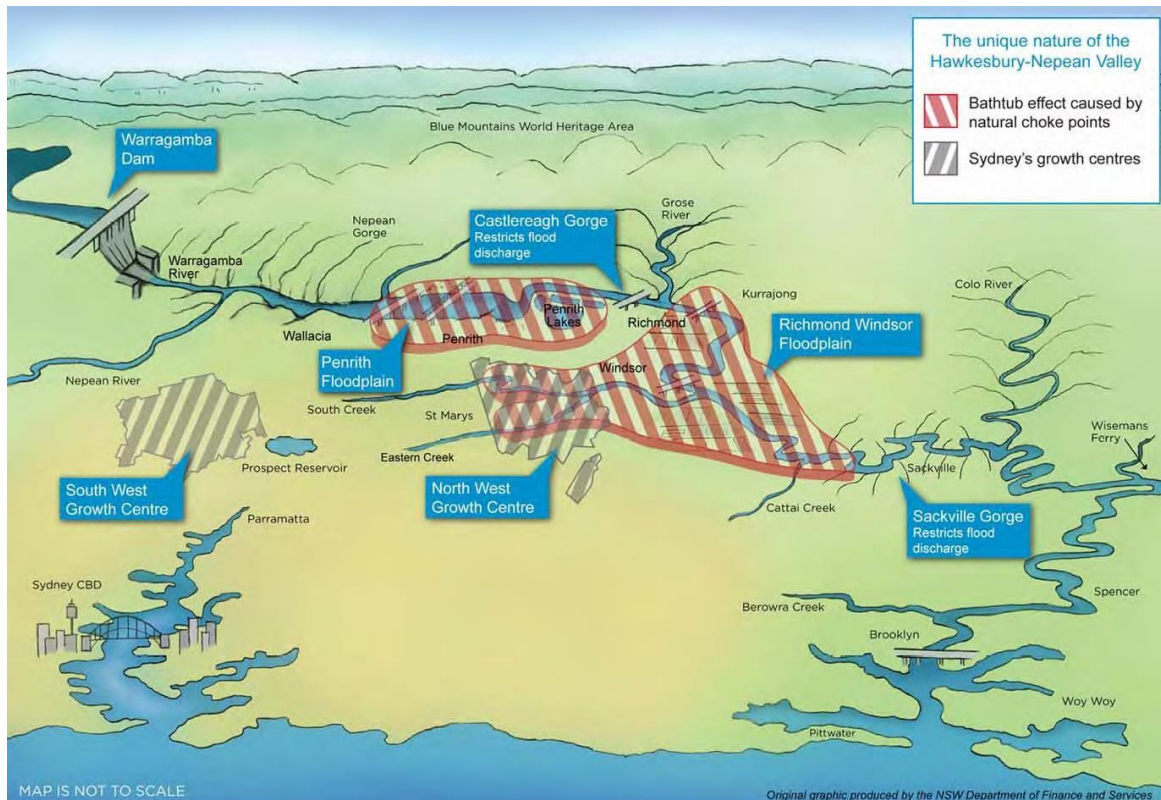


Figure Y: The two main floodplains in the Hawkesbury-Nepean Valley

The Overland Flow Flood Overview Study undertaken in 2006 states that large areas of the Penrith LGA are subject to mainstream flooding from the Nepean River and South Creek. In a 1 in 100 Average Recurrence Interval (ARI) event, approximately 29 square kilometres of Nepean River floodplain, and 23 square kilometres of South Creek floodplain would be inundated. In addition, there are numerous tributaries of these waterways that have significant floodplain areas within the LGA as a result of local catchment flooding. More than 14,000 properties were identified as being affected by flooding in a 1 in 100 year ARI event.

Significant flood events have been experienced in the area with the largest occurring in 1867. This flood resulted in loss of life, destruction of property and livestock, flooding Emu Plains, Castlereagh and the lower parts of Penrith. Other significant flooding events occurred in March 1978, August 1986, April-May 1988, and August 1990. The most recent flood event, which was only minor, occurred in 2015.

Fire Weather

The Bureau of Meteorology (BoM) reports that there has been an increase in extreme fire weather, and a longer fire season, across large parts of Australia since the 1970s. In NSW the fire season, which generally runs from October to March, is starting earlier and lasting longer, with fire weather extending into spring and autumn.

Fire weather is classified by the BoM as 'severe' when the Forest Fire Danger Index (FFDI) is above 50. The FFDI combines observations of temperature, humidity and wind speed with an estimate of the state of 'fuel'. FFDI in Sydney is only available for Richmond and Sydney Airport. Severe fire weather conditions are estimated to occur on average 1 day per year at Sydney Airport and 1.8 days per year at nearby Richmond. Penrith's FFDI is expected to be much closer to the conditions recorded at Richmond, with a higher risk of bushfires than more coastal parts of Sydney.

The 2013-14 bush fire season saw 195 homes destroyed in the nearby communities of Yellow Rock and Winmalee in the Blue Mountains. Extreme fire weather is increasing in Australia's southeast. During the February 2017 heatwave, nearly 100 bushfires were ignited through parts of inland NSW.

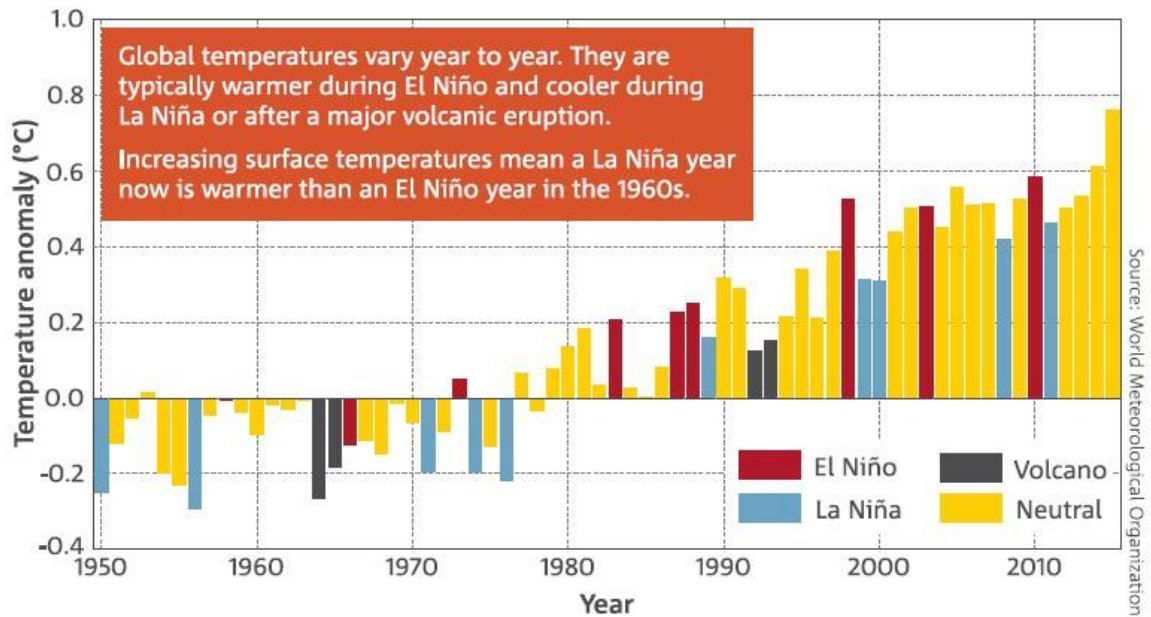
The 2019-20 bushfire season significantly affected the eastern coast of NSW. The bushfires in total burned more than 5.5 million hectares of bushland and destroyed 2,448 homes throughout the State.

Whilst the Penrith LGA was seriously not affected by the 2019 bushfire events, adjoining Local Government Areas of Wollondilly Shire, Blue Mountains, and Hawkesbury Local Government Areas were significantly impacted, with significant loss of bushland and building structures in those areas.

Projected Weather

Global average annual carbon dioxide levels are steadily increasing, reaching 399 parts per million in 2015. This increase in global carbon dioxide levels acts to increase the temperature of the Earth's surface, ocean and atmosphere by making it harder for the Earth to radiate incoming solar radiation back into space. Because carbon dioxide increases persist in the atmosphere for hundreds of years, future warming and sea level rises are now considered to be locked in, resulting in unavoidable climate change.

As a result of these changes in our atmosphere 2015 was the warmest year on record globally since reliable air temperature records began in 1880. The last 15 years are amongst the warmest 16 years ever recorded. Similarly Australia's mean surface air temperature has risen by around 1°C since 1910.



Observations and climate modelling consistently indicate a future of ongoing, long term climate change interacting with natural variability. These changes are expected to have an impact on the Penrith environment and community, particularly related to increases in the frequency or intensity of heat events, fire weather and drought.

The climate change projections referenced in this document are from the NSW and ACT Regional Climate Modelling (NARClIM) project. The project has produced a suite of twelve regional climate projections spanning the range of likely future changes in climate. The information in this document has been sourced from the regional projection for Metropolitan Sydney (NSW OEH, 2014).

Future climate change projections are provided for two future 20 year time frames: 2020-2039, referred to as 2030 or 'Near Future'; and 2060-2079, referred to as 2070 or 'Far Future'.

Temperature

Across NSW all of the climate models agree that average, minimum and maximum temperatures are increasing for the near future and the far future. There is also expected to be more hot days and fewer cold nights.

In the Sydney metropolitan area maximum temperatures are expected to increase by 0.7°C in the near future and up to 1.9°C in the far future. Spring will experience the greatest change in maximum temperatures, increasing by up to 2.2°C in the far future. Increased maximum temperatures are known to impact human health through heat stress and increasing the number of heatwave events. They are also likely to impact on the health of plants and animals and their distribution patterns.

Minimum temperatures are projected to increase by 0.6°C in the near future and up to 2°C in the far future.

Temperature Extremes

Similarly there is expected to be an increase in the number of hot days experienced in Penrith. Western Sydney currently experiences between 10 and 20 hot days on average each year (>35°C). There is projected to be an additional 5 to 10 hot days in the near future, increasing to 10 to 20 additional hot days each year by 2070.

These hot days are projected to occur mainly in spring and summer, although in the far future hot days may also extend into autumn.

There is a significant body of research available to demonstrate that prolonged hot days results in an increased incidence of illness and death, and this is particularly evident for vulnerable members of the community including the elderly, the very young and those with chronic diseases.

An increase in the number of hot days is also linked to increased bushfire risk and water supply, it also has implications for ecosystem and biodiversity health, as well as the functioning of critical infrastructure.

The Sydney region is also expected to experience fewer cold nights (<2°C) in the near and far future, with an average of around 5 fewer cold nights per year in the near future and around 12 fewer cold nights per year by 2070. This has implications for some agricultural and horticultural industries that rely on cold winters for production, as well as for ecosystem maintenance.

Penrith recorded its hottest day ever on 11 February, 2017 of 46.9°C.

Rainfall

There are likely to be two main ways in which rainfall experienced in Penrith will change over time. This includes changes to both the pattern of when rain falls, for example summer versus winter, as well as changes in the overall amount of rainfall experienced each year.

Modelling rainfall is complex due to the variation in the weather systems that generate rain. Penrith currently experiences significant variations in seasonal and annual rainfall, however in the Sydney region the majority of models agree that autumn rainfall will increase in both the near and far future. The models also predict that spring rainfall will decrease in the near future, however beyond this it is less clear what we can expect.

Projections for total annual rainfall are not clear, with projections ranging from a decrease of 13% through to an increase of 18% by 2030.

Changes in both the amount of rainfall, as well as changes in rainfall patterns have the potential for significant effects with possible impacts on native species reproductive cycles as well as agricultural and primary production that rely on winter rains for optimum growth.

Extreme Rainfall

Based on the NARClIM projections, rainfall extremes across NSW are projected to increase in the near and far future. In the near future all increases are within the inter-annual variability and are therefore not statistically significant. In the far future this remains true for

most indices and regions; however, several indices and regions do now show statistically significant increases.

Fire Weather

Metropolitan Sydney is projected to experience an increase in average and severe fire weather in the near and far future. Increasing hot days, heatwaves and rainfall deficiencies in NSW are driving the likelihood of very high fire danger weather.

Land Use

Penrith Council is currently undertaking a review to update the current Rural Lands Study. The previous study informed the zonings under Penrith's current Local Environmental Plan 2010 (LEP).

A set of land use zonings and corresponding minimum lot sizes have been established for rural lands to reflect the desirable land uses for identified localities under Penrith's LEP.

The land use zonings and minimum lot sizes are:

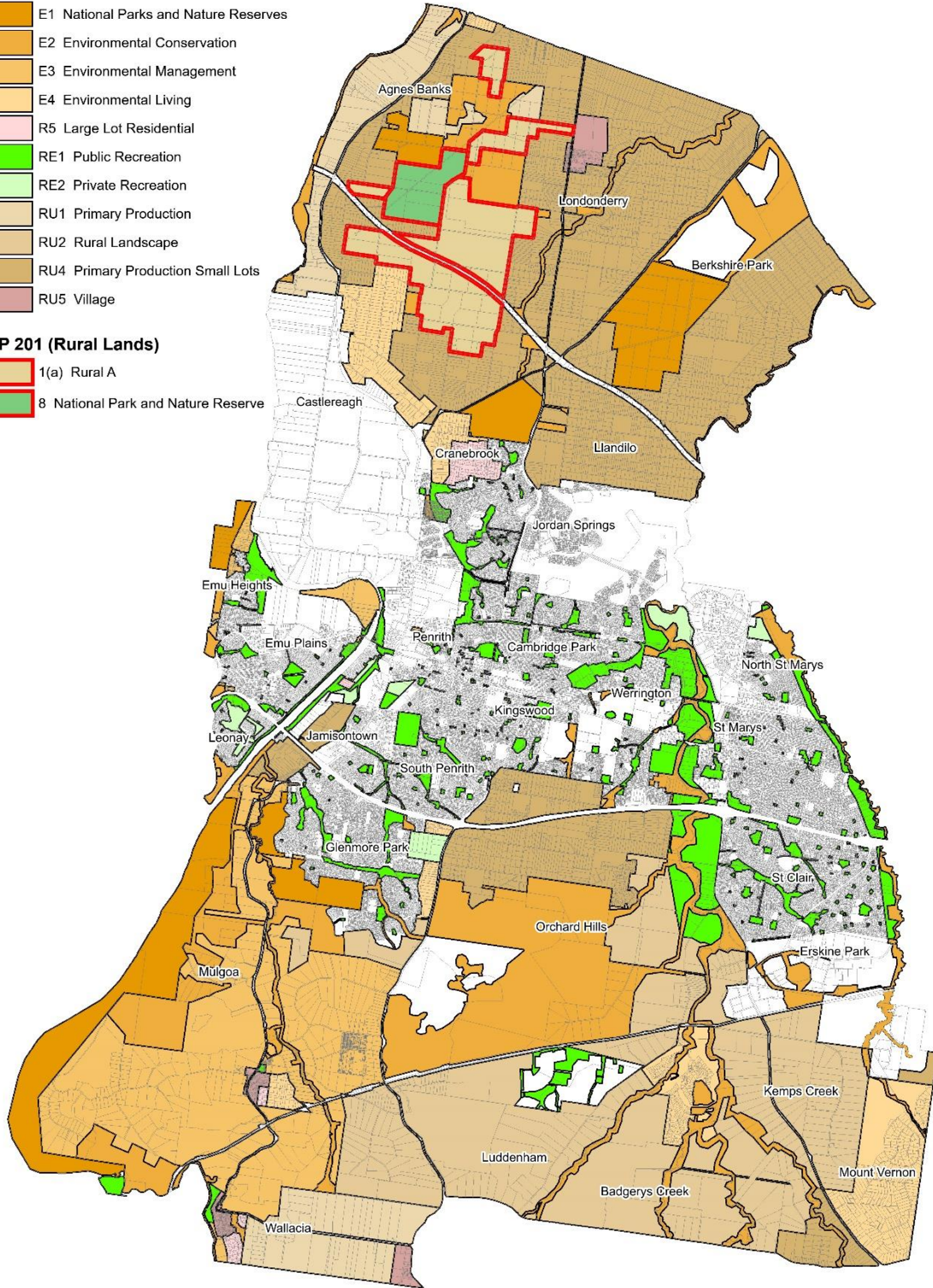
RU1 Primary Production	20 hectares
RU2 Rural Landscape	40 hectares
RU4 Primary Production Small Lots	560 m2 2 hectares 1000 hectares
RU5 Village	1000 hectares 550 m2 2000 m2
R5 Large Lot Residential	4000 m2 2 hectares
E1 National Parks and Nature Reserves	40 hectares 20 hectares
E2 Environmental Conservation	20 hectares 40 hectares 2 hectares
E3 Environmental Management	20 hectares 40 hectares 1 hectare 600 m2
E4 Environmental Living	1 hectare 2 hectares 20 hectares 4000 m2

LEP 2010

- E1 National Parks and Nature Reserves
- E2 Environmental Conservation
- E3 Environmental Management
- E4 Environmental Living
- R5 Large Lot Residential
- RE1 Public Recreation
- RE2 Private Recreation
- RU1 Primary Production
- RU2 Rural Landscape
- RU4 Primary Production Small Lots
- RU5 Village

LEP 201 (Rural Lands)

- 1(a) Rural A
- 8 National Park and Nature Reserve



Current Rural and Environmental Zonings

Employment land use

There are significant industrial centres within Penrith LGA. Large commercial/industrial areas exist at Penrith (Castlereagh Road), St Marys (Dunheved Estate), Emu Plains (Old Bathurst Road) and Jamisontown. Also, a new emerging centre is located at Luddenham (Sydney Science Park). A major new development at Erskine Park has also been established under the State Environmental Plan Western Sydney Employment Area 2009.

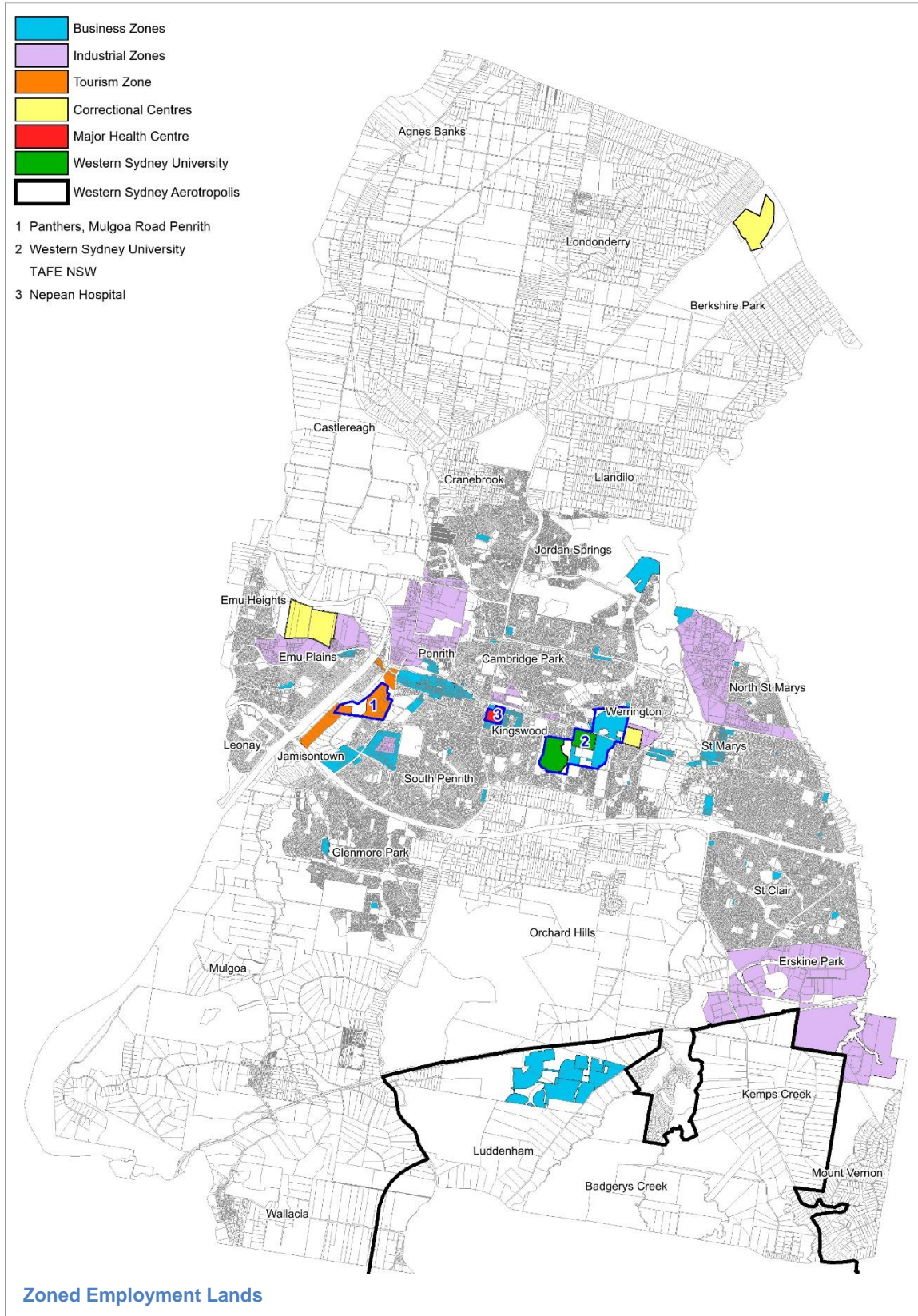
A vital centre for health and education in Western Sydney is located within Kingswood and is known as “The Quarter”. This location covers over 300 hectares between Penrith and St Marys and is committed to becoming an international destination for investment and excellence in health care, medical research, education and related technology. Employment facilities in “The Quarter” include Western Sydney University, NSW TAFE, Nepean Hospital and Nepean Private Hospital.

Three correctional centres are located within the LGA: Cobham at Kingswood, Emu Plains Correctional Centre, and John Moroney at Londonderry.

The following map show the existing and future planned employment lands within the Penrith LGA.

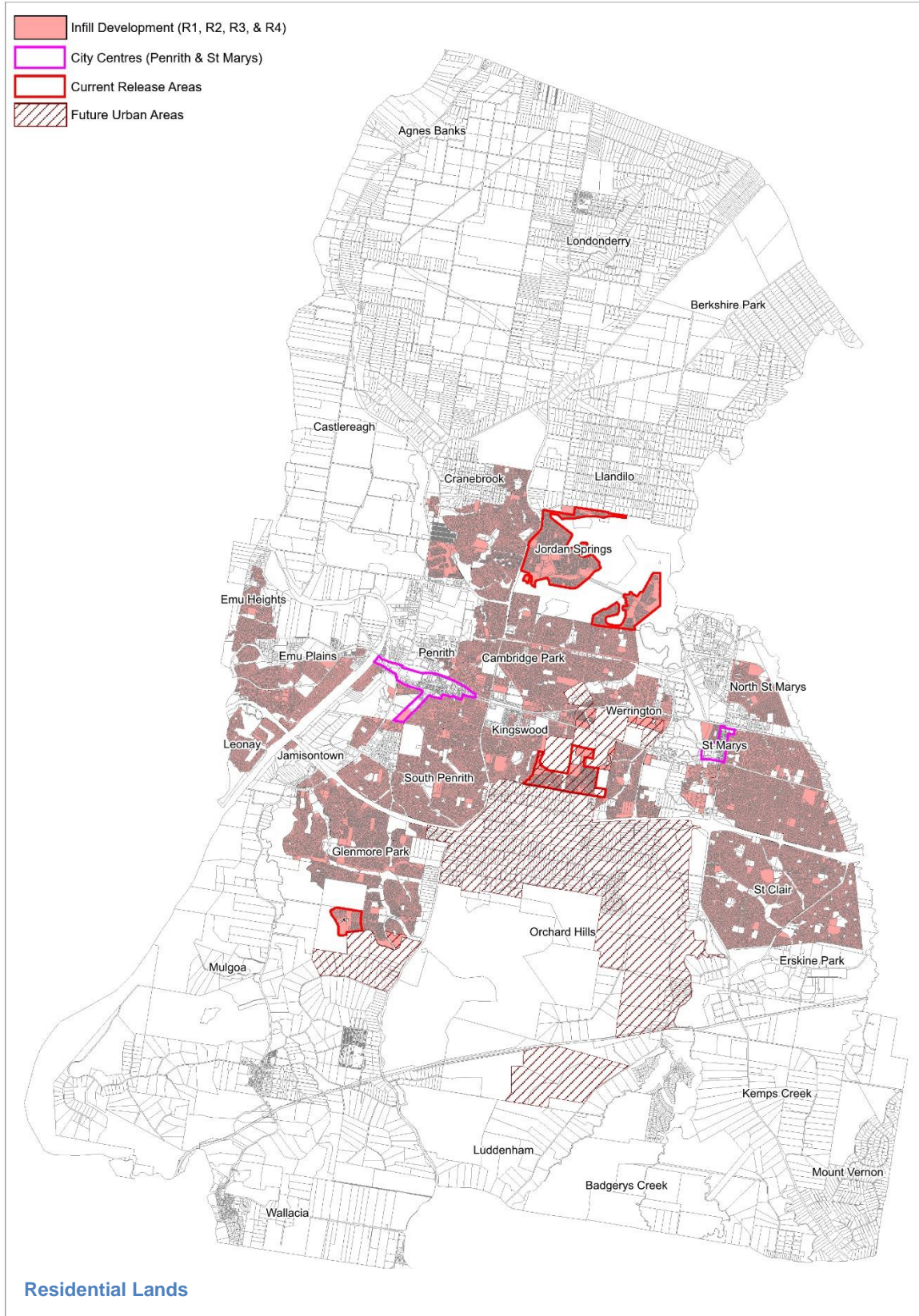
Industries include:

- Light industry
- Agriculture
- Education
- Health Facilities - The major public hospital in the area is the Nepean Hospital at Kingswood.
- Tourism
- Correctional Centres



Residential land use

The following map shows the existing residential zones, City Centres and current and future release areas within the Penrith LGA.



The table below shows the approximate areas as at July 2019, of the various land use zonings within the Penrith Local Government Area.

Land Use Zone / Type / Classification	Area (sq km)	% of LGA
Business Zones	6.44	2
Industrial Zones	15.76	4
Recreation Zones	24.77	6
Residential Zones	57.58	14
Rural Zones	159.8	40
Environment Protection Zones	116	29
Infrastructure Zones	21.12	5
	403.8	100

The Draft Penrith Rural Lands Strategy identifies a range of agricultural activities within the Penrith LGA that includes a large number of commercial farming and grazing businesses. These include commercial vegetable businesses, orchards, beef grazing holdings, in Berkshire Park, Llandilo, Luddenham, Kemps Creek and Badgerys Creek. There are also 20 egg and poultry farms concentrated in Londonderry, Llandilo, Luddenham, and Kemps creek.

In addition to these commercial activities there is also a broad range of livestock and companion animals held by rural landowners.

Nursery and cut flower production is also carried out in the rural areas of Penrith, with Nurseries in North Cranebrook, Llandilo and Agnes Banks, Orchard Hills, Kemps Creek, and Mulgoa. Turf farming activities occur along the fertile alluvial plains of the Nepean River in Agnes Banks and North Castlereagh.

The presence of these activities on rural lands within the Penrith LGA provides potential implications for emergency service agencies, in Particular the Department of Primary Industries, managing evacuation of animals in the event of the bushfires and flooding or isolation of livestock and farming properties in the event of an outbreak of significant plant and animal communicable diseases.

Population and People

Population statistics were obtained from Profile id data for the Penrith LGA. The Penrith City Community Profile provides demographic analysis for the City and its suburbs based on results from the 2011, 2006, 2001, 1996, 1991 Censuses of Population and Housing. The profile is updated with population estimates when the Australian Bureau of Statistics (ABS) releases new figures.

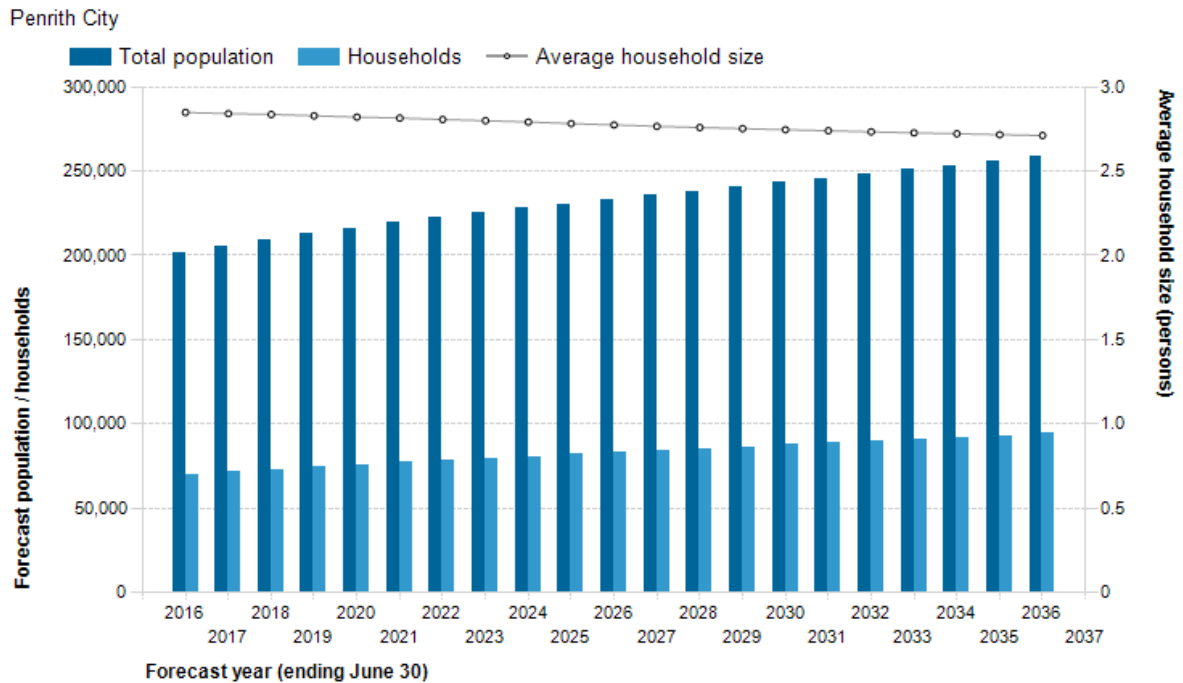
In 2016, the total resident population in the Penrith LGA was 201,597, having risen from 184,589 in 2011. This change represented significant growth between these Census periods, at an average rate of over 1.77% each year. The Penrith City Estimated Resident Population for 2018 is 209,210, with a population density of 5.17 persons per hectare, an

increase from 4.98 persons per hectare in 2016. These figures indicate that Penrith is continuing to experience significant growth in its resident population.

The total resident population in the Penrith LGA is expected to experience an increase of over 56,791 people between 2016 and 2036, at an average annual growth rate of 1.25% per annum. This is based on an increase of over 24,272 households for the period, with the average number of persons per household falling from 2.85 to 2.71.

The Penrith City population forecast for 2021 is 219,315, and is forecast to reach 258,195 by 2036. This represents an overall population change between 2016 and 2036 of 28.2% as indicated in the graph below. Whilst the overall rate of population increase is expected to average at 1.25% per annum for the twenty year period between 2016 and 2036, higher growth is expected in the five year period between 2016 and 2021 (1.72% per annum).

Forecast population, households and average household size



Population and household forecasts, 2016 to 2036, prepared by .id the population experts, December 2017.



The most recent population projections are based on expected new dwellings in new release areas and some infill development, with more than 24,900 additional dwellings expected by 2036. The highest average annual population increases between 2016 and 2036 are expected to occur within the Caddens release Area (6.0%), Penrith (3.8%), Werrington (3.5%) and the St Marys release area – Jordan Springs (3.5%) (shaded blue in the table below shown in the table below).

Population forecast 2016-2036, based on Estimated Resident Population							
Area	Forecast year					Change 2016-2036	
	2016	2021	2026	2031	2036	change	annual %
Caddens	1,068	3,163	3,634	3,549	3,456	+2,389	6.0
Cambridge Park	6,889	6,999	7,078	7,262	7,515	+626	0.4
Claremont Meadows	4,920	5,006	4,938	4,932	4,955	+35	0.0
Colyton	8,600	8,616	8,701	8,867	9,091	+491	0.3
Cranebrook	16,268	15,900	15,780	15,789	15,939	-329	-0.1
Emu Heights	3,362	3,258	3,273	3,302	3,349	-13	0.0
Emu Plains	8,621	8,909	9,137	9,371	9,643	+1,022	0.6
Erskine Park	6,595	6,463	6,502	6,621	6,807	+212	0.2
Glenmore Park	23,679	24,949	24,402	24,038	23,815	+136	0.0
Jamison town	5,614	5,991	6,219	6,563	7,003	+1,389	1.1
Kingswood	10,026	11,937	12,789	13,217	13,728	+3,702	1.6
Leonay	2,583	2,558	2,612	2,670	2,790	+207	0.4
Llandilo - Berkshire Park	3,894	3,925	3,971	3,997	4,016	+122	0.2
Londonderry - Castlereagh - Agnes Banks	5,704	5,736	5,814	5,935	6,062	+358	0.3
North St Marys	4,040	4,163	4,213	4,335	4,446	+406	0.5
Orchard Hills	5,057	5,069	4,974	4,931	4,922	-134	-0.1
Oxley Park	3,076	3,215	3,349	3,511	3,669	+593	0.9
Penrith	13,630	16,920	20,493	24,805	28,613	+14,983	3.8
Regentville - Mulgoa - Wallacia	4,071	4,589	4,690	4,796	4,913	+842	0.9
South Penrith	12,070	12,041	12,250	12,616	13,040	+970	0.4
St Clair	20,377	20,182	20,136	20,127	20,244	-133	0.0
St Marys	12,739	14,329	15,644	16,953	18,157	+5,417	1.8
St Marys Release Area - Jordan Springs	5,317	9,446	11,134	10,918	10,634	+5,317	3.5
Werrington	4,158	5,874	7,022	7,831	8,207	+4,049	3.5
Werrington Downs - Werrington County - Cambridge Gardens	9,033	9,064	9,066	9,169	9,402	+369	0.2
Penrith City	201,404	219,315	232,754	245,683	258,195	+56,791	1.2

Population and household forecasts, 2016 to 2036, prepared by .id , the population experts, December 2017. <https://home.id.com.au>

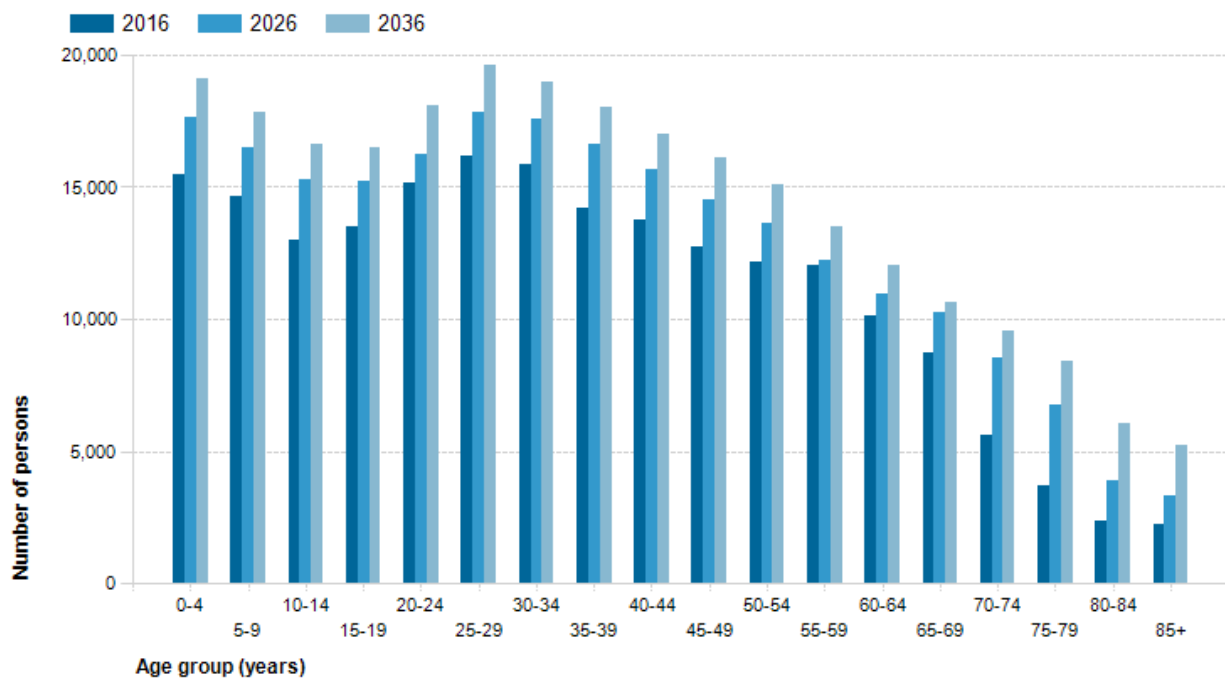
In 2016, the most populous age group in Penrith City was 30-34 year olds, with 15,251 persons and accounting for 7.8% of the total persons. Whereas, In 2011, the dominant age structure for persons in Penrith City was 0-4 year olds , which accounted for 7.6% of the population with 13,558 total persons.

In 2021 the most populous forecast age group will be 25-29 year olds, with an estimated 17,333 persons (7.3% of the population).

The 5 year age group with the largest increase in persons between 2016 and 2026 is forecast to be in ages 75 to 79, which is expected to increase by 3,067 and account for 2.9% of the total persons. The number of people aged under 17 is forecast to increase by 7,463 (14.6%), and will comprise 25.1% of the population. The number of persons aged over 60 is expected to increase to 10,985 (33.4%) and comprise 18.8% of the total population by 2026.

Forecast age structure - 5 year age groups

Penrith City - Total persons



Population and household forecasts, 2016 to 2036, prepared by .id the population experts, December 2017.



Household Type

The dominant household type in Penrith is couples with children (37.2%), compared with couples without children (21.7%). Penrith has a slightly higher proportion of single parent families (14.1%) compared to Greater Sydney (10.4%).

Ethnicity

Analysis of the country of birth of the population in Penrith City in 2016 compared to the Greater Sydney shows that there was a smaller proportion of people born overseas and also a smaller proportion of people from a non-English speaking background.

Overall, 21.6% of the population was born overseas, and 16.8% were from a non-English speaking background, compared with 36.7% and 35.8% respectively for the Greater Sydney.

The dominant non-English speaking country of birth in Penrith City was Philippines, where 1.9% of the population, or 3,797 people, were born.

The major differences between the countries of birth of the population in Penrith City and Greater Sydney were: a *smaller* percentage of people born in China (0.6% compared to 4.7%), and a *smaller* percentage of people born in Vietnam (0.2% compared to 1.7%)

Between 2011 and 2016, the number of people born overseas increased by 5,081 or 12.2% and the number of people from a non-English speaking background increased by 7,053 or 27.2%

The largest changes in birthplace countries of the population in this area between 2011 and 2016 were for those born in:

- India (+1,509 persons)
- United Kingdom (-747 persons)
- Philippines (+724 persons)
- New Zealand (+631 persons)

Aboriginality

The Indigenous population Penrith increased from 5,385 in 2011 to 7,740 in 2016. As a proportion of Penrith's total population, Aboriginal or Torres Strait Islanders make up 3.9% of the population; this proportion was 3.0% in 2011

Analysis of the Aboriginal and Torres Strait Islander service age groups in Penrith City in 2016 compared to the Aboriginal and Torres Strait Islander population in New South Wales shows that there was a similar proportion of people in the younger age groups (0 to 17 years) and a lower proportion of people in the older age group (65+ years).

Overall, 41.2% of the Aboriginal and Torres Strait Islander population in Penrith City was aged between 0 and 17, and 3.6% were aged 65 years and over, compared with 30.8% and 5.4% respectively for the Aboriginal and Torres Strait Islander population in New South Wales.

The major differences between the age groups of the Aboriginal and Torres Strait Islander population in Penrith City and the Aboriginal and Torres Strait Islander population in New South Wales were:

- A *larger* percentage of people aged 18 to 24 years (14.5% compared to 12.7%)
- A *larger* percentage of people aged 25 to 34 years (14.2% compared to 12.8%)
- A *smaller* percentage of people aged 50 to 59 years (7.2% compared to 9.1%)

From 2011 to 2016, Penrith City's Aboriginal and Torres Strait Islander population increased by 2,358 people (43.8%). This represents an average annual population change of 7.53% per year over the period.

The largest changes in age groups of the Aboriginal and Torres Strait Islander population in this area between 2011 and 2016 were in the age groups:

- 25 to 34 (+398 people)
- 18 to 24 (+384 people)
- 35 to 49 (+366 people)
- 5 to 11 (+357 people)

Key statistics							
Aboriginal and Torres Strait Islander peoples - Penrith City	2016			2011			Change
Number of persons usually resident	Number	%	New South Wales - ATSI %	Number	%	New South Wales - ATSI %	
Total indigenous population							
Indigenous population	7,742	100.0	3.6	5,386	100.0	3.1	+2,356
Population summary							
Total population	7,742	100.0	100.0	5,386	100.0	100.0	+2,356
Males	3,871	50.0	49.7	2,628	48.8	49.3	+1,243
Females	3,871	50.0	50.3	2,758	51.2	50.7	+1,113
Indigenous status							
Aboriginal	7,511	97.0	95.9	5,187	96.3	95.4	+2,324
Torres Strait Islander	146	1.9	2.2	122	2.3	2.8	+24
Both Aboriginal and Torres Strait Islander	88	1.1	1.9	78	1.4	1.9	+10
Dwellings							
Persons counted in non private dwellings	370			239			+131
Persons counted in private dwellings	7,335			5,207			+2,128
Occupied private dwellings	3,418			2,363			+1,055

Source: Australian Bureau of Statistics, Census of Population and Housing 2011 and 2016 (Usual residence). Compiled and presented in profile.id by



Transport Routes and Facilities

The main transport routes through the Region are: -

M4 Motorway

The Driftway/Richmond Road Great Western Highway

The Northern Road Mamre Road

Castlereagh Road Elizabeth Drive

Mulgoa Road Dunheved Road

The Main Western Rail Line connecting Sydney CBD to the Western Districts and Western NSW.

The rail line traverses East-West through the centre of the city, adjacent to residential, commercial and industrial areas. The line is used for the transport of people (particularly during peak hours), hazardous and inert materials.

The consequences of a rail accident will vary, depending on the nature of the incident, with factors including the type of material being transported (hazardous or inert material), the time at which the accident occurs, and the location along the rail line relative to adjacent housing and transport routes.

Incidents which will impact on both internal and external to the Rail network system are infrequent; however the consequences of such an accident may be high.

Major aircraft routes traverse the area and include air traffic from Richmond air base, Mascot, Bankstown, and to a lesser extent to smaller airfield at Camden.

Disruptions on these routes are likely to cause a significant regional problem.

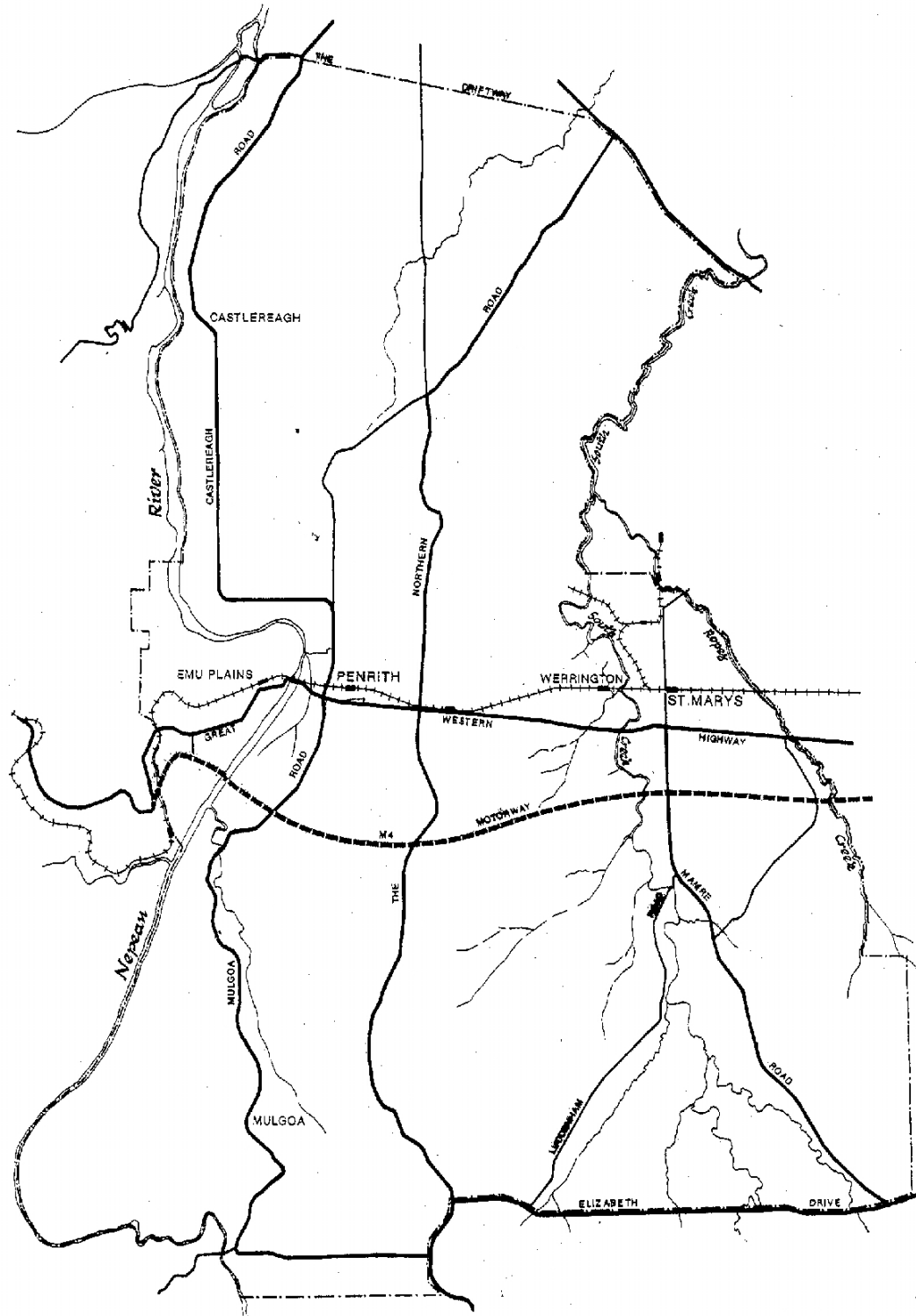
The area's main waterway is the Nepean River, which is utilised by a wide variety of watercraft (particularly in summer), including motorboats, rowboats and jet skis.

The area is traversed by smaller, un-navigable waterways flowing in a northerly direction (*see Map below*).

Major fresh water storage reservoir facilities exist at:

- Defence Establishment Orchard Hills - The Northern Road, Orchard Hills
- Cranebrook - adjacent to the intersection of Borrowdale Way and The Northern Road
- Kingswood - Glebe Place
- Erskine Park - adjacent to the corner of Swallow Drive and Chameleon Drive

Major Transport Routes & Waterways



Economy and Industry

Penrith City is a residential and rural area, with most of the population living in residential areas in a linear corridor along the Great Western Highway and the main western railway.

The City has a total area of approximately 407 sq km, of which 80% is either rural and/or rural residential. Most of the urban area is residential, with some commercial and industrial areas which include extractive industries and manufacturing. A large portion of the rural area is used for agricultural purposes, including dairy, poultry and hobby farming, orcharding, market gardening and horse breeding. The major commercial centres within the LGA are situated at Penrith and St Marys.

The employment statistics in this section have been extracted from data obtained from .id in its economic and industrial profile of Penrith City. The employment statistics were compiled by .id from the National Institute of economic and Industry Research (NIEIR). Employment total is the most accurate and up to date measure of the total number of people employed in Penrith.

The workforce in Penrith is made up of all the people who are employed in the local area, regardless of where they live. Workforce statistics reveal how the characteristics of the workforce in Penrith City vary between each industry sector and indicates specific industry sector workforce requirements and employment opportunities.

The analysis of the workforce in Penrith City in 2017/2018 identified the three largest employment industries as:

- Health Care and Social Assistance (12,573 people or 14.5%)
- Construction (11,849 people or 13.7%)
- Retail Trade (10,322 people or 11.9%)

In combination, these three industries accounted for 37,744 people in total or 40.1% of the workforce.

The number of people in the workforce in Penrith City increased by 2,851 between 2013/14 and 2017/18, with the largest changes in employment being for people employed in:

- Construction (+3,734 local workers)
- Health Care and Social Assistance (+2,495 local workers)
- Education and Training (+1,688 local workers); and
- Retail Trade (+1,348 local workers)

The economic impacts of disasters or emergencies can potentially be devastating given that dwellings, business, and community infrastructure can be damaged and services disrupted with a flow on effect on employment.

Businesses and households experience a range of impacts both direct and indirect which, depending on the nature of the emergency/disaster and its severity, that have long and short-term effects.

Direct impacts result from flood, storm, wind, and bushfire or fire damage to crops, and damage to commercial/ residential/and public buildings and infrastructure including roads and services. Indirect impacts result from disruptions to communications and transport networks.

Indirect impacts may impact on tourism, workers and businesses due to trade losses, loss of social and business networks and interruptions to the natural resource/raw materials and product supply chains.

Historical data indicates that the emergencies or disasters most likely to occur in the Penrith Local Government Area are low impact and short term bushfire and flood (riverine and flash flooding) emergencies which will have a short term effect but are unlikely to have a long term effect the local Penrith economy.

Employment (total) by industry

Penrith City	2017/18			2012/13			Change
Industry	Number	%	New South Wales%	Number	%	New South Wales%	2012/13 to 2017/18
Agriculture, Forestry and Fishing	811	0.9	2.2	722	1.0	2.2	+89
Mining	412	0.5	1.1	493	0.7	1.2	-82
Manufacturing	7,319	8.5	6.5	7,506	10.4	8.0	-187
Electricity, Gas, Water and Waste Services	1,089	1.3	0.9	1,042	1.4	1.1	+47
Construction	11,849	13.7	9.3	7,275	10.0	8.2	+4,574
Wholesale Trade	2,332	2.7	3.2	2,505	3.5	4.2	-173
Retail Trade	10,322	11.9	10.0	8,934	12.3	10.1	+1,388
Accommodation and Food Services	6,833	7.9	7.5	5,640	7.8	7.1	+1,193
Transport, Postal and Warehousing	5,102	5.9	4.8	4,150	5.7	5.2	+952
Information Media and Telecommunications	509	0.6	2.2	633	0.9	2.6	-124
Financial and Insurance Services	1,024	1.2	5.0	996	1.4	5.1	+28
Rental, Hiring and Real Estate Services	1,257	1.5	1.7	1,154	1.6	1.8	+102
Professional, Scientific and Technical Services	2,879	3.3	8.7	2,436	3.4	8.3	+443

Penrith City	2017/18			2012/13			Change
Industry	Number	%	New South Wales%	Number	%	New South Wales%	2012/13 to 2017/18
Administrative and Support Services	2,569	3.0	3.4	2,130	2.9	3.5	+439
Public Administration and Safety	5,768	6.7	5.8	5,489	7.6	6.0	+278
Education and Training	9,437	10.9	9.1	7,533	10.4	8.2	+1,904
Health Care and Social Assistance	12,573	14.5	13.3	9,660	13.3	11.7	+2,913
Arts and Recreation Services	1,032	1.2	1.6	1,095	1.5	1.7	-63
Other Services	3,305	3.8	3.7	3,081	4.3	3.9	+225
Total Industries	86,420	100.0	100.0	72,473	100.0	100.0	+13,946

Registered businesses by industry

Penrith City - Total registered businesses	2018			2014			Change 2014 to 2018
	Industry	Number	% New South Wales %	Number	% New South Wales %	% New South Wales %	
Agriculture, Forestry and Fishing	267	1.9	6.8	275	2.2	7.9	-8
Mining	15	0.1	0.2	19	0.2	0.2	-4
Manufacturing	752	5.2	3.4	686	5.6	3.7	+66
Electricity, Gas, Water and Waste Services	68	0.5	0.3	55	0.4	0.3	+13
Construction	3,527	24.6	16.0	2,958	23.9	14.9	+569
Wholesale Trade	462	3.2	3.6	457	3.7	4.0	+5
Retail Trade	758	5.3	5.7	766	6.2	6.5	-8
Accommodation and Food Services	394	2.8	4.0	315	2.6	4.1	+79
Transport, Postal and Warehousing	1,745	12.2	7.6	1,237	10.0	6.2	+508
Information Media and Telecommunications	74	0.5	1.2	66	0.5	1.2	+8
Financial and Insurance Services	878	6.1	9.1	691	5.6	8.5	+187
Rental, Hiring and Real Estate Services	1,461	10.2	10.9	1,348	10.9	11.1	+113
Professional, Scientific and Technical Services	1,173	8.2	13.1	1,034	8.4	13.0	+139
Administrative and Support Services	627	4.4	4.1	523	4.2	4.0	+104

Penrith City - Total registered businesses	2018			2014			Change
Industry	Number	%	New South Wales %	Number	%	New South Wales %	2014 to 2018
Public Administration and Safety	72	0.5	0.4	85	0.7	0.4	-13
Education and Training	218	1.5	1.4	172	1.4	1.4	+46
Health Care and Social Assistance	699	4.9	5.9	581	4.7	5.7	+117
Arts and Recreation Services	196	1.4	1.3	148	1.2	1.3	+48
Other Services	849	5.9	4.0	768	6.2	4.0	+81
Industry not classified	96	0.7	0.9	168	1.4	1.6	-72
Total business	14,332	100.0	100.0	12,355	100.0	100.0	+1,977

Local workers key statistics - All industries

Penrith City	2016			2011			Change
Name	Number	%	New South Wales %	Number	%	New South Wales %	2011 to 2016
Local workers							
Total local workers (Census)	68,597	100.0	100.0	60,546	100.0	100.0	+8,051
• Males	34,850	50.8	52.6	30,349	50.1	53.3	+4,501
• Females	33,747	49.2	47.4	30,192	49.9	46.7	+3,555
Age structure							
15 - 24 years	11,709	17.1	14.0	10,567	17.5	14.5	+1,142
25 - 54 years	43,746	63.8	66.6	39,328	65.0	67.7	+4,418
55 - 64 years	10,646	15.5	15.0	9,045	14.9	14.4	+1,601
65 years and over	2,503	3.6	4.3	1,602	2.6	3.5	+901
Top three industries							
Health care and social assistance	9,767	13.5	11.9	8,187	13.2	11.3	+1,580
Retail trade	8,034	11.1	9.2	7,807	12.6	10.1	+227
Education and training	6,943	9.6	8.0	6,277	10.1	7.7	+666

Penrith City	2016			2011			Change
Name	Number	%	New South Wales %	Number	%	New South Wales %	2011 to 2016
Top three occupations							
Professionals	12,893	18.8	23.6	11,133	18.4	22.7	+1,760
Clerical and administrative workers	9,937	14.5	13.8	9,668	16.0	15.0	+269
Technicians and trades workers	8,729	12.7	12.7	7,831	12.9	13.2	+898
Hours worked							
Full time	42,862	62.5	63.1	37,504	61.9	62.9	+5,358
Part time	24,349	35.5	34.9	21,573	35.6	33.1	+2,776
Qualifications							
Bachelor or higher degree	15,769	23.0	32.6	11,977	19.8	27.9	+3,792
Advanced diploma or diploma	7,015	10.2	11.1	5,504	9.1	10.5	+1,511
Certificate level	17,341	25.3	22.2	14,747	24.4	22.2	+2,594
No qualifications	26,521	38.7	31.1	25,502	42.1	34.9	+1,019
Individual Income							
Less than \$500	12,590	18.4	17.2				
\$500 -\$1,749	45,098	65.7	60.8				

\$1,750 or more	9,760	14.2	20.5				
Method of Travel to Work							
Car	52,473	76.5	61.9	44,897	74.2	62.5	+7,576
Public Transport	2,990	4.4	16.0	2,599	4.3	13.8	+391
Bicycle	192	0.3	0.7	270	0.4	0.7	-78
Walked only	1,240	1.8	3.9	1,290	2.1	4.1	-50
Other Characteristics							
Born overseas	18,768	27.4	32.8	15,485	25.6	30.1	+3,283
Speaks a language other than English at home	14,409	21.0	26.4	10,611	17.5	22.8	+3,798
Arrived between 2011 and 9th August 2016	2,165	3.2	6.0				

Annexure B – Hazards and Risks Summary

A Local Emergency Risk Management (ERM) Study has been undertaken by the Penrith Local Emergency Management Committee identifying the following hazards as having risk of causing loss of life, property, utilities, services and/or the community’s ability to function within its normal capacity. These hazards have been identified as having the potential to create an emergency. The Penrith Local Emergency Risk Management Study should be referenced to identify the complete list of consequences and risk descriptions.

Hazard	Risk Description	Likelihood Rating	Consequence Rating	Risk Priority	Combat / Responsible Agency
Agricultural Disease (Animal/Plant)	An agriculture/horticulture incident that results, or has potential to result, in the spread of a communicable disease or infestation.	Possible	Moderate	High	Department of Primary Industries
Bridge Collapse	Failure of a major bridge structure with or without warning owing to structural failure or as a result of external/ internal events or other hazards/ incidents.	Unlikely	Major	Medium	LEOCON FRNSW
Building Collapse	Collapse of building owing to structural failure or impact from external/internal event of other hazards /incidents.	Possible	Major	High	FRNSW (USAR) LEOCON
Communicable Disease - Human	Pandemic illness that affects, or has potential to affect, large portions of the human population	Possible	Catastrophic	Extreme	NSW Health

Hazard	Risk Description	Likelihood Rating	Consequence Rating	Risk Priority	Combat / Responsible Agency
Dam Failure	A dam is compromised that results in localised or widespread flooding.	Unlikely	Catastrophic	High	NSW SES
Earthquake	Earthquake of significant strength that results in localised or widespread damage.	Rare	Major	Medium	LEOCON
Fire (Bush or Grass)	Major fires in areas of bush or grasslands.	Almost Certain	Moderate	High	NSWRFS in RFS District FRNSW in Fire District
Fire (Industrial)	Serious industrial fire in office complexes and/or warehouses within industrial estates.	Possible	Moderate	High	NSWRFS in RFS District FRNSW in Fire District
Fire (Commercial)	Serious commercial fires in shopping centres, aged persons units, nursing homes and hospitals.	Possible	Moderate	High	NSWRFS in RFS District FRNSW in Fire District

Hazard	Risk Description	Likelihood Rating	Consequence Rating	Risk Priority	Combat / Responsible Agency
Fire (Residential)	Serious residential fire in medium/high rise apartments.	Possible	Moderate	High	NSWRFS in RFS District FRNSW in Fire District
Flood (Flash)	Heavy rainfall causes excessive localised flooding with minimal warning time	Likely	Moderate	High	NSW SES
Flood (Riverine)	River flows exceed the capacity of normal river systems resulting in flood waters escaping and inundating river plains	Likely	Moderate	High	NSW SES
Hazardous Release	Hazardous material released as a result of an incident or accident.	Possible	Moderate	High	FRNSW
Heatwave	A sequence of abnormally hot conditions having the potential to affect a community adversely.	Possible	Moderate	High	SEOCN
Landslip	Landslip/landslide resulting in localised or widespread damage.	Unlikely	Insignificant	Low	LEOCN

Hazard	Risk Description	Likelihood Rating	Consequence Rating	Risk Priority	Combat / Responsible Agency
Storm	Severe storm with accompanying lightning, hail, wind, and/or rain that causes severe damage and/or localised flooding (includes tornado)	Almost Certain	Moderate	High	NSW SES
Transport Emergency (Air)	Aircraft crashes in LGA resulting in large number of fatalities, injuries and/or damage to property.	Unlikely	Major	Medium	LEOCON
Transport Emergency (Rail)	A major rail accident that disrupts one or more major transport routes that can result in risk to people trapped in train carriages, restrict supply routes and/or protracted loss of access to or from the area.	Unlikely	Major	Medium	LEOCON
Transport Emergency (Road)	A major vehicle accident that disrupts one or more major transport routes that can result in risk to people trapped in traffic jams, restrict supply routes and/or protracted loss of access to or from the area.	Likely	Moderate	High	LEOCON NSWPF
Utilities Failure	Major failure of essential utility for unreasonable periods of time as a result of a natural or man-made occurrence.	Almost Certain	Moderate	High	LEOCON

Annexure C – Local Sub Plans, Supporting Plans and Policies

Responsibility for the preparation and maintenance of appropriate sub and supporting plans rest with the relevant Combat Agency Controller or the relevant Functional Area Coordinator.

The sub/supporting plans are developed in consultation with the Penrith LEMC and the community.

The plans listed below are supplementary to this EMPLAN. The sub/supporting plans have been endorsed by the LEMC and are determined as compliant and complimentary to the arrangements listed in this EMPLAN.

These plans are retained by the LEMO on behalf of the LEMC and public release versions are available on the Council Website.

Plan/Policy	Purpose	Combat / Responsible Agency
Hawkebury Nepean Flood Emergency State Plan	This Plan covers the preparedness measures, the conduct of response operations and coordination of immediate recovery measures for all levels of flooding on the Nepean River	NSW State Emergency Service
City of Penrith Local Flood Plan 2012	This Plan covers the preparedness measures, the conduct of response operations and coordination of immediate recovery measures for all levels of flooding on the Nepean River within the boundaries of the Penrith City.	NSW State Emergency Service

Plan/Policy	Purpose	Combat / Responsible Agency
<p>State Agriculture and Animal Services Functional Area Supporting Plan</p>	<p>This supporting plan details the control and coordination arrangements for the use of all agricultural and animal resources available within the State to the Agriculture and Animal Services Functional Area Coordinator for the prevention of, preparedness for, response to, and recovery from the impact and effects of an emergency</p>	<p>Department of Primary Industries/Local Land service.</p>

