Flooding: Glossary of Terms & Key Concepts

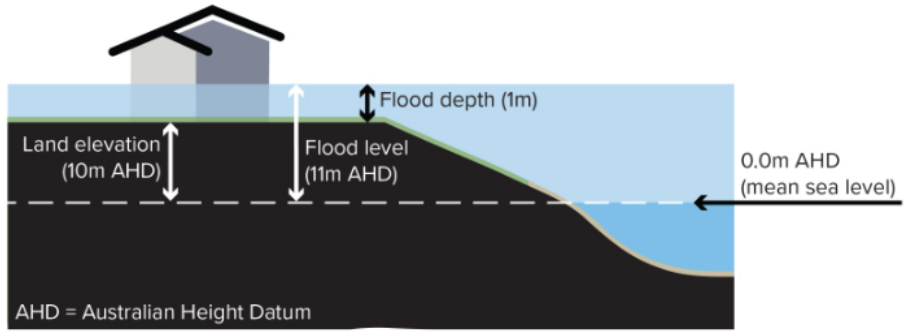
Floods are part of our natural environment. They have occurred in Logan for generations and will continue to occur in future. All floods are different, however their behaviour and impact can be studied, modelled and predicted. Our flood studies provide information to support better decision making and higher levels of resilience, to keep people and property in our community safe.

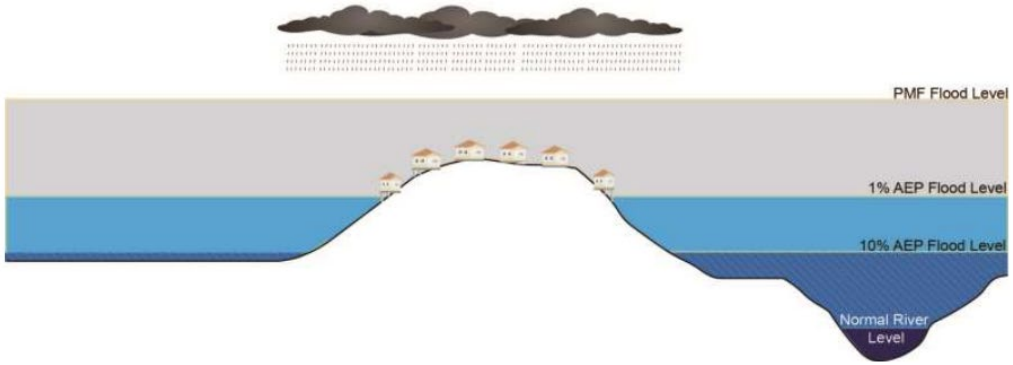
The table below provides information to help you understand terms and concepts used in relation to flooding in Logan. This is relevant for a range of online information and services, including Council's website, various documents and the online Logan Flood Portal.

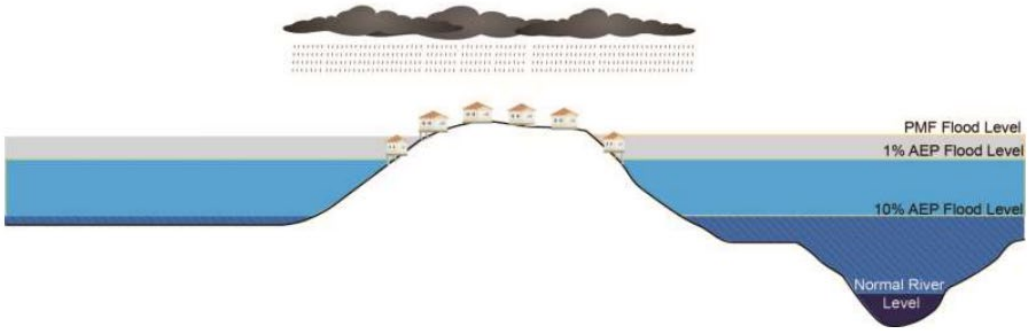
The terms and concepts are presented in alphabetical order with a summary and links below.

A-E	AEP, Catchments, Climate change, Creek flooding, Depth, Essential community infrastructure
F	Flash floods, Flood investigation area, Flood islands, Flood level, Flood risk areas, Flood risk management plan (FRMP), Floodplain, Freeboard
G-J	Hazard, High flow area, Isolation risk
K-O	Overland flow
P-T	Probable Maximum Flood (PMF), River flooding
U-Z	Velocity, Vulnerable use

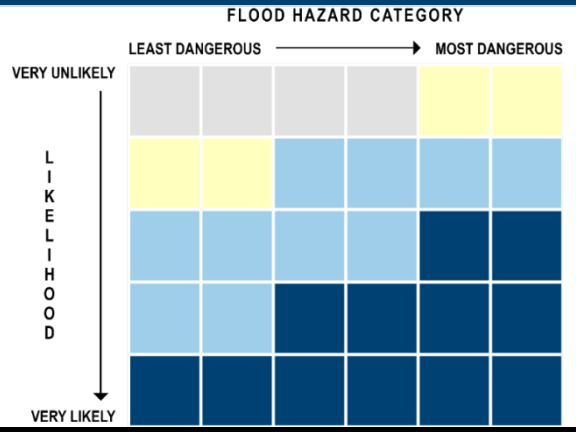
There are further flood terms and definitions available on the Queensland Reconstruction Authority website:
Flood terms and definitions | Queensland Reconstruction Authority (qra.qld.gov.au).

Term / Concept	What does it mean?
AEP	**Annual Exceedance Probability** – the chance of a flood of a given size occurring or being exceeded in any given year. Generally used as a measure of likelihood or probability to describe a range of flood events/scenarios. This reinforces that there is an **ongoing flood risk every year**. For example a 10% AEP flood has a 10% chance (or 1 in 10) of happening each year, or a 1% AEP has a 1% chance in any one year (*it does not mean it will only occur once in 100 years*).
Catchments	Basin-shaped areas of land, surrounded by natural features such as hills, in which water is collected and flows into Logan's creeks and rivers. These natural drainage areas are the extents covered by flood studies. You can view a PDF map of Logan's catchments and waterways. An interactive map is available in our Logan Flood Portal. You can also visit the Queensland Government's website to learn more about the Logan and the Albert River catchments.
Climate change	The changes to the present day climate associated with the effect of global warming. It is a risk multiplier that is likely to make the extent, intensity, duration and timing of hazards worse.
Creek flooding	Creek flooding happens after more localised heavy rainfall events (such as a thunderstorm), when creeks rise and rainfall runoff that is making its way through waterways breaks the banks. Creek flooding has a relatively shorter warning time and can result in 'flash flooding' which can be deep and fast flowing, but generally eases faster.
Depth (of flooding)	How deep the flood water is projected to get in a particular flood scenario (e.g. in a flood with a 5% chance of happening in any given year), measured in metres. Flood depth is the difference between the flood level and the land elevation beneath it. For example, if the land is 10m AHD above sea level and is covered by floodwater to a height of 1m, the depth will show as 1m and the flood level will show as 11m AHD, as illustrated in the diagram. 

Term / Concept	What does it mean?
Essential community infrastructure	Infrastructure or services that need to continue to function and serve the community during a flood, such as major electricity infrastructure, substations, telecommunications facilities, police stations, fire stations, sewerage and water treatment plants. It is important that these facilities are not located in the floodplain, unless there is no feasible alternative, and that mitigation measures can be applied so that they are able to remain operational during a flood.
Flash floods	Flash floods are of short duration and a relatively high flow, generally happening within 6 hours of an intense burst of rainfall, for example during a thunderstorm. While flash floods are generally localised they are dangerous because of their rapid onset and may cut off low lying evacuation routes.
Flood investigation area	Locations where a current flood study does not exist to determine the flood risk. A localised flood risk assessment may be required for any proposed development in these areas. Future flood studies may deliver information that allows the risk to be defined.
Flood islands (Isolation risk)	Flooding can isolate areas and cut-off evacuation routes, which can present dangerous situations. Our flood risk mapping identifies flood islands, described below. There may be other areas which may also be isolated due to roads, bridges or other access routes being unavailable because of floodwater and/or consequential damage during or after a flood event. **Low flood islands** are at first isolated from flood-free land and then completely inundated by floodwater (submerged) as the flood continues to rise. People in this situation must evacuate before the loss of access to ensure safety. 

Term / Concept	What does it mean?
	High flood islands are surrounded by floodwater but retain a portion of the area as flood free in the largest conceivable flood (the Probable Maximum Flood). There is somewhere for people to retreat to if they do not evacuate before the loss of access, however they may without services, supplies and shelter for an extended period.  *Image source:* *adr-guideline-7-2.pdf (aidr.org.au)*
Flood level	The projected **water surface level** relative to sea level (which is approximately zero) in the selected flood scenario. Measured in 'metres AHD' or 'm AHD' above mean sea level, where AHD = Australian Height Datum. Note that the Bureau of Meteorology issue flood warnings with flood levels relative to the flood gauge, not sea level, particularly for gauges further up the catchment such as Maclean's Bridge.

Term / Concept	What does it mean?
Flood risk areas	There are 4 flood risk areas that underpin the risk-based flood policy. These are derived from consideration of the following factors: • multiple flood events, up to the probable maximum flood (PMF), which represents the full extent of the floodplain based on the largest conceivable flood • the likelihood or chance of these events occurring • the hazard, behaviour or level of danger caused by these events.



Risk	Characteristics	Additional Information
High	Floodwaters may be deep and/or fast flowing or have a relatively high chance of occurrence (for example 80% chance in 30 years). Conditions may pose a risk to life and cause damage to buildings, possibly severe.	Areas will be considered **high** risk where over a 30 year period (lifetime of a regular mortgage) there is: • 80% chance of being flooded (within the 5% or 1 in 20 chance part of the floodplain) OR • 25% chance of being flooded deeper than 0.5m or faster than 2m/s OR • 15% chance of being flooded deeper than 2m or faster than 2m/s At 0.5m depth the flood is likely to be above floor level, causing damage to the home with costs to repair, recovery time and money, loss of personal items, loss of services/utilities (with other impacts such as food wastage), or difficulty obtaining affordable insurance.
Moderate	These areas have a lesser chance of being flooded, or where the chance is higher, with shallow and slower moving floodwater. Conditions potentially pose an unacceptable	Areas will be considered **moderate** risk where over a 30 year period (lifetime of a regular mortgage) the chance of flooding is between 1% and 25%. Where the chance is higher (25%), flooding is predicted to be less than 0.5m deep or slower than 2m/s. Flooding could lead to dangerous conditions, but with a very unlikely chance of occurrence.

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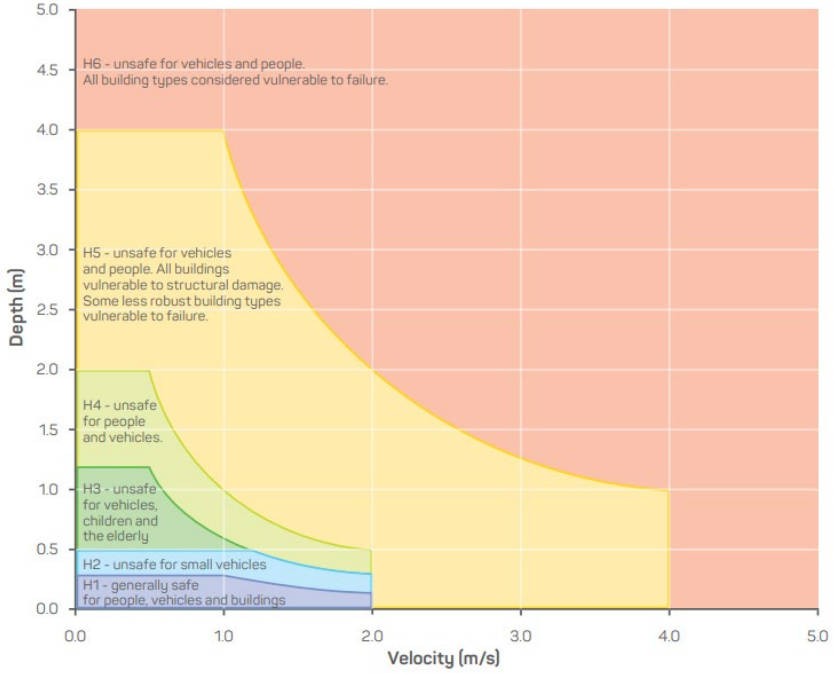
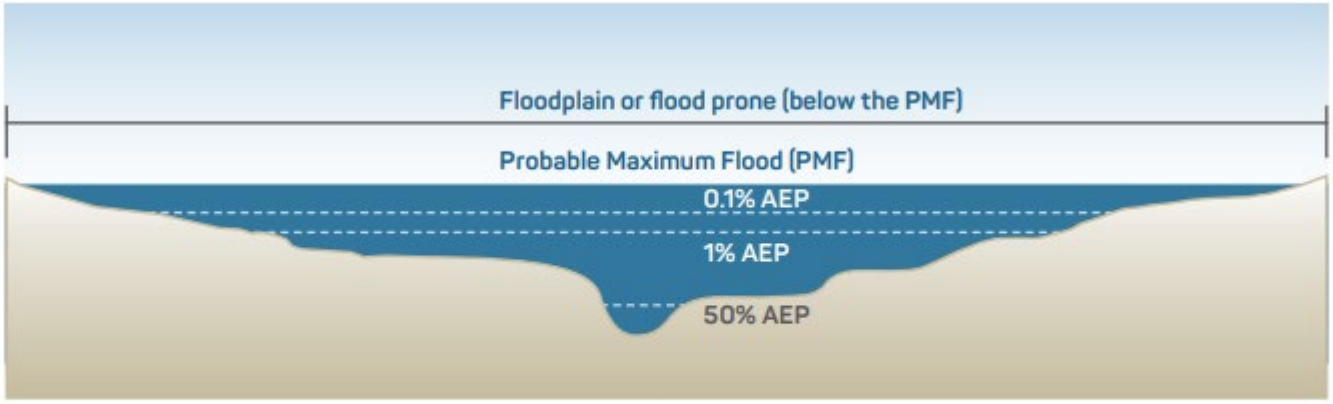
		level of risk to people or property if not mitigated.	
	Low	Extremely unlikely chance of flooding and/or relatively shallow or benign flooding conditions.	This is an extremely unlikely flood event with a 1% chance or less of happening over a 30 year period. Despite the unlikely chance of occurrence, flooding poses an unacceptable level of risk for vulnerable land uses such as aged care or childcare.
	Very Low	Identifies the full floodplain under the largest conceivable flood that could occur.	
Flood risk management plan (FRMP)	A prioritised and agreed plan of actions that will manage flood risk to acceptable limits. The actions will vary based on the scale of the project, the flood hazard and the community and stakeholder tolerance of risk. See Queensland Flood Risk Management Framework.		
Floodplain	The extent of land inundated by the largest conceivable flood, comprising floodway, flood storage and flood fringe areas. Floodways or flow conveyance areas are where significant flow of water occurs. They often align with natural channels and may be areas of deeper flow and higher velocity. If they are even only partially blocked by changes in topography or development, they can cause a significant redistribution of flood flow and/or significant increases in flood levels. Flood storage areas are important for the temporary storage of floodwater during the passage of a flood. These can be natural, like a wetland, or structural, like a reservoir. Flood fringe areas make up the remainder of the flood extent for the particular event.		
Freeboard	An extra amount of height applied as a safety measure above the water surface level of a particular flood event. The freeboard may vary depending on the type of use, but for habitable rooms it may typically mean the floor level needs to be 500mm above the level of the nominated flood event (e.g. a flood with a 1% chance of happening in any given year). The freeboard addresses		

Term / Concept	What does it mean?
	uncertainties in flood level information that may cause floodwaters to rise in real (actual) flood events, such as wave actions or unforseeable blockages.
Hazard (or Flood hazard)	The potential loss of life, injury and economic loss caused by future flood events. Hazard varies with the severity of flooding and is affected by flood behaviour (extent, depth, velocity, isolation, rate of rise of floodwaters, duration), topography and emergency management. Hazard is classified as the level of danger using a rating of 1 to 6 (where 6 is highest) based on flood hazard vulnerability curves (which consider depth and velocity) presented in the Australian Institute for Disaster Resilience Handbook 7-3.



H1	Generally safe for vehicles, people and buildings.
H2	Unsafe for small vehicles.
H3	Unsafe for vehicles, children and the elderly.
H4	Unsafe for vehicles and people.
H5	Unsafe for vehicles and people. All building types vulnerable to structural damage. Some less robust building types vulnerable to failure.
H6	Unsafe for vehicles and people. All building types considered vulnerable to failure.

Image source: *adr-guideline-7-3.pdf (aidr.org.au)*

Term / Concept	What does it mean?
High flow area	High hazard areas of flooding where significant (deeper, faster) flow of water occurs and in which a building is vulnerable to structural damage or failure from floodwater. This is classified as H5 or H6 (high hazard) in the Australian Institute of Disaster Resilience (AIDR) Guideline 7-3.
Overland flow	Overland flow flooding, sometimes called stormwater flooding, happens when the capacity of stormwater pipes and channels is exceeded, or where there is no stormwater network. It shows the path that surface water/runoff takes across the ground from higher areas of the catchments to a watercourse, channel or gully. There is limited warning for this type of flooding.
Probable Maximum Flood (PMF)	The largest flood event that could conceivably occur in a particular location. The PMF generally defines the full extent of the floodplain. It is usually estimated from probable maximum rainfall and the worst catchment conditions. It is generally larger than all flood-related development standards are designed for and may overwhelm many flood mitigation works, resulting in significant impacts on the community.  AEP = annual exceedance probability **Figure 2.2** Floodplain and probable maximum flood *Image source:* *adr-handbook-7.pdf (aidr.org.au)*

Term / Concept	What does it mean?
River flooding **(riverine flooding)**	River flooding happens when, after significant rainfall such as an event lasting 1-3 days, rivers rise and flood waters exceed the capacity of the river and spill out into the floodplain area. River flooding is generally a catchment-wide event and the inundation can last for days, but there is normally a reasonable warning time. Logan has 2 major rivers: the Logan and the Albert. Their catchment extends from the top of the McPherson Ranges all the way down to their outlet in southern Moreton Bay.
Velocity (of flood water)	How fast the flood water is projected to flow in a particular flood scenario (e.g. a flood with a 1% chance of happening in any given year). This is usually measured in metres per second (m/s).
Vulnerable use	For the purposes of the Flood overlay in Logan Plan 2025, a vulnerable use includes any of the following: • Childcare centre • Community care centre • Educational establishment other than for vocational trade training only • Detention facility • Hospital • Relocatable home park • Residential care facility • Retirement facility. Vulnerability refers to how susceptible and resilient a community is to flood hazards, in terms of their ability to anticipate, cope and recover from flood events. Many of these land uses classified as vulnerable, for example, involve larger numbers of people who have limited mobility and/or independence being gathered in one location or facility. During a flood some of the key considerations may include evacuation, supplying medical services, the impact of disruptions to essential services such as electricity, and the availability of qualified staff who are able to get to and from the facility.