

ANNUAL EXCEEDANCE PROBABILITY

Levels of service apply to stormwater provision, while levels of protection apply to flood protection systems.

Stormwater involves drainage of a locality or developed area, and may be provided by means of reticulation (pipes), open drains or natural watercourses, or on-site controls such as soak-holes and wetlands. Flood protection consists of those measures and infrastructure designed to protect property and life in the event of a major rainfall or storm event.

Historically, storms were expressed as having a specific return period, or Average Recurrence Interval (ARI). The return period is the average time period between the occurrence of flood flows of the same size. For example a 1 in 100 year return period flow in any given river or stream will occur on average once every 100 years. This can be confusing as it is possible (but statistically unlikely) to get two "100 year storms" in the same year. The 200 or 500 year storm may also occur within one of the 100 year periods as well as the 100 year event.

To better explain the statistical nature of storm frequency, the percentage of a particular storm event being exceeded in any one year, probability is now expressed as the Annual Exceedance Probability (AEP). This is a similar format to the weather forecast projections which some television weathercasters give for the likelihood of rain for an area on a given day (in percentages). A 1% AEP flood flow has a 1% or 1 in 100 chance of occurring in any one year and a 10% chance of occurring in any 10 year period. A 20% AEP event therefore has a 20% chance of being exceeded in any one year, and is approximately the equivalent of the five year storm. Similarly, a 1% AEP event can be considered equivalent to the 100 year storm.

The **level of service** for residential property is to design stormwater infrastructure to cope with a 20% Annual Exceedance Probability (AEP), whereas the **level of protection** for residential floors is for a 1% AEP.

In the case of a major flood event, the expectation is that the roads and grounds of properties may become flooded, provided that floor levels are not inundated.