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InSite
Integrated Water Management

The role of buildings in sustainable stormwater management

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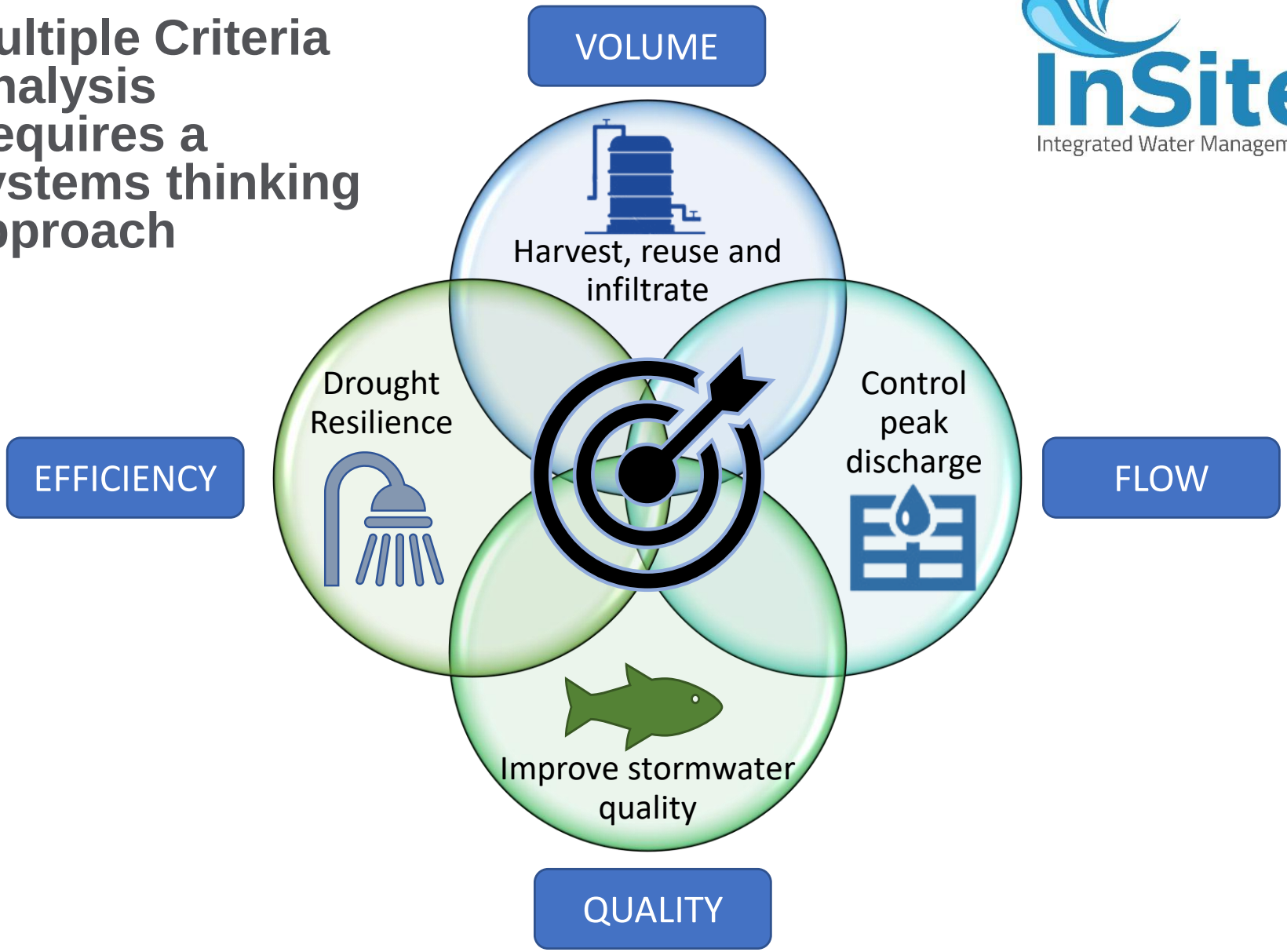
Multiple Criteria Analysis Requires a systems thinking approach



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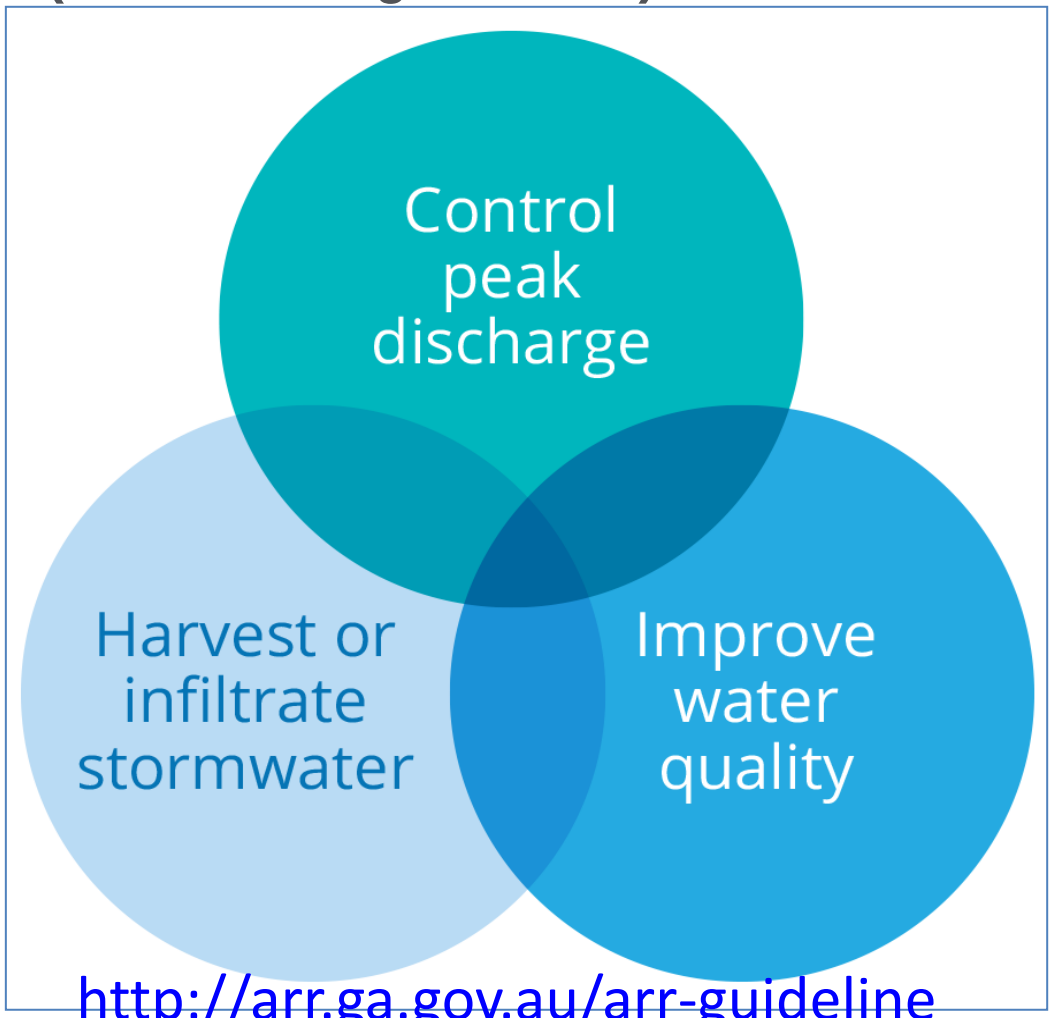
Where has Volume Management come from? Australian Rainfall and Runoff Book 9 (ARR 2019 figure 9.4.1.)



http://arr.ga.gov.au/arr-guideline

- ARR 2019 Emphasises an 'at source' volume management strategy
- Multiple criteria
- Small facilities, widely distributed across the catchment
- Complements larger scale integrated urban water strategy

Business as usual will deliver this…..

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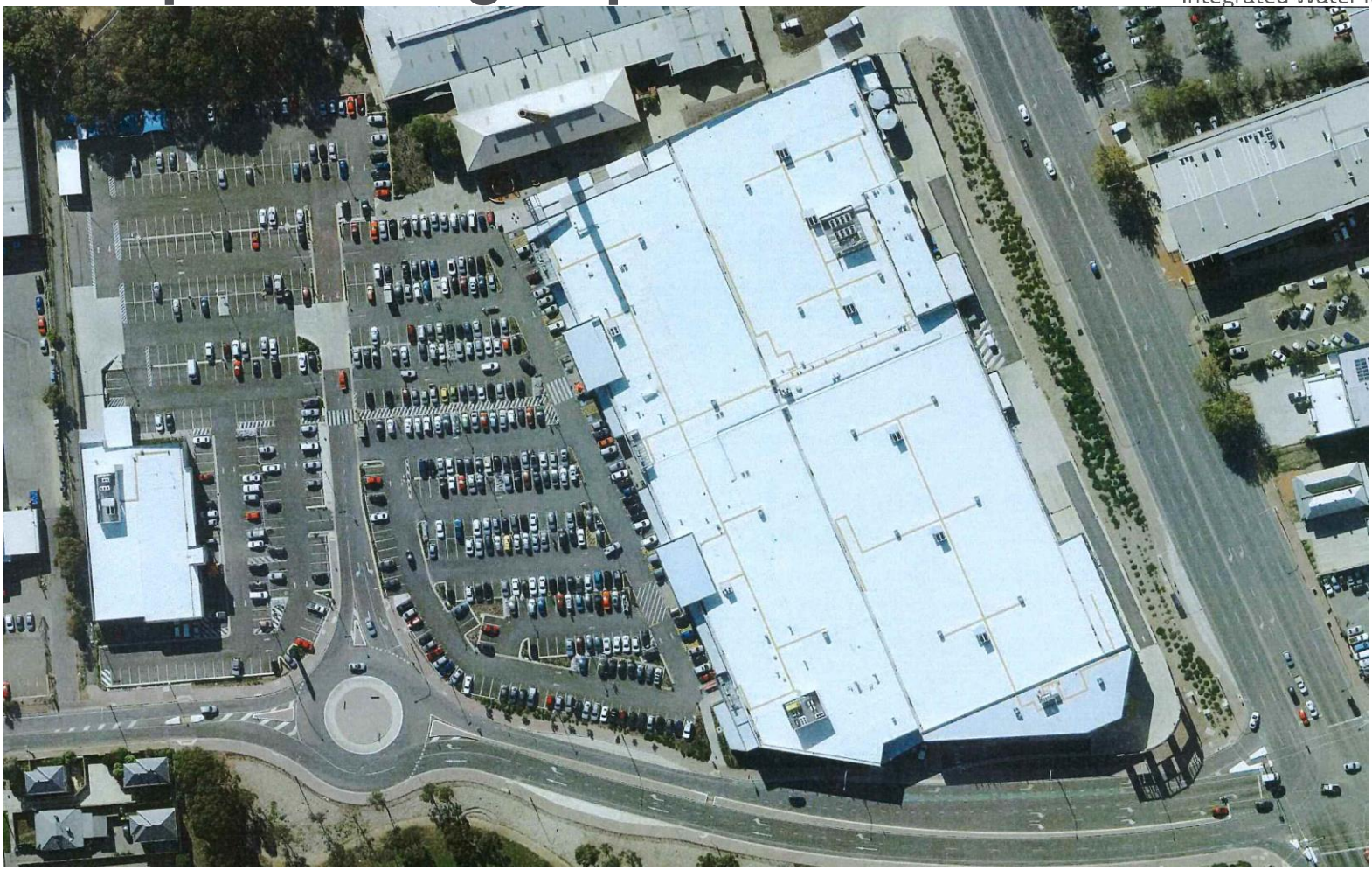
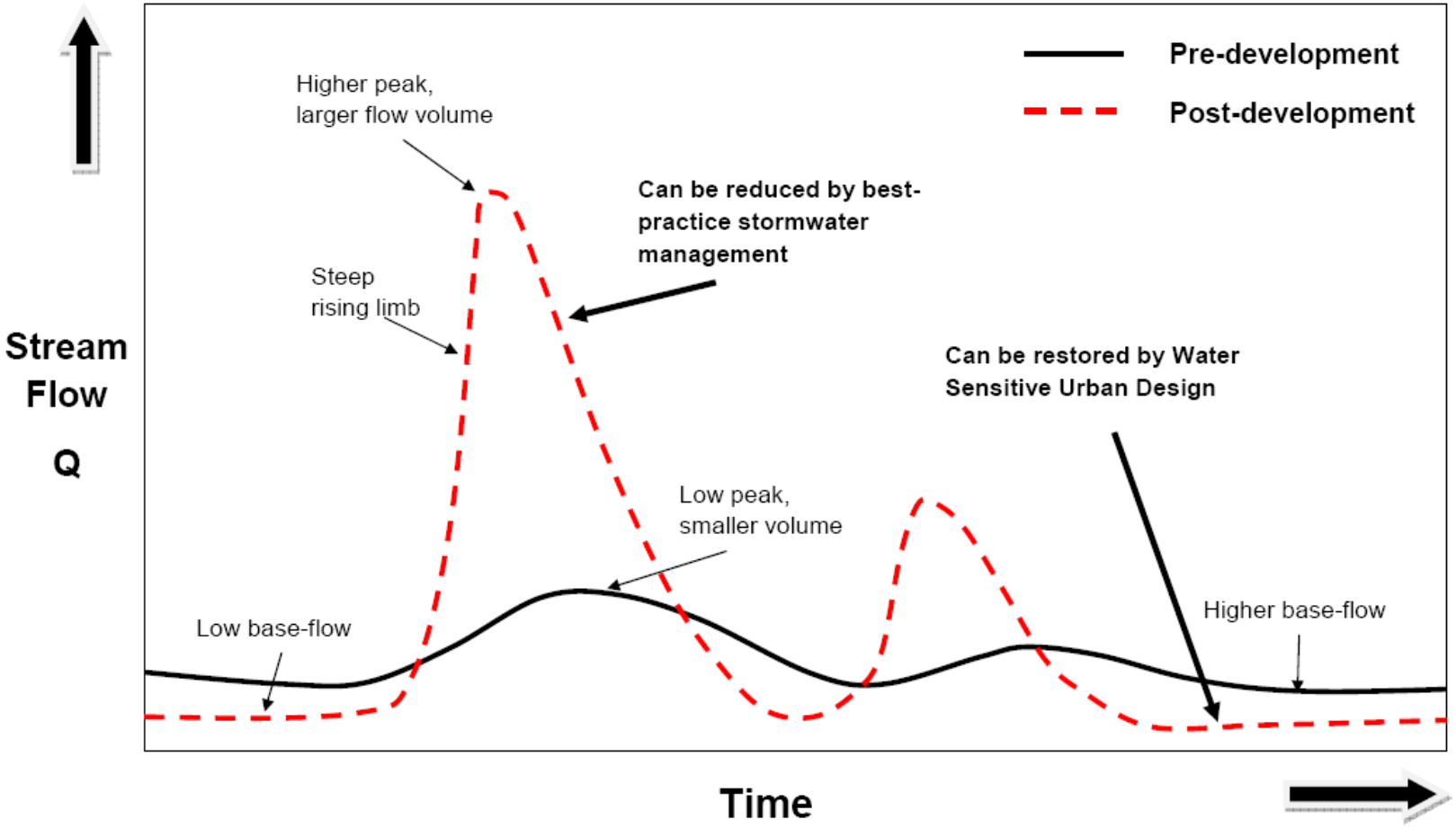
Business as usual …..
Underperforming Asphalt



Source: AKing

Change to hydrograph pre and post development



Typical storm flow hydrograph pre and post development (after Wong et al 2011).

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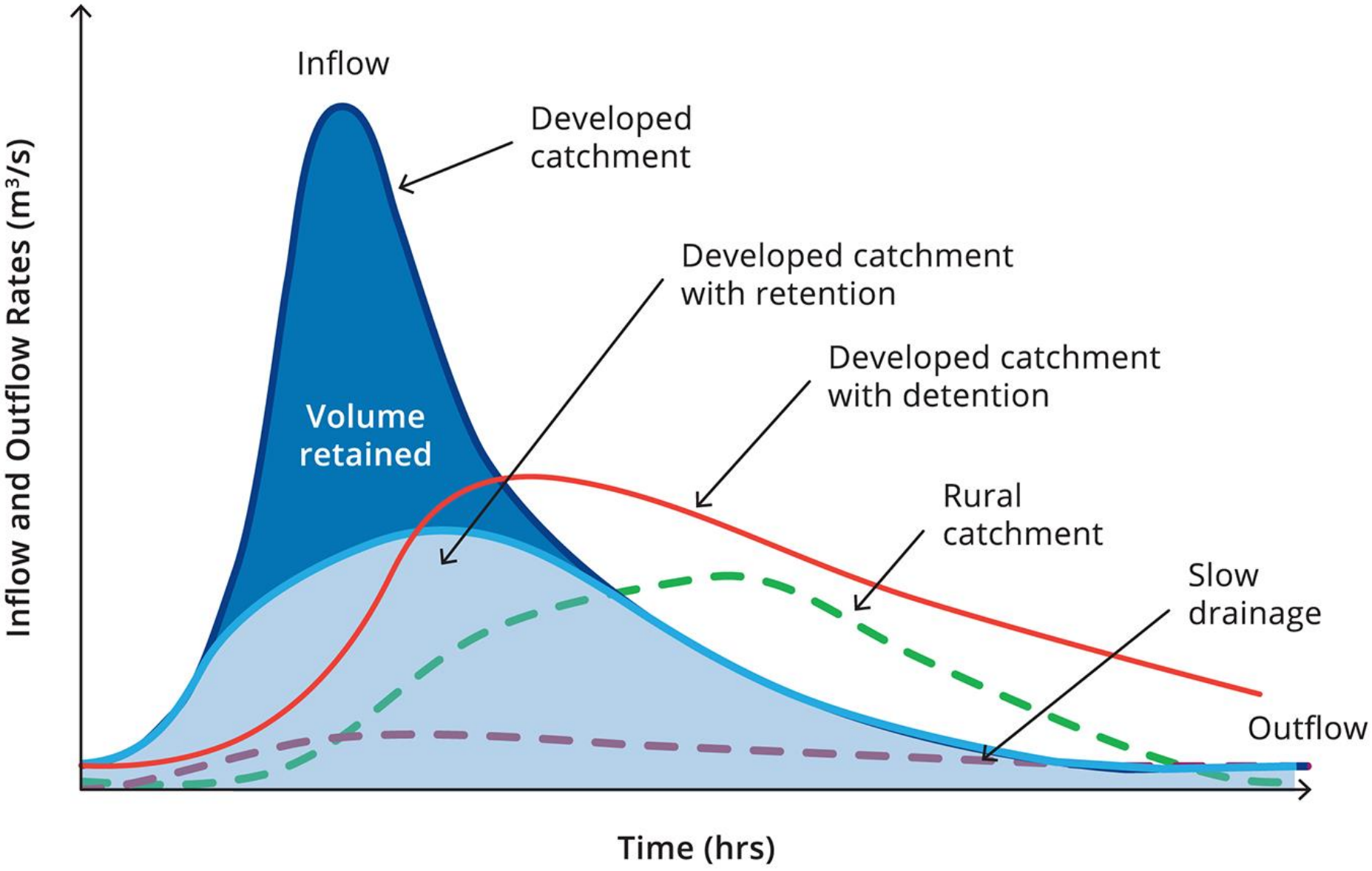
Management


Inflow
Developed catchment
Developed catchment with retention
Developed catchment with detention
Volume retained
Rural catchment
Slow drainage
Outflow
Inflow and Outflow Rates (m³/s)
Time (hrs)

EPA Volume requirements

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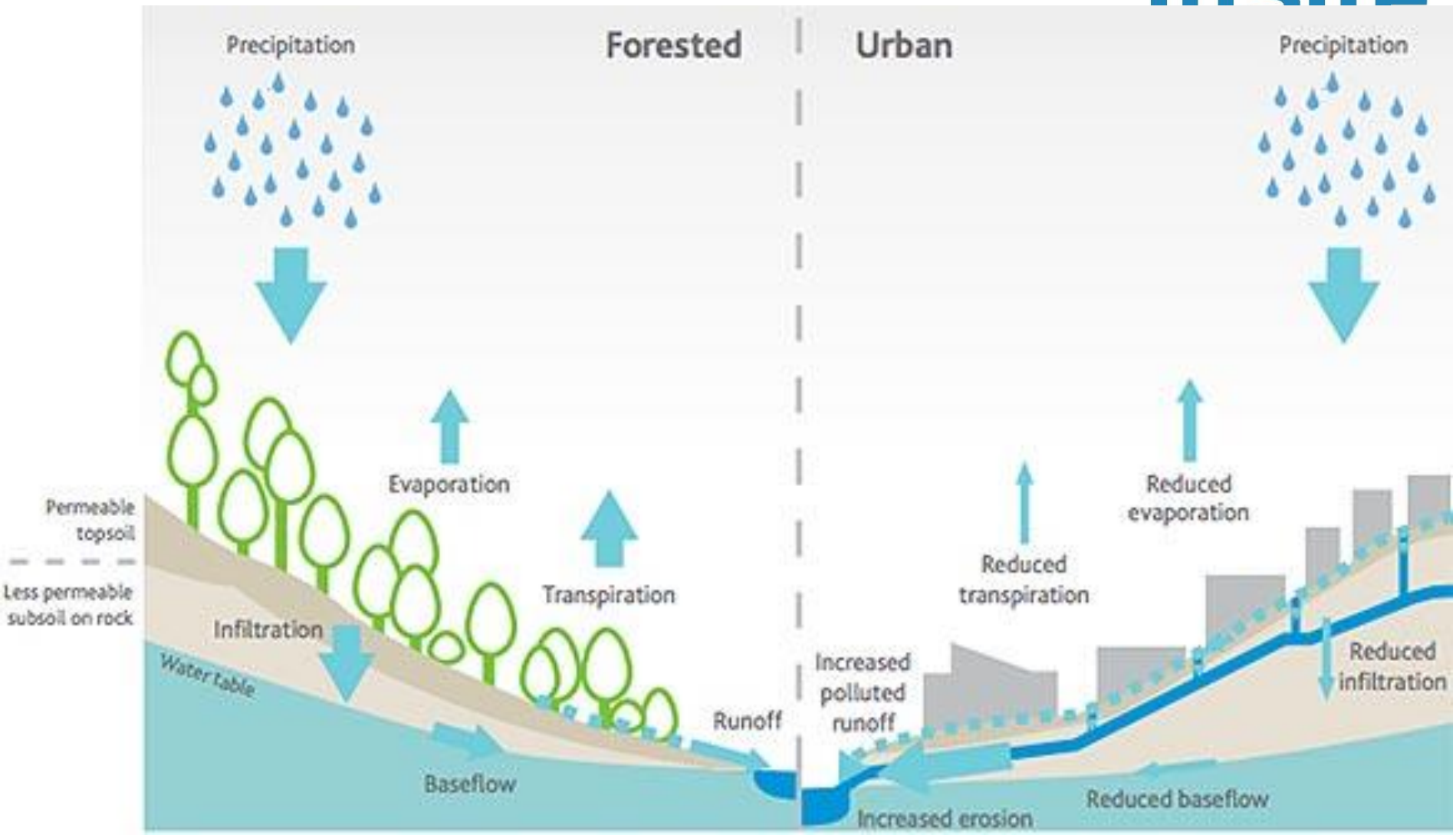
Flow (water volume)		Priority areas (Notes 2, 4, 5, 6)		Other areas (Notes 3, 4, 5, 6)	
	rainfall band (ml)	Harvest/evapotranspire (% mean annual impervious run-off)	Infiltrate/filter (% mean annual impervious run-off)	Harvest/evapotranspire (% mean annual impervious run-off)	Infiltrate/filter (% mean annual impervious run-off)
	200	93	0	37	0
	300	88	0	35	0
	400	83	0	33	0
	500	77	5	31	4
	600	72	9	29	7
	700	68	11	27	9
	800	64	14	26	11
	900	60	16	24	13
	1000	56	18	22	14
	1100	53	19	21	15
	1200	50	21	20	17
	1300	48	22	19	18
	1400	46	23	18	18
	1500	44	25	18	20
	1600	42	26	17	21
	1700	40	27	16	22
	1800	38	28	15	22

Forested vs Urban catchments



EPA Pollution Targets

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Table 1: Quantitative performance objectives for urban stormwater

Indicator	Performance objective
Suspended solids	80% reduction in mean annual load (Note:1)
Total phosphorus	45% reduction in mean annual load (Note:1)
Total nitrogen	45% reduction in mean annual load (Note:1)
Litter	70% reduction of mean annual load

Green Star Buildings v1

Pollution Reduction Targets

All stormwater discharged from site meets specified pollution reduction targets listed in the table below.

Pollutant	Reduction Target (% of the post development annual average load)
Total Suspended Solids (TSS)[1]	85%
Gross Pollutants	90%
Total Nitrogen (TN)[2]	45%
Total Phosphorus (TP)[2]	65%

Environmental Management	Minimise the risk of chemical pollutants and other toxicants entering the stormwater system, including by, but not limited to: • Chemical storage, loading, refuelling or work areas must install bunding, with any spills draining to trade waste or appropriate treatment devices. These areas must have an awning or roofing to separately divert rainfall into the stormwater system. • If a site has more than 200m² of uncovered areas where vehicles are likely to transit and/or park, then hydrocarbon treatment devices must be installed, specified to remove at least 98% of hydrocarbons, sized to treat a 1-in-3 month

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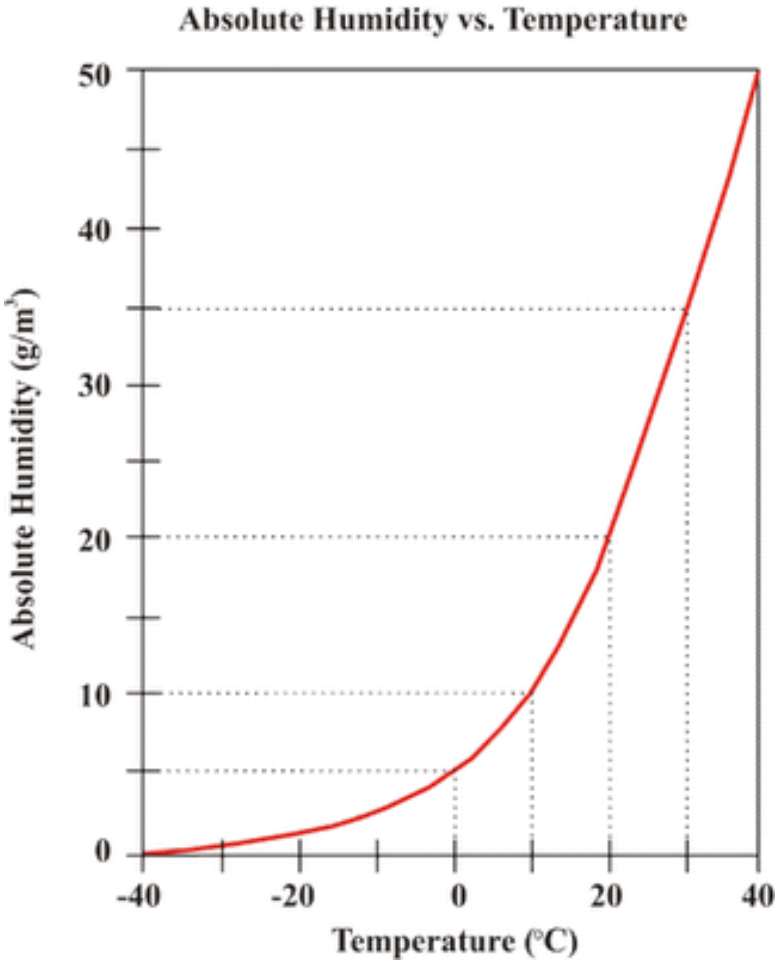
CRITERIA

Minimum Expectation	**Nil**	The building installs efficient water fixtures or uses 15% less potable water compared to a reference building. Multi-unit residential buildings use 10% less potable water compared to a reference building.
Credit Achievement	**3 points**	The building uses 45% less potable water compared to a reference building. Multi-unit residential buildings use 40% less potable water compared to a reference building.
Exceptional Performance	**3 points**	The building uses 75% less potable water compared to a reference building. Each unit in an apartment building uses 60% less potable water compared to a reference building.

Green Star Buildings v1

- Climate Change Resilience
  Resilient Category
  Points: 1
  Outcome
  The building has been built to respond to the direct and indirect impacts of climate change.

- Operations Resilience
  Resilient Category
  Points: 2
  Outcome
  The building can respond to acute shocks and chronic stresses that can affect its operations over time.



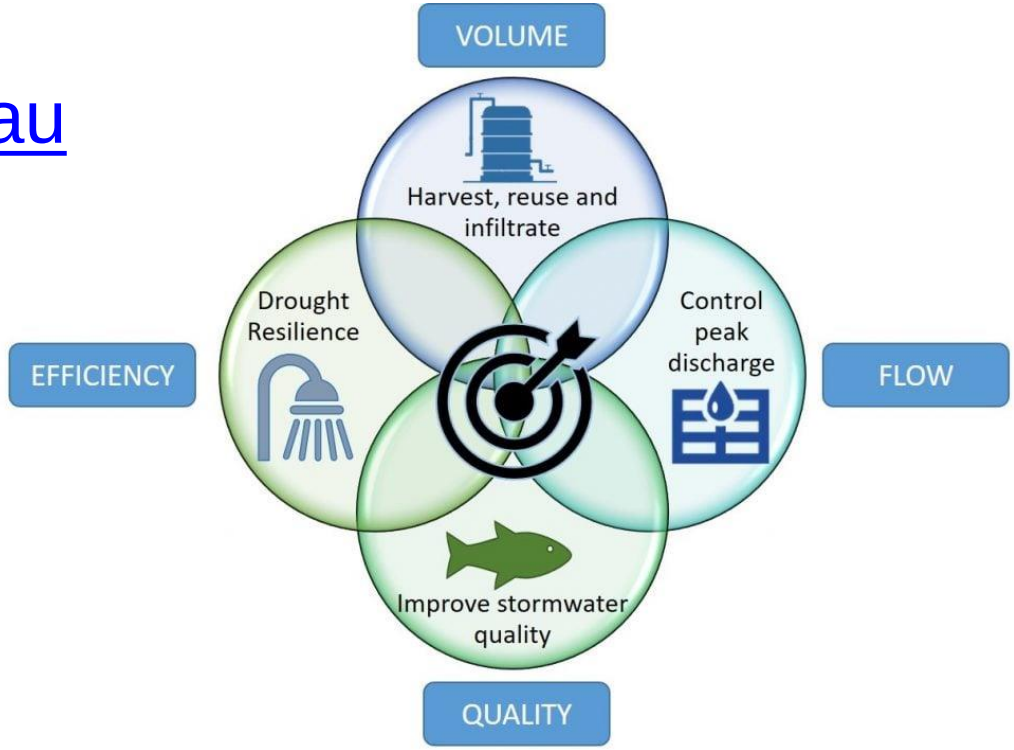
Implementing best practices

Image: Concrete Masonry Association of Australia

Software:

- **InSiteWater**

www.insitewater.com.au



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Thank you!

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