

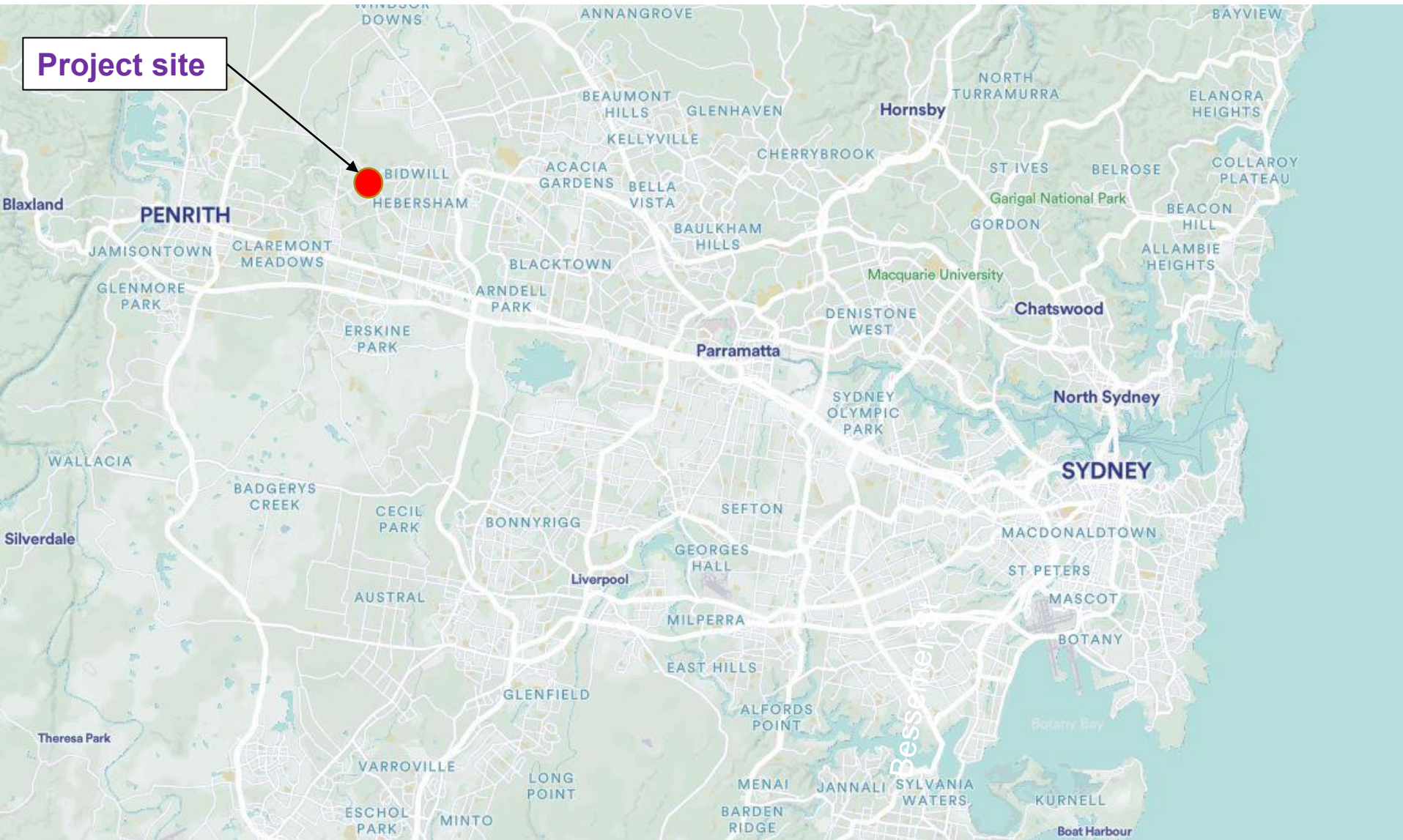
A future-proof drainage upgrade at Ree Place, Bidwill

Thanh Nguyen
Oct 2025

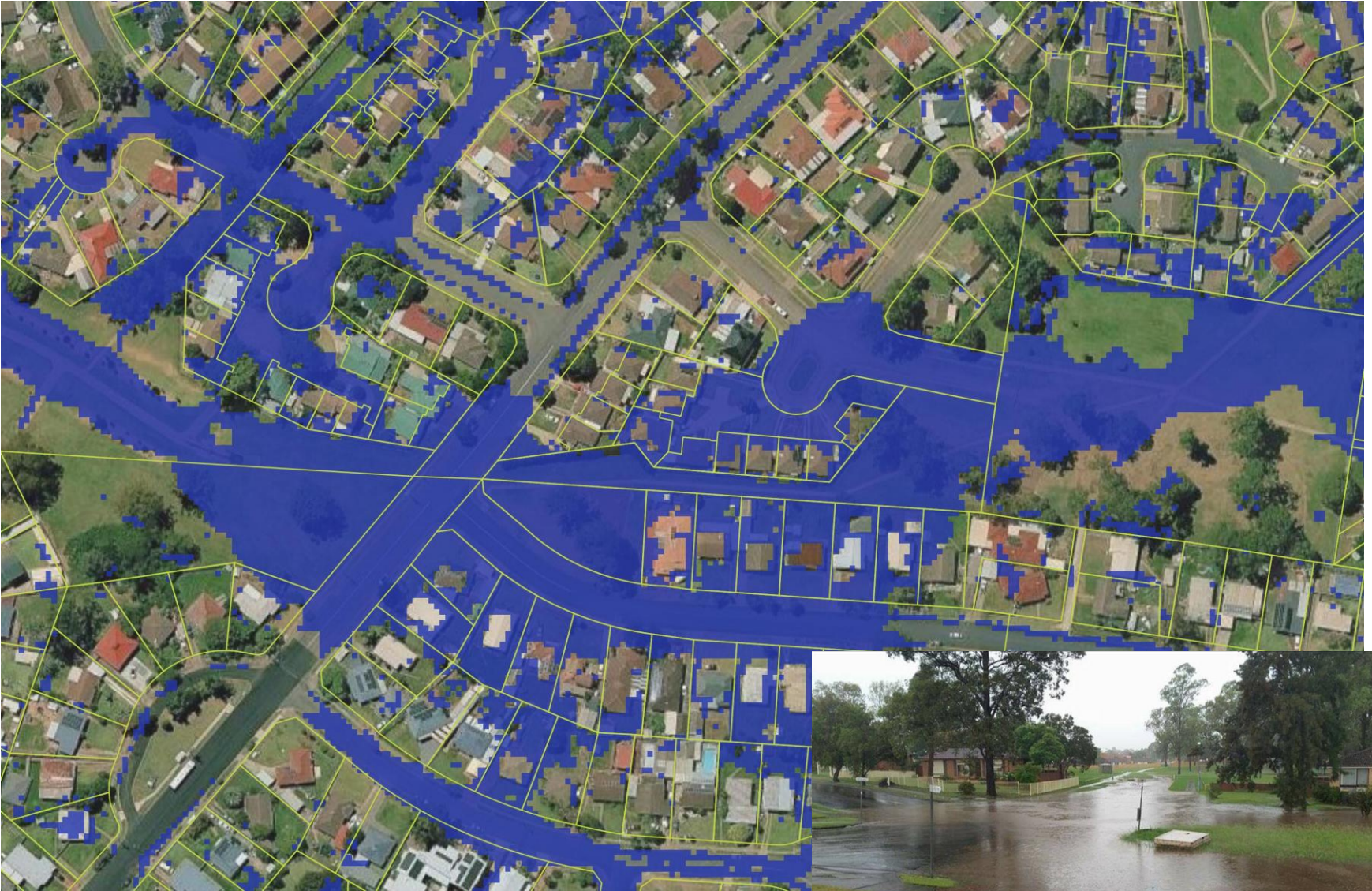


Blacktown
City Council

Project location



Project background



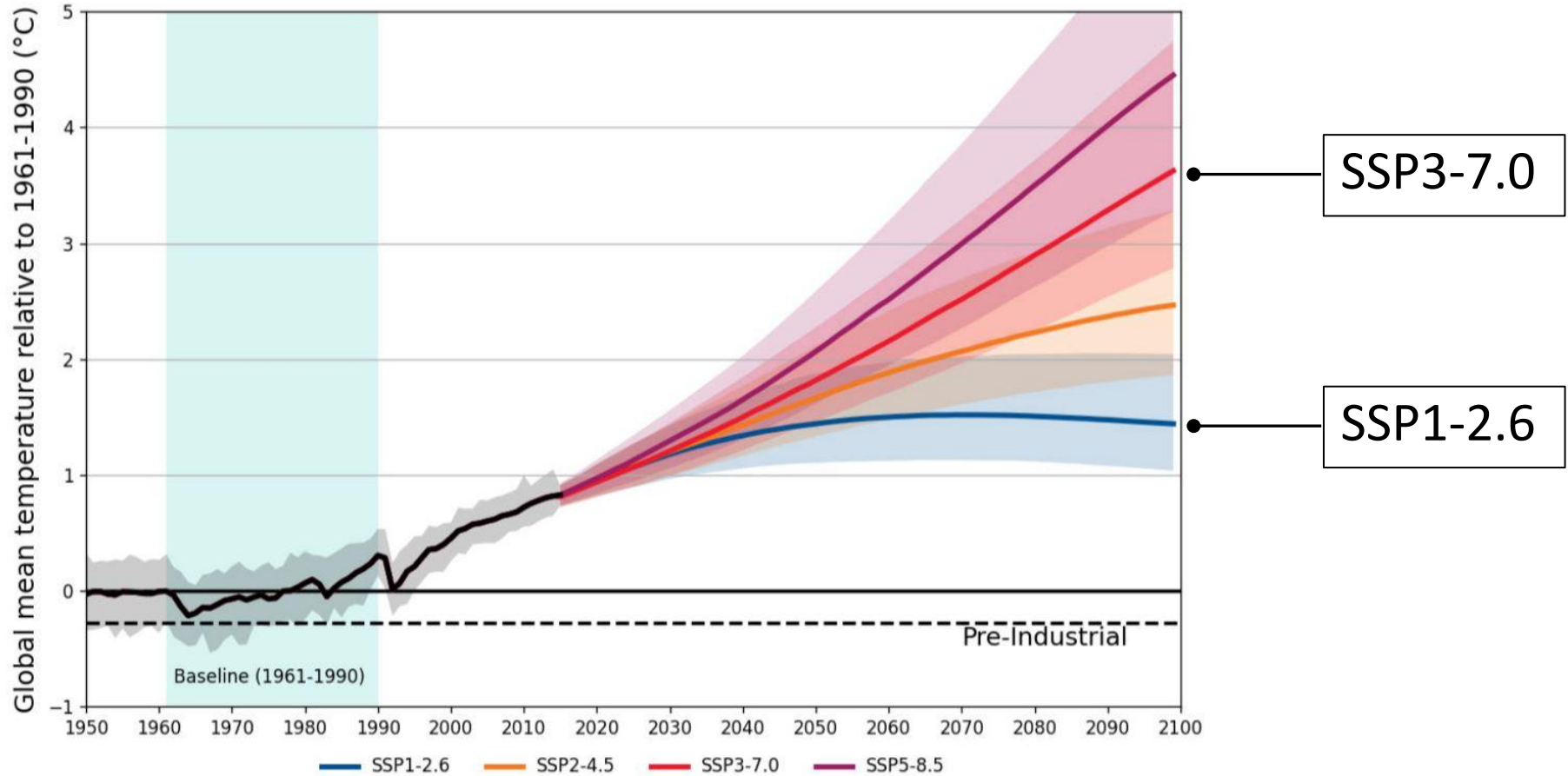
Pre & Post-upgrade



EXISTING - - - - -

DESIGN ■ ■ ■ ■ ■

Climate change consideration



Projected temperature increases associated with AR6 socioeconomic pathways (*ARR Book 1 v4.2*)

Climate change modelling

$$I_p = I \times \left(1 + \frac{\alpha}{100}\right)^{\Delta T} \tag{1.6.1}$$

where

- I_p the projected (current or future) design rainfall depth or intensity
- α is the rate of change from [Table 1.6.1](#)
- I is the historical design rainfall depth or intensity (e.g. from the 2016 IFD portal or historical PMP estimates)
- ΔT is the most up-to-date estimate of global (land and ocean) temperature projection for the design period of interest and selected climate scenario relative to a baseline time period. When used in conjunction with the 2016 IFD curves the baseline is recommended to be the 1961-1990 period (see [Table 1.6.2](#) and text below).

Table 1.6.1. Recommended rates of change (α) and associated uncertainty derived in [Wasko et al. \(2024\)](#), presented per degree global temperature change ($\%/^{\circ}\text{C}$). The factors in this table are applicable for exceedance probabilities from 1EY up to and including the PMP and are designed for application across mainland Australia and Tasmania.

	≤ 1 hr	> 1 hr and < 24 hr	≥ 24 hr
Central (median) estimate (%/°C)	15	Interpolation zone (see Table 1.6.5)	8
‘Likely’ range (corresponding to ~66% ^a range) (%/°C)	7-28		2-15

^aConsistent with terminology used by the IPCC the 66% range corresponds to an uncertainty range of +/- 33%.

Rainfall intensity increase (%)

Short duration 1hr

Med duration 12hr

Long duration 24hr

Year	SSP3-7.0	SSP1-2.6	Year	SSP3-7.0	SSP1-2.6	Year	SSP3-7.0	SSP1-2.6
2030	18.3	18.3	2030	14.0	13.9	2030	9.7	9.7
2040	23.3	19.9	2040	17.7	15.2	2040	12.2	10.5
2050	28.6	21.6	2050	21.6	16.5	2050	14.9	11.4
2060	34.1	21.9	2060	25.7	16.7	2060	17.5	11.6
2070	39.9	22.3	2070	29.9	17.0	2070	20.3	11.7
2080	45.8	22.6	2080	34.2	17.2	2080	23.1	11.9
2090	52.1	22.9	2090	38.6	17.5	2090	26.0	12.1
2100	58.6	23.3	2100	43.2	17.7	2100	28.9	12.2

Results – 1%AEP 1hr storm

Pre-upgrade



Post-upgrade



Post-upgrade SSP1



Post-upgrade SSP3



Results – 1%AEP 12hr storm

Pre-upgrade



Post-upgrade



Post-upgrade SSP1



Post-upgrade SSP3



Results – 1%AEP 24hr storm

Pre-upgrade



Post-upgrade



Post-upgrade SSP1



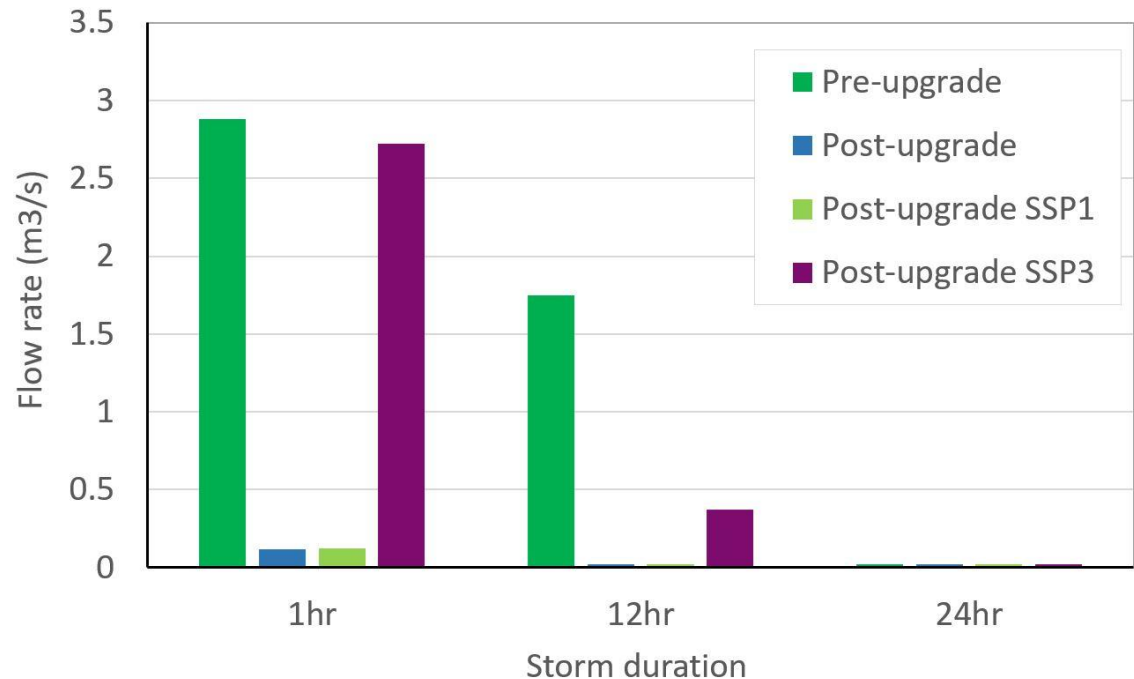
Post-upgrade SSP3



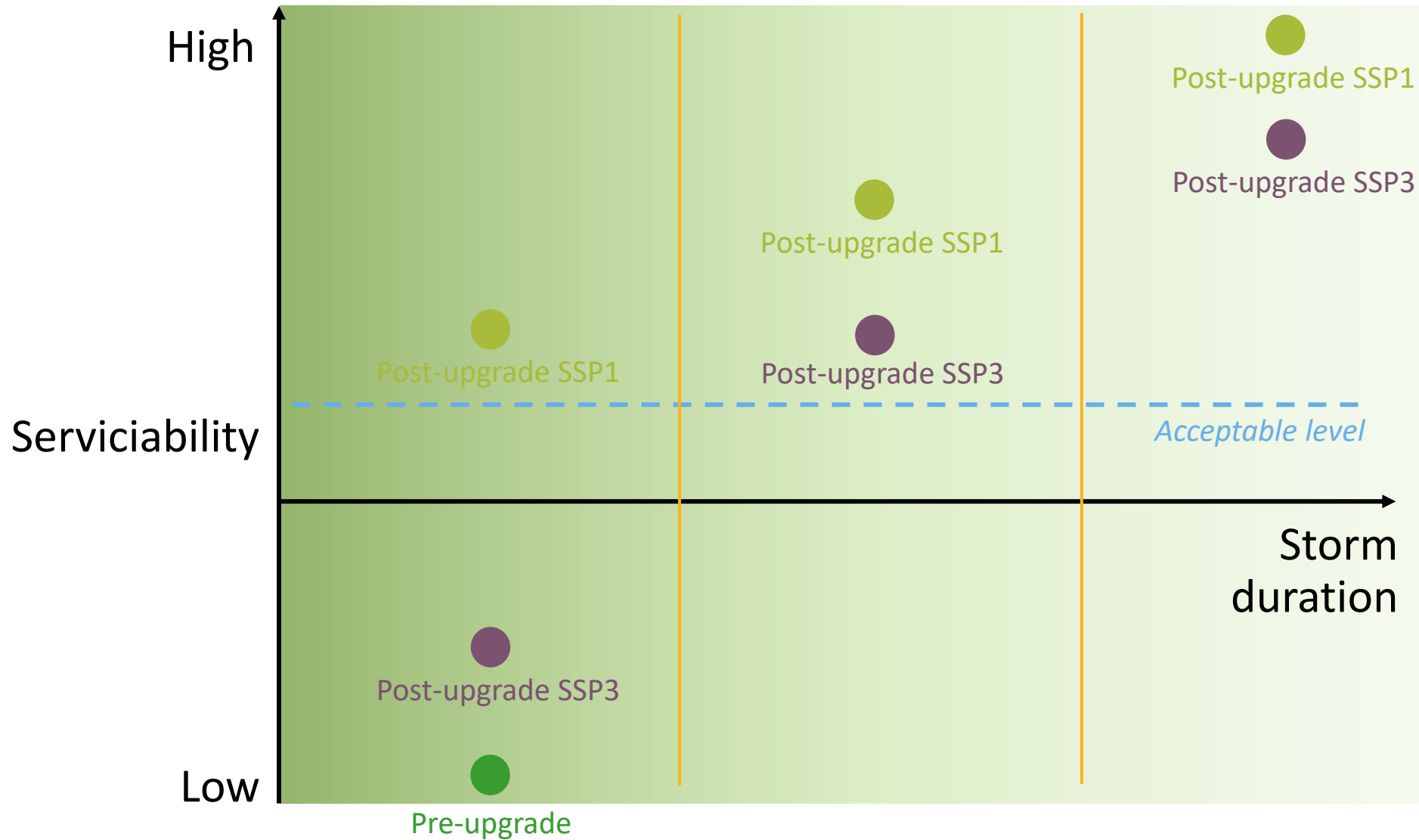
Results – Overland flow



Overland flow rate at private properties



Drainage system performance







Thank you!

