Memo

Subject	Addendum to the Stormwater Management Strategy –Regional Park Scenario
Distribution	David Portelli (VPA)
Date	29 August 2017
Project	McPherson PSP

This addendum is provided to supplement Alluvium's previous *Stormwater Management Strategy – McPherson Precinct Structure Plan (PSP 1055)* (Alluvium, 2016).

1 Constructed waterway

1.1 Bend sharpness

In the original strategy, the constructed waterway in the Baillieu Creek area featured a sharp bend toward the centre of the site. Some concerns were raised by Melbourne Water as to potential high velocities and shear stresses at the location of the bend. Melbourne Water suggested their preference was for a gentler bend in line with previous draft versions of the strategy.

A review of the bend has been undertaken in line with the draft version of Melbourne Water's Constructed Waterway Design Manual. The manual describes appropriate design considerations for channel bends in section 3.3.3 of *Part D: Reach-scale Functional Design*. Bend sharpness is defined as the ratio of the bend radius of curvature to channel width:

$$Bend\ sharpness = \frac{Bend\ radius\ of\ curvature\ (m)}{Bend\ channel\ width\ (m)}$$

Bend sharpness should generally be in the range of 2-3 for constructed waterways. Sharper bends for sections of relatively uniform cross-section can lead to flow separation and increased energy losses.

The total constructed waterway corridor includes the core riparian zone and the vegetated buffer in addition to the waterway channel itself. Since constructed waterways are typically designed with some sinuosity in both the low and high flow channels, the actual channel planform can be curved around sharper sections of the total corridor. The proposed waterway corridor at the location of the tight bend has a hydraulic width of 33m. A small splay has been added to the southern boundary of the corridor at this location to allow a radius of curvature of approximately 75m in the high flow channel. The resulting bend sharpness is 2.3, within the acceptable range. Figure 1 demonstrates this arrangement.

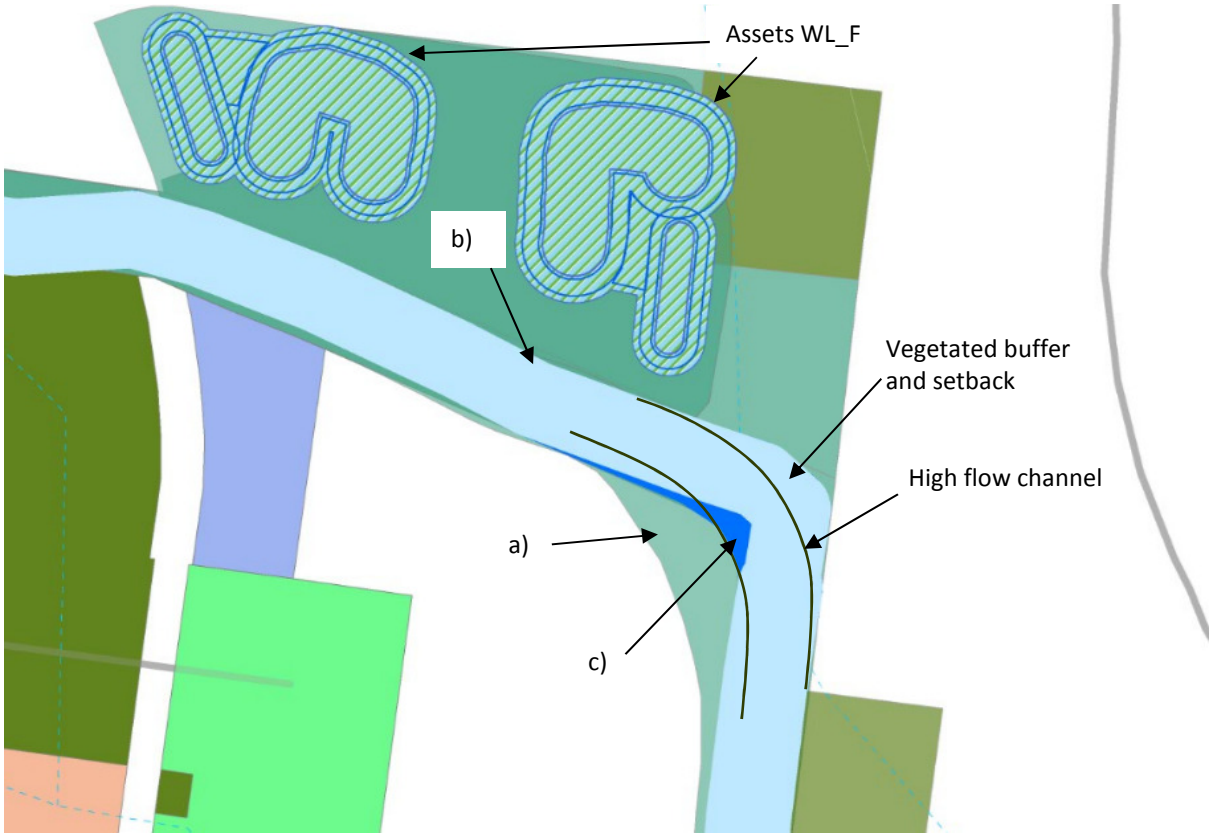

Figure 1. *a) Previous draft alignment (suggested by Melbourne Water), b) alignment with sharp curve (current PSP alignment), c) updated splay allowing channel radius of curvature of 75m.*

1.2 Growling Grass Frog Areas of Strategic Importance

The *Growling Grass Frog Masterplan for Melbourne's Growth Corridors* (DELWP, 2017) was released in April 2017, specifying ASIs for the location of existing or future habitat for the GGF. Cardinia Creek features several locations designated ASI under the *Growling Grass Frog Masterplan for Melbourne's Growth Corridors* (DELWP, 2017), including two specific areas highlighted for future GGF habitat wetlands near the crossing of McCormacks Road.

This information was not available when completing the original strategy. A site inspection was undertaken in July 2017 to determine an appropriate revised location of the constructed waterway outlet to Cardinia Creek. Accordingly, the proposed alignment of the constructed waterway has been modified to avoid direct impact on locations designated as a future habitat location or ASI, including a 50m buffer. Figure 2 shows the revised outlet location, just downstream of an existing bench/bar in Cardinia Creek. The existing GGF ASI overlay and new constructed waterway alignment is shown in Figure 3.

Based upon the advice from VPA, no Dwarf Galaxias populations were discovered in the potential habitat sites, hence do not constrain the constructed waterway alignment.

Figure 2. *Revised constructed waterway outlet location to Cardinia Creek downstream of bench/bar. Facing north-west from the west bank.*

Figure 3. *GGF ASIs along Cardinia Creek, with updated constructed waterway alignment and outline of treatment assets.*