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**From**  
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Reviewer: Pranil Wadan – Technical Director

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## Parkburn Stormwater Treatment and Disposal Options

### 1. Introduction and Background

This memorandum has been prepared for Fulton Hogan Land Development Ltd to outline potential stormwater treatment and disposal options for the proposed Parkburn Development in Cromwell, located between State Highway 6 and Lake Dunstan (Figure 1).

The applicant is seeking to establish a residential subdivision including a small neighbourhood centre (Figure 2), supported by the necessary infrastructure. As part of the development, a stormwater management system is required, comprising a network of pipes, inlet structures (catchpits), outlet structures (wingwalls), culverts, and a range of water quality treatment devices.

This memorandum presents a preliminary list of treatment devices considered suitable for improving stormwater quality, which will be subject to further assessment during the substantial application phase should the referral application be accepted.



Figure 1: Site area



Figure 2: Proposed development

## 2. Options

Several options have been considered for water quality for the various land uses. This includes residential, commercial areas (high use parking areas) and the roading network where various options are reviewed for suitability.

### Residential Areas

- **Roofing and Cladding:** Preference for low-contaminant or inert materials to minimise runoff pollution.
- **Right of ways:** Incorporation of catchpit filters i.e. use of Stormwater 360 littatrapps or similar.
- **Building Waste Areas:** Installation of gross pollutant traps to capture larger debris.

### Commercial Carparking

- **Deep Sumps:** Oversized catchpit sumps to maximise the capture of solids.
- **Filter Devices:** Strategic use of devices such as upflow filters or Stormwater360 filters.
- **Bioretention Devices:** Raingardens and tree pits to manage runoff and provide water-sensitive design benefits, aligning with mana whenua values.

### Road Network

- Similar approach to commercial carparks, including deep sumps, filters, and raingardens.
- **Roadside Swales:** Use of bioretention swales to slow and treat runoff.

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### Communal Treatment Options

- Constructed Wetlands: Potentially located within public open spaces to treat runoff from residential, commercial, and road catchments.
- End-of-Pipe Devices: Options such as baffle boxes or downstream defenders installed at the lower end of the network.

### Key Considerations

- Integration of devices into a treatment train approach, providing multiple stages of treatment and improved environmental outcomes.
- Limited hydraulic head may constrain the use of certain end-of-pipe options.
- Maintenance and vesting of end of pipe options.
- Infrequent rainfall in the Cromwell area may reduce the effectiveness of bioretention devices.

## 3. Conclusion

The stormwater treatment devices outlined in this memorandum represent a preliminary suite of options for managing runoff from residential, commercial, and roading areas within the Parkburn Development. These options have been selected to provide flexibility, align with best-practice water-sensitive urban design principles.

It is important to emphasise that the list presented here is not exhaustive. The suitability and performance of each device will require further assessment as the detailed design of the subdivision progresses, particularly once the layout of the stormwater pipe network, available hydraulic head, and treatment catchments are better understood. In addition, site-specific factors such as soil permeability, groundwater levels, maintenance requirements, and land availability will need to be investigated to confirm the feasibility of each treatment option.

At the substantive application phase, a more detailed analysis will be undertaken to:

- Confirm the preferred treatment train for each land use type.
- Assess the hydraulic and spatial feasibility of end-of-pipe and communal devices.
- Evaluate long-term operation and maintenance considerations to ensure performance is sustained.
- Incorporate cultural and environmental values into the final stormwater management approach.

Overall, the development presents an opportunity to implement a robust stormwater management system that not only meets regulatory requirements but also delivers broader environmental and community benefits. The next phase of work will be critical in refining and selecting the most effective combination of devices to achieve these outcomes.