Four Mile Creek Catchment
Bray Park – Gympie Road Flood Mitigation Investigation 2023
Information Sheet

Introduction

Following the February 2022 floods in Bray Park, City of Moreton Bay has been investigating mitigation options to help reduce flood impacts within the and Four Mile Creek catchment area. This was a devastating flood event for many residents who experienced severe damage to their properties, as well as major road closures and rail closures. The total rainfall depth recorded during this weather event was significant. However, when compared to other significant flood events within the catchment, such as the January 2024 flood, it was not the largest on record. Therefore, it is important to note that the Four Mile Creek catchment responds more rapidly to short, intense rainfall events than to more prolonged intense rainfall events.

As illustrated in Figure 1 below, rainfall flows from the upper catchment area in the west where the elevation is higher to the lower sections in the east, eventually converging downstream with the Pine River. The Four Mile Creek catchment is long and narrow, encompassing a total area of approximately 14.8 km^2. It is 10 km in length and 670 m in width, with an elevation difference of up to 67 m between upper and lower sections. Consequently, during heavy rainfall, water moves quickly through the Four Mile Creek catchment, resulting in downstream flash flooding.

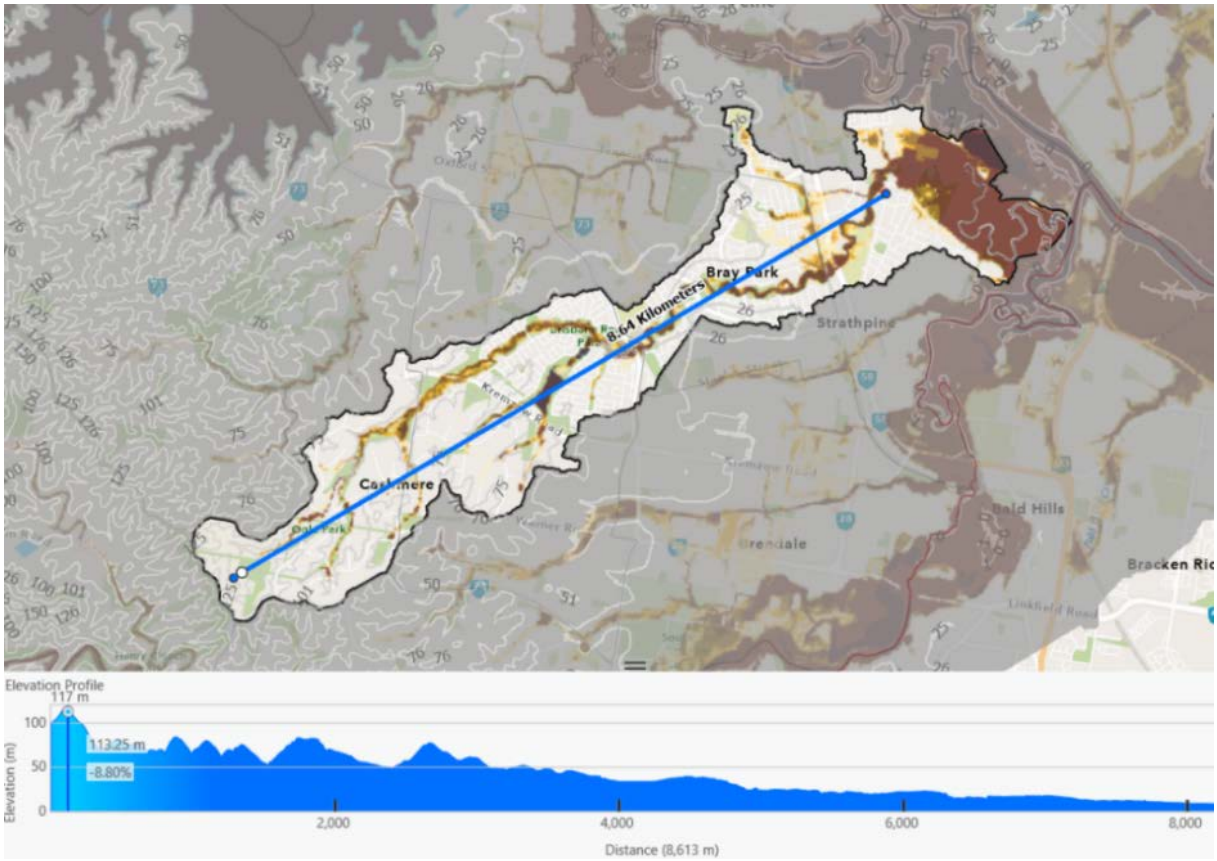

Figure 1: Bray Park Catchment Overview

Bray Park – Gympie Road Flood Mitigation Investigation 2023

Following the February 2022 flood, Council began a flood mitigation investigation to identify cost-effective flood and local drainage options to reduce the impacts of flooding on properties within the mid reaches of the Four Mile Creek catchment. The investigation identified two feasible flood mitigation options summarised as follows:

Strategy 1: Bridge Widening comprising of:

- Widening of the Queensland Rail bridges across Four Mile Creek (approximately 20m on both sides of crossing) to increase flow conveyance and help alleviate upstream flooding.
- Excavation downstream of the bridges to widen an existing waterway constriction (180-degree bend in the creek) and improve flow efficiency to offset increased water levels from the bridge widening.

A cross section of the proposed bridge widening is shown below in Figure 2:

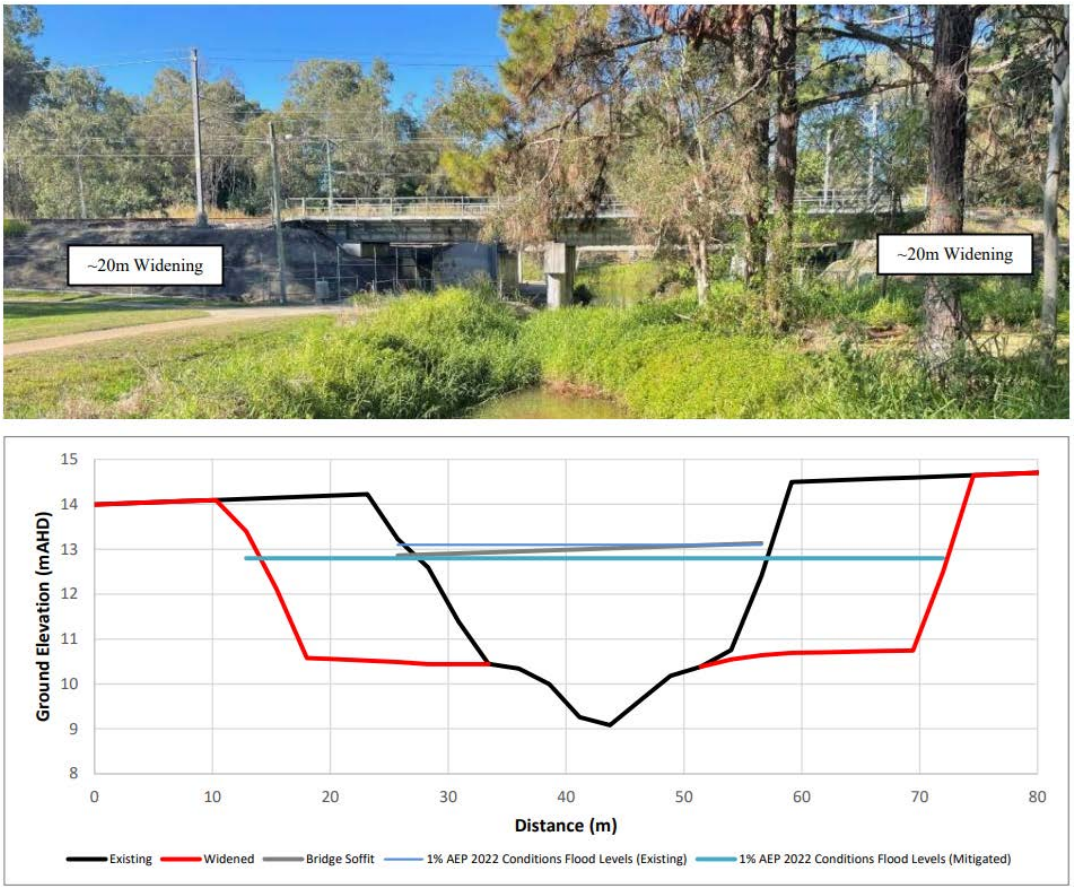

Figure 2 - Strategy 1 Proposed Extent of Works

Strategy 2: Flood Levee and Stormwater Network Upgrade comprising of:

- Upgrades to the existing stormwater network upstream of the rail line.
- A levee constructed on the northern side of Four Mile Creek upstream of the rail line.
- Excavation downstream of the bridges to widen an existing waterway constriction (180-degree bend in the creek) and improve flow efficiency.

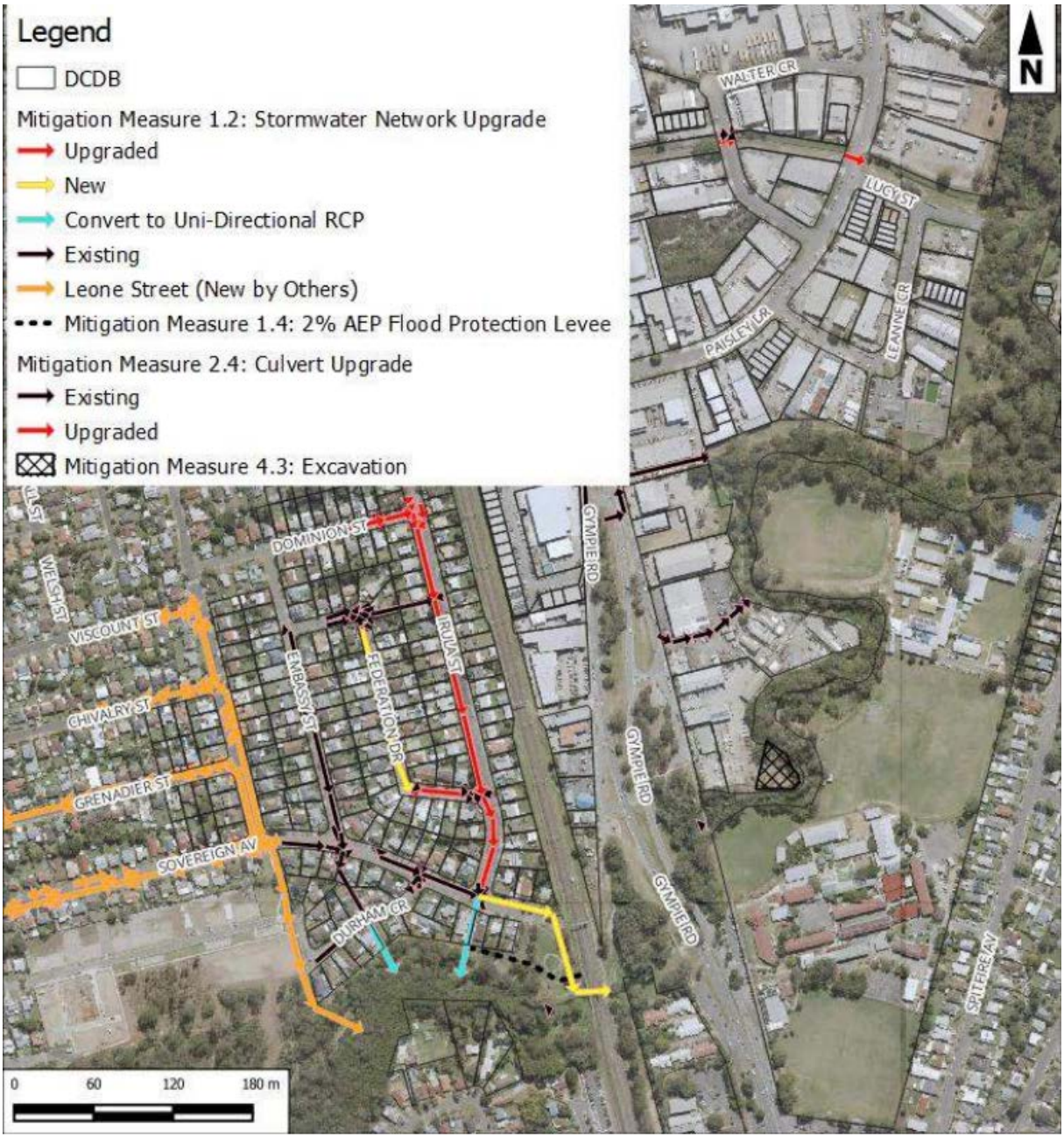

Figure 3 - Strategy 2 Proposed Extent of Works

Comparing the two mitigations, **Strategy 1** was the preferred, as it provided significant benefit in larger AEP events compared to **Strategy 2**. Widening the rail bridges and increasing conveyance resulted in a large drop in water levels upstream of the rail line in the creek and breakout areas.

Strategy 2 provided effective flood mitigation in events that did not overtop the levee. Limited benefit was noted in events where flood levels exceeded the crest of the levee. For the study, the crest elevation was set to a 2% AEP level, noting that there would be challenges and constraints in constructing a larger levee.

Neither of the strategies completely mitigate 1% AEP flooding, however modelling indicates there are significant benefits when implementing Strategy 1.

The project also highlighted the need for further investigations regarding resolution of downstream flood impacts from proposed mitigation works. While beyond the study's scope, high-level modelling exploration highlighted likely solutions to assist mitigation impacts downstream, notably relating to breakout flow behind Strathpine State School.

Engagement with State Agencies

Since completion of the study, Council has been engaging with State agencies on Strategy 1. Unfortunately, for several reasons, Council has been unable to gain support for the delivery of Strategy 1.

Council has secured funding from State Government through the *Flood Risk Management Program* to undertake conceptual designs and impact assessments of Strategy 2. This work will be commencing shortly.

Useful Community Flood Resources

Floods are a natural event that has the potential to cause harm to people, property, infrastructure and the environment. Council has prepared several resources and tools residents can use to understand their flood risk and prepare themselves and their home, these include:

- Flood Check Property Report
- Flood Smart Buildings Guideline
- Moreton Alert Sign-Up
- BOM - Flood Gauge Monitoring