

# Ashbourne Flood Study

- **Jonathan Smyth** – Manager of Assets, Alexandrina Council
- **Mark Tate** – Team Leader Civil and Transport Assets, Alexandrina Council
- **Todd Rundle** – Principal Engineer, Southfront



# Presentation Overview

---

**Background**, known flood issues in Ashbourne

---

**Site investigations**, catchment features and topography

---

**Flood modelling**, 'existing scenario'

---

**Preliminary flood mitigation strategies**



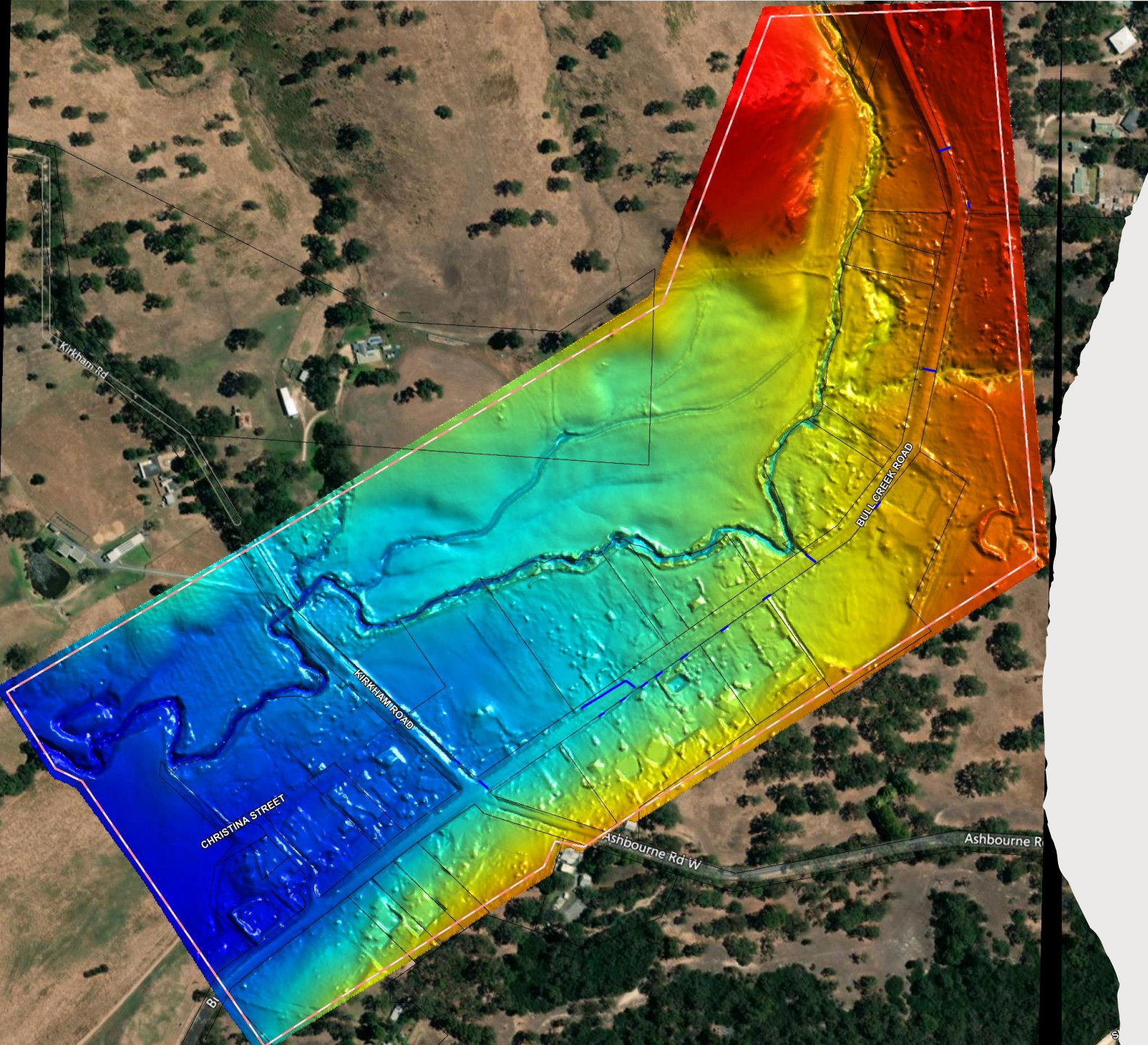


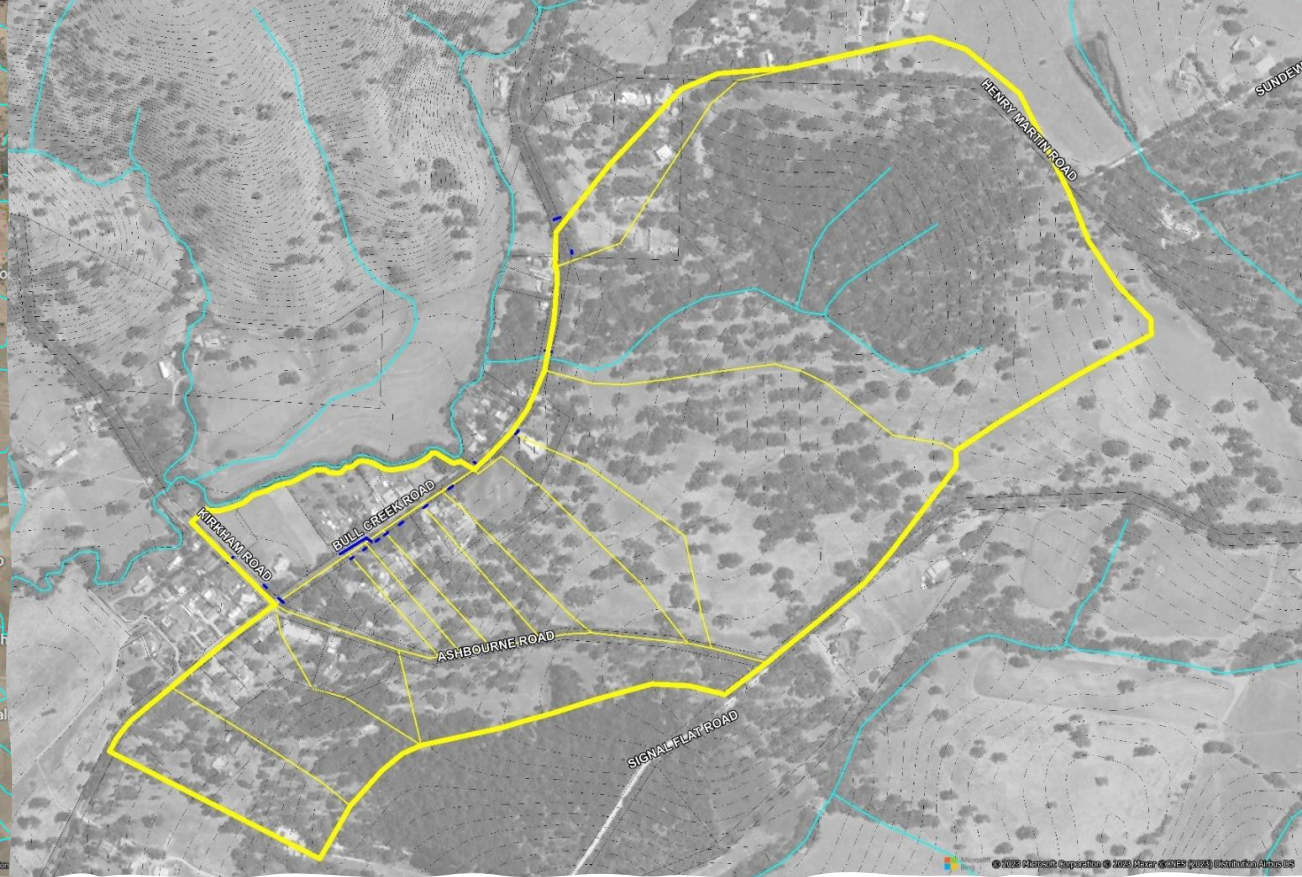
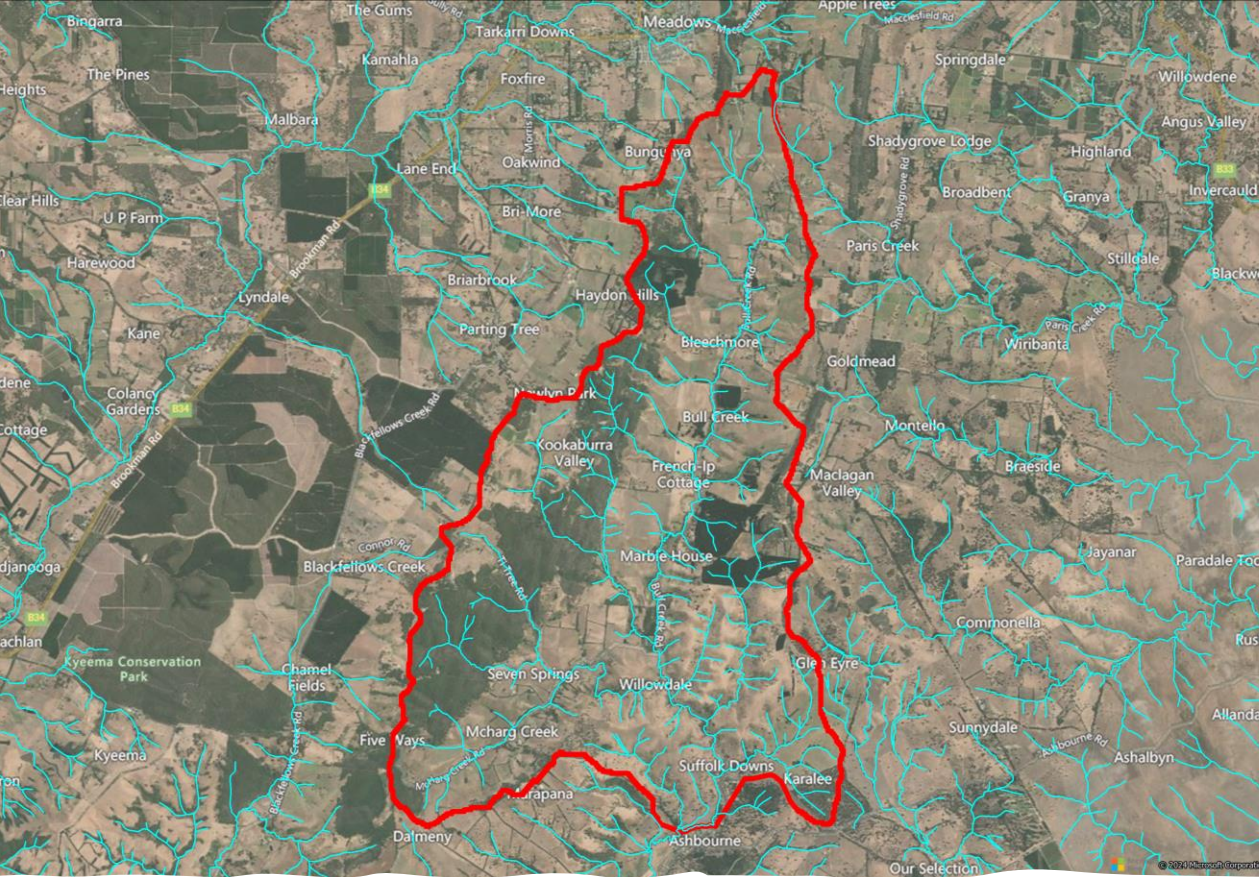
# Background

- Most recent flood events occurred in 2010, 2016 and 2022.
- Flooding occurs due to runoff from the 'local catchment' and breakouts from Bull Creek
- Flood modelling undertaken to better understand flood behaviour through the town and how best to mitigate it
- "Do it once and do it right"

# Catchment features and topography

- Drone Survey in February 2024 (left)
- Challenges:
  - Wide floodplain
  - Perched Creek
  - Heavily modified over the years
- 'Local Catchment' flow paths





# Catchments

- Bull Creek Catchment to Ashbourne: 42 km<sup>2</sup> (left)
- ‘Local Catchment’: 1.2 km<sup>2</sup> (right)

# Flood Definition Terminology



A **1% AEP storm** is a storm that has a 1% chance of occurring each year or will occur **on average** once every 100 years (i.e. 1 in 100 year storm)

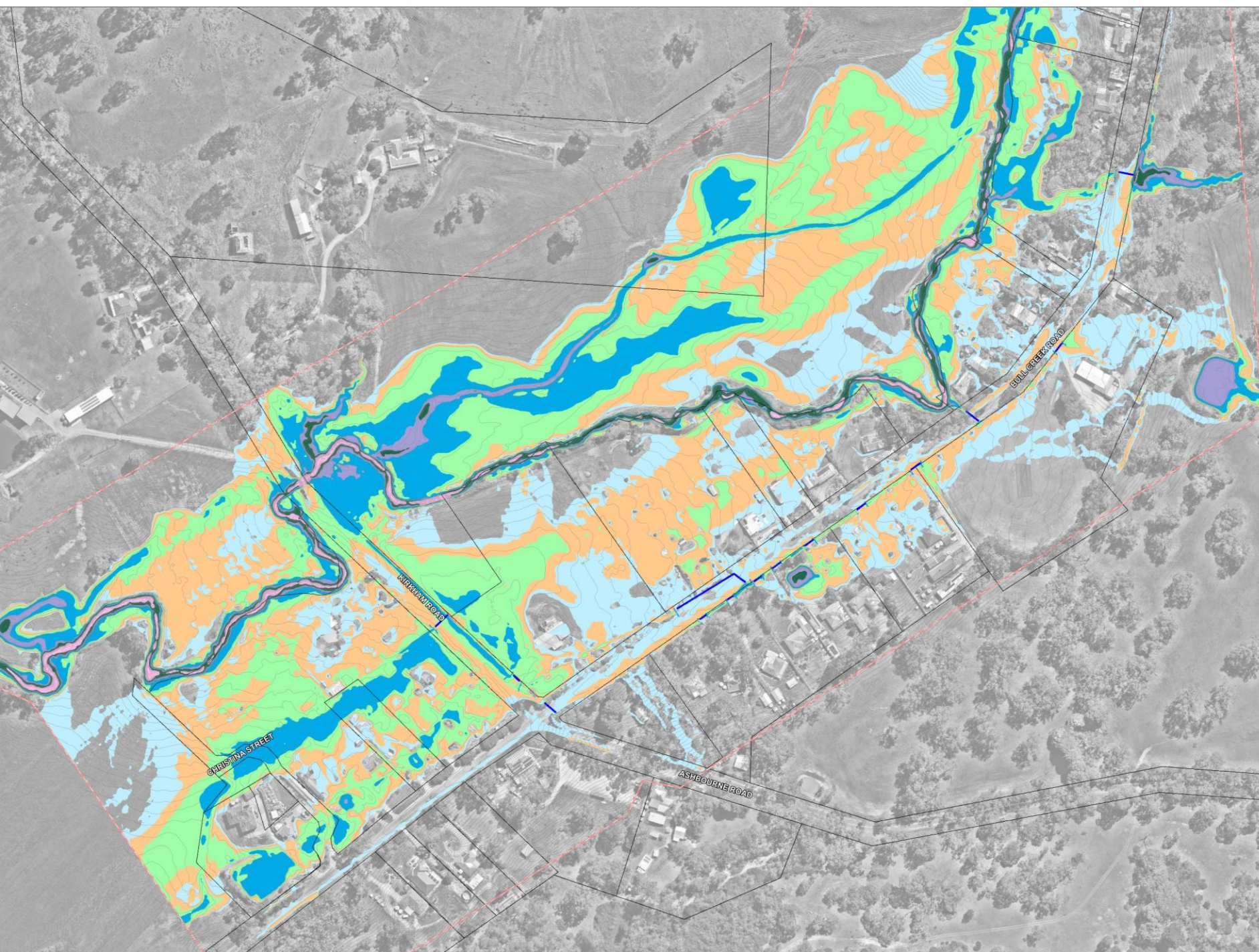


A **5% AEP storm** is a storm that has a 5% chance of occurring each year or will occur **on average** once every 20 years (i.e. 1 in 20 year storm)



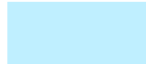
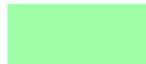
Flood Maps developed for this study are not intended to recreate historical flood events. They are a tool used to develop an understanding of flood behaviour and risk in the study area





## 1% AEP Flood Map Existing Scenario

### FLOOD DEPTH CONTOUR BAND

|                                                                                       |               |
|---------------------------------------------------------------------------------------|---------------|
|    | 0.025 - 0.1 m |
|    | 0.1 - 0.25 m  |
|    | 0.25 - 0.5 m  |
|    | 0.5 - 1.0 m   |
|    | 1.0 - 1.5 m   |
|   | 1.5 - 2.5 m   |
|  | 2.5 - 5.0 m   |
|  | >5.0 m        |

Simulation Time: 02:00:00.00

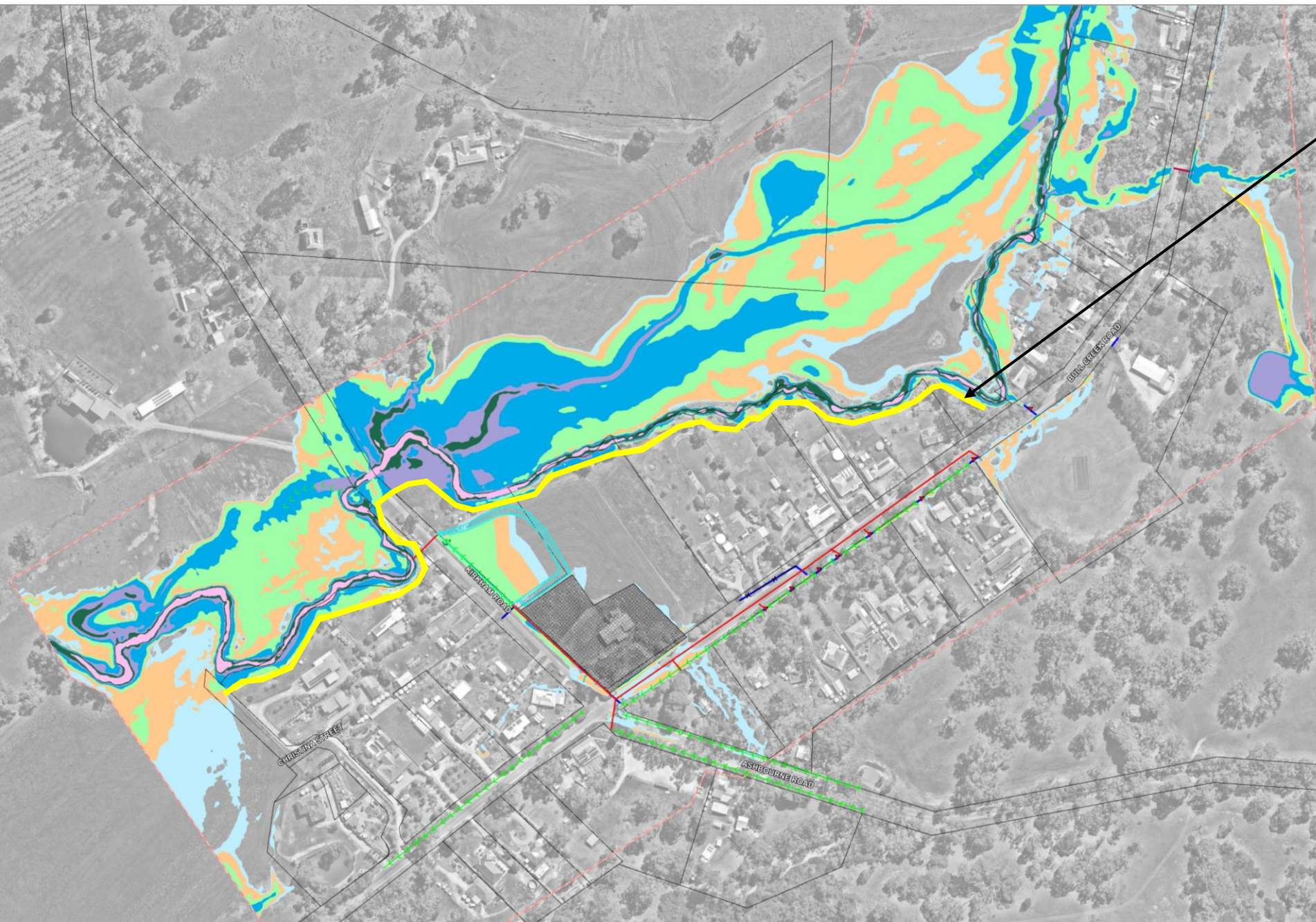


# Preliminary Flood Mitigation Strategies

- **Objective:** provide minimum 1% AEP (1 in 100 year) flood protection standard to existing development in the town
- Future development in Ashbourne will need to refer to the flood maps such that adequate protection measures can be applied
- Strategies were inserted into the flood model to assess their performance and provide an indication of required extent and characteristics of each element
- Three drainage alignment options developed for consideration



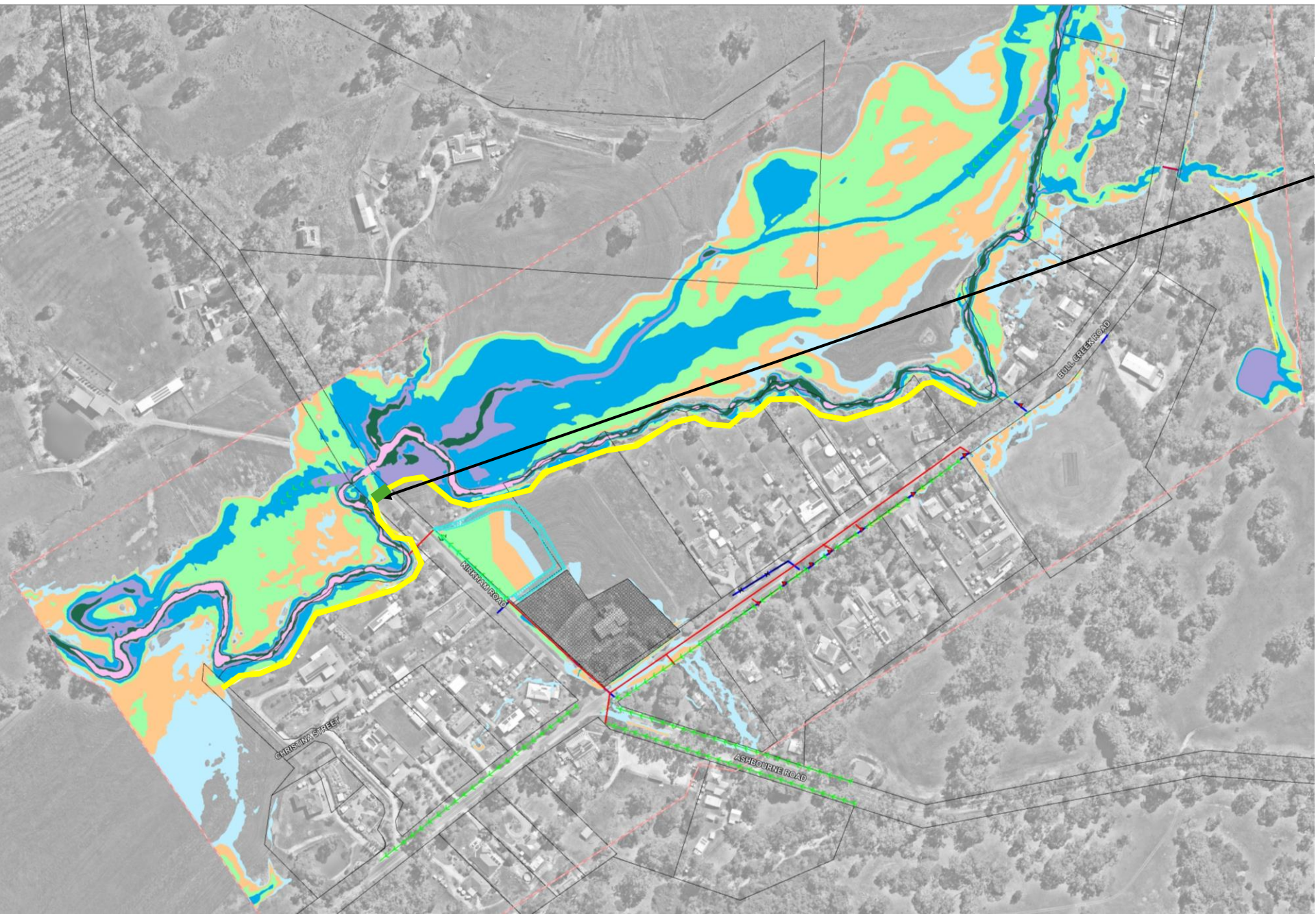
# Flood Mitigation Strategies



## Strategies:

## 1a. Flood Levee Upgrade

# Flood Mitigation Strategies



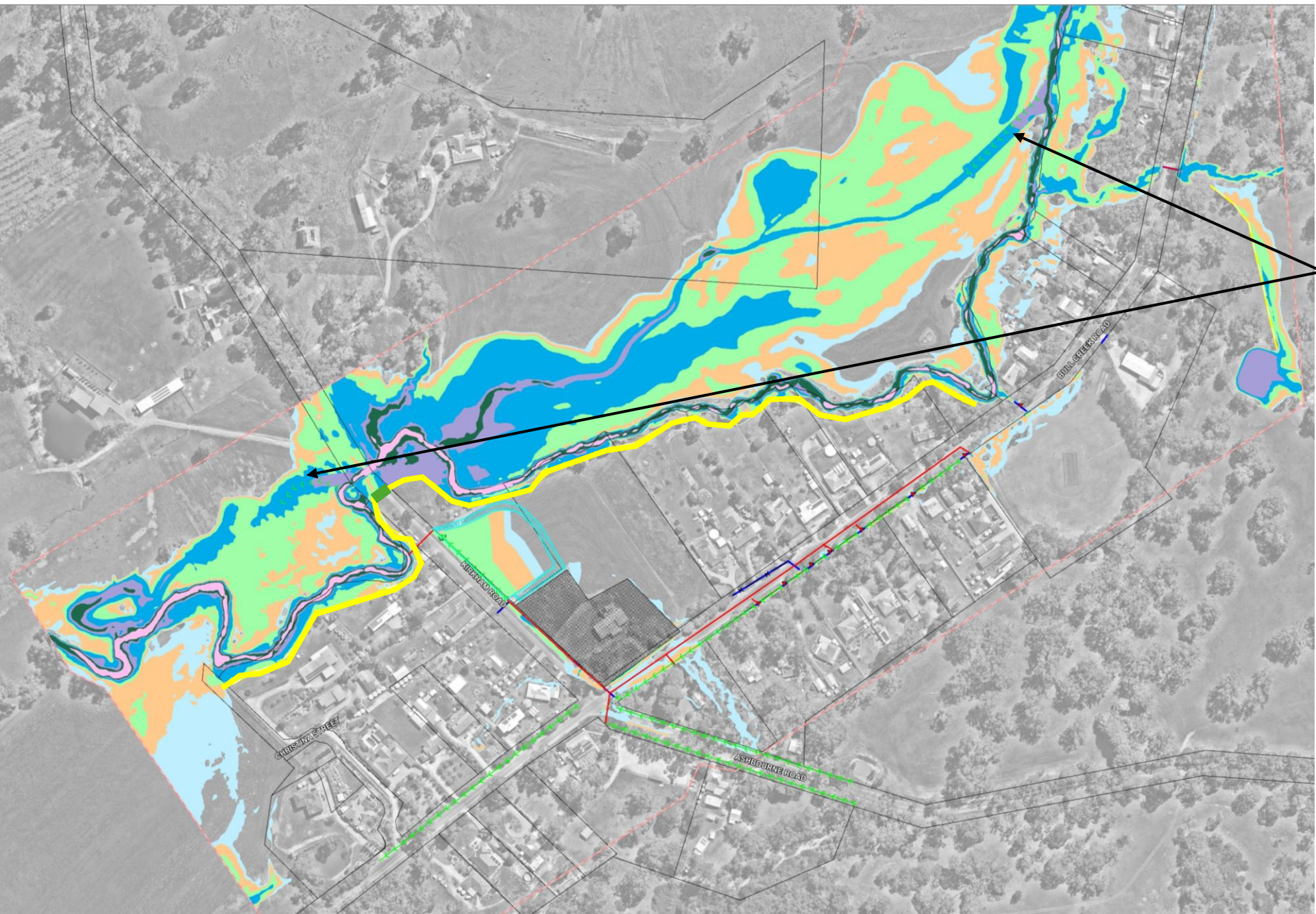
**Strategies:**

- 1a. Flood Levee Upgrade
- 1b. Kirkham Road Demountable Flood Barrier





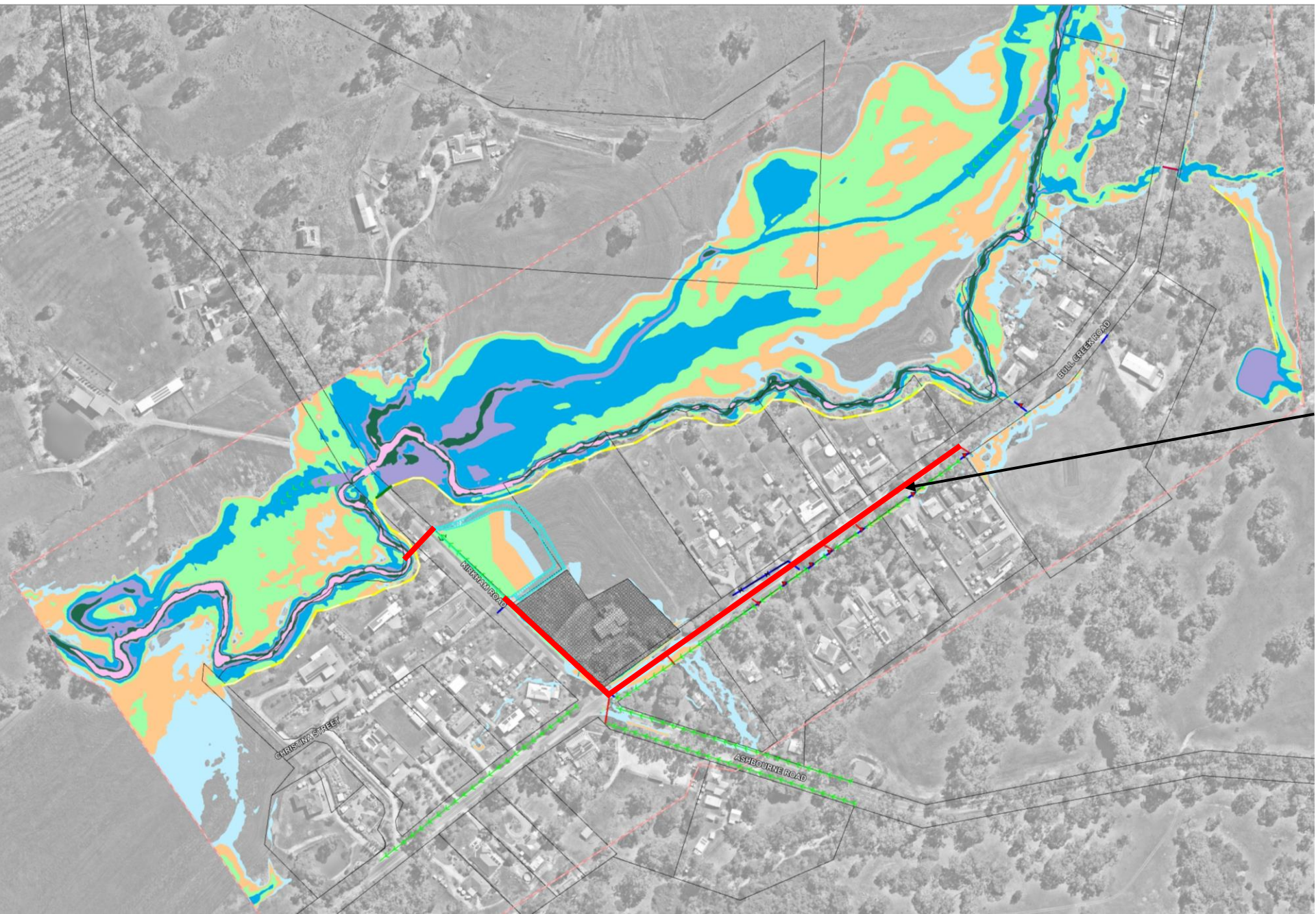
# Flood Mitigation Strategies



## Strategies:

- 1a. Flood Levee Upgrade
- 1b. Kirkham Road Demountable Flood Barrier
- 2. Creek Bypass Channels

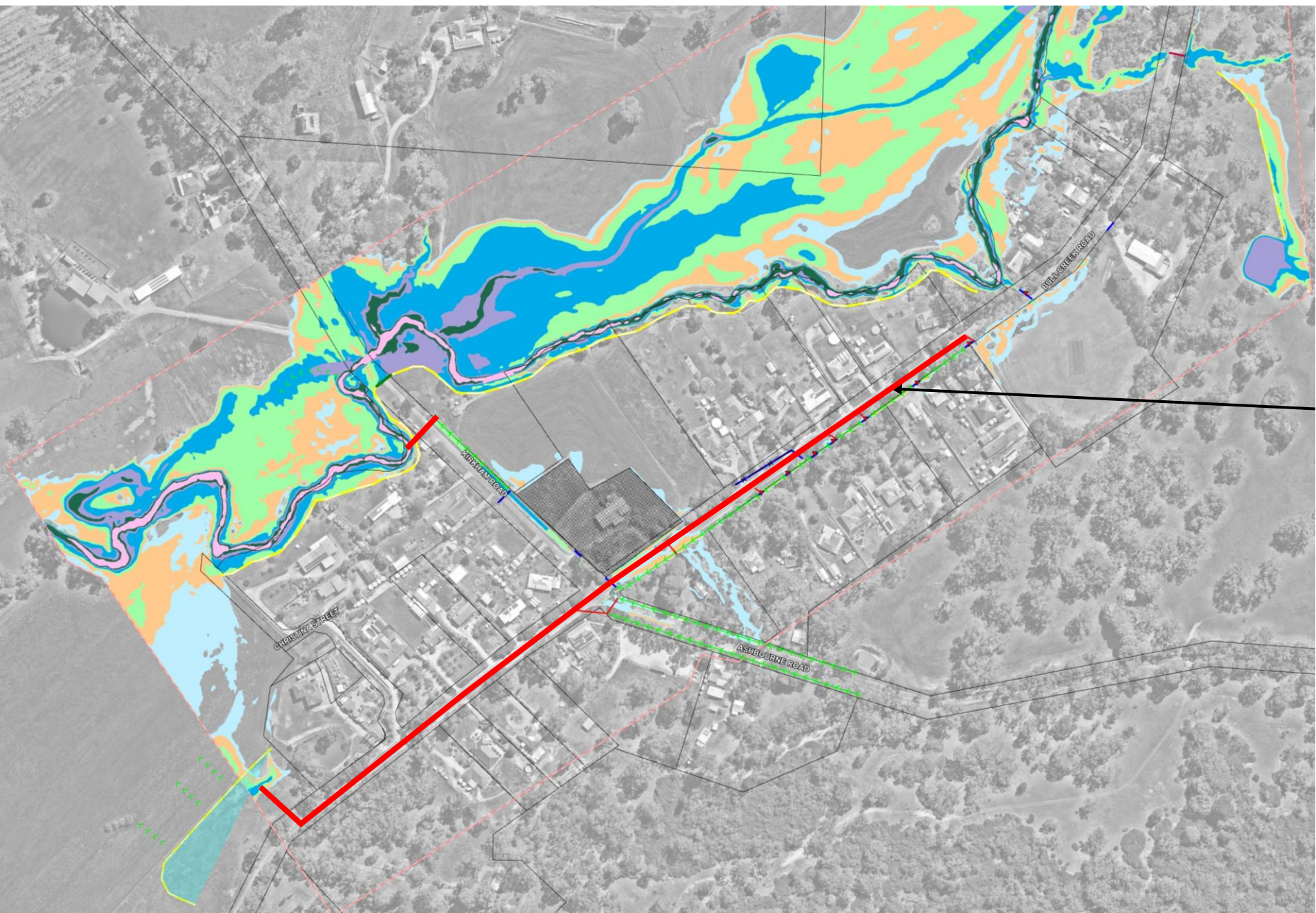
# Flood Mitigation Strategies



**Strategies:**

- 1a. Flood Levee Upgrade
- 1b. Kirkham Road Demountable Flood Barrier
- 2. Creek Bypass Channels
- 3. Bull Creek Road Drainage Upgrade (Option 1)

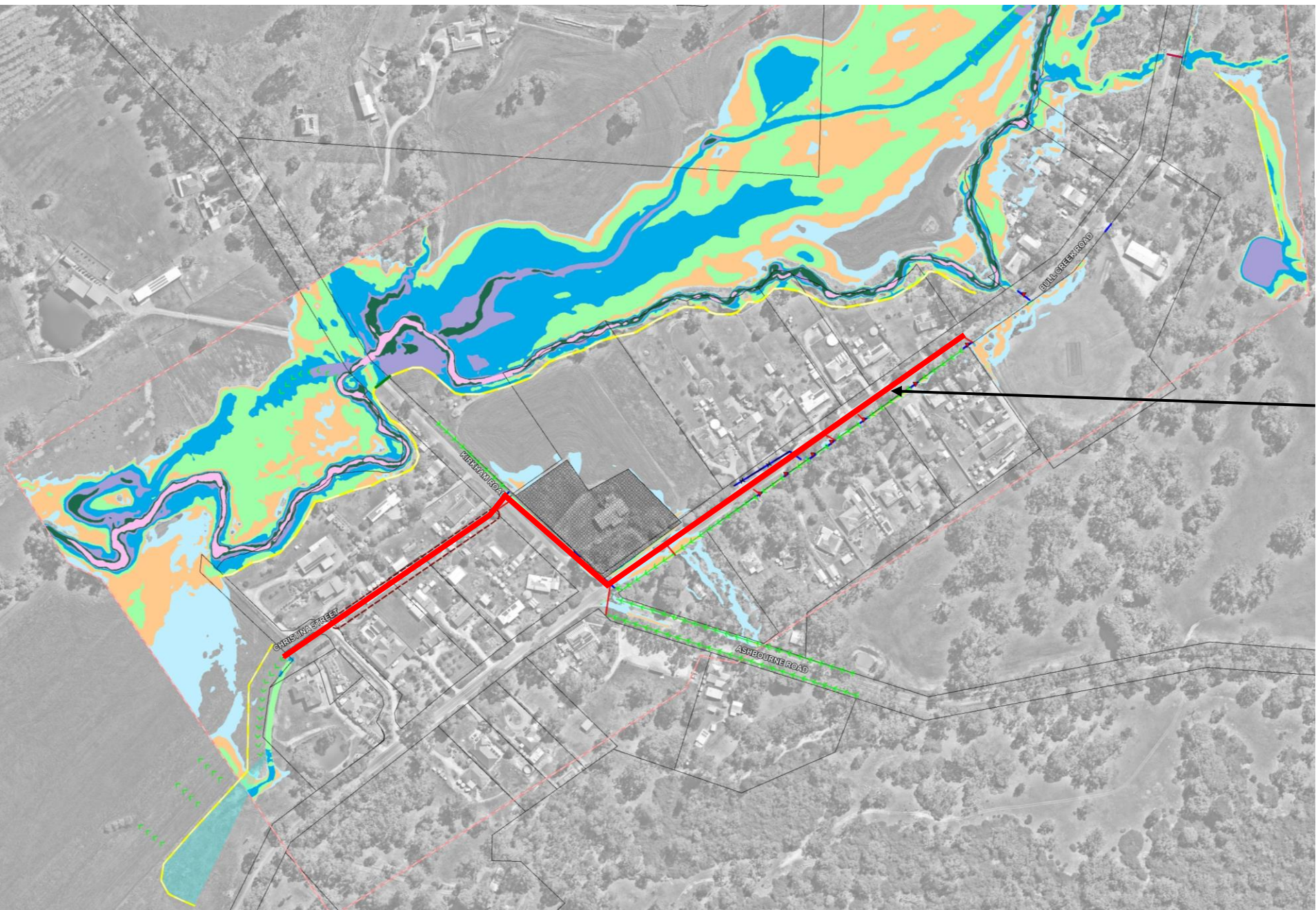
# Flood Mitigation Strategies



**Strategies:**

- 1a. Flood Levee Upgrade
- 1b. Kirkham Road Demountable Flood Barrier
- 2. Creek Bypass Channels
- 3. Bull Creek Road Drainage Upgrade (Option 2)

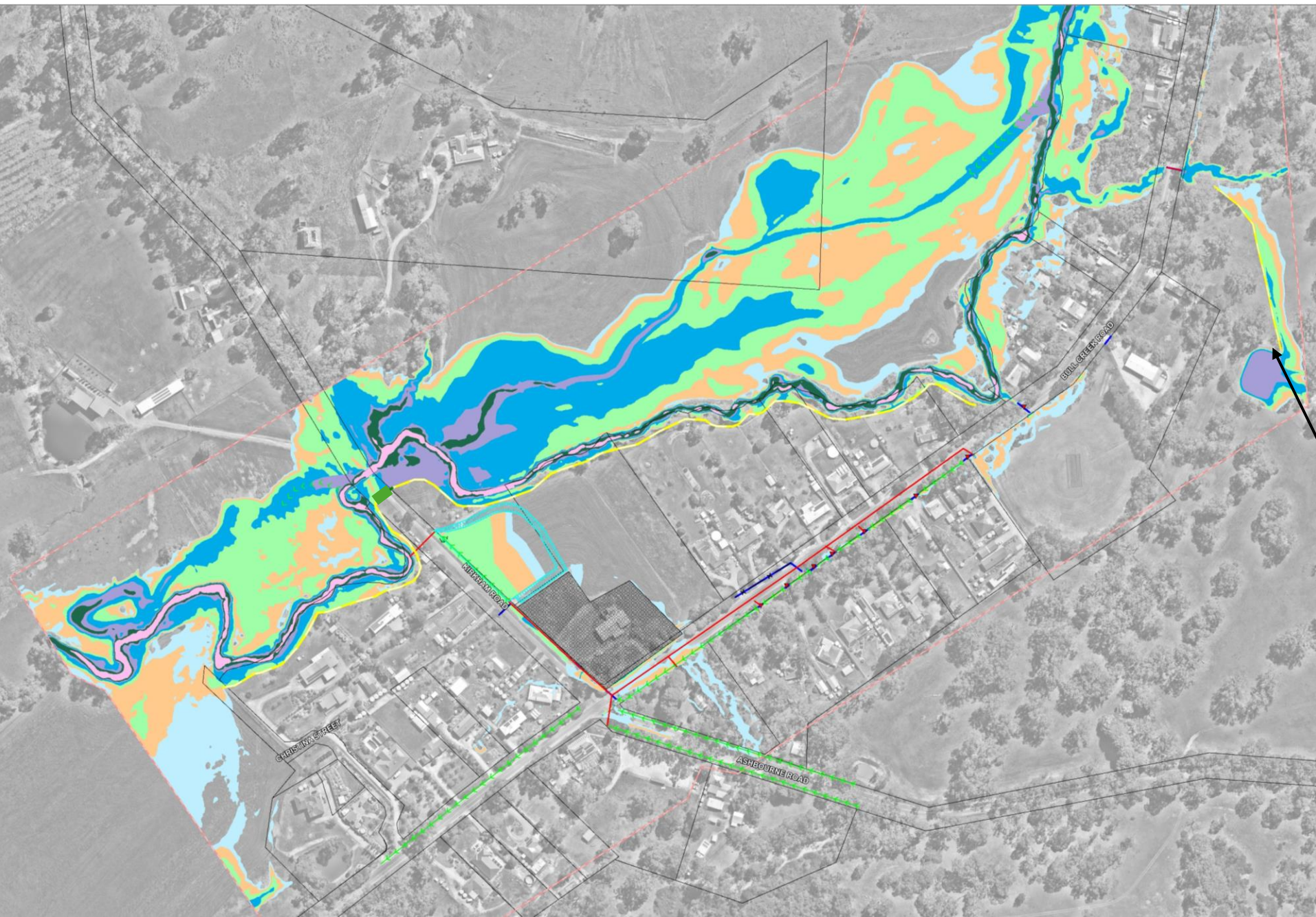
# Flood Mitigation Strategies



**Strategies:**

- 1a. Flood Levee Upgrade
- 1b. Kirkham Road Demountable Flood Barrier
- 2. Creek Bypass Channels
- 3. Bull Creek Road Drainage Upgrade (Option 3)

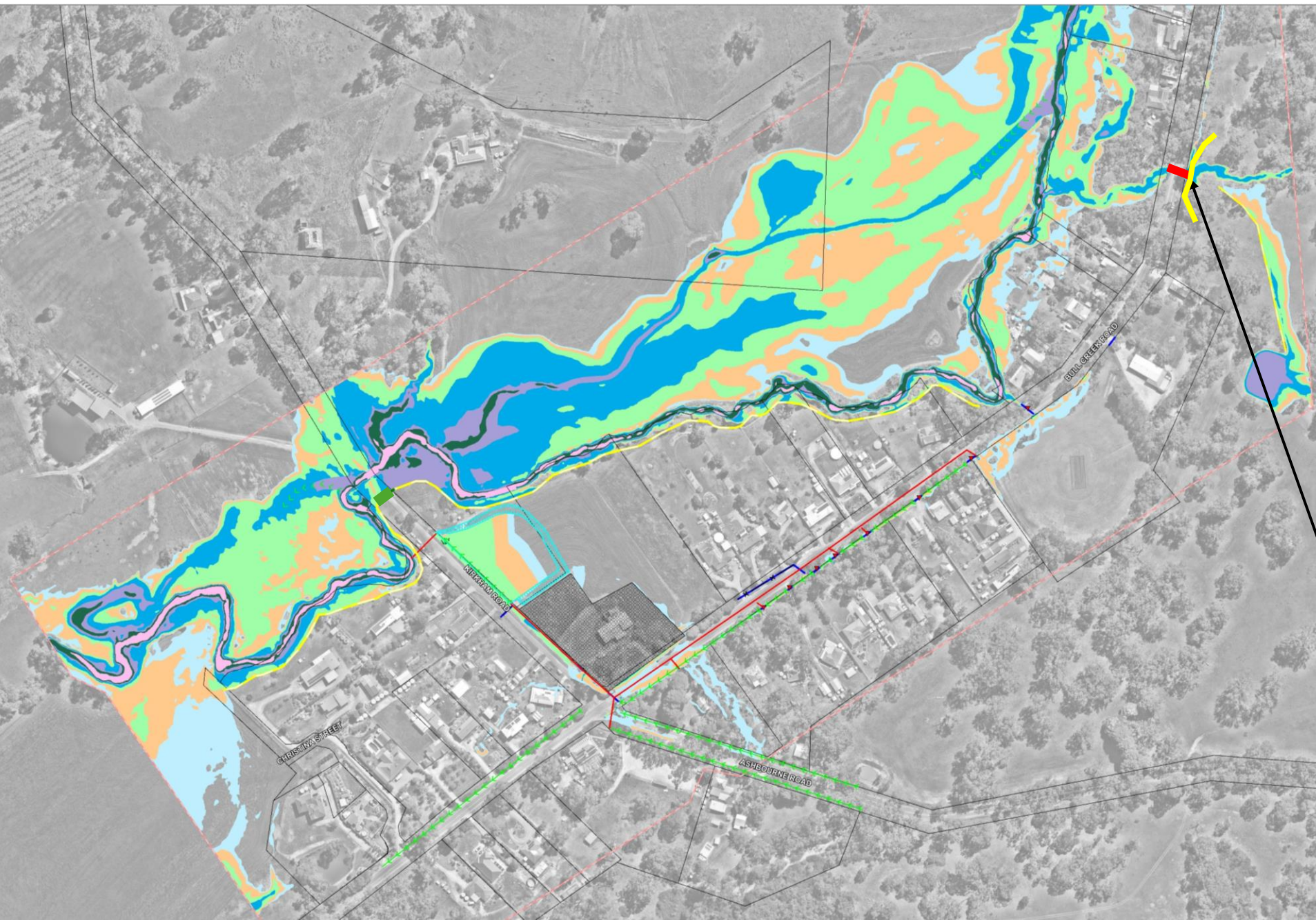
# Flood Mitigation Strategies



## Strategies:

- 1a. Flood Levee Upgrade
- 1b. Kirkham Road Demountable Flood Barrier
- 2. Creek Bypass Channels
- 3. Bull Creek Road Drainage Upgrade (Option 3)
- 4. Farm Dam Spillway Upgrade

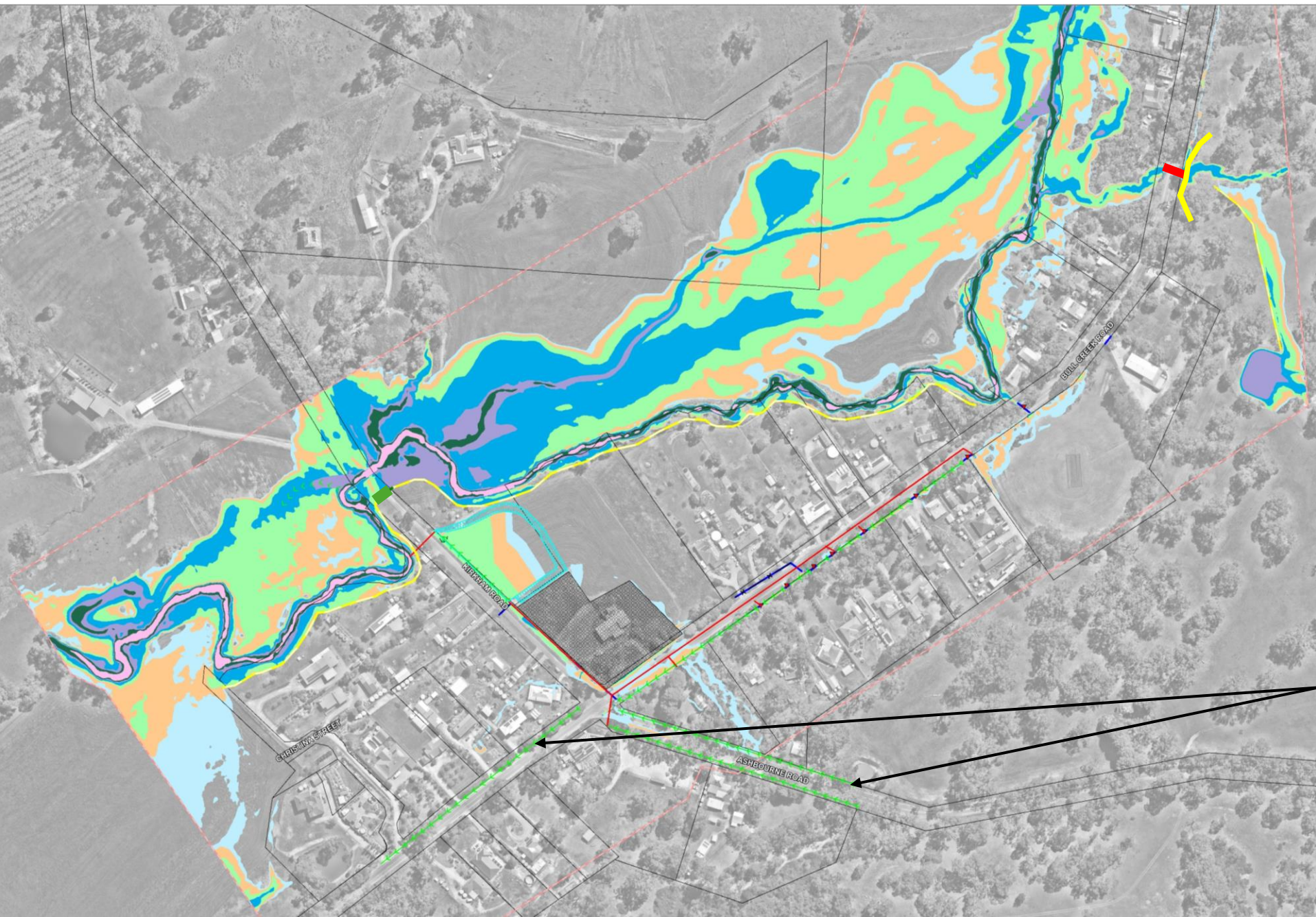
# Flood Mitigation Strategies



## Strategies:

- 1a. Flood Levee Upgrade
- 1b. Kirkham Road Demountable Flood Barrier
- 2. Creek Bypass Channels
- 3. Bull Creek Road Drainage Upgrade (Option 3)
- 4. Farm Dam Spillway Upgrade
- 5. Bull Creek Road Culvert Upgrade (or flood detention)

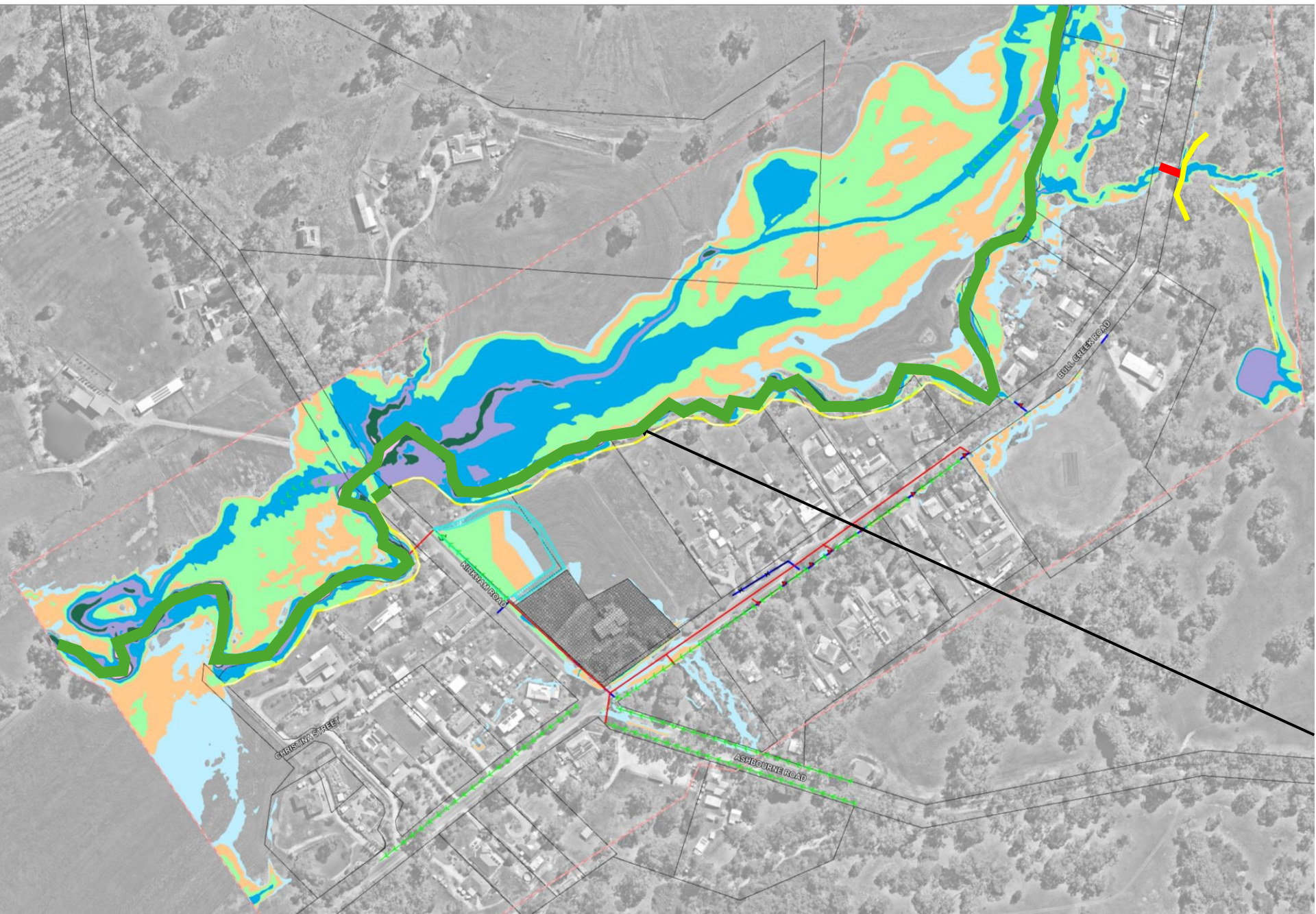
# Flood Mitigation Strategies



## Strategies:

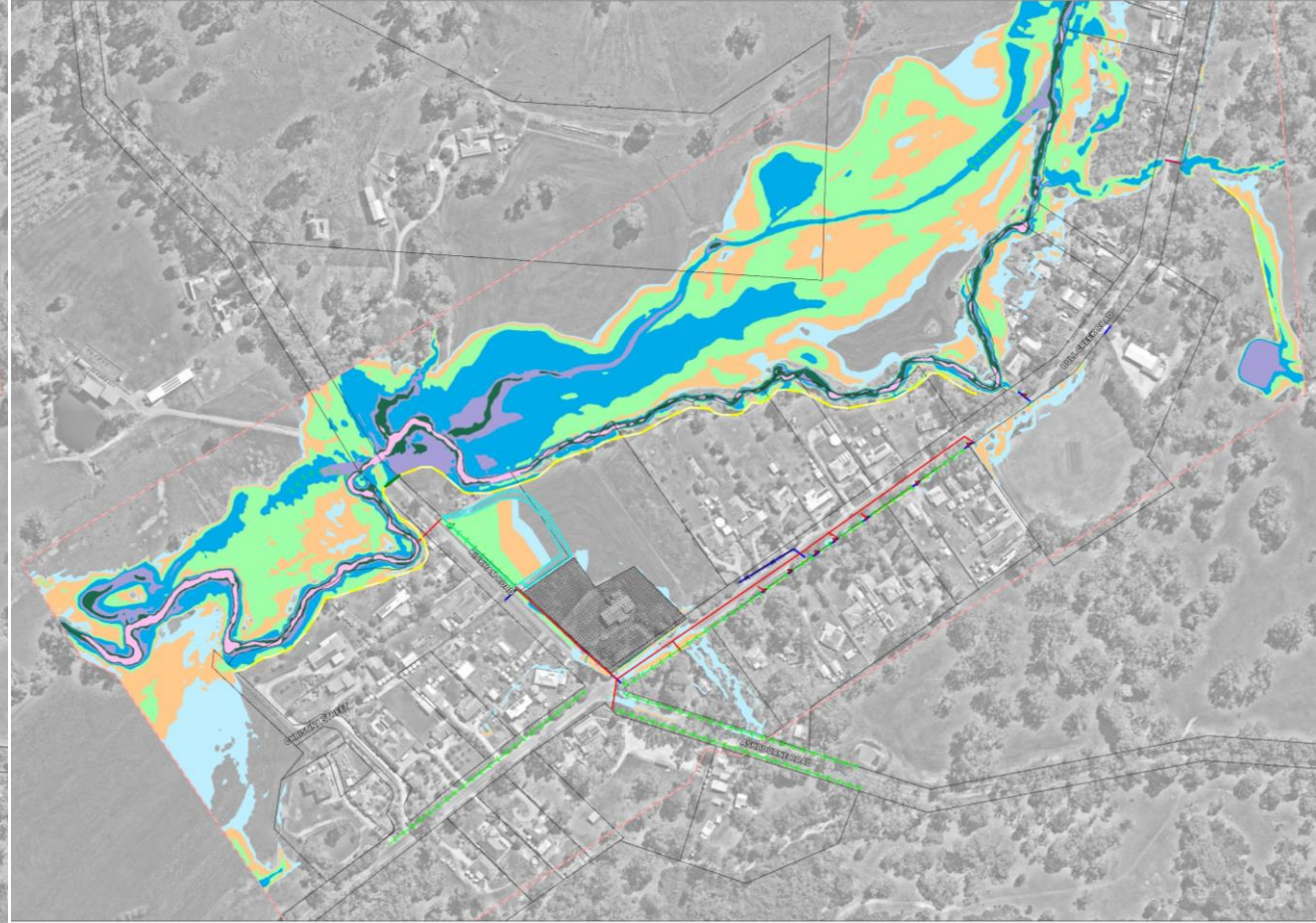
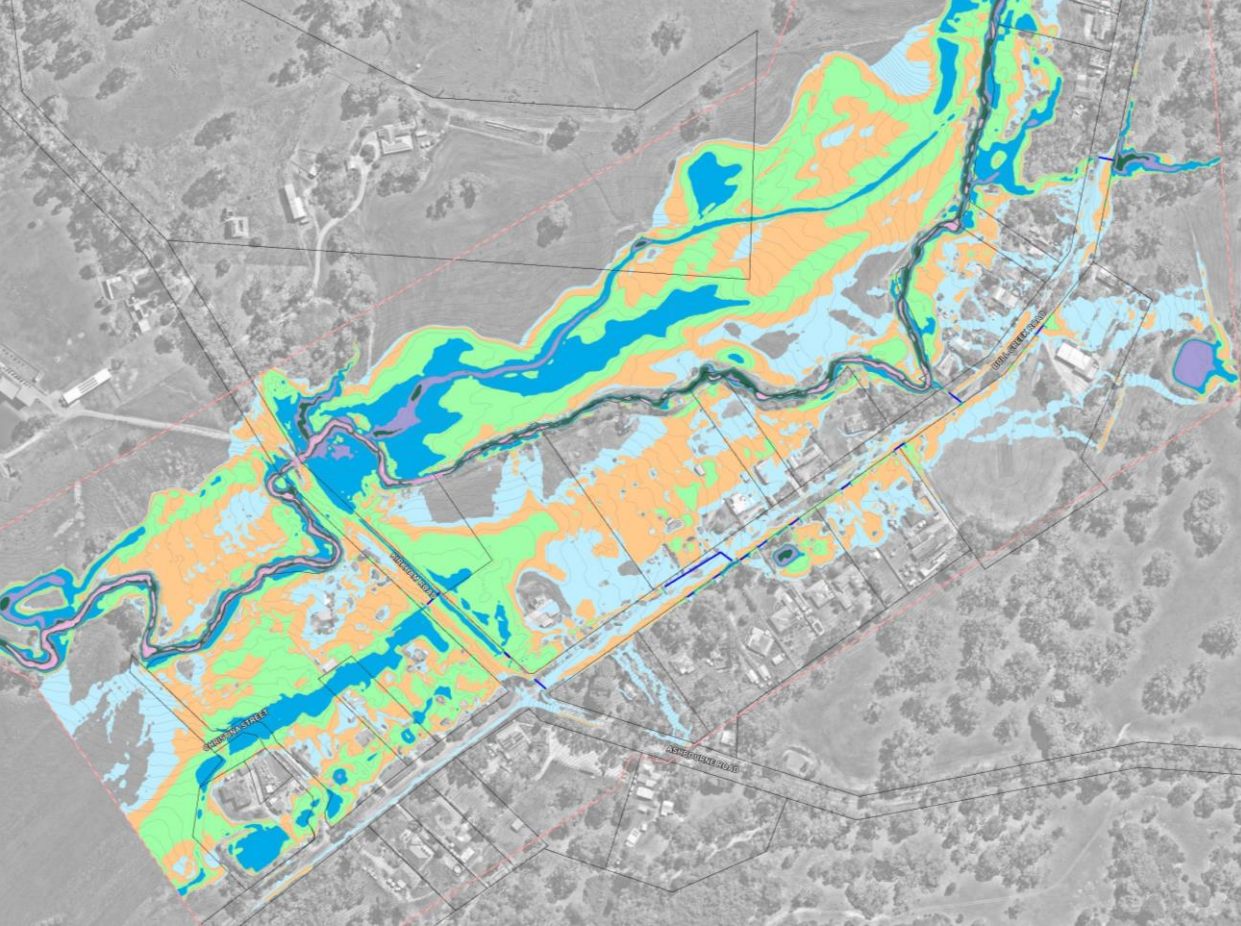
- 1a. Flood Levee Upgrade
- 1b. Kirkham Road Demountable Flood Barrier
- 2. Creek Bypass Channels
- 3. Bull Creek Road Drainage Upgrade (Option 3)
- 4. Farm Dam Spillway Upgrade
- 5. Bull Creek Road Culvert Upgrade (or flood detention)
- 6. Roadside Swales

# Flood Mitigation Strategies



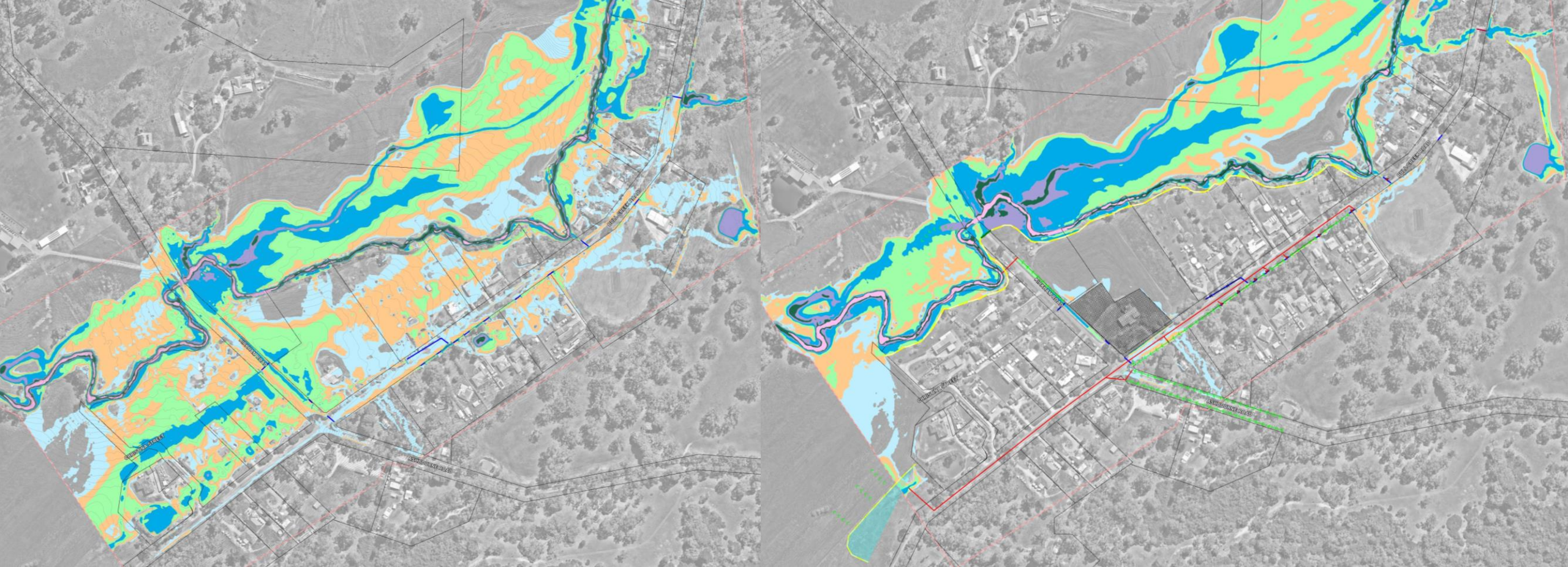
## Strategies:

- 1a. Flood Levee Upgrade
- 1b. Kirkham Road Demountable Flood Barrier
- 2. Creek Bypass Channels
- 3. Bull Creek Road Drainage Upgrade (Option 3)
- 4. Farm Dam Spillway Upgrade
- 5. Bull Creek Road Culvert Upgrade (or flood detention)
- 6. Roadside Swales
- 7. Creek Maintenance, vegetation clearing



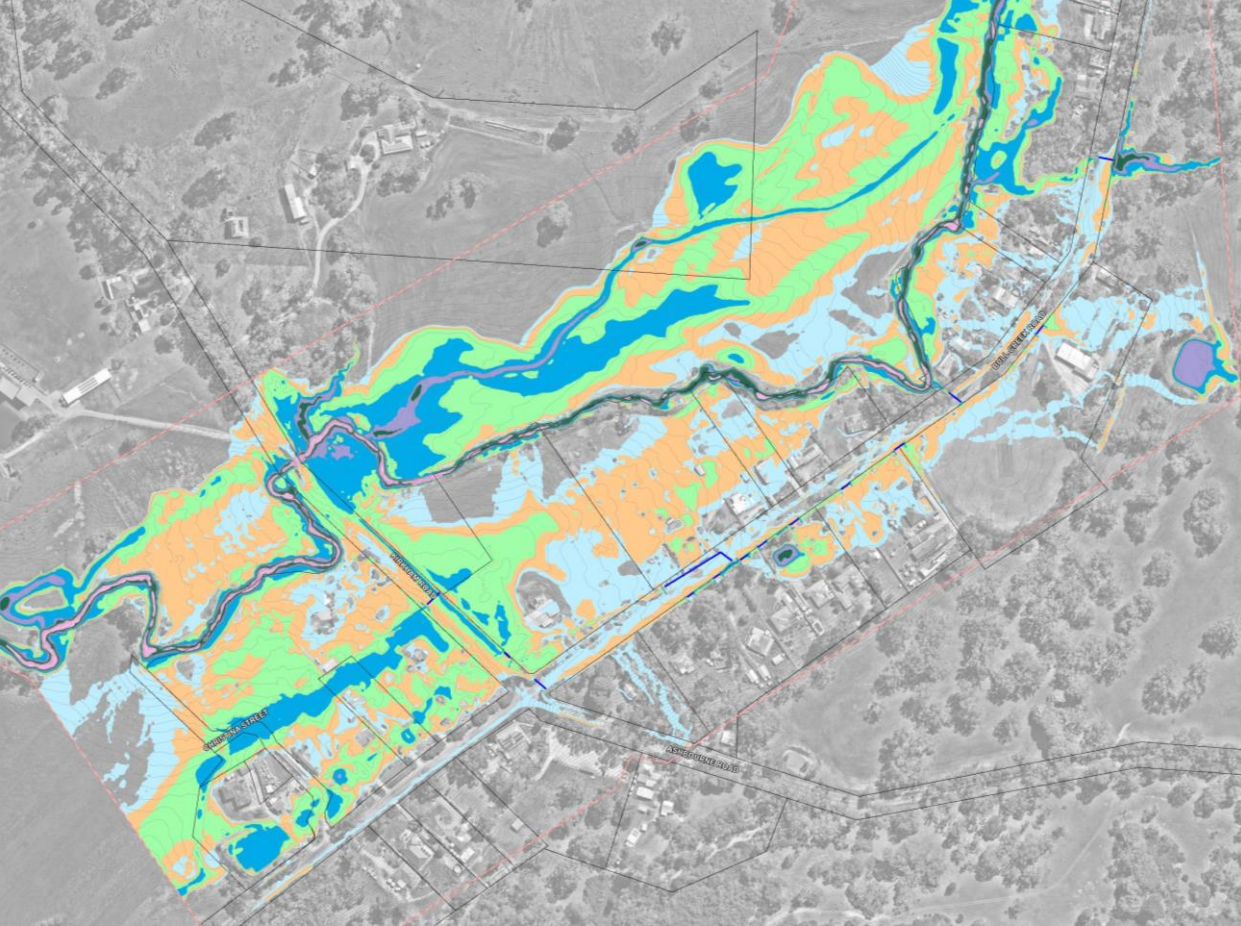
---

## Flood Mitigation Strategies (Option 1) – 1% AEP Comparison



---

## Flood Mitigation Strategies (Option 2) – 1% AEP Comparison



---

## Flood Mitigation Strategies (Option 3) – 1% AEP Comparison

Questions?

