

# Maps





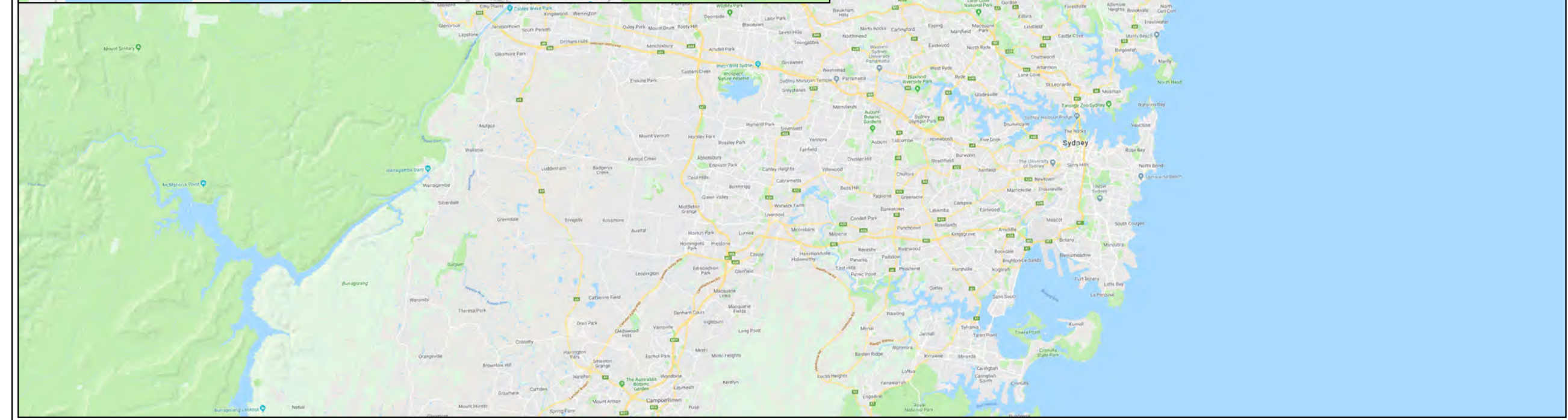
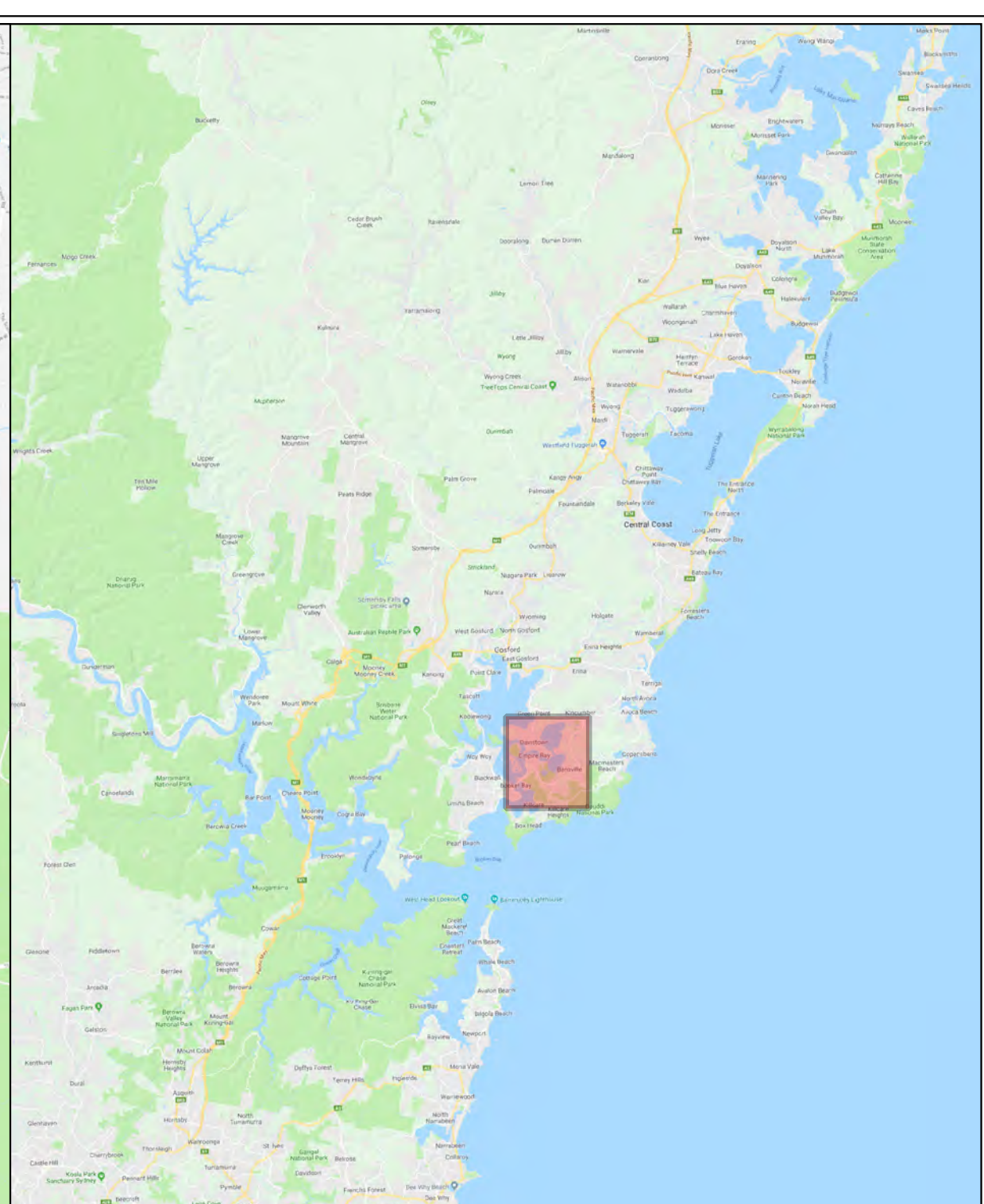
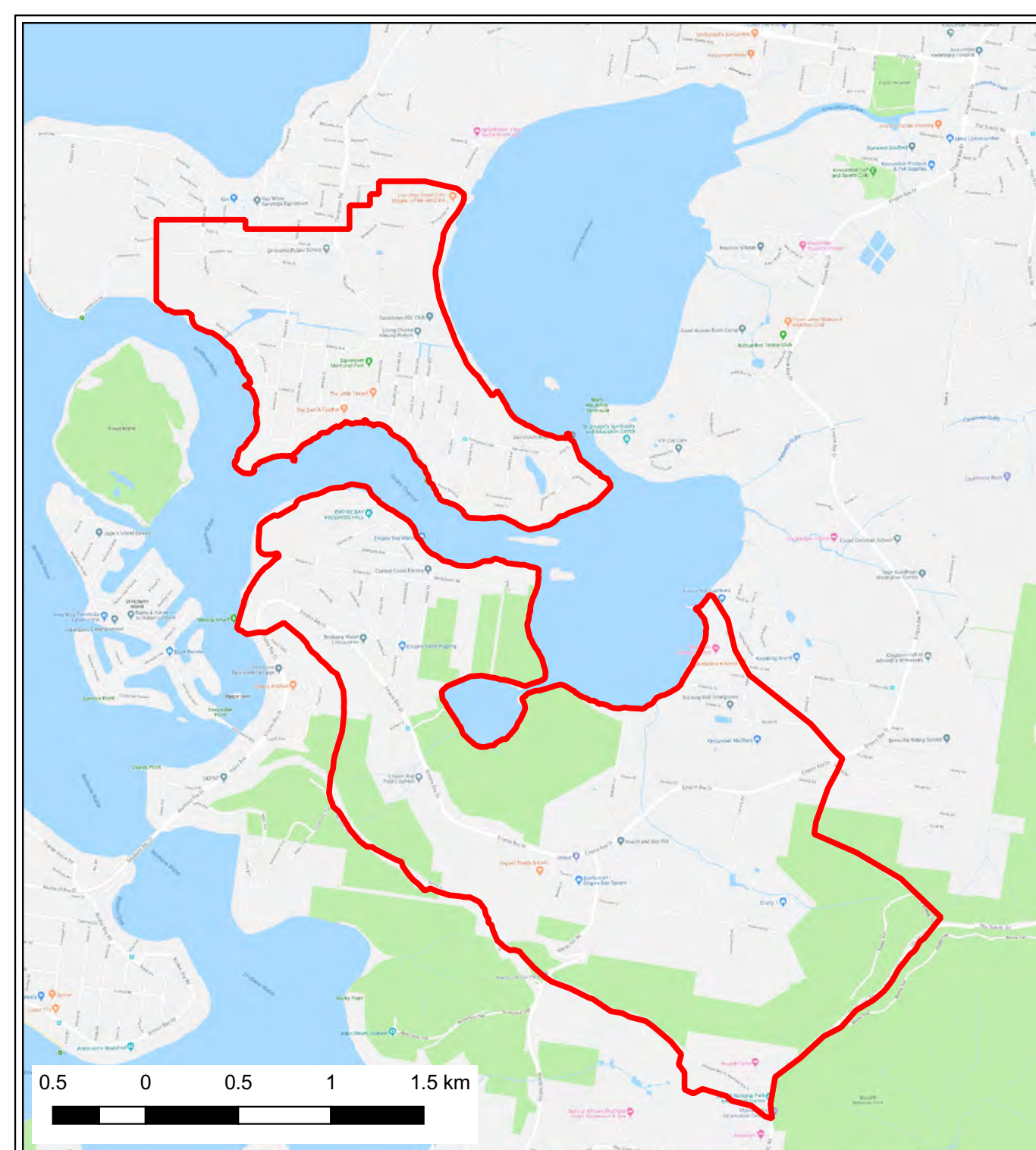
# Map G101

## Study Location

**Legend**  
Study Area

5 0 5 10 15 km

Scale : 1:400000@A3  
Date : 7 November 2018  
Revision : 1  
Created by : JRF  
Coordinate System : MGA 56





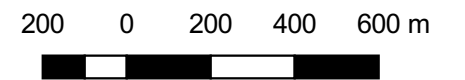


## Map G102

### Catchment Area Features

#### Legend

-  Study Area
-  General Surface Flow



Scale : 1:18000@A3  
Date : 15 January 2019  
Revision : 2  
Created by : JRF  
Coordinate System : MGA 56





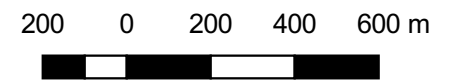


### Map G103

### Site Inspection Photo Locations

#### Legend

-  Study Area
-  Photo Locations



Scale : 1:18000@A3  
Date : 7 November 2018  
Revision : 1  
Created by : JRF  
Coordinate System : MGA 56

















### Map G104

### Floor Level Survey

#### Legend

-  Study Area
-  Brisbane Water FRMS (Cardno, 2015) Property Survey
-  2019 Property Survey
-  Properties for which ground levels and floor levels were estimated

#### 1% AEP Flood Depth (m)

-  0.15 - 0.2
-  0.2 - 0.3
-  0.3 - 0.4
-  0.4 - 0.5
-  0.5 - 0.75
-  0.75 - 1
-  1 - 1.2
-  > 1.2

200 0 200 400 600 m



Scale : 1:18000@A3  
Date : 08 October 2020  
Revision : D  
Created by : JS  
Coordinate System : MGA 56





### Map G105

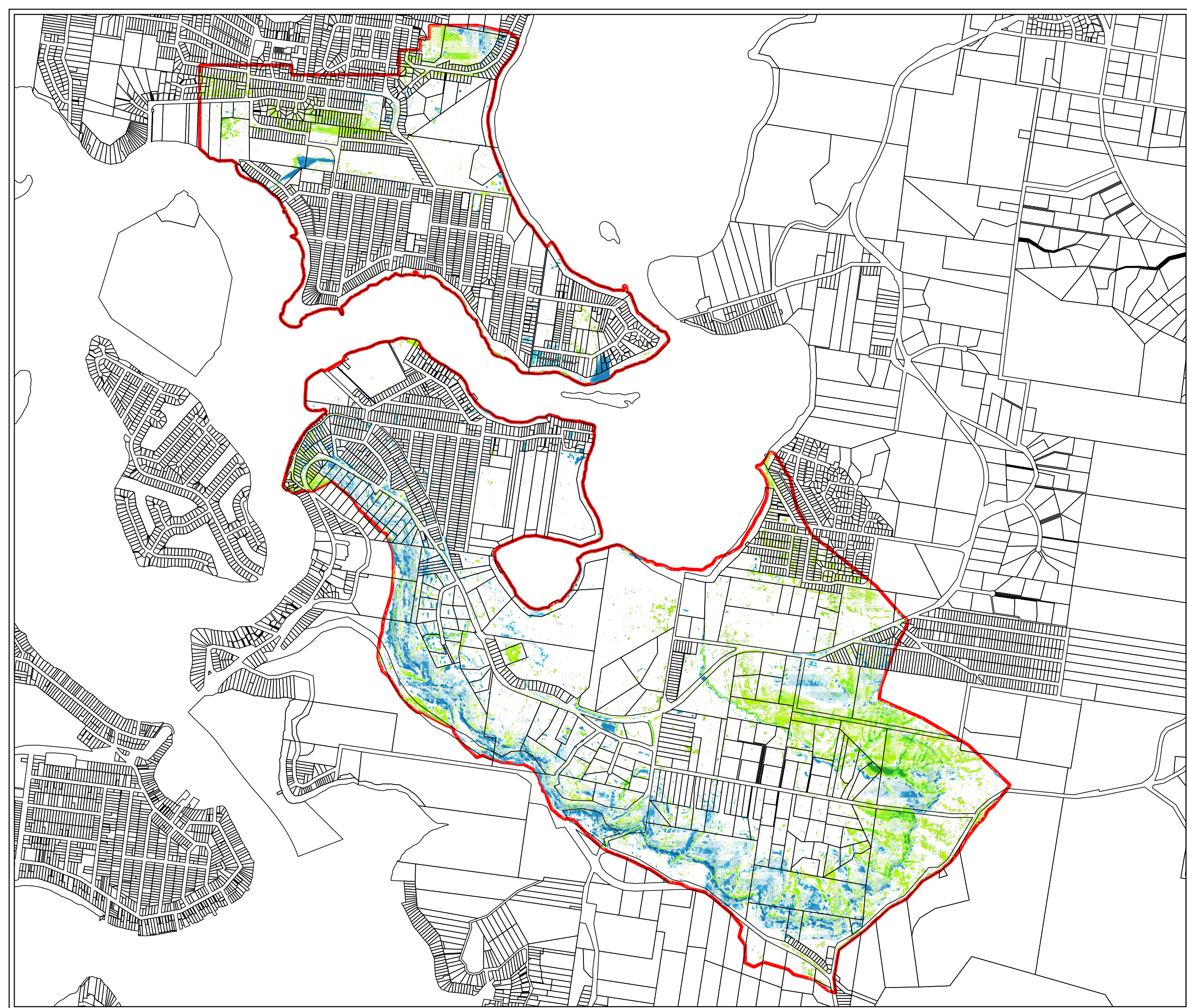
### Ground Surface Comparison

#### Legend

- Study Area
- 2013 LiDAR less 2010 DEM
- <= -2.0
- 2.0 - -1.0
- 1.0 - -0.5
- 0.5 - -0.3
- 0.3 - 0.3
- 0.3 - 0.5
- 0.5 - 1.0
- 1.0 - 2.0
- > 2.0



Scale : 1:18000@A3  
Date : 7 November 2018  
Revision : 1  
Created by : JRF  
Coordinate System : MGA 56









### Map G106

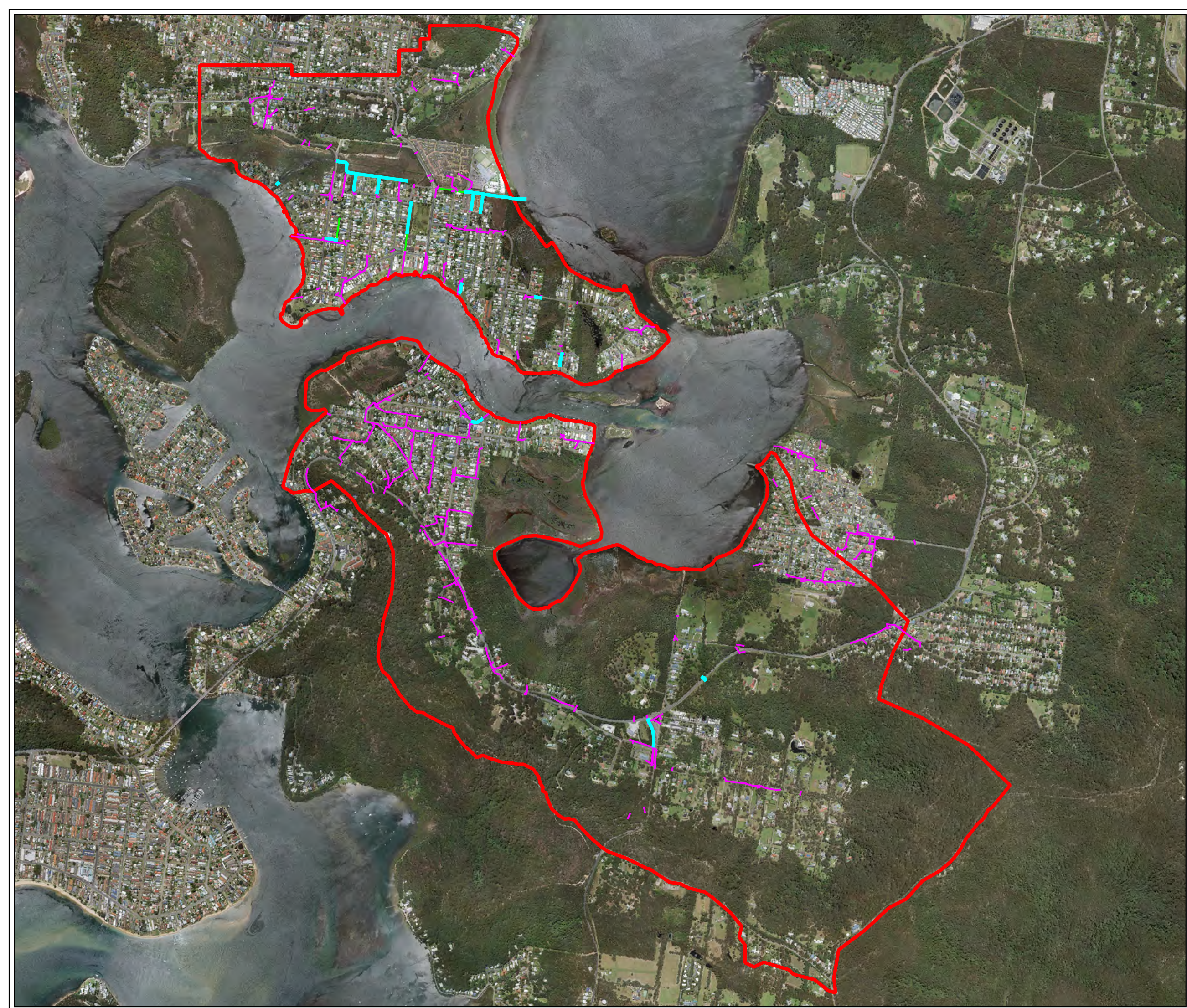
### SOBEK Model 1D Network

#### Legend

-  Study Area
-  SOBEK 1D Channels
-  SOBEK 1D Pipes
-  Channels Removed From 1D Domain in Revised Model



Scale : 1:18000@A3  
Date : 12 November 2018  
Revision : 1  
Created by : JRF  
Coordinate System : MGA 56





### Map G110

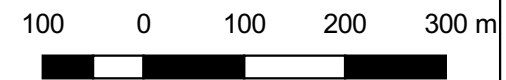
### Tuflow vs Sobek 1% AEP Depth Davistown

#### Legend

Study Area

Tuflow less Sobek Model  
Depth Difference (m)

- <= -0.5
- 0.5 - -0.3
- 0.3 - -0.2
- 0.2 - -0.1
- 0.1 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.5
- > 0.5



Scale : 1:7500@A3  
Date : 17 January 2019  
Revision : 1  
Created by : JRF  
Coordinate System : MGA 56







### Map G111

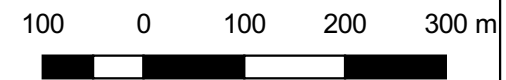
## Tuflow vs Sobek 20% AEP Depth Davistown

### Legend

Study Area

Tuflow less Sobek Model  
Depth Difference (m)

- <= -0.5
- 0.5 - -0.3
- 0.3 - -0.2
- 0.2 - -0.1
- 0.1 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.5
- > 0.5



Scale : 1:7500@A3  
Date : 17 January 2019  
Revision : 1  
Created by : JRF  
Coordinate System : MGA 56





### Map G112

### Tuflow vs Sobek 1% AEP Depth Empire Bay

#### Legend

Study Area

Tuflow less Sobek Model  
Depth Difference (m)

- <= -0.5
- 0.5 - -0.3
- 0.3 - -0.2
- 0.2 - -0.1
- 0.1 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.5
- > 0.5

100 0 100 200 300 400 500 m



Scale : 1:12000@A3  
Date : 17 January 2019  
Revision : 1  
Created by : JRF  
Coordinate System : MGA 56





### Map G113

## Tuflow vs Sobek 20% AEP Depth Empire Bay

#### Legend

Study Area

Tuflow less Sobek Model  
Depth Difference (m)

- <= -0.5
- 0.5 - -0.3
- 0.3 - -0.2
- 0.2 - -0.1
- 0.1 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.5
- > 0.5

100 0 100 200 300 400 500 m



Scale : 1:12000@A3  
Date : 17 January 2019  
Revision : 1  
Created by : JRF  
Coordinate System : MGA 56













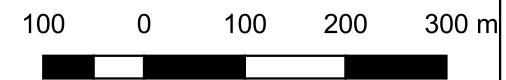


### Map G114

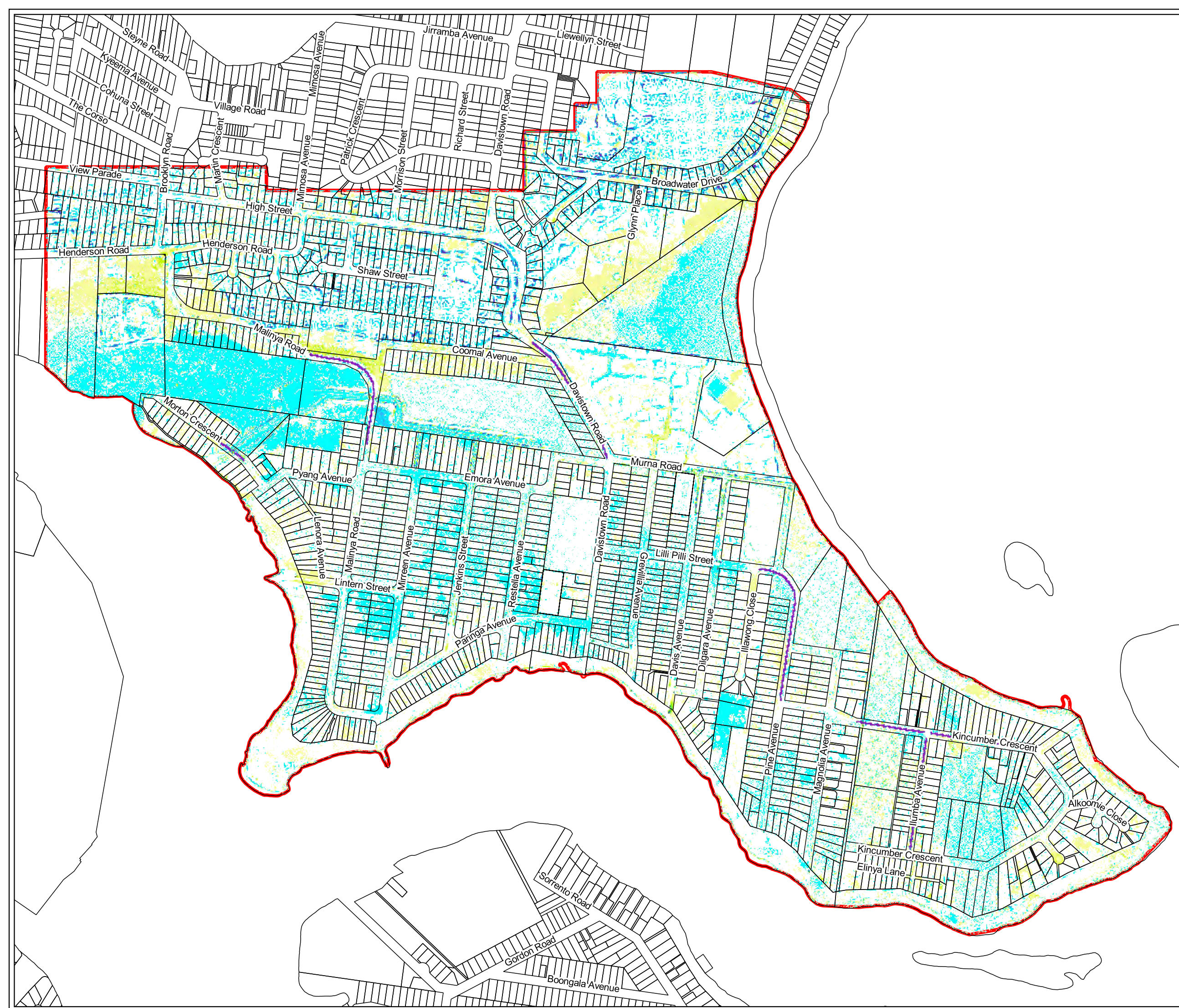
## Flood Depth Difference ARR2019 less ARR1987 1% AEP, 2 Hour Event Davistown

#### Legend

-  Study Area
- Depth Difference (m)
-  <= -0.2
-  -0.2 - -0.1
-  -0.1 - -0.05
-  -0.05 - -0.01
-  -0.01 - 0.01
-  0.01 - 0.05
-  0.05 - 0.1
-  0.1 - 0.2
-  > 0.2



Scale : 1:7500@A3  
Date : 13 February 2019  
Revision : 1  
Created by : JRF  
Coordinate System : MGA 56







### Map G115


### New LiDAR less Flood Study DEM 1% AEP, 1 Hour Empire Bay/Bensville


#### Legend


 Study Area


Depth Difference (m)


  $\leq -1$


 -1 - -0.5

 -0.5 - -0.2

 -0.2 - -0.1

 0.1 - 0.2

 0.2 - 0.5

 0.5 - 1

  $> 1$

100 0 100 200 300 400 500 m



Scale : 1:12000@A3

Date : 12 March 2019

Revision : 1

Created by : JRF

Coordinate System : MGA 56





### Map G116

## Pomona Road Survey and Flood Wall Impact Assessment 1% AEP Depth Empire Bay

#### Legend

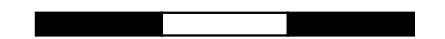
Survey Extent

Wall Extent

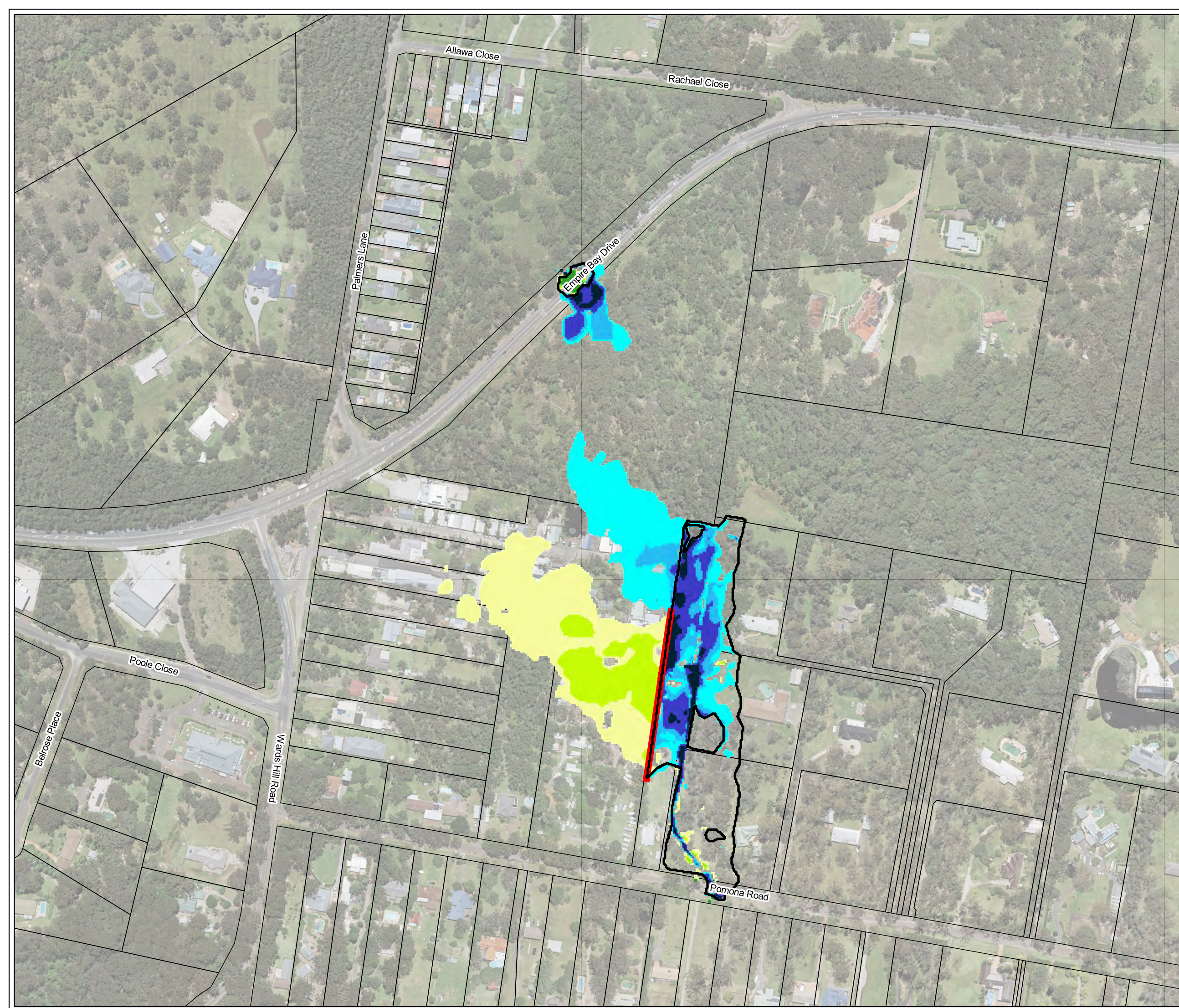
Survey Impact to Flood Levels  
Depth Difference (m)

- <math>\leq -0.5</math>
- 0.5 - -0.3
- 0.3 - -0.2
- 0.2 - -0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.5
- > 0.5

50      0      50      100 m



Scale : 1:2000@A3  
Date : December 2019  
Revision : 1  
Created by : JRF  
Coordinate System : MGA 56











### Map G120

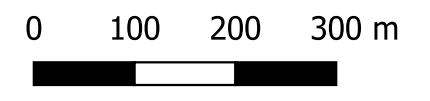
### Existing Hazard

### Davistown

### 1% AEP

 Model Area

- Hazard
-  H1 - Generally safe for vehicles, people & buildings
  -  H2 - Unsafe for small vehicles
  -  H3 - Unsafe for vehicles, children and the elderly
  -  H4 - Unsafe for vehicles and people
  -  H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure
  -  H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure



Scale : 1:7500@A3  
Date : December 2019  
Revision : A  
Created by : JS  
Coordinate System : MGA 56





## Map G121







### Existing Hazard

### Davistown

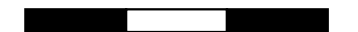
### PMF

 Model Area

#### Hazard

-  H1 - Generally safe for vehicles, people & buildings
-  H2 - Unsafe for small vehicles
-  H3 - Unsafe for vehicles, children and the elderly
-  H4 - Unsafe for vehicles and people
-  H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure
-  H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure

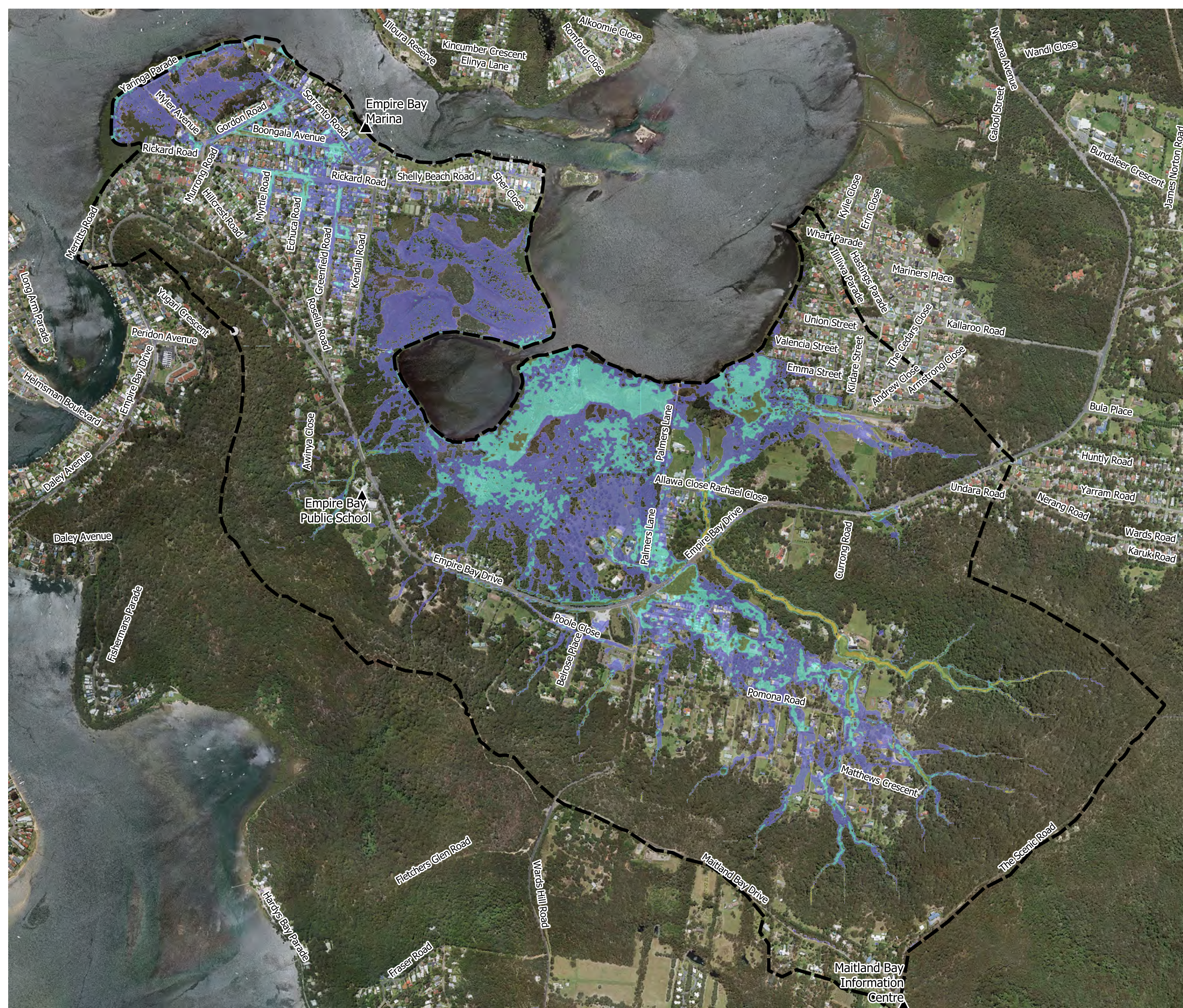
0 100 200 300 m



Scale : 1:7500@A3  
Date : December 2019  
Revision : A  
Created by : JS  
Coordinate System : MGA 56







**Map G122**

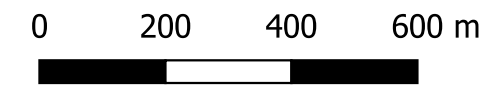
**Existing Hazard**

**Empire Bay/Bensville**

**1% AEP**

Model Area

- Hazard**
- H1 - Generally safe for vehicles, people & buildings
  - H2 - Unsafe for small vehicles
  - H3 - Unsafe for vehicles, children and the elderly
  - H4 - Unsafe for vehicles and people
  - H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure
  - H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure



Scale : 1:12000@A3  
 Date : December 2019  
 Revision : A  
 Created by : JS  
 Coordinate System : MGA 56





### Map G123

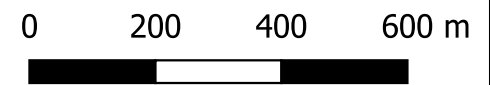
### Existing Hazard

### Empire Bay/Bensville

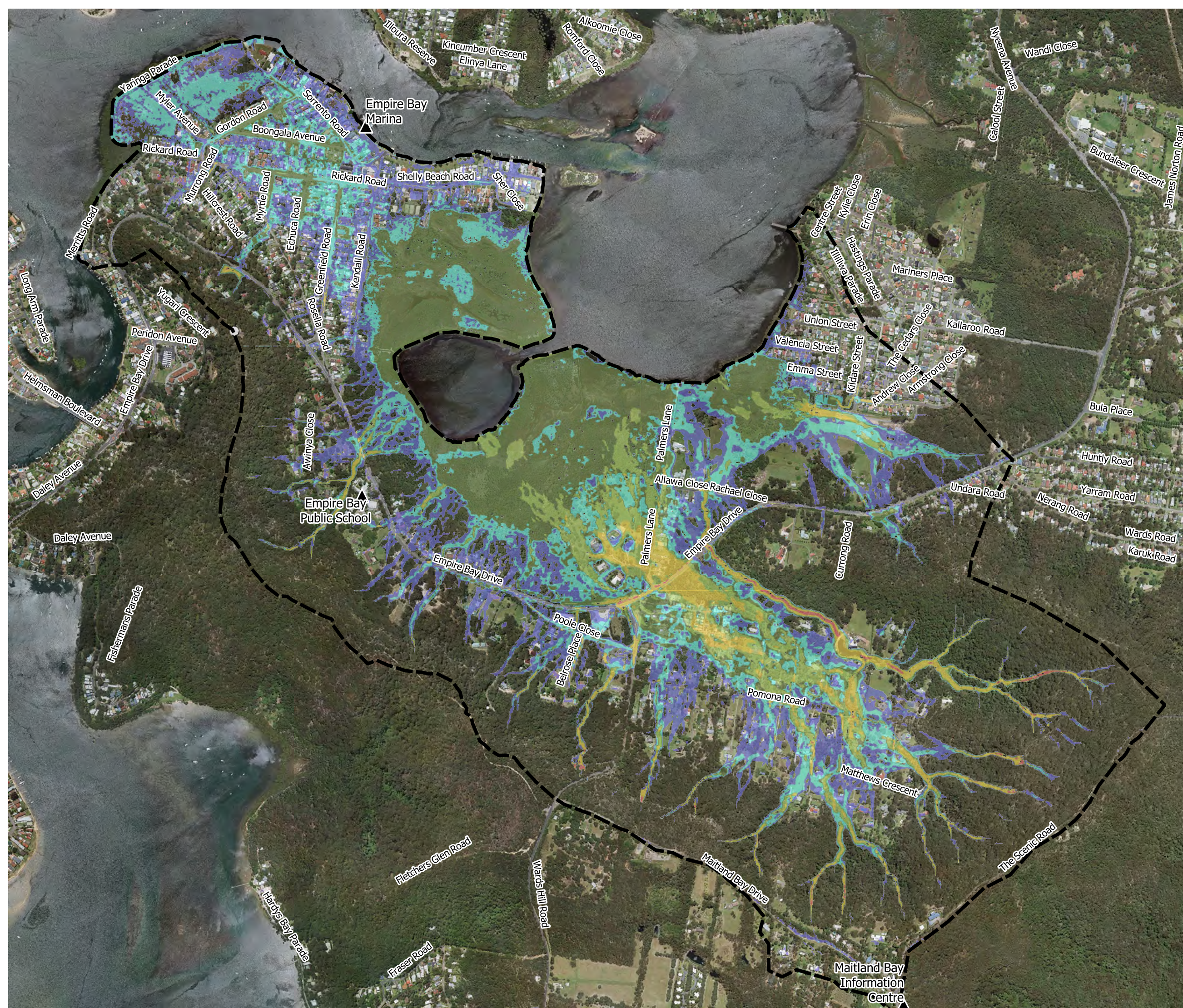
### PMF

Model Area

- Hazard
- H1 - Generally safe for vehicles, people & buildings
  - H2 - Unsafe for small vehicles
  - H3 - Unsafe for vehicles, children and the elderly
  - H4 - Unsafe for vehicles and people
  - H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure
  - H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure



Scale : 1:12000@A3  
Date : December 2019  
Revision : A  
Created by : JS  
Coordinate System : MGA 56





### Map G130

## Flood Emergency Response Classification

### Davistown

### 5% AEP

#### Legend

Model Area

Cadastre

#### Classification

Not Flooded, Indirect Consequence

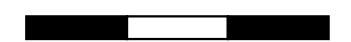
Flooded Rising Road

Flooded Overland Escape

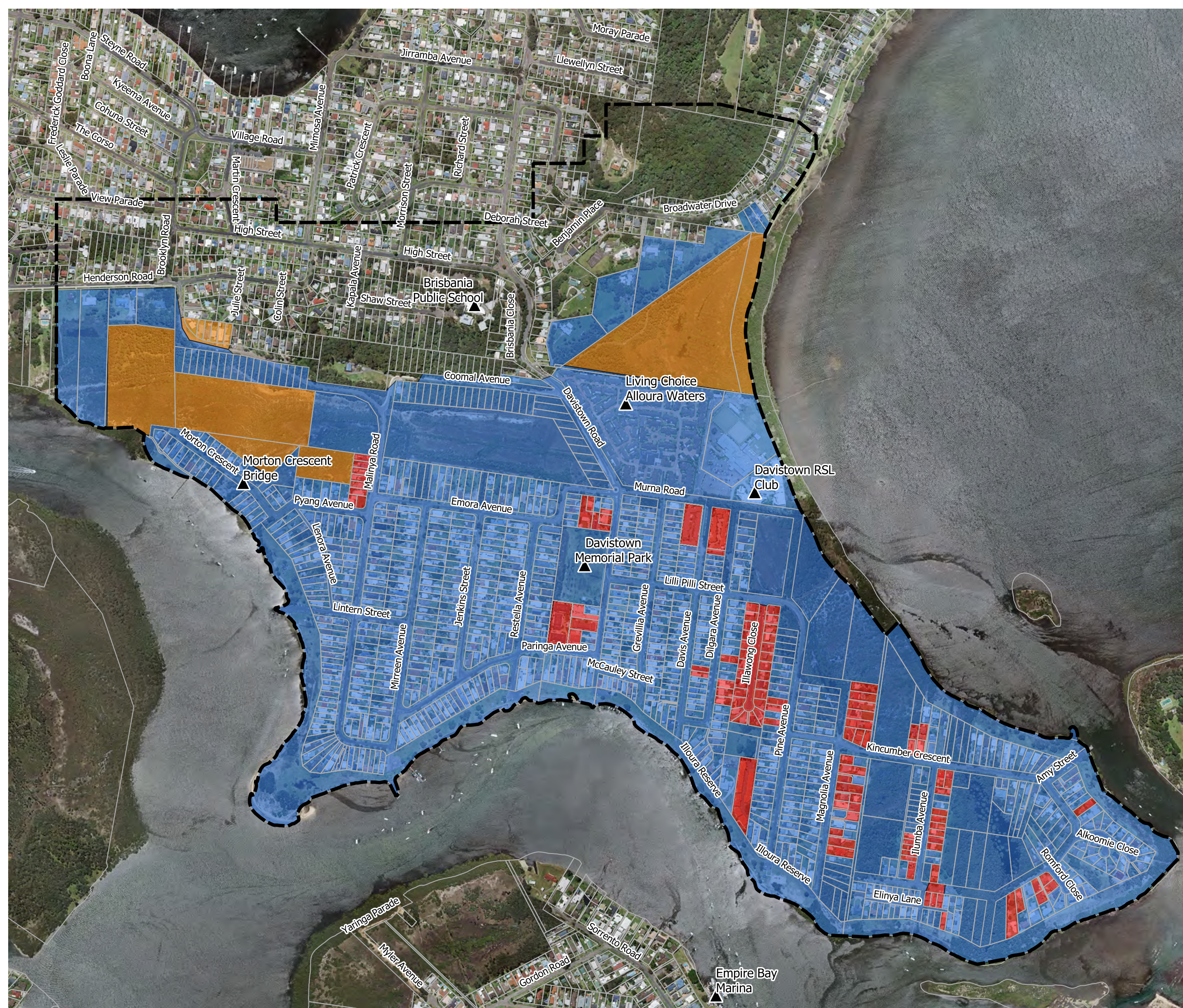
Flooded, Isolated, Elevated

Flooded, Isolated, Submerged

0 100 200 300 m



Scale : 1:7500@A3  
Date : December 2019  
Revision : A  
Created by : JS  
Coordinate System : MGA 56





### Map G131

## Flood Emergency Response Classification

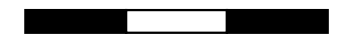
### Davistown

1% AEP

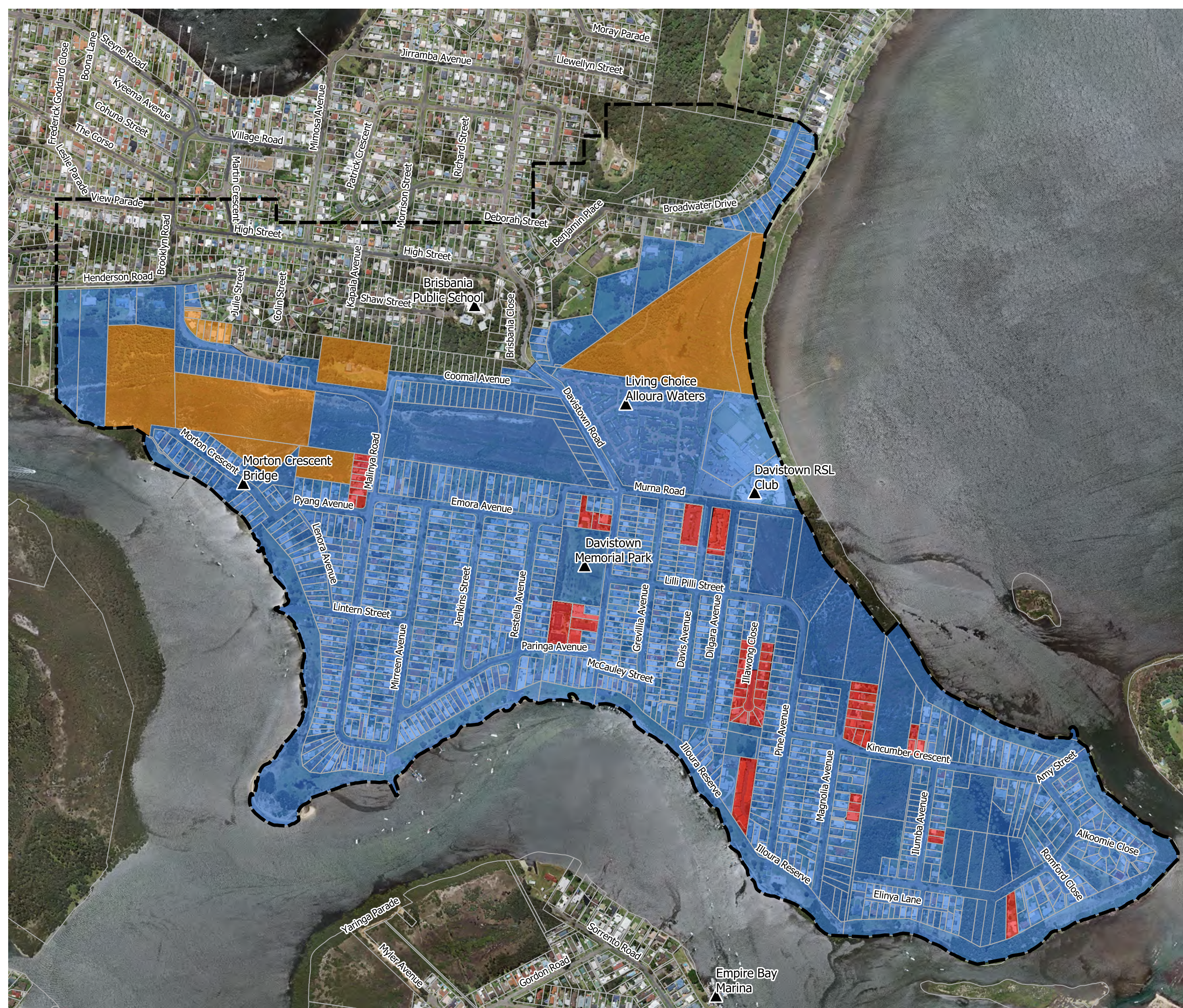
#### Legend

- Model Area
- Cadastre
- Classification**
- Not Flooded, Indirect Consequence
- Flooded Rising Road
- Flooded Overland Escape
- Flooded, Isolated, Elevated
- Flooded, Isolated, Submerged

0 100 200 300 m



Scale : 1:7500@A3  
Date : December 2019  
Revision : A  
Created by : JS  
Coordinate System : MGA 56





### Map G132

## Flood Emergency Response Classification

### Davistown

### PMF

#### Legend

Model Area

Cadastre

#### Classification

Not Flooded, Indirect Consequence

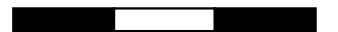
Flooded Rising Road

Flooded Overland Escape

Flooded, Isolated, Elevated

Flooded, Isolated, Submerged

0 100 200 300 m



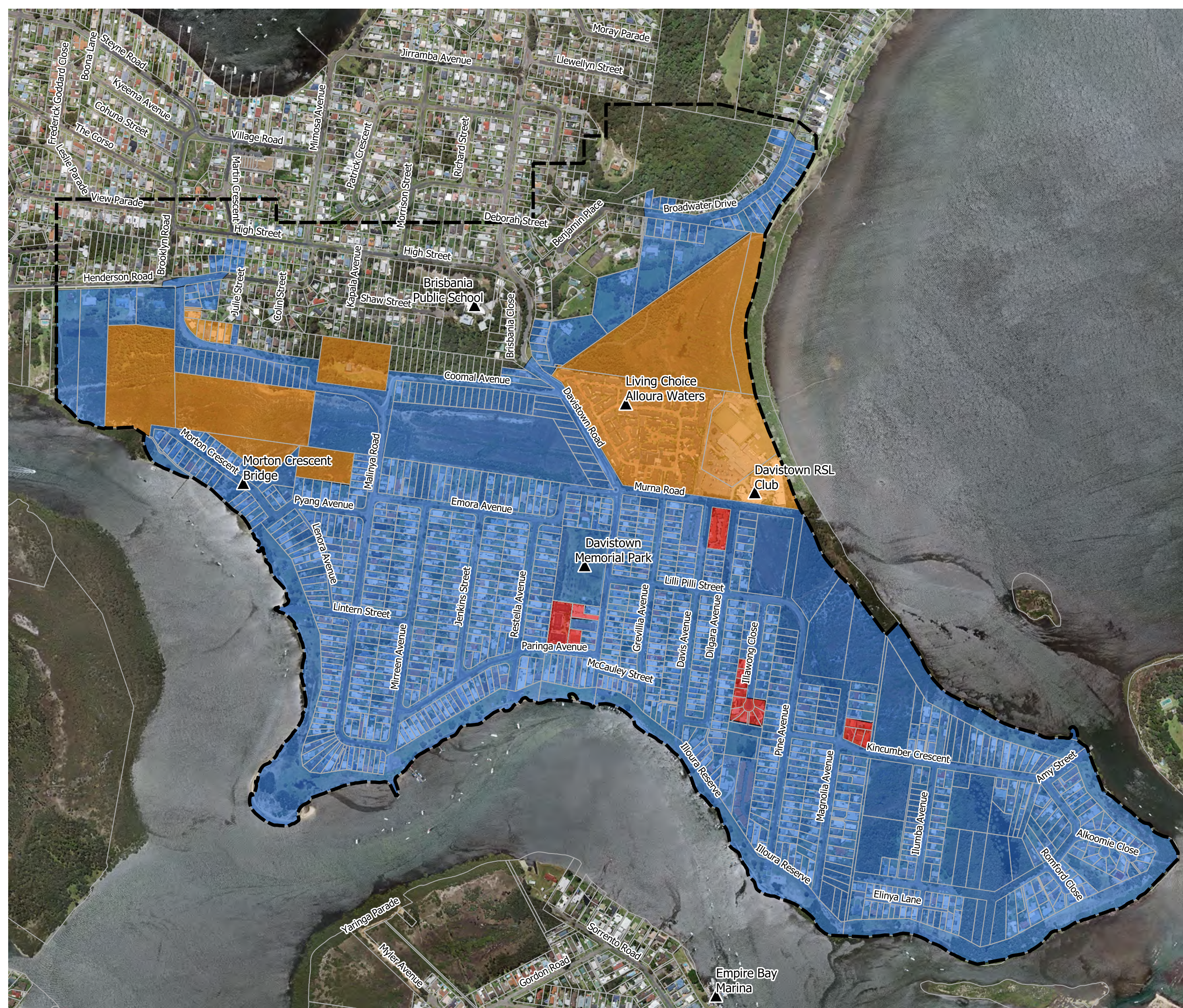
Scale : 1:7500@A3

Date : December 2019

Revision : A

Created by : JS

Coordinate System : MGA 56





### Map G134

## Flood Emergency Response Classification

### Empire Bay/Bensville

5% AEP

#### Legend

Model Area

Cadastre

#### Classification

Not Flooded, Indirect Consequence

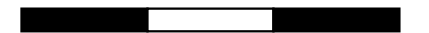
Flooded Rising Road

Flooded Overland Escape

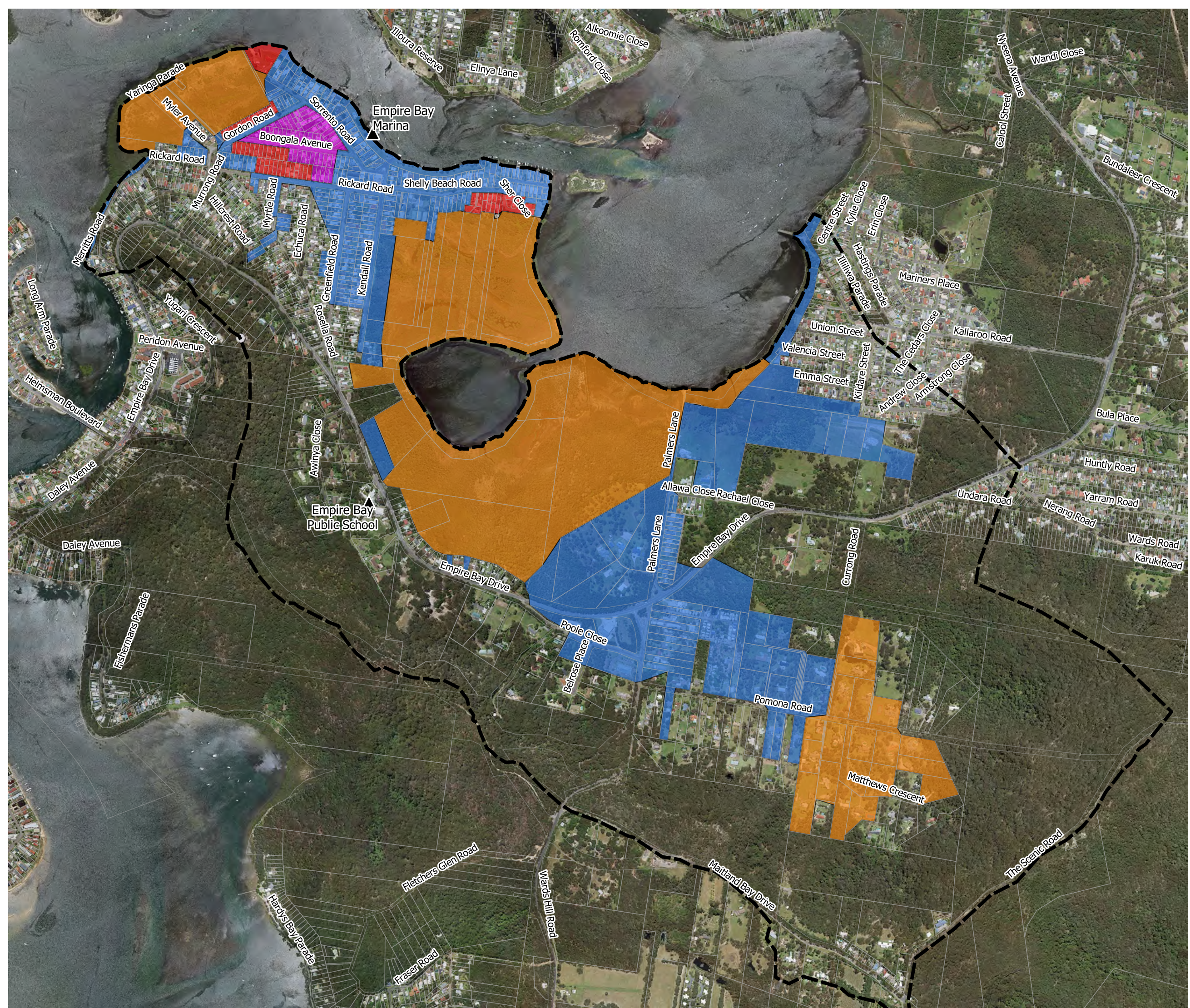
Flooded, Isolated, Elevated

Flooded, Isolated, Submerged

0 200 400 600 m



Scale : 1:12000@A3  
Date : December 2019  
Revision : A  
Created by : JS  
Coordinate System : MGA 56





### Map G134

## Flood Emergency Response Classification

### Empire Bay/Bensville

1% AEP

#### Legend

Model Area

Cadastre

#### Classification

Not Flooded, Indirect Consequence

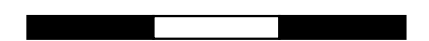
Flooded Rising Road

Flooded Overland Escape

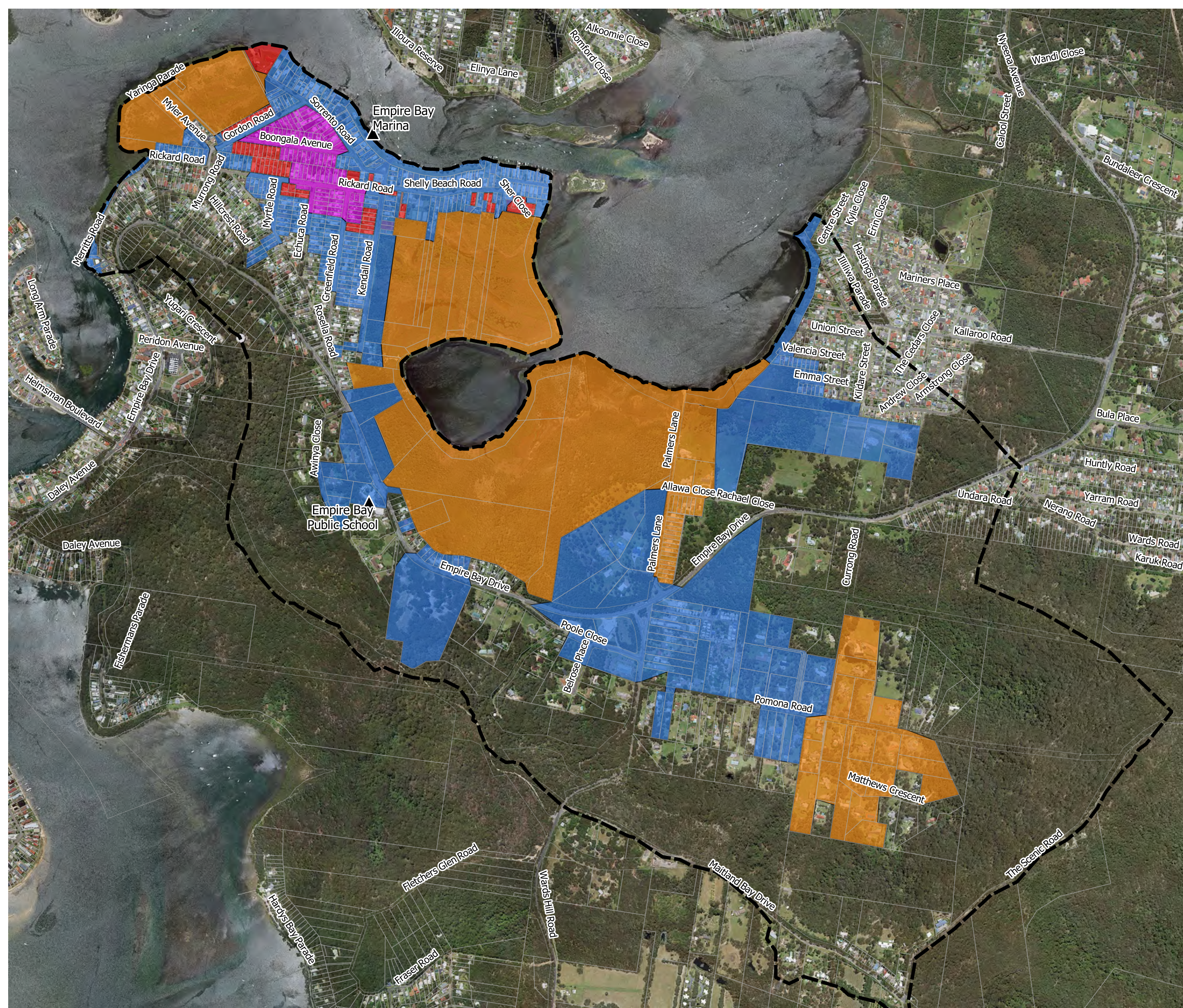
Flooded, Isolated, Elevated

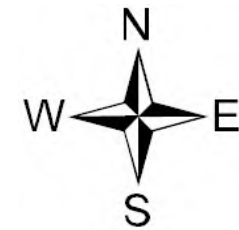
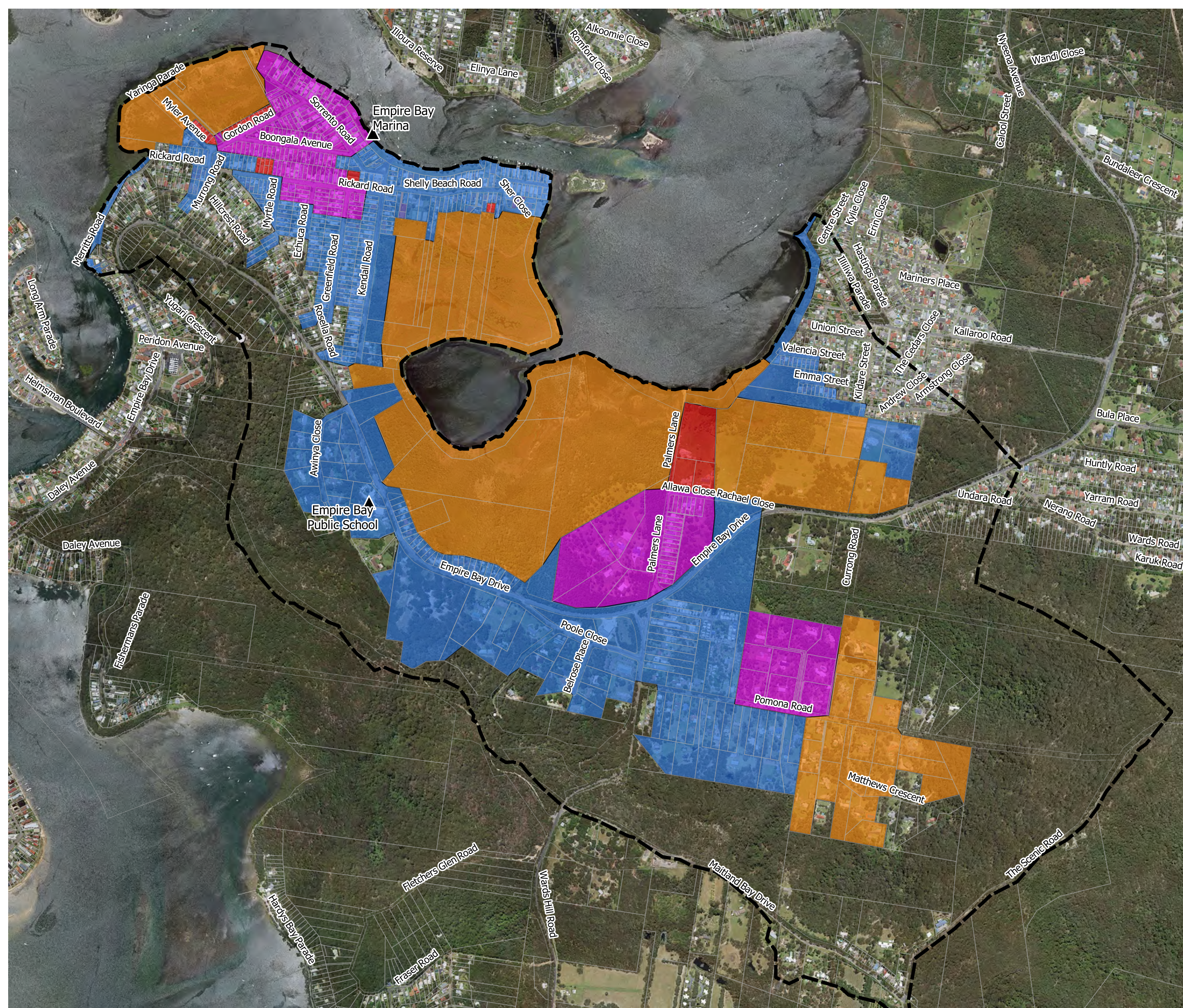
Flooded, Isolated, Submerged

0 200 400 600 m



Scale : 1:12000@A3  
Date : December 2019  
Revision : A  
Created by : JS  
Coordinate System : MGA 56












**Map G135**

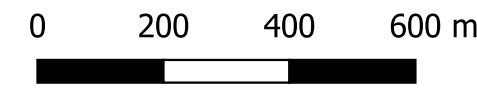
**Flood Emergency Response Classification**

**Empire Bay/Bensville**

**PMF**

**Legend**

-  Model Area
-  Cadastre
- Classification**
-  Not Flooded, Indirect Consequence
-  Flooded Rising Road
-  Flooded Overland Escape
-  Flooded, Isolated, Elevated
-  Flooded, Isolated, Submerged



Scale : 1:12000@A3  
 Date : December 2019  
 Revision : A  
 Created by : JS  
 Coordinate System : MGA 56







### Map G140

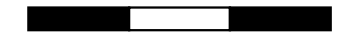
## Flood Planning Area (FPA)

### Davistown

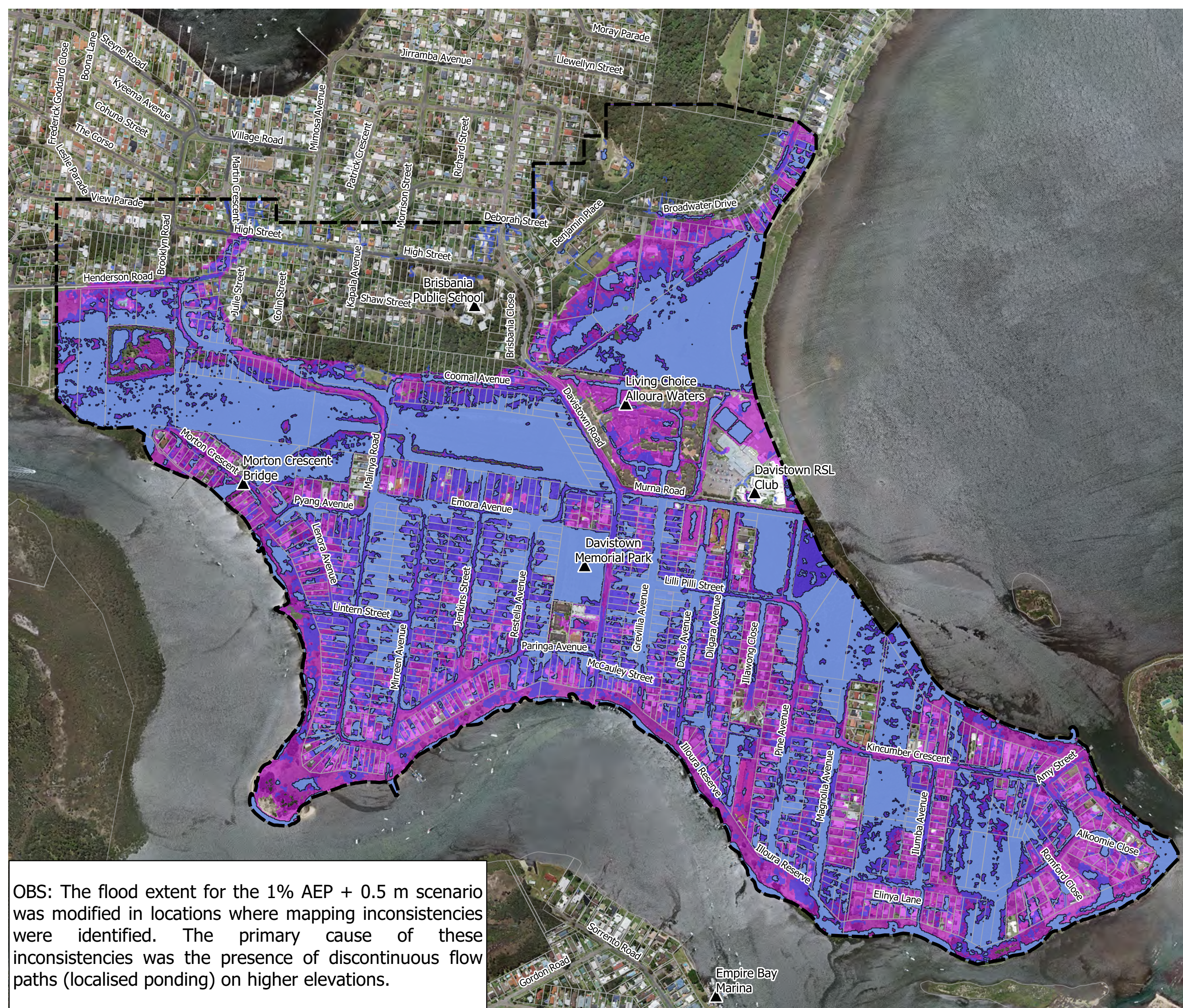
#### Legend

- Model Area
- Cadastre
- FPA - 1% AEP + 30% rainfall increase
- FPA - PMF
- FPA - 1% AEP + 0.5 m freeboard

0 100 200 300 m



Scale : 1:7500@A3  
Date : December 2019  
Revision : A  
Created by : JS  
Coordinate System : MGA 56



OBS: The flood extent for the 1% AEP + 0.5 m scenario was modified in locations where mapping inconsistencies were identified. The primary cause of these inconsistencies was the presence of discontinuous flow paths (localised ponding) on higher elevations.



### Map G141

## Flood Planning Area (FPA)

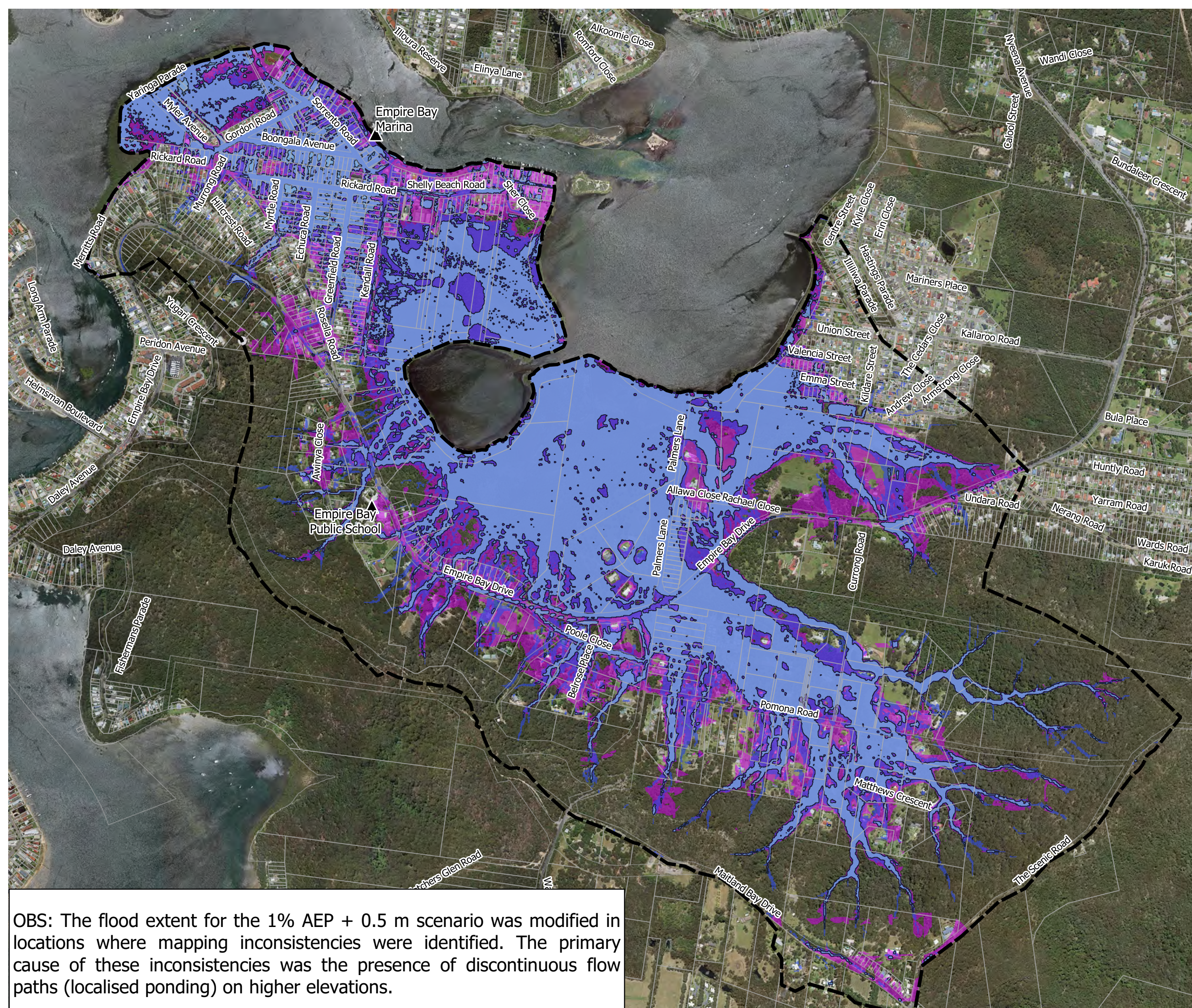
### Empire Bay/Bensville

#### Legend

- Model Area
- Cadastre
- FPA - 1% AEP + 30% rainfall increase
- FPA - PMF
- FPA - 1% AEP + 0.5 m freeboard



Scale : 1:12000@A3  
Date : December 2019  
Revision : A  
Created by : JS  
Coordinate System : MGA 56



OBS: The flood extent for the 1% AEP + 0.5 m scenario was modified in locations where mapping inconsistencies were identified. The primary cause of these inconsistencies was the presence of discontinuous flow paths (localised ponding) on higher elevations.

### Peak Overtopping Depths / Duration

ID	Location	20% AEP	1% AEP
DT-01	Malynia Road (North)	0.2m / 1hr	0.3m / 1.5hr
DT-03	Emora Avenue	0.2m / 2hr	0.3m / 4hr+
DT-02	Malynia Road (South)	0.1m / 1hr	0.2m / 3.5hr
DT-04	Kincumber Cresc	0.2m / 1.5hr	0.3m / 2.5hr



### Map G150

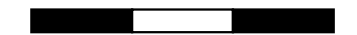
### Road Overtopping

### Davistown

### Legend

- Model Area
- Cadastre
- Infrastructure Locations
- 1% AEP Depth
  - 0.10 - 0.2
  - 0.2 - 0.3
  - 0.3 - 0.4
  - 0.4 - 0.5
  - 0.5 - 0.75
  - 0.75 - 1
  - 1 - 1.2
  - > 1.2

0 100 200 300 m



Scale : 1:7500@A3  
 Date : December 2019  
 Revision : A  
 Created by : JS  
 Coordinate System : MGA 56





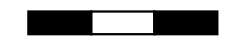
### Map G151

## Road Overtopping Empire Bay/Bensville

### Legend

- Model Area
- Cadastre
- Infrastructure Locations
- 1% AEP Depth
  - 0.10 - 0.2
  - 0.2 - 0.3
  - 0.3 - 0.4
  - 0.4 - 0.5
  - 0.5 - 0.75
  - 0.75 - 1
  - 1 - 1.2
  - > 1.2

0 100 200 300 m

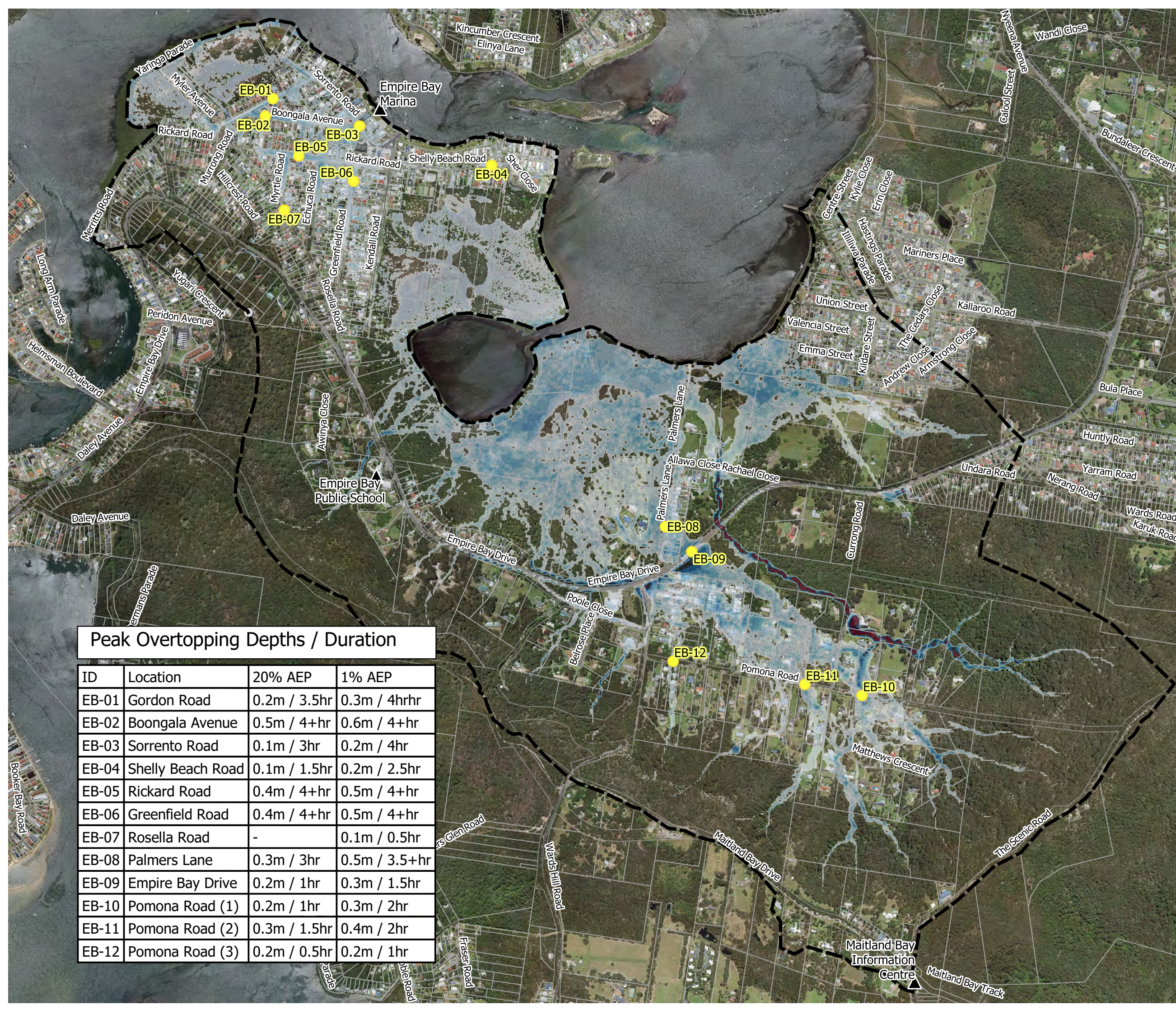


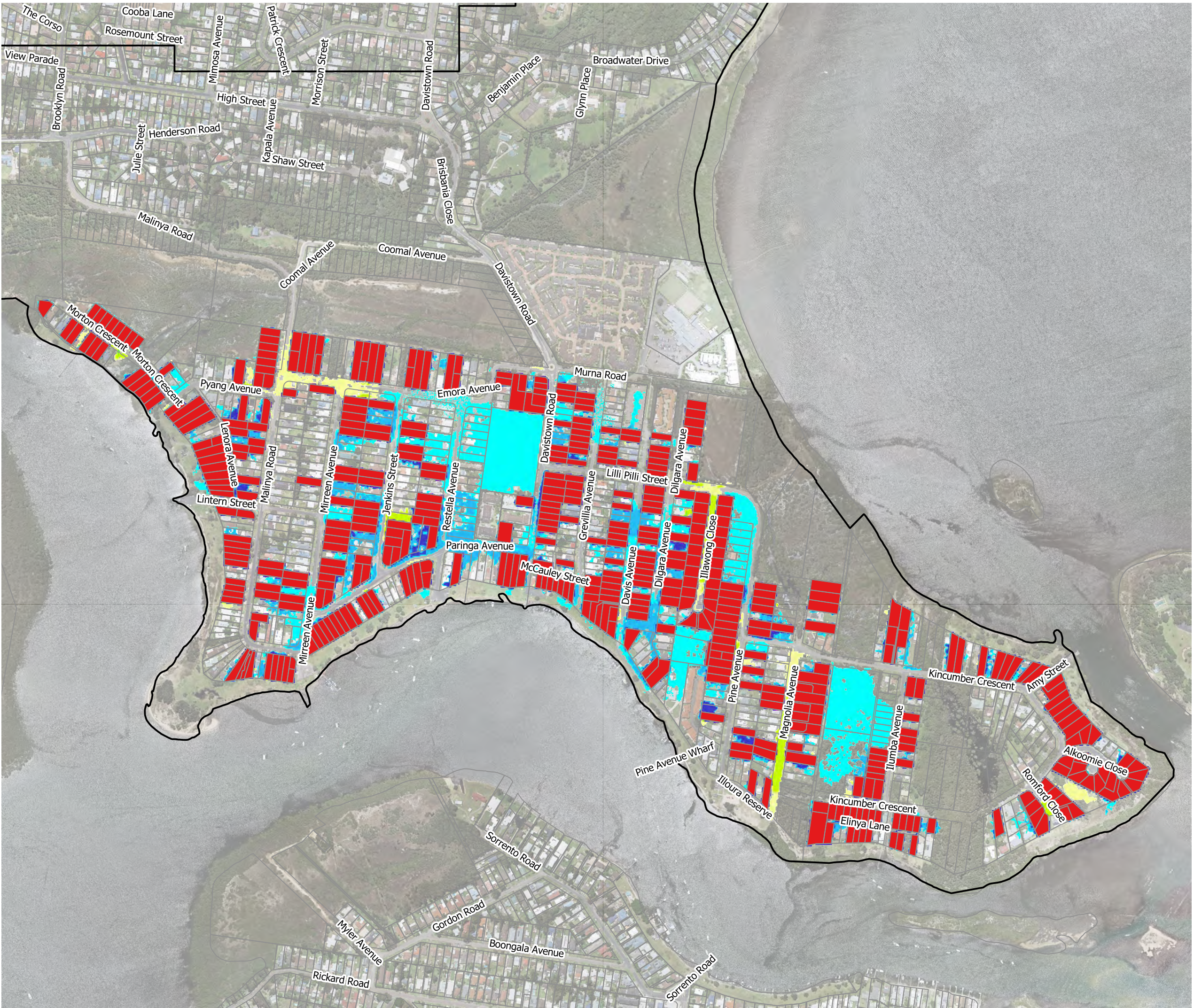
Scale : 1:12000@A3  
 Date : December 2019  
 Revision : A  
 Created by : JS  
 Coordinate System : MGA 56



### Peak Overtopping Depths / Duration

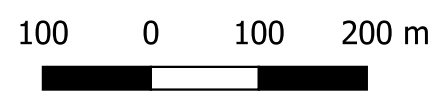
ID	Location	20% AEP	1% AEP
EB-01	Gordon Road	0.2m / 3.5hr	0.3m / 4hr
EB-02	Boongala Avenue	0.5m / 4+hr	0.6m / 4+hr
EB-03	Sorrento Road	0.1m / 3hr	0.2m / 4hr
EB-04	Shelly Beach Road	0.1m / 1.5hr	0.2m / 2.5hr
EB-05	Rickard Road	0.4m / 4+hr	0.5m / 4+hr
EB-06	Greenfield Road	0.4m / 4+hr	0.5m / 4+hr
EB-07	Rosella Road	-	0.1m / 0.5hr
EB-08	Palmers Lane	0.3m / 3hr	0.5m / 3.5+hr
EB-09	Empire Bay Drive	0.2m / 1hr	0.3m / 1.5hr
EB-10	Pomona Road (1)	0.2m / 1hr	0.3m / 2hr
EB-11	Pomona Road (2)	0.3m / 1.5hr	0.4m / 2hr
EB-12	Pomona Road (3)	0.2m / 0.5hr	0.2m / 1hr





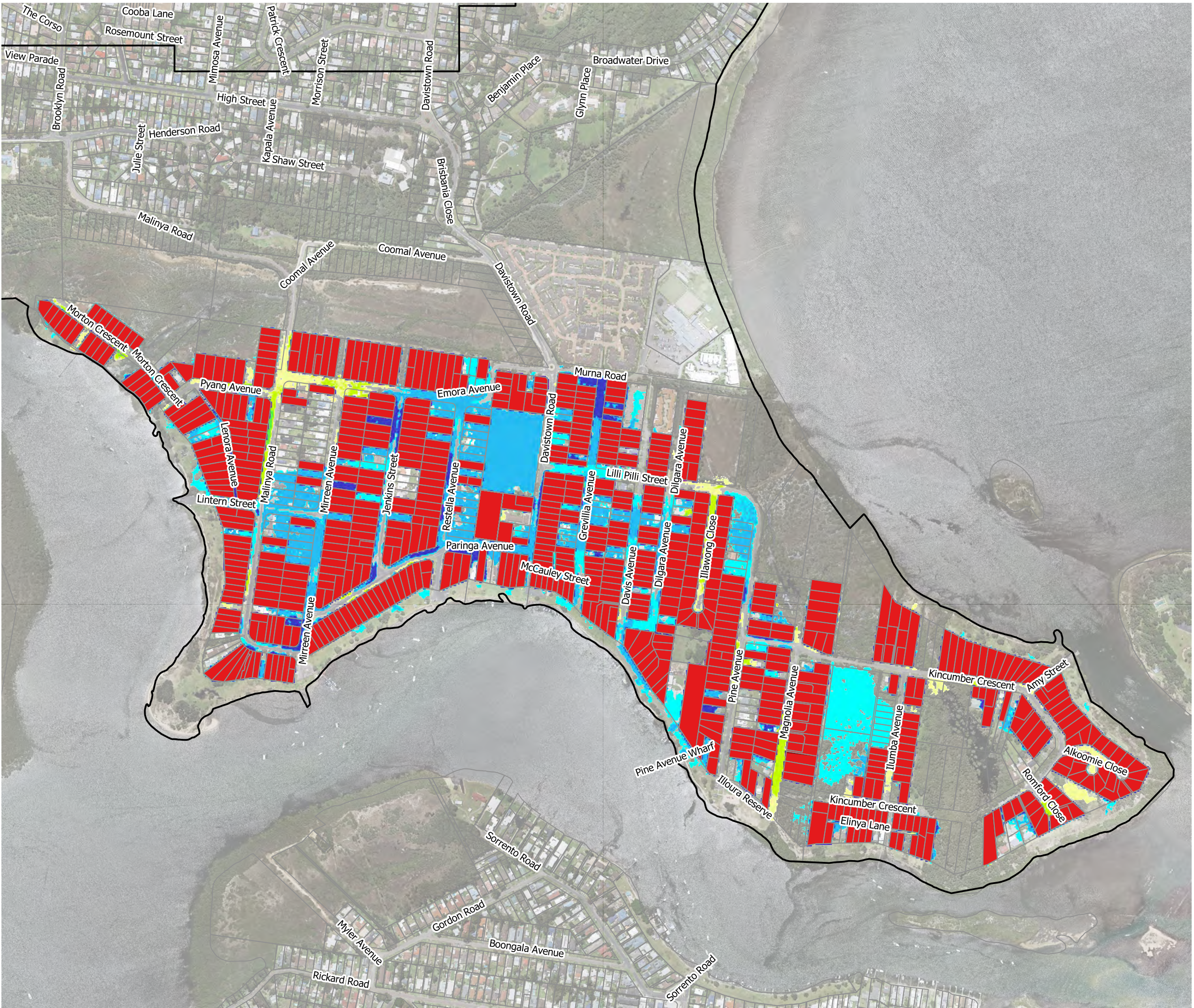
**Map G160**  
**Filling Impacts**  
**Davistown - 1% AEP**  
**Scenario 1**

- Legend**
- Cadastre
  - Study Area
  - Properties with Ground Raised
  - Impact on Existing Flood Levels (m)
  - <= -0.2
  - 0.2 - -0.05
  - 0.05 - -0.02
  - 0.02 - -0.01
  - 0.01 - 0.02
  - 0.02 - 0.05
  - 0.05 - 0.2
  - > 0.2



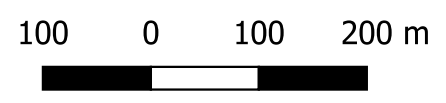
Scale : 1:7000@A3  
 Date : 28 May 2020  
 Revision : A  
 Created by : JRF  
 Coordinate System : Map Grid of Australia 94





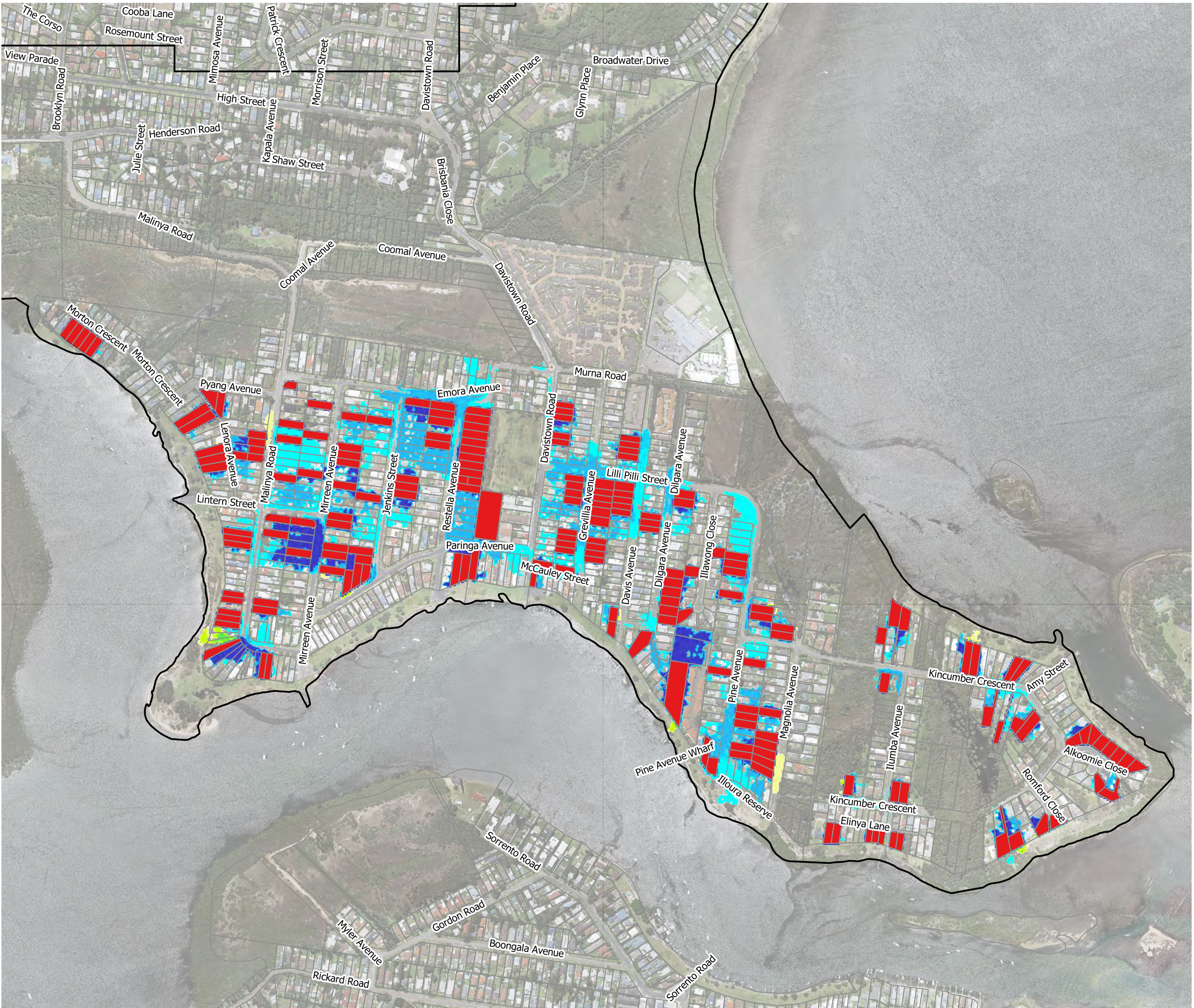
**Map G161**  
**Filling Impacts**  
**Davistown - 1% AEP**  
**Scenario 2**

- Legend**
- Cadastre
  - Study Area
  - Properties with Ground Raised
  - Impact on Existing Flood Levels (m)
  - <= -0.2
  - 0.2 - -0.05
  - 0.05 - -0.02
  - 0.02 - -0.01
  - 0.01 - 0.02
  - 0.02 - 0.05
  - 0.05 - 0.2
  - > 0.2



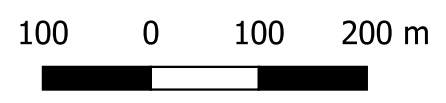
Scale : 1:7000@A3  
 Date : 28 May 2020  
 Revision : A  
 Created by : JRF  
 Coordinate System : Map Grid of Australia 94





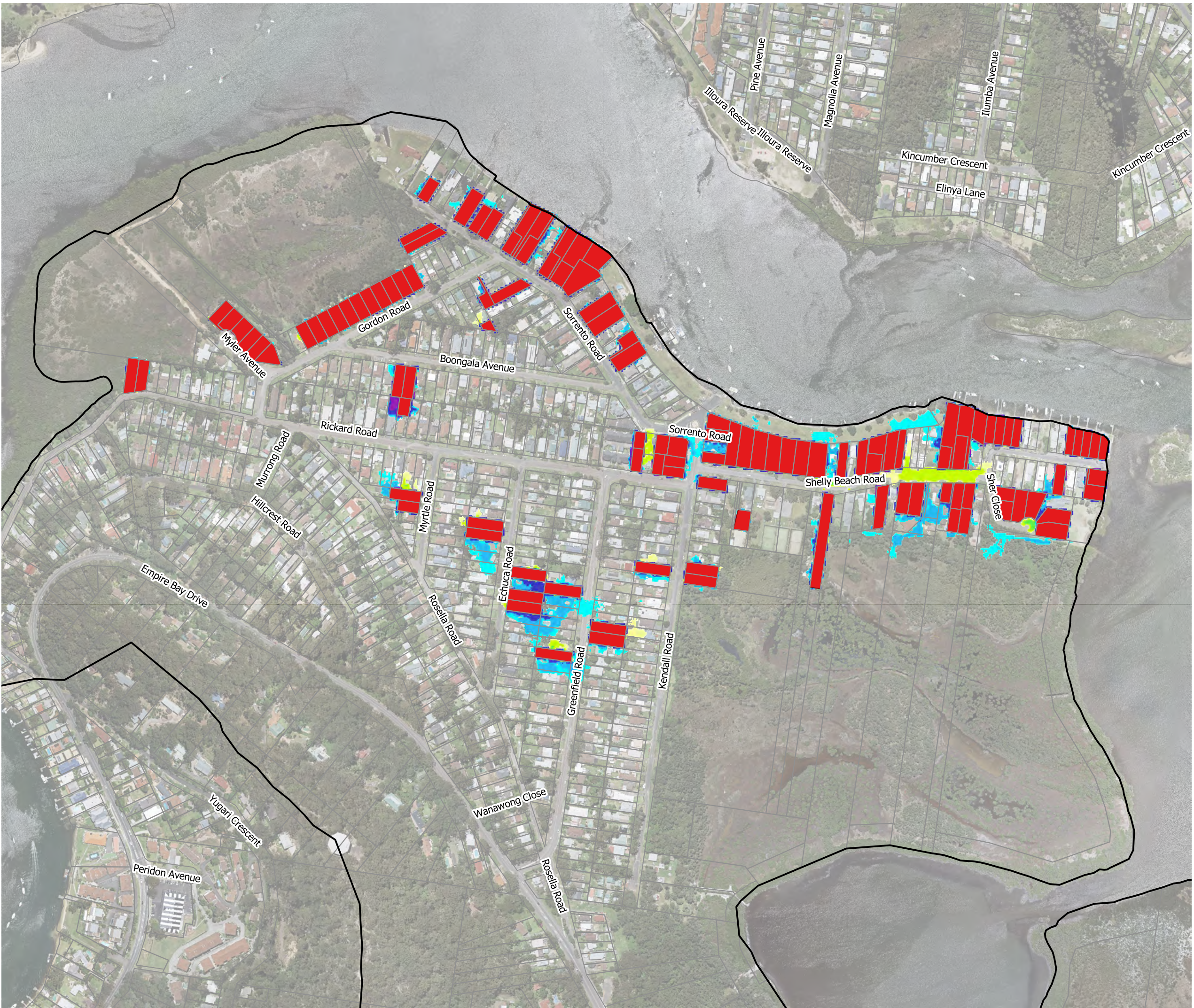
**Map G162**  
**Filling Impacts**  
**Davistown - 1% AEP**  
**Scenario 3**

- Legend**
- Cadastre
  - Study Area
  - Properties with Ground Raised
  - Impact on Existing Flood Levels (m)
  - <= -0.2
  - 0.2 - -0.05
  - 0.05 - -0.02
  - 0.02 - -0.01
  - 0.01 - 0.02
  - 0.02 - 0.05
  - 0.05 - 0.2
  - > 0.2



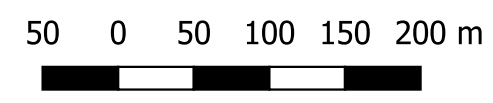
Scale : 1:7000@A3  
 Date : 28 May 2020  
 Revision : A  
 Created by : JRF  
 Coordinate System : Map Grid of Australia 94





**Map G163**  
**Filling Impacts**  
**Empire Bay - 1% AEP**  
**Scenario 1**

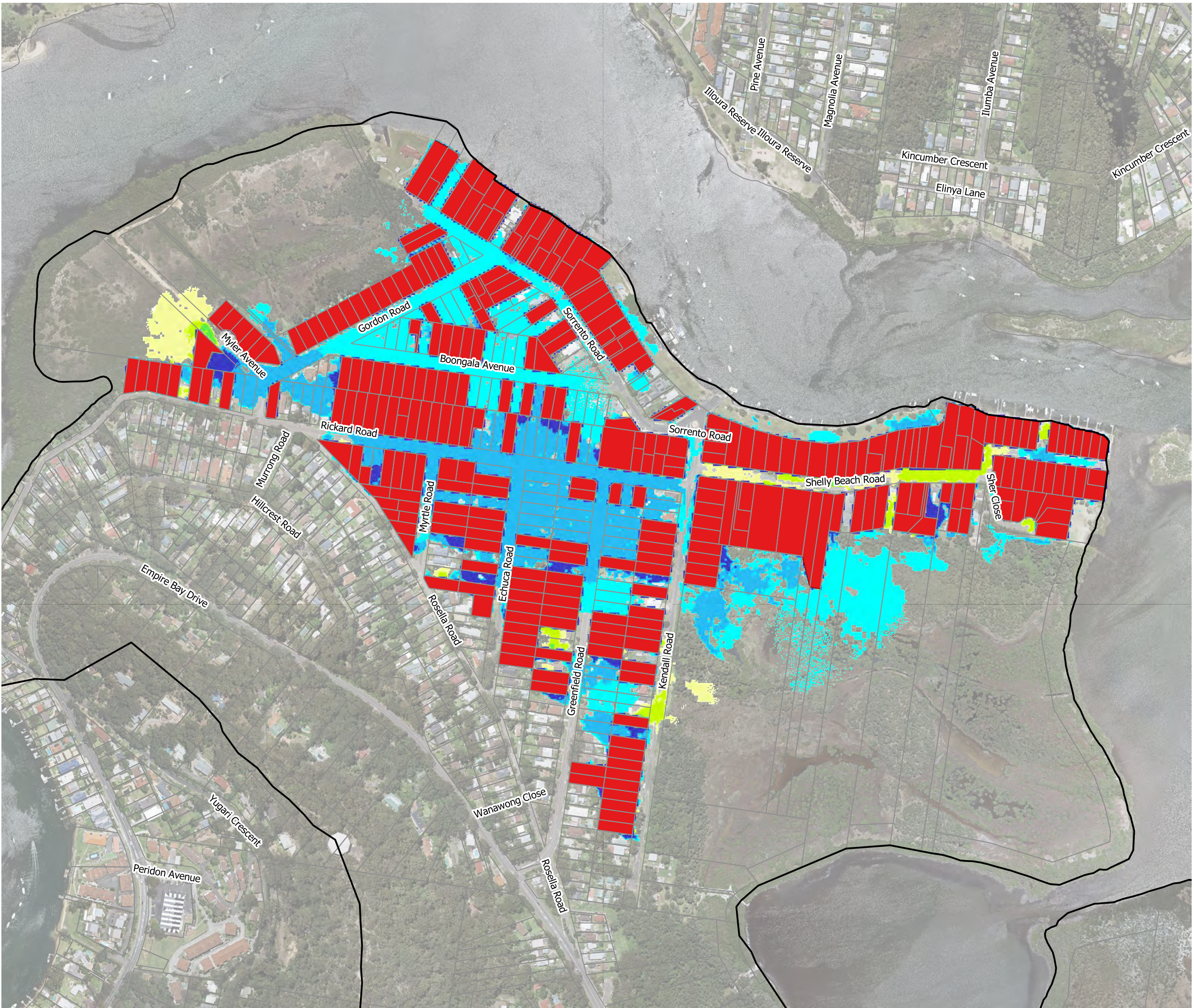
- Legend**
- DtownEBay-Cadastre-20180525
  - EmpireBay\_Boundary
  - Properties with Ground Raised
  - Impact on Existing Flood Levels
  - <= -0.2
  - 0.2 - -0.05
  - 0.05 - -0.02
  - 0.02 - -0.01
  - 0.01 - 0.02
  - 0.02 - 0.05
  - 0.05 - 0.2
  - > 0.2



Scale : 1:5000@A3  
 Date : 28 May 2020  
 Revision : A  
 Created by : JRF  
 Coordinate System : Map of Grid  
 Australia 94

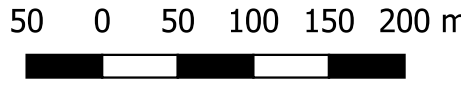






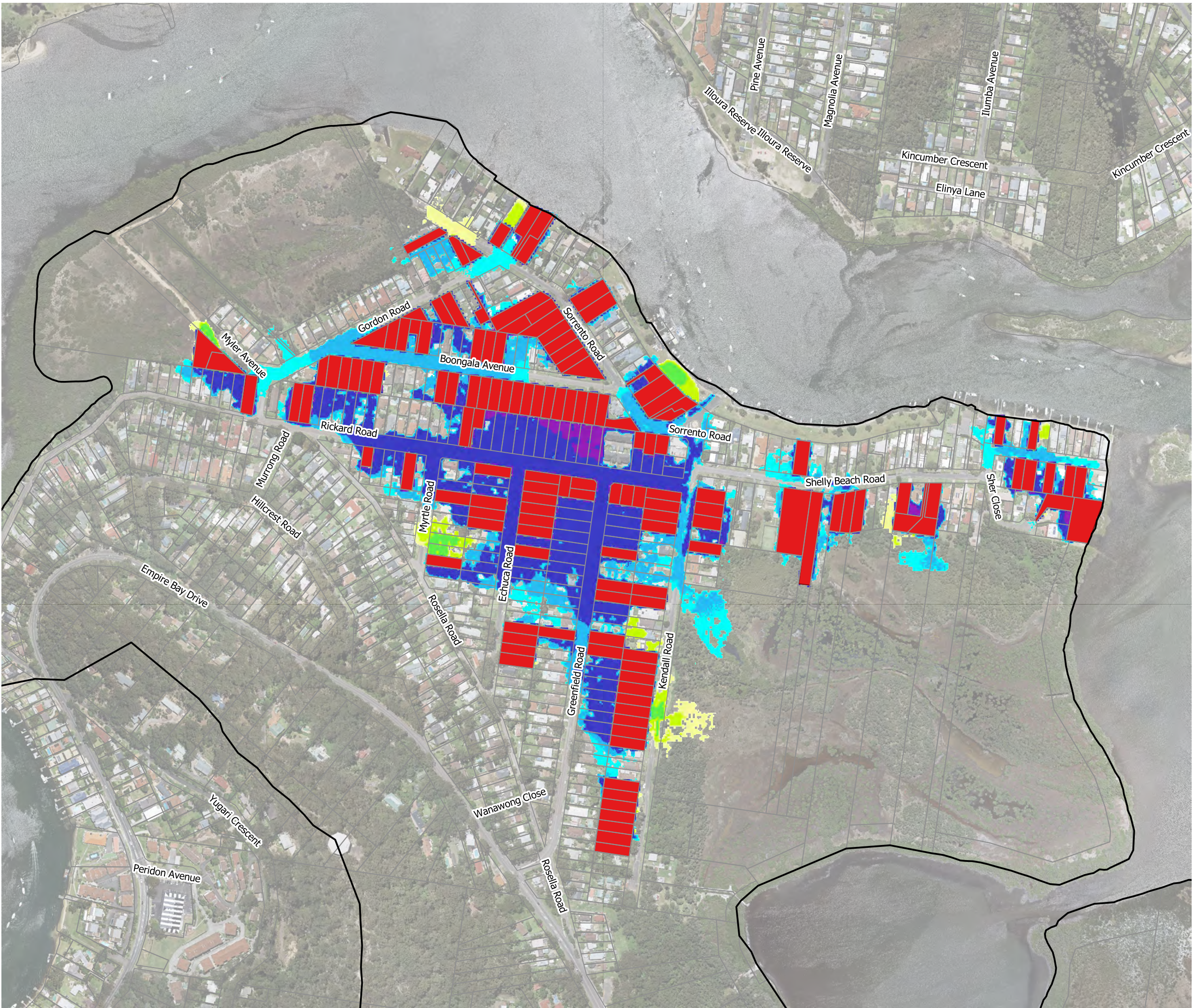
**Map G164**  
**Filling Impacts**  
**Empire Bay - 1% AEP**  
**Scenario 2**

- Legend**
- DtownEBay-Cadastre-20180525
  - EmpireBay\_Boundary
  - Properties with Ground Raised
  - Impact on Existing Flood Levels
    - $\le -0.2$
    - $-0.2 - -0.05$
    - $-0.05 - -0.02$
    - $-0.02 - -0.01$
    - $0.01 - 0.02$
    - $0.02 - 0.05$
    - $0.05 - 0.2$
    - $> 0.2$



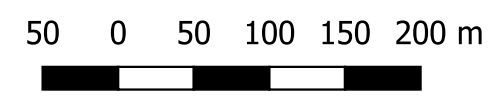
Scale : 1:5000@A3  
 Date : 28 May 2020  
 Revision : A  
 Created by : JRF  
 Coordinate System : Map of Grid  
 Australia 94





**Map G165**  
**Filling Impacts**  
**Empire Bay - 1% AEP**  
**Scenario 3**

- Legend**
- DtownEBay-Cadastre-20180525
  - EmpireBay\_Boundary
  - Properties with Ground Raised
  - Impact on Existing Flood Levels
    - <= -0.2
    - 0.2 - -0.05
    - 0.05 - -0.02
    - 0.02 - -0.01
    - 0.01 - 0.02
    - 0.02 - 0.05
    - 0.05 - 0.2
    - > 0.2



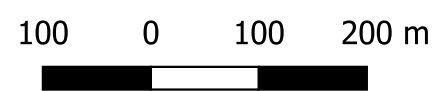
Scale : 1:5000@A3  
 Date : 28 May 2020  
 Revision : A  
 Created by : JRF  
 Coordinate System : Map of Grid  
 Australia 94





### Map G201 Preliminary Options Davistown

- Legend**
- Option DT1
  - Option DT2
  - Option DT3
  - Option DT4
  - Option DT5
  - Option DT6
  - Cadastre
  - Study Area











Scale : 1:7000@A3  
 Date : 02 June 2020  
 Revision : B  
 Created by : JS  
 Coordinate System : Map Grid of Australia 94

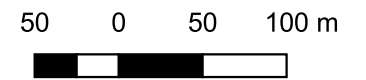
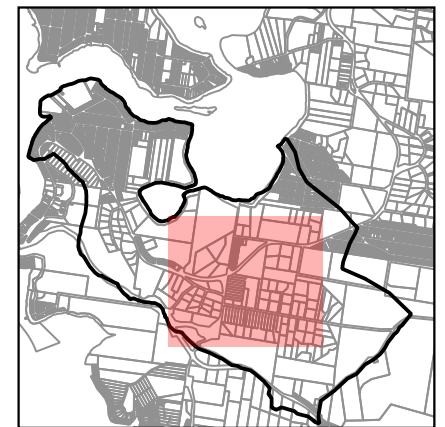




# Map G202 Preliminary Options Empire Bay 1

## Legend

-  Option EB1
-  Option EB2 & EB3
-  Option EB4
-  Option EB5
-  Option EB6
-  Option EB7
-  Cadastre
-  Study Area











Scale : 1:4500@A3  
Date : 30 November 2021  
Revision : C  
Created by : JS  
Coordinate System : MGA 56

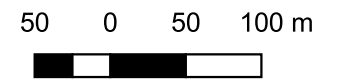
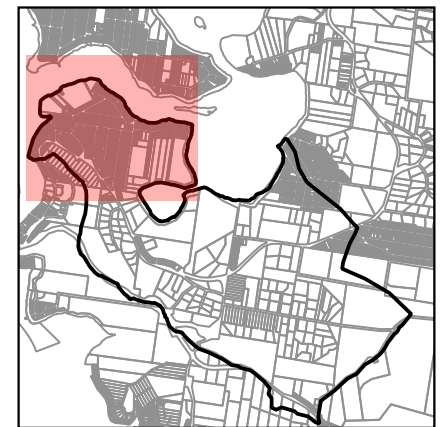




# Map G203 Preliminary Options Empire Bay 2

## Legend

-  Option EB1
-  Option EB2 & EB3
-  Option EB4
-  Option EB6
-  Option EB7
-  Option EB5
-  Cadastre
-  Study Area



Scale : 1:5000@A3  
Date : 29 November 2021  
Revision : C  
Created by : JS  
Coordinate System : MGA 56





# Map G210 Flood Modification Options

**FM DT1 Foreshore barrier around Davistown (excluding properties east of Magnolia Ave and the south of Morton Crescent)**

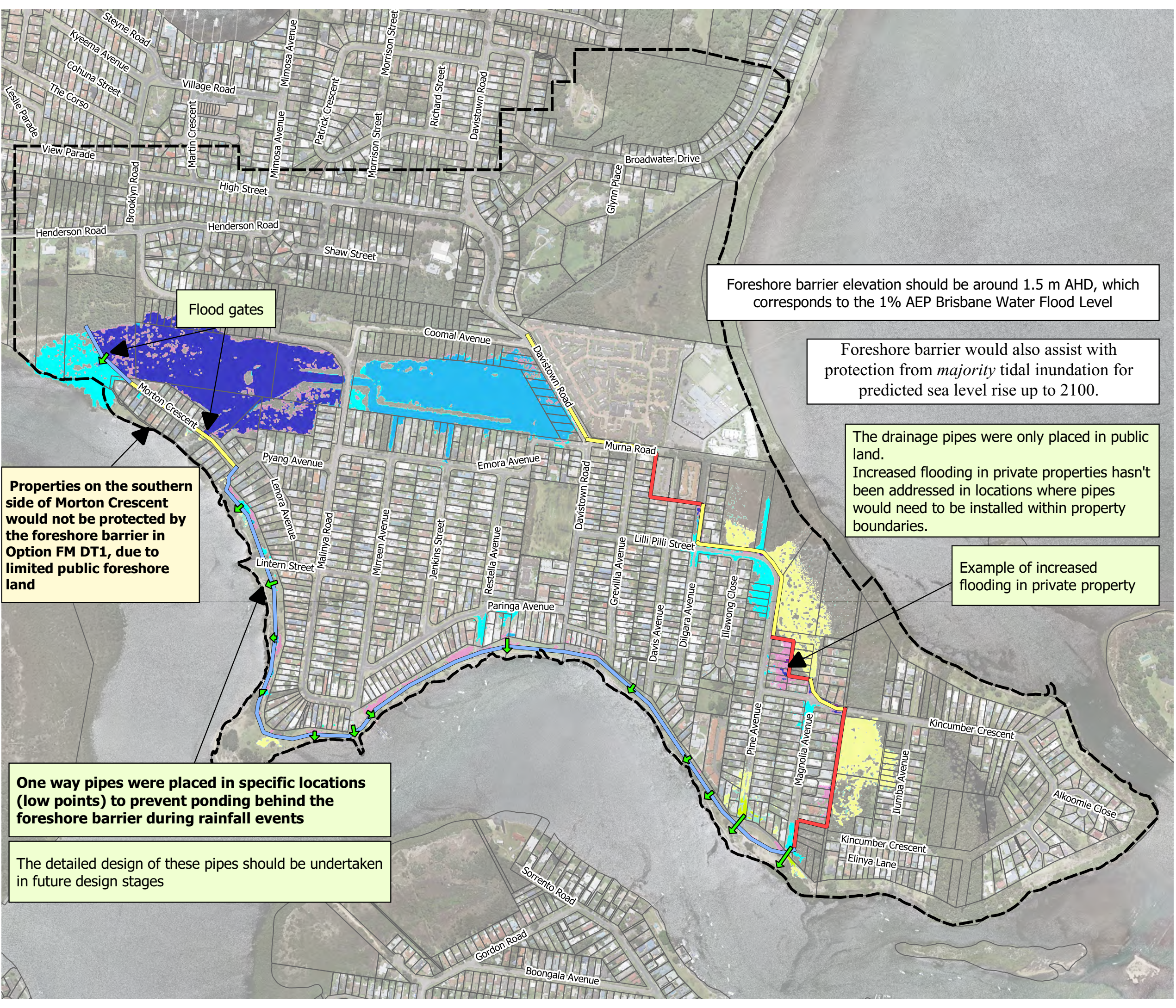
**1% AEP Depth Difference (Option FM DT1 less Existing)**

### Legend

- Cadastre
- Levee
  - Shared Path
  - Roadside Berm
  - Retaining Wall
  - One way pipes through foreshore barrier
- Wet/Dry
  - Was wet, now dry
  - Was dry, now wet
- 1% AEP - Depth Difference (m)
  - <= -0.2
  - 0.2 - -0.1
  - 0.1 - -0.05
  - 0.05 - -0.01
  - 0.01 - 0.05
  - 0.05 - 0.1
  - 0.1 - 0.2
  - > 0.2



Scale : 1:7500@A3  
Date : 02 June 2020  
Revision : B  
Created by : JS  
Coordinate System : Map of Grid Australia 94



Flood gates

Foreshore barrier elevation should be around 1.5 m AHD, which corresponds to the 1% AEP Brisbane Water Flood Level

Foreshore barrier would also assist with protection from majority tidal inundation for predicted sea level rise up to 2100.

The drainage pipes were only placed in public land. Increased flooding in private properties hasn't been addressed in locations where pipes would need to be installed within property boundaries.

Example of increased flooding in private property

Properties on the southern side of Morton Crescent would not be protected by the foreshore barrier in Option FM DT1, due to limited public foreshore land

One way pipes were placed in specific locations (low points) to prevent ponding behind the foreshore barrier during rainfall events

The detailed design of these pipes should be undertaken in future design stages



# Map G211 Flood Modification Options

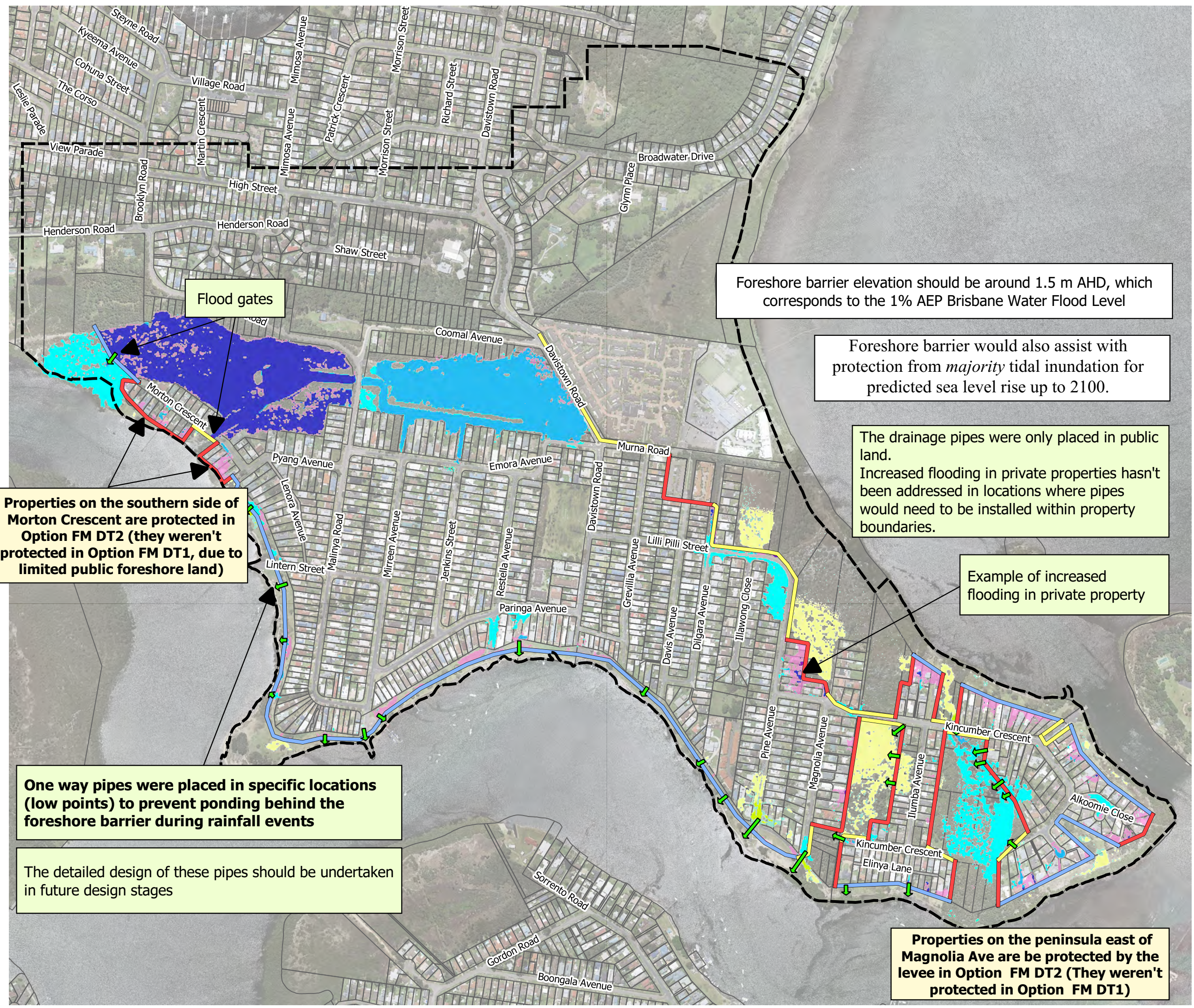
## Option FM DT2 Foreshore barrier around Davistown (including all properties)

### 1% AEP Depth Difference (Option FM DT2 less Existing)

#### Legend

- Cadastre
  - One way pipes through foreshore barrier
  - Wet/Dry**
  - Was wet, now dry
  - Was dry, now wet
  - Levee**
  - Shared Path
  - Roadside Bund
  - Retaining Wall
  - 1% AEP - Depth Difference (m)**
  - <= -0.2
  - 0.2 - -0.1
  - 0.1 - -0.05
  - 0.05 - -0.01
  - 0.01 - 0.05
  - 0.05 - 0.1
  - 0.1 - 0.2
  - > 0.2
- 0 100 200 300 m

Scale : 1:7500@A3  
 Date : 02 June 2020  
 Revision : B  
 Created by : JS  
 Coordinate System : Map of Grid  
 Australia 94



Flood gates

Foreshore barrier elevation should be around 1.5 m AHD, which corresponds to the 1% AEP Brisbane Water Flood Level

Foreshore barrier would also assist with protection from majority tidal inundation for predicted sea level rise up to 2100.

The drainage pipes were only placed in public land. Increased flooding in private properties hasn't been addressed in locations where pipes would need to be installed within property boundaries.

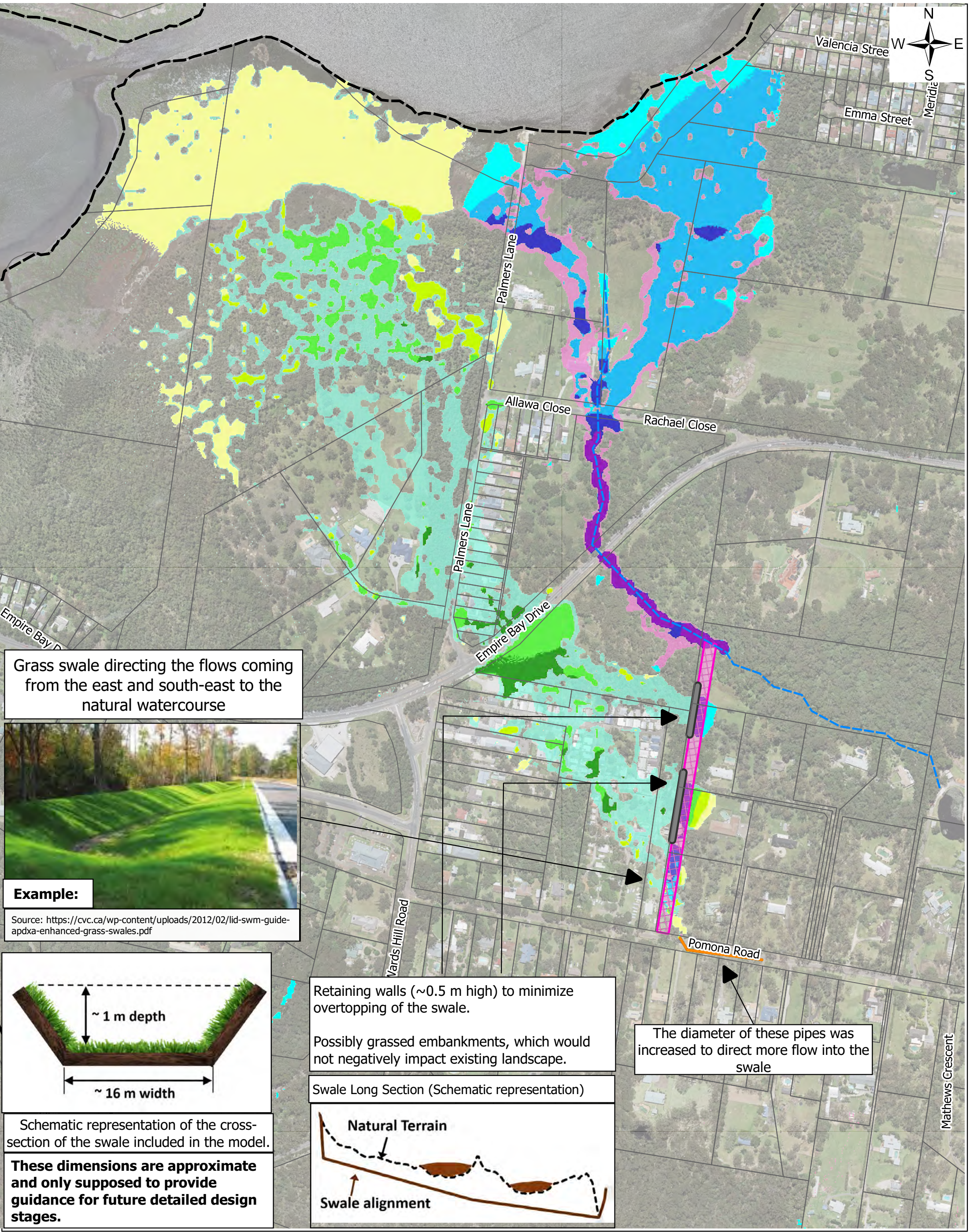
Example of increased flooding in private property

Properties on the southern side of Morton Crescent are protected in Option FM DT2 (they weren't protected in Option FM DT1, due to limited public foreshore land)

One way pipes were placed in specific locations (low points) to prevent ponding behind the foreshore barrier during rainfall events

The detailed design of these pipes should be undertaken in future design stages

Properties on the peninsula east of Magnolia Ave are protected by the levee in Option FM DT2 (They weren't protected in Option FM DT1)



Scale : 1:4500@A3  
 Date : 02 June 2020  
 Revision : A  
 Created by : JS  
 Coordinate System : Map Grid of Australia 94



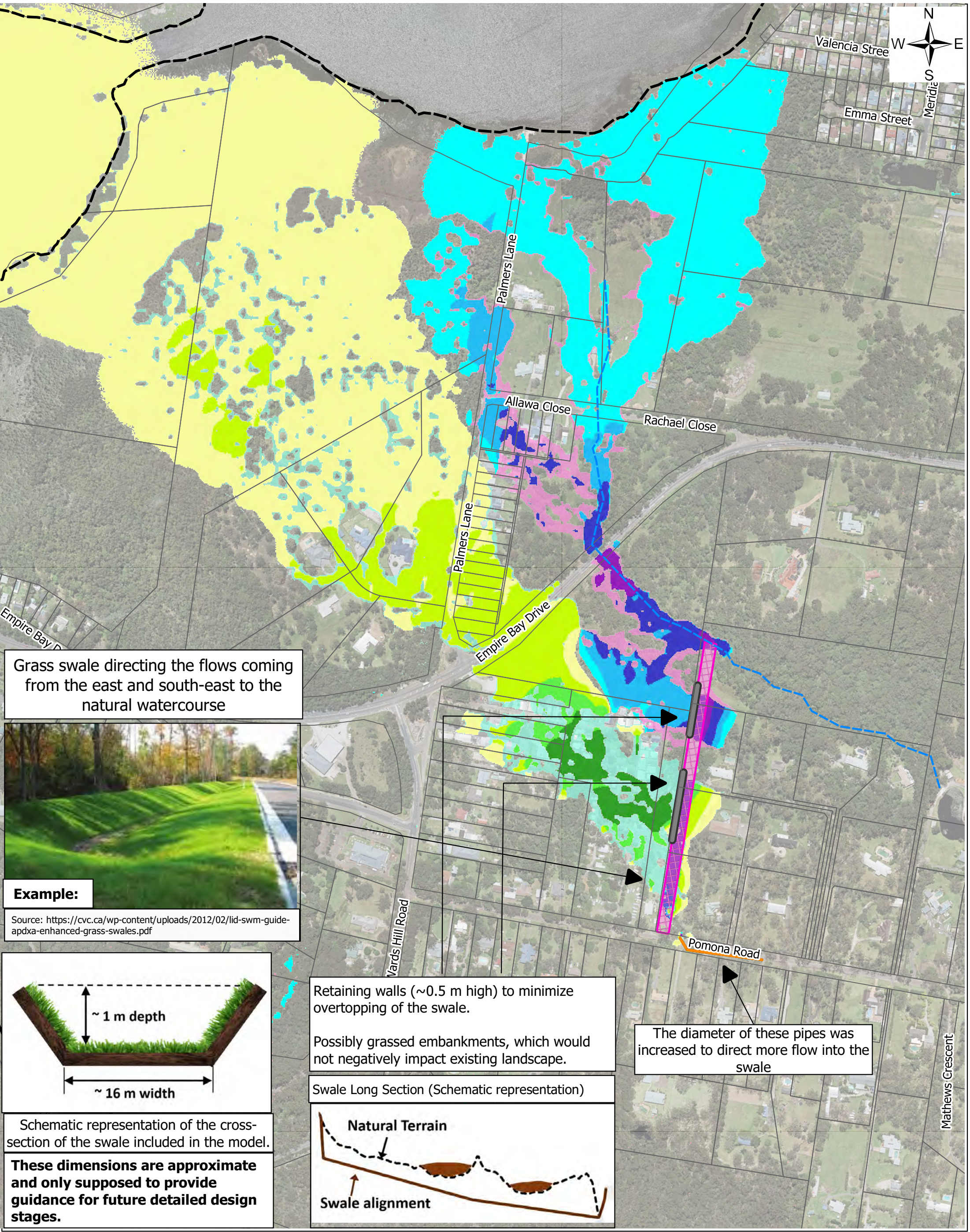
- Legend**
- White outline: Cadastre
  - Grey line: Retaining Wall
  - Pink line: Swale
  - Blue dashed line: Natural Watercourse
  - Orange line: Drainage Pipes with Increased Diameter

- Wet/Dry**
- Light Blue: Was wet, now dry
  - Pink: Was dry, now wet
- Depth Difference (m)**
- Light Green: <= -0.2
  - Yellow: -0.2 - -0.1

- Light Green: -0.1 - -0.05
- Yellow: -0.05 - -0.01
- Cyan: 0.01 - 0.05
- Blue: 0.05 - 0.1
- Dark Blue: 0.1 - 0.2
- Purple: > 0.2

**Map G212**  
**Flood Modification Options**  
**FM EB6 Pomona Road easement**  
**and drainage upgrades**  
**20% AEP**  
**Depth Difference (Option FM**  
**EB6 less Existing)**



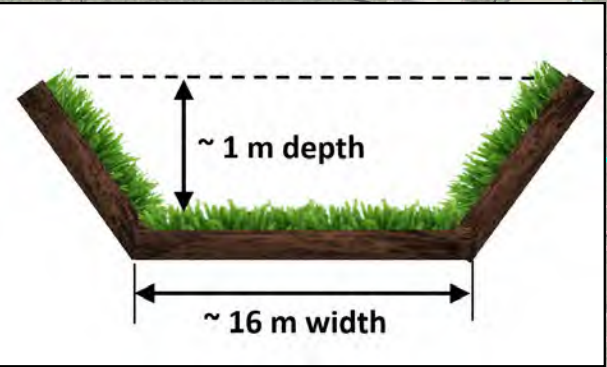


Grass swale directing the flows coming from the east and south-east to the natural watercourse



**Example:**

Source: <https://cvc.ca/wp-content/uploads/2012/02/lid-swm-guide-apdxa-enhanced-grass-swales.pdf>



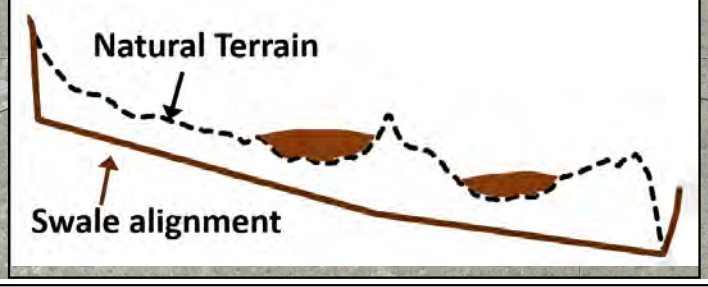
Schematic representation of the cross-section of the swale included in the model.

**These dimensions are approximate and only supposed to provide guidance for future detailed design stages.**

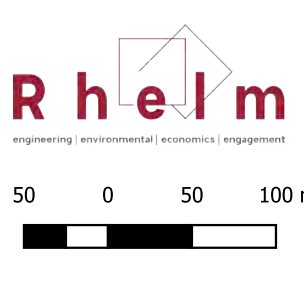
Retaining walls (~0.5 m high) to minimize overtopping of the swale.

Possibly grassed embankments, which would not negatively impact existing landscape.

Swale Long Section (Schematic representation)



The diameter of these pipes was increased to direct more flow into the swale



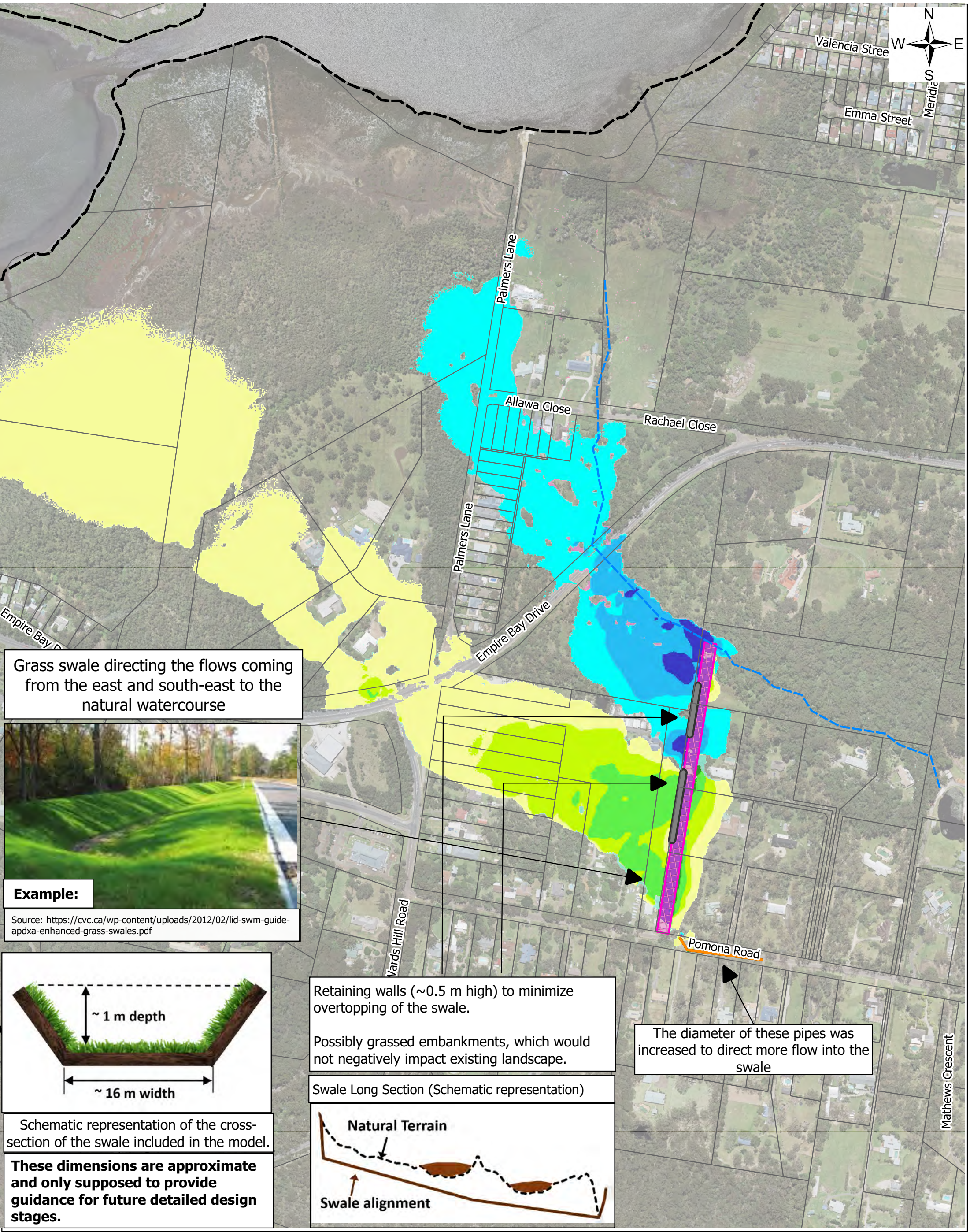
Scale : 1:4500@A3  
Date : 02 June 2020  
Revision : A  
Created by : JS  
Coordinate System : Map Grid of Australia 94



- Legend**
- ▭ Cadastre
  - ▬ Retaining Wall
  - ▭ Swale
  - ▬ Natural Watercourse
  - ▬ Drainage Pipes with Increased Diameter

- Wet/Dry**
- ▭ Was wet, now dry
  - ▭ Was dry, now wet
- Depth Difference (m)**
- ▭ <= -0.2
  - ▭ -0.2 - -0.1
  - ▭ -0.1 - -0.05
  - ▭ -0.05 - -0.01
  - ▭ 0.01 - 0.05
  - ▭ 0.05 - 0.1
  - ▭ 0.1 - 0.2
  - ▭ > 0.2

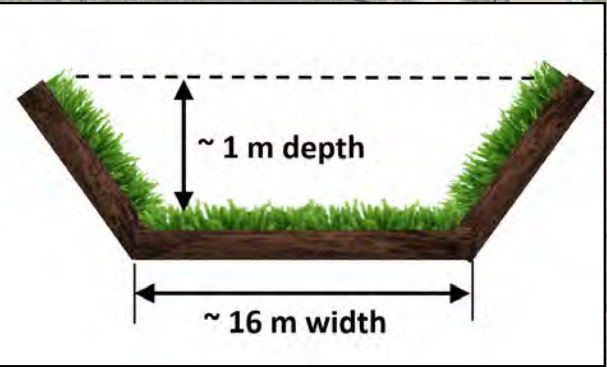
**Map G213**  
**Flood Modification Options**  
**FM EB6 Pomona Road easement**  
**and drainage upgrades**  
**1% AEP**  
**Depth Difference (Option FM**  
**EB6 less Existing)**



Grass swale directing the flows coming from the east and south-east to the natural watercourse



**Example:**  
Source: <https://cvc.ca/wp-content/uploads/2012/02/lid-swm-guide-apdxa-enhanced-grass-swales.pdf>



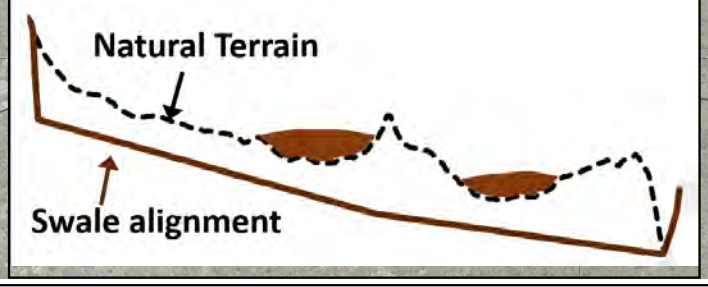
Schematic representation of the cross-section of the swale included in the model.

**These dimensions are approximate and only supposed to provide guidance for future detailed design stages.**

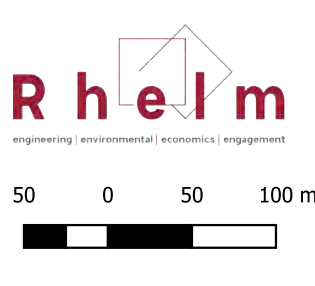
Retaining walls (~0.5 m high) to minimize overtopping of the swale.

Possibly grassed embankments, which would not negatively impact existing landscape.

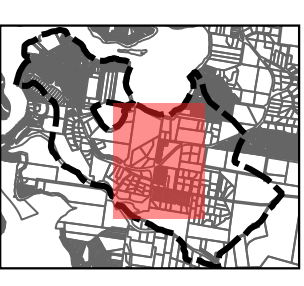
Swale Long Section (Schematic representation)



The diameter of these pipes was increased to direct more flow into the swale



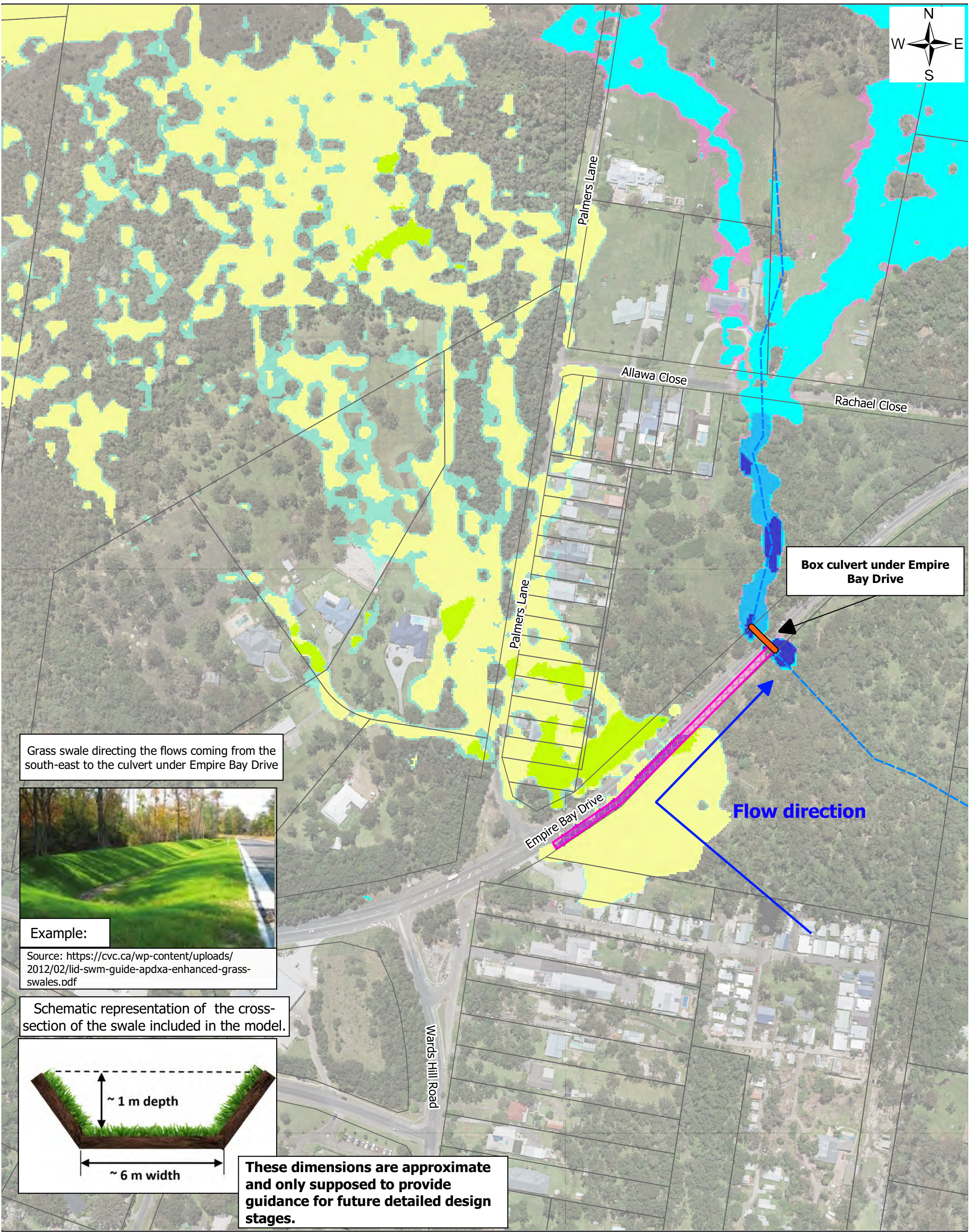
Scale : 1:4500@A3  
Date : 02 June 2020  
Revision : A  
Created by : JS  
Coordinate System : Map Grid of Australia 94



- Legend**
- Cadastre
  - Retaining Wall
  - Swale
  - Natural Watercourse
  - Drainage Pipes with Increased Diameter

- Wet/Dry**
- Was wet, now dry
  - Was dry, now wet
- Depth Difference (m)**
- <= -0.2
  - 0.2 - -0.1
  - 0.1 - -0.05
  - 0.05 - -0.01
  - 0.01 - 0.05
  - 0.05 - 0.1
  - 0.1 - 0.2
  - > 0.2

**Map G214**  
**Flood Modification Options**  
**FM EB6 Pomona Road easement**  
**and drainage upgrades**  
**PMF**  
**Depth Difference (Option FM**  
**EB6 less Existing)**

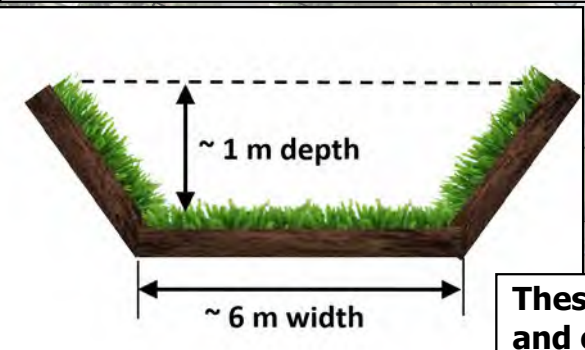


Grass swale directing the flows coming from the south-east to the culvert under Empire Bay Drive

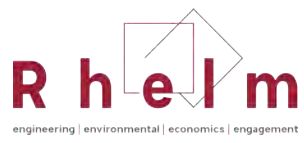


Example:  
Source: <https://cvc.ca/wp-content/uploads/2012/02/lid-swm-guide-apdxa-enhanced-grass-swales.pdf>

Schematic representation of the cross-section of the swale included in the model.



**These dimensions are approximate and only supposed to provide guidance for future detailed design stages.**



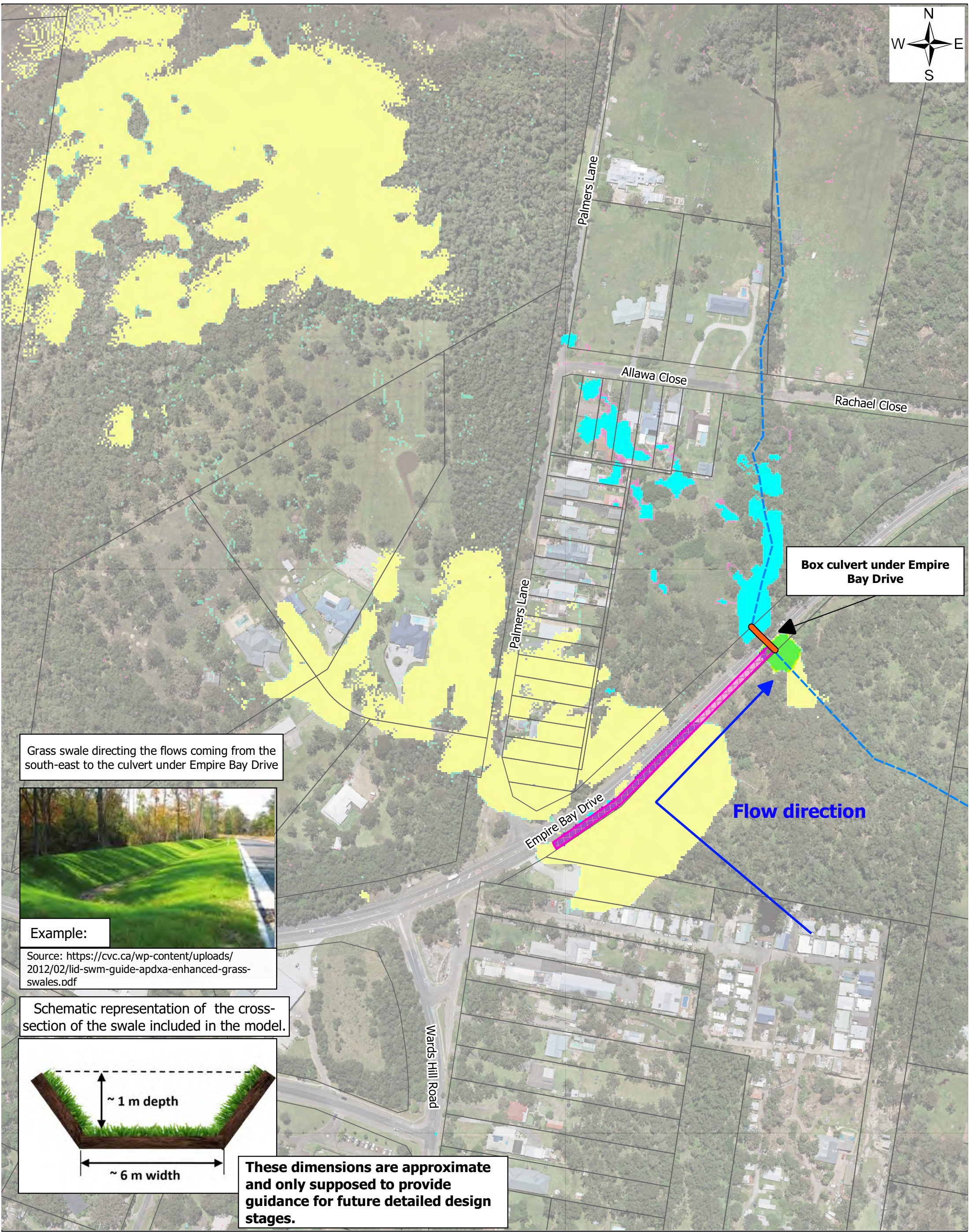
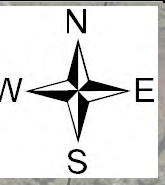
Scale : 1:2500@A3  
Date :02 June 2020  
Revision : A  
Created by : JS  
Coordinate System : Map Grid of Australia 94



Legend		
Cadastre	Swale	-0.05 - -0.01
Natural Watercourse	Wet/Dry	0.01 - 0.05
Was wet, now dry	<= -0.2	0.05 - 0.1
Was dry, now wet	-0.2 - -0.1	0.1 - 0.2
-0.1 - -0.05	> 0.2	> 0.2

**Map G215**  
**Flood Modification Options**  
**FM EB7 Empire Bay Drive**  
**Easement and drainage**  
**upgrades**  
**20% AEP**  
**Depth Difference ( Option FM**  
**EB7 less Existing)**



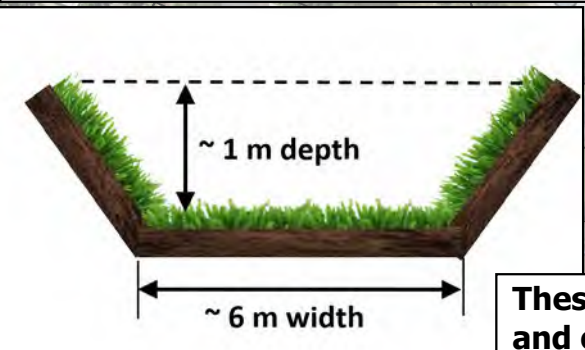


Grass swale directing the flows coming from the south-east to the culvert under Empire Bay Drive



Example:  
Source: <https://cvc.ca/wp-content/uploads/2012/02/lid-swm-guide-apdxa-enhanced-grass-swales.pdf>

Schematic representation of the cross-section of the swale included in the model.



**These dimensions are approximate and only supposed to provide guidance for future detailed design stages.**

**Box culvert under Empire Bay Drive**

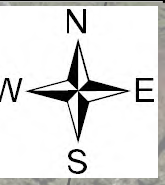
**Flow direction**

Scale : 1:2500@A3  
Date :02 June 2020  
Revision : A  
Created by : JS  
Coordinate System : Map Grid of Australia 94



Legend	
Cadastre	Was dry, now wet
Swale	-0.05 - -0.01
Natural Watercourse	0.01 - 0.05
Wet/Dry	0.05 - 0.1
Was wet, now dry	0.1 - 0.2
	> 0.2
	<= -0.2
	-0.2 - -0.1
	-0.1 - -0.05

**Map G216**  
**Flood Modification Options**  
**FM EB7 Empire Bay Drive**  
**Easement and drainage**  
**upgrades**  
**1% AEP**  
**Depth Difference ( Option FM**  
**EB7 less Existing)**

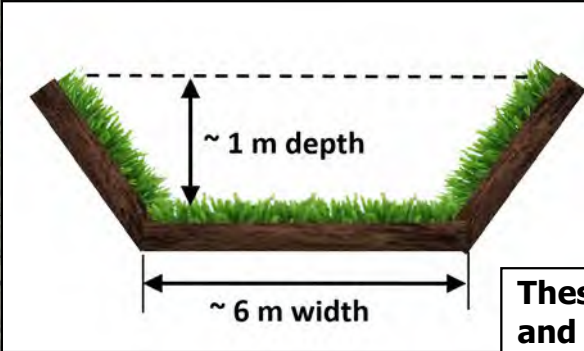


Grass swale directing the flows coming from the south-east to the culvert under Empire Bay Drive

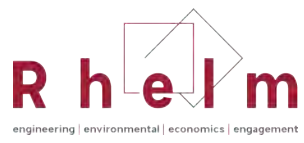
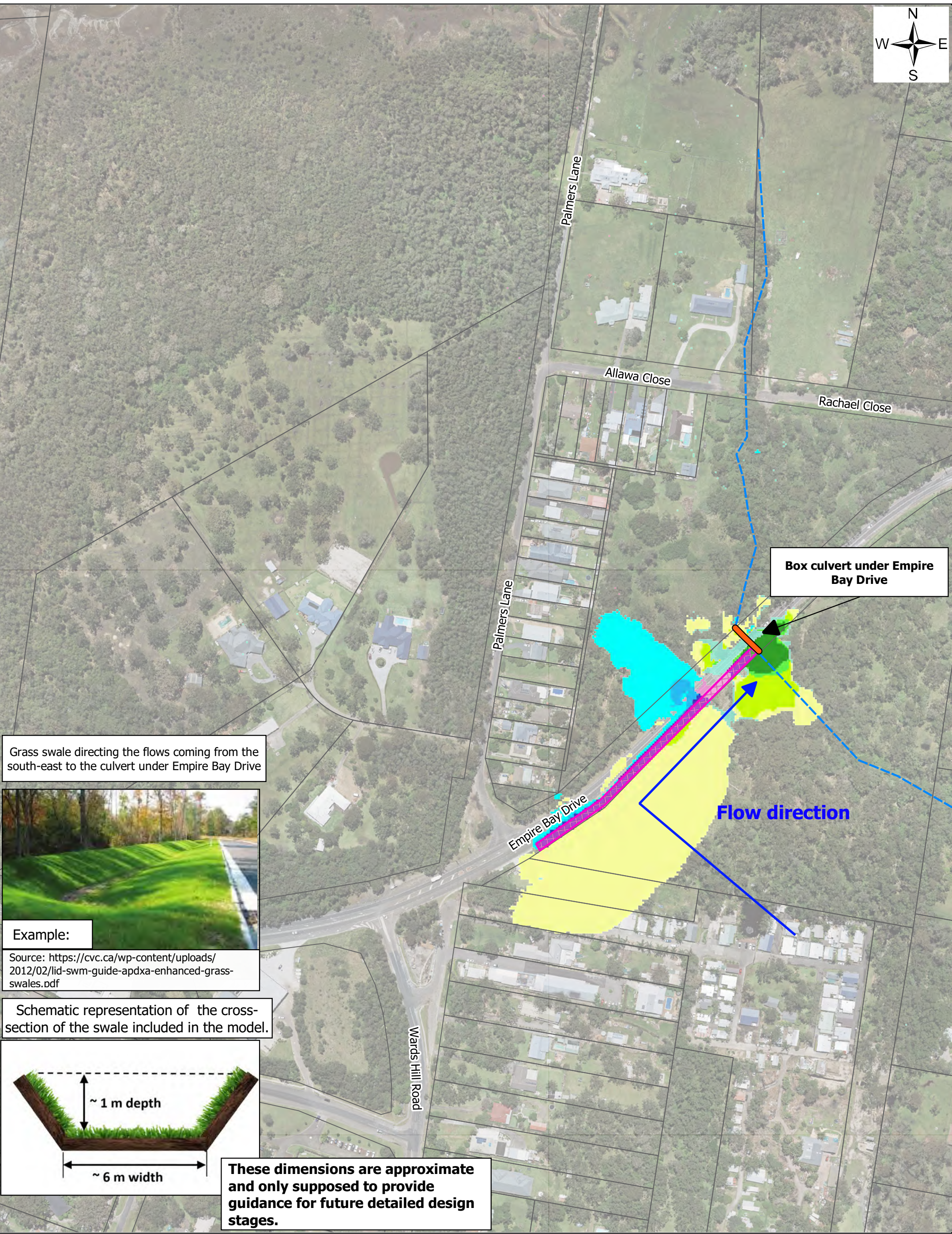


Example:  
Source: <https://cvc.ca/wp-content/uploads/2012/02/lid-swm-guide-apdxa-enhanced-grass-swales.pdf>

Schematic representation of the cross-section of the swale included in the model.



**These dimensions are approximate and only supposed to provide guidance for future detailed design stages.**



Scale : 1:2500@A3  
Date :02 June 2020  
Revision : A  
Created by : JS  
Coordinate System : Map Grid of Australia 94



Legend	
	Cadastrre
	Swale
	Natural Watercourse
	Wet/Dry
	Was wet, now dry
	Was dry, now wet
	-0.05 - -0.01
	0.01 - 0.05
	0.05 - 0.1
	0.1 - 0.2
	> 0.2
	<= -0.2
	-0.2 - -0.1
	-0.1 - -0.05

**Map G217**  
**Flood Modification Options**  
**FM EB7 Empire Bay Drive**  
**Easement and drainage**  
**upgrades**  
**PMF**  
**Depth Difference ( Option FM**  
**EB7 less Existing)**



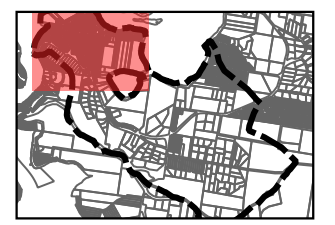


**Map G218**  
**Flood Modification**  
**Options**  
**FM EB4 Foreshore**  
**barrier around Empire**  
**Bay**

**1% AEP - Depth**  
**Difference (FM EB4**  
**less Existing)**

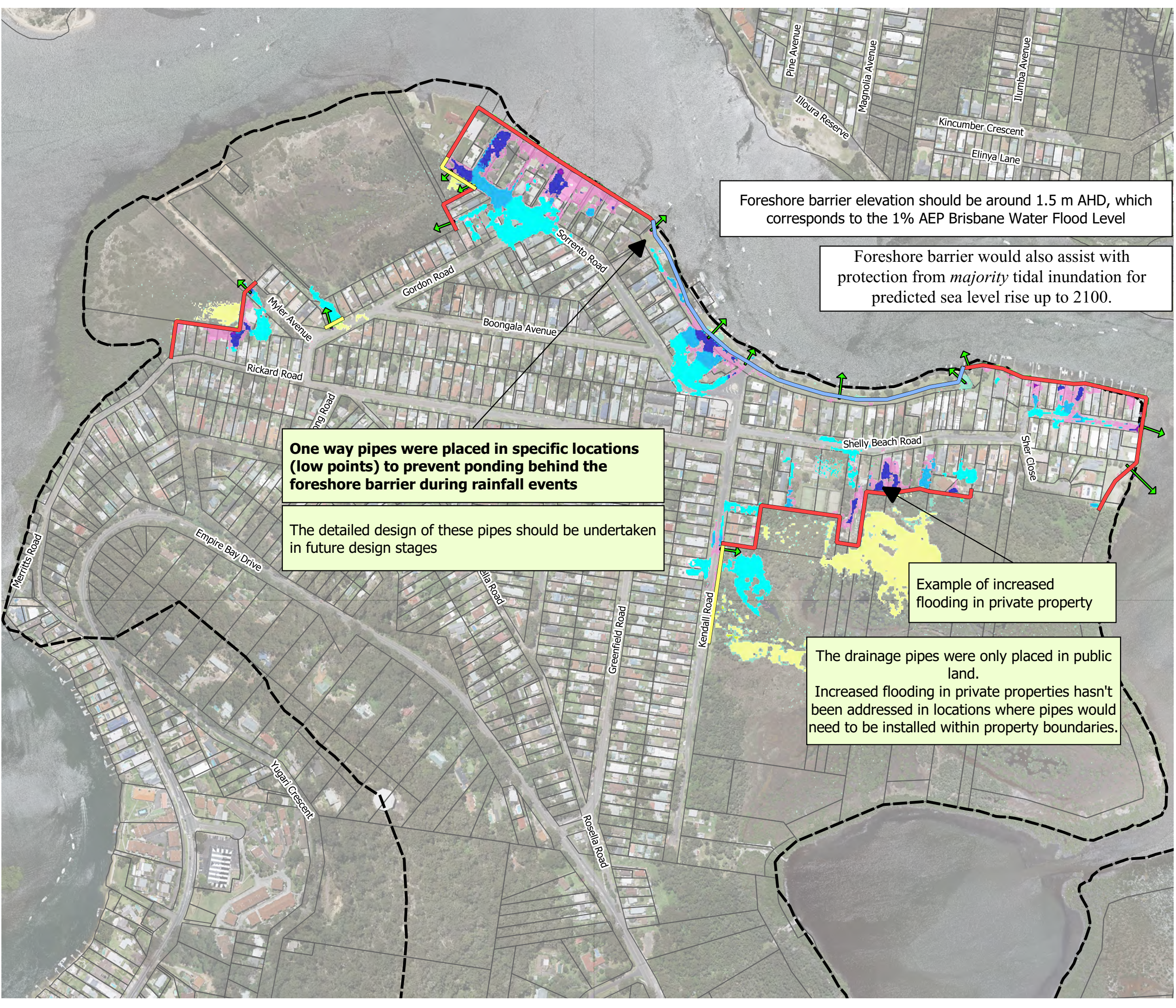
**Legend**

- Cadastre
- One way pipes through foreshore barrier
- EB\_Levee\_FMMDT4\_V01
  - Shared Path
  - Roadside Berm
  - Retaining Wall
- Wet/Dry
  - Was wet, now dry
  - Was dry, now wet
- Depth Difference (m)
  - <= -0.2
  - 0.2 - -0.1
  - 0.1 - -0.05
  - 0.05 - -0.01
  - 0.01 - 0.05
  - 0.05 - 0.1
  - 0.1 - 0.2
  - > 0.2



0 75 150 225 m

Scale : 1:7500@A3  
 Date : 2 June 2020  
 Revision : A  
 Created by : JS  
 Coordinate System : Map of Grid  
 Australia 94



Foreshore barrier elevation should be around 1.5 m AHD, which corresponds to the 1% AEP Brisbane Water Flood Level

Foreshore barrier would also assist with protection from *majority* tidal inundation for predicted sea level rise up to 2100.

One way pipes were placed in specific locations (low points) to prevent ponding behind the foreshore barrier during rainfall events

The detailed design of these pipes should be undertaken in future design stages

Example of increased flooding in private property

The drainage pipes were only placed in public land. Increased flooding in private properties hasn't been addressed in locations where pipes would need to be installed within property boundaries.

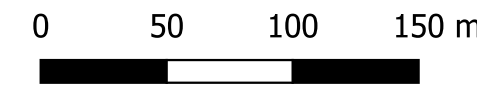


**Map G219**  
**FM EB5 Drainage**  
**easement from Myrtle**  
**Road to Kendall Road**  
**20% AEP**

**Depth Difference**  
**(FM EB5 less Existing)**

**Legend**

- Cadastre
- Wet/Dry**
- Was wet, now dry
- Was dry, now wet
- Depth Difference (m)**
- <= -0.2
- 0.2 - -0.1
- 0.1 - -0.05
- 0.05 - -0.01
- 0.01 - 0.05
- 0.05 - 0.1
- 0.1 - 0.2
- > 0.2

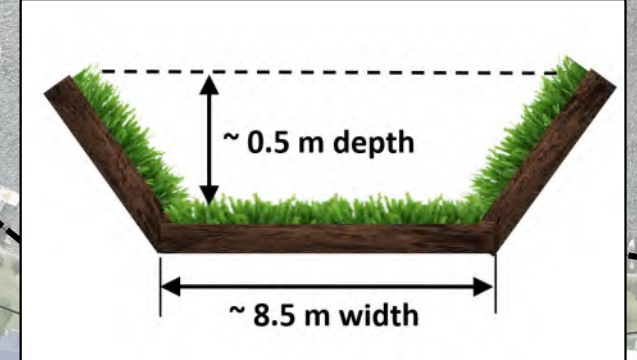


Scale : 1:3000@A3  
 Date : 29 MArch 2022  
 Revision : B  
 Created by : JRF  
 Coordinate System : Map of Grid  
 Australia 94



Schematic representation of the cross-section of the swale included in the model.

These dimensions are approximate and only supposed to provide guidance for future detailed design stages.



Culverts would be constructed under roads

**Easement directing flows coming from the south to wetland area**

The easement could convey flows via a channel, overland flow (with minor flows in underground pipes), or a large underground culvert. The composition of the easement design will determine if, and how many voluntary property purchases would be required.

The location of the easement could also be modified slightly to accommodate voluntary purchase options

If the easement were to be a full property (or even two) wide, this would provide a significant green corridor for the community, which could incorporate shared pathways, parkland, landscaping, as well as a 'natural channel'

**Examples of drainage easement:**



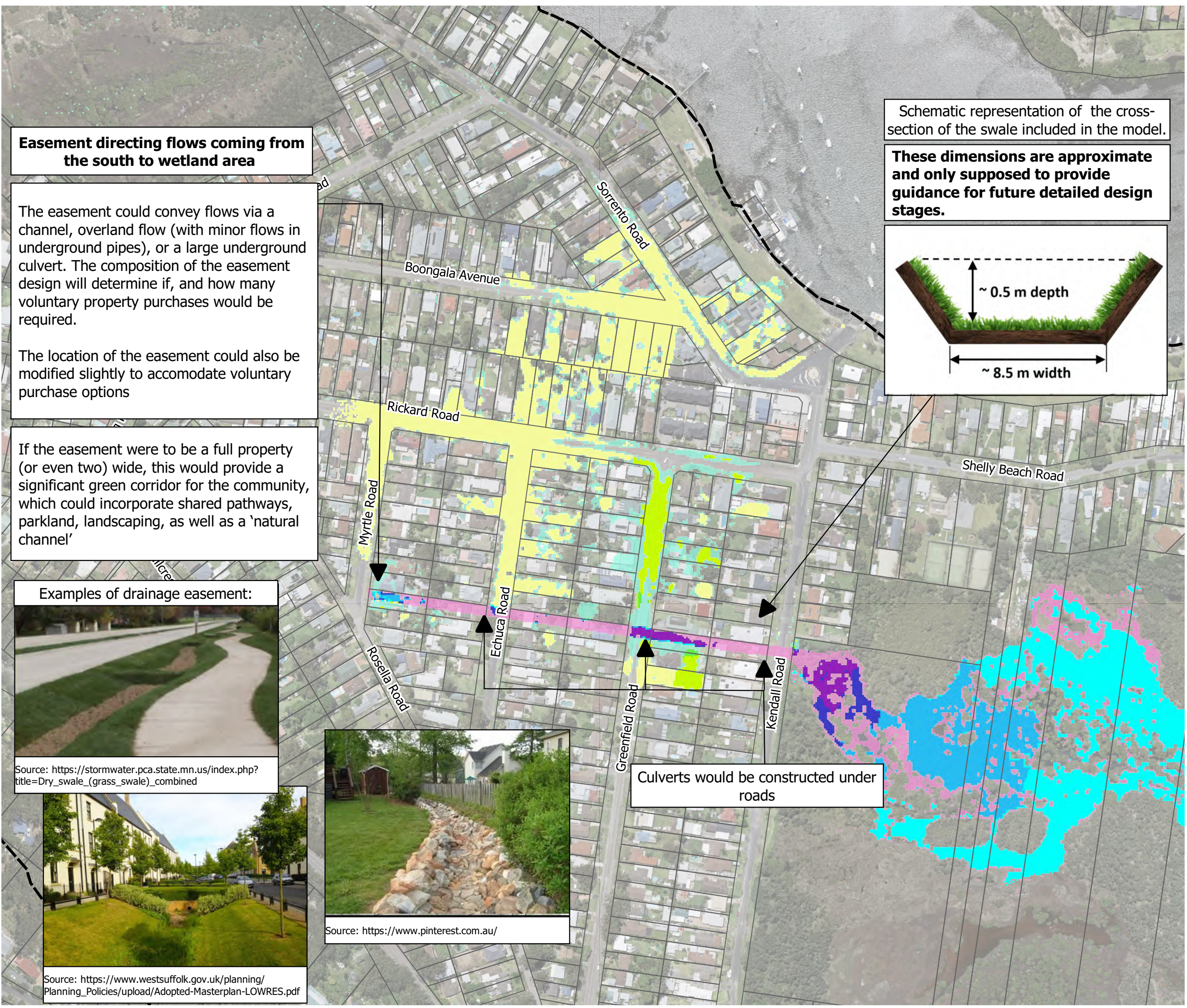
Source: [https://stormwater.pca.state.mn.us/index.php?title=Dry\\_swale\\_\(grass\\_swale\)\\_combined](https://stormwater.pca.state.mn.us/index.php?title=Dry_swale_(grass_swale)_combined)



Source: [https://www.westsuffolk.gov.uk/planning/Planning\\_Policies/upload/Adopted-Masterplan-LOWRES.pdf](https://www.westsuffolk.gov.uk/planning/Planning_Policies/upload/Adopted-Masterplan-LOWRES.pdf)



Source: <https://www.pinterest.com.au/>

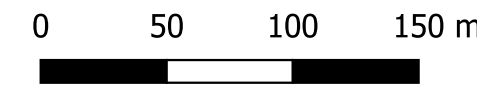




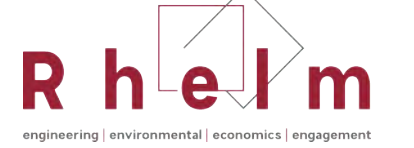
### Map G220 FM EB5 Drainage easement from Myrtle Road to Kendall Road 1% AEP

### Depth Difference (FM EB5 less Existing)

- Legend**
- Cadastre
  - Wet/Dry
    - Was wet, now dry
    - Was dry, now wet
  - Depth Difference (m)
    - ≤ -0.2
    - -0.2 - -0.1
    - -0.1 - -0.05
    - -0.05 - -0.01
    - 0.01 - 0.05
    - 0.05 - 0.1
    - 0.1 - 0.2
    - > 0.2

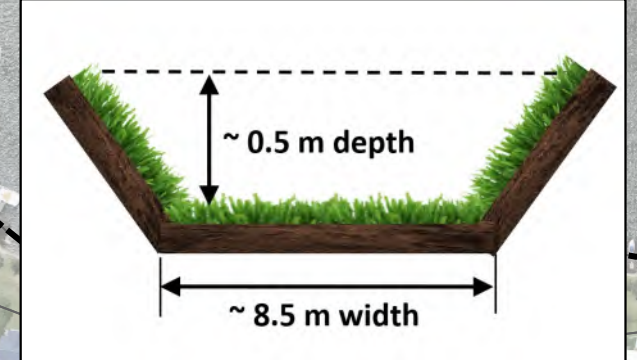


Scale : 1:3000@A3  
Date : 29 March 2022  
Revision : B  
Created by : JRF  
Coordinate System : Map of Grid  
Australia 94



Schematic representation of the cross-section of the swale included in the model.

These dimensions are approximate and only supposed to provide guidance for future detailed design stages.



### Easement directing flows coming from the south to wetland area

The easement could convey flows via a channel, overland flow (with minor flows in underground pipes), or a large underground culvert. The composition of the easement design will determine if, and how many voluntary property purchases would be required.

The location of the easement could also be modified slightly to accommodate voluntary purchase options

If the easement were to be a full property (or even two) wide, this would provide a significant green corridor for the community, which could incorporate shared pathways, parkland, landscaping, as well as a 'natural channel'

### Examples of drainage easement:



Source: [https://stormwater.pca.state.mn.us/index.php?title=Dry\\_swale\\_\(grass\\_swale\)\\_combined](https://stormwater.pca.state.mn.us/index.php?title=Dry_swale_(grass_swale)_combined)

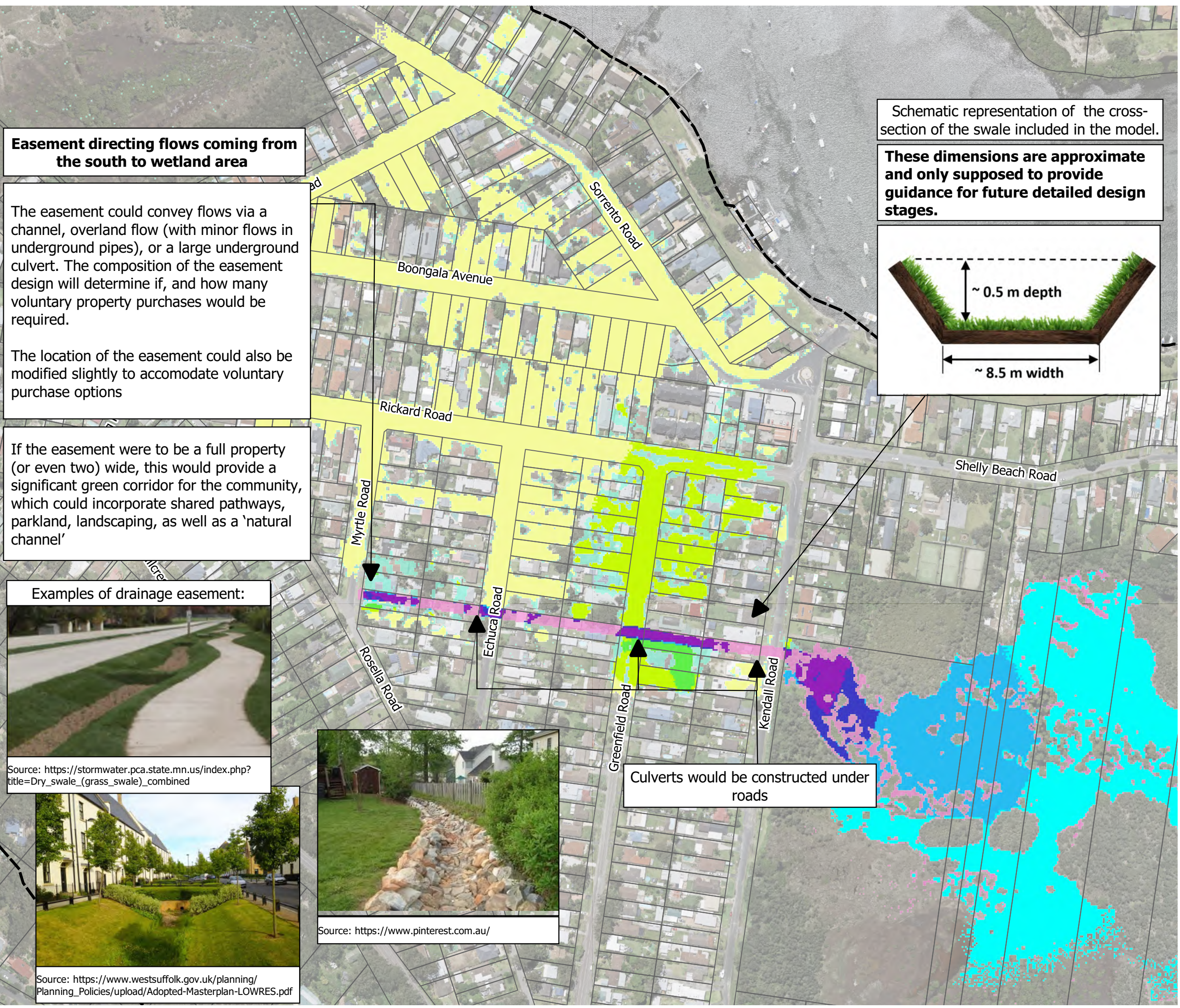


Source: [https://www.westsuffolk.gov.uk/planning/Planning\\_Policies/upload/Adopted-Masterplan-LOWRES.pdf](https://www.westsuffolk.gov.uk/planning/Planning_Policies/upload/Adopted-Masterplan-LOWRES.pdf)



Source: <https://www.pinterest.com.au/>

Culverts would be constructed under roads



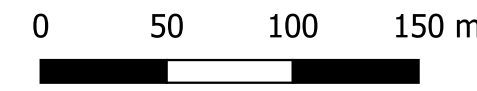




# Map G221 FM EB5 Drainage easement from Myrtle Road to Kendall Road PMF

## Depth Difference (FM EB5 less Existing)

- Legend**
- Cadastre
  - Wet/Dry
    - Was wet, now dry
    - Was dry, now wet
  - Depth Difference (m)
    - <= -0.2
    - 0.2 - -0.1
    - 0.1 - -0.05
    - 0.05 - -0.01
    - 0.01 - 0.05
    - 0.05 - 0.1
    - 0.1 - 0.2
    - > 0.2

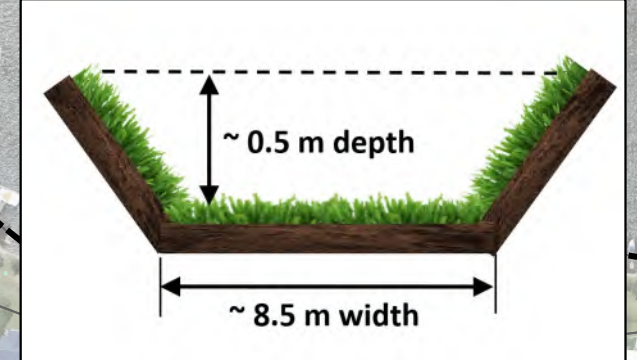


Scale : 1:3000@A3  
Date : 29 March 2022  
Revision : B  
Created by : JRF  
Coordinate System : Map of Grid  
Australia 94



Schematic representation of the cross-section of the swale included in the model.

These dimensions are approximate and only supposed to provide guidance for future detailed design stages.



### Easement directing flows coming from the south to wetland area

The easement could convey flows via a channel, overland flow (with minor flows in underground pipes), or a large underground culvert. The composition of the easement design will determine if, and how many voluntary property purchases would be required.

The location of the easement could also be modified slightly to accommodate voluntary purchase options

If the easement were to be a full property (or even two) wide, this would provide a significant green corridor for the community, which could incorporate shared pathways, parkland, landscaping, as well as a 'natural channel'

### Examples of drainage easement:



Source: [https://stormwater.pca.state.mn.us/index.php?title=Dry\\_swale\\_\(grass\\_swale\)\\_combined](https://stormwater.pca.state.mn.us/index.php?title=Dry_swale_(grass_swale)_combined)



Source: [https://www.westsuffolk.gov.uk/planning/Planning\\_Policies/upload/Adopted-Masterplan-LOWRES.pdf](https://www.westsuffolk.gov.uk/planning/Planning_Policies/upload/Adopted-Masterplan-LOWRES.pdf)



Source: <https://www.pinterest.com.au/>

Culverts would be constructed under roads





# Map G222 Emergency Response Modification Options

## EM01 Review of Evacuation Centre Locations

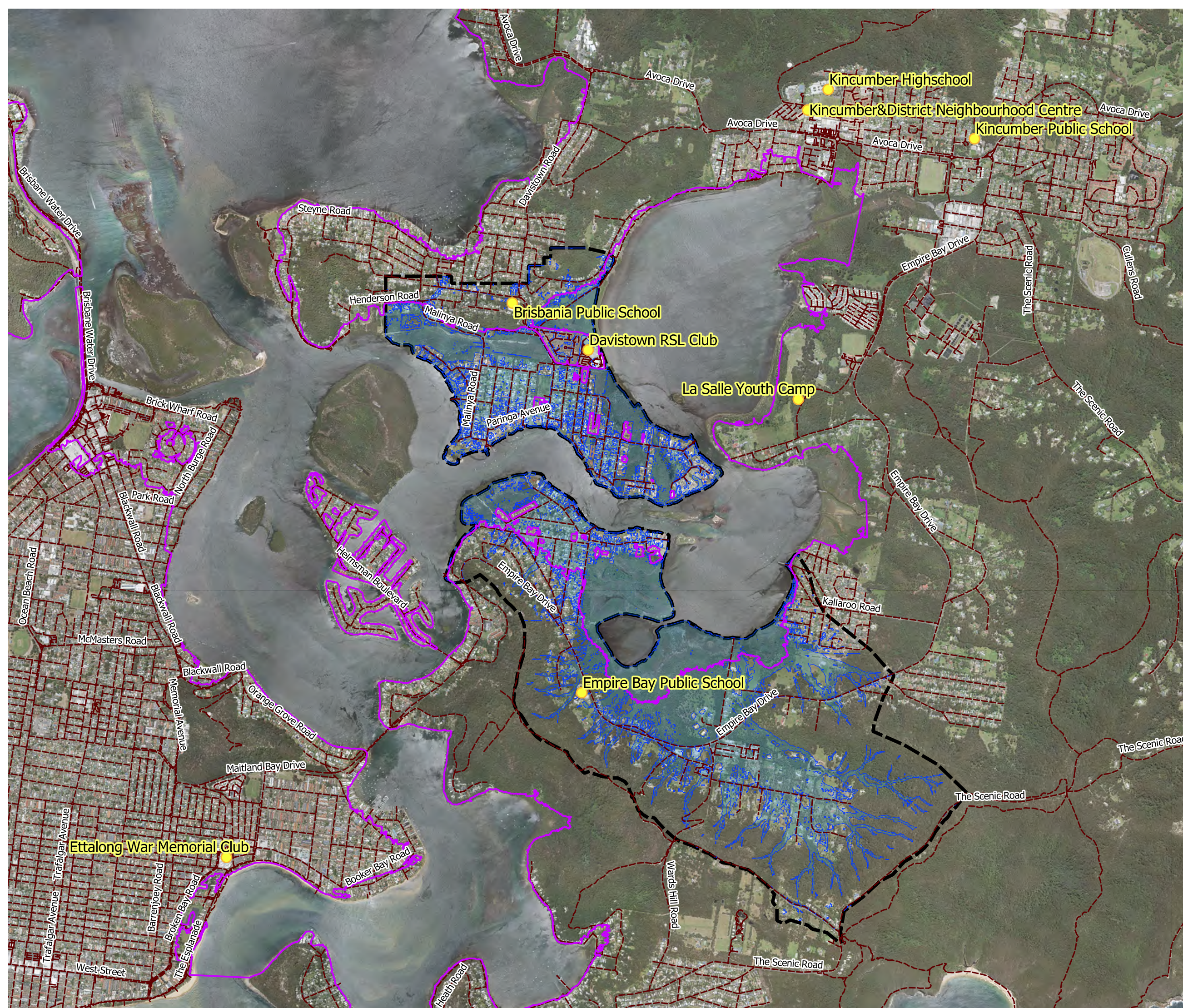
### Davistown/Empire Bay

#### Legend

- Study Areas
- Cadastre
- Potential Evacuation Centre Locations
- Roadways
- PMF Brisbane Water Flood Extents
- PMF Catchment Flood Extents

0 250 500 750 m

Scale : 1:25,000@A3  
Date : 02 June 2020  
Revision : A  
Created by : JS  
Coordinate System : MGA 56



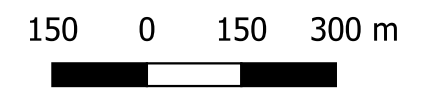


# Map G223 Emergency Response Modification Options

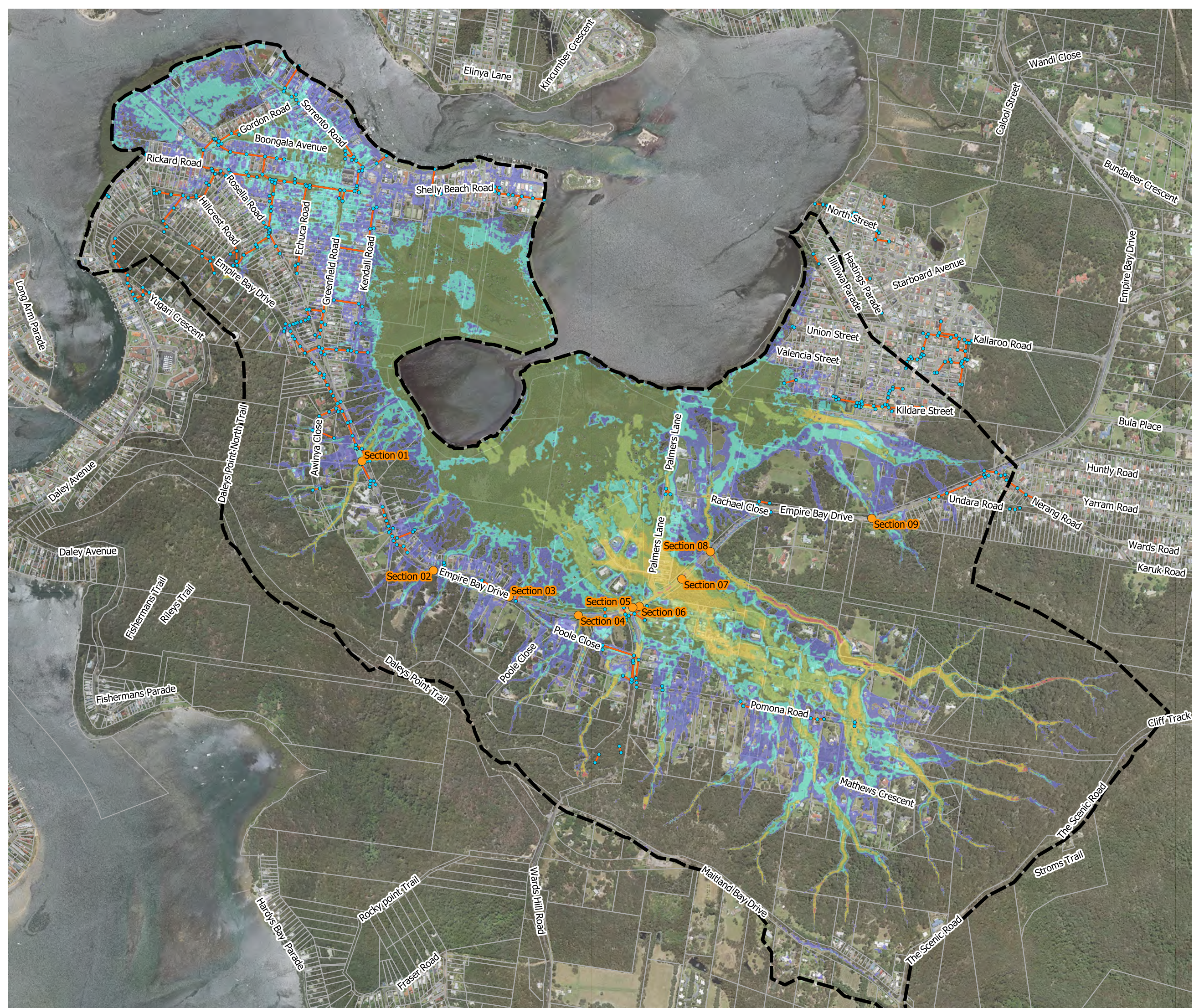
## EM03 Improve Empire Bay Road Flood Immunity

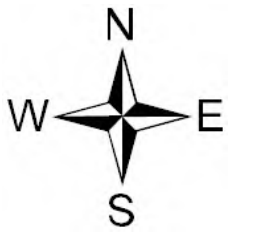
### Legend

- Cadastre
- Study Area
- Sections of Empire Bay Drive Subjected to High Hazard (Greater than H2)
- Pits
- Pipes/Culverts
- PMF Hazard**
  - H1 - Generally safe for vehicles, people & buildings
  - H2 - Unsafe for small vehicles
  - H3 - Unsafe for vehicles, children and the elderly
  - H4 - Unsafe for vehicles and people
  - H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure
  - H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure



Scale : 1:12000@A3  
Date : 02 June 2020  
Revision : B  
Created by : JS  
Coordinate System : Map Grid of Australia 94





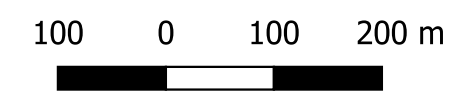
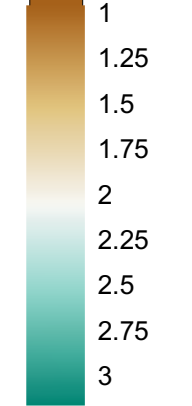
### Map G230 Final Landform Davistown

#### Legend

— Contours (0.2m)

□ Cadastre

Terrain (m AHD)



Scale : 1:7000@A3  
 Date : 02 June 2020  
 Revision : A  
 Created by : JRF  
 Coordinate System : Map Grid of Australia 94





# Map G231 Interim Landform Scenario Davistown

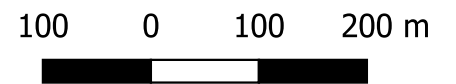
## Legend

- Cadastre
- Proposed Levee at 1.5 m AHD
  - Berm
  - Retaining Wall
  - Shared Pathway
- Landform Raised
  - Roadways
  - Properties



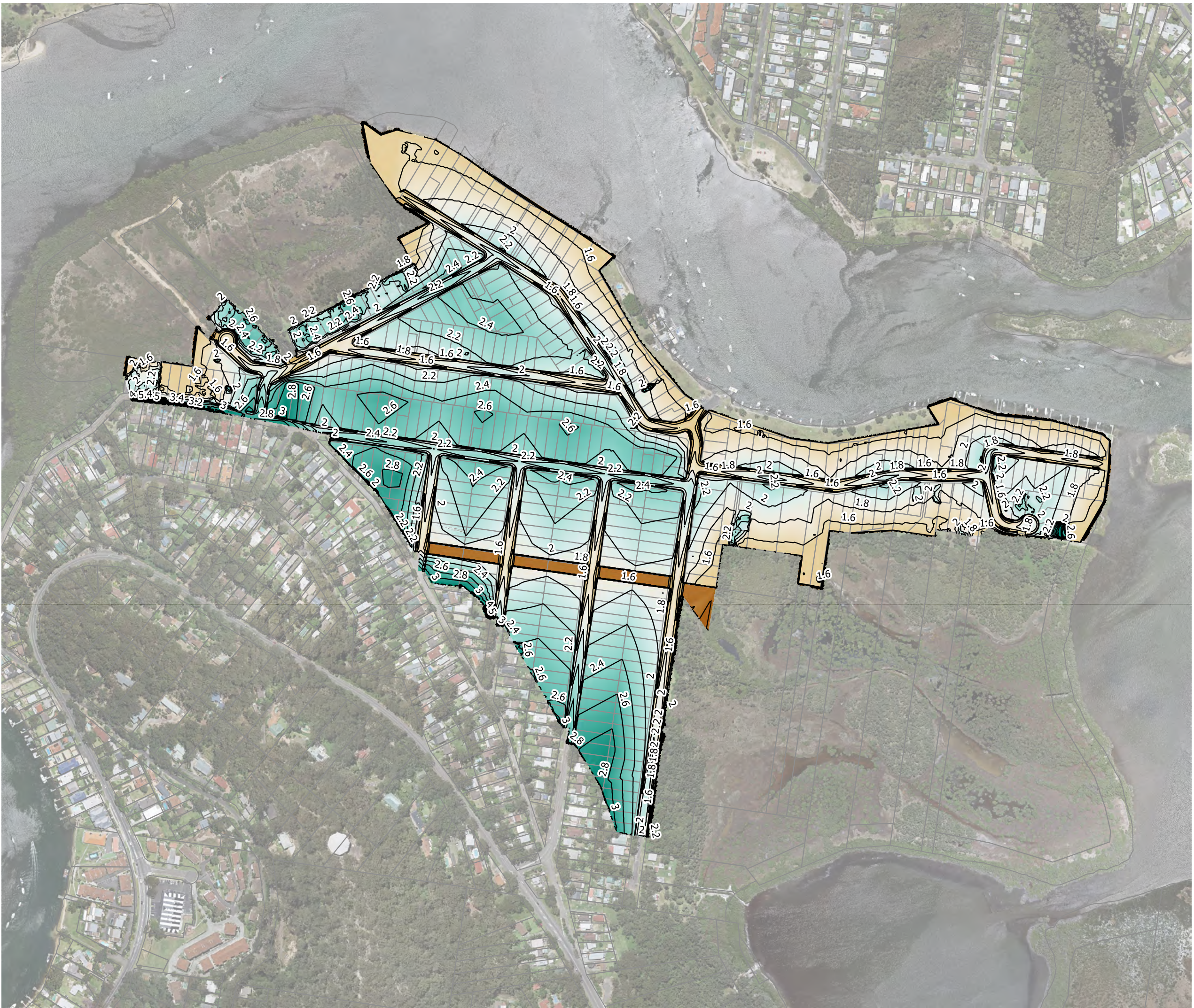
Flood gates required to control flow in an out of existing wetland

Minor ground raising as existing levels are near 1.5 m AHD



Scale : 1:7000@A3  
Date : 02 June 2020  
Revision : A  
Created by : JRF  
Coordinate System : Map Grid of Australia 94





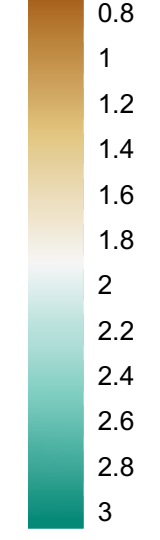
### Map G232 Final Landform Empire Bay

#### Legend

— Contours (0.2m)

□ Cadastre

Terrain (m AHD)



50 0 50 100 150 200 m



Scale : 1:5000@A3  
 Date : 02 June 2020  
 Revision : A  
 Created by : JRF  
 Coordinate System : Map of Grid  
 Australia 94

