

Maps



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Map G301

Catchment Flood Extents

Davistown

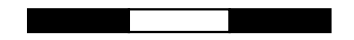
Peak Overtopping Depths

ID	Location	20% AEP	1% AEP	PMF
DT-01	Malynia Road (North)	0.2m	0.3m	0.3m
DT-02	Malynia Road (South)	0.1m	0.2m	0.5m
DT-03	Emora Avenue	0.2m	0.3m	0.6m
DT-04	Grevilla Avenue	0.2m	0.3m	0.6m
DT-05	Kincumber Cresc	0.2m	0.3m	0.4m

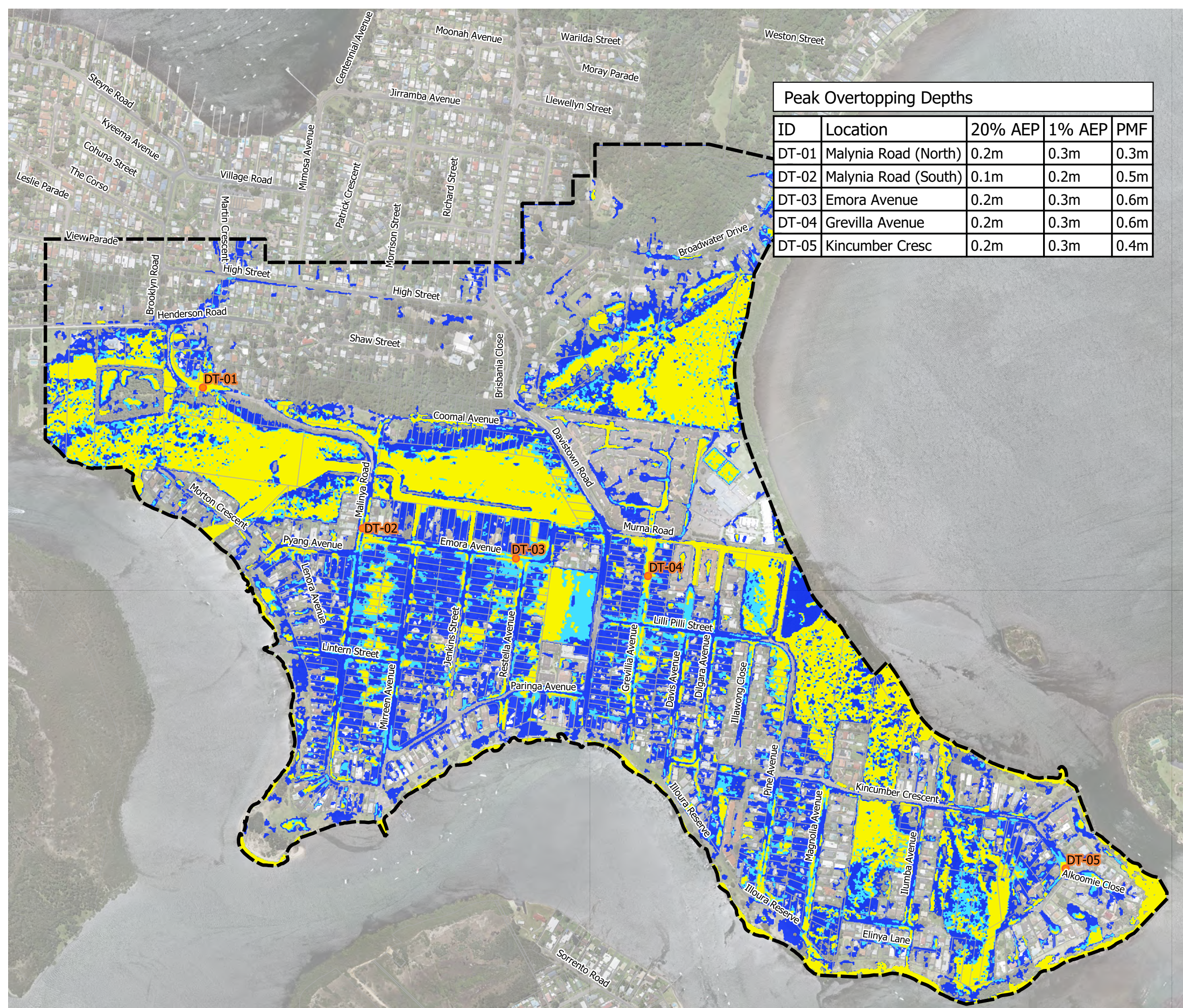
Legend

- Cadastre
 - Study Area
 - Road Locations
- Flood Extents (0.1 m filter)
- 20% AEP
 - 1% AEP
 - PMF

0 100 200 300 m



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Map G302

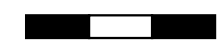
Catchment Flood Extents Empire Bay/Bensville

Legend

- Cadastre
 - Study Area
 - Road Locations
- Flood Extents (0.1 m filter)
- 20% AEP
 - 1% AEP
 - PMF

Peak Overtopping Depths				
ID	Location	20% AEP	1% AEP	PMF
EB-01	Gordon Road	0.2m	0.3m	0.6m
EB-02	Boongala Avenue	0.5m	0.6m	0.9m
EB-03	Sorrento Road	0.1m	0.2m	0.5m
EB-04	Shelly Beach Road	0.1m	0.2m	0.3m
EB-05	Rickard Road	0.4m	0.5m	0.8m
EB-06	Greenfield Road	0.4m	0.5m	0.7m
EB-07	Rosella Road	-	0.1m	0.4m
EB-08	Palmer's Lane	0.3m	0.5m	0.9m
EB-09	Empire Bay Drive	0.2m	0.3m	0.6m
EB-10	Pomona Road (1)	0.2m	0.3m	0.6m
EB-11	Pomona Road (2)	0.3m	0.4m	0.7m
EB-12	Pomona Road (3)	0.2m	0.2m	0.5m

0 100 200 300 m



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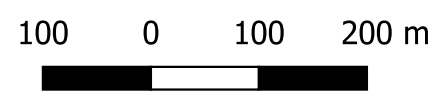
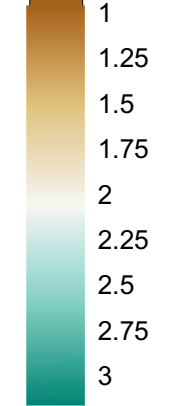
Map G303 Proposed Landform Davistown

Legend

— Contours (0.2m)

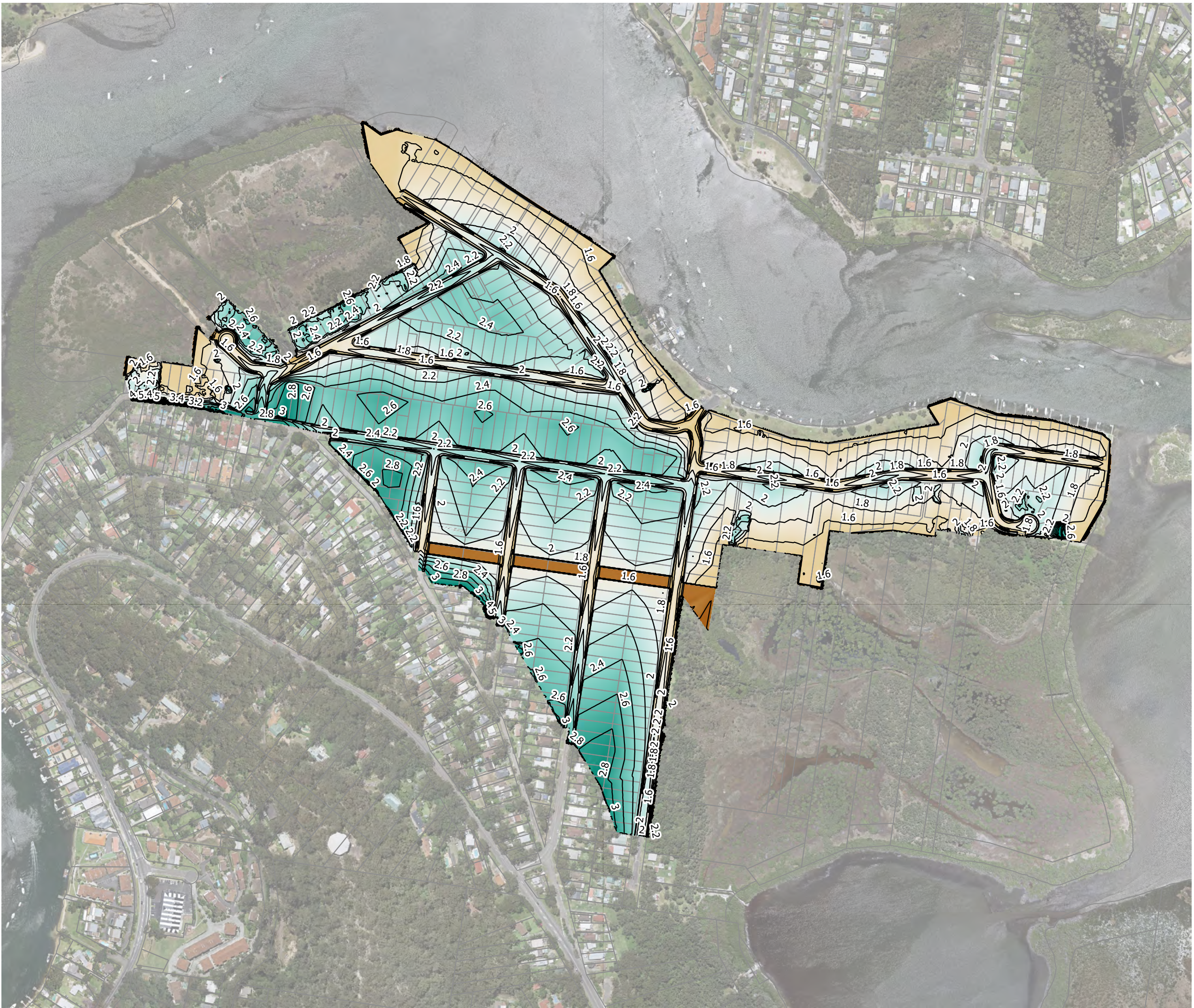
□ Cadastre

Terrain (m AHD)



Scale : 1:7000@A3
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 Australia 94





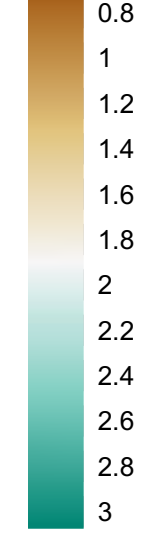
Map G304 Proposed Landform Empire Bay

Legend

— Contours (0.2m)

□ Cadastre

Terrain (m AHD)



50 0 50 100 150 200 m








Scale : 1:5000@A3
 Date : 18 August 2020
 Revision : A
 Created by : JRF
 Coordinate System : Map of Grid
 Australia 94

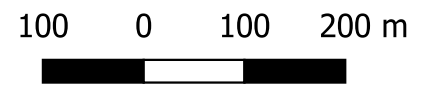




Map G305 Recommended Options Davistown

Legend

-  Cadastre
-  Study Area
-  FM DT01 - Davistown foreshore barrier
-  EM01 - Review of evacuation centres - Potential Locations
-  EM03 - Provide Data to Inform Future Road Drainage Improvements - Road Locations












Scale : 1:7500@A3
 Date : 18 August 2020
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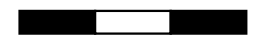


Map G306 Recommended Options Empire Bay

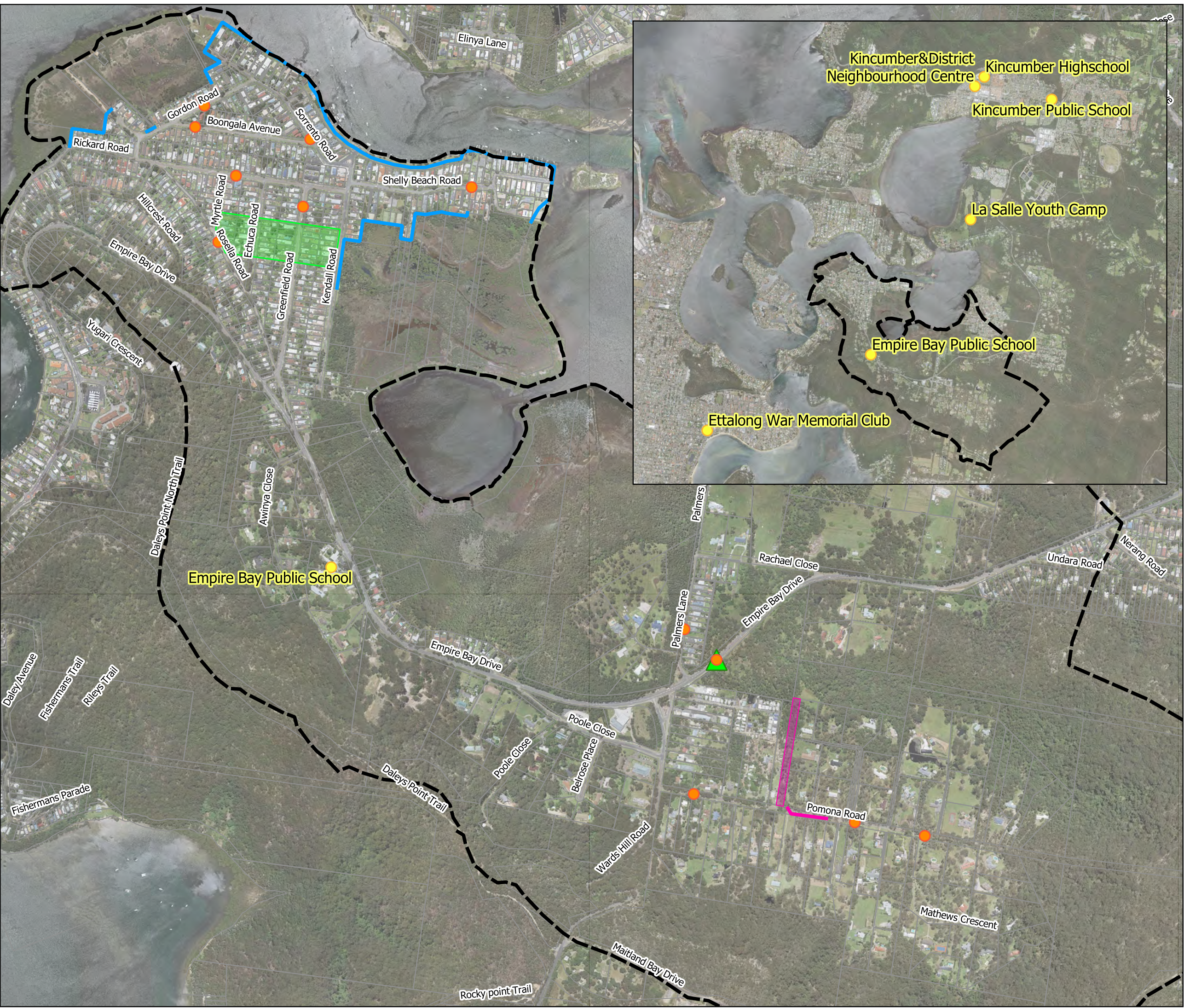
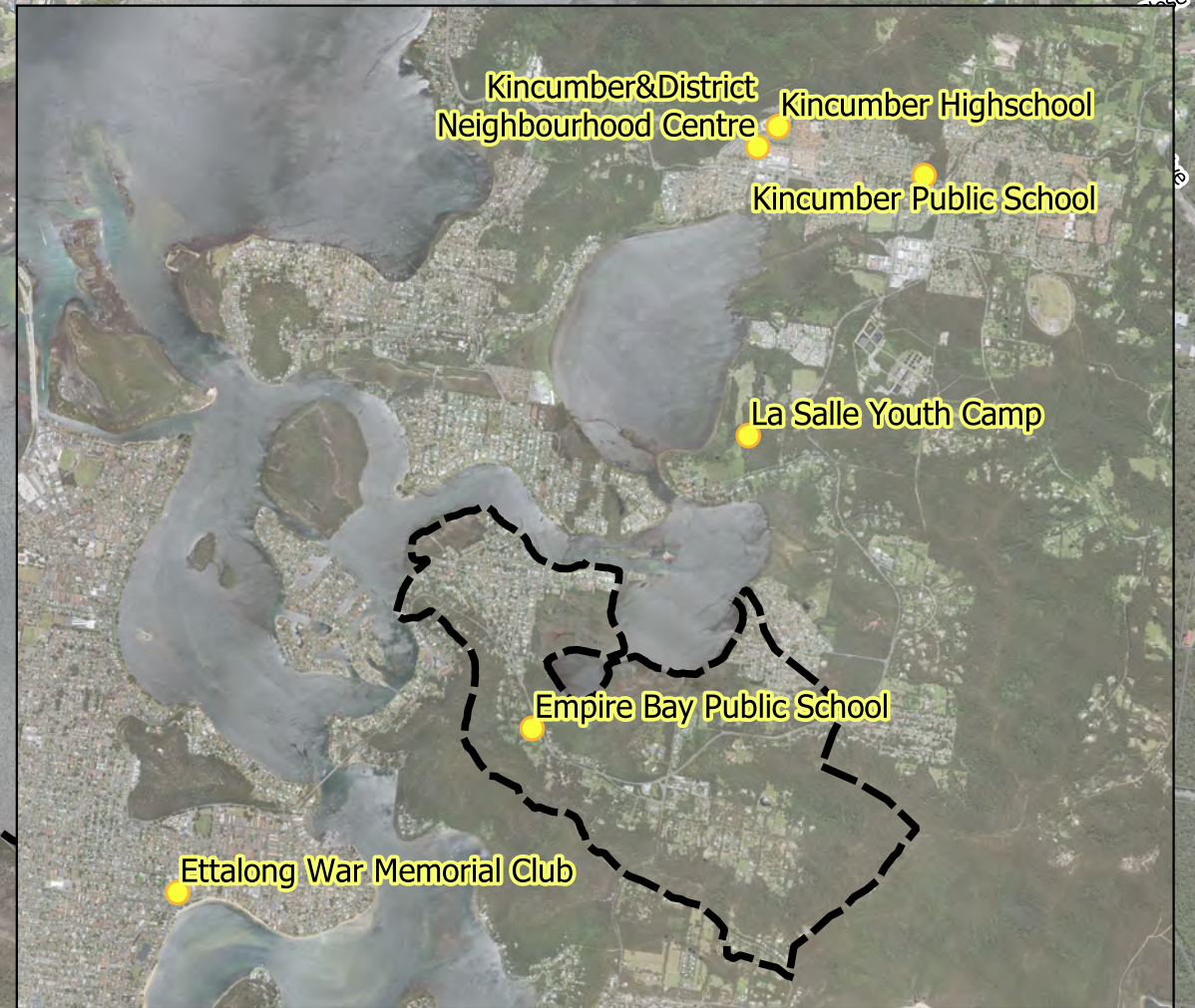
Legend

-  Cadastre
-  Study Area
-  EM01 - Review of evacuation centres - Potential Locations
-  EM03 - Provide Data to Inform Future Road Drainage Improvements - Road Locations
-  EM05 - Flood Warning Signs - Depth Marker Location
-  FM EB05 - Drainage Easement (Myrtle Road to Kendall Road)
-  FM EB06 - Pomona Road Easement and Drainage Upgrades
-  FM EB01 - Pomona Road Easement and Drainage Upgrades
-  FM EB04 - Empire Bay foreshore barrier

0 100 200 300 m



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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

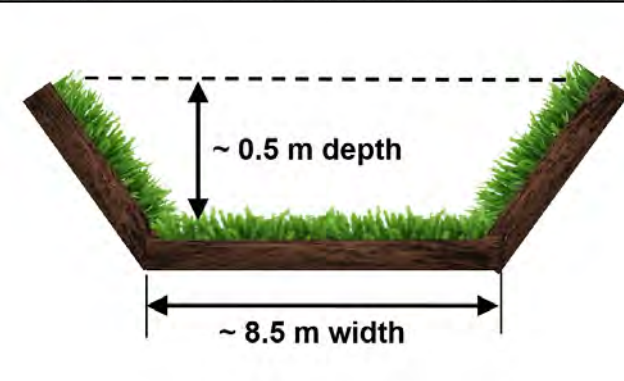


Source: <https://www.pinterest.com.au/>



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

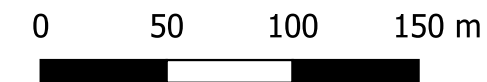


**Map G307
FM EB5 Drainage
easement from Myrtle
Road to Kendall Road
1% AEP**

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

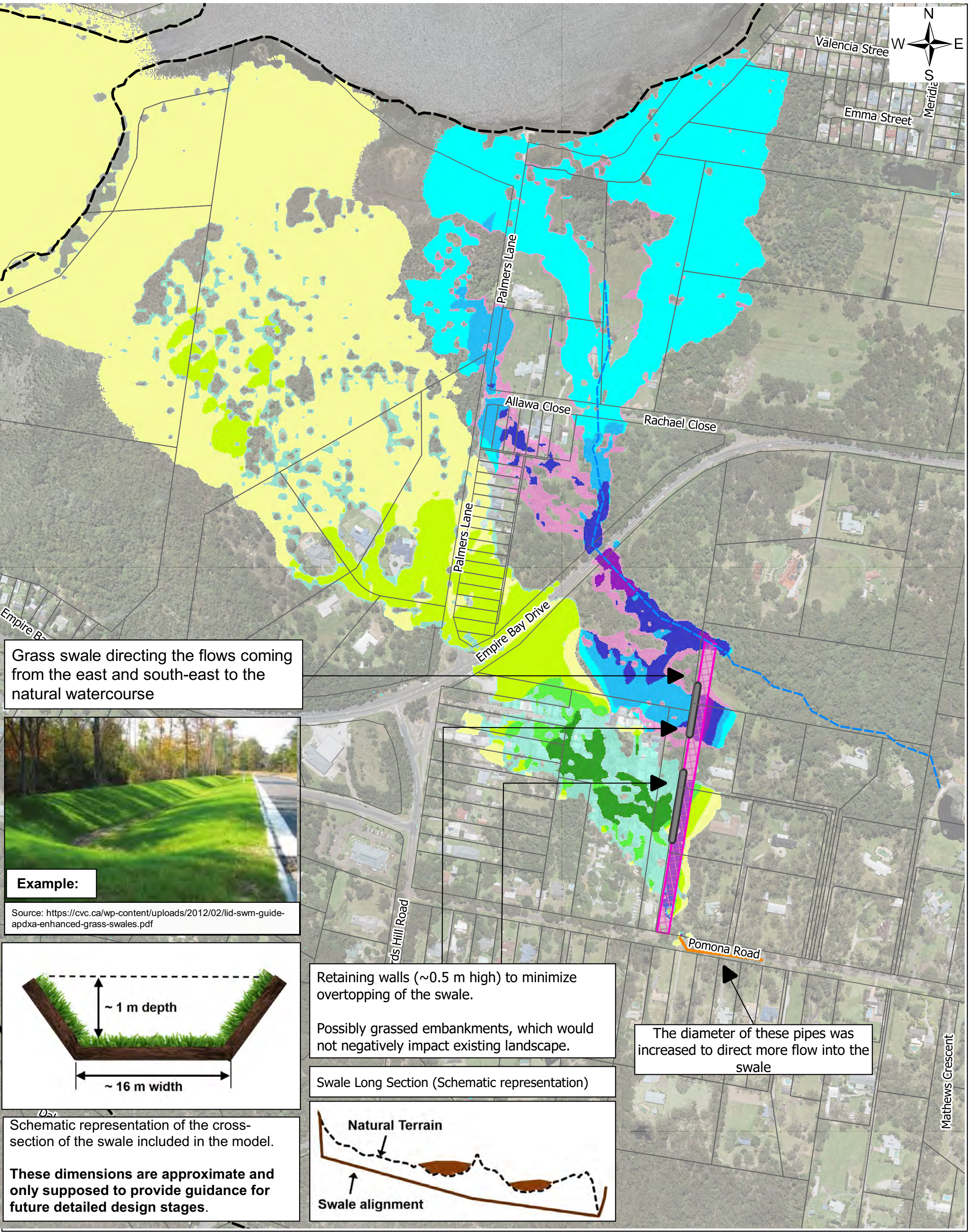
Legend

- Cadastre
- Swale
- Wet/Dry**
 - Was wet, now dry
 - Was dry, now wet
- Flood 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 : 18 August 2020
Revision : A
Created by : JS
Coordinate System : Map of Grid
Australia 94



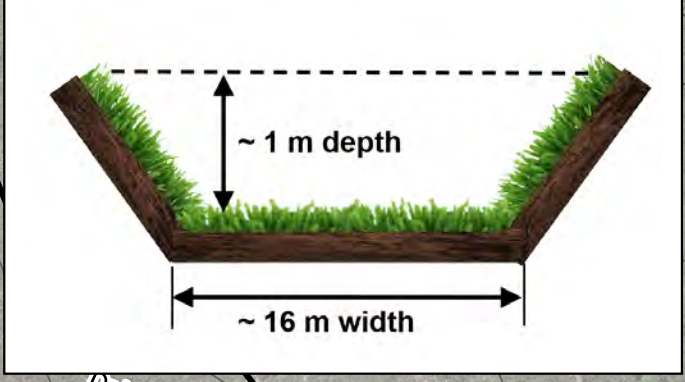


Grass swale directing the flows coming from the east and south-east to the natural watercourse



Example:

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



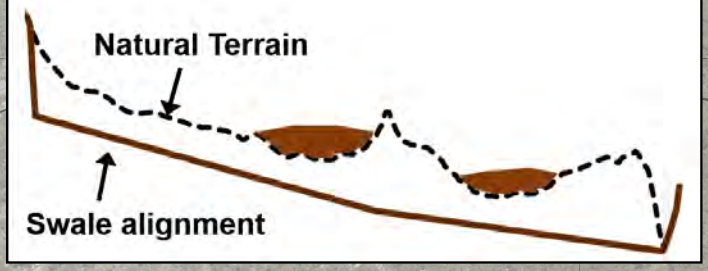
Schematic representation of the cross-section of the swale included in the model.

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

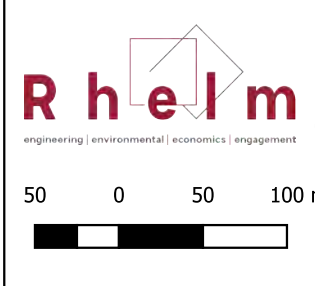
Retaining walls (~0.5 m high) to minimize overtopping of the swale.

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



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

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

Map G308
Flood Modification Options
FM EB6 Pomona Road easement
and drainage upgrades
1% AEP
Depth Difference (Option FM
EB6 less Existing)



Flood gates could be used to protect properties inside the barrier during ocean storms and could also be used to 'mimic' existing tidal flows to protect wetland areas from impacts of sea level rise.

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

Shared pathway integrated with foreshore barrier. Embankment approximately 0.5m above existing ground levels.



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

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 tidal inundation for predicted sea level rise up to 2100.

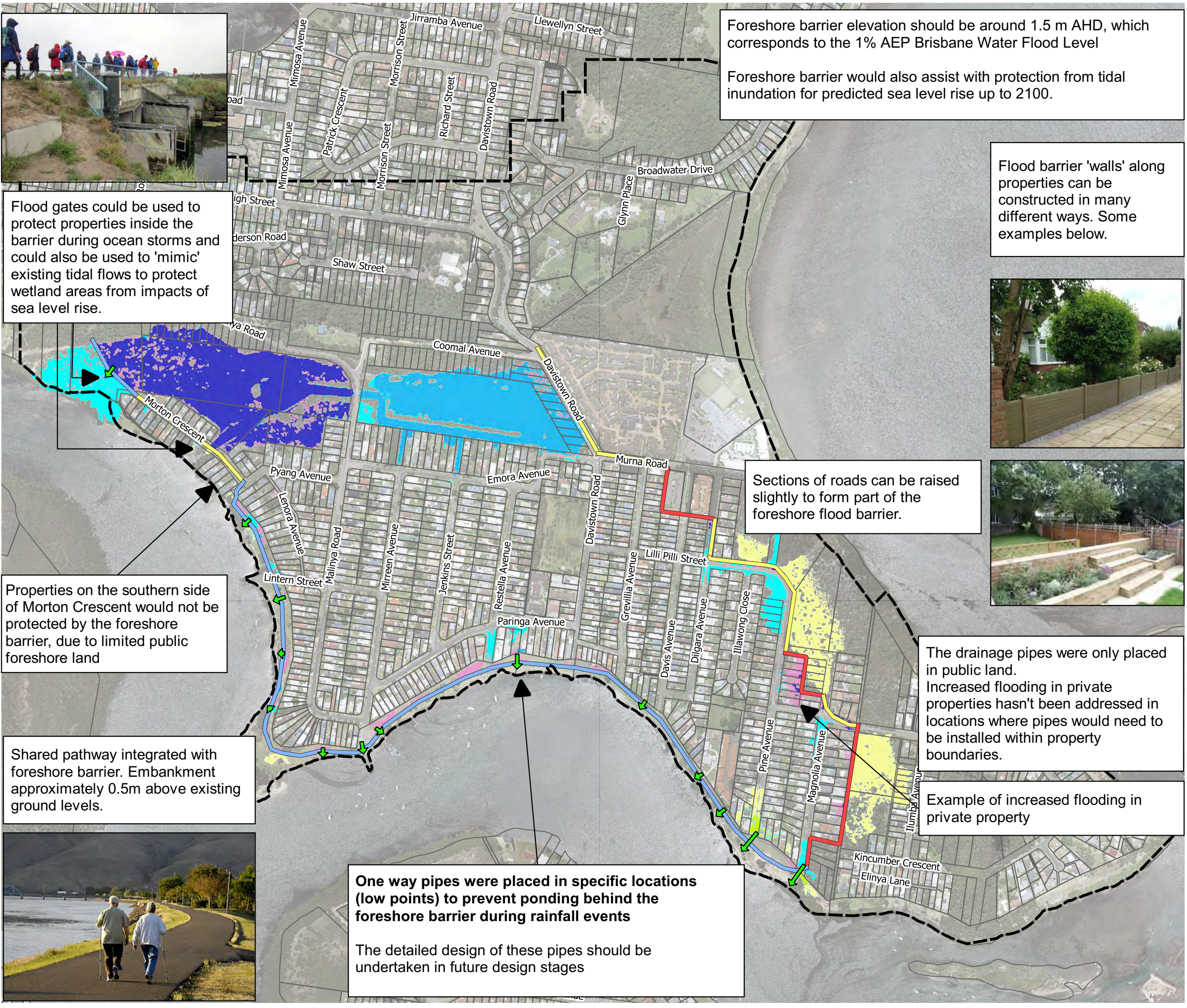
Flood barrier 'walls' along properties can be constructed in many different ways. Some examples below.



Sections of roads can be raised slightly to form part of the foreshore flood barrier.

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



Map G309 Flood Modification Options

FM DT1 Davistown Foreshore Barrier

1% AEP Depth Difference Catchment Flooding (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 - Flood 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
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Created by : JS
Coordinate System : Map of Grid
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Map G310 Flood Modification Options FM EB4 Empire Bay Foreshore Barrier

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

Legend

- Cadastre
- One way pipes through foreshore barrier
- Levee**
- Shared Path
- Roadside Berm
- Retaining Wall
- Wet/Dry**
- Was wet, now dry
- Was dry, now wet
- Flood 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



Shared pathway integrated with foreshore barrier. Embankment approximately 0.5m above existing ground levels.

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 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

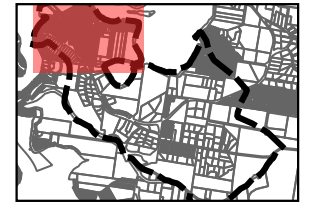
Flood barrier 'walls' along properties can be constructed in many different ways. Some examples below.



Sections of roads can be raised slightly to form part of the foreshore flood barrier.

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



0 75 150 225 m

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Map G311 Emergency Response Modification Options

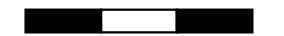
EM01 Review of Evacuation Centre Locations

Davistown/Empire Bay

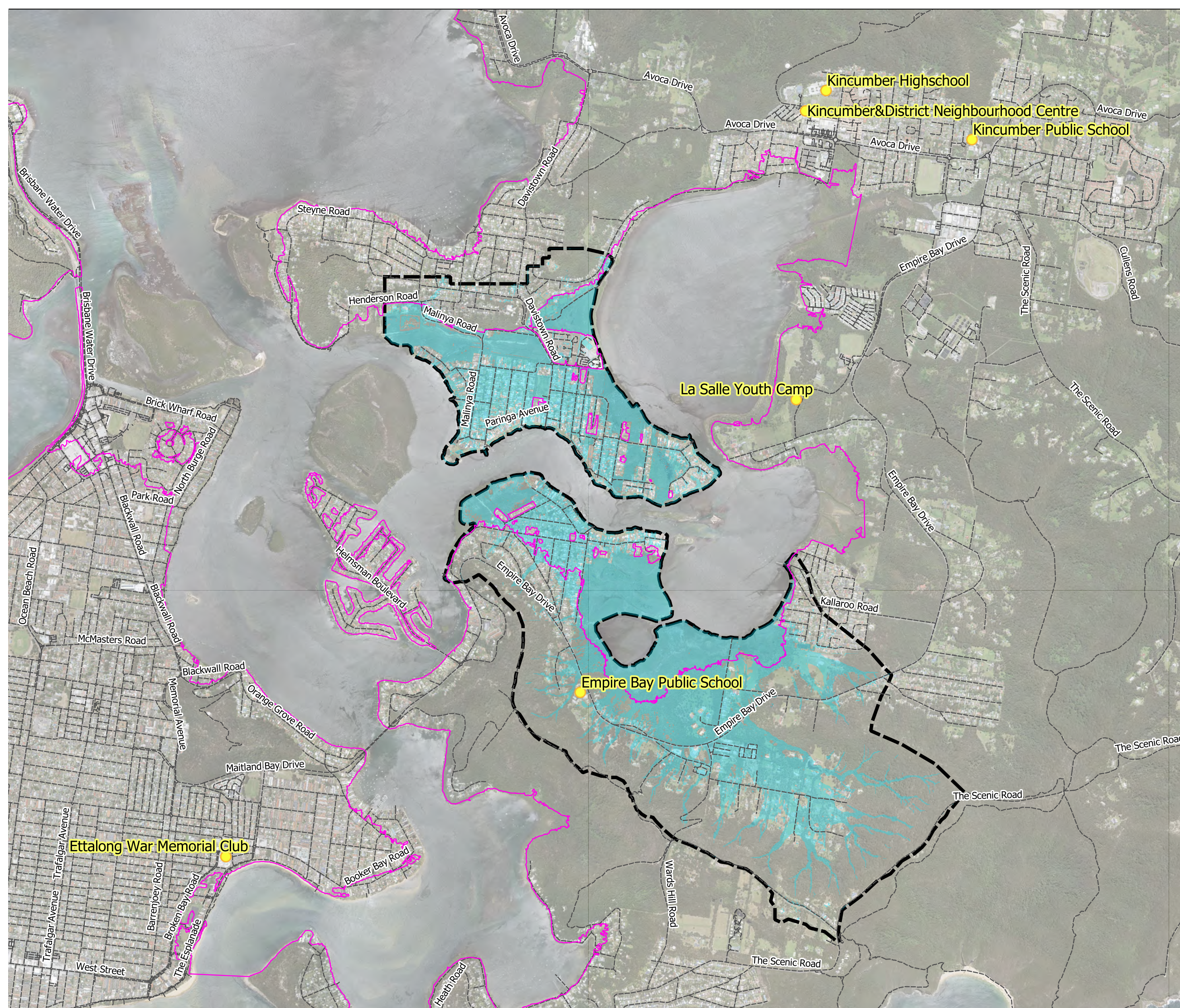
Legend

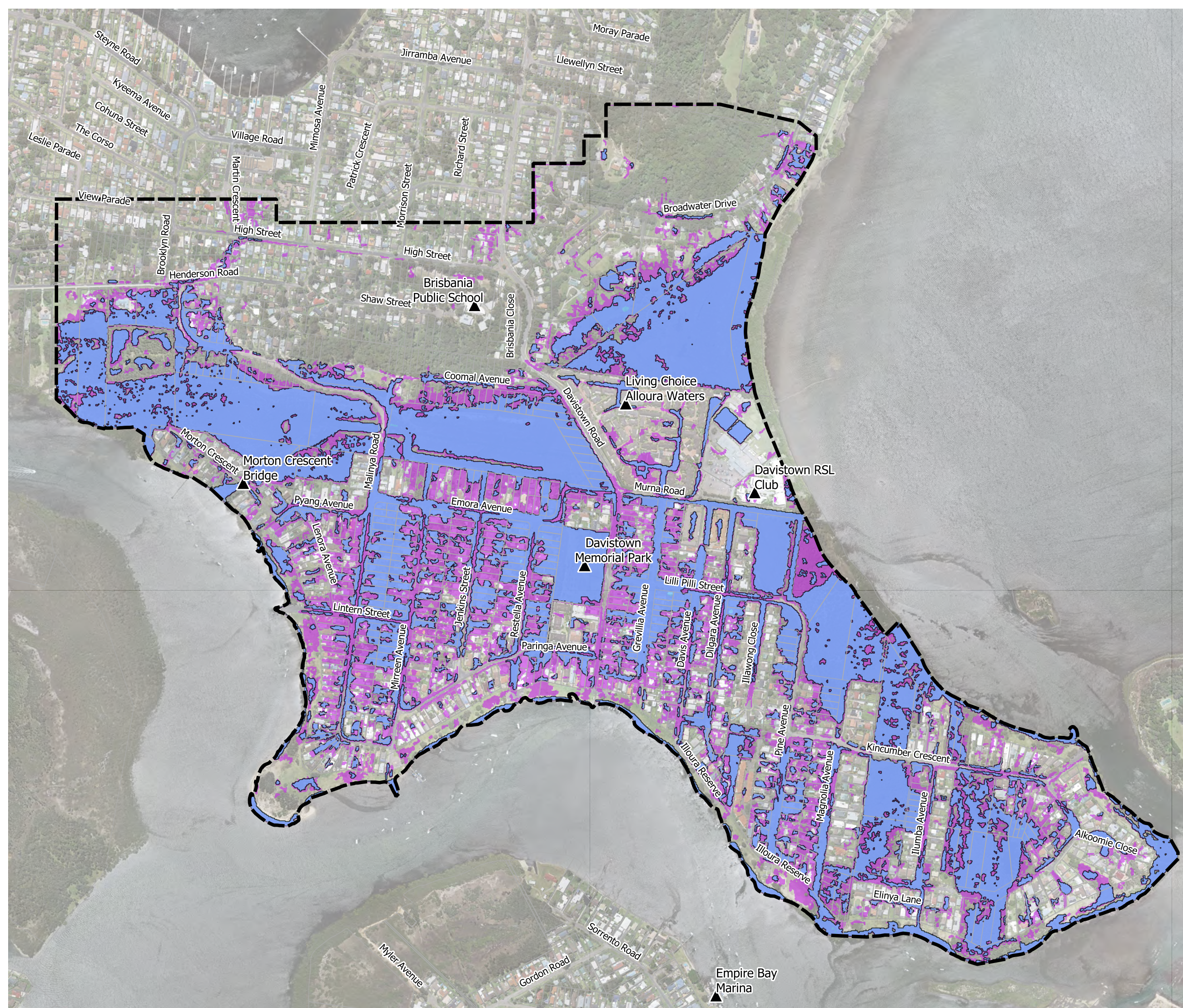
- Study Areas
- Cadastre
- Potential Evacuation Centre Locations
- Roadways
- PMF Brisbane Water Flood Extents
- PMF Catchment Flood Extents

0 250 500 750 m



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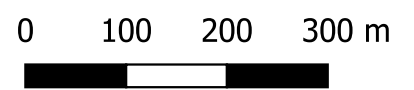
Map G312

Flood Planning Area (FPA)

Davistown

Legend

-  Study Area
-  Cadastre
-  FPA - 1% AEP + 30% rainfall increase
-  PMF - Catchment Flood Extent



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 Created by : JS
 Coordinate System : MGA 56





Map G313

Flood Planning Area (FPA)

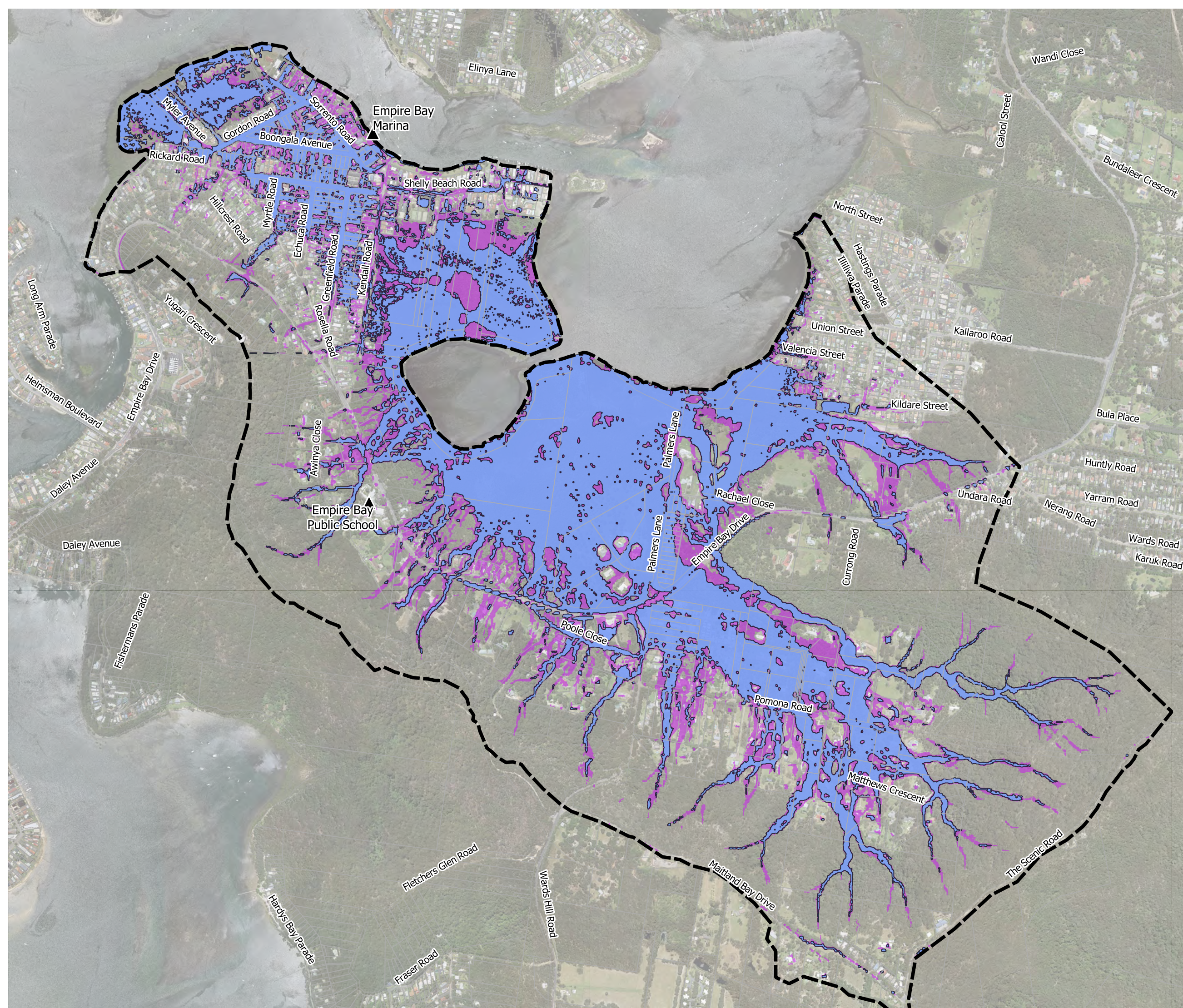
Empire Bay/Bensville

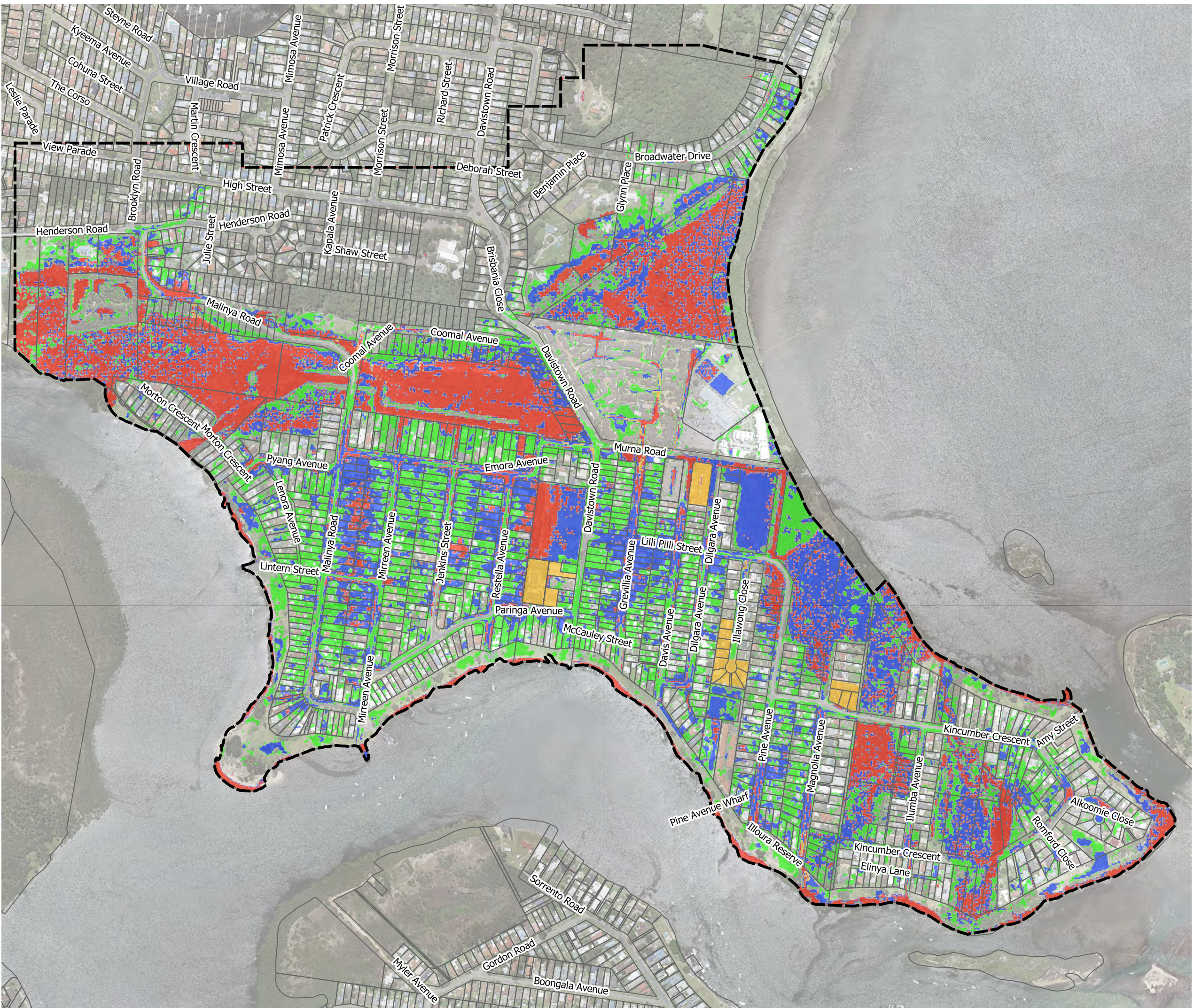
Legend

- Study Area
- Cadastre
- FPA - 1% AEP + 30% rainfall increase
- PMF - Catchment Flood Extent



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Date : 18 August 2020
Revision : A
Created by : JS
Coordinate System : MGA 56











Map G314

**Flood Planning
Constraint Categories
(FPCC)**

Davistown

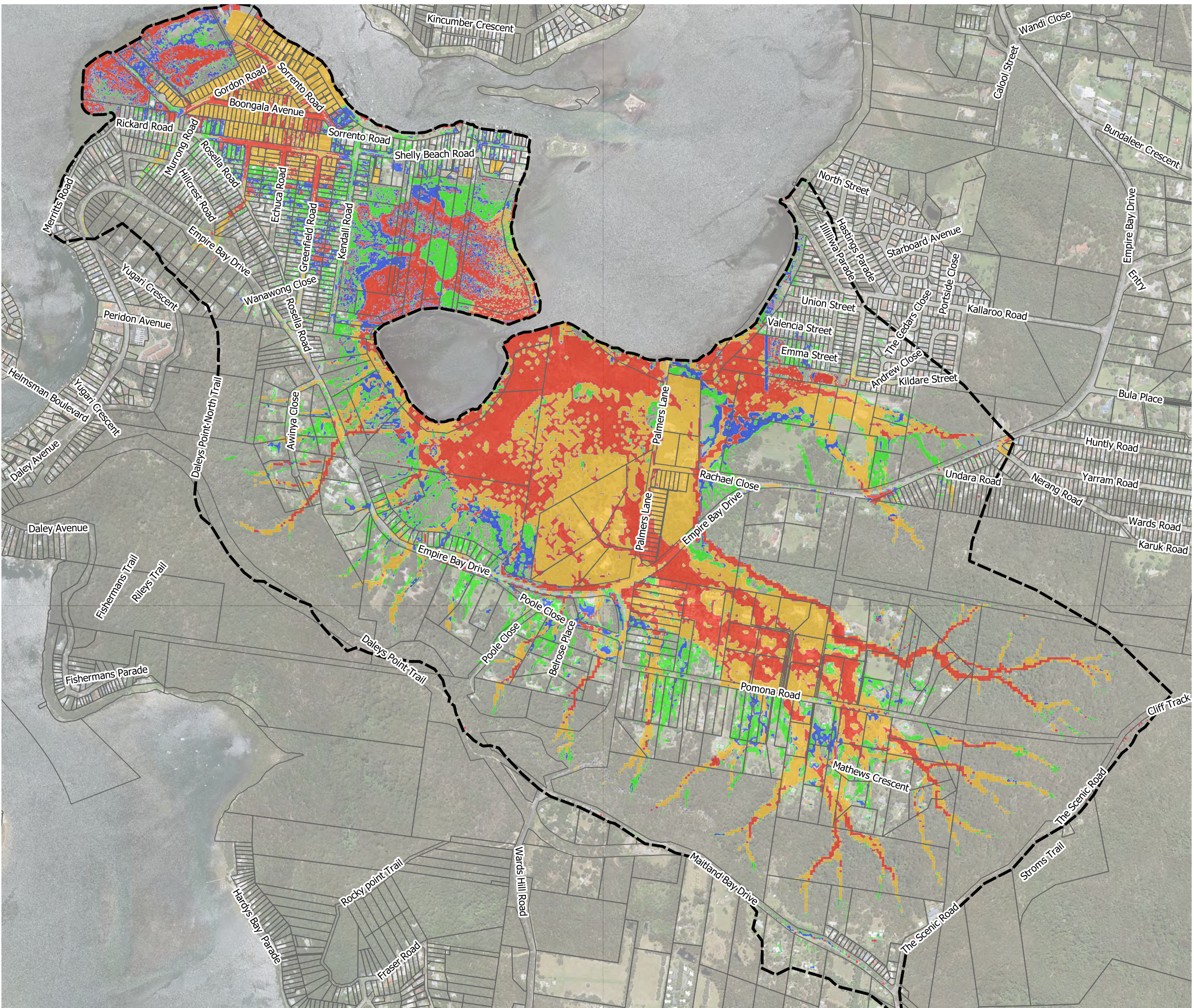
Legend

-  Cadastre
-  Study Area
- Flood Planning Constraint Categories
 -  FPCC 1
 -  FPCC 2
 -  FPCC 3
 -  FPCC 4



Scale : 1:7500@A3
 Date : 18 August 2020
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 Created by : JS
 Coordinate System : Map of Grid
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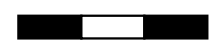
Map G315

**Flood Planning
Constraint Categories
(FPCC)**

Empire Bay/Bensville

- Legend**
- Cadastre
 - Study Area
 - Flood Planning Constraint Categories**
 - FPCC 1
 - FPCC 2
 - FPCC 3
 - FPCC 4

0 100 200 300 m



Scale : 1:12000@A3
 Date : 18 August 2020
 Revision : A
 Created by : JS
 Coordinate System : Map of Grid
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