

Marrickville Valley Floodplain Risk
Management Study and Plan

APPENDIX

A

FLOOD MODIFICATION OPTIONS

FM 1.1**Description**

An existing 750mm diameter pipe collects runoff from Morton Ave and traverses through properties along Wardell Rd, Jarvie Ave and Bishop St to connect to an existing 1050mm diameter pipe that runs underneath Marrickville Oval. In this option a new 900mm diameter pipe with additional inlet pits will re-direct runoff from Morton Ave to Frazer St and continue down Frazer St to connect to a new 1800mm X 1200mm box culvert from the sag along Frazer St to a new surcharge pit in Marrickville Oval. This option aims to reduce flooding for properties along Wardell Rd, Jarvie Ave, Bishop St, and Lawson Ave where up to approximately 600mm depth of flooding is observed in the 2 year ARI event.

Modelling Results

The results highlight that the proposed diversion provides water level reductions of up to 30mm in the 2 year ARI event along Wardell Rd and Jarvie Ave, up to 90mm along Bishop St and up to 150mm along Frazer St and Lawson Ave. For the 1% AEP event water level reductions of up to 50mm are observed along Wardell Rd, Jarvie Ave, Bishop St, Frazer St and Lawson Ave. For the 1% AEP event this option removed over floor flooding for 7 properties.

FM 1.2**Description**

An existing 750mm diameter pipe collects runoff from Morton Ave and traverses through properties along Wardell Rd, Jarvie Ave and Bishop St to connect to an existing 1050mm diameter pipe that runs underneath Marrickville Oval. In this option, additional inlet pits will collect runoff from Wardell Rd at the intersection of Morgan St and direct flows to the low point in Frazer St via new 600mm and 900mm diameter pipes in Morgan St and Bishop St, respectively. A new 1800mm X 1200mm box culvert will connect from the sag along Frazer St to a new surcharge pit in Marrickville Oval. This option may result in reduced flooding for properties along Wardell Rd, Jarvie Ave, Bishop St, Frazer Ave and Lawson Ave where up to approximately 600mm depth of flooding is observed in the 2 year ARI event.

Modelling Results

The results highlight that the proposed diversion provides water level reductions of up to 20mm in the 2 year ARI event along Wardell Rd and Jarvie Ave, up to 60mm along Bishop St and up to 150mm along Frazer St and Lawson Ave. Increases in flood levels of up to 40mm are observed along Wardell Rd but these are confined within the road corridor and within the Marrickville Oval. For the 1% AEP event water level reductions of up to 60mm are observed along Bishop St, Frazer St and Lawson Ave. Increases in flood levels of up to 60mm are observed along Wardell Rd but these are confined within the road corridor.

The increases along Wardell Road are attributed to changes in catchment inflows, which for the option are applied to the new pit and pipe network along Morgan Street.

FM 2.1**Description**

This option is to modify the basin outlet pit to install a 450mm outlet pit from the existing pit connected to a new pit with a high level inlet (approximately 500mm above the existing grate). In order to retain flows in a 20% AEP, the basin spillway to the north (approximately 9m wide) is raised to the existing 20% AEP flood level and modified to maintain the same spillway discharge for larger events. The objective of the proposed option is to throttle flows at the basin outlet to maximise basin flood attenuation up to the 20% AEP event. This option may result in reduced flooding for properties downstream of the basin in Livingstone Road and Petersham Road.

Modelling Results

The results highlight that the proposed option increases the detention depth in Marrickville oval by up to 160mm in the 2 year ARI event and hence water level reductions of up to 80mm are observed downstream for properties along Livingstone Rd, Brereton Ave, Petersham Rd, Sydenham Rd and Boland Ave. For the 1% AEP event increases in water levels of up to 50mm are observed within the basin and properties downstream along Livingstone Rd, Brereton Ave, Petersham Rd, Sydenham Rd and Boland Ave. This is due to overtopping of the basin which is resulting in increased flooding downstream. This is due to the limitations in the model grid

size to accurately fine tune the modified spillway to maintain the same flows. It is believed that refinements to the model setup would enable better results to be achieved for the 1% AEP with no increases in flood levels.

FM 2.3

Description

An existing 450mm diameter pipe runs along George St and connects to a 750mm diameter pipe along Livingstone Rd which then connects to a 750mm diameter pipe along Pile St. This option proposes a new 600mm diameter pipe with additional inlet pits along George St that will divert the runoff from George St and Livingstone Rd to the 1450mm X 2100mm box culvert underneath Centennial St via Hawkhurst St. This option may result in reduced flooding for properties along Livingstone Rd, Brereton Ave and Petersham Rd, which currently lie along an overland flow path from George St, Pile St and north of Marrickville Oval and experience approximately 30mm to 400mm depth of flooding in the 2 year ARI event.

Modelling Results

The results highlight that the proposed diversion provides water level reductions of up to 30mm in the 2 year ARI event along Livingstone Rd, Brereton Ave, and several adjoining properties. Minor increases in flood levels of up to 40mm are observed but these are confined within the open channel between Boland Ln and Centennial St. Minimal differences are observed in 1% AEP event.

FM 3.1

Description

An existing 1050mm diameter pipe carries stormwater flows from Petersham Rd to the open Western Channel near Northcote St via Jarvie Park. In this option, a new 1050mm diameter pipe will divert flows from Jarvie Park to the existing box culvert underneath Malakoff Street (Malakoff Tunnel). The proposed new connection to Malakoff Tunnel will be throttled with a 750mm diameter to eliminate afflux in the 1% AEP event. In addition, new inlet pits in Petersham Road (at sag), Northcote St and Carew Lane and a new 450mm pipe along Malakoff Street will be installed to pick up street flows and divert to the new connection to Malakoff Tunnel. These upgrades aim to alleviate flooding in Jarvie Park and for properties along Petersham Rd, Northcote St and Carew Ln, where approximately 10mm to 300mm depth of flooding is observed in the 2 year ARI event, by diverting flows to Malakoff Tunnel from Western Channel, which the downstream section is currently running at capacity in a 2 year ARI event.

Modelling Results

The results highlight that the proposed diversion and upgrades provide water level reductions of up to 100mm in the 2 year ARI event in Northcote St and Carew Ln. For the 1% AEP event water level reductions of up to 30mm are observed in Jarvie Park and for properties along Northcote St.

However, minor increases in water level of up to 10mm are observed along Convent Ln. These increases are caused due to the additional flows in the Malakoff Tunnel which is at capacity in the 1% AEP event. The addition of flows results in reduced capacity of the upper Malakoff Tunnel to accept flows from the Sydenham Rd area. This results in increases in water levels in the area thereby causing increased overland flow for properties along Convent Ln.

FM 3.2

Description

This option involves installation of a new 1200mm diameter pipe along Sydenham Rd starting at Petersham Rd and joining the existing box culvert underneath Malakoff Street (Malakoff Tunnel). Additional pits and pipes will connect Park Rd and Neville St drainage to this new pipe. This option will collect overland flows off Sydenham Rd and divert it from the Western Channel to Malakoff Tunnel aiming to have general water level reductions along the route of the pipe and adjacent areas.

Modelling Results

For the 2 year ARI event, water level reductions of up to 40mm are observed along Sydenham Rd, Northcote St, Carew Ln, Malakoff St, Warnam St, Despointes St and Peace Ln. Reductions in water levels of up to 130mm are observed in the Western Channel extending up to Garners Ln. For the 1% AEP event water level

reductions of up to 40mm are observed along Sydenham Rd, Northcote St, Carew Ln and Warnam St. For the 1% AEP event this option removed over floor flooding for 1 property.

FM 3.3

Description

This option includes a new 600mm diameter pipe along Sydenham Rd starting near Despointes St and connecting to the Western Channel box culvert underneath Illawarra Rd. This option will collect overland flows off Sydenham Rd and discharge to the Western Channel.

Modelling Results

For the 2 year ARI event, water level reductions of up to 20mm are observed at some locations along Sydenham Rd, Despointes St and Peace Ln. Increases of up to 40mm are observed in the Western Channel downstream of Peace Ln. For the 1% AEP event water level reductions of up to 30mm are observed along Illawarra Rd and increases of up to 50mm are observed in the Western Channel upstream and downstream of Peace Ln.

FM 3.4

Description

Existing 300mm and 450mm diameter pipes collect street runoff from Despointes St, Convent Ln, Peace Ln, Le Clos Ln, Illawarra Rd and Silver St. In this option, these pipes will be upgraded to 600mm diameter with additional inlet pits to help alleviate flooding along the streets where 200mm to 900mm depth of flooding is observed in the 2 year ARI event.

Modelling Results

For the 2 year ARI event, water level reductions in an order of 100mm to 500mm are observed on Despointes St, Convent Ln, Peace Ln, Le Clos Ln, Illawarra Rd and Silver St. Increases unto 250mm are observed in the Western Channel because of the proposed works.

For the 1% AEP event, the reductions of up to 300mm are observed in vicinity of the proposed works. Decreases in water levels also extended up to Sydenham Rd with reduction of 20mm to 150mm observed. However, increases in water levels are observed in the Western Channel and downstream of the channel in Garners Ln of up to 40mm to 600mm. This is attributed to the increases in water levels in the Western Channel.

FM3.6

Description

This option involves installation of a detention basin within the Wilkins School Oval. This will include lowering the oval by 600mm to provide approximately 2300m³ storage volume and throttling the outlet from the basin via a 300mm pipe to retain maximum flows in the basin.

Modelling Results

In a 2 year ARI flood event, retention of flows in the oval results in water levels reductions downstream in the channel by 150mm and minor decreases along Sydenham Rd, Carew Ln and Malakoff St. Slight increases of up to 40mm are observed on Sydenham Rd immediately downstream of the basin.

For the 1% AEP event, slight increases in water levels of up to 10mm are observed downstream of the basin along Petersham Rd, Sydenham Rd and Boland Ln. Decreases in water of up to 20mm are observed on Northcote St, Carew Ln, Malakoff St, Convent Ln and Warham Ln.

FM4.2

Description

This option divert flows from Chester St and Oxford St to Audley St via new 450mm diameters pipes and new pits. In addition, new thresholds are proposed on Chester St and Oxford St and dish drains are proposed across Oxford St and Chester St at Audley St to direct flows down Audley St.

Modelling Results

The results highlight that in a 2 year ARI event the proposed diversion of flows into Audley Street from Oxford Street and Chester Street results in reduction in water levels of up to 10mm along Maria St, Napier St and within Marrickville Oval. Minor increases in flood levels of up to 20mm are observed along Audley St and Mcrae St.

For the 1% AEP event, the extent of water level reductions is widespread. The reduction in flood levels is observed along Maria St, Morgan St, Napier St, Milner Ln, streets south of Sydenham Rd and within Marrickville Oval. The reduction in levels are in the order of 20mm to 30mm. Increases in water levels of up to 30mm are observed along Audley Street and Mcrae Street.

FM 5.2

Description

This option involves demolition of existing brick walls and structures built over the existing drainage easement between 80-82 Neville Street and 34-36 Park Road and upgrade the existing 300mm diameter pipe along this easement to a 450mm diameter pipe. The option may result in reduced flooding along Park Rd and Neville St, however, may have small increases in flooding downstream of Neville St due to the additional flow coming through the drainage easement.

Modelling Results

The results highlight that the proposed upgrades provide localised water level reductions of up to 170mm in the 2 year ARI event for a few properties along Park Rd and Neville St. However, increases in water levels of up to 50mm are observed along Surrey St, Essex St, several adjoining properties and at the Addison Road Community Centre. For the 1% AEP event water level reductions of up to 50mm are observed for a few properties along Park Rd and Neville St and increases in water levels of up to 20mm along Surrey St, Essex St and at the Addison Road Community Centre.

FM 5.3 and FM 5.4

Description

The existing 750mm diameter pipes along Addison Rd between Park Rd and East St have capacity to take more flows based on the pipe capacity assessment (**Section 5.4**). In this option, new 600mm diameter pipes with additional inlet pits between Park Rd and Gordon Ln will divert the overland flows to the existing Addison Rd 750mm pipe network with additional capacity. In addition, the road levels (thresholds) at the intersections of Park St, Neville St and Essex St with Addison Rd will be raised by 100mm to prevent overtopping of overland flows from Addison Rd.

Modelling Results

The results highlight that the proposed raising of road thresholds and new pipes provide water level reductions of up to 50mm in the 2 year ARI event along Neville Ln, Surrey St, Essex St and at the Addison Road Community Centre. For the 1% AEP event water level reductions of up to 30mm are observed along Park Rd, Neville Ln, Surrey St, Essex St, Charles St and at the Addison Road Community Centre. For the 1% AEP event this option removed over floor flooding for 4 properties.

FM 5.6

Description

Existing 300mm to 375mm diameter pipes collect street runoff from Illawarra Rd, York St and Shepherd St and discharge into the Eastern Channel which traverse these streets. The pipes will be upgraded to 450mm diameter to help alleviate overland flooding from Addison Road.

Modelling Results

For the 2 year ARI event, water level reductions of up to 400mm are observed along York St, 150mm along Illawarra Rd and Meeks Ln, and 50mm along Shepherd St, Meeks Ln and Handley St. Increases of up to 260mm are observed in the Eastern Channel downstream of Meeks Ln. These are confined within the open channel. For the 1% AEP event water level reductions of up to 120mm are observed along York St, 60mm along Illawarra Rd, Shepherd St, Meeks Ln, Handley St, Jazeb St, Denby St, Brompton St, Cook Rd and Smith St. However, minor increases of up to 10mm are observed in the Eastern Channel downstream of Meeks Ln and also for properties along Fitzroy St, Lillian Fowler St, Saywell St and Sydenham pit. This is attributed to

the increases in flow in the Eastern Channel causing flows to breakout of the channel along Smith St. For the 1% AEP event this option removed over floor flooding for 14 properties.

A possible solution could be to raise the channel walls to prevent the breakout. This option can be optimised to resolve these issues during future investigation and design stages.

FM5.9

Description

This option includes a new 825mm diameter pipe along Essex St and through the backyards of eight (8) properties along Surrey St and Gordon Sq. The pipe will be connected to the existing downstream network via a surcharge pit. In addition, new inlet pits will be installed along Essex St and Surrey St.

Modelling Results

For the 2 year ARI event, water level reductions of up to 200mm are observed along Surrey St, Essex St and properties downstream of the proposed pipe. Minor increases in water levels of up to 10mm are observed along Agar Rd, Illawarra Rd York St, Shepherd St and Meeks Ln.

In the 1% AEP event, water level reductions of up to 50mm are observed along Surry St, Essex St and Charles St.

FM 6.1

Description

An existing 300mm diameter pipe on Newington Rd between Wemyss St and England Ave diverts runoff from Brown Ave and Wemyss St to a 1050mm diameter interallotment drainage pipe that runs between the rear of properties along England Ave and Agar St and connects to Addison Rd drainage. This pipe will be upgraded to a 600mm diameter pipe with additional inlet pits and a new 600mm diameter pipe along the other side of Newington Rd will collect and convey additional flows to the existing 1050mm diameter pipe. This option may help alleviate flooding for the properties along England Ave and Agar St where approximately 30mm to 230mm depth of flooding is observed in the 2 year ARI event.

Modelling Results

The results demonstrate that the proposed upgrade and new pipe provides water level reductions of up to 40mm in the 2 year ARI event for properties along England Ave and Agar St. Minor increases of up to 30mm are observed on Newington Rd but these are within the road reserve. For the 1% AEP event minor water level reductions **of up to 20mm are observed along few properties along England Ave and Agar St.**

FM 6.4

Description

This option involves new 600mm diameter pipes and inlet pits along England Ave, Agar St and Wemyss St. These pipes will divert overland flows to the drainage lines along Addison Rd which have additional capacity. This option may result in water level reductions for properties north and south of Addison Rd where approximately 20mm to 650mm depth of flooding is observed in the 2 year ARI event.

Modelling Results

For the 2 year ARI event, water level reductions of up to 20mm are observed along Illawarra Rd, York St, Shepherd St, and Meeks Ln. For the 1% AEP event water level reductions of up to 20mm are observed along England Ave, Addison Rd, Shepherd St, Meeks Ln, Denby St, Brompton St, Cook Rd and Smith St. However minor increases of up to 20mm are observed in a 1% AEP event at some properties along England Ave and Agar St. Minor increases of up to 30mm are also observed in the Eastern Channel and Sydenham pit due to the increased flows upstream in the pipe network. This has attributed to the increase in flow in the Eastern Channel. For the 1% AEP event this option removed over floor flooding for 4 properties.

FM 7.1 and FM 7.5

Description

This option involves a new 600mm diameter pipe along Cook Rd and Enmore Rd to connect to a new 1800mm x 600mm box culvert along Smith St that will connect to the existing open channel (Eastern Channel) at the

back of the properties along Smith St. This may help alleviate flooding along Cook Rd, Enmore Rd, Smith St and Victoria Rd where approximately 100mm to 400mm depth of flooding is observed in the 2 year ARI event.

In addition, a new 600mm diameter pipe along Denby St together with raised road threshold levels at the intersection of Denby St with Addison Rd may prevent overtopping of overland flows from Addison Rd and reduce flooding along Denby St where approximately 100mm to 800mm depth of flooding observed in the 2 year ARI event.

Modelling Results

For the 2 year ARI event, water level reductions of up to 110mm on Brompton St, 50mm on Cook Rd and Enmore Rd, 100mm on Victoria and 300mm on Smith St are observed. Increases of up to 90mm are observed in the open channel. No impacts are observed near Denby St.

For the 1% AEP event water level reductions of up to 50mm are observed along Enmore Rd and Smith St, up to 40mm along Victoria Rd between Enmore Rd and Central Ln, and for properties on the eastern side of Victoria Rd. Increases of up to 30mm are observed in the open channel, properties along Fitzroy St and the Sydenham pit. Water level reductions of up to 50mm are observed along Addison Rd and Philpott St. For the 1% AEP event this option removed over floor flooding for 6 properties.

FM7.6

Description

This option includes installation of new 600mm, 750mm, 900mm and 1050mm diameter pipes on Addison Rd and Philpott St. In addition, new inlet pits will be stalled at the sag of Addison Road to convey more flows into the existing drainage network underneath Addison Road.

Modelling Results

For the 2 year ARI event, water level reductions of up to 200mm are observed along Denby St, Addison St, Cook St and Brompton St due to the diversion of flows into the existing drainage network which has additional capacity. For the 1% AEP event, the extent of reduction is widespread with water level reductions of up to 50mm observed along Addison Rd and Cook Rd.

FM 8.1 and FM 8.2

Description

An existing 600mm diameter pipe along Arthur St connects to a 1050mm diameter pipe underneath the railway corridor which then connects into the Malakoff Tunnel underneath McNeilly Park. It is proposed that a new 900mm diameter pipe will connect the existing 600mm diameter pipe to the Malakoff Tunnel underneath Arthur St. In addition, a new 600mm diameter pipe along Robert St will connect to the existing 600mm diameter pipe along Arthur St.

This option could help alleviate flooding along Livingstone St, Arthur St, Warburton St, Jersey St, Illawarra Rd and the railway corridor where approximately up to a 1m depth of flooding is observed in the 2 year ARI event.

Modelling Results

For the 2 year ARI event water level reductions of up to 50mm are observed along Livingstone St, Arthur St, Illawarra Rd, the railway corridor and Western Channel. For the 1% AEP event widespread reductions of up to 50mm are observed at McNeilly Park and along Illawarra Rd, Byrnes St, O'Hara St, Myrtle St, Carrington Rd and at Mackey Park. However, widespread increases in water levels of up to 70mm are observed along properties south of Sydenham Rd between Northcote St and Garners Ave and in the Marrickville Industrial Area (MIA) including the Sydenham Pit.

In the 1% AEP event Malakoff Tunnel is running at capacity between Malakoff St and McNeilly Park, hence the addition of flows at Arthur St results in reduced capacity of the upper Malakoff Tunnel to accept flows from the Sydenham Rd area. This results in increases in water levels in the area thereby causing increased overland flow along properties south of Sydenham Rd and diverting flows down Sydenham Rd to the MIA which increases loads on the Sydenham Rd and MIA drainage networks.

A possible solution could be to connect the new 900mm diameter pipe to Malakoff Tunnel downstream of McNeilly Park where it has capacity for PMF flows as shown in the pipe capacity assessment (**Section 5.4**). This option can be optimised to resolve these issues during future investigation and design stages.

For the 1% AEP event this option removed over floor flooding for 22 properties.

FM8.3

Description

This option includes a new 1050mm pipe to divert flow from Marrickville Road to Livingston Road via Harney St, Pine St and Hollands Ave. A 1200mm pipe will be installed from bottom of Hollands Ave via the rail corridor to a 8000m³ storage under McNeilly Park. The underground storage will connect to Malakoff Tunnel via a new 450mm pipe. In addition, new inlet pits will be installed along Marrickville Rd, Pine St and Hollands Ave to utilise the additional capacity.

Modelling Results

The 2 year ARI event results highlight reductions in water levels along the flowpath of up to 200mm. Slight increases of up to 70mm are seen at McNeilly Park but these increases are confined to the park reserve and rail corridor. For the 1% AEP event, the reduction in water levels along the flowpath are up to 150mm.

FM 9.1

Description

This option includes installation of new 450mm and 600mm diameter pipes with inlet pits at the intersection of Livingstone Road and Marrickville Road. A new 900mm pipe will convey all the upstream flows along Marrickville Road up to Petersham Road. From bottom of Petersham Rd a new 1500mm pipe will connect to a 100m³ underground storage which will connect to the existing 2.9m X 2.9m box culvert underneath Malakoff St (Malakoff Tunnel). This option may help alleviate flooding for the properties along Illawarra Road and Central Avenue. This option may also help alleviate flooding for the properties along Lilydale St, Marrickville Rd, Petersham Rd and Malakoff St where approximately 20mm to 300mm depth of flooding is observed in the 2 year ARI event.

Modelling Results

The 2 Year ARI event results highlight that the proposed drainage works eliminate flooding on Marrickville Rd between Livingstone Rd and Fletcher St and between Malakoff St and Illawarra Rd. Water level reductions of up to 100mm are observed for properties along Cecilia St, Carew Ln and Malakoff St. The results show that approximately 1.8m³/s of flows are diverted into the Malakoff Tunnel.

For the 1% AEP event water level reductions of up to 100mm are observed at a few properties along Depot Ln and at the intersection of Livingstone Rd and Marrickville Rd. Due to the proposed works flooding is removed on Marrickville Rd between Malakoff St and Illawarra Rd. However increases of up to 60mm are observed along Western Channel at Malakoff St, Convent Ln, Despointes St and Peace Ln. Increases up to 20mm are seen along Sydenham Road and areas downstream. These increases at the upstream end of Malakoff Tunnel are caused due to the additional flows in the Malakoff Tunnel which is at capacity in the 1% AEP event.

This option may also be more effective in combination with another option which reduces flows entering Malakoff Tunnel at the upstream end near Sydenham Road

FM 10.1

Description

An existing 450mm diameter pipe along Marrickville Rd connects to a 750mm diameter pipe underneath Fraser Park. A new 600mm diameter pipe with inlet pits will re-direct flows from Marrickville Rd to Sydenham Rd via Barclay St.

Modelling Results

For the 2 year ARI event the proposed diversion provides water level reductions of up to 140mm along Barclay St, 60mm along Marrickville Rd and 20mm at Fraser Park. No differences are observed in the 1% AEP.

FM10.2***Description***

This option involves diversion of flows from Carrington Rd to pump station (SPS271). A new 600mm diameter pipe will be installed between Harriet St and Myrtle St and new 750mm and 900mm diameter pipes will be installed from Myrtle St to the pump station (SPS271).

Modelling Results

Diverting the flows from Carrington Rd to the pump station results in reduction in water levels of up to 300mm on Carrington Rd in a 2 year ARI event. For the 1% AEP event, the modelling results show up to 30mm reduction in water levels on Carrington Rd. Minor increases are observed along the open channel next to the pump station but these increases are confined to the rail corridor.

FM 10.4***Description***

This option involves a new 900mm diameter pipe with inlet pits along Myrtle St which will divert flows from Charlotte Ave to the Western Channel. This option may help alleviate flooding for properties along Charlotte Ave and Myrtle St where up to 700mm depth of flooding is observed in the 2 year ARI event.

Modelling Results

For the 2 year ARI event the proposed new pipe provides water level reductions of up to 160mm along Victoria Rd at the rail bridge, 700mm for the property along Myrtle St and 30mm along Carrington Rd. Increases of up to 50mm are observed in the Western Channel. For the 1% AEP water level reductions of up to 50mm are observed along Victoria Rd at the rail bridge and Myrtle St.

FM 11.1 and FM 11.2***Description***

This option involves construction of an overland flowpath along the north-eastern boundary of Tillman Park from Unwins Bridge Rd to the railway culvert and along the south-western boundary of Tillman Park from the Early Learning Centre to the railway culvert. This option may alleviate flooding along Unwins Bridge Rd where up to 900mm depth of flooding is observed in the 2 year ARI event.

Modelling Results

The modelling results highlight that this option provides water level reductions of up to 150mm along Unwins Bridge Rd and up to 220mm at the Early Learning Centre for the 2 year ARI event. Increases of up to 900mm are observed downstream but these are mainly along the constructed overland flowpaths and are confined to the Park. For the 1% AEP event water level reductions of up to 230mm are observed at several locations along Unwins Bridge Rd, Terry Street, Belmore St and Railway Rd. For the 1% AEP event this option removed over floor flooding for 12 properties.

FM 11.3***Description***

An existing 525mm diameter and 600mm diameter pipe on Unwins Bridge Rd connects to twin 900mm diameter pipes underneath Tillman Park. In this option, new 600mm diameter pipes along Unwins Bridge Rd and Terry St will connect to the existing twin pipes to divert additional overland flows. This option may result in decreases in flood levels along Unwins Bridge Rd and surrounding areas where up to 900mm depth of flooding is observed in the 2 year ARI event.

Modelling Results

For the 2 year ARI event up to 80mm decreases in water levels are observed along Unwins Bridge Rd and Belmore St. Increases of up to 600mm are observed downstream but these are mainly confined to the Park. For the 1% AEP event water level reductions of up to 20mm only are observed at several locations along Unwins Bridge Rd, Terry Street, Belmore St, Railway Rd and Tillman Park. For the 1% AEP event this option removed over floor flooding for 3 properties.

FM 11.4

Description

An existing 675mm diameter pipe along Unwins Bridge Rd connects into a 900mm diameter and 750mm diameter pipe along Bridge St. A new 450mm diameter pipe and additional inlet pits along Unwins Bridge Rd near Bridge St will divert additional runoff to the existing pipes along Bridge St. This option may result in decreases in flood levels along Unwins Bridge Rd where up to 900mm depth of flooding is observed in the 2 year ARI event.

Modelling Results

For the 2 year ARI event up to 80mm decreases in water levels are observed along Unwins Bridge Rd and up to 20mm along Belmore St. For the 1% AEP event minor water level reductions of up to 50mm are observed along Unwins Bridge Rd. For the 1% AEP event this option removed over floor flooding for 2 properties.

FM 12.1 and FM 12.2**Description**

Existing 450mm diameter pipes along Renwick St, Cary St and Premier St and discharge into the Western Channel. New 750mm diameter pipes and inlet pits will collect additional overland flows from these streets and discharge into the Western Channel. This option aims to reduce flooding along the streets and intercept runoff from bypassing the Western Channel and entering Central Channel along Carrington Rd thereby reducing flooding along Carrington Rd.

Modelling Results

For the 2 year ARI event decreases in water levels in the order of 20mm to 60mm are observed along Renwick St and Carrington Road. Increases in flood levels are seen in the Western Channel between Renwick St and Cary St due to additional flows. For the 1% AEP event decreases in water levels up to 80mm are observed along Renwick St. Increases in flood levels are seen in the Western Channel between Renwick St and Cary St due to additional flows and also up to 40mm for some properties along Renwick St. For the 1% AEP event this option removed over floor flooding for 3 properties.

FM 12.4**Description**

During set-up this option was optimised to include installation of a weir to 1.1m AHD in the central channel to divert the flows into the Mackey Park pump station (DPS2). The proposed option is to prevent the backflow from the Cooks River in the Central Channel entering the pump station and thereby optimising the pump station operations at Mackey Park to pump more catchment flows away from the area. The aim is to reduce flood levels on Carrington Road and surrounding industrial area.

Modelling Results

The modelling results show that the reduction in flood levels in a 2 year ARI event are in the order of 20mm to 120mm in vicinity of Carrington Road, Renwick St east of Carrington Rd and along the Central Channel alignment. Maximum reductions up to 120mm are observed at a low point on Renwick Street. In a 1% AEP event the impacts are negligible due to the large volume of water stored in the area.

Further optimisation of this option could be to explore increasing the capacity of pumps to achieve further reductions in flood levels.

FM 12.5**Description**

The proposed option is to raise the Western Channel wall between Renwick St and Cary St to prevent overflows into adjacent properties and in Cary Street. Reduction in flood levels are expected in Cary Street and Renwick Street

Modelling Results

Raising the channel wall prevents the over flow entering the properties on the eastern side of the channel between Renwick Street and Cary Street in a 2 year ARI event. In a 1% AEP event the impacts are minor. This option does not provide major benefits as expected for properties along Renwick St and Cary St near the

channel due to the topography grading back towards the channel. The raised wall traps some water behind it preventing it from entering back into the channel.

FM 13.1, FM 13.2 and FM 13.5

Description

This option involves duplicate the existing 1500mm x 700mm box culvert underneath the railway corridor. This option may help alleviate flooding on Unwins Bridge Rd and Gannon St where up to 700mm depth of flooding is observed in the 2 year ARI event. In addition, new large inlet pits will be installed at the intersection of Gannon St, Griffiths St and Unwins Bridge Rd (at sag).

Modelling Results

The modelling results highlight that the proposed new pits and box culvert reduces water levels up to 500mm at the intersection of Gannon St, Griffiths St and Unwins Bridge Road in a 2 year ARI event. For the 1% AEP event, the reduction in water levels are up to 150mm. Minor increases in water levels of up to 10mm are observed along the Eastern Channel due to the additional flows from the new box culvert.

FM13.4

Description

This option involves diverting part of the catchment that drains to Tramway St to a new 1050mm pipe along Edgar St. This option would not be effected by backwater from the Eastern Channel due to higher elevation enabling pressurisation of the system under the railway corridor. In addition, new inlet pits and pipes will be installed at the intersection of Unwins Bridge Rd and Tramway St.

Modelling Results

The modelling results highlight that the proposed diversion of flows would result in reduction of water levels up to 50mm at the intersection of Gannon St, Griffiths St and Unwins Bridge Rd. For the 1% AEP event reductions of up to 10mm are observed. Minor increases in water levels of up to 10mm are observed along the Eastern Channel due to the additional flows from the new pipe.

FM 14.1

Description

Existing 600mm diameter pipes connect inlet pits at the intersection of Unwins Bridge Rd and Sutherland St to a 675mm diameter pipe that passes underneath the railway line and connects to the Eastern Channel. These pipes will be upgraded to 1200mm diameter pipes. This option may result in decreases in flood levels along Unwins Bridge Rd and surrounding areas by discharging additional flows into the Eastern Channel. Greater than 1m flood depth is observed in some of these areas for the 2 year ARI event.

Modelling Results

The modelling results highlight that the proposed upgrades provide water level reductions of up to 150mm along the railway corridor and for a few properties along Bolton St and up to 30mm along Unwins Bridge Rd. For the 1% AEP event additional reductions of up to 80mm are observed along George St, Hogan Ave, Sutherland St and Briar Ln.

For the 1% AEP event this option removed over floor flooding for 1 property.

FM 15.1 and FM 15.2

Description

For Victoria Rd north of Sydenham Rd up to 300mm depth of flooding is observed in the 2 year ARI event. Two 450mm diameter pipes on either side of the road discharge runoff into an existing box culvert underneath the Victoria Rd and Sydenham Rd intersection which connects to the Sydenham pit. The pipe along the eastern side of the road will be extended and upgraded to a 600mm diameter pipe to help alleviate flooding in the area.

For Victoria Rd south of Sydenham Rd up to 500mm depth of flooding is observed in the 2 year ARI event. Two 375mm diameter pipes on either side of the road discharge runoff into an existing box culvert underneath the Victoria Rd and Sydenham Rd intersection which connects to the Sydenham pit. The pipe

along the eastern side of the road will be extended and upgraded to 600mm diameter pipe to help alleviate flooding in the area.

In addition, new 600mm diameter pipes along Victoria Ln and Meeks Ln will collect additional flows and convey them to the Sydenham pit.

Modelling Results

For the 2 year ARI event less than 20mm reductions in water levels are observed along Victoria Rd north of Sydenham Rd, no reductions along Victoria Rd south of Sydenham Rd and up to 20mm reductions along Victoria Ln, Meeks Ln and Vincent St. For the 1% AEP event no impact on flood behaviour is observed.

While this option does not provide any benefit in the 1% AEP event, this option combined with FM 15.3 could provide water level reductions in the area as FM 15.3 provides increased capacity in the network along Sydenham Rd, Sloane St and Saywell St.

FM 15.3

Description

This proposed option is to divert flows from Buckley St and Wilkinson Ln into Shirlow St via a new 1500mm diameter pipe to the Sydenham pit. This option may alleviate flooding in the vicinity of the proposed works.

Modelling Results

The modelling results show there are negligible benefits for the 2 year ARI event but for the 1% AEP event the extent of reduction in flood levels is significant with reductions of up to 200mm observed along Shirlow St and Garden St. The reductions on Buckley St and Sydenham Rd are up to 80mm. The increases in levels in the Sydenham pit is due to the additional flows. This option provides increased capacity in the network along Sydenham Rd, Sloane St and Saywell St, which could provide opportunity for upgrades in the western industrial area catchments to improve flooding in those areas.

For the 1% AEP event this option removed over floor flooding for 7 properties.

FM 15.5

Description

An existing 450mm diameter pipe along Faversham St will be upgraded to a 600mm diameter pipe. This option will provide additional capacity and collect overland flows off Faversham St.

Modelling Results

The modelling results highlight that this option has no impact on flood behaviour in the 2 year ARI and 1% AEP event. While this option has resulted in increased flows through the upgraded pipe, these are minor and hence do not provide any benefits to flooding.

FM 15.7

Description

An existing 600mm diameter pipe along Vincent St and Sydney St connects to a 1050mm diameter pipe along Sydenham Rd. A new 600mm diameter pipe along Sydney St and 900mm diameter pipe along Vincent St will collect the overland flows and discharge downstream to the existing 1050mm diameter pipe that eventually discharges into the Sydenham Pit. This option may alleviate some of the flooding identified in the surrounding area.

Modelling Results

The results highlight that while although up to 100mm reduction in water levels are observed along Sydney St, there is an increase in flood levels up to 10mm along Vincent St for the 2 year ARI event. The increases are a result of the additional flows in the downstream 1050mm diameter pipe from the new 600mm diameter pipe along Sydney St. This pipe is currently at capacity in a 2 year ARI event and the additional flows have surcharged onto Vincent St causing increased flooding. Similarly, for the 1% AEP event increases in water level are observed along Sydenham Rd and Barclay St.

While this option does not provide much benefit and causes increases in flood depths along Vincent St and Barclay St, this option combined with FM 15.3 could provide water level reductions in the area as FM 15.3 provides increased capacity in the network along Sydenham Rd, Sloane St and Saywell St.

FM 15.9

Description

The proposed option is to duplicate the existing 2000mm x 1200mm box culvert underneath Saywell St between Cadogan Lane and Sloane St and duplicate the existing 3000mm x 1200mm box culvert underneath Saywell St between Sloane St and the Sydenham pit. A new junction chamber will be installed to connect existing and new culverts. A number of new large inlet pits are proposed to take more flows into the proposed pipe network. This option is expected to reduce flood levels in the industrial area between Saywell St and Sydenham Rd.

Modelling Results

The modelling results show there are negligible benefits for the 2 year ARI event as this area only has small depths of flooding in the 2 year ARI event. For the 1% AEP event decreases in flood levels of up to 500mm are observed within the industrial area. The reduction of flood levels between Sydenham Rd and Marrickville Rd are in an order of 100mm to 150mm. Maximum reduction of flood levels are seen on Saywell St, Sydenham Rd, Shirlow St, Sloane Ln, Sloane St, Cadogan Ln and Cadogan St. The increases in water levels in the Sydenham pit are due to the additional flows. For the 1% AEP event this option removed over floor flooding for 17 properties.

It is likely that this option could be optimised for the 2 year ARI event by providing additional inlet pits in flooded areas such as between Sydenham Rd and Marrickville Rd as the underground network now has additional capacity to accept more flows from these areas.

FM 15.10

Description

This option is a combination of FM15.3 and FM15.9. The proposed works are to divert flows from Buckley St and Wilkinson Ln into Shirlow St via a 1500mm diameter pipe to Sydenham pit along with duplication of the existing drainage network in Saywell Street. This upgrade includes duplication of the existing 2000mm x 1200mm box culvert between Cadogan Lane and Sloane St and duplication of the existing 3000mm x 1200mm box culvert between Sloane St and Sydenham Pit.

Modelling Results

The modelling results show there are negligible benefits for the 2 year ARI event as this area only has small depths of flooding in the 2 year ARI event. For the 1% AEP event decreases in flood levels of up to 600mm are observed within the industrial area. The reduction of flood levels are seen in the industrial area between Marrickville Rd and Saywell St. Maximum reduction of flood levels in the order of 200mm to 600mm are seen on Marrickville Rd, Barclay St, Buckley St, Sydenham Rd, Shirlow St, Sloane Ln, Sloane St, Cadogan Ln, Cadogan St and Saywell St. The increases in water levels in the Sydenham pit are due to the additional flows. For the 1% AEP event this option removed over floor flooding for 23 properties.

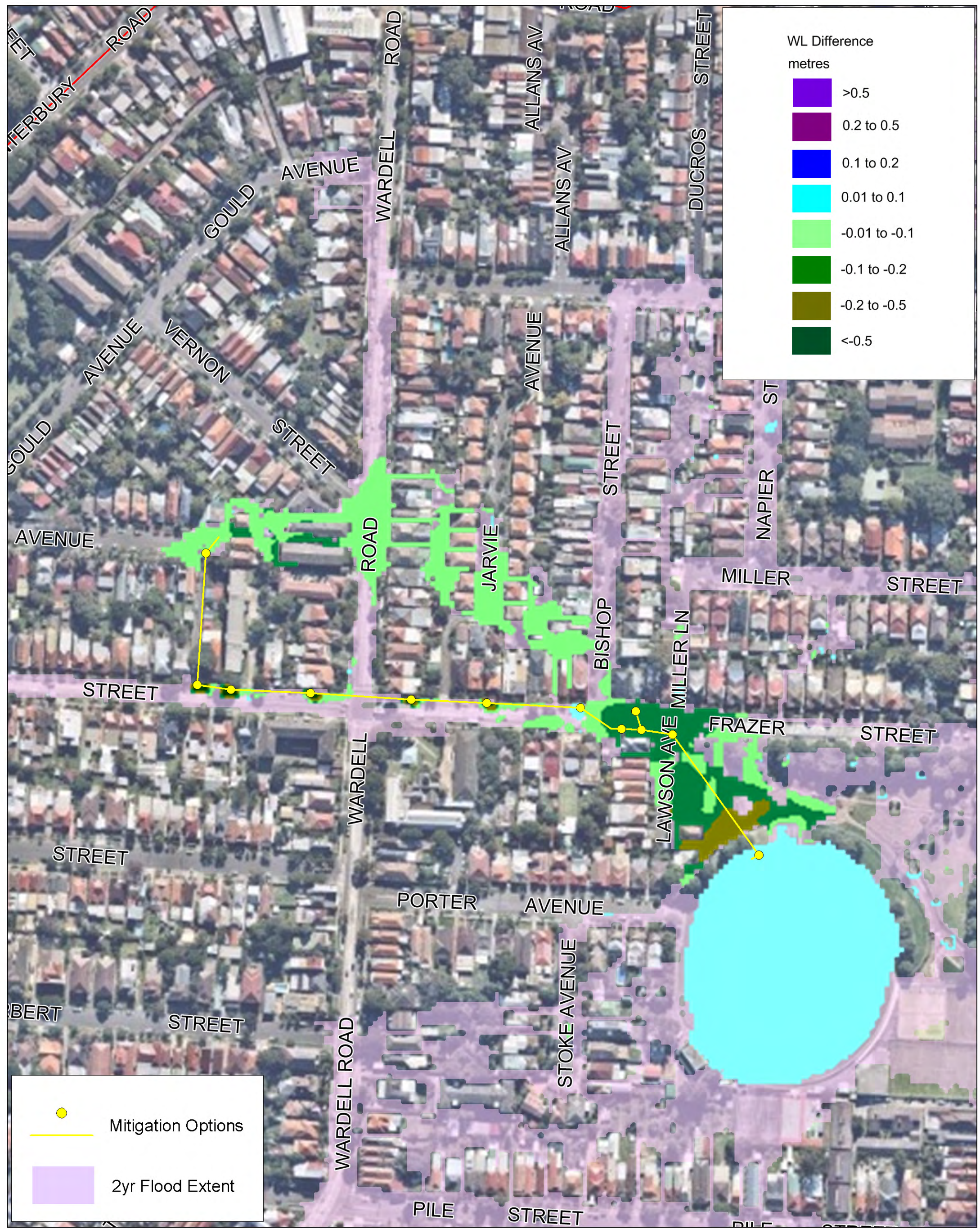
As per FM 15.9, it is likely that this option could be optimised for the 2 year ARI event by providing additional inlet pits in flooded areas such as between Sydenham Rd and Marrickville Rd as the underground network now has additional capacity to accept more flows from these areas.

Marrickville Valley Floodplain Risk
Management Study and Plan

APPENDIX

A1

OPTIONS WATER LEVEL DIFFERENCES



**Water Level Difference
2 Yr
Option FM1.1**

MARRICKVILLE VALLEY FRMS&P



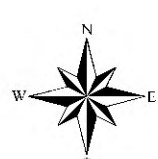
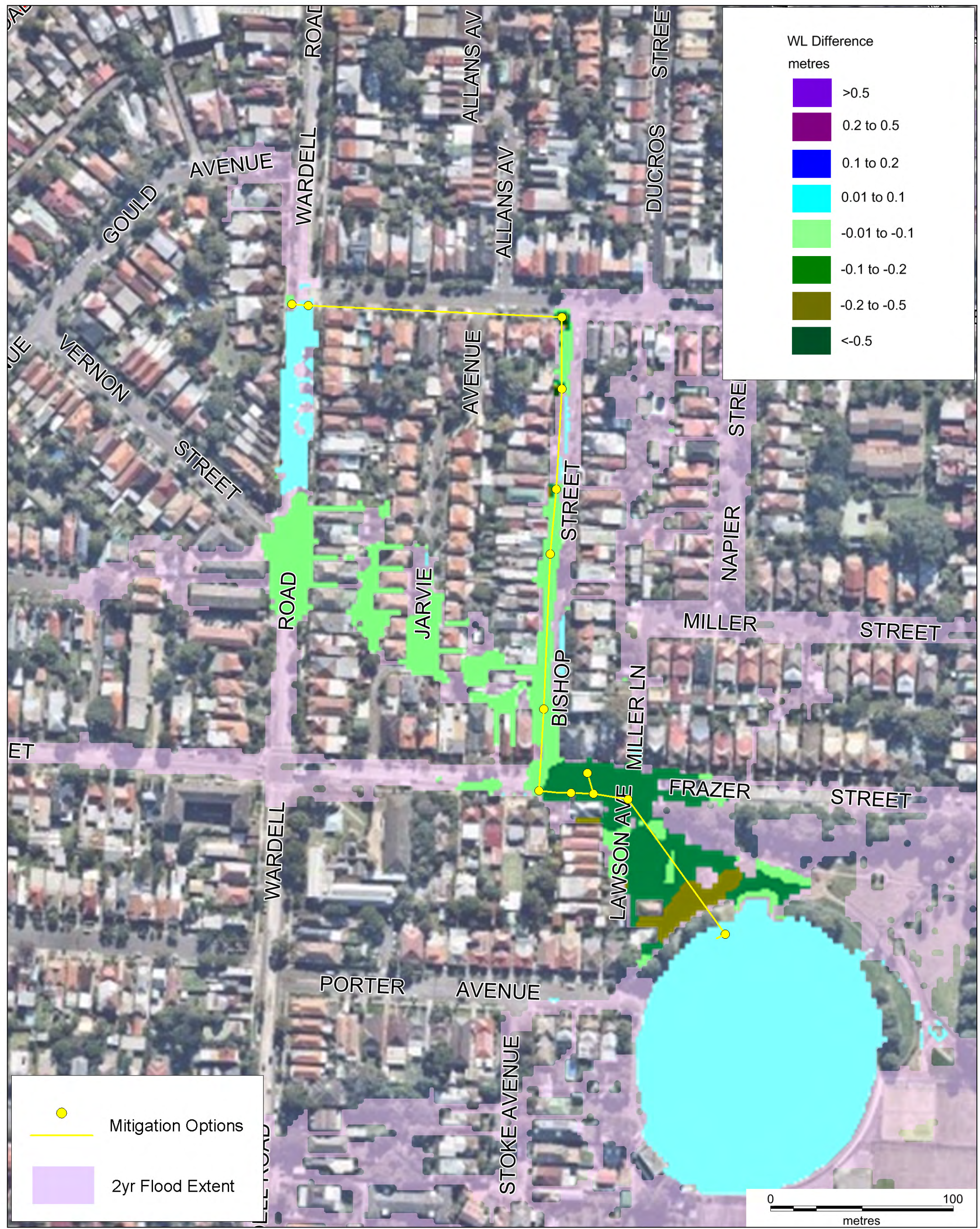
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Water Level Difference
1% AEP
Option FM1.1
MARRICKVILLE VALLEY FRMS&P



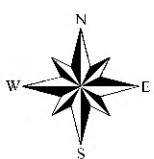
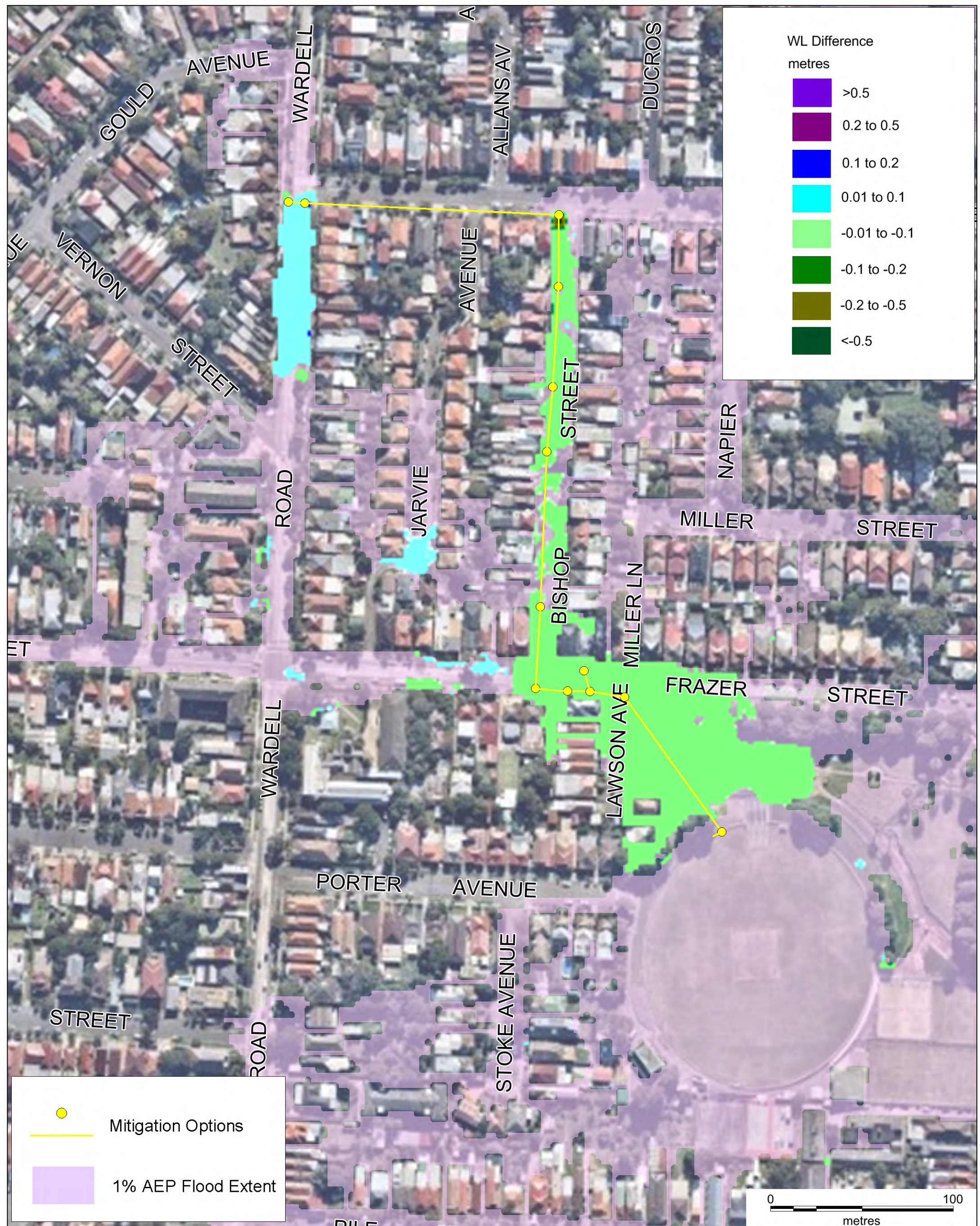
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Water Level Difference
2 Yr
Option FM1.2
MARRICKVILLE VALLEY FRMS&P



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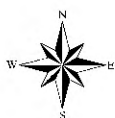
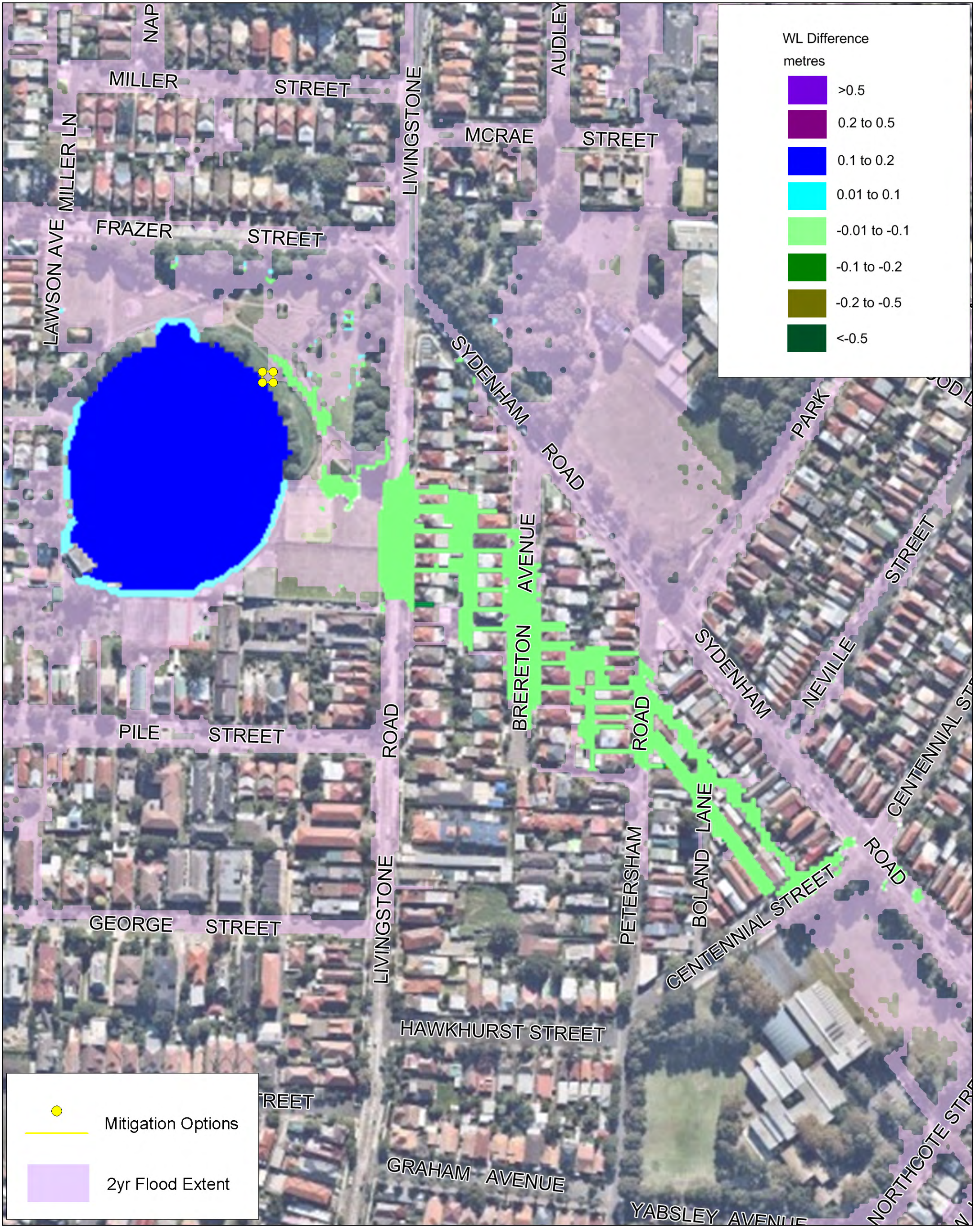


**Water Level Difference
1% AEP
Option FM1.2**

MARRICKVILLE VALLEY FRMS&P



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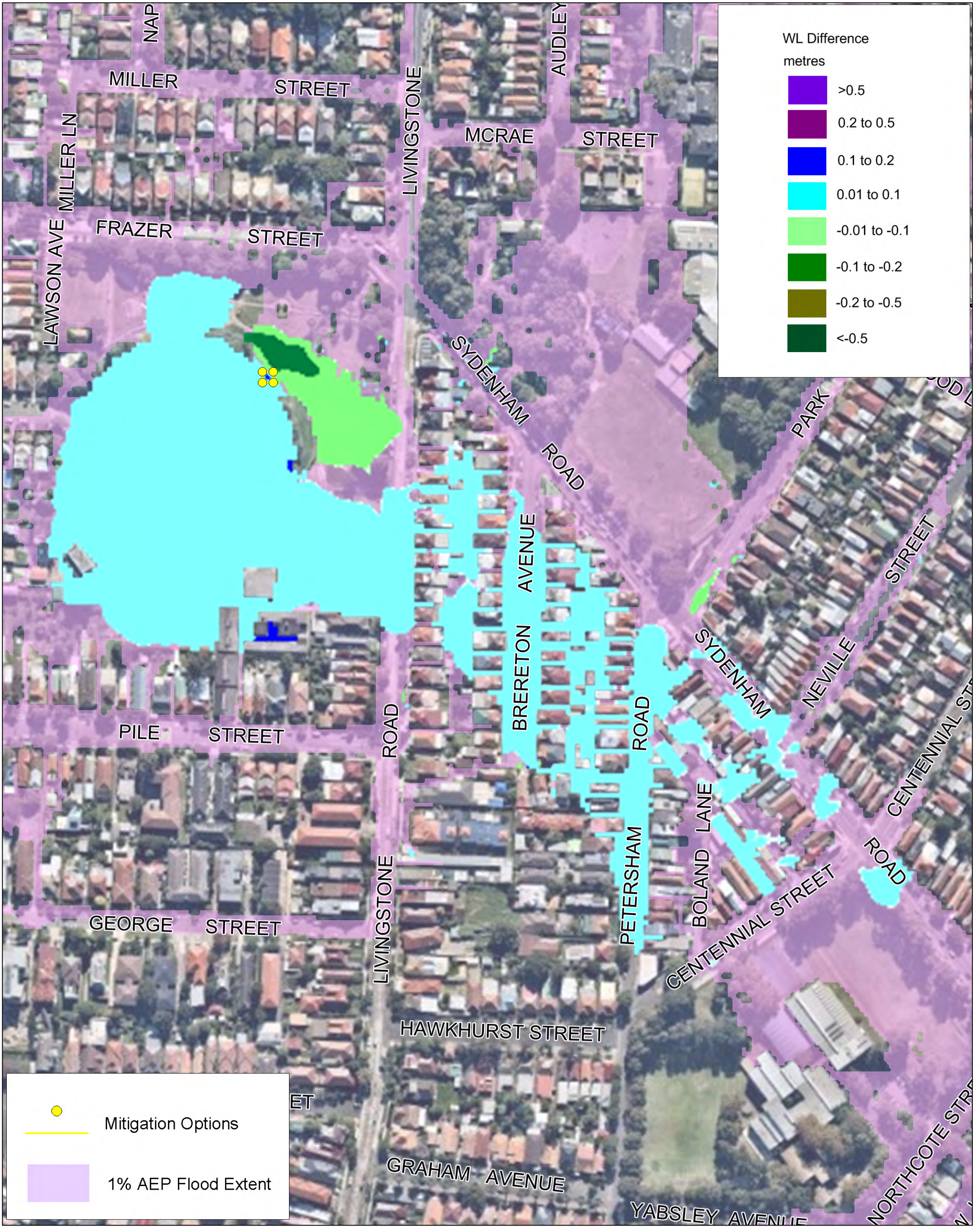


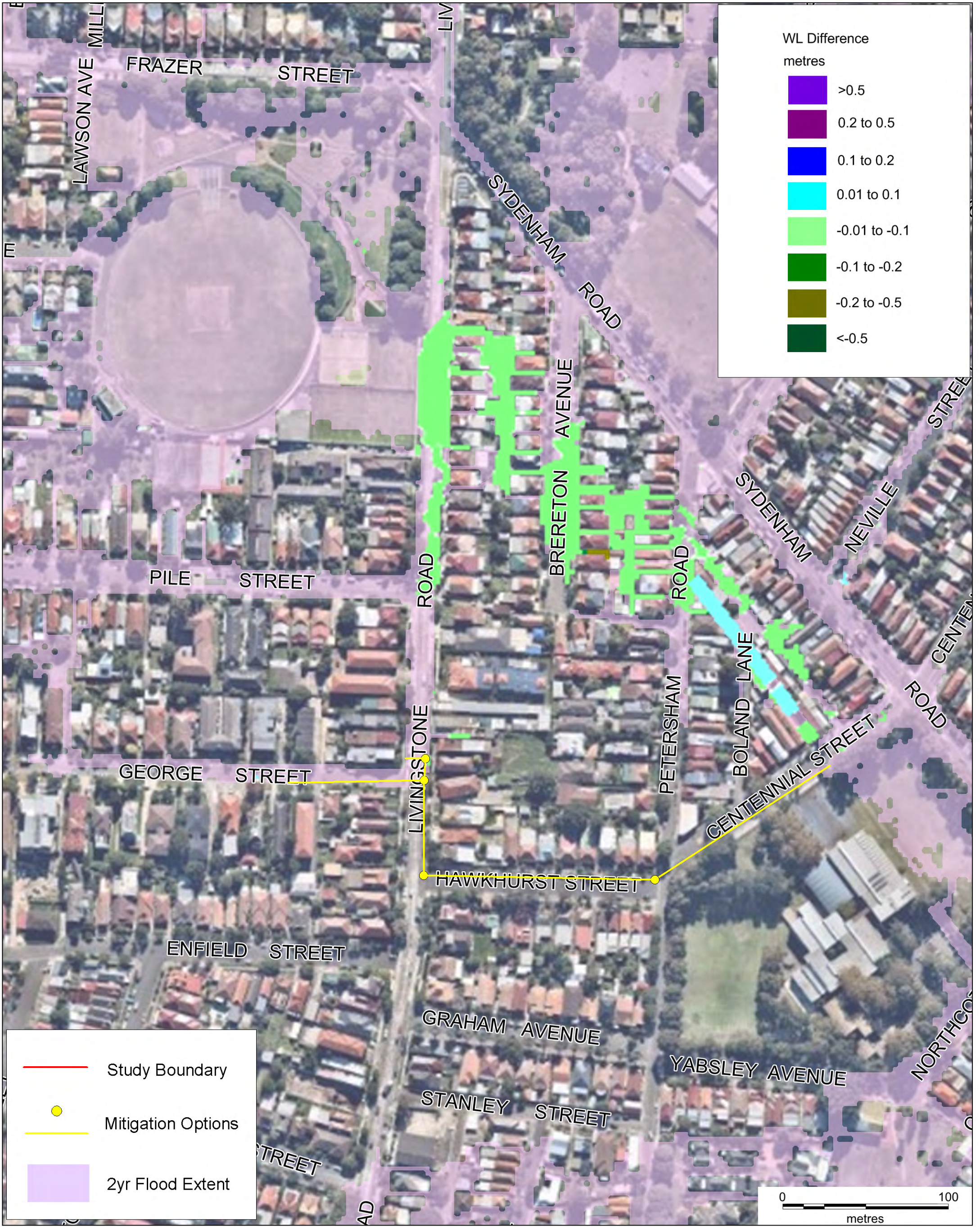
**Water Level Difference
2 Yr
Option FM 2.1**

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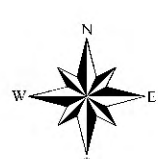
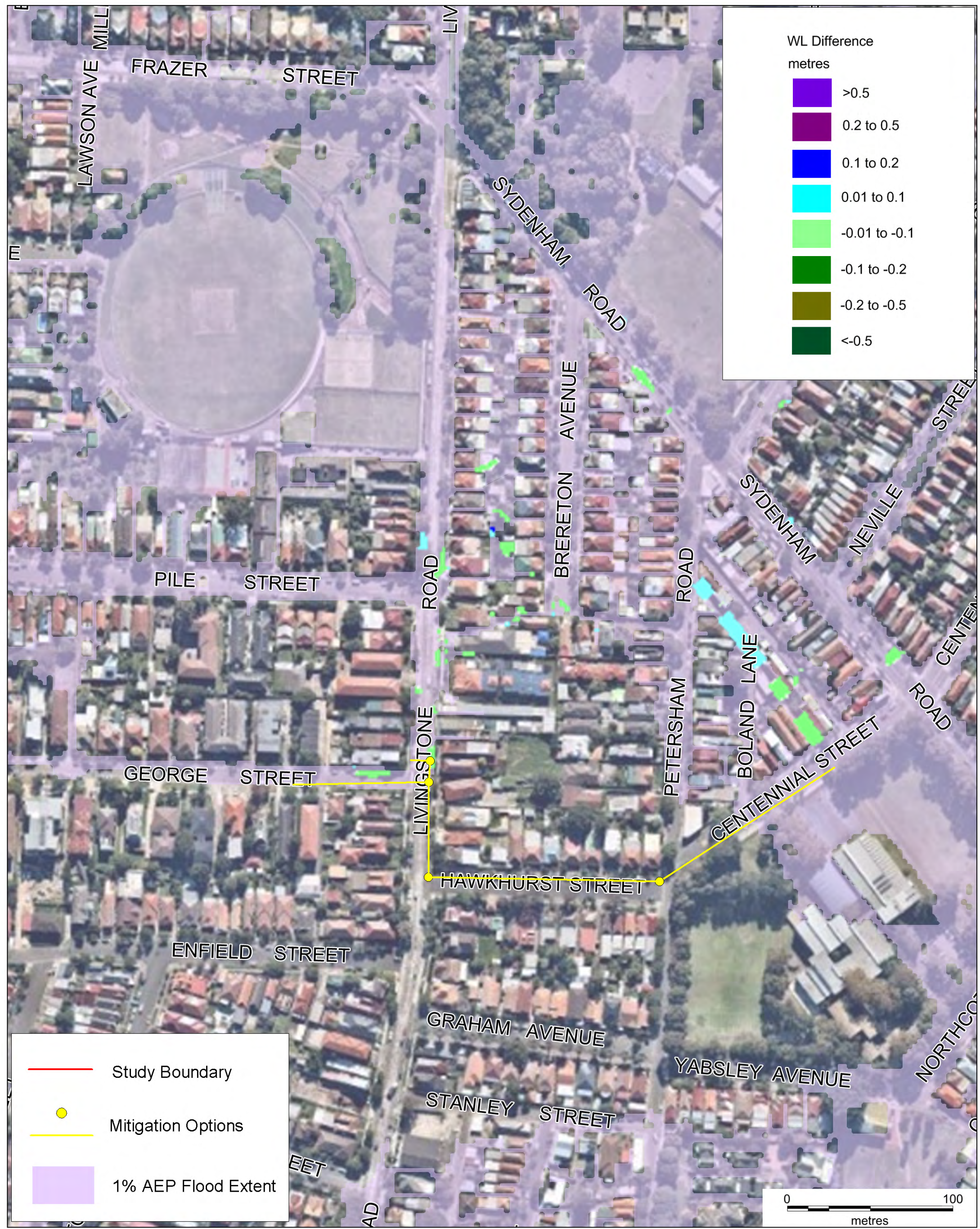


Water Level Difference
2 Yr
Option FM2.3

MARRICKVILLE VALLEY FRMS&P



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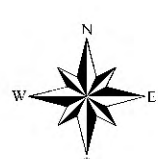


Water Level Difference
1% AEP
Option FM2.3

MARRICKVILLE VALLEY FRMS&P



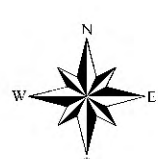
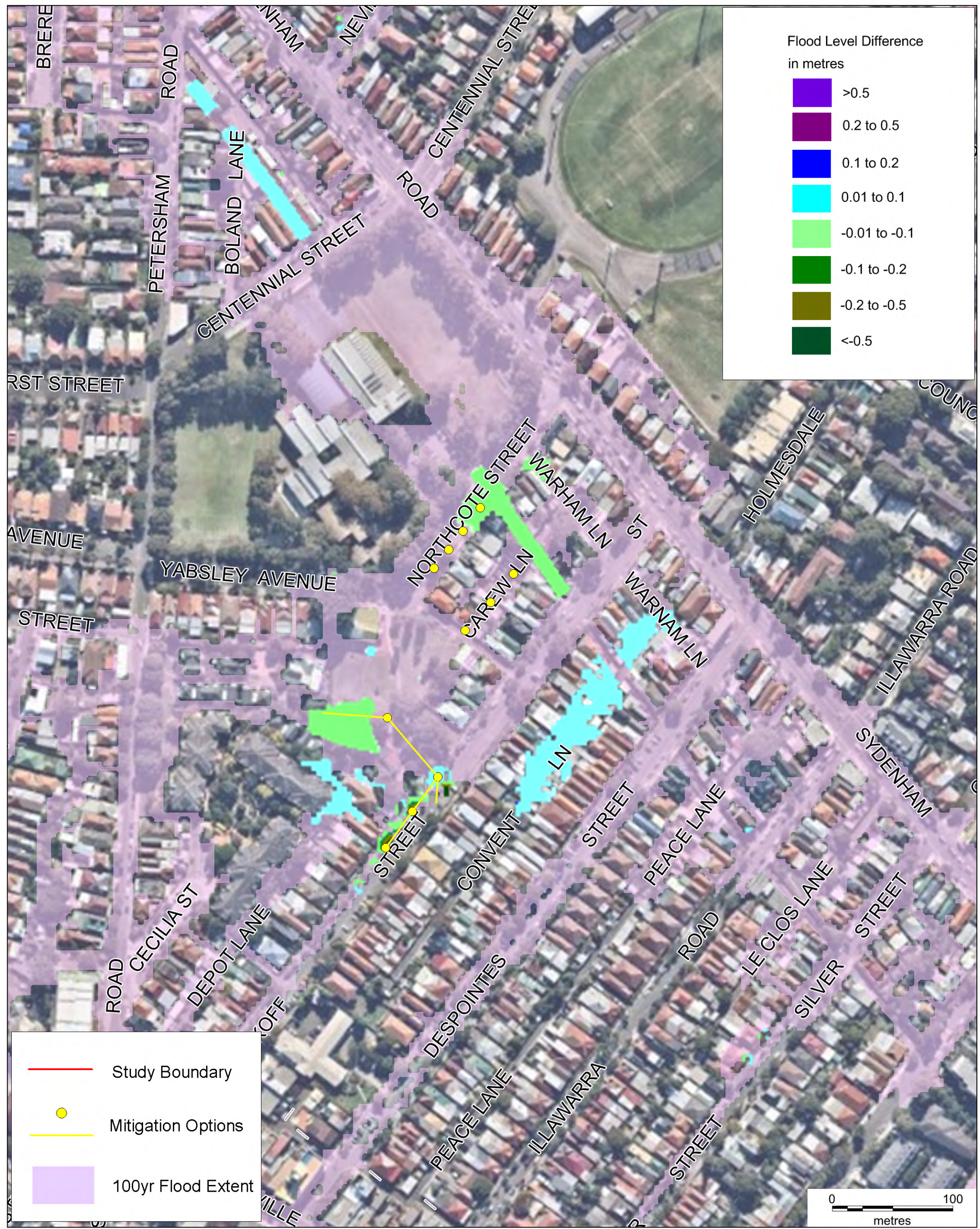
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Water Level Difference
2 Yr
Option FM3.1
MARRICKVILLE VALLEY FRMS&P



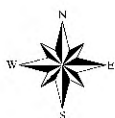
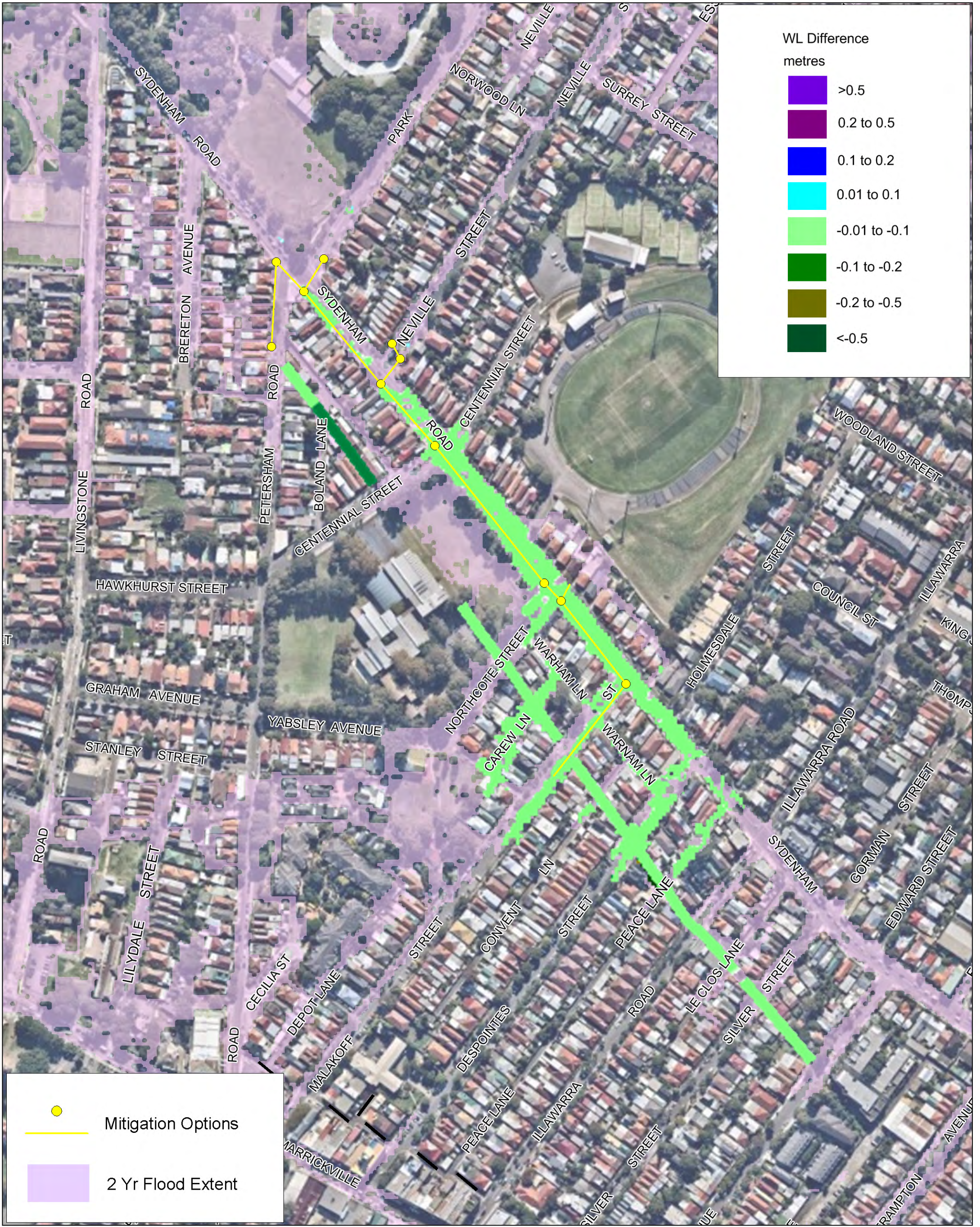
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Water Level Difference
100 Yr
Option FM3.1
MARRICKVILLE VALLEY FRMS&P



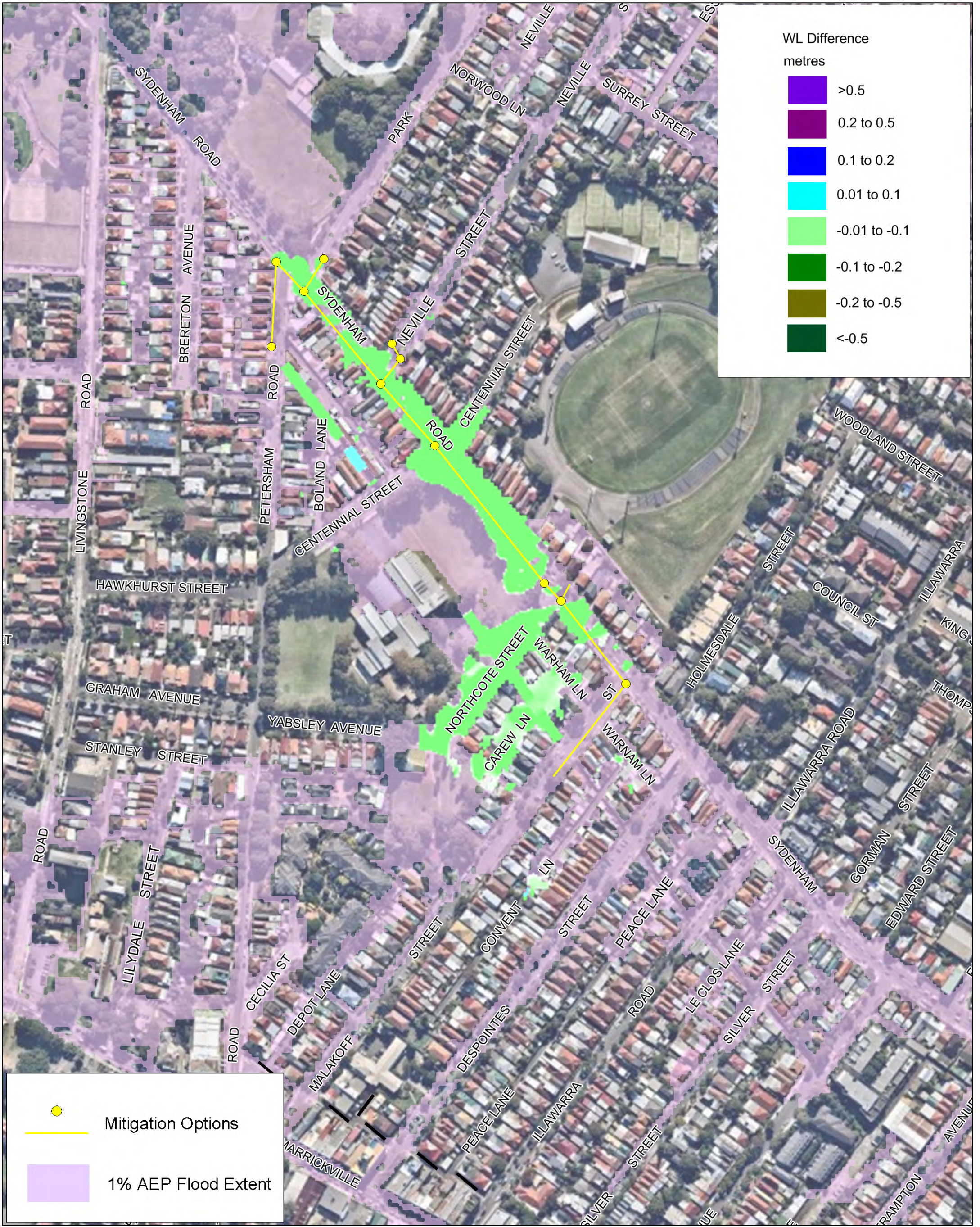
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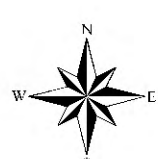


Water Level Difference
2 Yr
Option FM3.2
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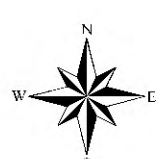
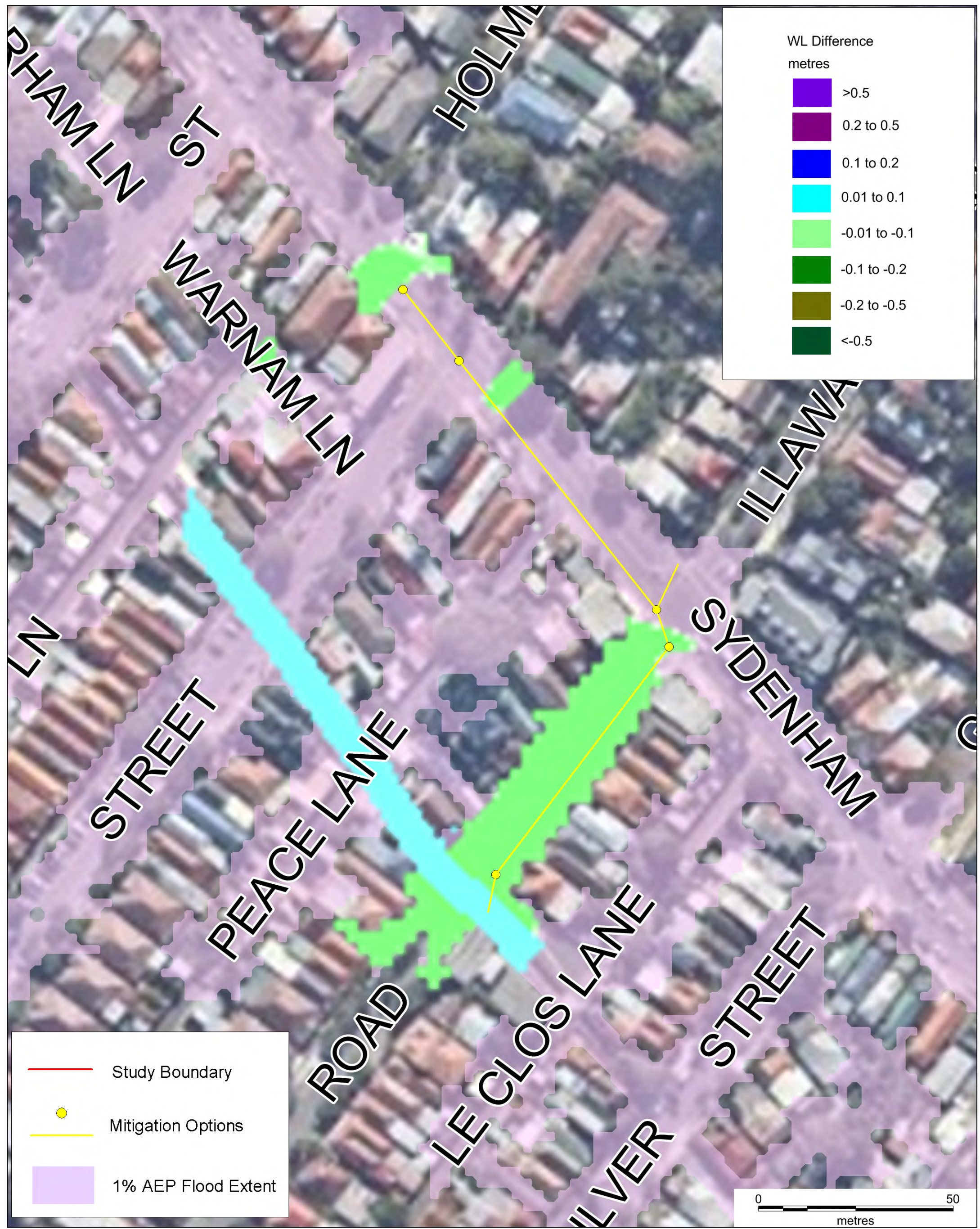




Water Level Difference
2 Yr
Option FM3.3
MARRICKVILLE VALLEY FRMS&P



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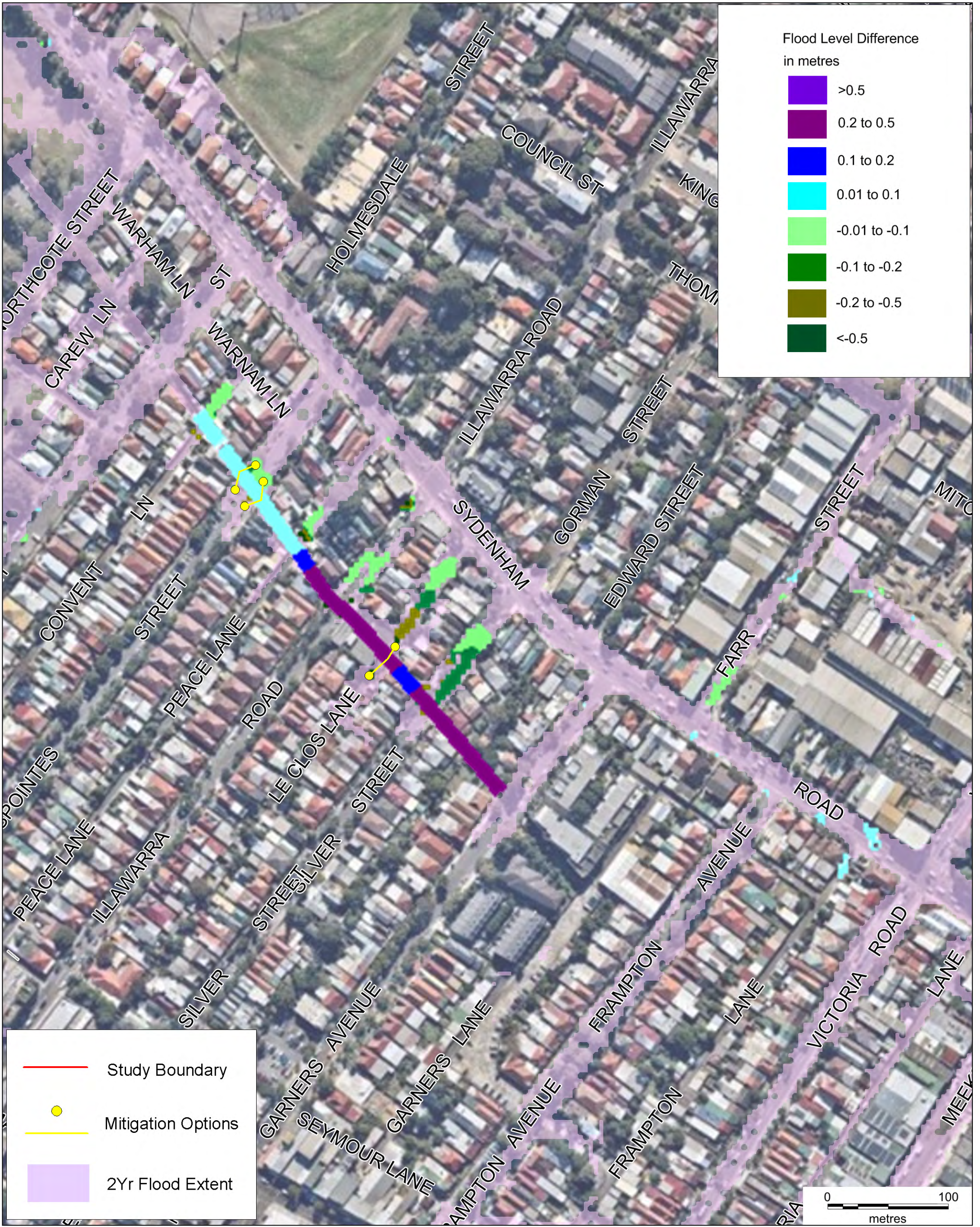


**Water Level Difference
1% AEP
Option FM3.3**

MARRICKVILLE VALLEY FRMS&P



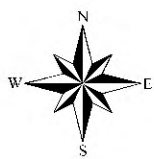
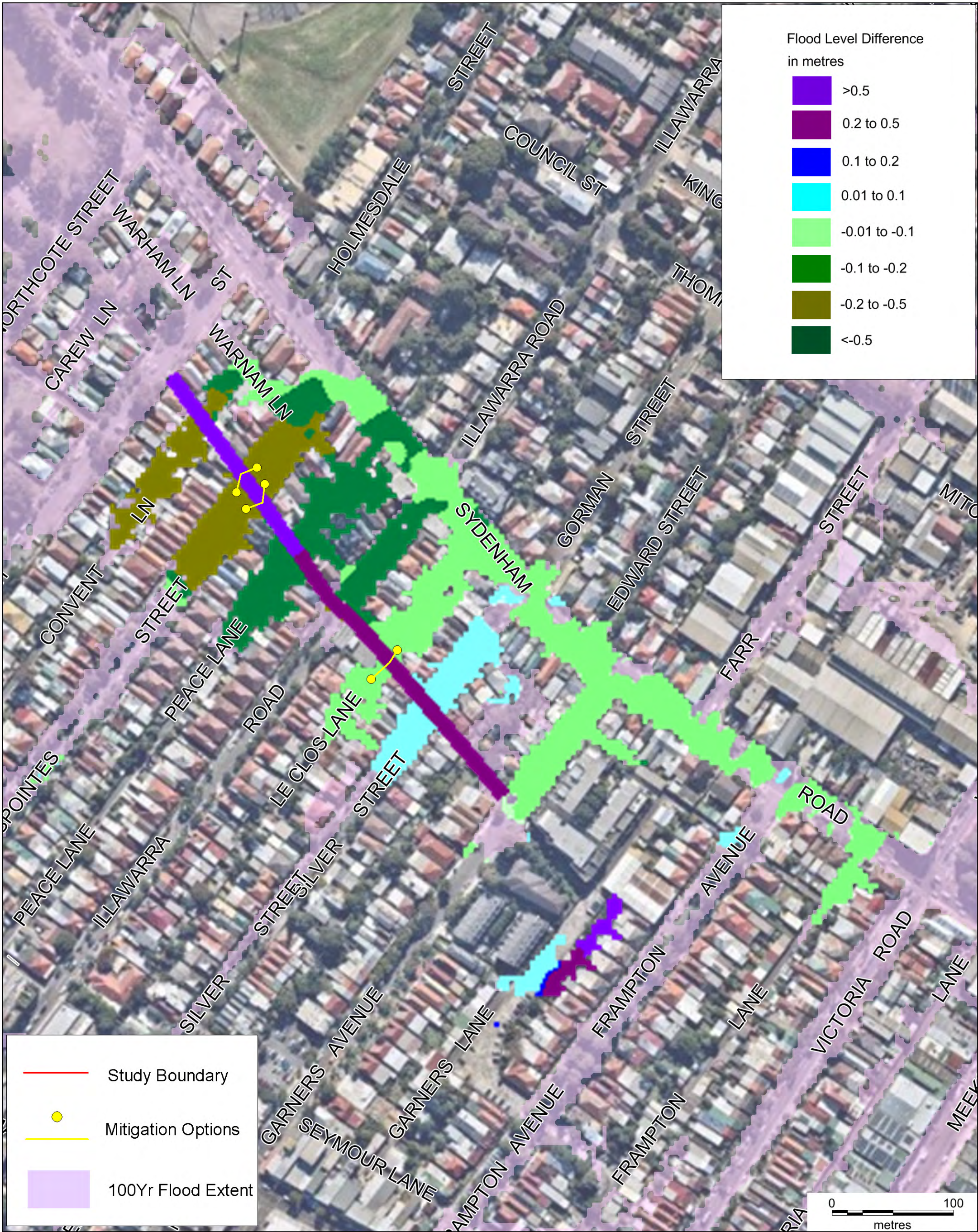
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Water Level Difference
2 Yr
Option FM3.4
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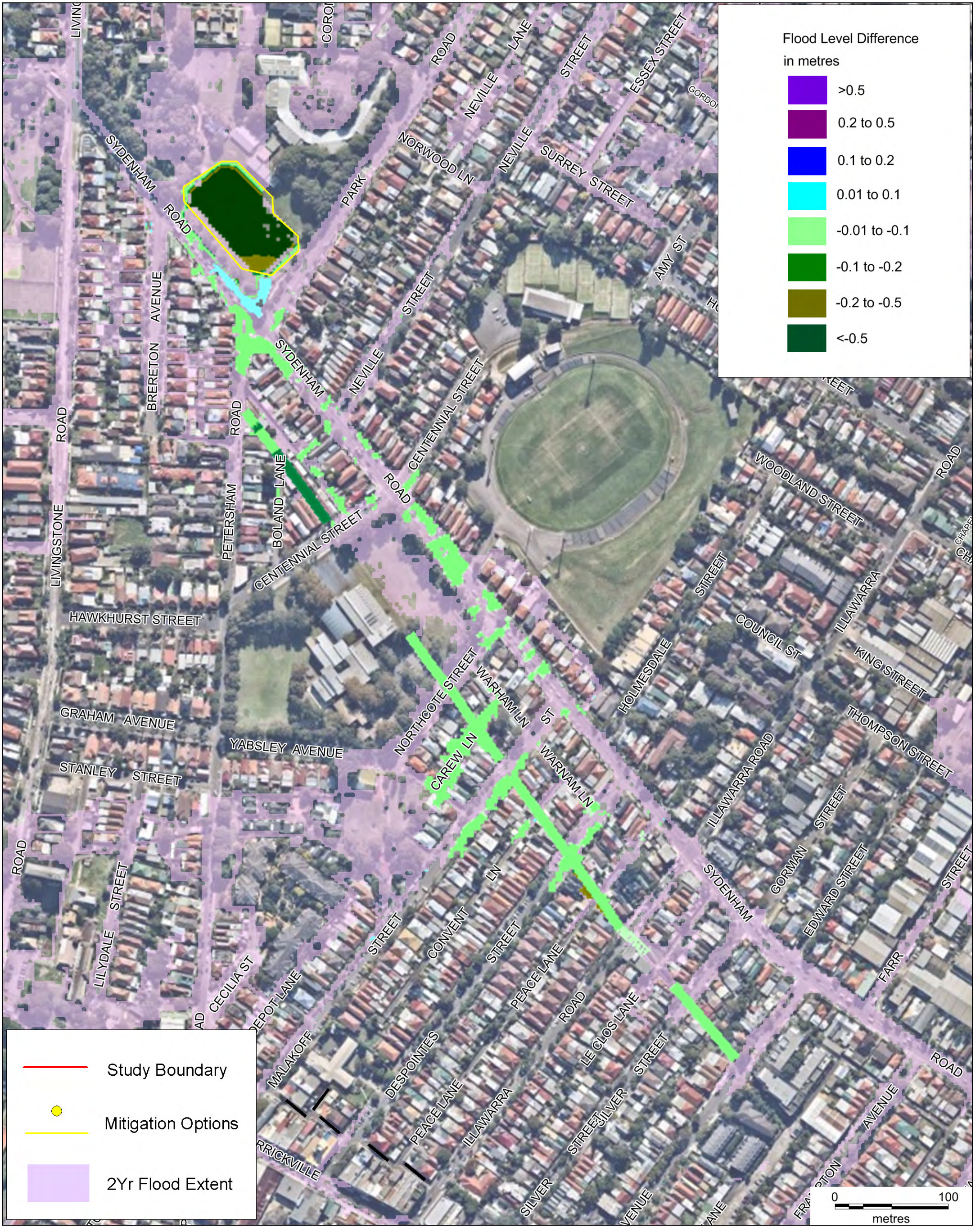


**Water Level Difference
100 Yr
Option FM3.4**

MARRICKVILLE VALLEY FRMS&P



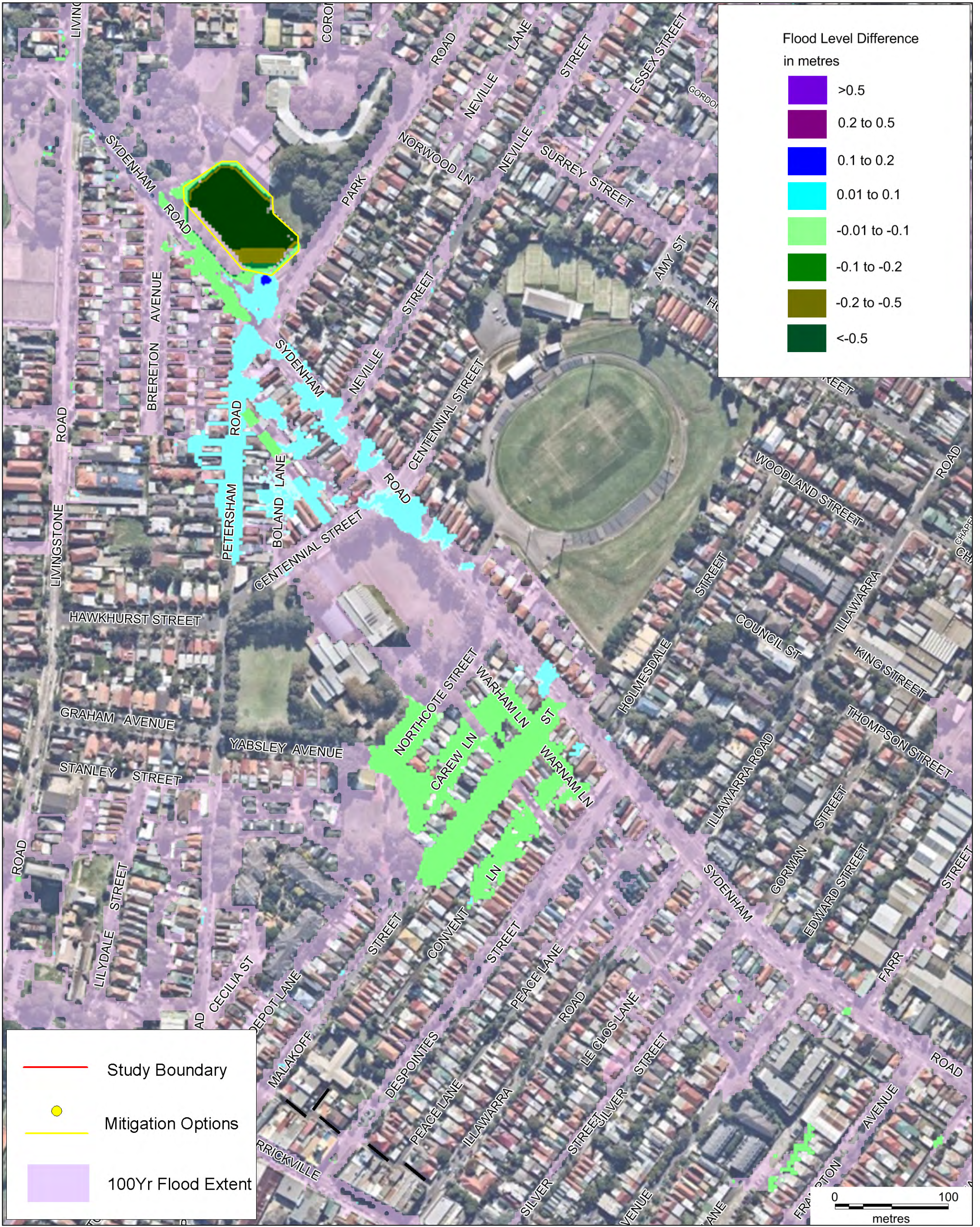
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Water Level Difference
2 Yr
Option FM3.6
MARRICKVILLE VALLEY FRMS&P



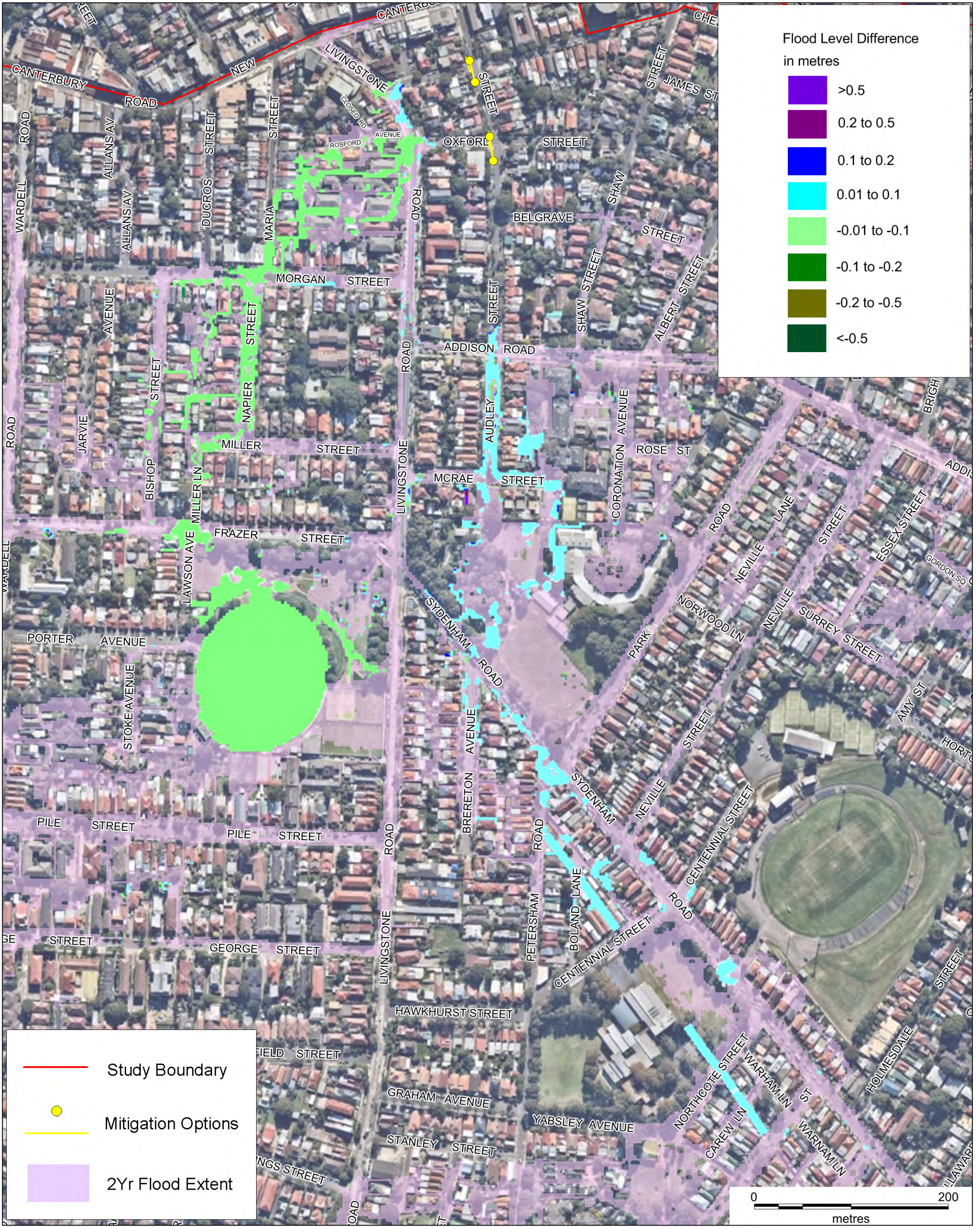
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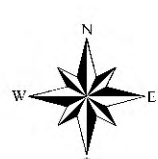
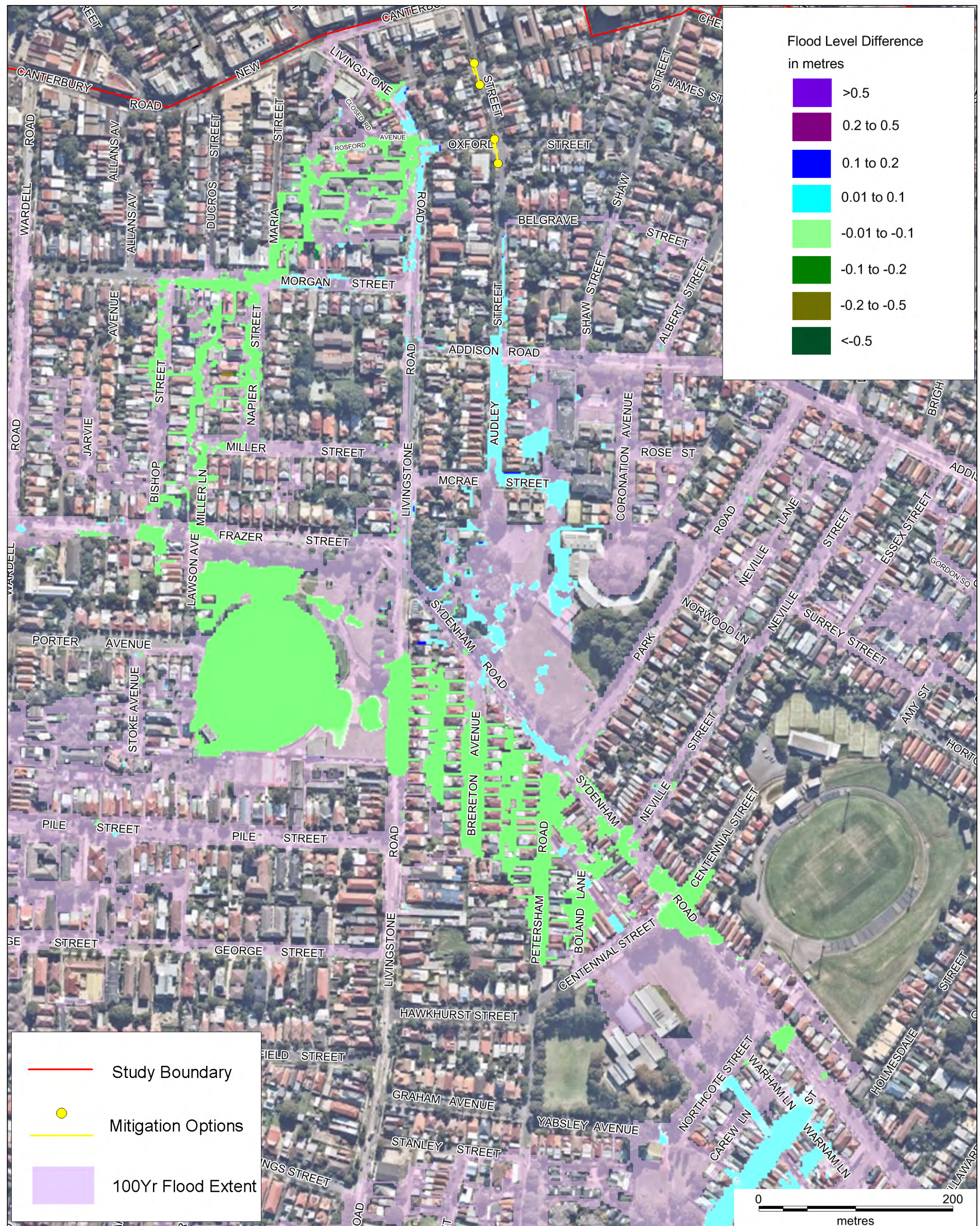


Water Level Difference
100 Yr
Option FM3.6
MARRICKVILLE VALLEY FRMS&P



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**Water Level Difference
100 Yr
Option FM4.2**

MARRICKVILLE VALLEY FRMS&P

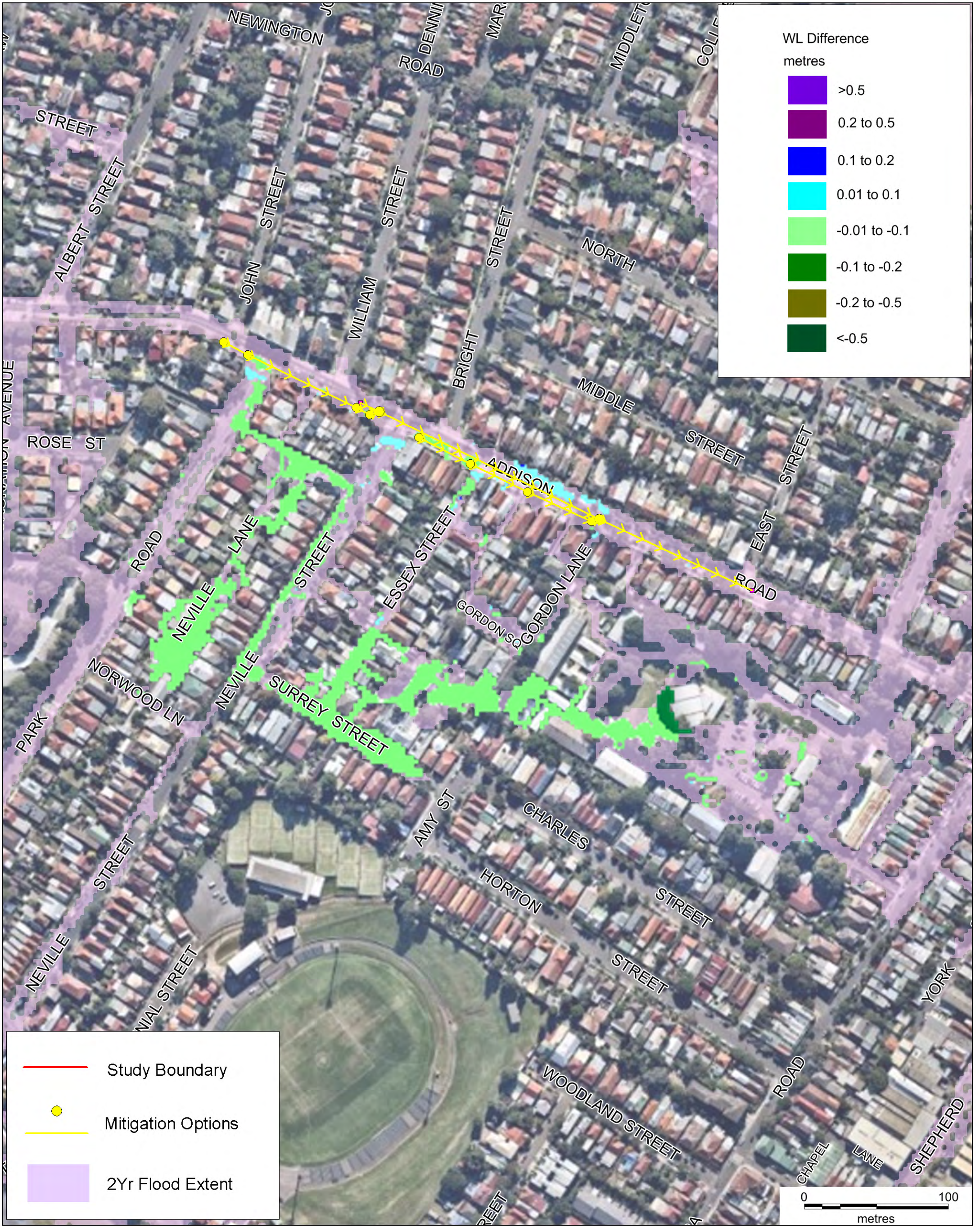


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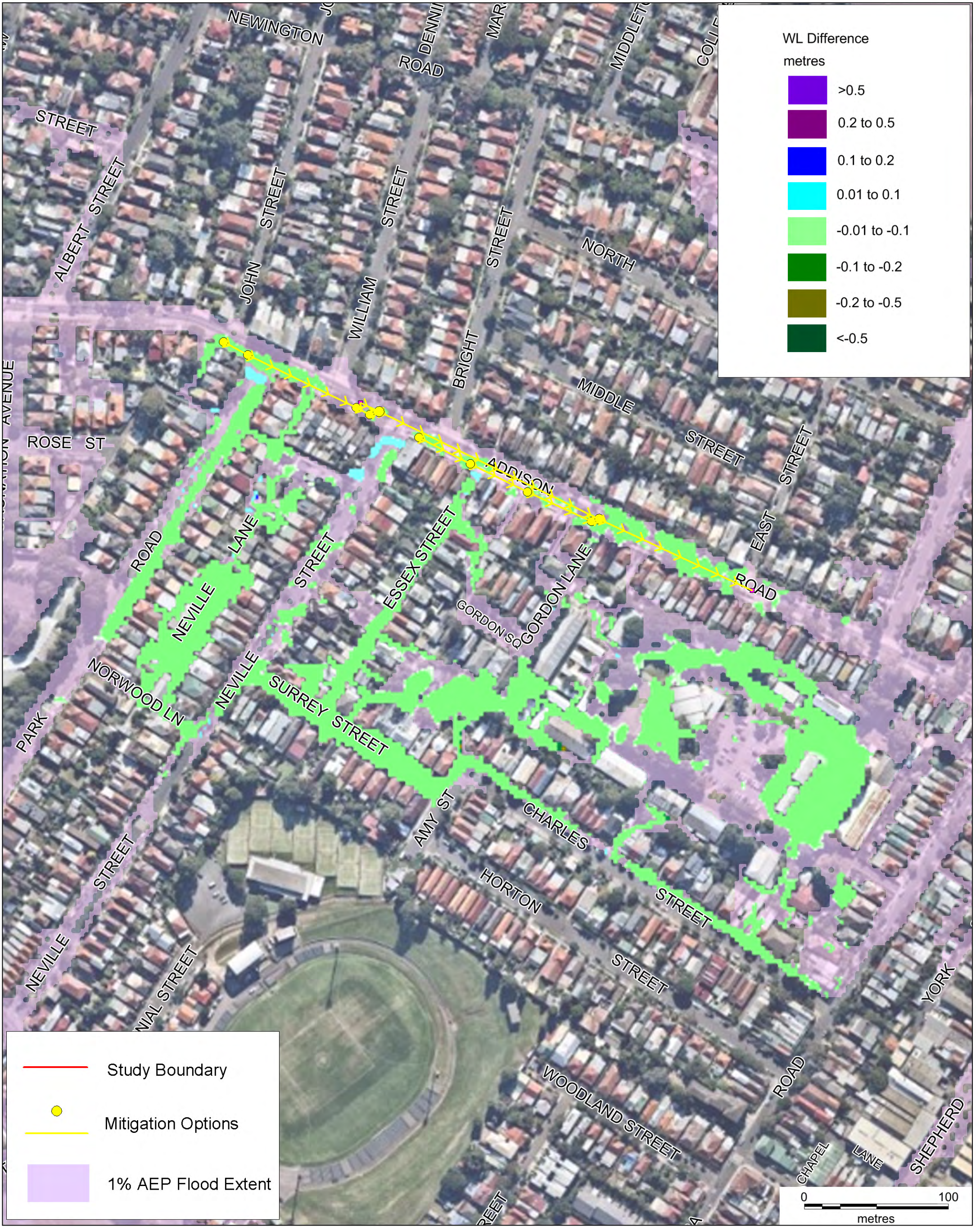
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Water Level Difference
2 Yr
Option FM5.3 & FM5.4
MARRICKVILLE VALLEY FRMS&P



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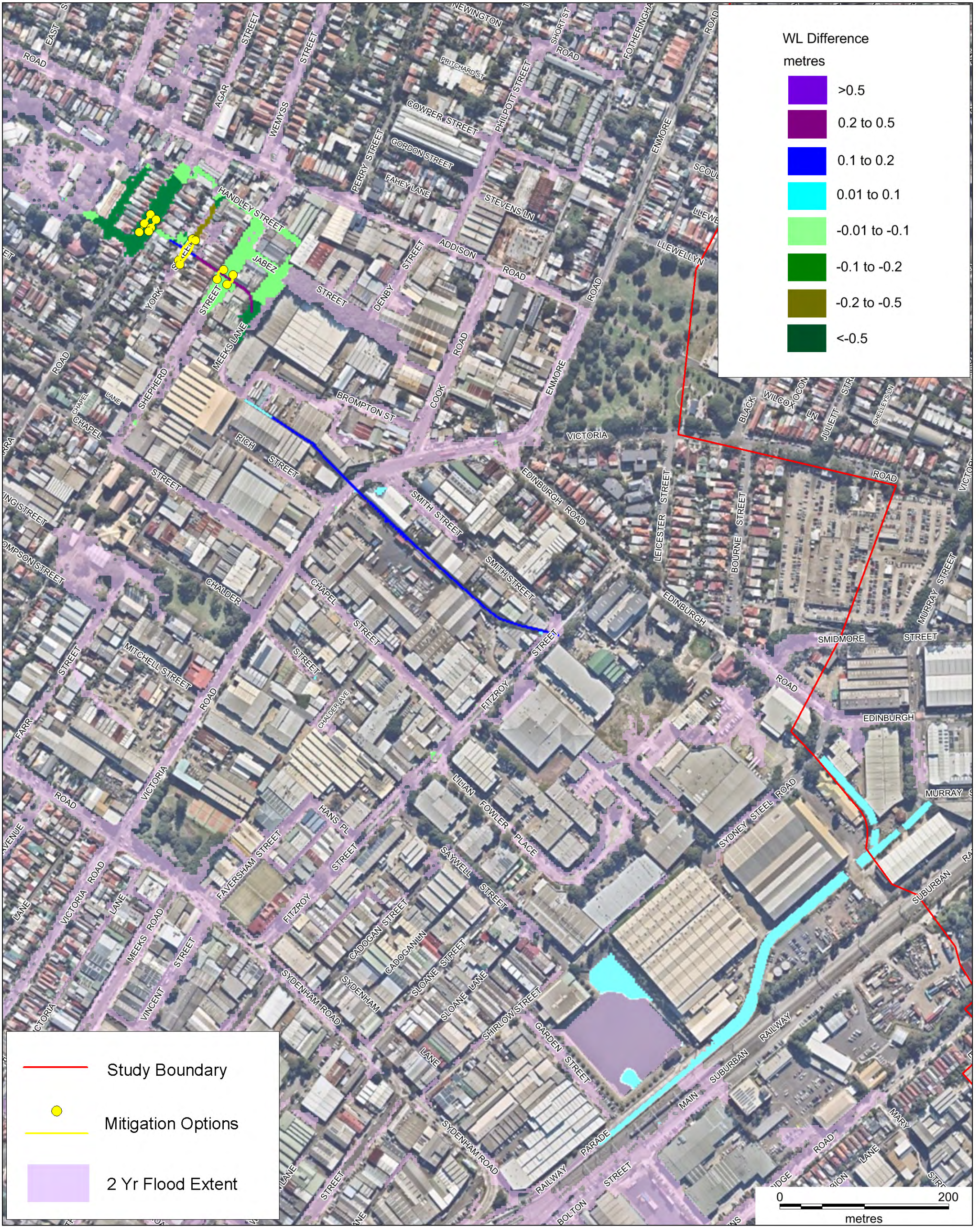


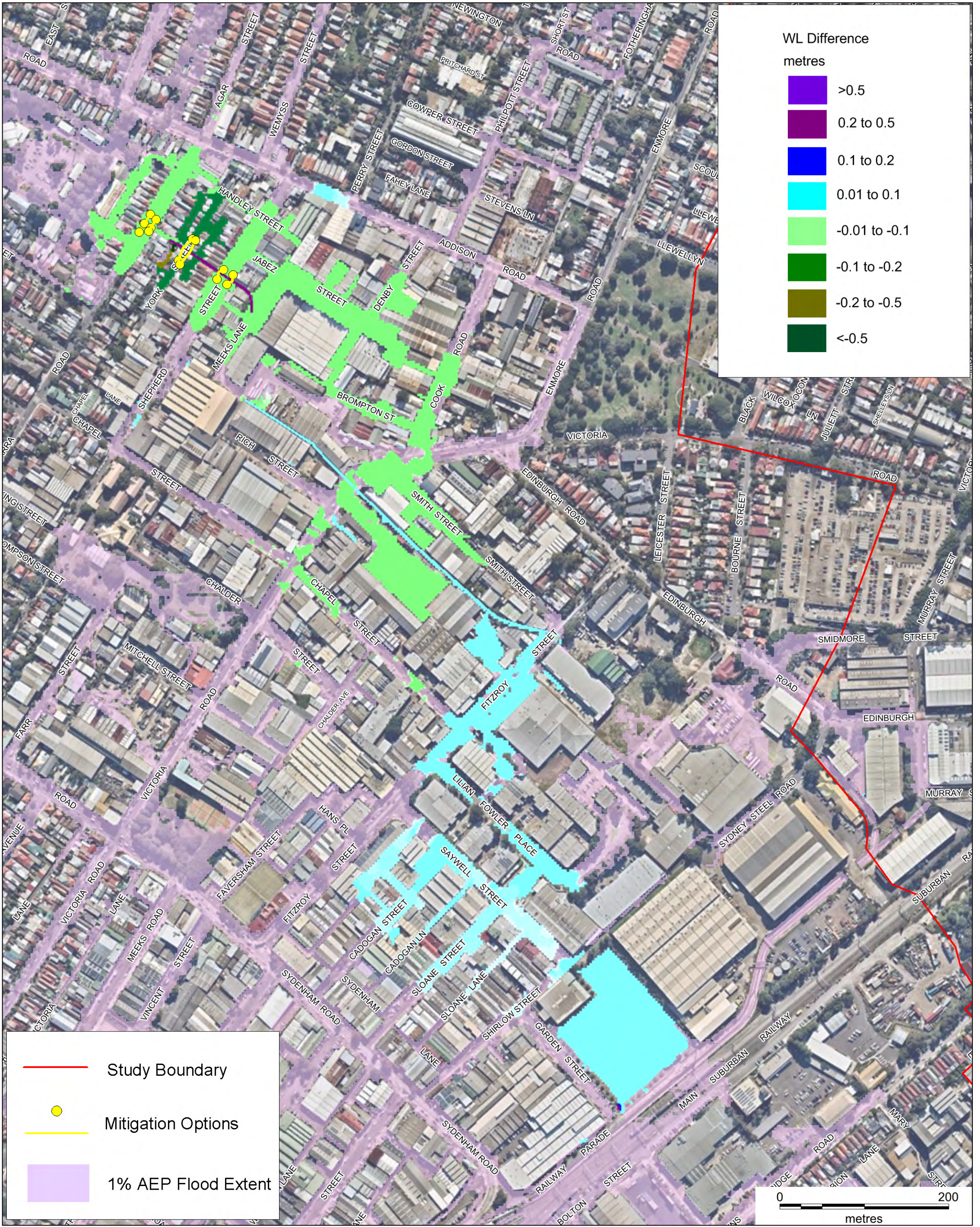
**Water Level Difference
1% AEP
Option FM5.3 & FM5.4**

MARRICKVILLE VALLEY FRMS&P



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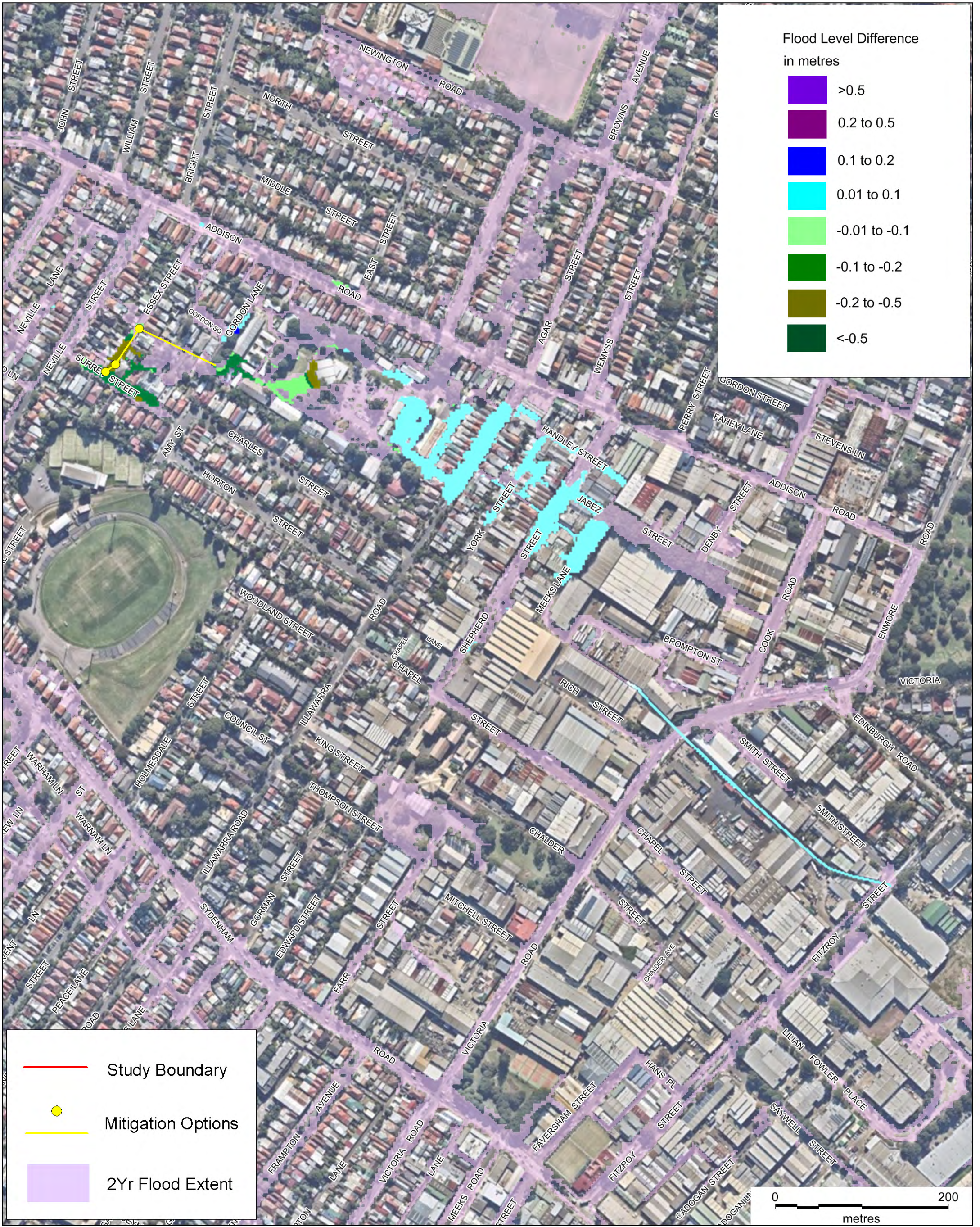


**Water Level Difference
1% AEP
Option FM5.6**

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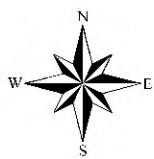
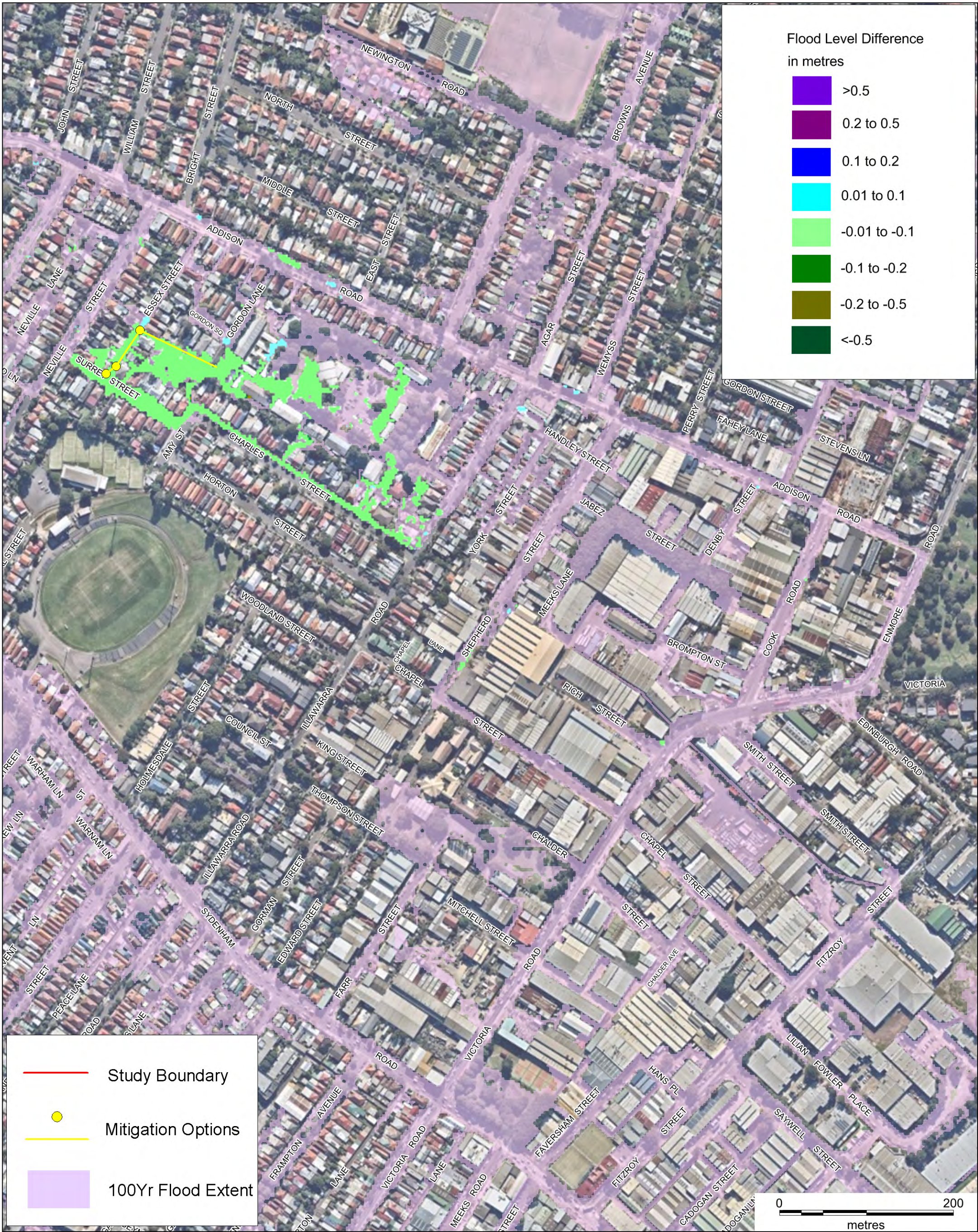


**Water Level Difference
2 Yr
Option FM5.9**

MARRICKVILLE VALLEY FRMS&P



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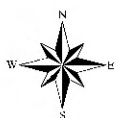


**Water Level Difference
100 Yr
Option FM5.9**

MARRICKVILLE VALLEY FRMS&P



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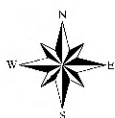
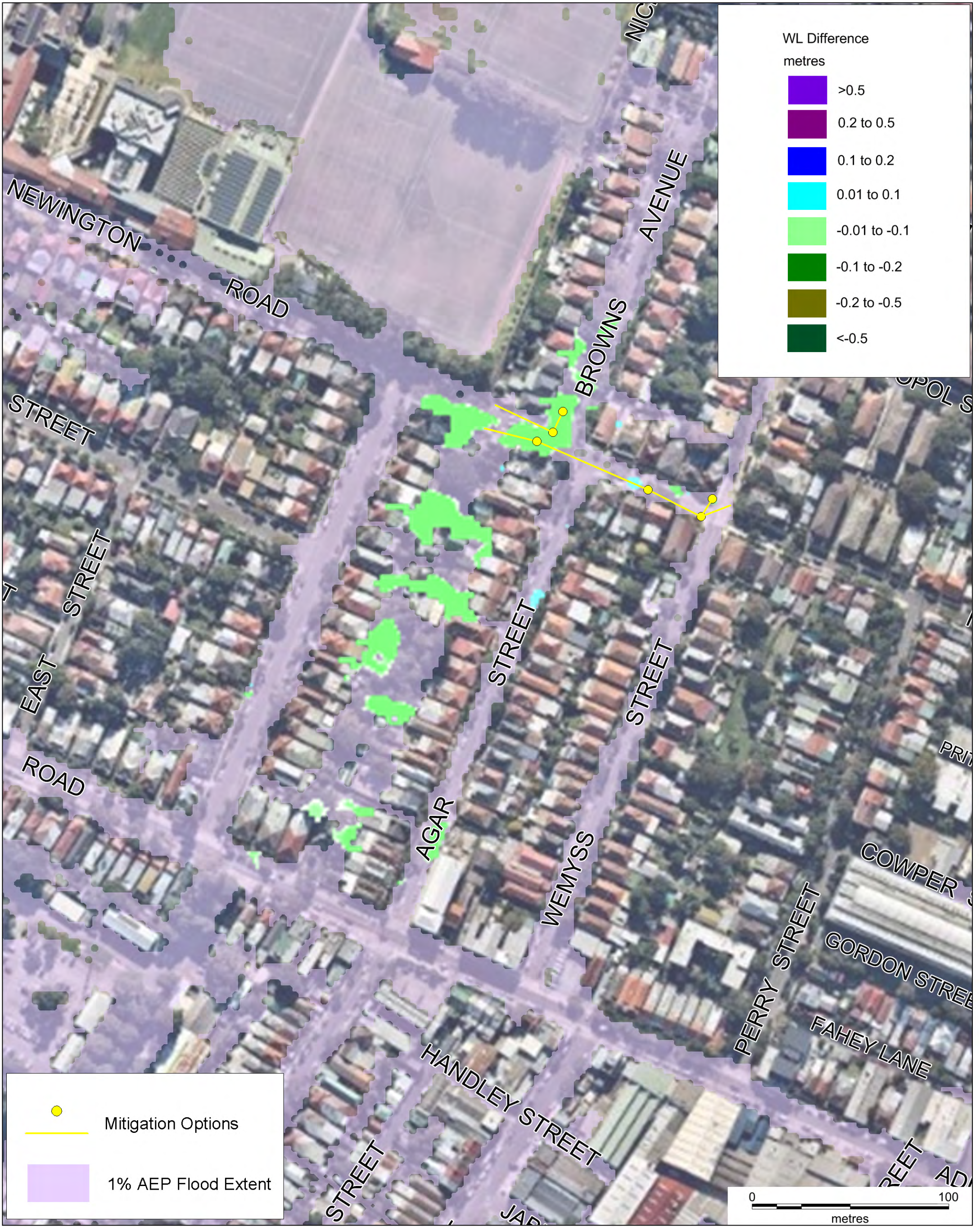


**Water Level Difference
2 Yr
Option FM6.1**

MARRICKVILLE VALLEY FRMS&P



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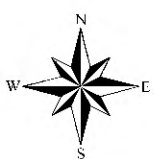
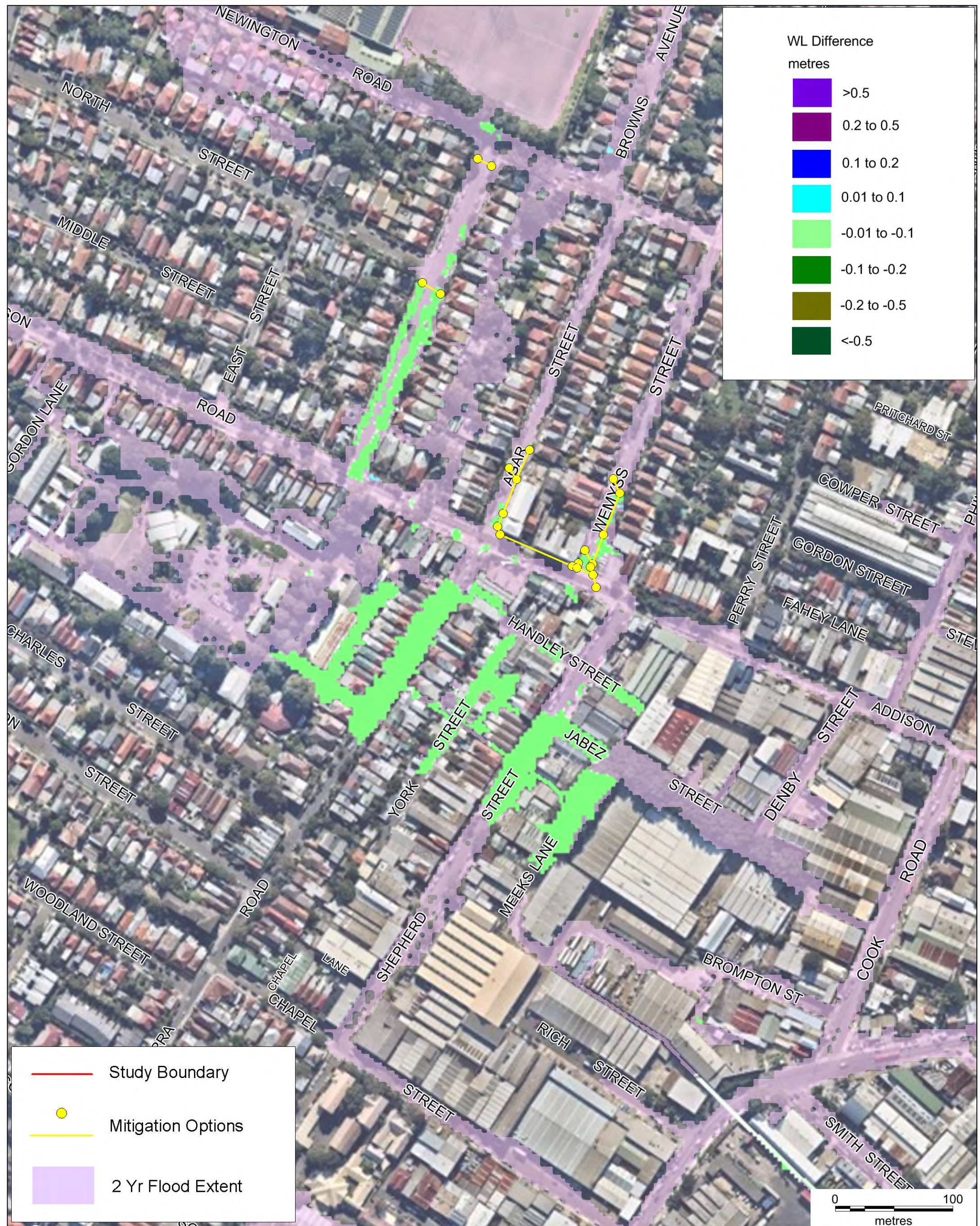


**Water Level Difference
1% AEP
Option FM6.1**

MARRICKVILLE VALLEY FRMS&P



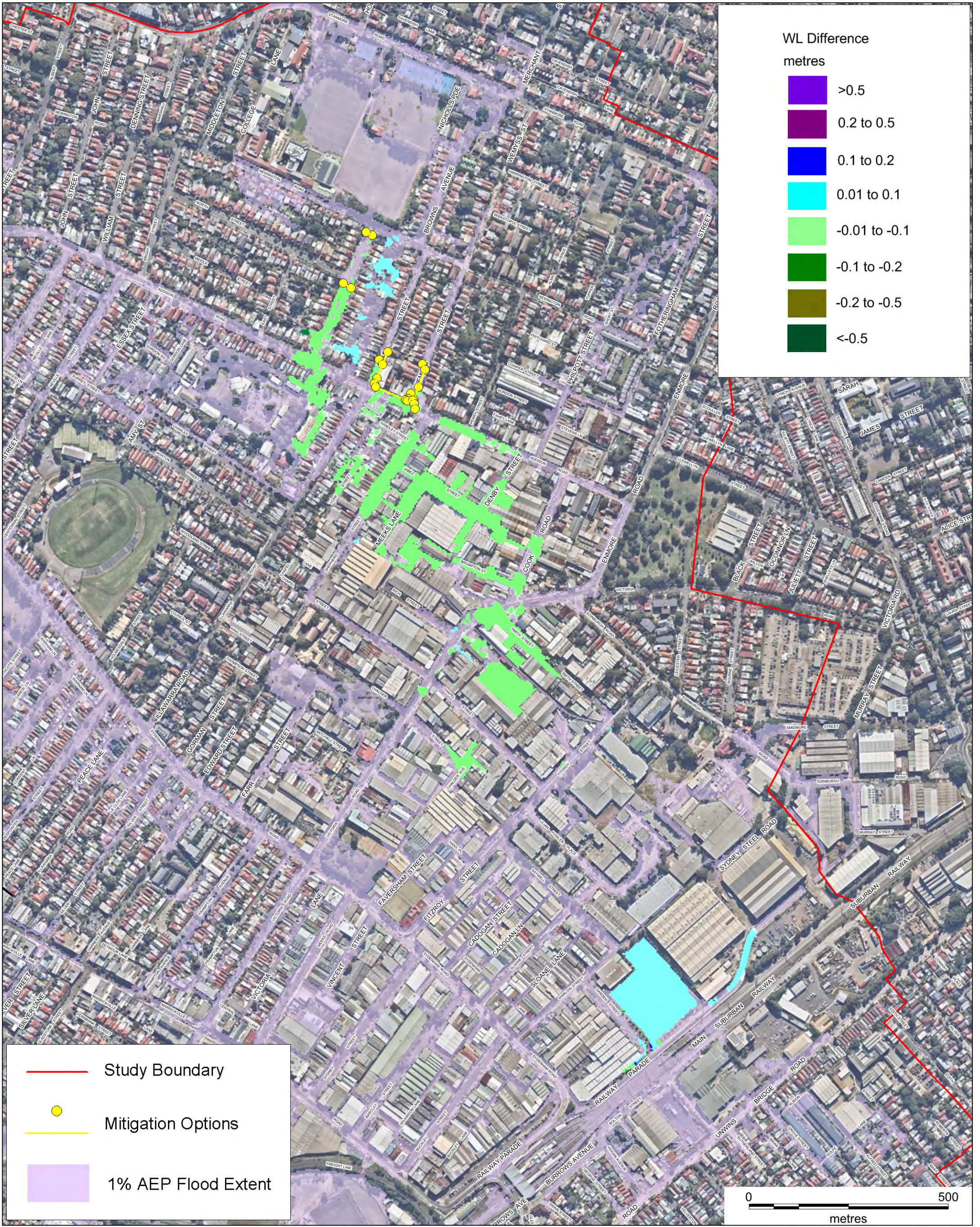
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Water Level Difference
2 Yr
Option FM6.4
MARRICKVILLE VALLEY FRMS&P



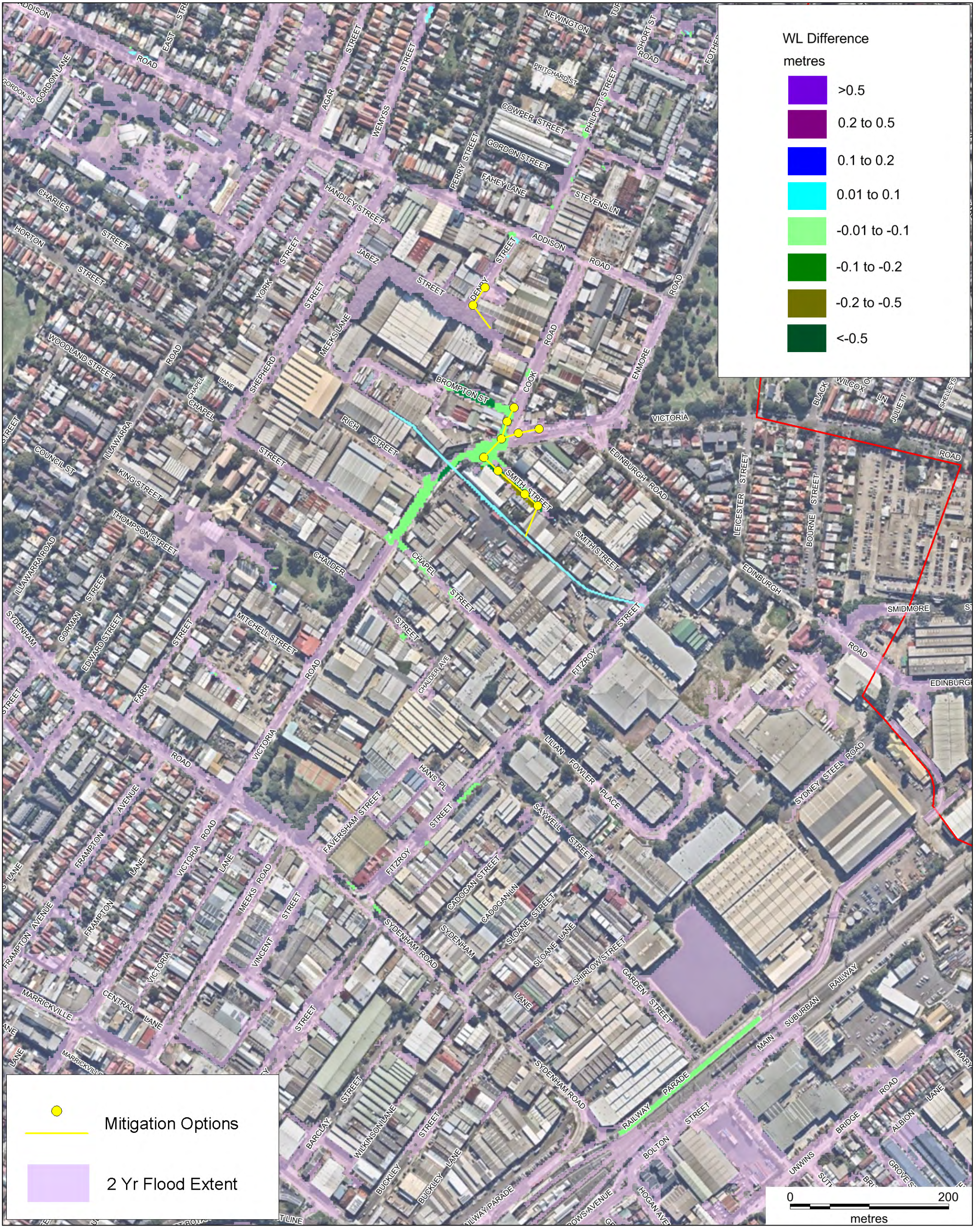
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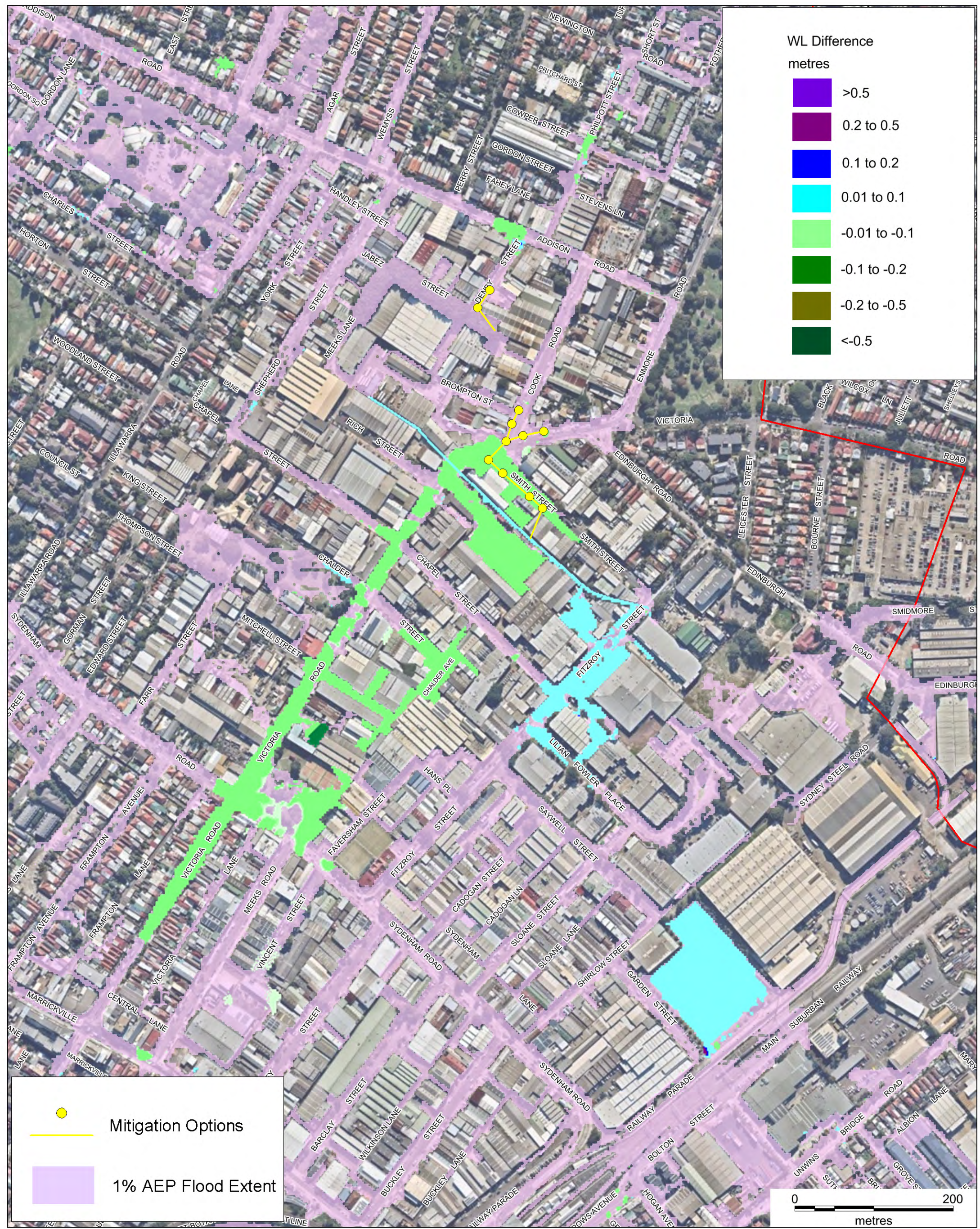


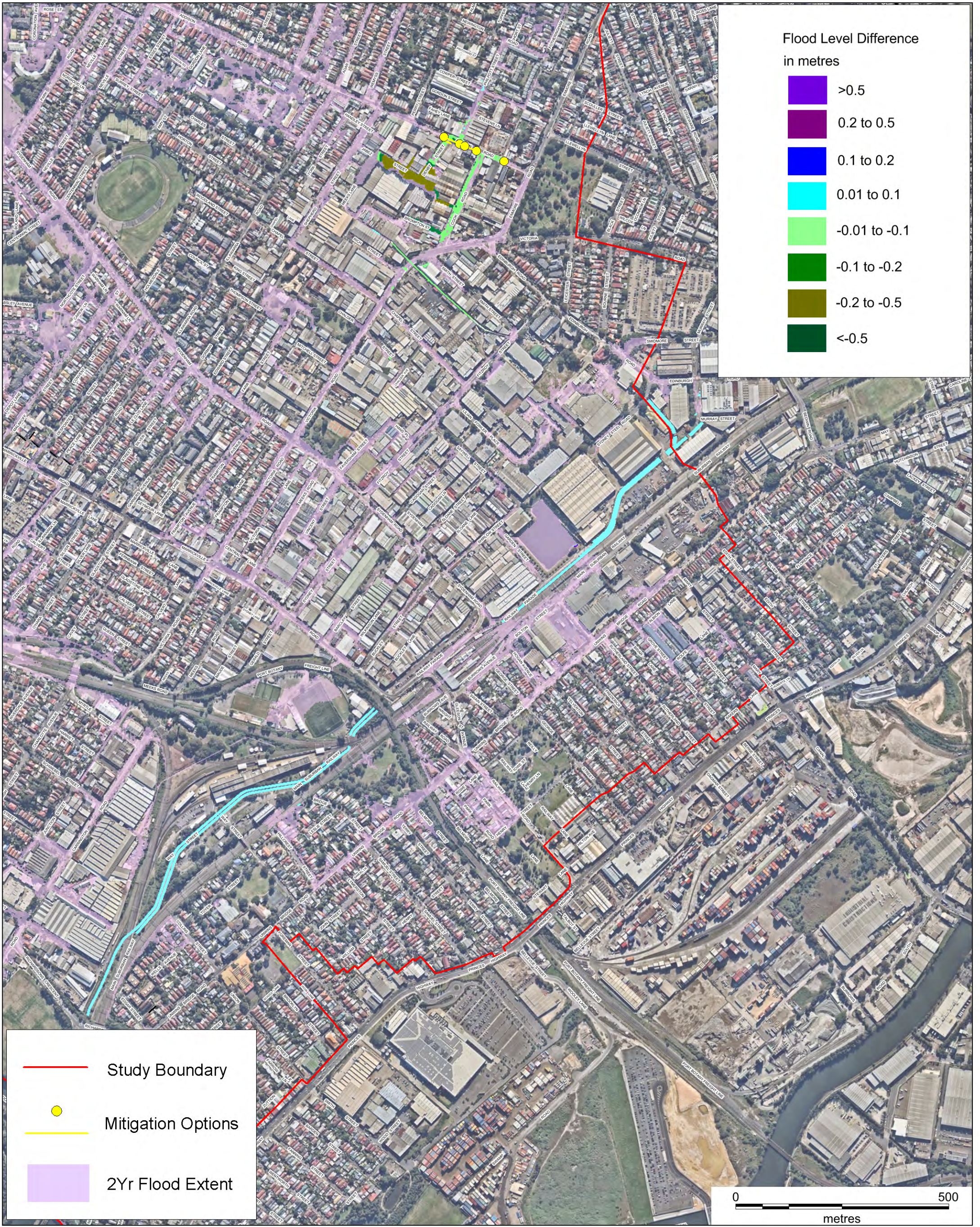
Water Level Difference
1% AEP
Option FM6.4
MARRICKVILLE VALLEY FRMS&P



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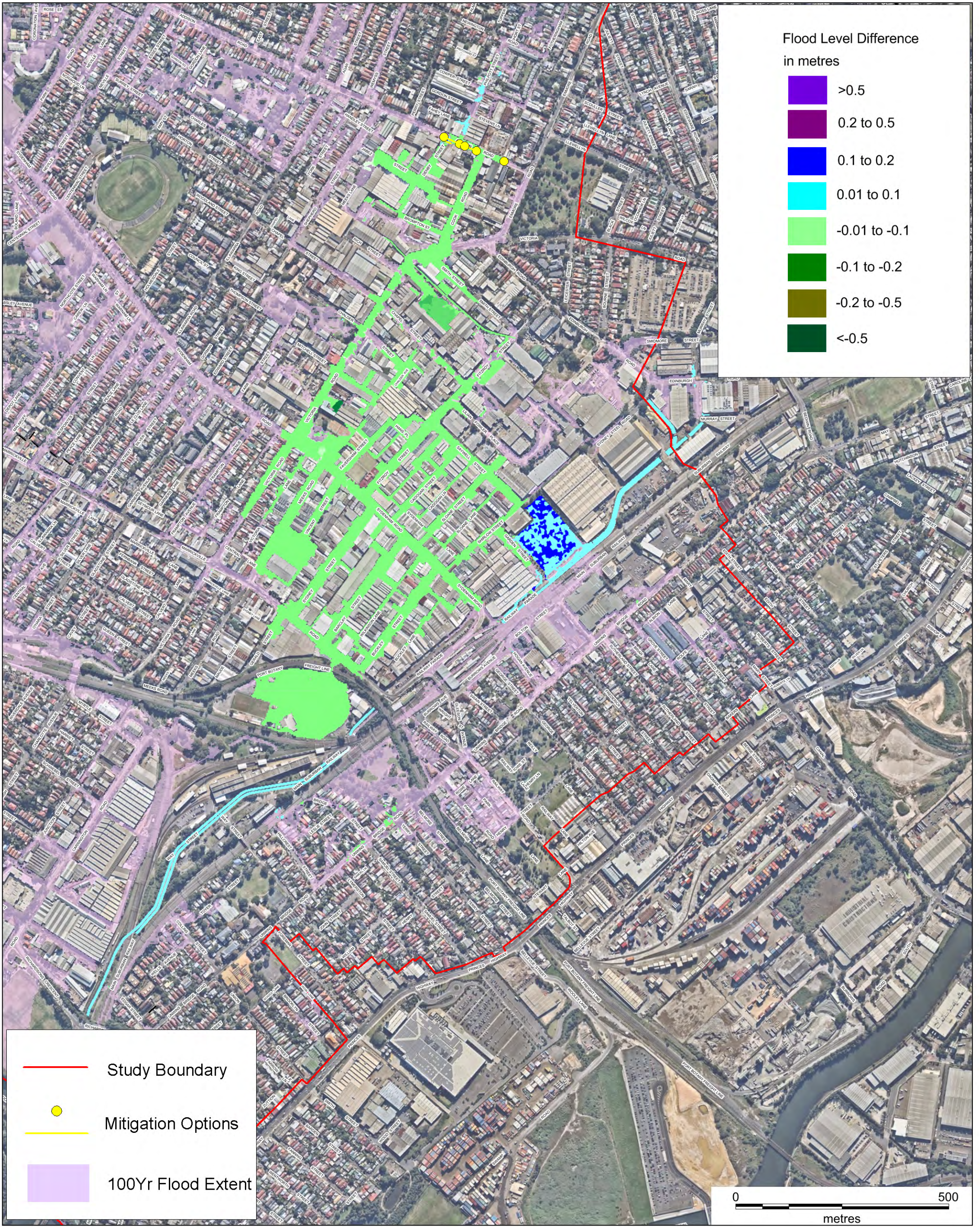


**Water Level Difference
2 Yr
Option FM7.6**

MARRICKVILLE VALLEY FRMS&P



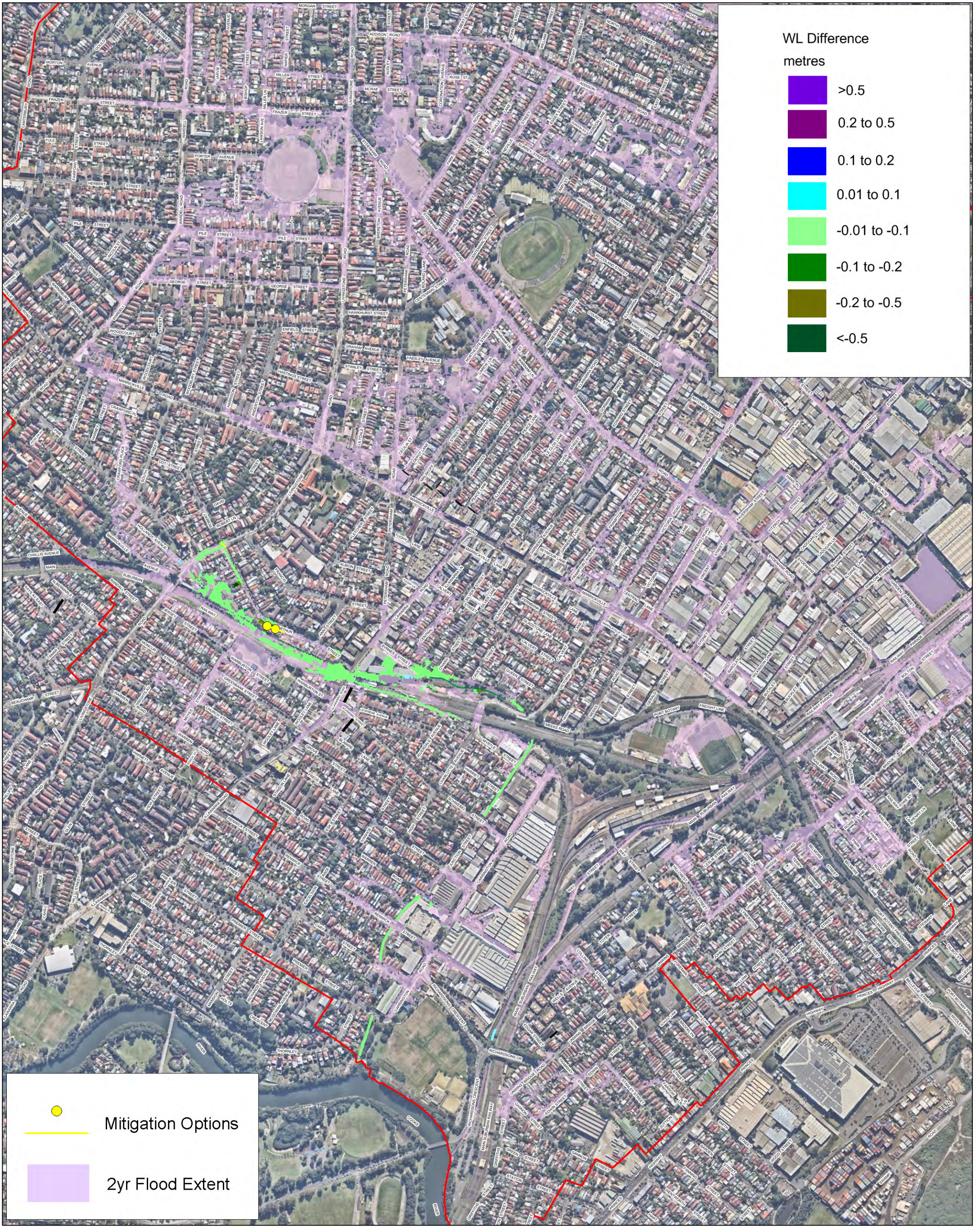
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Water Level Difference
100 Yr
Option FM7.6
MARRICKVILLE VALLEY FRMS&P



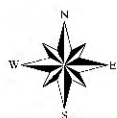
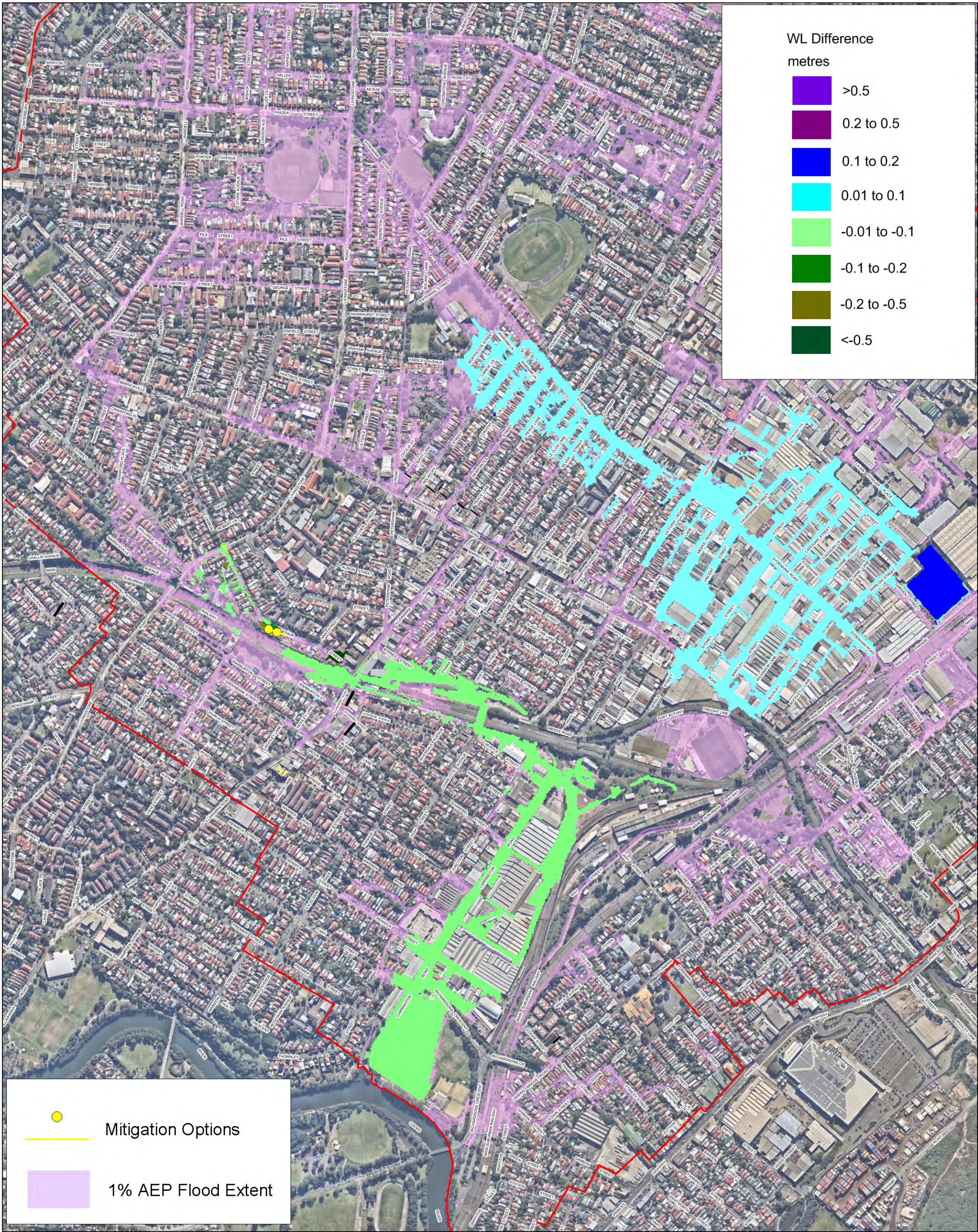
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**Water Level Difference
2 Yr
Option FM 8.1 & 8.2
MARRICKVILLE VALLEY FRMS&P**



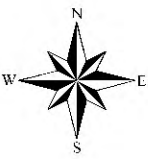
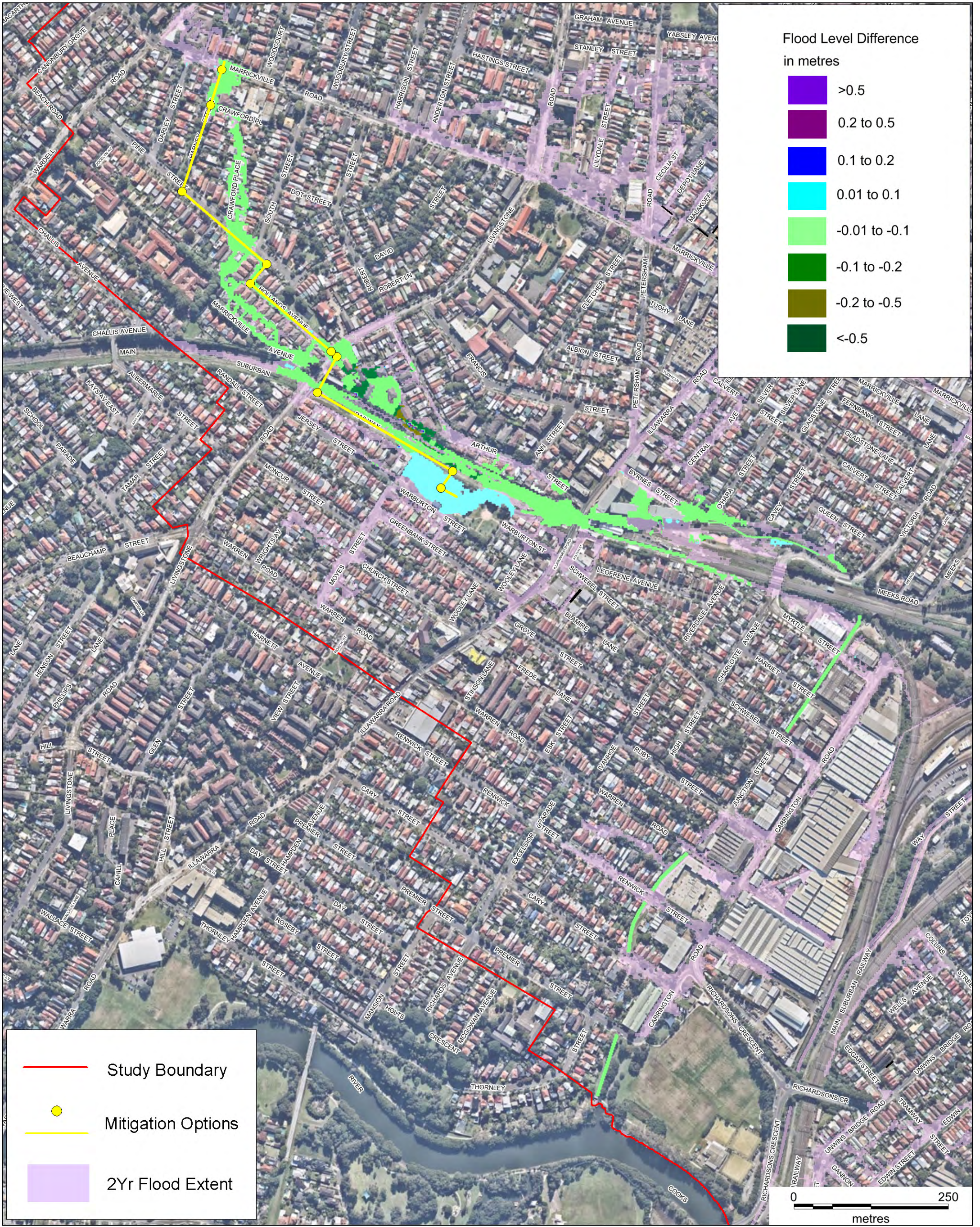
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Water Level Difference
1% AEP
Option FM 8.1 & 8.2
MARRICKVILLE VALLEY FRMS&P



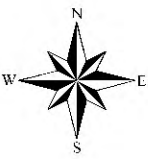
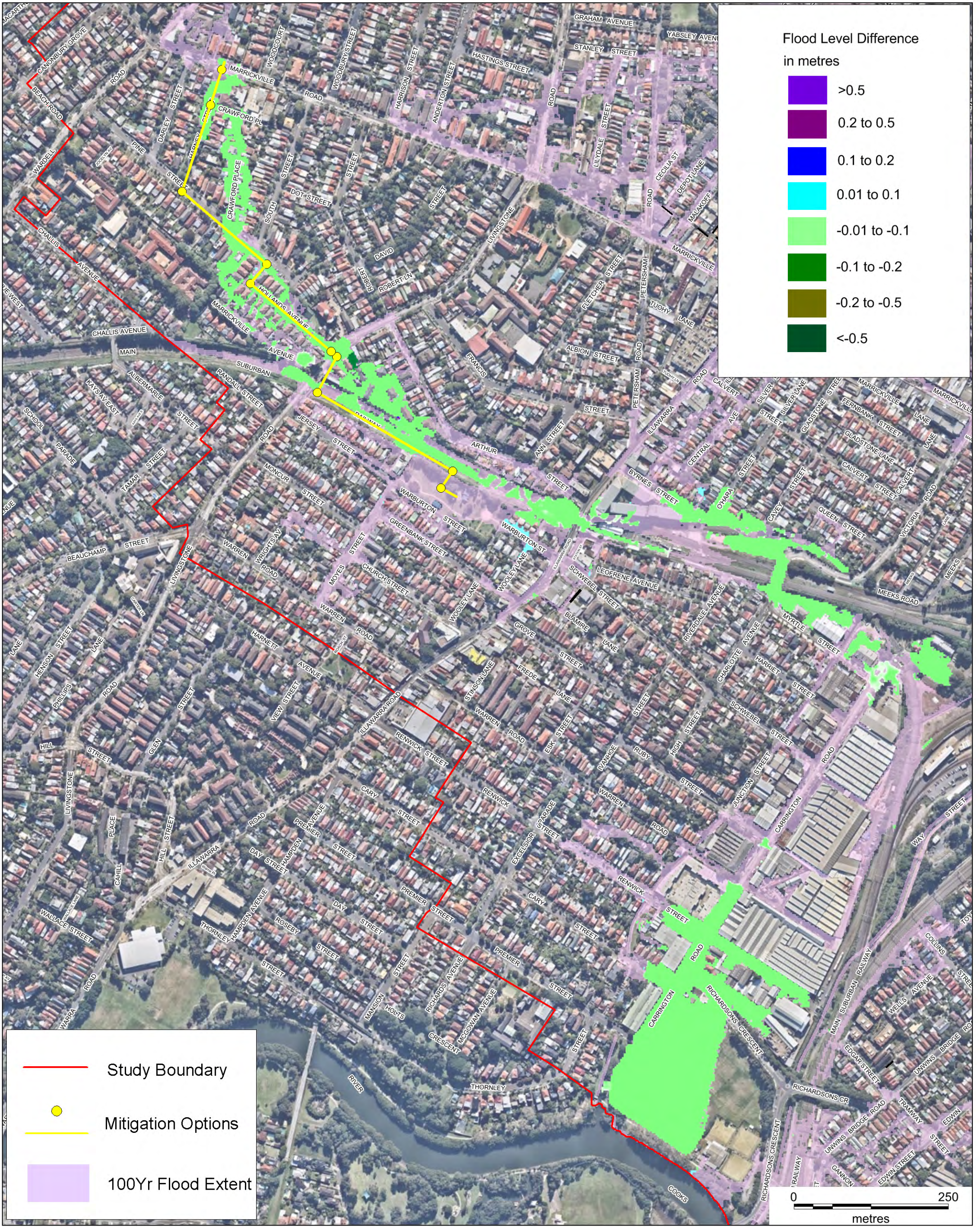
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Water Level Difference
2 Yr
Option FM8.3
MARRICKVILLE VALLEY FRMS&P



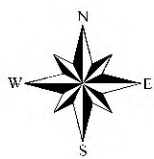
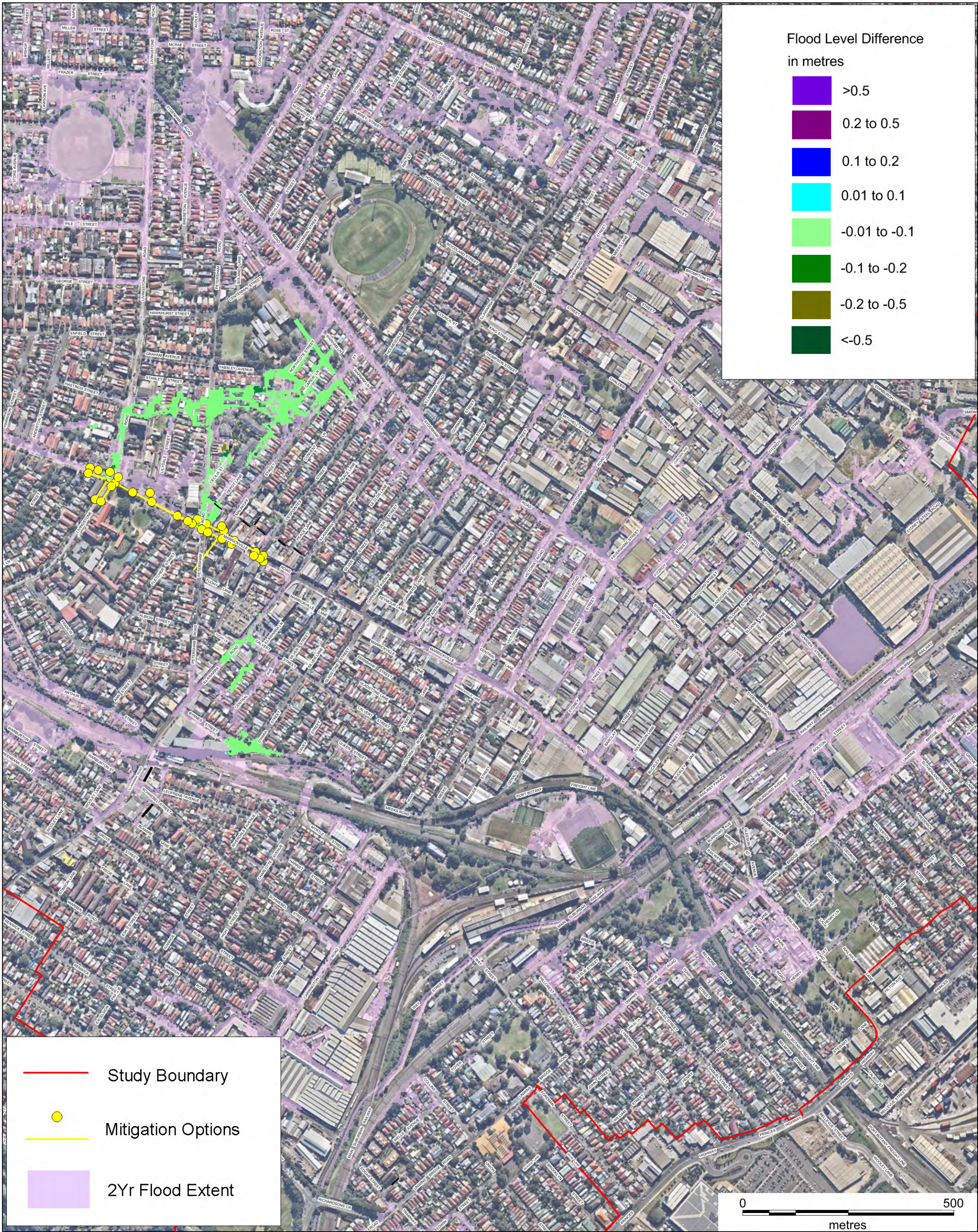
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Water Level Difference
100 Yr
Option FM8.3
MARRICKVILLE VALLEY FRMS&P



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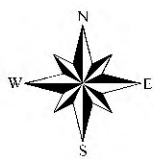
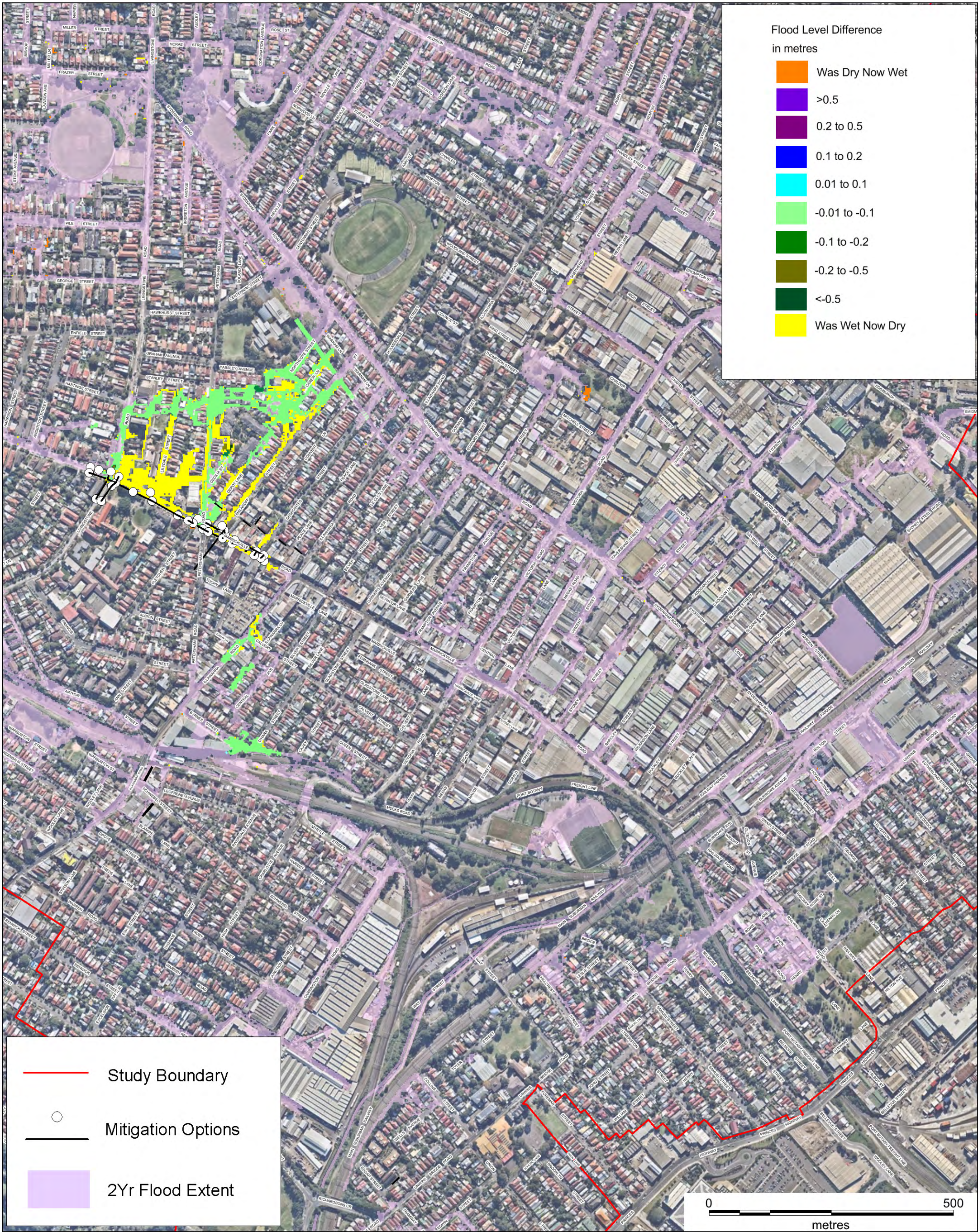


**Water Level Difference
2 Yr
Option FM9.1**

MARRICKVILLE VALLEY FRMS&P



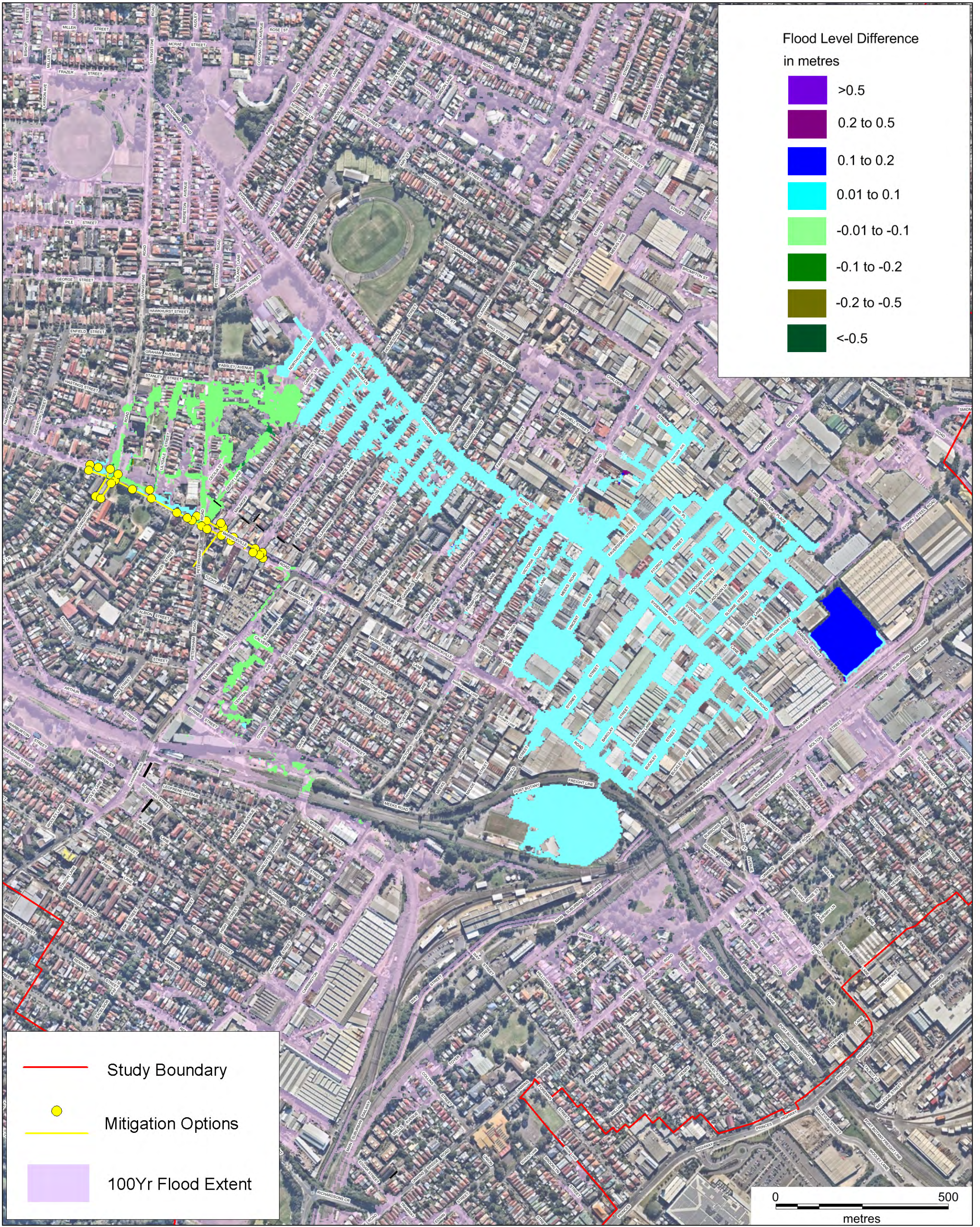
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Water Level Difference
2 Yr
Option FM9.1
MARRICKVILLE VALLEY FRMS&P



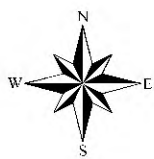
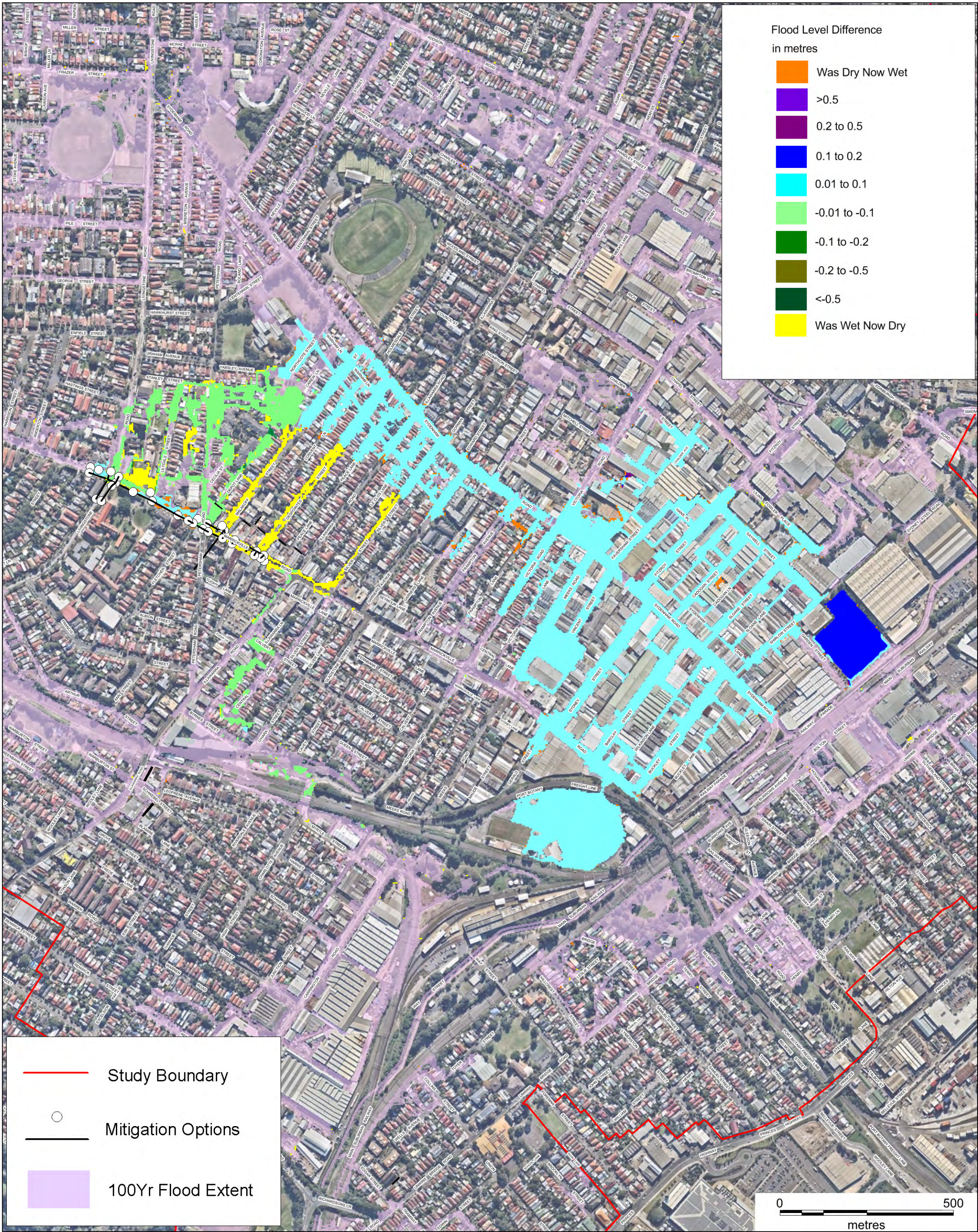
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Water Level Difference
100 Yr
Option FM9.1
MARRICKVILLE VALLEY FRMS&P



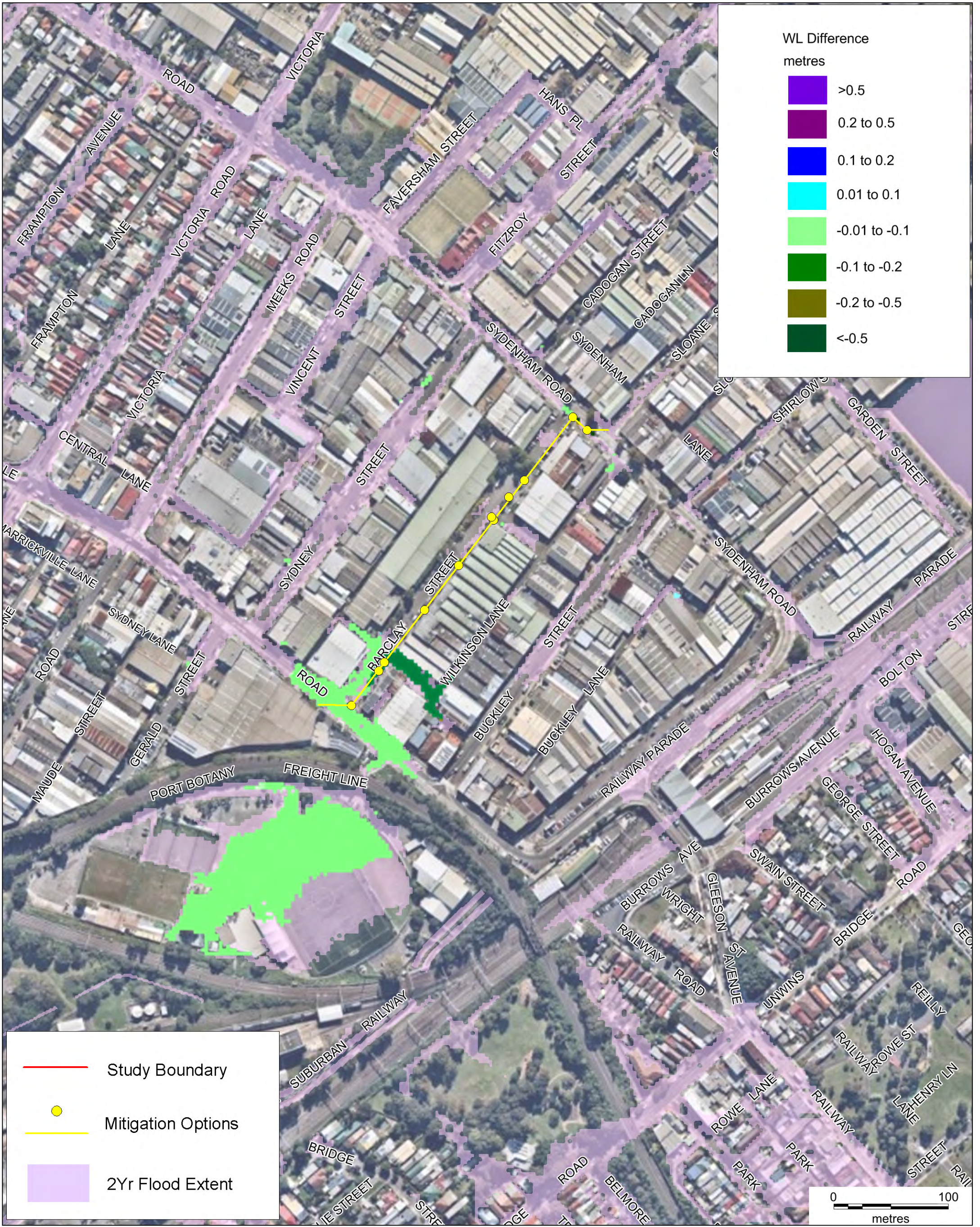
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Water Level Difference
100 Yr
Option FM9.1
MARRICKVILLE VALLEY FRMS&P



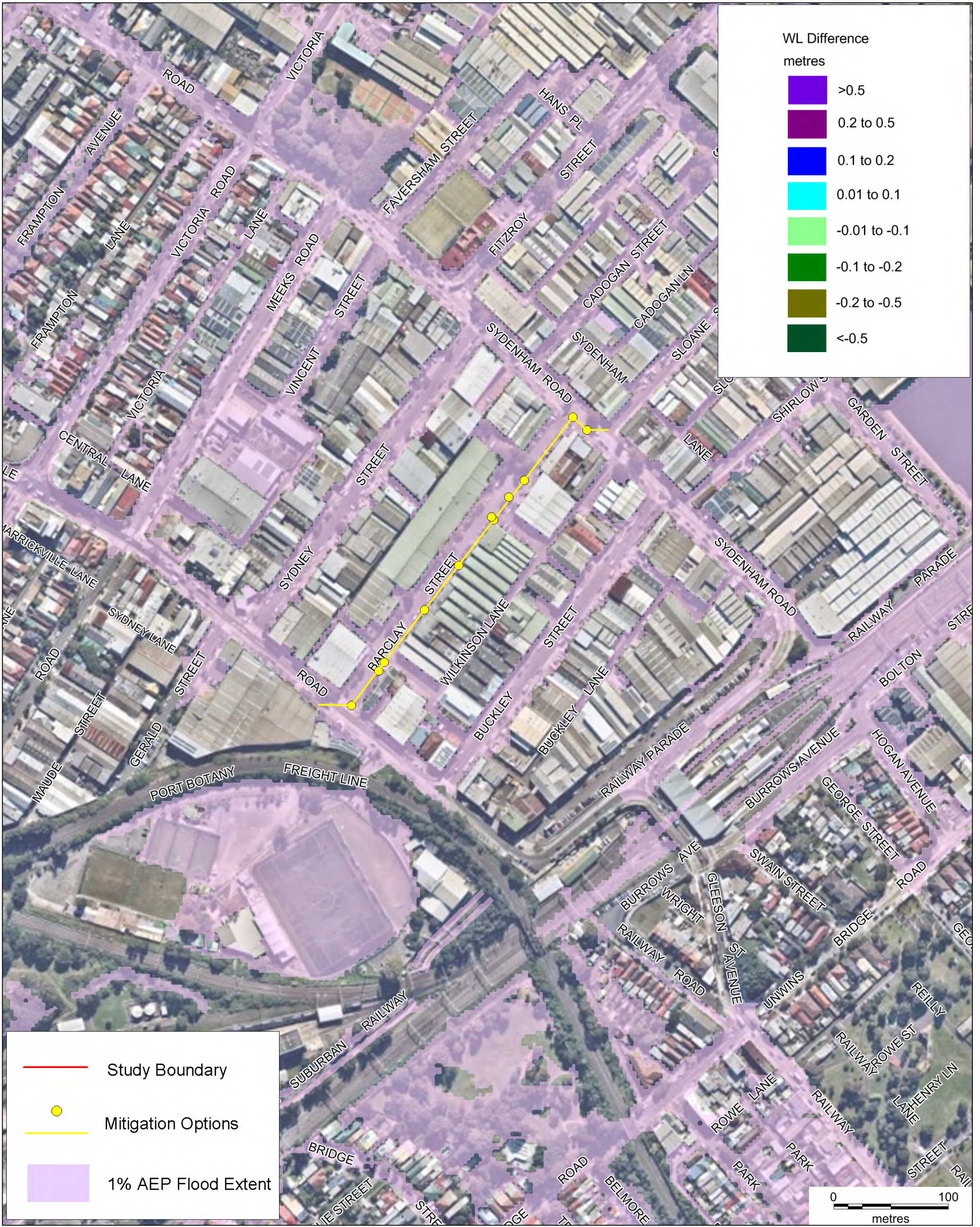
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Water Level Difference
2 Yr
Option FM10.1
MARRICKVILLE VALLEY FRMS&P



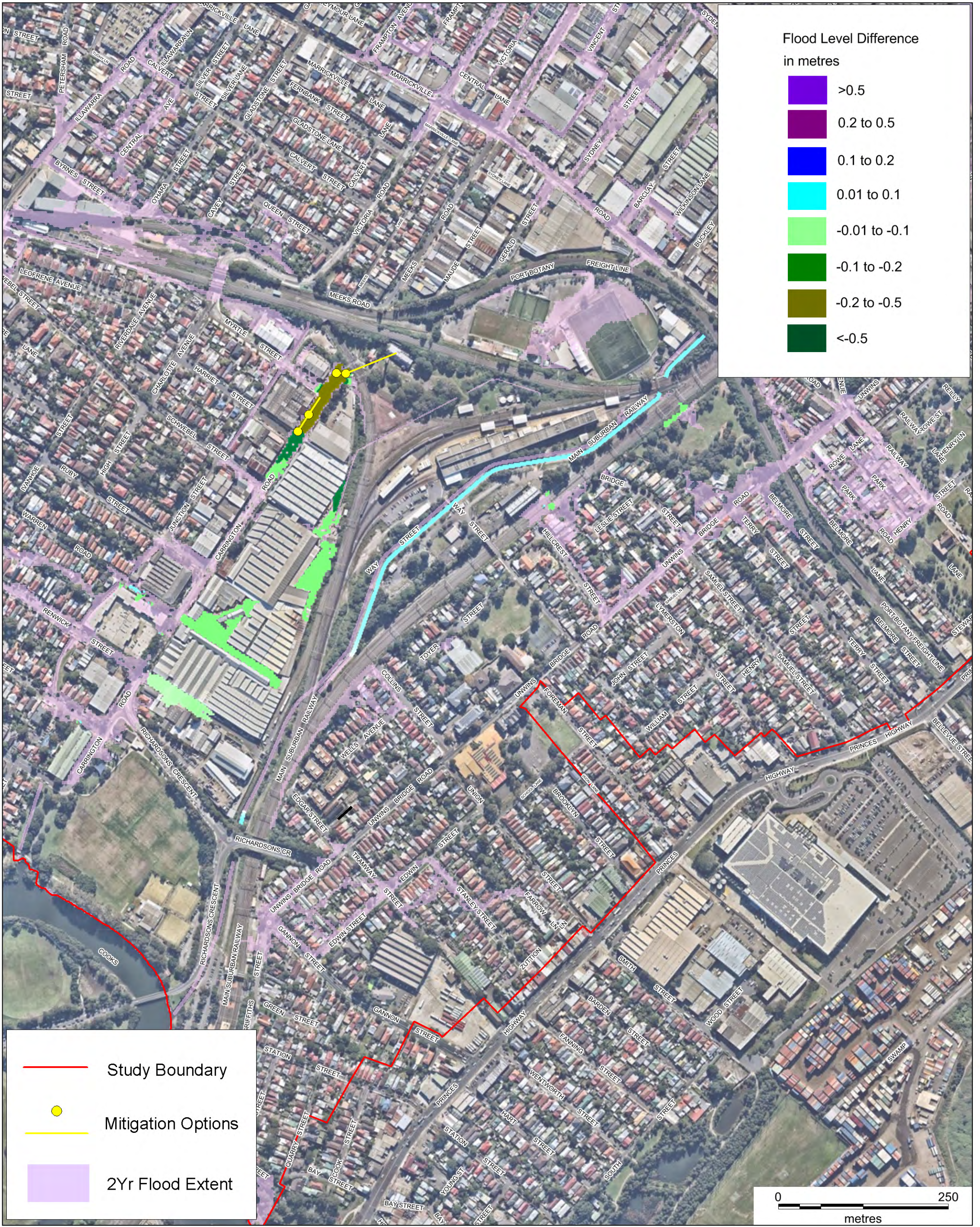
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Water Level Difference
1% AEP
Option FM10.1
MARRICKVILLE VALLEY FRMS&P



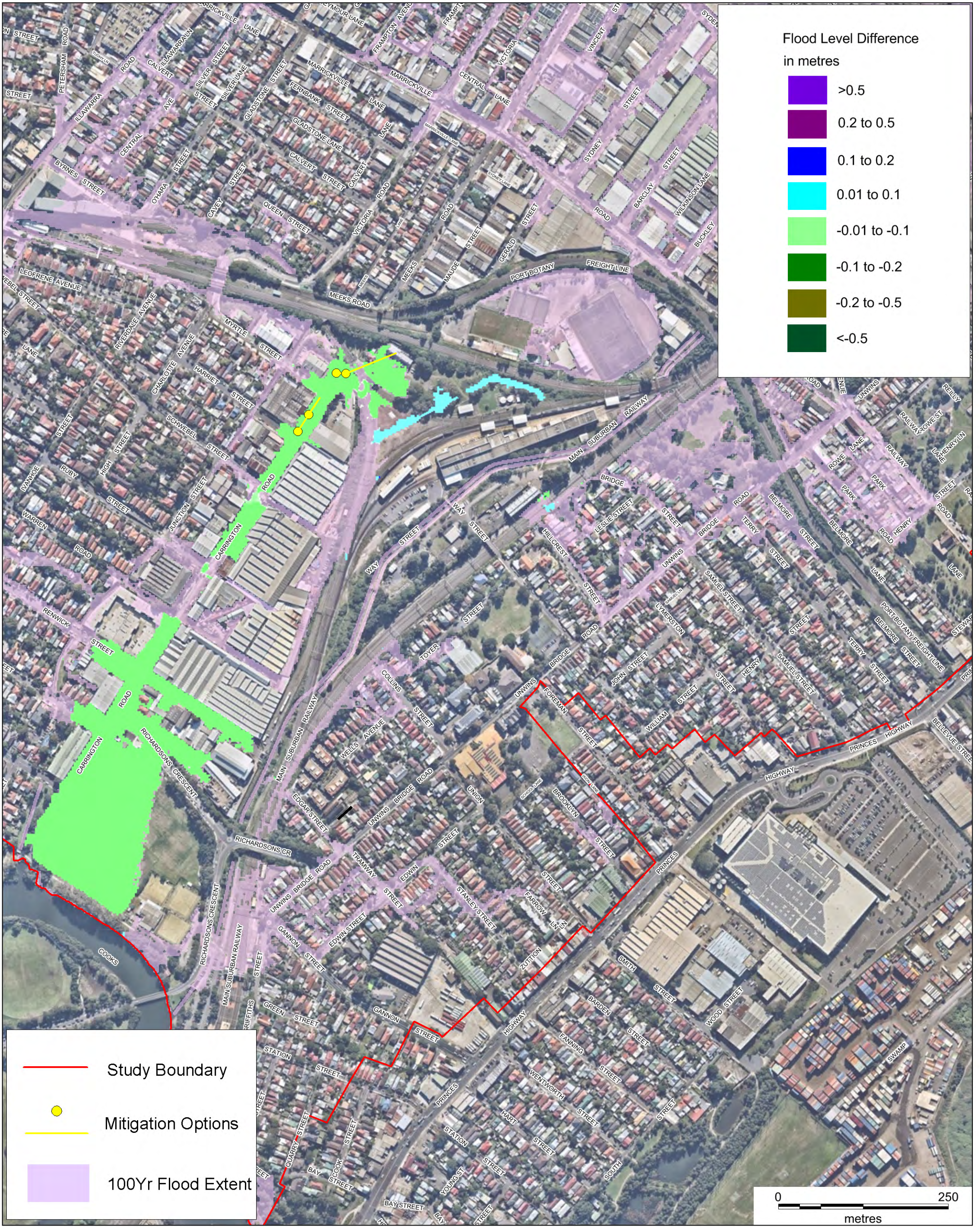
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Water Level Difference
2 Yr
Option FM10.2
MARRICKVILLE VALLEY FRMS&P



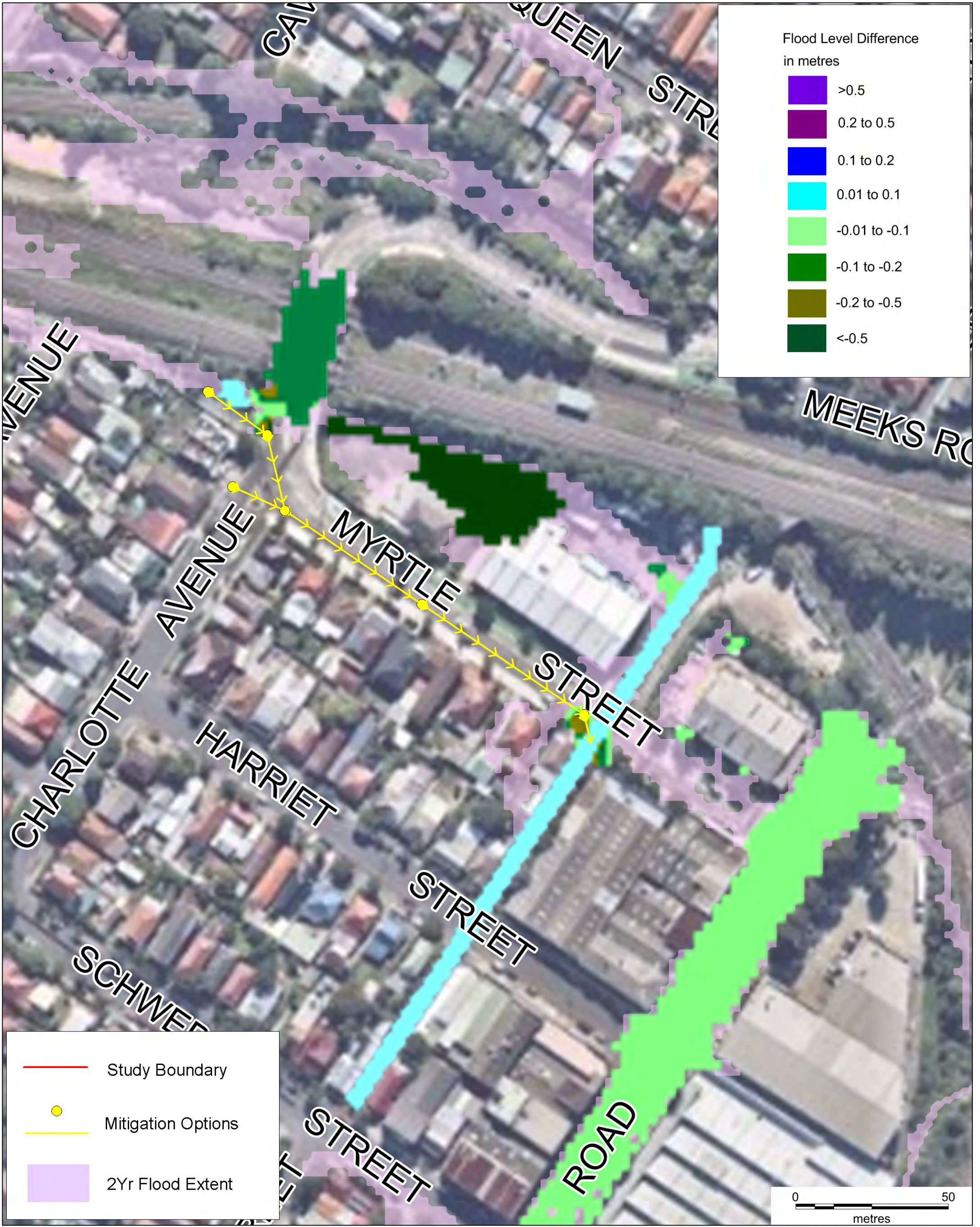
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Water Level Difference
100 Yr
Option FM10.2
MARRICKVILLE VALLEY FRMS&P



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**Water Level Difference
2 Yr
Option FM10.4**

MARRICKVILLE VALLEY FRMS&P



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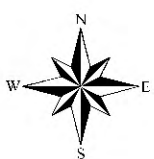
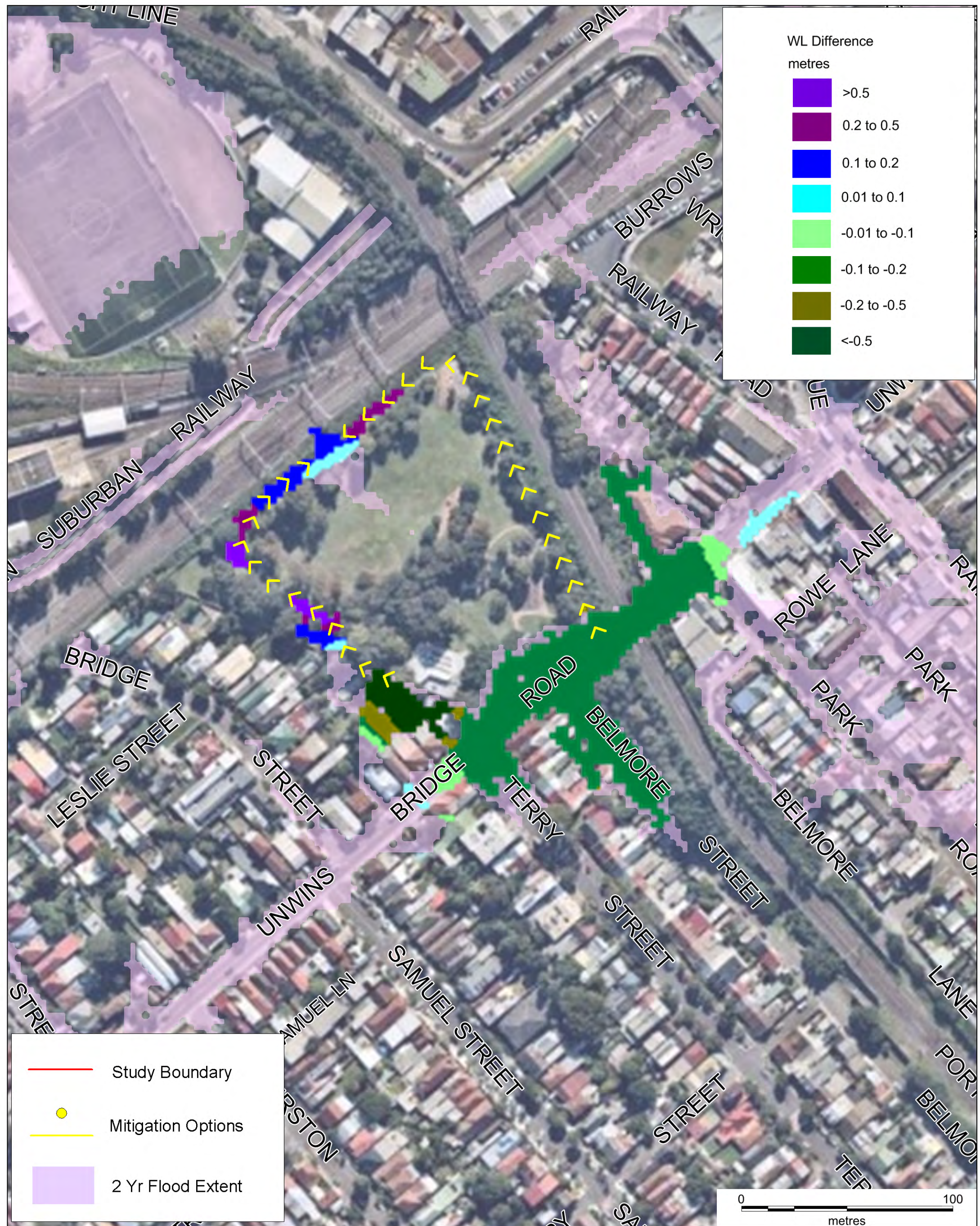


**Water Level Difference
1% AEP
Option FM10.4**

MARRICKVILLE VALLEY FRMS&P



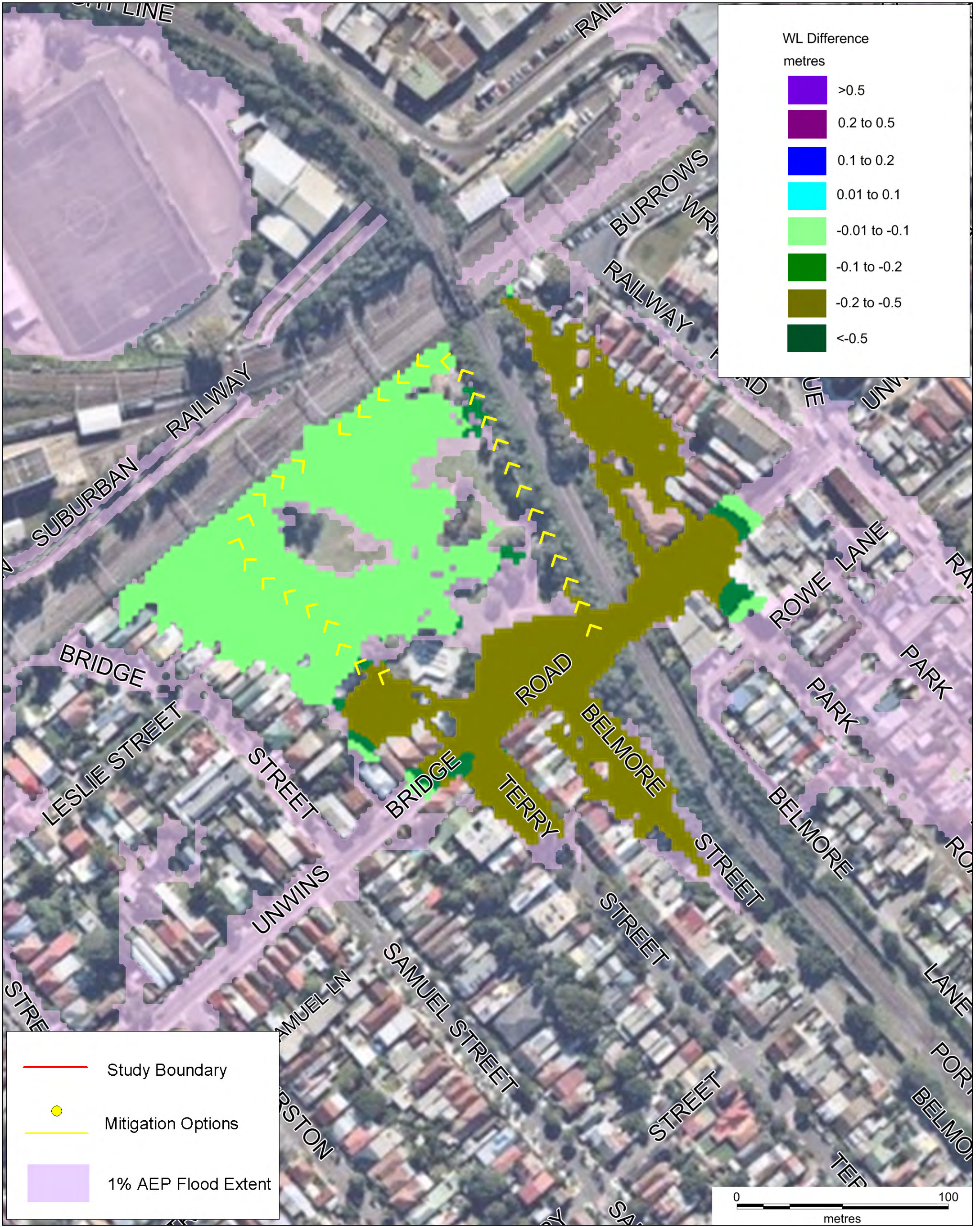
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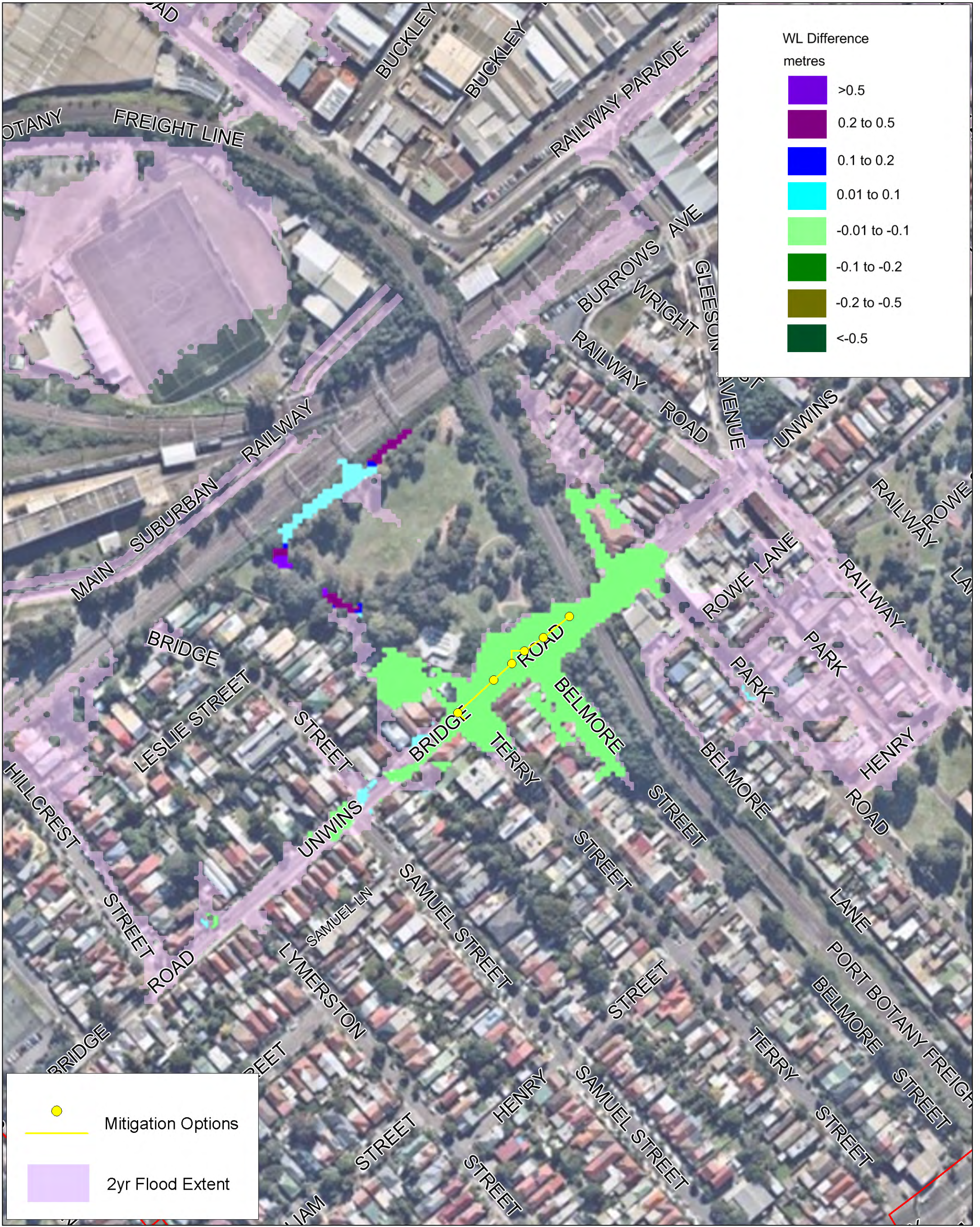


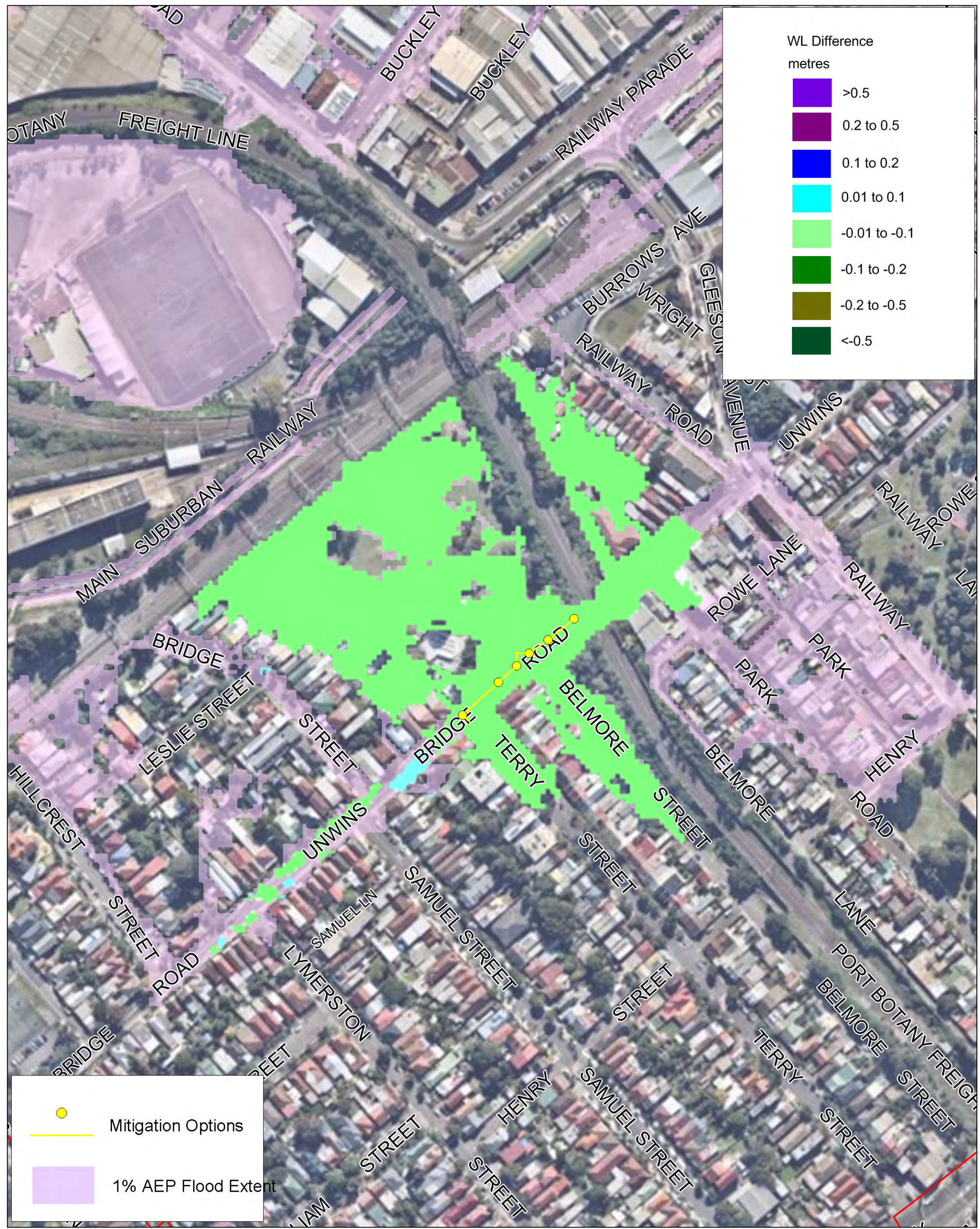
**Water Level Difference
2 Yr
Option FM11.1 & FM11.2**
MARRICKVILLE VALLEY FRMS&P



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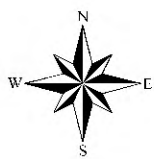


**Water Level Difference
2 Yr
Option FM11.4**

MARRICKVILLE VALLEY FRMS&P



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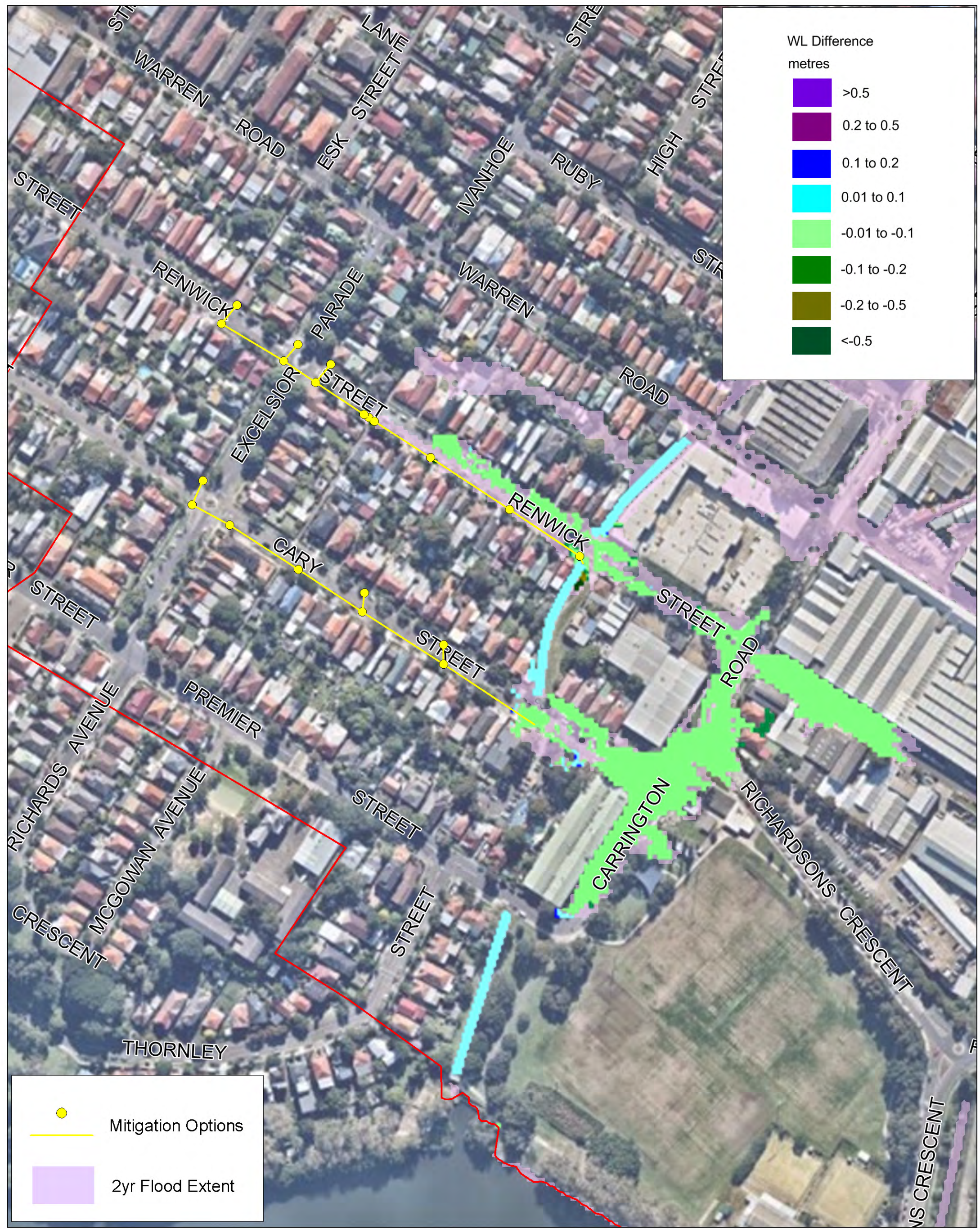


**Water Level Difference
1% AEP
Option FM11.4**

MARRICKVILLE VALLEY FRMS&P



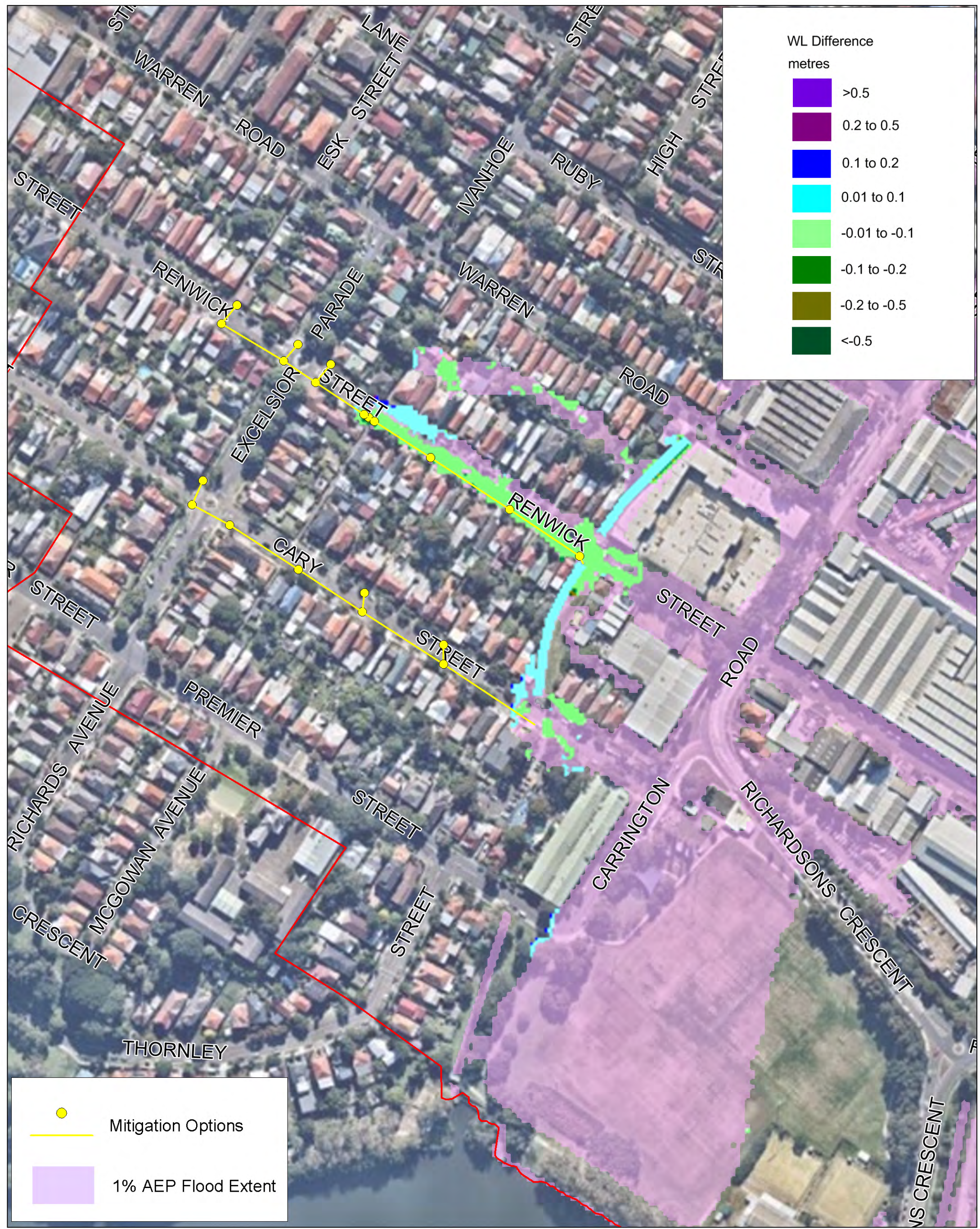
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Water Level Difference
2 Yr
Option FM 12.1 & 12.2
MARRICKVILLE VALLEY FRMS&P



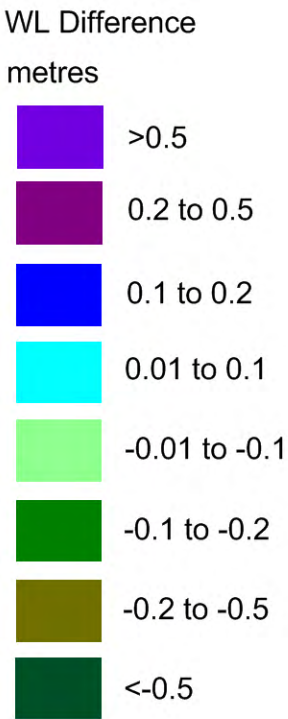
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**Water Level Difference
1% AEP
Option FM 12.1 & 12.2
MARRICKVILLE VALLEY FRMS&P**



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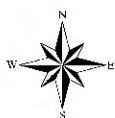
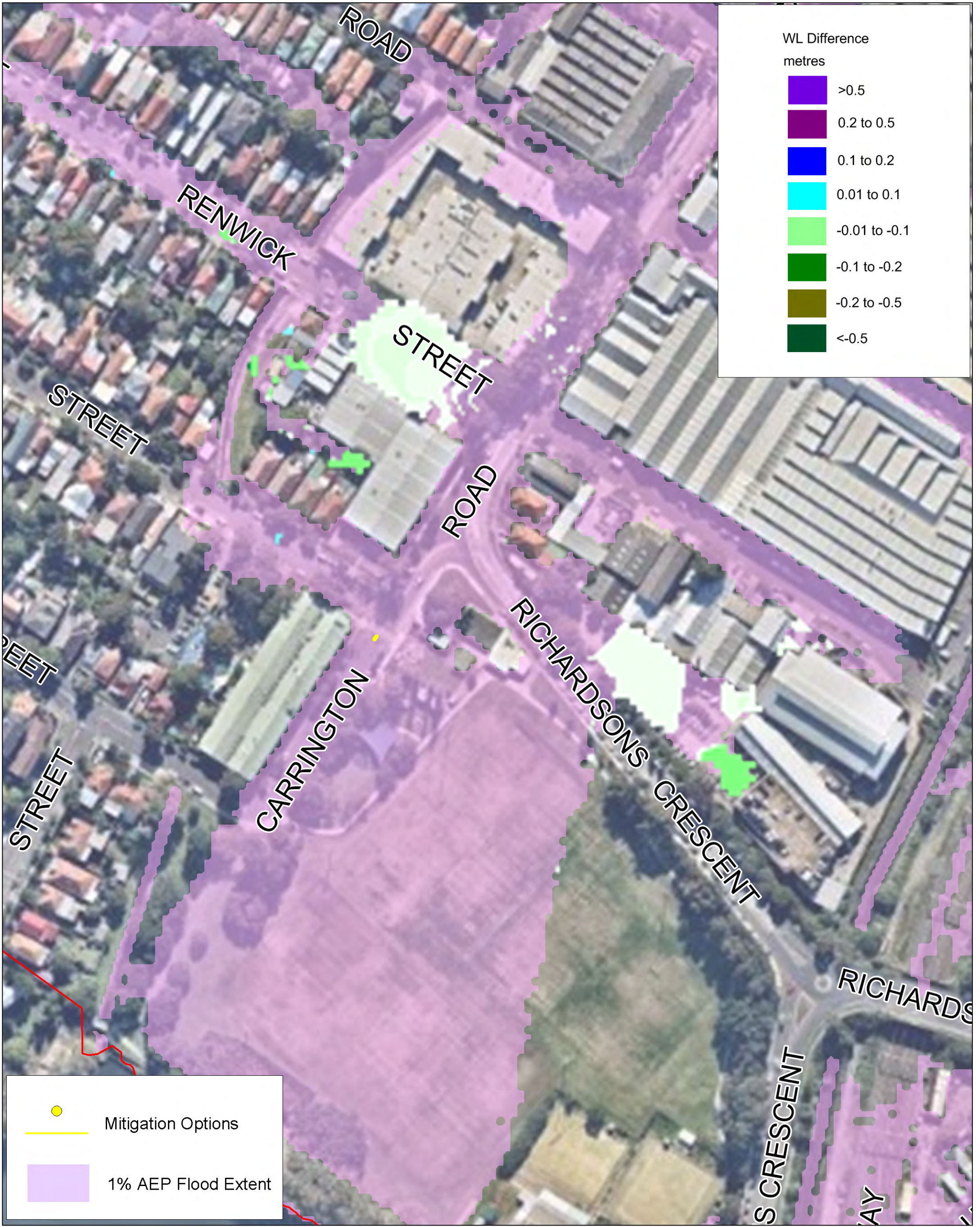
Mitigation Options

2yr Flood Extent

Water Level Difference
2 Yr
Option FM 12.4
MARRICKVILLE VALLEY FRMS&P



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Water Level Difference
1% AEP
Option FM 12.4
MARRICKVILLE VALLEY FRMS&P



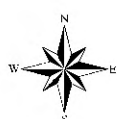
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Water Level Difference
2 Yr
Option FM 12.5
MARRICKVILLE VALLEY FRMS&P



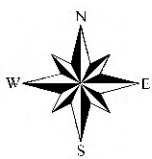
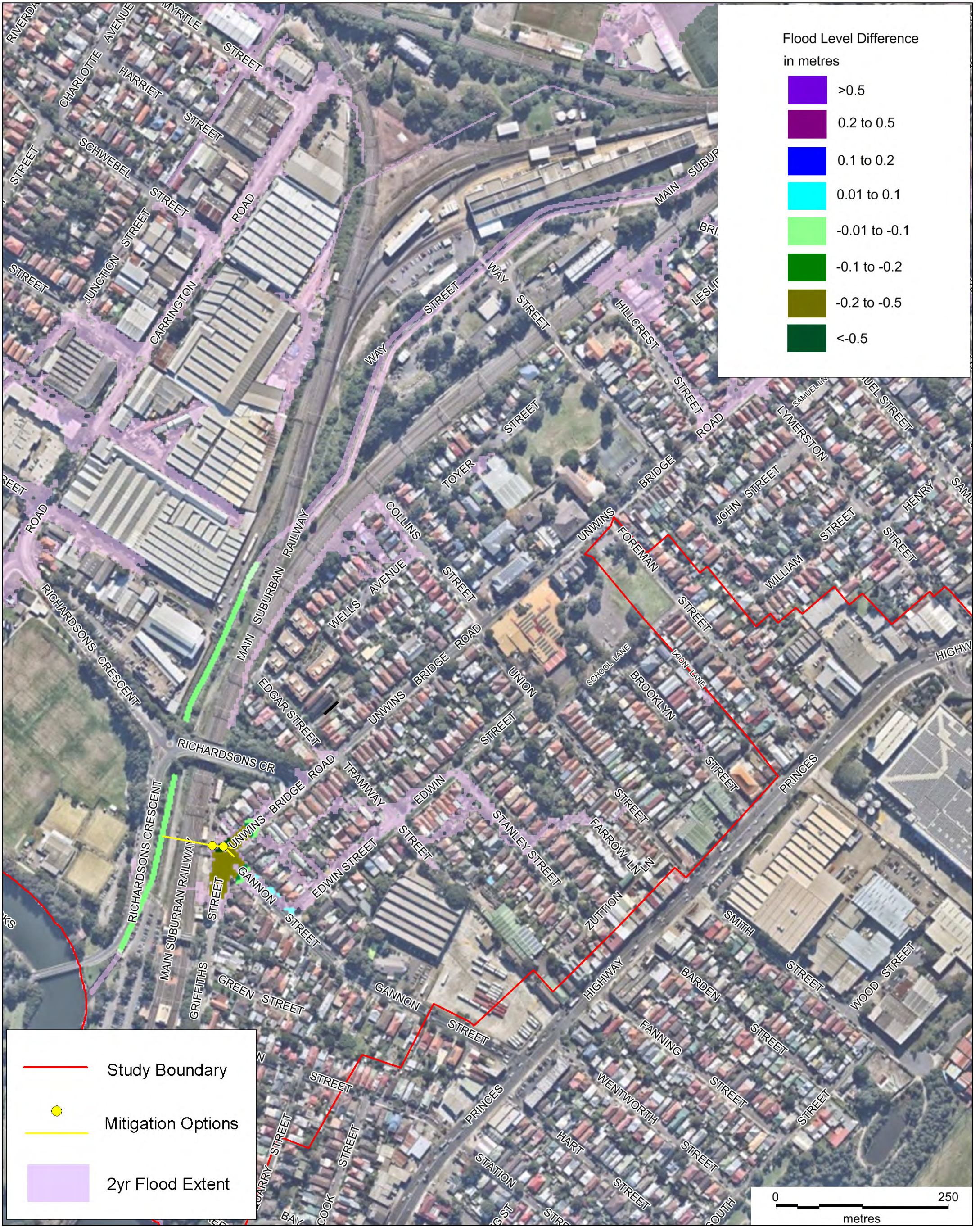
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Water Level Difference
1% AEP
Option FM 12.5
MARRICKVILLE VALLEY FRMS&P



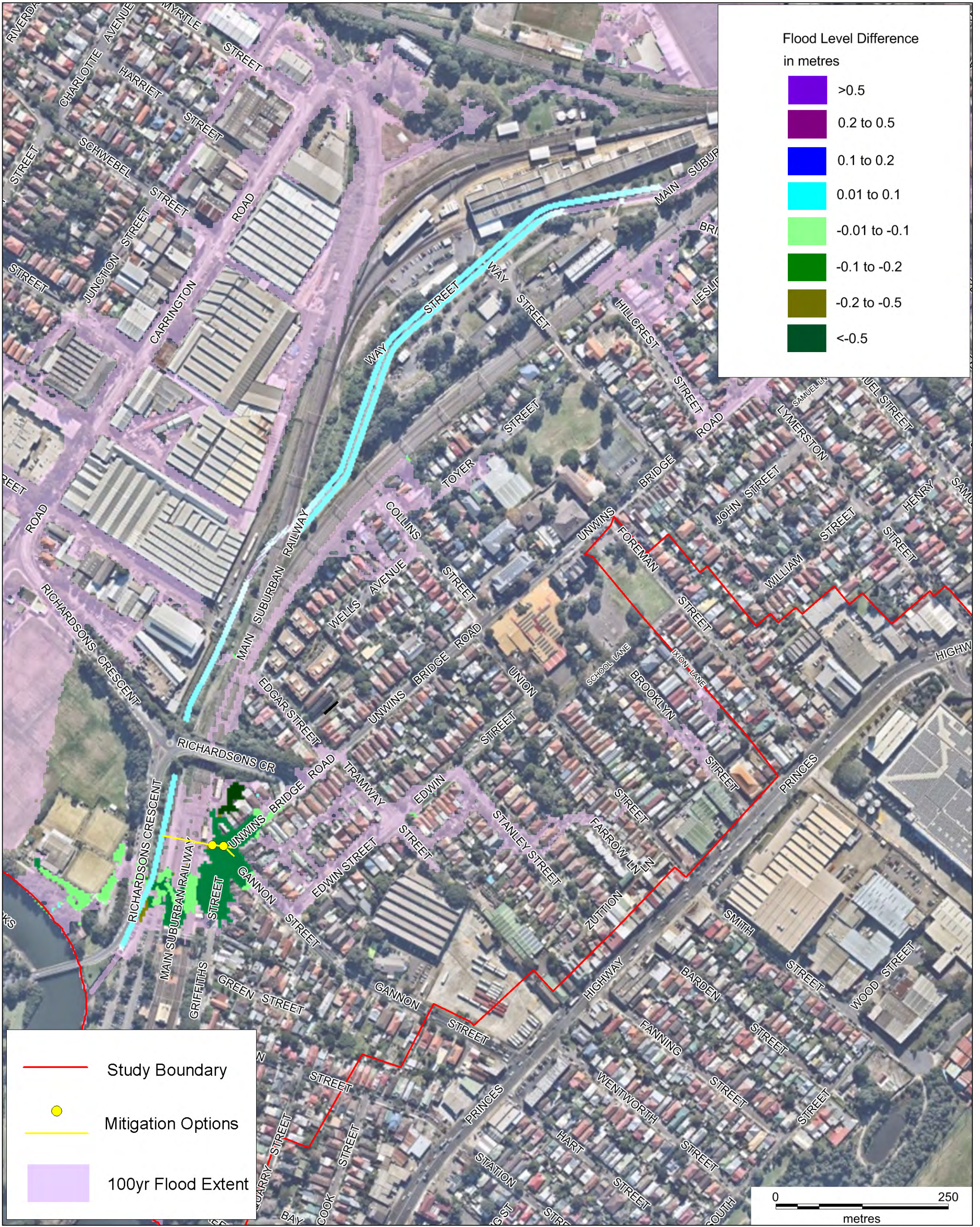
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**Water Level Difference
2 Yr
Option FM13.1 & FM13.2
MARRICKVILLE VALLEY FRMS&P**



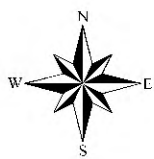
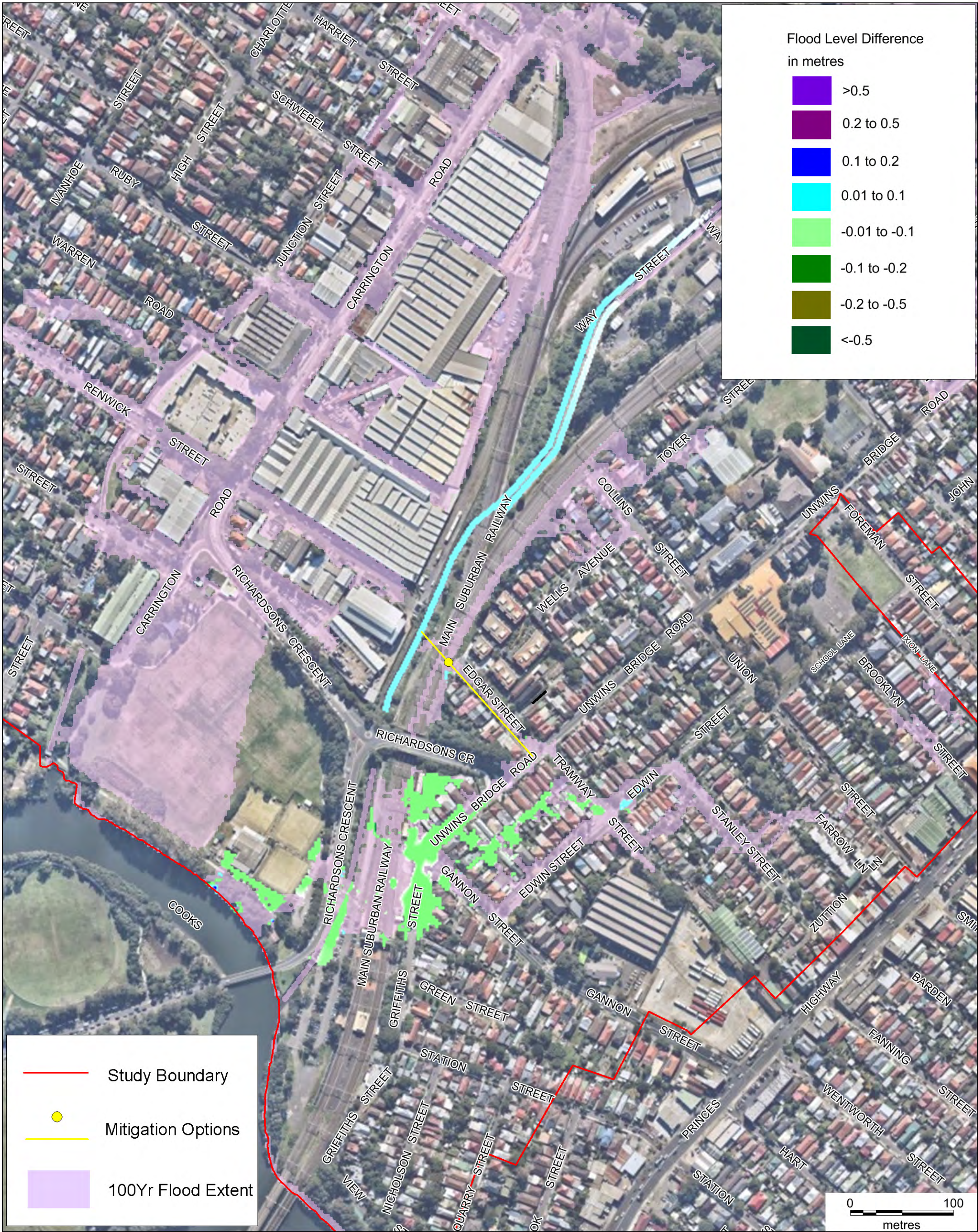
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**Water Level Difference
100 Yr
Option FM13.1 & FM13.2
MARRICKVILLE VALLEY FRMS&P**



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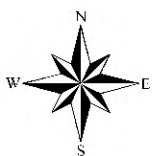
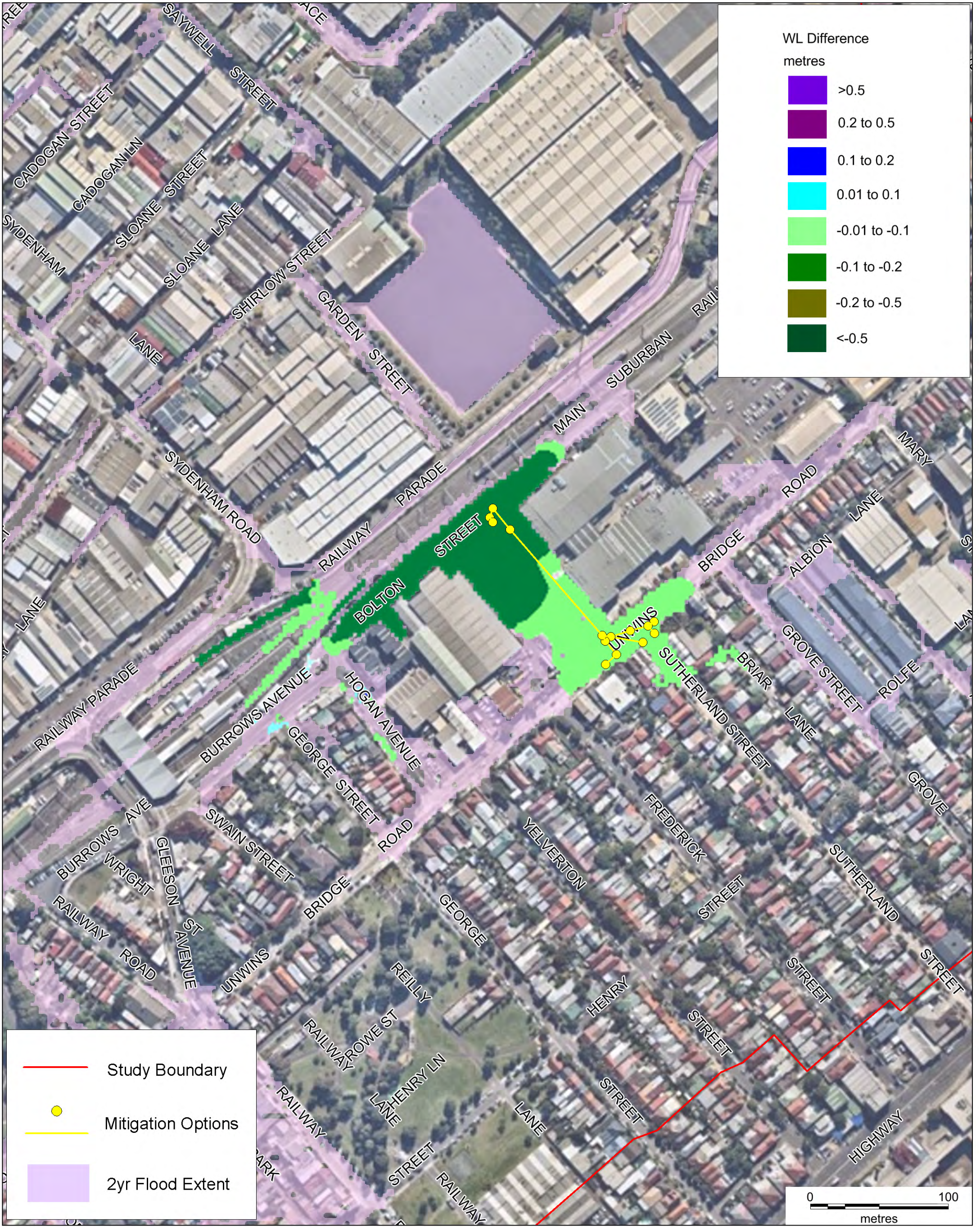


**Water Level Difference
100 Yr
Option FM13.4**

MARRICKVILLE VALLEY FRMS&P



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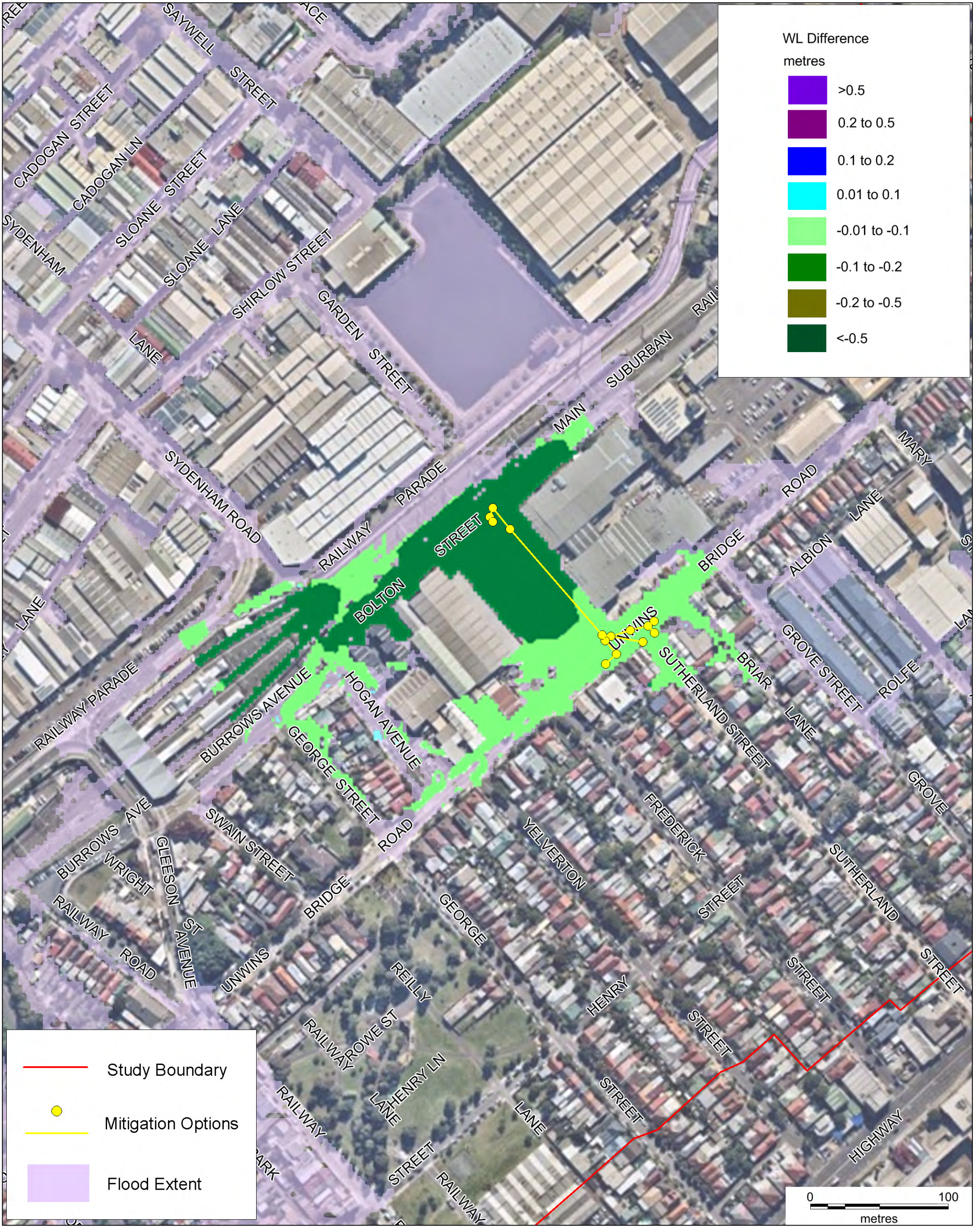


**Water Level Difference
2 Yr
Option FM14.1**

MARRICKVILLE VALLEY FRMS&P



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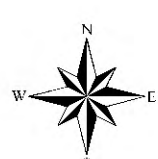
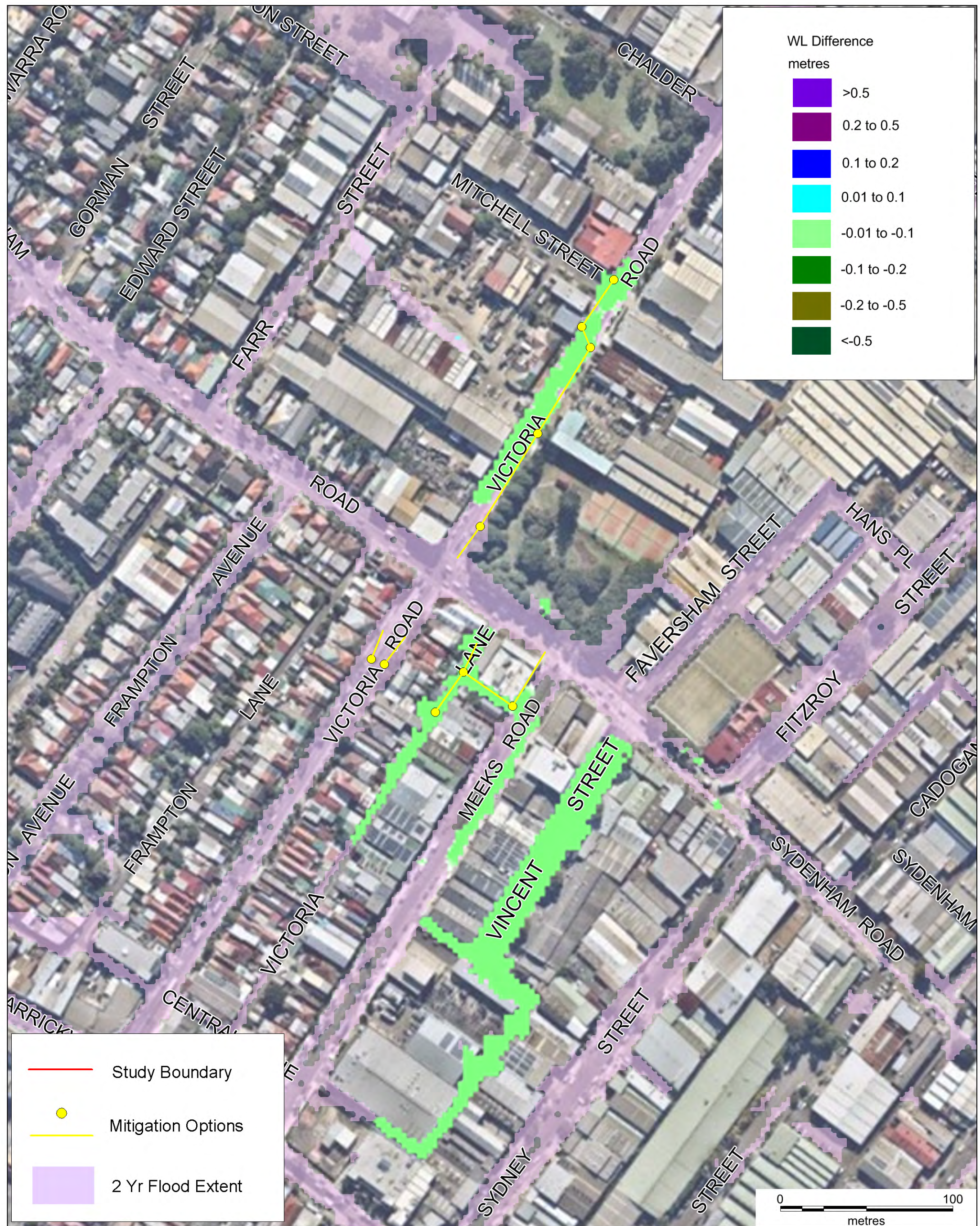


**Water Level Difference
1% AEP
Option FM14.1**

MARRICKVILLE VALLEY FRMS&P



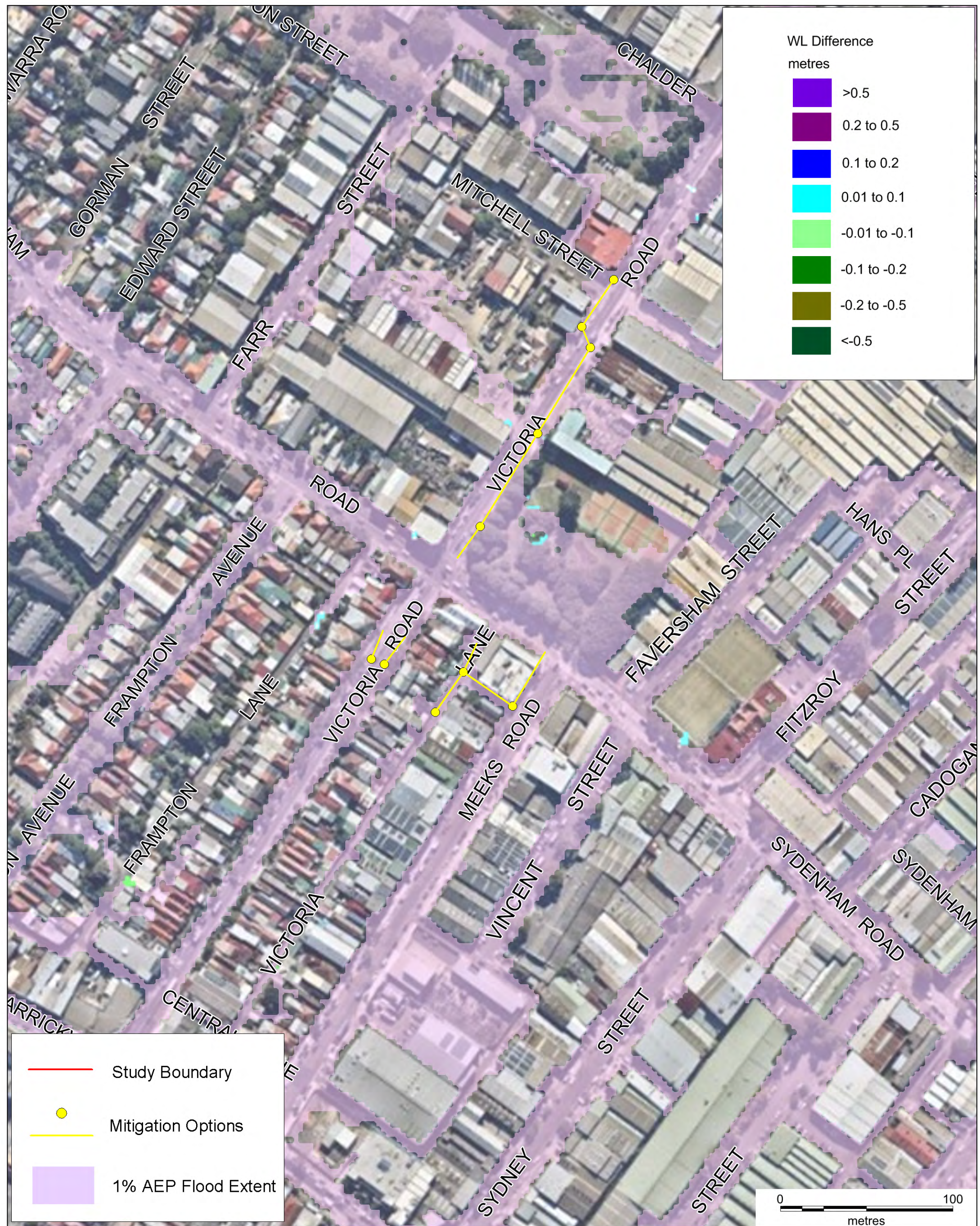
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Water Level Difference
2 Yr
Option FM15.1 & FM15.2
MARRICKVILLE VALLEY FRMS&P



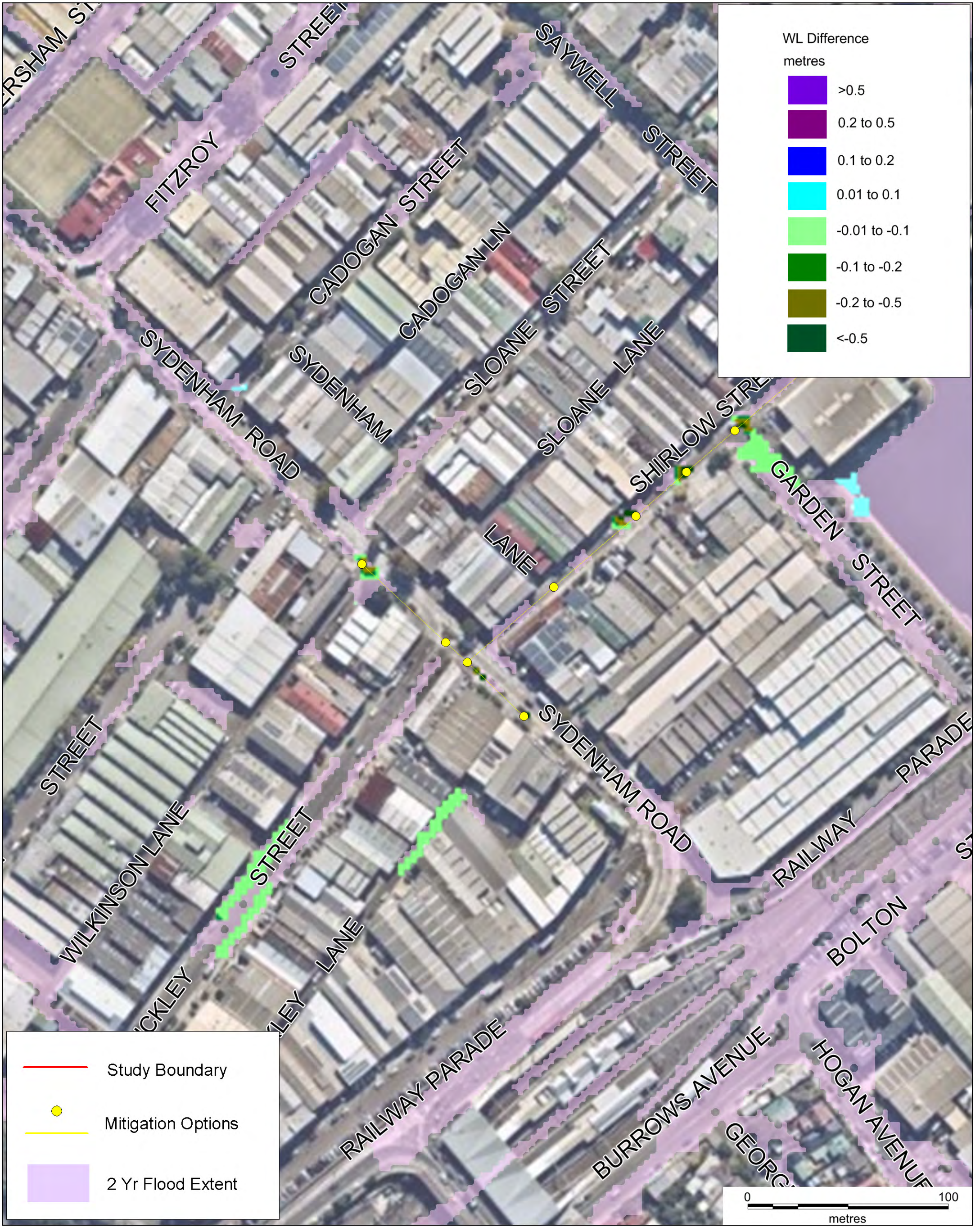
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**Water Level Difference
1% AEP
Option FM15.1 & FM15.2
MARRICKVILLE VALLEY FRMS&P**



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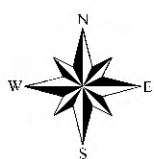
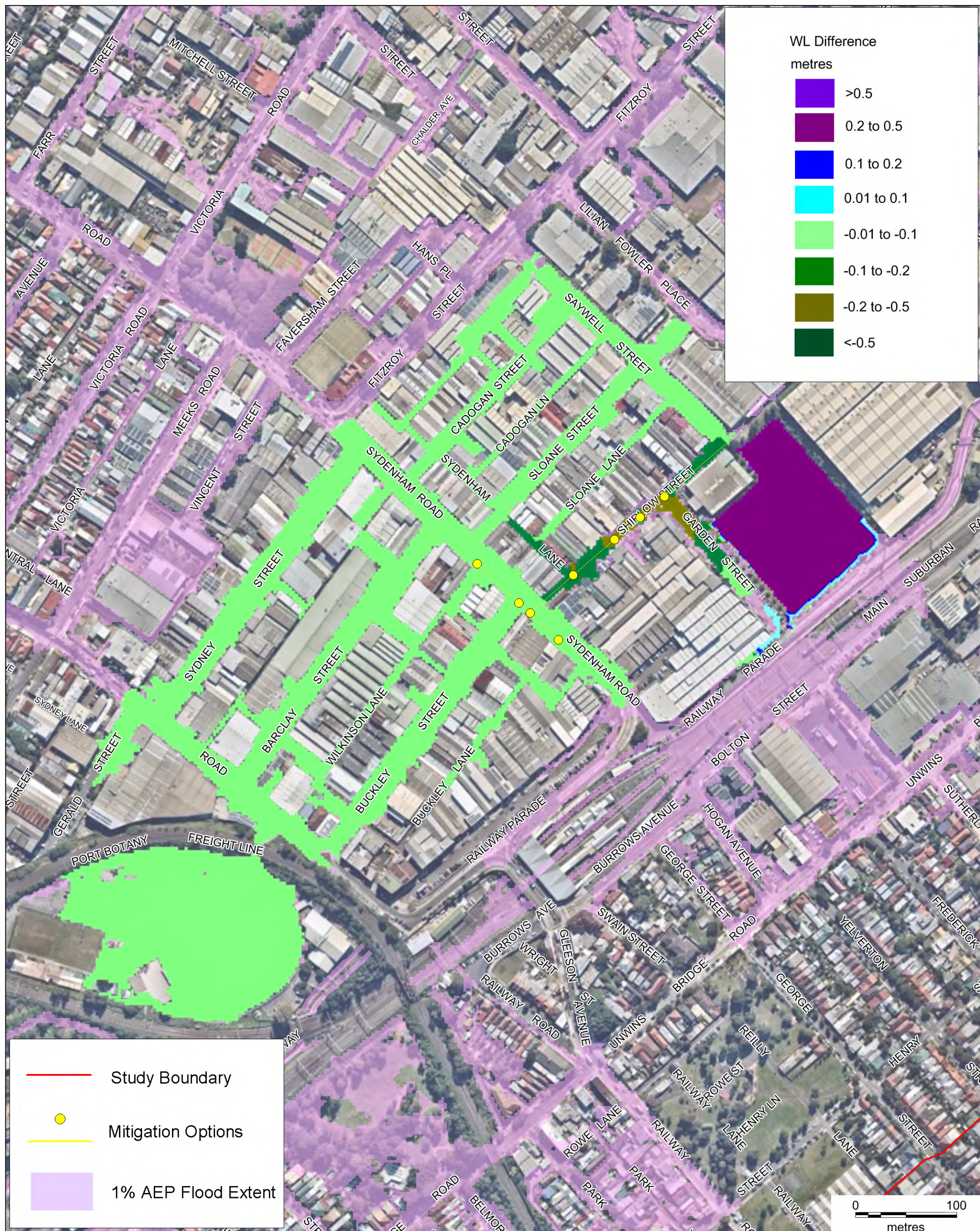


**Water Level Difference
2 Yr
Option FM15.3**

MARRICKVILLE VALLEY FRMS&P



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Water Level Difference **1% AEP** **Option FM15.3**

MARRICKVILLE VALLEY FRMS&P



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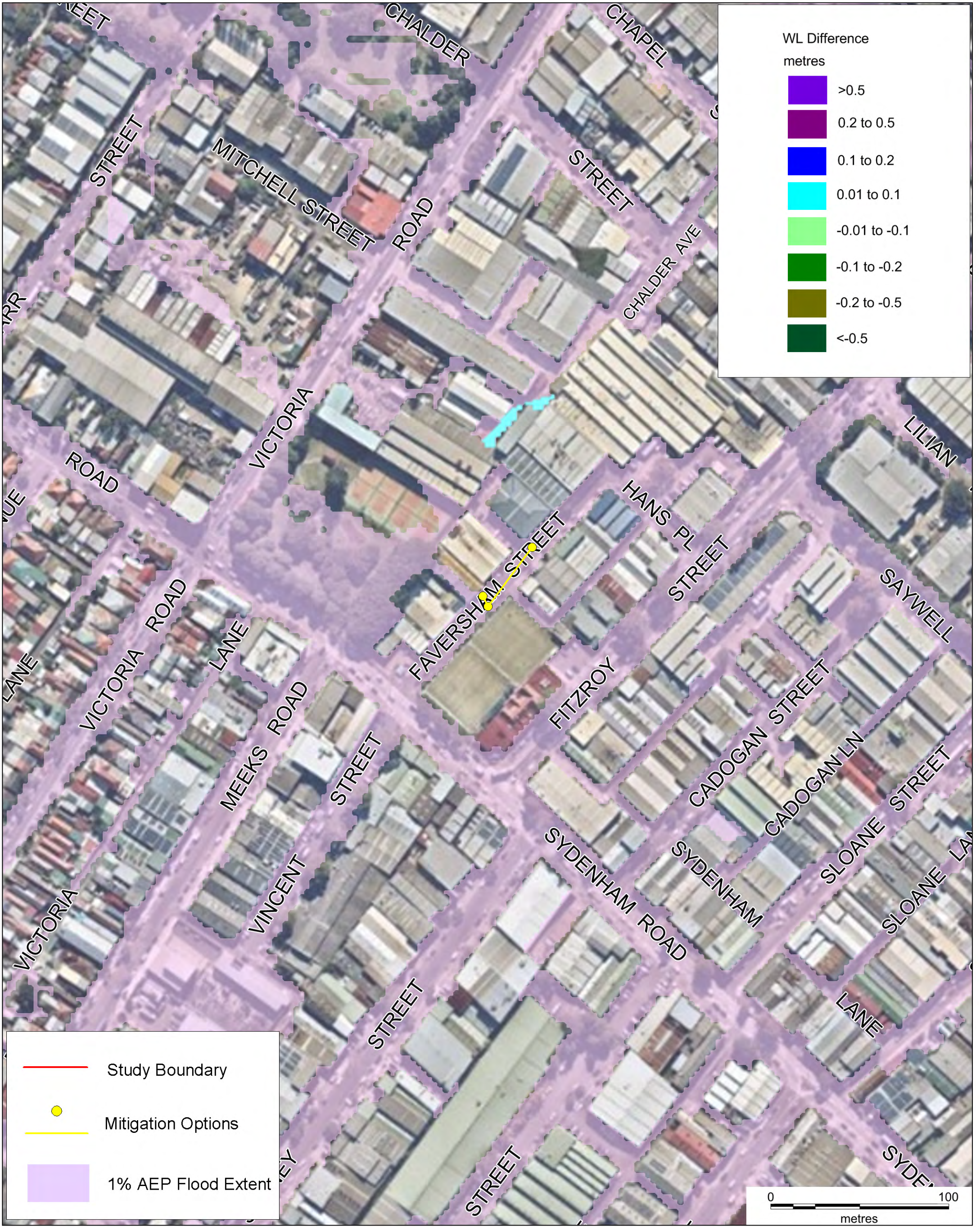


**Water Level Difference
2 Yr
Option FM15.5**

MARRICKVILLE VALLEY FRMS&P



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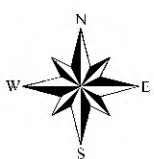
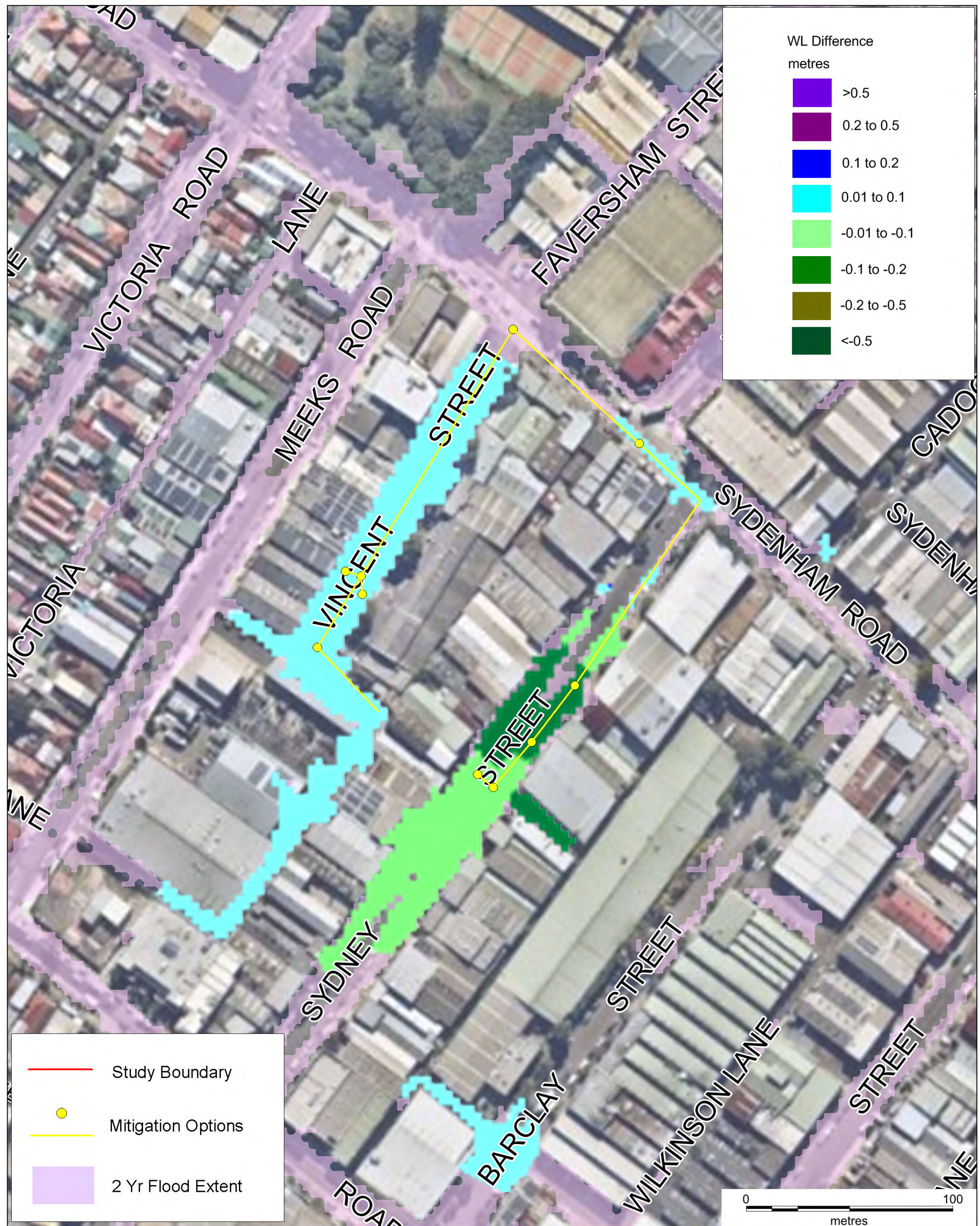


Water Level Difference
1% AEP
Option FM15.5

MARRICKVILLE VALLEY FRMS&P



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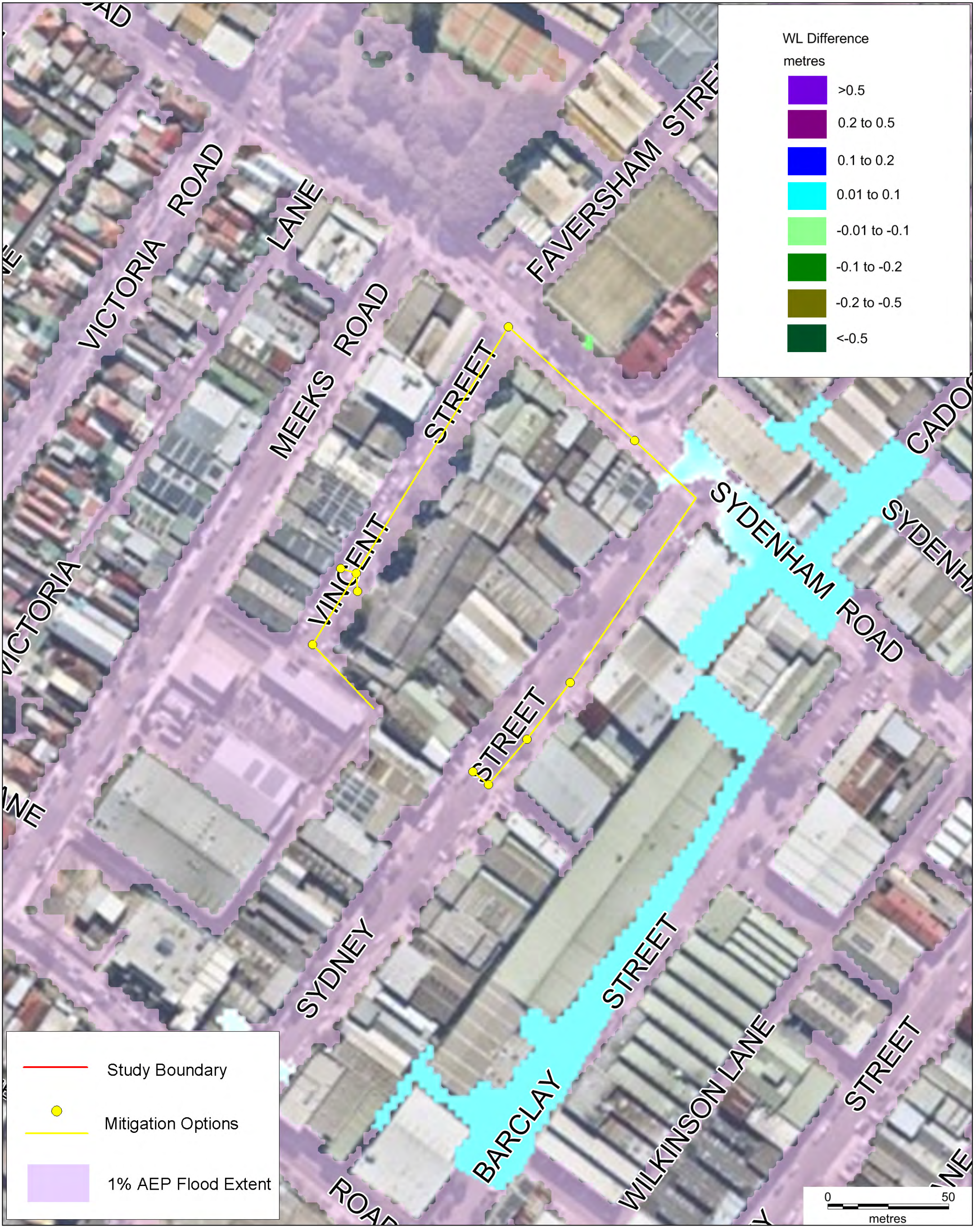


**Water Level Difference
2 Yr
Option FM15.7**

MARRICKVILLE VALLEY FRMS&P



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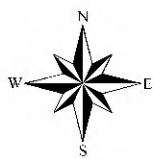
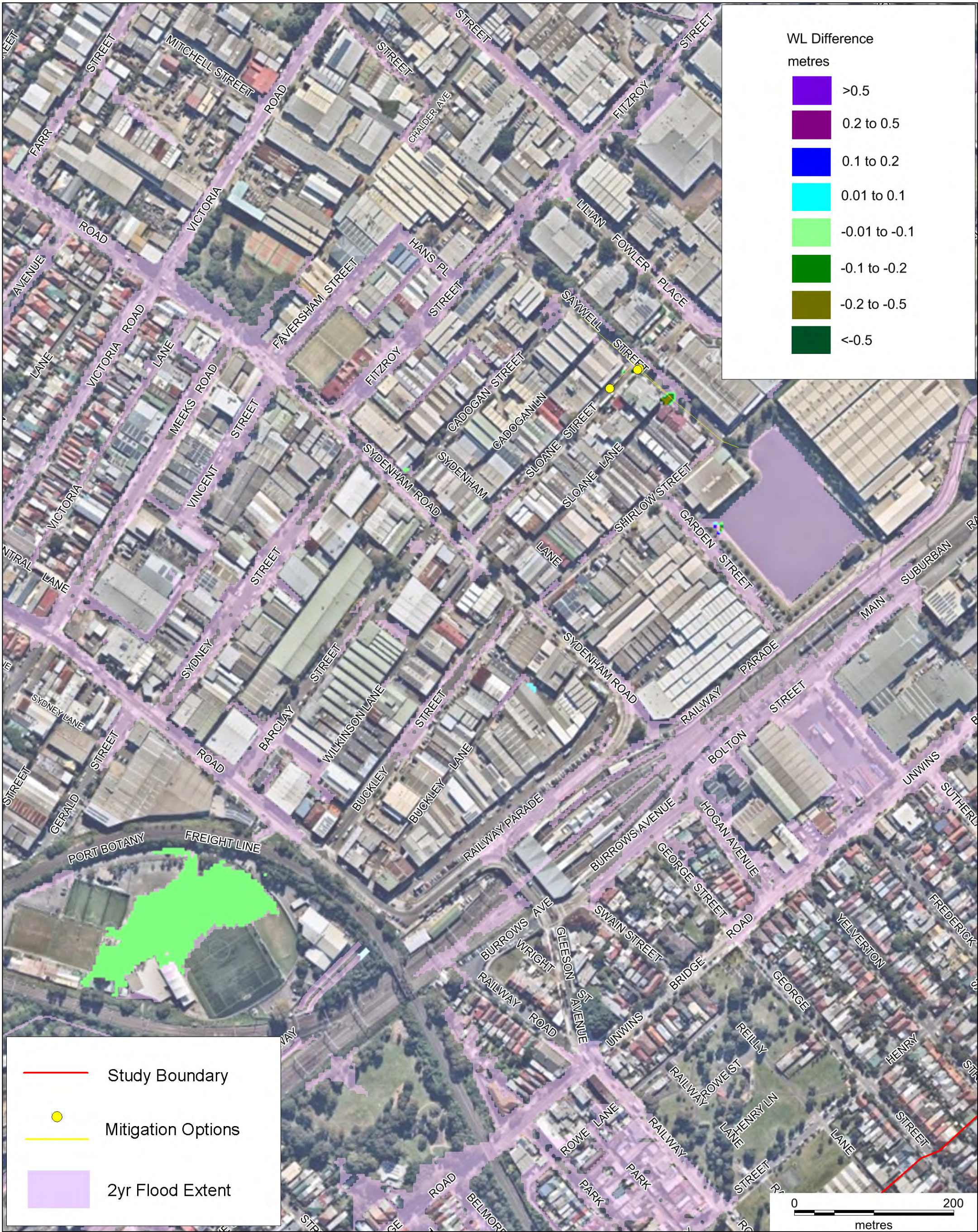


**Water Level Difference
1% AEP
Option FM15.7**

MARRICKVILLE VALLEY FRMS&P



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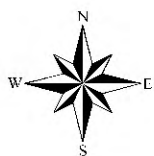
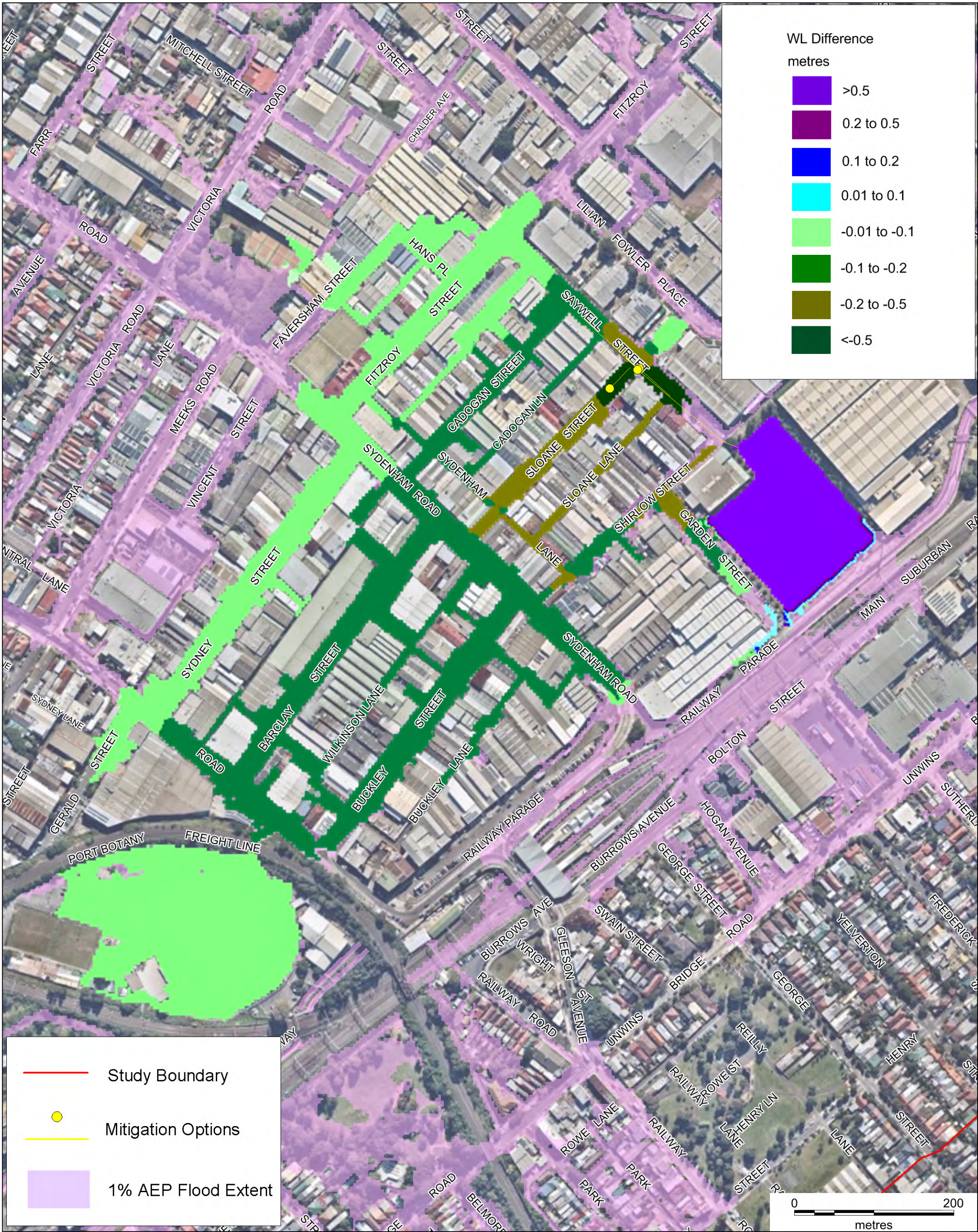


**Water Level Difference
2 Yr
Option FM15.9**

MARRICKVILLE VALLEY FRMS&P



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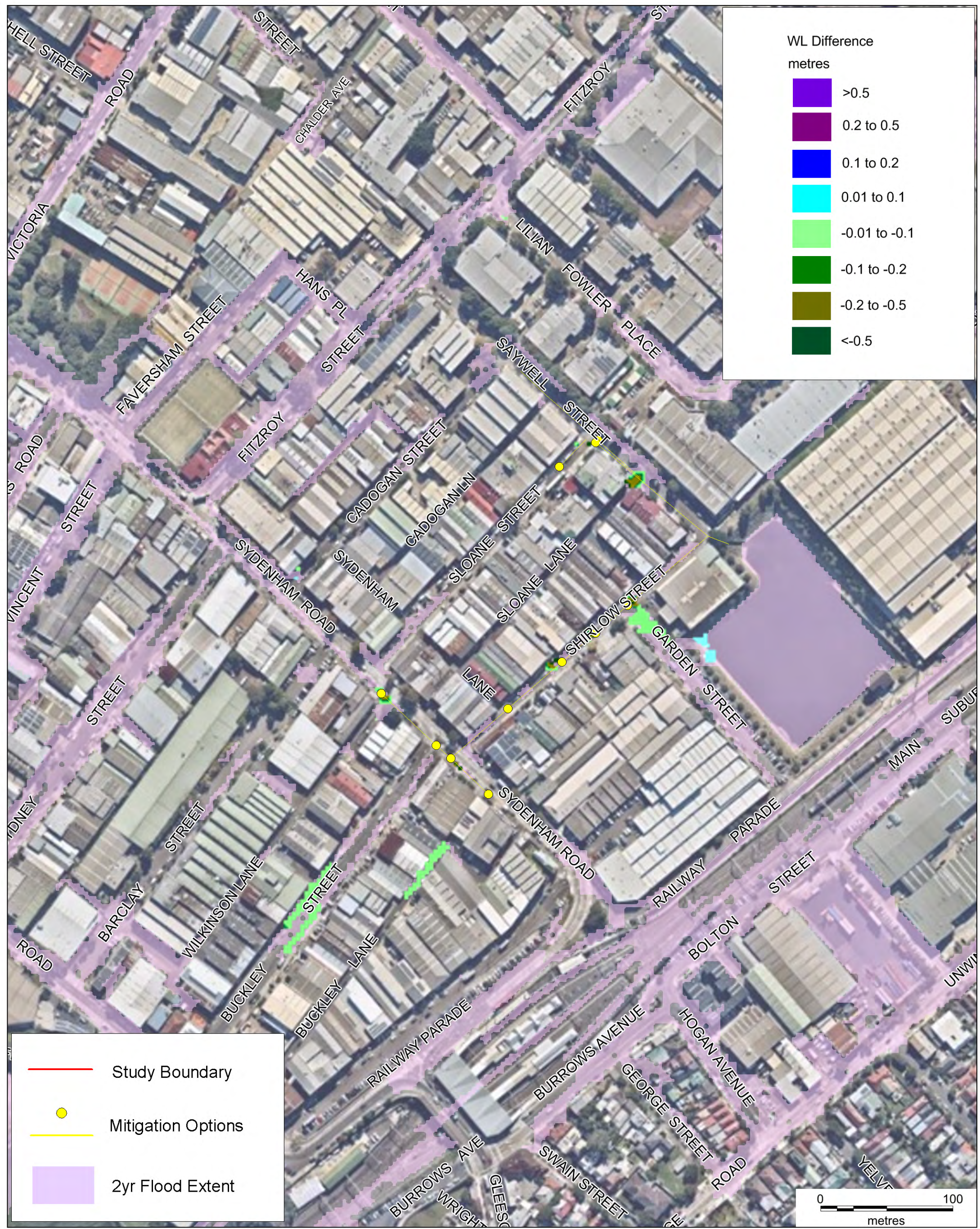


**Water Level Difference
1% AEP
Option FM15.9**

MARRICKVILLE VALLEY FRMS&P



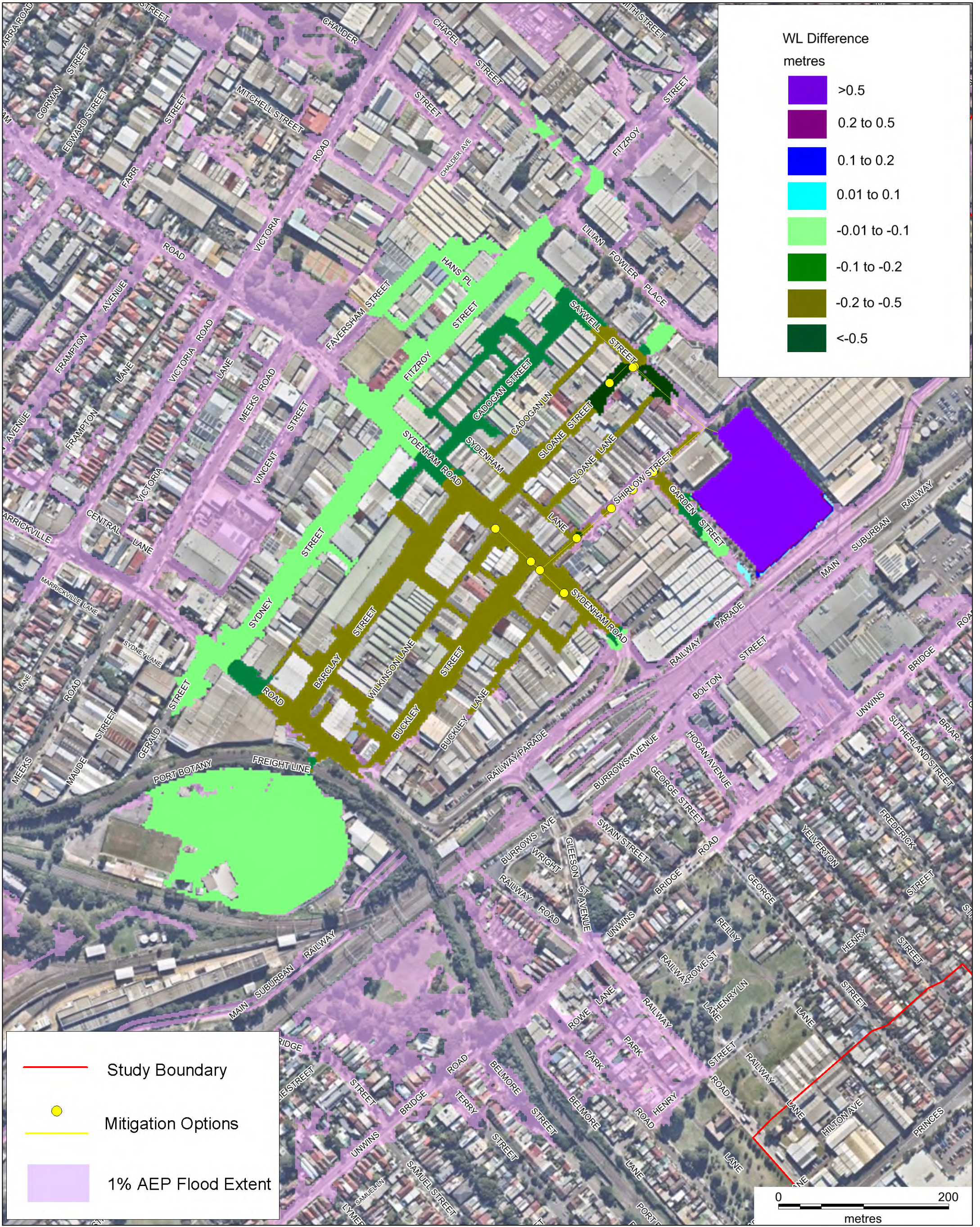
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Water Level Difference
2 Yr
Option FM15.10
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Water Level Difference
1% AEP
Option FM15.10
MARRICKVILLE VALLEY FRMS&P



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Marrickville Valley Floodplain Risk
Management Study and Plan

APPENDIX

A2

OPTIONS COST BREAKDOWN

Lookup Sheet for Construction Rates

Rates based on
Council's
Comments

| Pipe / Culvert Size | Rate (\$/lin.m) | Rate 2010 | Rate 2016 (\$/lin.m) | Council Comment |
|---|-----------------|-----------|----------------------|------------------------|
| Supply, excavate, bed, lay, joint, backfill and provide connections for 0.1m dia. Pipe | 650 | 750 | 862.5 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 0.225m dia. Pipe | 720 | 825 | 948.75 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 0.375m dia. Pipe | 780 | 900 | 1035 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | 800 | 925 | 1063.75 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 0.525m dia. Pipe | 820 | 950 | 1092.5 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 850 | 975 | 1121.25 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 0.675m dia. Pipe | 870 | 1000 | 1150 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | 930 | 1075 | 1236.25 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | 980 | 1125 | 1293.75 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | 1040 | 1200 | 1380 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | 1230 | 1425 | 1638.75 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | 1430 | 1650 | 1897.5 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | 1690 | 1950 | 2242.5 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 1.5m dia. Pipe | 1950 | 2250 | 2587.5 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 1.65m dia. Pipe | 2330 | 2700 | 3105 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | 2850 | 3300 | 3795 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 1.95m dia. Pipe | 3110 | 3600 | 4140 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | 3370 | 3900 | 4485 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for twin 1.8m dia. Pipe | 6270 | 6750 | 7762.5 | all about 25% too high |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | 1380 | 1200 | 1380 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | 1725 | 1500 | 1725 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m x 0.9m culvert | 2185 | 1900 | 2185 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | 2760 | 2400 | 2760 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | 3220 | 2800 | 3220 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 1.8m culvert | 3680 | 3200 | 3680 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 2.0m x 2.1m culvert | 4485 | 3900 | 4485 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m x 2.1m culvert | 4600 | 4000 | 4600 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 1.5m culvert | 4600 | 4000 | 4600 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | 4830 | 4200 | 4830 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 2.7m x 2.7m culvert | 5520 | 4800 | 5520 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 3.0m x 0.6m culvert | 3680 | 3200 | 3680 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 3.0m x 0.9m culvert | 5520 | 4800 | 5520 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 3.0m x 1.5m culvert | 5865 | 5100 | 5865 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 3.0m x 3.0m culvert | 6555 | 5700 | 6555 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 3.3m x 3.3m culvert | 7072.5 | 6150 | 7072.5 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 3.6m x 0.6m culvert | 5865 | 5100 | 5865 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 3.6m x 0.9m culvert | 7245 | 6300 | 7245 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 3.6m x 1.5m culvert | 7590 | 6600 | 7590 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 3.6m x 1.8m culvert | 8107.5 | 7050 | 8107.5 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 3.6m x 2.0m culvert | 9315 | 8100 | 9315 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 3.6m x 2.7m culvert | 10695 | 9300 | 10695 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 3.6m x 3.3m culvert | 13225 | 11500 | 13225 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 3.6m x 3.6m culvert | 15180 | 13200 | 15180 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 3.8m x 1.8m culvert | 13915 | 12100 | 13915 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 4.3m x 1.9m culvert | 14720 | 12800 | 14720 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 5.0m x 1.8m culvert | 15295 | 13300 | 15295 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 5.5m x 1.5m culvert | 15525 | 13500 | 15525 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 5.5m x 2.7m culvert | 16100 | 14000 | 16100 | |
| Supply, excavate, bed, lay, joint, backfill and provide connections for 6.0m x 1.8m culvert | 18975 | 16500 | 18975 | |

Other Rates

| | Rate (\$) | Unit |
|---|-----------|----------|
| Clearing & grubbing | 10 | sq.m |
| Strip topsoil & stockpile for re-use (assuming 150mm depth) | 25 | cu.m |
| Dispose of excess topsoil (nominal 10% allowance) | 200 | cu.m |
| Pull up and dispose existing road surface (assuming 500mm depth) | 150 | sq.m |
| Removal and disposal of existing stormwater network | 60 | lin.m |
| Excavate material , including disposal / provision of cut | 200 | cu.m |
| | | |
| Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 10 | sq.m |
| | | |
| Weeding / clearing of channel sections with overgrown banks or invasive / exotic species. | 30 | sq.m |
| Plant riparian corridor with suitable trees and shrubs | 20 | sq.m |
| Reinstate disturbed road pavement, including kerbs where necessary | 120 | sq.m |
| | | |
| Removal of existing culvert system | 5000 | lin.m |
| Import, prepare and compact fill material | 20 | cu.m |
| | | |
| Supply and install inlet or junction pit | 6000 | per unit |
| | | |
| Supply, excavate, bed, lay, backfill surcharge pit | 30000 | per unit |
| | | |

| | | |
|---|--------|----------|
| Excavate- cut / fill & regrade to suit new design levels, including disposal / provision of cut / fill | 30 | cu.m |
| Relocation of services for minor road | 30000 | per unit |
| Relocation of services for major road | 100000 | per unit |
| Allowance for nightworks (assume for works on all regional/state roads and within 20m of traffic signals) | 30% | |

| Option ID | Details | Capital | Ongoing - assumed 1% of capital cost |
|-----------|---|----------------|--------------------------------------|
| FM1.1 | Install new pipes to re-direct flows from Morton Ave to Frazer St, and install a new box culvert from the low point along Frazer St to a new surcharge pit in Marrickville Oval. Additional sag inlet pits to get flows into the pipes. | \$2,328,000.00 | \$23,280 |
| FM1.2 | Divert Flows from Wardell Rd down Bishop St to basin via pipes & a box culvert from the low point along Frazer St to a new surcharge pit in Marrickville Oval. | \$2,208,900.00 | \$22,089 |
| FM2.1 | Install orifice plate on basin outlet to maximise basin flood attenuation for up to the 20% AEP event. | \$72,000.00 | \$720 |
| FM2.3 | Divert George Street catchment from Livingstone Road sag to Centennial St. | \$806,800.00 | \$8,068 |
| FM3.1 | Divert flows from Jarvie Park to Malakoff Tunnel and upgrade drainage in Petersham Rd and Northcote St. | \$794,200.00 | \$7,942 |
| FM3.2 | Installing new pits and a pipe along Sydenham to divert flows from the intersection of Sydenham Rd and Petersham Rd to Malakoff Tunnel. | \$2,288,700.00 | \$22,887 |
| FM3.3 | New drainage in Sydenham Road and connect to Western Channel. | \$526,300.00 | \$5,263 |
| FM3.4 | Increase inlet capacity on Despointes St, Silver St and Sydenham Road near Garners Ave. | \$450,500.00 | \$4,505 |
| FM5.2 | Demolish brick wall and structures built over drainage easement between Park and Neville Streets and upgrade pipe size and/or construct a overland flow channel. | \$222,600.00 | \$2,226 |
| FM5.3 | Upgrade drainage in Addison Rd between Park Rd and Gordon Lane via 600mm diameter pipes. | \$1,406,700.00 | \$14,067 |
| FM5.4 | New raised thresholds at Park St, Neville St and Essex St. | \$59,100.00 | \$591 |
| FM5.6 | Increase inlet capacity in Illawarra, York and Shephard Streets via 450mm diameter pipes. | \$324,600.00 | \$3,246 |
| FM5.9 | Drainage upgrades in Essex and Surrey Streets | \$874,500.00 | \$8,745 |
| FM6.1 | Upgrade drainage in Newington Rd to 600mm diameter pipes. | \$422,900.00 | \$4,229 |
| FM6.4 | Install new inlets and pipes along England Ave, Agar St and Wemyss St. | \$580,800.00 | \$5,808 |
| FM7.1 | Upgrade drainage and additional inlet capacity near Smith St, Enmore Rd and Cook Rd. Install pipes along Enmore and Cook Rds, and a box culvert along Smith St. | \$1,493,200.00 | \$14,932 |
| FM7.4 | Duplicate under capacity trunk under Enmore Park from Addison at Philpott to Leicester Street. | \$5,629,800.00 | \$56,298 |
| FM7.5 | Duplicate existing pipe and new pits in Denby St and threshold on Denby St at Addison Rd. | \$187,900.00 | \$1,879 |
| FM7.6 | Drainage works along Philpott St and Addison St (near Denby St and Cook Road) | \$707,700.00 | \$7,077 |
| FM8.1 | New drainage in Arthur Street and connect to Malakoff tunnel. | \$255,200.00 | \$2,552 |
| FM8.2 | New drainage in Robert Street. | \$88,600.00 | \$886 |
| FM9.1 | New drainage in Marrickville Road and connect to Malakoff tunnel. | \$2,439,600.00 | \$24,396 |
| FM10.1 | Divert Marrickville Rd flows down Barclay Street to Sydenham Detention Basin. | \$811,600.00 | \$8,116 |
| FM10.2 | Divert flows from Carrington Road and Myrtle Street to pump station (SPS271) | \$957,200.00 | \$9,572 |
| FM10.4 | Divert flows from rail and Charlotte Ave into Western Channel. | \$499,300.00 | \$4,993 |

| | | | |
|-----------------|--|----------------|----------|
| FM11.1 | Construct overland flow Path from Unwins around edge of park to rail culvert. | \$281,100.00 | \$2,811 |
| FM11.2 | Construct overland flow path from childcare centre around edge of park to rail culvert. | \$196,800.00 | \$1,968 |
| FM11.3 | Upgrade drainage in Unwins Bridge Rd and Terry St. | \$404,300.00 | \$4,043 |
| FM11.4 | Upgrade drainage in Unwins Bridge Rd at Bridge Street. | \$404,400.00 | \$4,044 |
| FM12.1 | Upgrade drainage in Cary St to 750mm diameter pipes. | \$978,400.00 | \$9,784 |
| FM12.2 | Upgrade drainage in Renwick to install 750mm diameter pipes. | \$743,800.00 | \$7,438 |
| FM12.4 | Backflow prevention in the central channel and optimise pump station operations at Mackey Park. | \$95,500.00 | \$955 |
| FM12.5 | Raise channel wall to stop overflows in Cary street. | \$347,400.00 | \$3,474 |
| FM13.1 & FM13.5 | Upgrade drainage in Gannon St and Edwin St. Upgrade drainage in Griffiths St. | \$2,204,000.00 | \$22,040 |
| FM13.4 | Divert flows down Edgar Street to new connection under rail | \$2,411,300.00 | \$24,113 |
| FM13.5 | Upgrade drainage in Brooklyn St and Union St. | \$119,900.00 | \$1,199 |
| FM14.1 | Upgrade the existing pipe underneath Bolton St and railway line. | \$563,300.00 | \$5,633 |
| FM15.1 | Upgrade and extend drainage in Victoria Road South of Sydenham Rd and Victoria Lane, and Victoria Lane and Meeks Road. | \$402,300.00 | \$4,023 |
| FM15.2 | Upgrade and extend Drainage in Victoria Road north of Sydenham Rd. | \$544,600.00 | \$5,446 |
| FM15.3 | Divert Buckley St and Wilkinson Ln into Shirlow St trunk. | \$1,604,400.00 | \$16,044 |
| FM15.5 | Upgrade drainage in Faversham Street. | \$153,800.00 | \$1,538 |
| FM15.7 | Upgrade drainage in Sydney Street and Vincent Street. | \$951,500.00 | \$9,515 |
| FM15.9 | Drainage works along Saywell Street | \$2,543,500.00 | \$25,435 |
| FM15.10 | Drainage works along Saywell Street, Buckley St, Wilkinson Ln and Shirlow St | \$4,112,200.00 | \$41,122 |



Cost Estimate

Option: FM1.1 - Install new pipes to re-direct flows from Morton Ave to Frazer St, and install a new box culvert from the low point along Frazer St to a new surcharge pit in Marrickville Oval.
Additional sag inlet pits to get flows into the pipes.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|---------|-----------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 212,300 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas | 333 | sq. m | 10 | 3,330 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 49.95 | cu. m | 25 | 1,249 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 4.995 | cu. m | 200 | 999 |
| | SUBTOTAL | | | | 5,578 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.375m dia. Pipe | 10 | lin.m | 780 | 7,800 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | 0 | lin.m | 980 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | 360 | lin.m | 1040 | 374,400 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | 0 | lin.m | 1230 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | 0 | lin.m | 1430 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | 0 | lin.m | 2850 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.5m dia. Pipe | 0 | lin.m | 1950 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.65m dia. Pipe | 0 | lin.m | 2330 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 1.2m culvert | 141 | lin.m | 3680 | 518,880 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.7m x 2.7m culvert | | q | 5520 | 0 |
| 3.11 | Install new drainage / junction pit (assumed 1 pit per 50m of pipe) | 12 | each | 6000 | 72,000 |
| 3.12 | Supply, excavate, bed, lay, backfill surcharge pit | 2 | each | 30000 | 60,000 |
| 3.13 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 103,308 | 103,308 |
| 3.14 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 139,440 | 139,440 |
| | SUBTOTAL | | | | 1,275,828 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 TRAFFIC CONTROL | | | | | |
| 5.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 127583 | 127,583 |
| | SUBTOTAL | | | | 127,583 |
| 6.0 PROPERTY BY-BACK | | | | | |
| 6.1 | Purchase of properties in order to create drainage easements | | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 333 | sq. m | 20 | 6,660 |
| | SUBTOTAL | | | | 6,660 |
| CONSTRUCTION SUB-TOTAL | | | | | 1,627,949 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 488,385 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 2,116,333 |
| GST | | | | | 211,633 |
| CONSTRUCTION TOTAL, including GST | | | | | 2,327,966 |
| CONSTRUCTION TOTAL, rounded | | | | | 2,328,000 |
| DISCLAIMER: | | | | | |
| 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: | | | | | |
| 1. Estimate does not include Consultant's fees, including design or project management | | | | | |
| 2. Estimate / rates in 2016 dollars and does not allow for inflation | | | | | |

Cost Estimate

Option: FM1.2 - Divert Flows from Wardell Rd down Bishop St to basin via pipes & a box culvert from the low point along Frazer St to a new surcharge pit in Marrickville Oval.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|---------|------------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 201,500 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 333 | sq. m | 10 | 3,330 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 49.95 | cu. m | 25 | 1,249 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 4.995 | cu. m | 200 | 999 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 5,578 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.375m dia. Pipe | 10 | lin.m | 780 | 7,800 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 370 | lin.m | 850 | 314,500 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | 60 | lin.m | 1040 | 62,400 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 1.2m culvert | 141 | lin.m | 3680 | 518,880 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 50m of pipe) | 12 | each | 6000 | 72,000 |
| 3.17 | Supply, excavate, bed, lay, backfill surcharge pit | 2 | each | 30000 | 60,000 |
| 3.18 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 103,558 | 103,558 |
| 3.14 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 70,800 | 70,800 |
| | SUBTOTAL | | | | 1,209,938 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|-----|-------|---------|------------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 120994 | 120,994 |
| | SUBTOTAL | | | | 120,994 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 333 | sq. m | 20 | 6,660 |
| | SUBTOTAL | | | | 6,660 |
| CONSTRUCTION SUB-TOTAL | | | | | 1,544,670 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 463,401 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 2,008,070 |
| GST | | | | | 200,807 |
| CONSTRUCTION TOTAL, including GST | | | | | 2,208,877 |
| CONSTRUCTION TOTAL, rounded | | | | | 2,208,900 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2016 dollars and does not allow for inflation | | | | | |

Cost Estimate
Option: FM2.1 - Install orifice plate on basin outlet to maximise basin flood attenuation for up to the 20% AEP event.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|-------|---------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 6,600 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 78 | sq. m | 10 | 782 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 11.7225 | cu. m | 25 | 293 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 1.17225 | cu. m | 200 | 234 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 1,309 |
| 3.0 DRAINAGE | | | | | |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | 3 | lin.m | 800 | 2,400 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 3.0m x 1.5m culvert | | lin.m | 5865 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 1 | each | 6000 | 6,000 |
| 3.17 | Install Install orifice plate on basin outlet | 1 | each | 30000 | 30,000 |
| 3.18 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 0 | item | 0 | 0 |
| | SUBTOTAL | | | | 38,400 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|----|-------|---------|---------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 3840 | 3,840 |
| | SUBTOTAL | | | | 3,840 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 10 | sq. m | 20 | 200 |
| | SUBTOTAL | | | | 200 |
| CONSTRUCTION SUB-TOTAL | | | | | 50,349 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 15,105 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 65,454 |
| GST | | | | | 6,545 |
| CONSTRUCTION TOTAL, including GST | | | | | 71,999 |
| CONSTRUCTION TOTAL, rounded | | | | | 72,000 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM2.3 - Divert George Street catchment from Livingstone Road sag to Centennial St.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 73,600 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 129 | sq. m | 10 | 1,290 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 19.35 | cu. m | 25 | 484 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 1.935 | cu. m | 200 | 387 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 2,161 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 430 | lin.m | 850 | 365,500 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.5m dia. Pipe | | lin.m | 1950 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 50m of pipe) | 6 | each | 6000 | 36,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 40,150 | 40,150 |
| | SUBTOTAL | | | | 441,650 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |

| | | | | | |
|--|--|-----|-------|---------|----------------|
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 44165 | 44,165 |
| | SUBTOTAL | | | | 44,165 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 129 | sq. m | 20 | 2,580 |
| | SUBTOTAL | | | | 2,580 |
| CONSTRUCTION SUB-TOTAL | | | | | 564,156 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 169,247 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 733,402 |
| GST | | | | | 73,340 |
| CONSTRUCTION TOTAL, including GST | | | | | 806,743 |
| CONSTRUCTION TOTAL, rounded | | | | | 806,800 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2016 dollars and does not allow for inflation | | | | | |

Cost Estimate
Option: FM3.1 - Divert flows from Jarvie Park to Malakoff Tunnel and upgrade drainage in Northcote St and Carew Ln.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 72,400 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 95 | sq. m | 10 | 945 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 14.175 | cu. m | 25 | 354 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 1.4175 | cu. m | 200 | 284 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 1,583 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | 150 | lin.m | 800 | 120,000 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 40 | lin.m | 850 | 34,000 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | 25 | lin.m | 930 | 23,250 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | 100 | lin.m | 1230 | 123,000 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 20m of pipe) | 16 | each | 6000 | 96,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 39,625 | 39,625 |
| | SUBTOTAL | | | | 435,875 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |

| | | | | | |
|--|--|----|-------|---------|----------------|
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 43588 | 43,588 |
| | SUBTOTAL | | | | 43,588 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 95 | sq. m | 20 | 1,890 |
| | SUBTOTAL | | | | 1,890 |
| CONSTRUCTION SUB-TOTAL | | | | | 555,335 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 166,601 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 721,936 |
| GST | | | | | 72,194 |
| CONSTRUCTION TOTAL, including GST | | | | | 794,130 |
| CONSTRUCTION TOTAL, rounded | | | | | 794,200 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2016 dollars and does not allow for inflation | | | | | |

Cost Estimate

Option: FM3.2 - Installing new pits and a pipe along Sydenham to divert flows from the intersection of Sydenham Rd and Petersham Rd to Malakoff Tunnel.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|---|----------|-------|---------|------------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 208,800 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 189 | sq. m | 10 | 1,890 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 28.35 | cu. m | 25 | 709 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 2.835 | cu. m | 200 | 567 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 3,166 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 80 | lin.m | 850 | 68,000 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | 550 | lin.m | 1430 | 786,500 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 50m of pipe) | 8 | each | 6000 | 48,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$100,000) | 1 | item | 100,000 | 100,000 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 256,350 | 256,350 |
| | SUBTOTAL | | | | 1,258,850 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|-----|-------|---------|------------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 125885 | 125,885 |
| | SUBTOTAL | | | | 125,885 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 189 | sq. m | 20 | 3,780 |
| | SUBTOTAL | | | | 3,780 |
| CONSTRUCTION SUB-TOTAL | | | | | 1,600,481 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 480,144 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 2,080,625 |
| GST | | | | | 208,062 |
| CONSTRUCTION TOTAL, including GST | | | | | 2,288,687 |
| CONSTRUCTION TOTAL, rounded | | | | | 2,288,700 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM3.3 - New drainage in Sydenham Road and connect to Western Channel.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 48,000 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 66 | sq. m | 10 | 660 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 9.9 | cu. m | 25 | 248 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.99 | cu. m | 200 | 198 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 1,106 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 220 | lin.m | 850 | 187,000 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 50m of pipe) | 6 | each | 6000 | 36,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 35,700 | 35,700 |
| | SUBTOTAL | | | | 288,700 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|----|-------|---------|----------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 28870 | 28,870 |
| | SUBTOTAL | | | | 28,870 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 66 | sq. m | 20 | 1,320 |
| | SUBTOTAL | | | | 1,320 |
| CONSTRUCTION SUB-TOTAL | | | | | 367,996 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 110,399 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 478,394 |
| GST | | | | | 47,839 |
| CONSTRUCTION TOTAL, including GST | | | | | 526,234 |
| CONSTRUCTION TOTAL, rounded | | | | | 526,300 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate
Option: FM3.4 - Increase inlet capacity on Despointes St , Convent Lane, Peace Lane, Le Clos Lane, Illawarra Road and SilverStreet.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 41,100 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 45 | sq. m | 10 | 450 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 6.75 | cu. m | 25 | 169 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.675 | cu. m | 200 | 135 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 754 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 150 | lin.m | 850 | 127,500 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 10m of pipe) | 15 | each | 6000 | 90,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| | SUBTOTAL | | | | 247,500 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|----|-------|---------|----------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 24750 | 24,750 |
| | SUBTOTAL | | | | 24,750 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 45 | sq. m | 20 | 900 |
| | SUBTOTAL | | | | 900 |
| CONSTRUCTION SUB-TOTAL | | | | | 315,004 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 94,501 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 409,505 |
| GST | | | | | 40,950 |
| CONSTRUCTION TOTAL, including GST | | | | | 450,455 |
| CONSTRUCTION TOTAL, rounded | | | | | 450,500 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM3.6 - Possible detention basin in Wilkins School**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|---------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 66,400 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 1,515 | sq. m | 10 | 15,150 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 227.25 | cu. m | 25 | 5,681 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 22.725 | cu. m | 200 | 4,545 |
| 2.4 | Pull up and dispose existing road surface | | sq.m | 35 | 0 |
| | SUBTOTAL | | | | 25,376 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.375m dia. Pipe | 50 | lin.m | 780 | 39,000 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 2 | each | 5000 | 10,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| | SUBTOTAL | | | | 79,000 |
| 4.0 EARTHWORKS | | | | | |
| 4.1 | Import, prepare and compact fill material | | cu. m | 120 | 0 |
| 4.2 | Excavate material , including disposal / provision of cut | 1500 | cu. m | 200 | 300,000 |


| | | | | | |
|--|--|-------|-------|---------|----------------|
| | SUBTOTAL | | | | 300,000 |
| 5.0 | PROPERTY BY-BACK | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 | TRAFFIC CONTROL | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 7900 | 7,900 |
| | SUBTOTAL | | | | 7,900 |
| 7.0 | MINOR LANDSCAPING | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 1,515 | sq. m | 20 | 30,300 |
| | SUBTOTAL | | | | 30,300 |
| CONSTRUCTION SUB-TOTAL | | | | | 508,976 |
| 8.0 | CONTINGENCIES | | | | |
| 8.1 | 30% construction cost | | | | 152,693 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 661,669 |
| GST | | | | | 66,167 |
| CONSTRUCTION TOTAL, including GST | | | | | 727,836 |
| CONSTRUCTION TOTAL, rounded | | | | | 727,900 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM4.2 - Drainage works on Oxford Street, Chester Street and Audley Street**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|---------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 20,100 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 18 | sq. m | 10 | 180 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 2.7 | cu. m | 25 | 68 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.27 | cu. m | 200 | 54 |
| 2.4 | Pull up and dispose existing road surface | 80 | sq.m | 35 | 2,800 |
| | SUBTOTAL | | | | 3,102 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | 30 | lin.m | 800 | 24,000 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 30 | lin.m | 850 | 25,500 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 3 | each | 5000 | 15,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| | SUBTOTAL | | | | 94,500 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 80 | sq. m | 120 | 9,600 |

| | | | | | |
|--|---|----|-------|---------|----------------|
| 4.2 | Provision of diversion "speed humps" (assumed from same material as road pavement, laid at time of pavement reinstatement, with 3m width) | 40 | lin.m | 360 | 14,400 |
| | SUBTOTAL | | | | 24,000 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 11850 | 11,850 |
| | SUBTOTAL | | | | 11,850 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 18 | sq. m | 20 | 360 |
| | SUBTOTAL | | | | 360 |
| CONSTRUCTION SUB-TOTAL | | | | | 153,912 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 46,173 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 200,085 |
| GST | | | | | 20,008 |
| CONSTRUCTION TOTAL, including GST | | | | | 220,093 |
| CONSTRUCTION TOTAL, rounded | | | | | 220,100 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

| | | | | | |
|--|--|----------|--|---------|----------------|
| 59915195 MARRICKVILLE FRMS&P | | |  Cardno Shaping the Future | | |
| Cost Estimate | | | | | |
| Option: FM5.2 - Demolish brick wall and structures built over drainage easement between Park and Neville Streets and upgrade pipe size and/or construct a overland flow channel. | | | | | |
| v1 | | | | | |
| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 20,300 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas | 30 | sq. m | 10 | 300 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 4.5 | cu. m | 25 | 113 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.45 | cu. m | 200 | 90 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 503 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | 100 | lin.m | 800 | 80,000 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | 0 | lin.m | 980 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | 0 | lin.m | 1040 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | 0 | lin.m | 1230 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | 0 | lin.m | 1430 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.5m dia. Pipe | 0 | lin.m | 1950 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.65m dia. Pipe | 0 | lin.m | 2330 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | 0 | lin.m | 4830 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.7m x 2.7m culvert | | q | 5520 | 0 |
| 3.11 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 2 | each | 6000 | 12,000 |
| 3.12 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | | item | 30,000 | 30,000 |
| | SUBTOTAL | | | | 122,000 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 TRAFFIC CONTROL | | | | | |
| 5.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 12200 | 12,200 |
| | SUBTOTAL | | | | 12,200 |
| 6.0 PROPERTY BY-BACK | | | | | |
| 6.1 | Purchase of properties in order to create drainage easements | | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 30 | sq. m | 20 | 600 |
| | SUBTOTAL | | | | 600 |
| CONSTRUCTION SUB-TOTAL | | | | | 155,603 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 46,681 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 202,283 |
| GST | | | | | 20,228 |
| CONSTRUCTION TOTAL, including GST | | | | | 222,512 |
| CONSTRUCTION TOTAL, rounded | | | | | 222,600 |
| DISCLAIMER: | | | | | |
| 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: | | | | | |
| 1. Estimate does not include Consultant's fees, including design or project management | | | | | |
| 2. Estimate / rates in 2016 dollars and does not allow for inflation | | | | | |

Cost Estimate
Option: FM5.3 - Upgrade drainage in Addison Rd between Park Rd and Gordon Lane via 600mm diameter pipes.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|---------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 128,300 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 170 | sq. m | 10 | 1,695 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 25.425 | cu. m | 25 | 636 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 2.5425 | cu. m | 200 | 509 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 2,839 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 265 | lin.m | 850 | 225,250 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | 300 | lin.m | 930 | 279,000 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 50m of pipe) | 10 | each | 6000 | 60,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 56,425 | 56,425 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 151,275 | 151,275 |
| | SUBTOTAL | | | | 771,950 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|-----|-------|---------|------------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 77195 | 77,195 |
| | SUBTOTAL | | | | 77,195 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 170 | sq. m | 20 | 3,390 |
| | SUBTOTAL | | | | 3,390 |
| CONSTRUCTION SUB-TOTAL | | | | | 983,674 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 295,102 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 1,278,776 |
| GST | | | | | 127,878 |
| CONSTRUCTION TOTAL, including GST | | | | | 1,406,654 |
| CONSTRUCTION TOTAL, rounded | | | | | 1,406,700 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM5.4 - New raised thresholds at Park St, Neville St and Essex St.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|------|--------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 5,400 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | | sq. m | 10 | 0 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 0 | cu. m | 25 | 0 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0 | cu. m | 200 | 0 |
| 2.4 | Pull up and dispose existing road surface | 120 | sq.m | 35 | 4,200 |
| | SUBTOTAL | | | | 4,200 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | | each | 5000 | 0 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 0 | 0 |
| | SUBTOTAL | | | | 0 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 120 | sq. m | 120 | 14,400 |

| | | | | | |
|--|---|----|-------|---------|---------------|
| 4.2 | Provision of diversion "speed humps" (assumed from same material as road pavement, laid at time of pavement reinstatement, with 3m width) | 40 | lin.m | 360 | 14,400 |
| | SUBTOTAL | | | | 28,800 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 2880 | 2,880 |
| | SUBTOTAL | | | | 2,880 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 0 | sq. m | 20 | 0 |
| | SUBTOTAL | | | | 0 |
| CONSTRUCTION SUB-TOTAL | | | | | 41,280 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 12,384 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 53,664 |
| GST | | | | | 5,366 |
| CONSTRUCTION TOTAL, including GST | | | | | 59,030 |
| CONSTRUCTION TOTAL, rounded | | | | | 59,100 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate
Option: FM5.6 - Increase inlet capacity in Illawarra, York and Shephard Streets via 450mm diameter pipes.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 29,600 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 42 | sq. m | 10 | 420 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 6.3 | cu. m | 25 | 158 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.63 | cu. m | 200 | 126 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 704 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | 140 | lin.m | 800 | 112,000 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 6 | each | 6000 | 36,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| | SUBTOTAL | | | | 178,000 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |

| | | | | | |
|--|--|----|-------|---------|----------------|
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 17800 | 17,800 |
| | SUBTOTAL | | | | 17,800 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 42 | sq. m | 20 | 840 |
| | SUBTOTAL | | | | 840 |
| CONSTRUCTION SUB-TOTAL | | | | | 226,944 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 68,083 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 295,027 |
| GST | | | | | 29,503 |
| CONSTRUCTION TOTAL, including GST | | | | | 324,529 |
| CONSTRUCTION TOTAL, rounded | | | | | 324,600 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost EstimateOption: **FM5.9 - Drainage upgrades in Essex and Surrey Streets**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 53,700 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 75 | sq. m | 10 | 750 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 11.25 | cu. m | 25 | 281 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 1.125 | cu. m | 200 | 225 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 1,256 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | 50 | lin.m | 800 | 40,000 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 25 | lin.m | 850 | 21,250 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | 175 | lin.m | 980 | 171,500 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.5m dia. Pipe | | lin.m | 1950 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 3.2m x 2.0m culvert | | lin.m | 6500 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 10 | each | 6000 | 60,000 |
| 3.17 | Adjustment of existing services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 0 | 0 |
| | SUBTOTAL | | | | 322,750 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|----|-------|--------|----------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 Legal Costs | | | | | |
| 5.1 | Allowance for legal costs to create easement | 1 | each | 200000 | 200,000 |
| | SUBTOTAL | | | | 200,000 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 32275 | 32,275 |
| | SUBTOTAL | | | | 32,275 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 75 | sq. m | 20 | 1,500 |
| | SUBTOTAL | | | | 1,500 |
| CONSTRUCTION SUB-TOTAL | | | | | 611,481 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 183,444 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 794,926 |
| GST | | | | | 79,493 |
| CONSTRUCTION TOTAL, including GST | | | | | 874,418 |
| CONSTRUCTION TOTAL, rounded | | | | | 874,500 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2016 dollars and does not allow for inflation | | | | | |

Cost Estimate

Option: FM6.1 - Upgrade drainage in Newington Rd to 600mm diameter pipes.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 38,600 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 59 | sq. m | 10 | 585 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 8.775 | cu. m | 25 | 219 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.8775 | cu. m | 200 | 176 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 980 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 195 | lin.m | 850 | 165,750 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 50m of pipe) | 6 | each | 6000 | 36,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | | item | 30,000 | 30,000 |
| | SUBTOTAL | | | | 231,750 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |

| | | | | | |
|--|--|----|-------|---------|----------------|
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 23175 | 23,175 |
| | SUBTOTAL | | | | 23,175 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 59 | sq. m | 20 | 1,170 |
| | SUBTOTAL | | | | 1,170 |
| CONSTRUCTION SUB-TOTAL | | | | | 295,675 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 88,702 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 384,377 |
| GST | | | | | 38,438 |
| CONSTRUCTION TOTAL, including GST | | | | | 422,815 |
| CONSTRUCTION TOTAL, rounded | | | | | 422,900 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2016 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM6.4 - Install new inlets and pipes along England Ave, Agar St and Wemyss St.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 53,000 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 90 | sq. m | 10 | 900 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 13.5 | cu. m | 25 | 338 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 1.35 | cu. m | 200 | 270 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 1,508 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | 300 | lin.m | 800 | 240,000 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 8 | each | 6000 | 48,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | | item | 30,000 | 30,000 |
| | SUBTOTAL | | | | 318,000 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |

| | | | | | |
|--|--|----|-------|---------|----------------|
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 31800 | 31,800 |
| | SUBTOTAL | | | | 31,800 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 90 | sq. m | 20 | 1,800 |
| | SUBTOTAL | | | | 1,800 |
| CONSTRUCTION SUB-TOTAL | | | | | 406,108 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 121,832 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 527,940 |
| GST | | | | | 52,794 |
| CONSTRUCTION TOTAL, including GST | | | | | 580,734 |
| CONSTRUCTION TOTAL, rounded | | | | | 580,800 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2016 dollars and does not allow for inflation | | | | | |

Cost Estimate

Option: FM7.1 - Upgrade drainage and additional inlet capacity near Smith St, Enmore Rd and Cook Rd.
Install pipes along Enmore and Cook Rds, and a box culvert along Smith St.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 136,200 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 77 | sq. m | 10 | 765 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 11.475 | cu. m | 25 | 287 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 1.1475 | cu. m | 200 | 230 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 1,281 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 95 | lin.m | 850 | 80,750 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.6m culvert | 160 | lin.m | 3500 | 560,000 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 8 | each | 6000 | 48,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 68,875 | 68,875 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 65,250 | 65,250 |
| | SUBTOTAL | | | | 822,875 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|----|-------|---------|------------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 82288 | 82,288 |
| | SUBTOTAL | | | | 82,288 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 77 | sq. m | 20 | 1,530 |
| | SUBTOTAL | | | | 1,530 |
| CONSTRUCTION SUB-TOTAL | | | | | 1,044,174 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 313,252 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 1,357,426 |
| GST | | | | | 135,743 |
| CONSTRUCTION TOTAL, including GST | | | | | 1,493,169 |
| CONSTRUCTION TOTAL, rounded | | | | | 1,493,200 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate
Option: FM7.4 - Duplicate under capacity trunk under Enmore Park from Addison at Philpott to Leicester Street.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|---------|------------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 513,500 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 110 | sq. m | 10 | 1,095 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 16.425 | cu. m | 25 | 411 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 1.6425 | cu. m | 200 | 329 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 1,834 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 3.2m x 2.0m culvert | 365 | lin.m | 6500 | 2,372,500 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 15 | each | 6000 | 90,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 246,250 | 246,250 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 399,750 | 399,750 |
| | SUBTOTAL | | | | 3,108,500 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|-----|-------|---------|------------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 310850 | 310,850 |
| | SUBTOTAL | | | | 310,850 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 110 | sq. m | 20 | 2,190 |
| | SUBTOTAL | | | | 2,190 |
| CONSTRUCTION SUB-TOTAL | | | | | 3,936,874 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 1,181,062 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 5,117,936 |
| GST | | | | | 511,794 |
| CONSTRUCTION TOTAL, including GST | | | | | 5,629,730 |
| CONSTRUCTION TOTAL, rounded | | | | | 5,629,800 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2016 dollars and does not allow for inflation | | | | | |

Cost Estimate
Option: FM7.5 - Duplicate existing pipe and new pits in Denby St and threshold on Denby St at Addison Rd.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 17,100 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 20 | sq. m | 10 | 195 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 2.925 | cu. m | 25 | 73 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.2925 | cu. m | 200 | 59 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 327 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 65 | lin.m | 850 | 55,250 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.6m culvert | | lin.m | 3500 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 3 | each | 6000 | 18,000 |
| 3.17 | Adjustment of existing services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| | SUBTOTAL | | | | 103,250 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |

| | | | | | |
|--|--|----|-------|---------|----------------|
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 10325 | 10,325 |
| | SUBTOTAL | | | | 10,325 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 20 | sq. m | 20 | 390 |
| | SUBTOTAL | | | | 390 |
| CONSTRUCTION SUB-TOTAL | | | | | 131,392 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 39,417 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 170,809 |
| GST | | | | | 17,081 |
| CONSTRUCTION TOTAL, including GST | | | | | 187,890 |
| CONSTRUCTION TOTAL, rounded | | | | | 187,900 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate
Option: FM7.6 - Drainage works along Philpott St and Addison St (near Denby St and Cook Road)

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 64,500 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 66 | sq. m | 10 | 660 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 9.9 | cu. m | 25 | 248 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.99 | cu. m | 200 | 198 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 1,106 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 50 | lin.m | 850 | 42,500 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | 45 | lin.m | 930 | 41,850 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | 115 | lin.m | 1040 | 119,600 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | 10 | lin.m | 1230 | 12,300 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 3.2m x 2.0m culvert | | lin.m | 6500 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 15m of pipe) | 15 | each | 6000 | 90,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,625 | 30,625 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 52,125 | 52,125 |
| | SUBTOTAL | | | | 389,000 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|----|-------|---------|----------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 38900 | 38,900 |
| | SUBTOTAL | | | | 38,900 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 66 | sq. m | 20 | 1,320 |
| | SUBTOTAL | | | | 1,320 |
| CONSTRUCTION SUB-TOTAL | | | | | 494,826 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 148,448 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 643,273 |
| GST | | | | | 64,327 |
| CONSTRUCTION TOTAL, including GST | | | | | 707,600 |
| CONSTRUCTION TOTAL, rounded | | | | | 707,700 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2016 dollars and does not allow for inflation | | | | | |

Cost Estimate

Option: FM8.1 - New drainage in Arthur Street and connect to Malakoff tunnel.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 23,300 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 18 | sq. m | 10 | 180 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 2.7 | cu. m | 25 | 68 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.27 | cu. m | 200 | 54 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 302 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | 60 | lin.m | 1040 | 62,400 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 3 | each | 6000 | 18,000 |
| 3.17 | Install new junction pit at Malakoff tunnel | 1 | each | 30000 | 30,000 |
| 3.18 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| | SUBTOTAL | | | | 140,400 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|----|-------|---------|----------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 14040 | 14,040 |
| | SUBTOTAL | | | | 14,040 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 18 | sq. m | 20 | 360 |
| | SUBTOTAL | | | | 360 |
| CONSTRUCTION SUB-TOTAL | | | | | 178,402 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 53,520 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 231,922 |
| GST | | | | | 23,192 |
| CONSTRUCTION TOTAL, including GST | | | | | 255,114 |
| CONSTRUCTION TOTAL, rounded | | | | | 255,200 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate

Option: FM8.2 - New drainage in Robert Street.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|---------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 8,100 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 5 | sq. m | 10 | 45 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 0.675 | cu. m | 25 | 17 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.0675 | cu. m | 200 | 14 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 75 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 15 | lin.m | 850 | 12,750 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 1 | each | 6000 | 6,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| | SUBTOTAL | | | | 48,750 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |

| | | | | | |
|--|--|---|-------|---------|---------------|
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 4875 | 4,875 |
| | SUBTOTAL | | | | 4,875 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 5 | sq. m | 20 | 90 |
| | SUBTOTAL | | | | 90 |
| CONSTRUCTION SUB-TOTAL | | | | | 61,890 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 18,567 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 80,457 |
| GST | | | | | 8,046 |
| CONSTRUCTION TOTAL, including GST | | | | | 88,503 |
| CONSTRUCTION TOTAL, rounded | | | | | 88,600 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate
Option: FM8.3 - New drainage works from Hollands Avenue via rail corridor to storage under McNeily Park connecting to Malakoff Tunnel

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|---------|------------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 193,400 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 218 | sq. m | 10 | 2,175 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 32.625 | cu. m | 25 | 816 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 3.2625 | cu. m | 200 | 653 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 3,643 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | 50 | lin.m | 800 | 40,000 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | 650 | lin.m | 1230 | 799,500 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | 25 | lin.m | 1430 | 35,750 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.5m dia. Pipe | | lin.m | 1950 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 3.2m x 2.0m culvert | | lin.m | 6500 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 29 | each | 6000 | 174,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 104,925 | 104,925 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 10,725 | 10,725 |
| | SUBTOTAL | | | | 1,164,900 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|-----|-------|---------|------------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 116490 | 116,490 |
| | SUBTOTAL | | | | 116,490 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 218 | sq. m | 20 | 4,350 |
| | SUBTOTAL | | | | 4,350 |
| CONSTRUCTION SUB-TOTAL | | | | | 1,482,783 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 444,835 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 1,927,618 |
| GST | | | | | 192,762 |
| CONSTRUCTION TOTAL, including GST | | | | | 2,120,380 |
| CONSTRUCTION TOTAL, rounded | | | | | 2,120,400 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2016 dollars and does not allow for inflation 3. This option exludes cost of and is contingent on proposed works by Sydney Metro from Hollands Ave to McNeilly Park | | | | | |

Cost Estimate
Option: FM9.1 - New drainage in Marrickville Road and connect to Malakoff tunnel.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|---------|------------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 222,500 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 212 | sq. m | 10 | 2,115 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 31.725 | cu. m | 25 | 793 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 3.1725 | cu. m | 200 | 635 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 3,543 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | 270 | lin.m | 800 | 216,000 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 90 | lin.m | 850 | 76,500 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | 225 | lin.m | 1040 | 234,000 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | 105 | lin.m | 1230 | 129,150 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | 15 | lin.m | 1430 | 21,450 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.5m dia. Pipe | | lin.m | 1950 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 3.2m x 2.0m culvert | | lin.m | 6500 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 29 | each | 6000 | 174,000 |
| 3.17 | Supply and install m3 pre-cast storage tank | 1 | each | 150000 | 150,000 |
| 3.18 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 85,110 | 85,110 |
| 3.19 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 255,330 | 255,330 |
| | SUBTOTAL | | | | 1,341,540 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|-----|-------|---------|------------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 134154 | 134,154 |
| | SUBTOTAL | | | | 134,154 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 212 | sq. m | 20 | 4,230 |
| | SUBTOTAL | | | | 4,230 |
| CONSTRUCTION SUB-TOTAL | | | | | 1,705,967 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 511,790 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 2,217,757 |
| GST | | | | | 221,776 |
| CONSTRUCTION TOTAL, including GST | | | | | 2,439,532 |
| CONSTRUCTION TOTAL, rounded | | | | | 2,439,600 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2016 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM10.1 - Divert Marrickville Rd flows down Barclay Street to Sydenham Detention Basin.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 74,000 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 120 | sq. m | 10 | 1,200 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 18 | cu. m | 25 | 450 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 1.8 | cu. m | 200 | 360 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 2,010 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 400 | lin.m | 850 | 340,000 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 50m of pipe) | 8 | each | 6000 | 48,000 |
| 3.17 | Adjustment of existing services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 38,800 | 38,800 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 17,850 | 17,850 |
| | SUBTOTAL | | | | 444,650 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|-----|-------|---------|----------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 44465 | 44,465 |
| | SUBTOTAL | | | | 44,465 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 120 | sq. m | 20 | 2,400 |
| | SUBTOTAL | | | | 2,400 |
| CONSTRUCTION SUB-TOTAL | | | | | 567,525 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 170,258 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 737,783 |
| GST | | | | | 73,778 |
| CONSTRUCTION TOTAL, including GST | | | | | 811,561 |
| CONSTRUCTION TOTAL, rounded | | | | | 811,600 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate
Option: FM10.2 - Divert flows from Carrington Road and Myrtle Street to pump station (SPS271).

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|---------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 87,300 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 39 | sq. m | 10 | 390 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 5.85 | cu. m | 25 | 146 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.585 | cu. m | 200 | 117 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 653 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 65 | lin.m | 850 | 55,250 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | 65 | lin.m | 930 | 60,450 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | 100 | lin.m | 1040 | 104,000 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.5m dia. Pipe | | lin.m | 1950 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 3.2m x 2.0m culvert | | lin.m | 6500 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 10 | each | 6000 | 60,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 18,135 | 18,135 |
| 3.19 | Allowance for allowance for crossing or direct drill under rail siding | 1 | item | 200,000 | 200,000 |
| | SUBTOTAL | | | | 527,835 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|----|-------|---------|----------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 52784 | 52,784 |
| | SUBTOTAL | | | | 52,784 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 39 | sq. m | 20 | 780 |
| | SUBTOTAL | | | | 780 |
| CONSTRUCTION SUB-TOTAL | | | | | 669,352 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 200,806 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 870,157 |
| GST | | | | | 87,016 |
| CONSTRUCTION TOTAL, including GST | | | | | 957,173 |
| CONSTRUCTION TOTAL, rounded | | | | | 957,200 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2016 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM10.4 - Divert flows from rail and Charlotte Ave into Western Channel.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 45,500 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 60 | sq. m | 10 | 600 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 9 | cu. m | 25 | 225 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.9 | cu. m | 200 | 180 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 1,005 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | 200 | lin.m | 1040 | 208,000 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 6 | each | 6000 | 36,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| | SUBTOTAL | | | | 274,000 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |

| | | | | | |
|--|--|----|-------|---------|----------------|
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 27400 | 27,400 |
| | SUBTOTAL | | | | 27,400 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 60 | sq. m | 20 | 1,200 |
| | SUBTOTAL | | | | 1,200 |
| CONSTRUCTION SUB-TOTAL | | | | | 349,105 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 104,732 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 453,837 |
| GST | | | | | 45,384 |
| CONSTRUCTION TOTAL, including GST | | | | | 499,220 |
| CONSTRUCTION TOTAL, rounded | | | | | 499,300 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM11.1 - Construct overland flow Path from Unwins around edge of park to rail culvert.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 25,600 |
| 2.0 DEMOLITION, CLEARING, GRUBBING & EARTHWORKS | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 1,250 | sq. m | 10 | 12,500 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 187.5 | cu. m | 25 | 4,688 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 18.75 | cu. m | 200 | 3,750 |
| 2.4 | Excavate material and regrade to suit design levels (incl. disposal of cut) | 625 | cu.m | 200 | 125,000 |
| 2.5 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 145,938 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 0 | each | 5000 | 0 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 0 | 0 |
| | SUBTOTAL | | | | 0 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|-------|-------|---------|----------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 0 | 0 |
| | SUBTOTAL | | | | 0 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 1,250 | sq. m | 20 | 25,000 |
| | SUBTOTAL | | | | 25,000 |
| CONSTRUCTION SUB-TOTAL | | | | | 196,538 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 58,961 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 255,499 |
| GST | | | | | 25,550 |
| CONSTRUCTION TOTAL, including GST | | | | | 281,049 |
| CONSTRUCTION TOTAL, rounded | | | | | 281,100 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate
Option: FM11.2 - Construct overland flow path from childcare centre around edge of park to rail culvert.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 17,900 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 875 | sq. m | 10 | 8,750 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 131.25 | cu. m | 25 | 3,281 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 13.125 | cu. m | 200 | 2,625 |
| 2.4 | Excavate material and regrade to suit design levels (incl. disposal of cut) | 437.5 | cu.m | 200 | 87,500 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 102,156 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 0 | each | 5000 | 0 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 0 | 0 |
| | SUBTOTAL | | | | 0 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|-----|-------|---------|----------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 0 | 0 |
| | SUBTOTAL | | | | 0 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 875 | sq. m | 20 | 17,500 |
| | SUBTOTAL | | | | 17,500 |
| CONSTRUCTION SUB-TOTAL | | | | | 137,556 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 41,267 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 178,823 |
| GST | | | | | 17,882 |
| CONSTRUCTION TOTAL, including GST | | | | | 196,705 |
| CONSTRUCTION TOTAL, rounded | | | | | 196,800 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM11.3 - Upgrade drainage in Unwins Bridge Rd and Terry St.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 36,900 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 36 | sq. m | 10 | 360 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 5.4 | cu. m | 25 | 135 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.54 | cu. m | 200 | 108 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 603 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | 120 | lin.m | 1040 | 124,800 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 5 | each | 6000 | 30,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 37,440 | 37,440 |
| | SUBTOTAL | | | | 222,240 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|----|-------|---------|----------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 22224 | 22,224 |
| | SUBTOTAL | | | | 22,224 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 36 | sq. m | 20 | 720 |
| | SUBTOTAL | | | | 720 |
| CONSTRUCTION SUB-TOTAL | | | | | 282,687 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 84,806 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 367,493 |
| GST | | | | | 36,749 |
| CONSTRUCTION TOTAL, including GST | | | | | 404,242 |
| CONSTRUCTION TOTAL, rounded | | | | | 404,300 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM11.4 - Upgrade drainage in Unwins Bridge Rd at Bridge Street.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 36,900 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 45 | sq. m | 10 | 450 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 6.75 | cu. m | 25 | 169 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.675 | cu. m | 200 | 135 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 754 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | 150 | lin.m | 800 | 120,000 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 6 | each | 6000 | 36,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 36,000 | 36,000 |
| | SUBTOTAL | | | | 222,000 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|----|-------|---------|----------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 22200 | 22,200 |
| | SUBTOTAL | | | | 22,200 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 45 | sq. m | 20 | 900 |
| | SUBTOTAL | | | | 900 |
| CONSTRUCTION SUB-TOTAL | | | | | 282,754 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 84,826 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 367,580 |
| GST | | | | | 36,758 |
| CONSTRUCTION TOTAL, including GST | | | | | 404,338 |
| CONSTRUCTION TOTAL, rounded | | | | | 404,400 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM12.1 - Upgrade drainage in Cary St and and Premier St to 750mm diameter pipes.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 89,200 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 125 | sq. m | 10 | 1,245 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 18.675 | cu. m | 25 | 467 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 1.8675 | cu. m | 200 | 374 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 2,085 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | 415 | lin.m | 930 | 385,950 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.6m culvert | | lin.m | 3500 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 17 | each | 6000 | 102,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 48,795 | 48,795 |
| | SUBTOTAL | | | | 536,745 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |

| | | | | | |
|--|--|-----|-------|---------|----------------|
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 53675 | 53,675 |
| | SUBTOTAL | | | | 53,675 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 125 | sq. m | 20 | 2,490 |
| | SUBTOTAL | | | | 2,490 |
| CONSTRUCTION SUB-TOTAL | | | | | 684,195 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 205,258 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 889,453 |
| GST | | | | | 88,945 |
| CONSTRUCTION TOTAL, including GST | | | | | 978,399 |
| CONSTRUCTION TOTAL, rounded | | | | | 978,400 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM12.2 - Upgrade drainage in Renwick to install 750mm diameter pipes.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 67,800 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 95 | sq. m | 10 | 945 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 14.175 | cu. m | 25 | 354 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 1.4175 | cu. m | 200 | 284 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 1,583 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | 315 | lin.m | 930 | 292,950 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.6m culvert | | lin.m | 3500 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 13 | each | 6000 | 78,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 37,095 | 37,095 |
| | SUBTOTAL | | | | 408,045 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |

| | | | | | |
|--|--|----|-------|---------|----------------|
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 40805 | 40,805 |
| | SUBTOTAL | | | | 40,805 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 95 | sq. m | 20 | 1,890 |
| | SUBTOTAL | | | | 1,890 |
| CONSTRUCTION SUB-TOTAL | | | | | 520,122 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 156,037 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 676,159 |
| GST | | | | | 67,616 |
| CONSTRUCTION TOTAL, including GST | | | | | 743,775 |
| CONSTRUCTION TOTAL, rounded | | | | | 743,800 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate
Option: FM12.4 - Backflow prevention in the central channel and optimise pump station operations at Mackey Park.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|-------|---------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 8,700 |
| 2.0 DEMOLITION, CLEARING, GRUBBING & EARTHWORKS | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 10 | sq. m | 10 | 100 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 1.5 | cu. m | 25 | 38 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.15 | cu. m | 200 | 30 |
| 2.4 | Construct earthen embankment and regrade to suit design levels (incl. provision of suitable fill) | 0 | cu.m | 200 | 0 |
| 2.5 | Pull up and dispose existing road surface | 10 | sq.m | 150 | 1,500 |
| | SUBTOTAL | | | | 1,668 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 3.0m x 1.5m culvert | | lin.m | 5865 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 0 | each | 6000 | 0 |
| 3.17 | Install new junction pit to divert flows to the Mackey Park pump station | 1 | each | 50000 | 50,000 |
| 3.18 | Adjustment of existing services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 0 | 0 |
| | SUBTOTAL | | | | 50,000 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|---|--|----|-------|---------|---------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 10 | sq. m | 120 | 1,200 |
| | SUBTOTAL | | | | 1,200 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 5000 | 5,000 |
| | SUBTOTAL | | | | 5,000 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 10 | sq. m | 20 | 200 |
| | SUBTOTAL | | | | 200 |
| CONSTRUCTION SUB-TOTAL | | | | | 66,768 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 20,030 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 86,798 |
| GST | | | | | 8,680 |
| CONSTRUCTION TOTAL, including GST | | | | | 95,478 |
| CONSTRUCTION TOTAL, rounded | | | | | 95,500 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate

Option: FM12.5 - Raise channel wall to stop overflows in Cary street.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|------------|-------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 31,700 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 0 | sq. m | 10 | 0 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 0 | cu. m | 25 | 0 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0 | cu. m | 200 | 0 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 0 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 3.0m x 1.5m culvert | | lin.m | 5865 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | | each | 6000 | 0 |
| 3.18 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | | item | 0 | 0 |
| 3.19 | Increase height of channel wall (construction as per existing channel) | 160 | face sq. m | 1,200 | 192,000 |
| | SUBTOTAL | | | | 192,000 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|---|-------|---------|----------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 19200 | 19,200 |
| | SUBTOTAL | | | | 19,200 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 0 | sq. m | 20 | 0 |
| | SUBTOTAL | | | | 0 |
| CONSTRUCTION SUB-TOTAL | | | | | 242,900 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 72,870 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 315,770 |
| GST | | | | | 31,577 |
| CONSTRUCTION TOTAL, including GST | | | | | 347,347 |
| CONSTRUCTION TOTAL, rounded | | | | | 347,400 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate
Option: FM13.1 and FM13.2 - Duplicate outlet under rail at intersection of Gannon Street and Griffiths Street

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|-----------|------------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 201,000 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 5 | sq. m | 10 | 45 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 0.675 | cu. m | 25 | 17 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.0675 | cu. m | 200 | 14 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 75 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | 15 | lin.m | 930 | 13,950 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.5m dia. Pipe | 60 | lin.m | 1950 | 117,000 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 3.2m x 2.0m culvert | | lin.m | 6500 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 3 | each | 6000 | 18,000 |
| 3.17 | Adjustment of existing services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 39,285 | 39,285 |
| 3.19 | Allowance for cost for bore (under rail) | 1 | item | 1,000,000 | 1,000,000 |
| | SUBTOTAL | | | | 1,218,235 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|---|-------|---------|------------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 121824 | 121,824 |
| | SUBTOTAL | | | | 121,824 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 5 | sq. m | 20 | 90 |
| | SUBTOTAL | | | | 90 |
| CONSTRUCTION SUB-TOTAL | | | | | 1,541,224 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 462,367 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 2,003,591 |
| GST | | | | | 200,359 |
| CONSTRUCTION TOTAL, including GST | | | | | 2,203,950 |
| CONSTRUCTION TOTAL, rounded | | | | | 2,204,000 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2016 dollars and does not allow for inflation | | | | | |

Cost Estimate
Option: FM13.4 - Divert flows down Edgar Street to new connection under rail

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|-----------|------------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 219,900 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 63 | sq. m | 10 | 630 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 9.45 | cu. m | 25 | 236 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.945 | cu. m | 200 | 189 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 1,055 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | 20 | lin.m | 800 | 16,000 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 20 | lin.m | 850 | 17,000 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | 170 | lin.m | 1230 | 209,100 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 3.2m x 2.0m culvert | | lin.m | 6500 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 9 | each | 6000 | 54,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 4,800 | 4,800 |
| 3.19 | Allowance for cost for bore (under rail) | 1 | item | 1,000,000 | 1,000,000 |
| | SUBTOTAL | | | | 1,330,900 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|----|-------|---------|------------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 133090 | 133,090 |
| | SUBTOTAL | | | | 133,090 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 63 | sq. m | 20 | 1,260 |
| | SUBTOTAL | | | | 1,260 |
| CONSTRUCTION SUB-TOTAL | | | | | 1,686,205 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 505,862 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 2,192,067 |
| GST | | | | | 219,207 |
| CONSTRUCTION TOTAL, including GST | | | | | 2,411,274 |
| CONSTRUCTION TOTAL, rounded | | | | | 2,411,300 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2016 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM13.5 - Upgrade drainage in Brooklyn St and Union St.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|---------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 10,900 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 9 | sq. m | 10 | 90 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 1.35 | cu. m | 25 | 34 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.135 | cu. m | 200 | 27 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 151 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | 30 | lin.m | 800 | 24,000 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 2 | each | 6000 | 12,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | | item | 30,000 | 30,000 |
| | SUBTOTAL | | | | 66,000 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |

| | | | | | |
|--|--|---|-------|---------|----------------|
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 6600 | 6,600 |
| | SUBTOTAL | | | | 6,600 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 9 | sq. m | 20 | 180 |
| | SUBTOTAL | | | | 180 |
| CONSTRUCTION SUB-TOTAL | | | | | 83,831 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 25,149 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 108,980 |
| GST | | | | | 10,898 |
| CONSTRUCTION TOTAL, including GST | | | | | 119,878 |
| CONSTRUCTION TOTAL, rounded | | | | | 119,900 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2016 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM14.1 - Upgrade the existing pipe underneath Bolton St and railway line.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 51,400 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 54 | sq. m | 10 | 540 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 8.1 | cu. m | 25 | 203 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.81 | cu. m | 200 | 162 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 905 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.825m dia. Pipe | | lin.m | 980 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | 180 | lin.m | 1430 | 257,400 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 50m of pipe) | 4 | each | 6000 | 24,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 28,140 | 28,140 |
| | SUBTOTAL | | | | 309,540 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |

| | | | | | |
|--|--|----|-------|---------|----------------|
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 30954 | 30,954 |
| | SUBTOTAL | | | | 30,954 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 54 | sq. m | 20 | 1,080 |
| | SUBTOTAL | | | | 1,080 |
| CONSTRUCTION SUB-TOTAL | | | | | 393,879 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 118,164 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 512,042 |
| GST | | | | | 51,204 |
| CONSTRUCTION TOTAL, including GST | | | | | 563,246 |
| CONSTRUCTION TOTAL, rounded | | | | | 563,300 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2016 dollars and does not allow for inflation | | | | | |

Cost Estimate
Option: FM15.1 - Upgrade and extend drainage in Victoria Road South of Sydenham Rd and Victoria Lane, and Victoria Lane and Meeks Road.

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 36,700 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 48 | sq. m | 10 | 480 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 7.2 | cu. m | 25 | 180 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.72 | cu. m | 200 | 144 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 804 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 160 | lin.m | 850 | 136,000 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 7 | each | 6000 | 42,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 12,750 | 12,750 |
| | SUBTOTAL | | | | 220,750 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|----|-------|---------|----------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 22075 | 22,075 |
| | SUBTOTAL | | | | 22,075 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 48 | sq. m | 20 | 960 |
| | SUBTOTAL | | | | 960 |
| CONSTRUCTION SUB-TOTAL | | | | | 281,289 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 84,387 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 365,676 |
| GST | | | | | 36,568 |
| CONSTRUCTION TOTAL, including GST | | | | | 402,243 |
| CONSTRUCTION TOTAL, rounded | | | | | 402,300 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM15.2 - Upgrade and extend Drainage in Victoria Road north of Sydenham Rd.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 49,700 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 60 | sq. m | 10 | 600 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 9 | cu. m | 25 | 225 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.9 | cu. m | 200 | 180 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 1,005 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 200 | lin.m | 850 | 170,000 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 8 | each | 6000 | 48,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 51,000 | 51,000 |
| | SUBTOTAL | | | | 299,000 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|----|-------|---------|----------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 29900 | 29,900 |
| | SUBTOTAL | | | | 29,900 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 60 | sq. m | 20 | 1,200 |
| | SUBTOTAL | | | | 1,200 |
| CONSTRUCTION SUB-TOTAL | | | | | 380,805 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 114,242 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 495,047 |
| GST | | | | | 49,505 |
| CONSTRUCTION TOTAL, including GST | | | | | 544,551 |
| CONSTRUCTION TOTAL, rounded | | | | | 544,600 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM15.3 - Divert Buckley St and Wilkinson Ln into Shirlow St trunk.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 146,300 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | | sq. m | 10 | 0 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 0 | cu. m | 25 | 0 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0 | cu. m | 200 | 0 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 0 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.5m dia. Pipe | 350 | lin.m | 1950 | 682,500 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.6m culvert | | lin.m | 3500 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 10 | each | 6000 | 60,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 74,250 | 74,250 |
| 3.18 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 70,200 | 70,200 |
| | SUBTOTAL | | | | 886,950 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|---|-------|---------|------------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 88695 | 88,695 |
| | SUBTOTAL | | | | 88,695 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 0 | sq. m | 20 | 0 |
| | SUBTOTAL | | | | 0 |
| CONSTRUCTION SUB-TOTAL | | | | | 1,121,945 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 336,584 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 1,458,529 |
| GST | | | | | 145,853 |
| CONSTRUCTION TOTAL, including GST | | | | | 1,604,381 |
| CONSTRUCTION TOTAL, rounded | | | | | 1,604,400 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM15.5 - Upgrade drainage in Faversham Street.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|---------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 14,000 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 15 | sq. m | 10 | 150 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 2.25 | cu. m | 25 | 56 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0.225 | cu. m | 200 | 45 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 251 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | 50 | lin.m | 850 | 42,500 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 2 | each | 6000 | 12,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 30,000 | 30,000 |
| | SUBTOTAL | | | | 84,500 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |

| | | | | | |
|--|--|----|-------|---------|----------------|
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 8450 | 8,450 |
| | SUBTOTAL | | | | 8,450 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 15 | sq. m | 20 | 300 |
| | SUBTOTAL | | | | 300 |
| CONSTRUCTION SUB-TOTAL | | | | | 107,501 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 32,250 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 139,752 |
| GST | | | | | 13,975 |
| CONSTRUCTION TOTAL, including GST | | | | | 153,727 |
| CONSTRUCTION TOTAL, rounded | | | | | 153,800 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM15.7 - Upgrade drainage in Sydney Street and Vincent Street.**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|--------|----------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 86,800 |
| 2.0 DEMOLITION, CLEARING AND GRUBBING | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 123 | sq. m | 10 | 1,230 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 18.45 | cu. m | 25 | 461 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 1.845 | cu. m | 200 | 369 |
| 2.4 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 2,060 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | 410 | lin.m | 1040 | 426,400 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.4m x 2.4m culvert | | lin.m | 4830 | 0 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 50m of pipe) | 8 | each | 6000 | 48,000 |
| 3.17 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 47,440 | 47,440 |
| | SUBTOTAL | | | | 521,840 |
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |

| | | | | | |
|--|--|-----|-------|---------|----------------|
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 52184 | 52,184 |
| | SUBTOTAL | | | | 52,184 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 123 | sq. m | 20 | 2,460 |
| | SUBTOTAL | | | | 2,460 |
| CONSTRUCTION SUB-TOTAL | | | | | 665,344 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 199,603 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 864,948 |
| GST | | | | | 86,495 |
| CONSTRUCTION TOTAL, including GST | | | | | 951,442 |
| CONSTRUCTION TOTAL, rounded | | | | | 951,500 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate**Option: FM15.9 - Drainage works along Saywell Street**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|---------|------------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 232,000 |
| 2.0 DEMOLITION, CLEARING, GRUBBING & EARTHWORKS | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 0 | sq. m | 10 | 0 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 0 | cu. m | 25 | 0 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0 | cu. m | 200 | 0 |
| 2.4 | Construct earthen embankment and regrade to suit design levels (incl. provision of suitable fill) | 180 | cu.m | 200 | 36,000 |
| 2.5 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 36,000 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 3.0m x 1.5m culvert | 200 | lin.m | 5865 | 1,173,000 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 50m of pipe) | 5 | each | 6000 | 30,000 |
| 3.17 | Install new outlet near Sydenham Pit | 1 | each | 50000 | 50,000 |
| 3.18 | Adjustment of existing services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 120,300 | 120,300 |
| | SUBTOTAL | | | | 1,373,300 |
| 4.0 PAVEMENTS | | | | | |

| | | | | | |
|--|--|---|-------|---------|------------------|
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 137330 | 137,330 |
| | SUBTOTAL | | | | 137,330 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 0 | sq. m | 20 | 0 |
| | SUBTOTAL | | | | 0 |
| CONSTRUCTION SUB-TOTAL | | | | | 1,778,630 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 533,589 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 2,312,219 |
| GST | | | | | 231,222 |
| CONSTRUCTION TOTAL, including GST | | | | | 2,543,441 |
| CONSTRUCTION TOTAL, rounded | | | | | 2,543,500 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Cost Estimate
**Option: FM15.9 - Drainage works along Saywell Street, Buckley
 St, Wilkinson Ln and Shirlow St**

v1

| ITEM NO. | DESCRIPTION OF WORK | QUANTITY | UNIT | RATE | COST |
|--|--|----------|-------|---------|------------------|
| 1.0 GENERAL AND PRELIMINARIES | | | | | |
| 1.1 | Site establishment, security fencing, facilities & disestablishment | 1 | item | | |
| 1.2 | Provision of sediment & erosion control | 1 | item | | |
| 1.3 | Construction setout & survey | 1 | item | | |
| 1.4 | Work as executed survey & documentation | 1 | item | | |
| 1.5 | Geotechnical supervision, testing & certification | 1 | item | | |
| | SUBTOTAL (Assumed as 15% of works cost, excluding property purchase) | | | | 375,100 |
| 2.0 DEMOLITION, CLEARING, GRUBBING & EARTHWORKS | | | | | |
| 2.1 | Clearing & grubbing of vegetated areas (nominal allowance) | 0 | sq. m | 10 | 0 |
| 2.2 | Strip topsoil & stockpile for re-use (assuming 150mm depth) | 0 | cu. m | 25 | 0 |
| 2.3 | Dispose of excess topsoil (nominal 10% allowance) | 0 | cu. m | 200 | 0 |
| 2.4 | Construct earthen embankment and regrade to suit design levels (incl. provision of suitable fill) | 180 | cu.m | 200 | 36,000 |
| 2.5 | Pull up and dispose existing road surface | 0 | sq.m | 150 | 0 |
| | SUBTOTAL | | | | 36,000 |
| 3.0 DRAINAGE | | | | | |
| 3.1 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m dia. Pipe | | lin.m | 800 | 0 |
| 3.2 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m dia. Pipe | | lin.m | 850 | 0 |
| 3.3 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.75m dia. Pipe | | lin.m | 930 | 0 |
| 3.4 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.9m dia. Pipe | | lin.m | 1040 | 0 |
| 3.5 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.05m dia. Pipe | | lin.m | 1230 | 0 |
| 3.6 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m dia. Pipe | | lin.m | 1430 | 0 |
| 3.7 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.35m dia. Pipe | | lin.m | 1690 | 0 |
| 3.8 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.5m dia. Pipe | 350 | lin.m | 1950 | 682,500 |
| 3.9 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m dia. Pipe | | lin.m | 2850 | 0 |
| 3.10 | Supply, excavate, bed, lay, joint, backfill and provide connections for 2.1m dia. Pipe | | lin.m | 3370 | 0 |
| 3.11 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.45m x 0.45m culvert | | lin.m | 1380 | 0 |
| 3.12 | Supply, excavate, bed, lay, joint, backfill and provide connections for 0.6m x 0.6m culvert | | lin.m | 1725 | 0 |
| 3.13 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.2m x 1.2m culvert | | lin.m | 2760 | 0 |
| 3.14 | Supply, excavate, bed, lay, joint, backfill and provide connections for 1.8m x 0.4m culvert | | lin.m | 3220 | 0 |
| 3.15 | Supply, excavate, bed, lay, joint, backfill and provide connections for 3.0m x 1.5m culvert | 200 | lin.m | 5865 | 1,173,000 |
| 3.16 | Install new drainage / junction pit (assumed 1 pit per 25m of pipe) | 12 | each | 6000 | 72,000 |
| 3.17 | Install new outlet near Sydenham Pit | 1 | each | 50000 | 50,000 |
| 3.18 | Adjustment of exsiting services (nominal allowance) (assumed 10% of drainage installation cost, with minimum cost of \$30,000) | 1 | item | 192,750 | 192,750 |
| 3.19 | Allowance for nightworks (assume for works on all regional/state roads) | 1 | item | 70,200 | 70,200 |
| | SUBTOTAL | | | | 2,240,450 |

| | | | | | |
|--|--|---|-------|---------|------------------|
| 4.0 PAVEMENTS | | | | | |
| 4.1 | Reinstate disturbed road pavement, including demolition and disposal of additional material to provide good jointing | 0 | sq. m | 120 | 0 |
| | SUBTOTAL | | | | 0 |
| 5.0 PROPERTY BY-BACK | | | | | |
| 5.1 | Purchase of properties in order to create drainage easements | 0 | each | 1300000 | 0 |
| | SUBTOTAL | | | | 0 |
| 6.0 TRAFFIC CONTROL | | | | | |
| 6.1 | Control of traffic during works, incl allowance for night works (assumed 10% of pipe install cost) | 1 | item | 224045 | 224,045 |
| | SUBTOTAL | | | | 224,045 |
| 7.0 MINOR LANDSCAPING | | | | | |
| 7.1 | Repair disturbed areas in accordance with landscape architects requirements (nominal allowance) | 0 | sq. m | 20 | 0 |
| | SUBTOTAL | | | | 0 |
| CONSTRUCTION SUB-TOTAL | | | | | 2,875,595 |
| 8.0 CONTINGENCIES | | | | | |
| 8.1 | 30% construction cost | | | | 862,679 |
| CONSTRUCTION TOTAL, excluding GST | | | | | 3,738,274 |
| GST | | | | | 373,827 |
| CONSTRUCTION TOTAL, including GST | | | | | 4,112,101 |
| CONSTRUCTION TOTAL, rounded | | | | | 4,112,200 |
| DISCLAIMER: 1. This estimate of cost is provided in good faith using information available at this stage. This estimate of cost is not guaranteed. Cardno (NSW) will not accept liability in the event that actual costs exceed the estimate. | | | | | |
| NOTES: 1. Estimate does not include Consultant's fees, including design or project management 2. Estimate / rates in 2010 dollars and does not allow for inflation | | | | | |

Marrickville Valley Floodplain Risk
Management Study and Plan

APPENDIX

A3

OPTIONS MCA ANALYSIS

| Category | Category Factor | Category Weighting | Criteria | Criteria Weighting | Metric | FM1.1 | FM1.2 | FM2.1 | FM2.3 | FM3.1 | FM3.2 | FM3.3 | FM3.4 | FM3.6 | FM4.2 | FM5.2 | FM5.3 & 5.4 | FM5.6 | FM5.9 | FM6.1 | FM6.4 | FM7.1 & 7.5 | FM7.6 | FM8.1 & 8.2 | FM8.3 | FM9.1 | FM10.1 | FM10.2 | FM10.4 | FM11.1 & 11.2 | FM11.3 | FM11.4 | M12.1 & 12.: | FM12.4 | M13.1 & 13.: | FM13.4 | FM14.1 | M15.1 & 15.: | FM15.3 | FM15.9 | FM15.10 | | |
|---|-----------------|--------------------|--|--------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------|-------|-------|-------|-------|-------------|-------|-------------|-------|-------|--------|--------|--------|---------------|--------|--------|--------------|--------|--------------|--------|--------|--------------|--------|--------|---------|------|----|
| Economic | 1.00 | 0.33 | Benefit Cost Ratio | 5 | Comparison of economic benefits against the capital and operating costs. | 2 | 1 | 4 | 1 | 2 | 2 | 3 | 2 | 2 | 1 | 4 | 4 | 4 | 1 | 3 | 3 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 4 | 3 | 1 | 2 | 1 | 1 | 3 | 2 | 1 | 1 | 1 | |
| | | | Complexity | 3 | Implementation or construction timeframe and challenges | 1 | 1 | 1 | 2 | 1 | -1 | 1 | 2 | -2 | 2 | 1 | 2 | 3 | -2 | 2 | 2 | 1 | 1 | 1 | -1 | -2 | 1 | -1 | 1 | 1 | 2 | 1 | 2 | 3 | 2 | -2 | 1 | 1 | -1 | -1 | -1 | | |
| | | | Staging of Works | 1 | Ability to stage proposed works | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 2 |
| Social | 0.75 | 0.25 | Reduction in risk to life | 4 | Change in number of properties with over floor flooding in 1% AEP event and reduced flooding for sensitive land uses (e.g. schools, child care facilities, aged care) | 2 | -1 | -2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | -2 | 1 | 3 | 1 | 0 | 1 | 2 | 1 | -3 | 1 | -1 | 0 | 1 | 0 | 3 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 2 | 4 | 4 | | |
| | | | Emergency Access | 3 | Flood depth and duration changes for critical transport routes in 1% AEP event | 2 | -1 | -2 | 0 | 0 | 3 | 0 | 3 | -1 | 2 | -1 | 1 | 1 | 1 | 0 | 1 | 3 | 2 | -2 | 2 | -2 | 0 | 1 | 1 | 1 | 3 | 2 | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 3 | 4 | 4 | |
| | | | Social Disruption | 3 | Flood depth and duration changes for transport routes in 2yr ARI event | 2 | -1 | 2 | 2 | 2 | 3 | 0 | 2 | 1 | 1 | -1 | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 4 | 1 | 2 | 1 | 3 | 1 | 1 | 2 | 3 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | | |
| | | | Community and Stakeholder Support | 4 | Level of agreement | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| Environmental | 0.75 | 0.25 | Heritage Conservation Areas and Heritage Items | 2 | Impacts to heritage items identified in the FRMS | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | Recreation and Flora / Fauna Impacts | 4 | Impacts on or benefits to recreation spaces or flora / fauna inc. street trees | -1 | -1 | 0 | 0 | -1 | 0 | 0 | 0 | -1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -2 | 0 | 0 | 0 | 0 | 0 | -1 | -1 | 0 | 0 | 0 | 0 | 0 |
| | | | Acid Sulfate Soils or contaminated land | 1 | Disruption of PASS or contaminated land | -2 | -2 | 0 | 0 | 0 | -2 | -1 | -1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -2 | -2 | 0 | 0 | 0 | -2 | -2 | -1 | -1 | -1 | -1 | -1 | 0 | 0 | -2 | -2 | 0 | -1 | -2 | -2 | -2 |
| | | | Visual Impact or Public Domain | 3 | Impact of completed works on visual amenity or public domain | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CATEGORY WEIGHTED SCORE - ECONOMIC | | | | | | 4.3 | 2.7 | 7.7 | 3.7 | 4.3 | 2.7 | 6.0 | 5.7 | 1.7 | 4.3 | 7.7 | 9.0 | 10.3 | -0.3 | 7.0 | 7.3 | 2.7 | 4.3 | 2.7 | 1.3 | 0.0 | 2.7 | 1.0 | 2.7 | 7.7 | 8.7 | 6.0 | 4.3 | 6.3 | 3.7 | -0.3 | 6.0 | 4.7 | 1.0 | 0.7 | 1.3 | | |
| CATEGORY WEIGHTED SCORE - SOCIAL | | | | | | 8.0 | 0.5 | 1.0 | 4.5 | 5.5 | 8.5 | 4.0 | 7.8 | 2.0 | 4.3 | -2.5 | 7.0 | 8.3 | 5.5 | 2.8 | 5.3 | 7.8 | 6.0 | -1.8 | 6.0 | 3.5 | 2.8 | 6.3 | 4.5 | 9.5 | 5.3 | 3.8 | 4.5 | 5.3 | 5.3 | 4.5 | 5.3 | 3.5 | 6.3 | 9.0 | 9.0 | | |
| CATEGORY WEIGHTED SCORE - ENVIRONMENTAL | | | | | | -1.0 | -1.0 | 0.0 | 0.0 | -1.0 | -0.5 | -0.3 | -0.3 | -1.8 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -0.5 | -0.5 | 0.5 | 0.5 | 0.5 | -0.5 | -0.5 | -0.3 | -1.5 | -0.3 | -0.3 | 0.0 | 0.0 | -1.5 | -1.5 | 0.0 | -0.3 | -0.5 | -0.5 | -0.5 | |
| MCA SCORE | | | | | | 9.58 | 2.29 | 8.42 | 7.04 | 7.71 | 8.67 | 8.81 | 11.29 | 1.85 | 7.52 | 5.79 | 14.63 | 16.52 | 3.79 | 9.06 | 11.27 | 8.10 | 8.46 | 1.73 | 6.21 | 3.00 | 4.35 | 5.31 | 5.85 | 13.67 | 12.42 | 8.63 | 7.71 | 10.27 | 6.48 | 1.92 | 9.94 | 7.10 | 5.31 | 7.04 | 7.71 | | |

CATEGORY WEIGHTED SCORE = CATEGORY WEIGHTING x CRITERIA WEIGHTING x CRITERIA SCORE
MCA SCORE = CATEGORY FACTOR x CATEGORY WEIGHTED SCORE

| Category | Category Weighting | Criteria | Criteria Weighting | Metric | PM 1 | PM 2 | PM 3 | PM 4 | PM 5 | PM 6 | EM 1 | EM 2 | EM 3 | EM 4 | EM 5 | EM 6 | EM 7 |
|---|--------------------|--|--------------------|---|--------|--------|--------|------|------|-------|------|-------|------|------|------|------|------|
| Economic | 0.33 | Capital Cost | 4 | Capital Cost of Option | -4 | -3 | -4 | -1 | -1 | 0 | -2 | 0 | 0 | 0 | -1 | -1 | -1 |
| | | Operating and Maintenance Cost | 4 | Annual Operating Cost of Option | 0 | 0 | -2 | -1 | -2 | -3 | -1 | 0 | 0 | 0 | -2 | -2 | -2 |
| | | Implementation Complexity | 3 | Implementation timeframe and challenges | -4 | -4 | -3 | -1 | 3 | 1 | 2 | 3 | -1 | -2 | 3 | 3 | 3 |
| Social | 0.20 | Increased Awareness | 5 | Level of likely increased awareness | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 3 | 3 | 3 | 4 | 4 | 0 |
| | | Improved Response | 5 | NA | 0 | 0 | 0 | 3 | 0 | 0 | 4 | 3 | 3 | 3 | 3 | 4 | 0 |
| | | Reduction in risk to life | 5 | NA | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 3 | 3 | 4 | 4 | 3 |
| | | Compatibility of proposed works / option with Council Plans & Policies | 3 | Level of compatibility | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Community and Stakeholder Support | 3 | Level of agreement | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 3 |
| Environmental | 0.25 | Heritage Conservation Areas and Heritage Items | 2 | Impacts to heritage items identified in the FRMS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Recreation and Flora / Fauna Impacts including Street Trees | 4 | Impacts or benefits to flora / fauna or passive/active recreational areas | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Acid Sulfate Soils and Contaminated Land | 1 | Disruption of PASS and/or Disruption of Contaminated Land | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Visual Impact | 3 | Impact of completed works on visual amenity or or function of public domain | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| CATEGORY WEIGHTED SCORE - ECONOMIC | | | | | -12.4 | -10.7 | -14.7 | -4.9 | -1.3 | -4.0 | -2.7 | 4.0 | -1.3 | -2.7 | -1.3 | -1.3 | -1.3 |
| CATEGORY WEIGHTED SCORE - SOCIAL | | | | | 3.0 | 3.0 | 3.0 | 9.0 | 4.8 | 4.8 | 7.0 | 6.0 | 9.0 | 9.0 | 11.0 | 12.6 | 4.8 |
| CATEGORY WEIGHTED SCORE - ENVIRONMENTAL | | | | | 2.8 | 0.0 | 1.0 | 0.0 | 1.5 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.3 |
| MCA SCORE | | | | | -12.13 | -11.82 | -16.41 | 0.68 | 3.19 | -0.93 | 2.04 | 10.13 | 5.42 | 3.64 | 7.02 | 8.30 | 3.75 |

CATEGORY WEIGHTED SCORE = CATEGORY WEIGHTING x CRITERIA WEIGHTING x CRITERIA SCORE

MCA SCORE = CATEGORY FACTOR x CATEGORY WEIGHTED SCORE