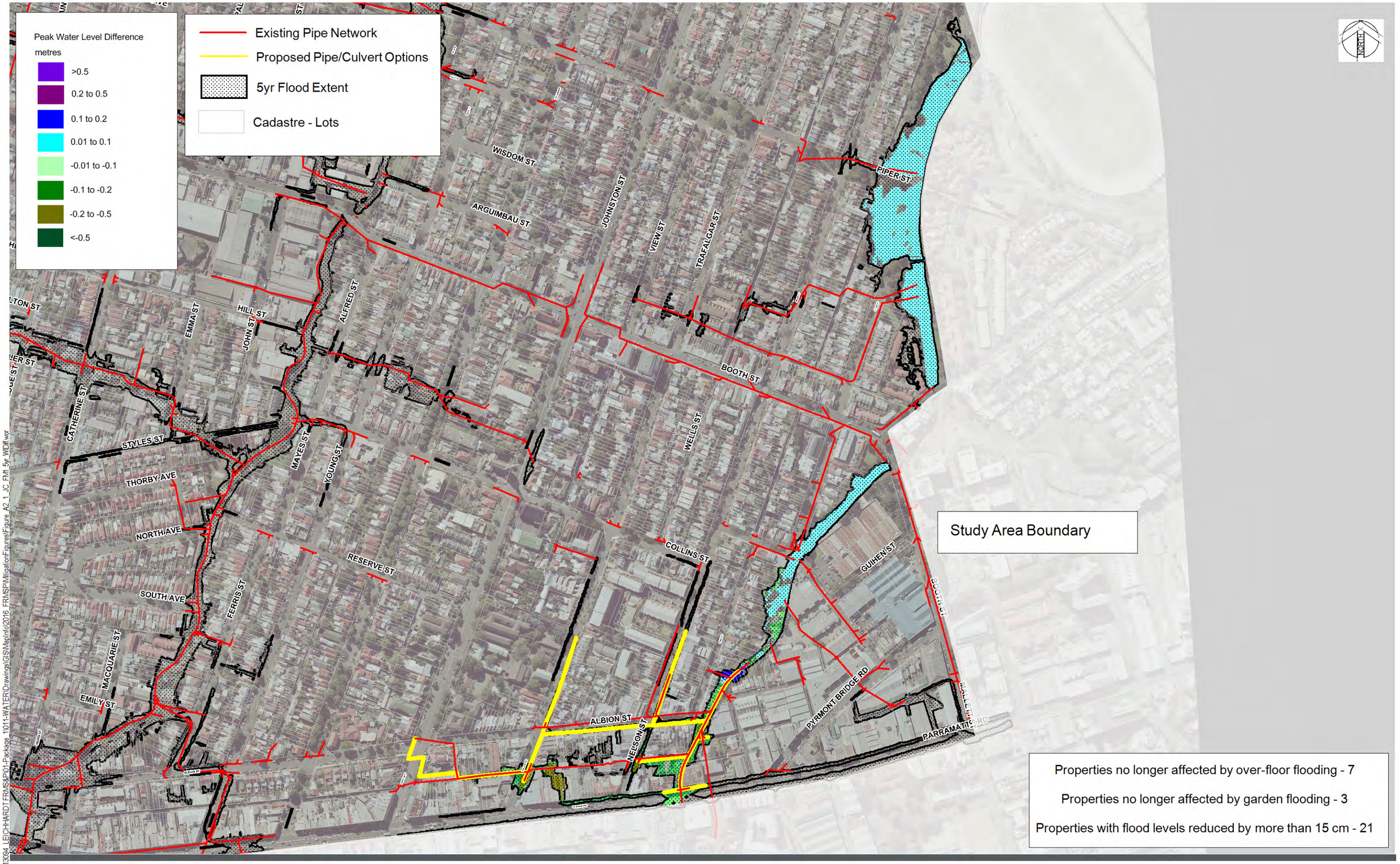

DATE PLOTTED: 04-Nov-2016 BY: Matthew Prumm
FILE: N:\Projects\4991\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package 1\011-WATER\Drawings\GIS\MapInfo\2016 FRMSP\MitigationFigures\Figure_A2_1_JC_FM1_5yr_WIDiff.wor

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM1 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_1

Date
03/2017

Size
A3

JC_FM1_5yr_WlDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres
- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

Existing Pipe Network
Proposed Pipe/Culvert Options
20yr Flood Extent
Cadastre - Lots

Study Area Boundary

Properties no longer affected by over-floor flooding - 14

Properties no longer affected by garden flooding - 4

Properties with flood levels reduced by more than 15 cm - 40

DATE PLOTTED: 04-Nov-2016 BY: Matthew.Prumm
FILE: N:\Projects\499\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A2_2_JC_FM1_20yr_WIDiff.wor

INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM1 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_2

Date
03/2017

Size
A3

JC_FM1_20yr_WIDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres
- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

Existing Pipe Network
Proposed Pipe/Culvert Options
100yr Flood Extent
Cadastre - Lots

NORTH

Study Area Boundary

Properties no longer affected by over-floor flooding - 7

Properties no longer affected by garden flooding - 4

Properties with flood levels reduced by more than 15 cm - 40

DATE PLOTTED: 04-Nov-2016 BY: Matthew.Prumm
FILE: N:\Projects\499\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A2_3_JC_FM1_100yr_WlDiff.wor

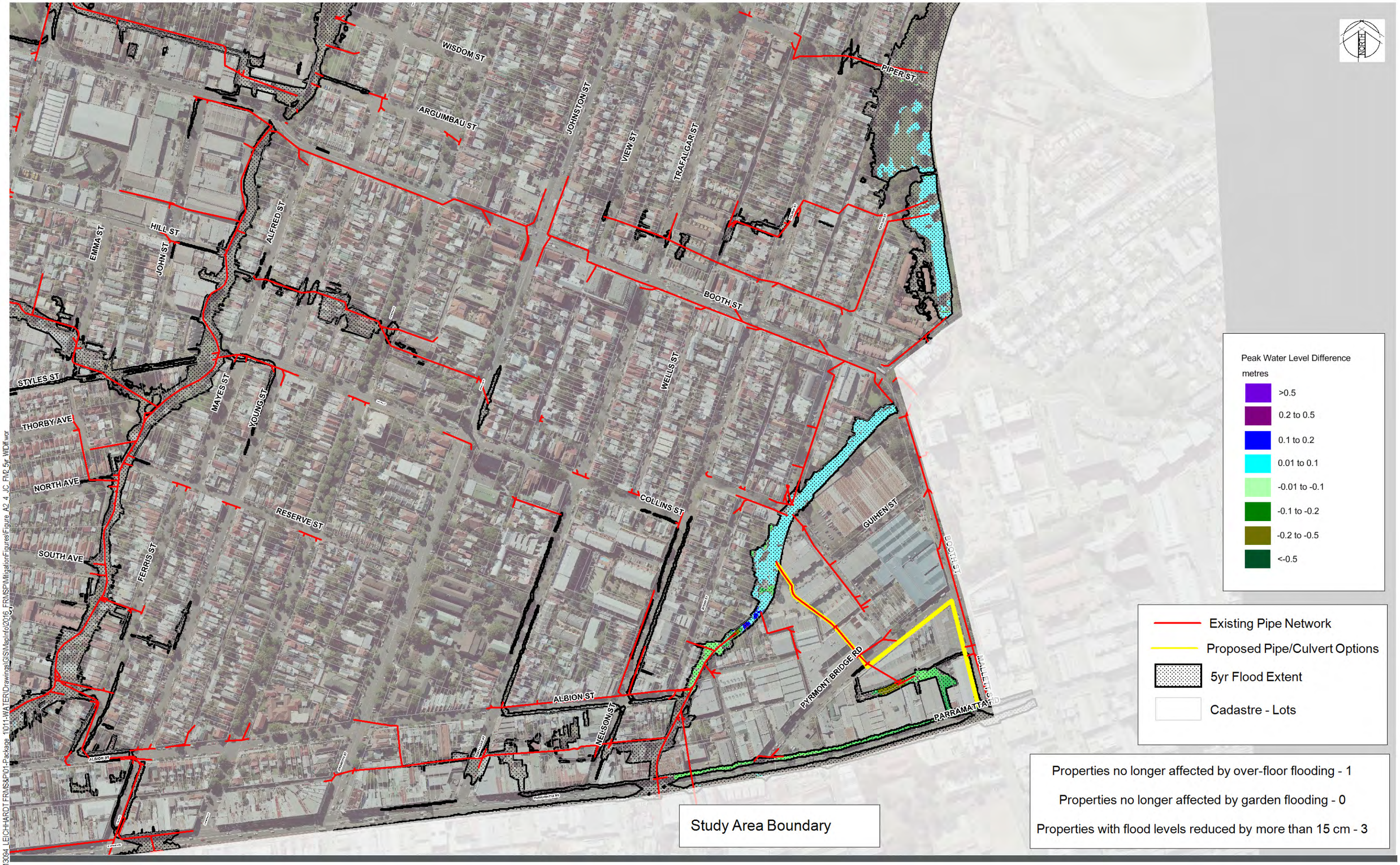
INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM1 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_3

Date
03/2017

Size
A3

JC_FM1_100yr_WlDiff
Drawing Number

03
Revision



DATE PLOTTED: 04-Nov-2016 BY: Matthew Prumm
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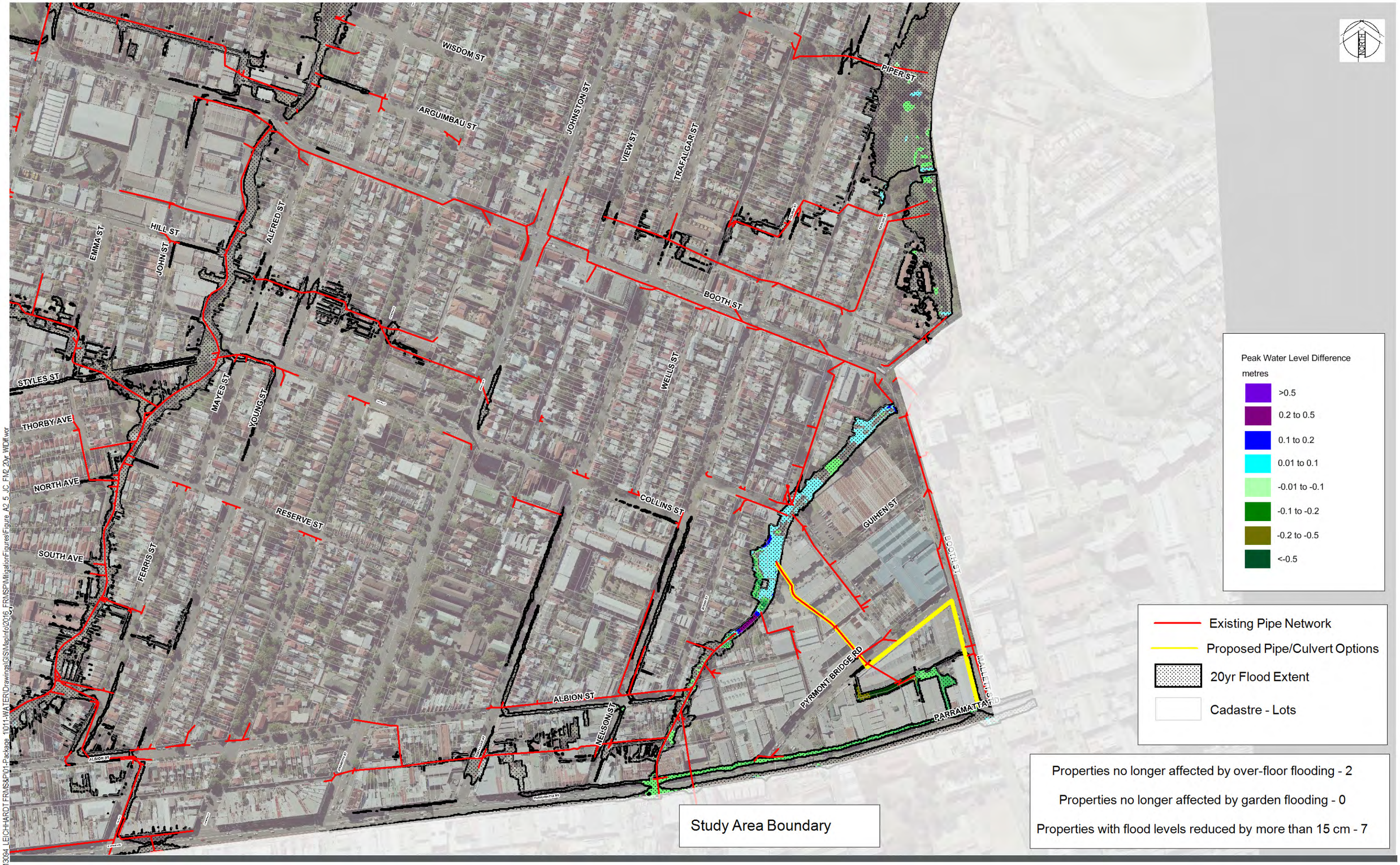
INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM2 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_4

Date
03/2017

Size
A3

JC_FM2_5yr_WIDiff
Drawing Number

03
Revision



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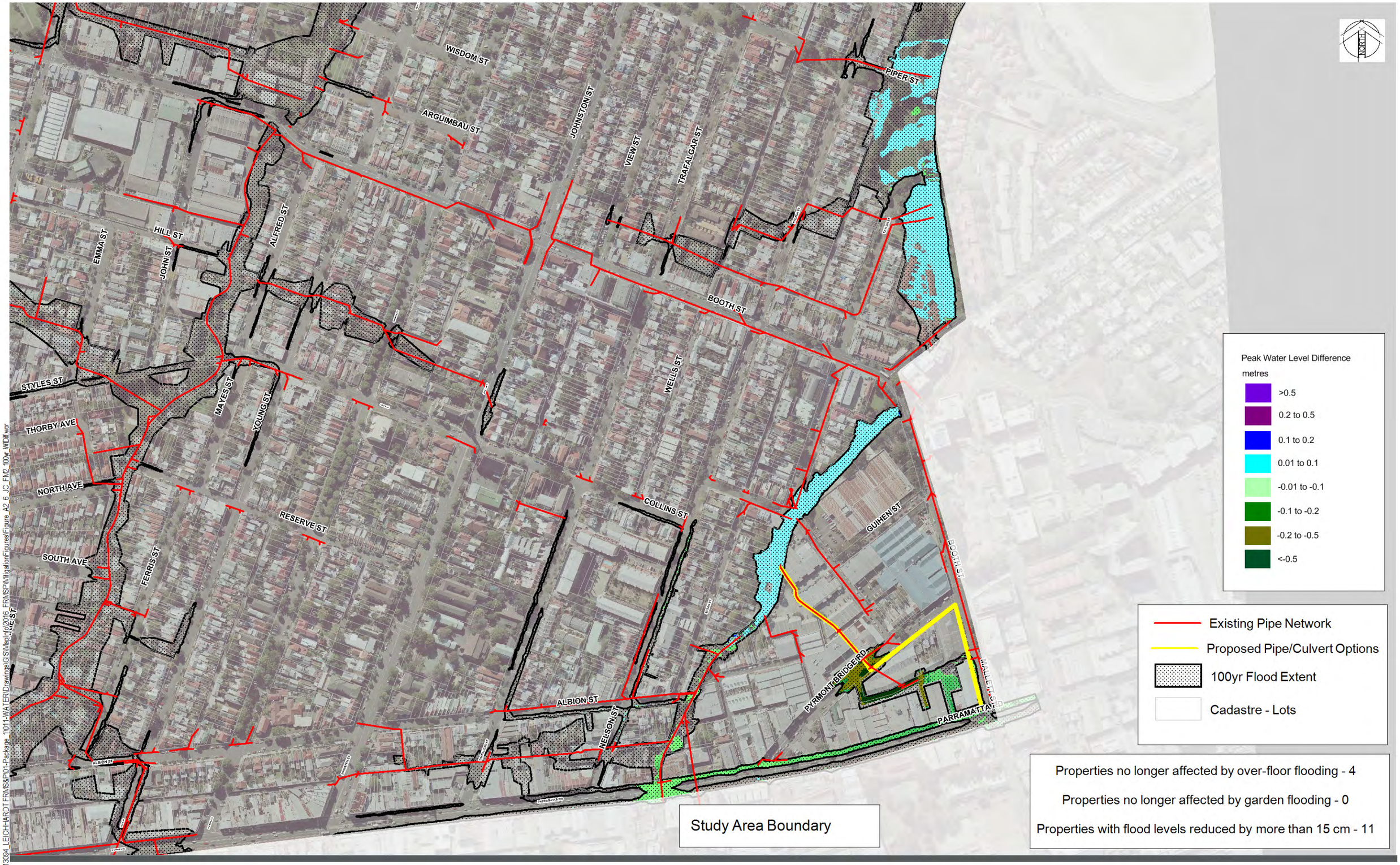
INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM2 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_5

Date
03/2017

Size
A3

JC_FM2_20yr_WIDiff
Drawing Number

03
Revision



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INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM2 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_6

Date
03/2017

Size
A3

JC_FM2_100yr_WIDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

Study Area Boundary

NORTH

TRAFALGAR ST

NELSON ST

TAYLOR ST

BOOTH ST

- Existing Pipe Network
- Proposed Pipe/Culvert Options
- 5yr Flood Extent
- Cadastre - Lots

Properties no longer affected by over-floor flooding - 1

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 2

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FILE: N:\Projects\499\FY13\NA49913094 LEICHHARDT FRMS&P\01-Package 1\011-WATER\Drawings\GIS\Mapinfo\2016_FRMSP\MitigationFigures\Figure_A2_7_JC_Fm3_5yr_WlDiff.wor

INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM3 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_7

Date
03/2017

Size
A3

JC_FM3_5yr_WlDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

Study Area Boundary

NORTH

TRAFALGAR ST

NELSON ST

TAYLOR ST

BOOTH ST

- Existing Pipe Network
- Proposed Pipe/Culvert Options
- 20yr Flood Extent
- Cadastre - Lots

Properties no longer affected by over-floor flooding - 1

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 5

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FILE: N:\Projects\499\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\Mapinfo\2016_FRMSP\MitigationFigures\Figure_A2_8_JC_FM3_20yr_WDiff.wor

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM3 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_8

Date
03/2017

Size
A3

JC_FM3_20yr_WlDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

VIEW ST

TRAFALGAR ST

NELSON ST

TAYLOR ST

BOOTH ST

NORTH

Study Area Boundary

- Existing Pipe Network
- Proposed Pipe/Culvert Options
- 100yr Flood Extent
- Cadastre - Lots

Properties no longer affected by over-floor flooding - 1

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 5

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FILE: N:\Projects\499\FY13\N449913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A2_9_JC_FM3_100yr_WIDiff.wor

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM3 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_9

Date
03/2017

Size
A3

JC_FM3_100yr_WIDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

JOHNSTON ST

VIEW ST

TRAFALGAR ST

ROSE ST

WILLIAM ST

NELSON

THE CRESCENT

Study Area Boundary

- Existing Pipe Network
- Proposed Pipe/Culvert Options
- 5yr Flood Extent
- Cadastre - Lots

Properties no longer affected by over-floor flooding - 4

Properties no longer affected by garden flooding - 1

Properties with flood levels reduced by more than 15 cm - 3

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM4 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_10

Date
03/2017

Size
A3

JC_FM4_5yr_WlDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

JOHNSTON ST

VIEW ST

TRAFALGAR ST

ROSE ST

WILLIAM ST

THE CRESCENT

NELSON

Study Area Boundary

NORTH

Existing Pipe Network

Proposed Pipe/Culvert Options

20yr Flood Extent

Cadastre - Lots

Properties no longer affected by over-floor flooding - 2

Properties no longer affected by garden flooding - 1

Properties with flood levels reduced by more than 15 cm - 20

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FILE: N:\Projects\499\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A2_11_JC_FM4_20yr_WlDiff.wor

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM4 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_11

Date
03/2017

Size
A3

JC_FM4_20yr_WlDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

JOHNSTON ST

ROSE ST

VIEW ST

TRAFALGAR ST

WILLIAM ST

THE CRESCENT

NELSON

Study Area Boundary

NORTH

- Existing Pipe Network
- Proposed Pipe/Culvert Options
- 100yr Flood Extent
- Cadastre - Lots

Properties no longer affected by over-floor flooding - 3

Properties no longer affected by garden flooding - 2

Properties with flood levels reduced by more than 15 cm - 28

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FILE: N:\Projects\499\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_10\11-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A2_12_JC_FM4_100yr_WIDiff.wor

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LEICHHARDT FRMS&P
JC_FM4 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_12

Date
03/2017

Size
A3

JC_FM4_100yr_WIDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

BAYVIEW CRES
KENTVILLE AVE
ANNANDALE ST
JOHNSTON ST
ROSE ST
VIEW ST
TRAFALGAR ST
WILLIAM ST
NELSON ST
THE CRESCENT
PIPER ST
BOOTH ST
WELLS ST

NORTH

Existing Pipe Network
Proposed Pipe/Culvert Options
5yr Flood Extent
Cadastre - Lots

Properties no longer affected by over-floor flooding - 0

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 2

Study Area Boundary

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LEICHHARDT FRMS&P

JC_FM5 5YR ARI WL DIFF MITIGATION LESS EXISTING

JC_FM5_5yr_WlDiff
Drawing Number

FIG_A2_13

Date
03/2017

Size
A3

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

NORTH

BAYVIEW CRES
CRESCENT
KENTVILLE AVE
ANNANDALE ST
JOHNSTON ST
ROSE ST
VIEW ST
TRAFALGAR ST
WILLIAM ST
NELSON ST
THE CRESCENT
PIPER ST
BOOTH ST
WELLS ST

Existing Pipe Network
Proposed Pipe/Culvert Options
20yr Flood Extent
Cadastre - Lots

Study Area Boundary

Properties no longer affected by over-floor flooding - 0

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 5

DATE PLOTTED: 04-Nov-2016 BY: Matth Plumm
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INNER WEST COUNCIL
LEICHHARDT FRMS&P

JC_FM5 20YR ARI WL DIFF MITIGATION LESS EXISTING

FIG_A2_14

Date
03/2017

Size
A3

JC_FM5_20yr_WlDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

NORTH

CRESCENT
BAYVIEW CRES
KENTVILLE AVE
ANNANDALE ST
JOHNSTON ST
ROSE ST
VIEW ST
TRAFALGAR ST
WILLIAM ST
THE CRESCENT
NELSON ST
PIPER ST
BOOTH ST
WELLS ST

Existing Pipe Network
Proposed Pipe/Culvert Options
100yr Flood Extent
Cadastre - Lots

Study Area Boundary

Properties no longer affected by over-floor flooding - 0

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 5

DATE PLOTTED: 04-Nov-2016 BY: Matth Prumm
FILE: N:\Projects\499\FY13\NA49913094 LEICHHARDT FRMSP\01-Package_1\011-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A2_15_JC_FM5_100

INNER WEST COUNCIL
LEICHHARDT FRMS&P

JC_FM5 100YR ARI WL DIFF MITIGATION LESS EXISTING
FIG_A2_15

Date 03/2017

Size A3

JC_FM5_100yr_WlDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

NORTH

PIPER ST

TRAFALGAR ST

NELSON ST

TAYLOR ST

Study Area Boundary

- Existing Pipe Network
- Proposed Levee
- Proposed Pipe/Culvert Options
- 5yr Flood Extent
- Cadastre - Lots

Properties no longer affected by over-floor flooding - 0

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 0

DATE PLOTTED: 04-Nov-2016 BY: Matthew Prumm
FILE: N:\Projects\499\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A2_16_JC_FM6 5yr_WDiff.wor

INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM6 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_16

Date
03/2017

Size
A3

JC_FM6_5yr_WlDiff
Drawing Number

03
Revision

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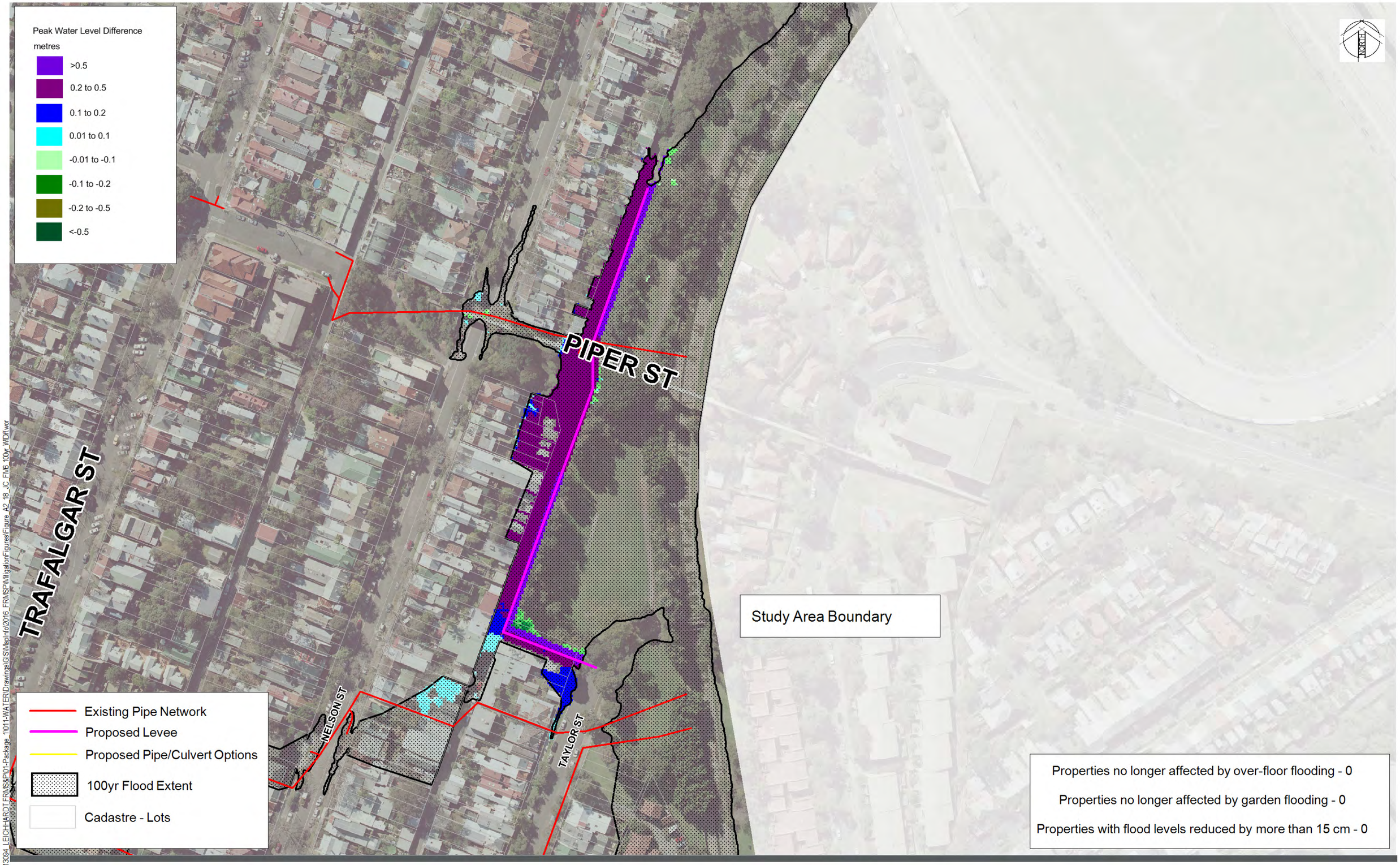
INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM6 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_17

Date
03/2017

Size
A3

JC_FM6_20yr_WIDiff
Drawing Number

03
Revision



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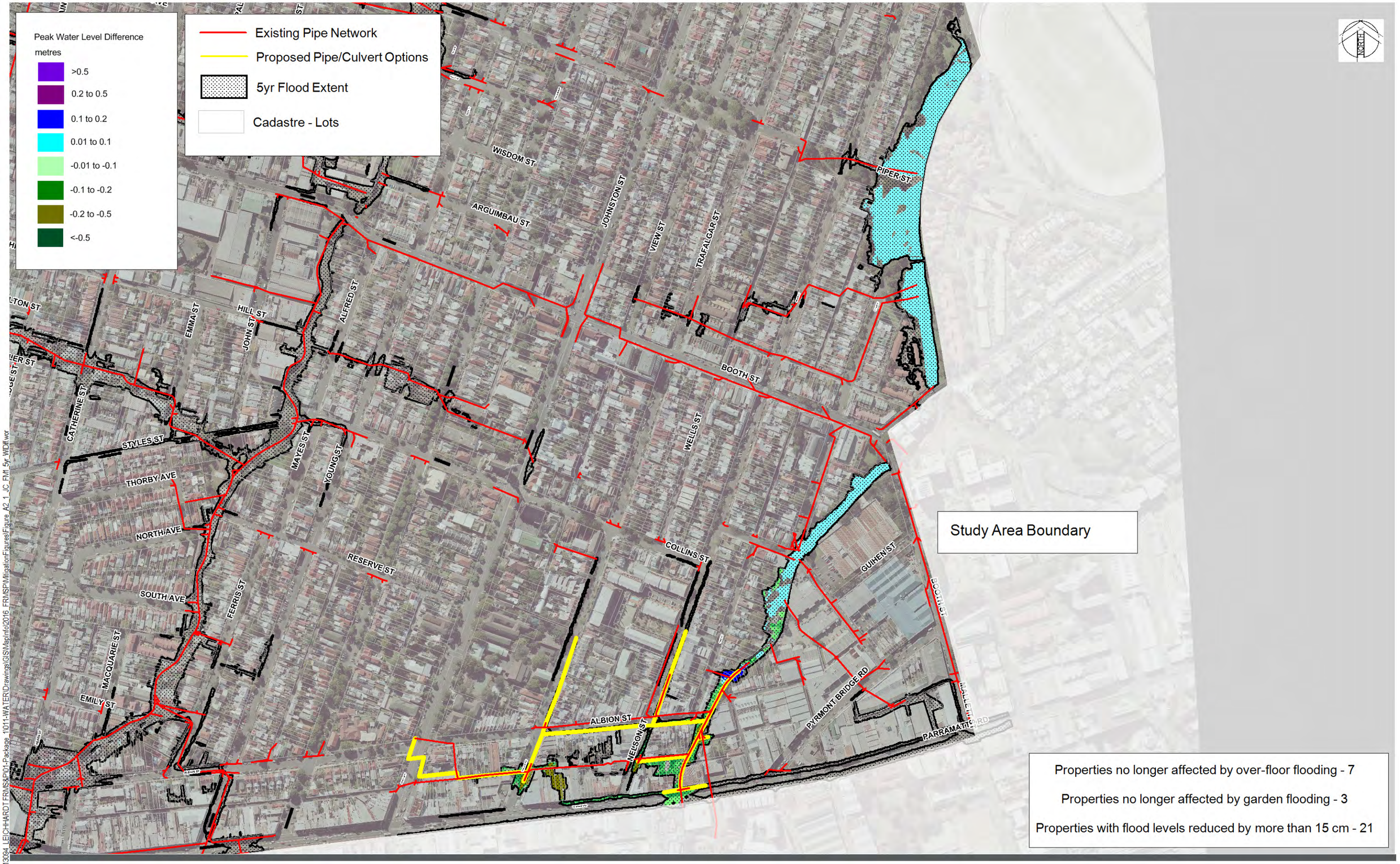
INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM6 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_18

Date
03/2017

Size
A3

JC_FM6_100yr_WlDiff
Drawing Number

03
Revision



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INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM1 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_1

Date
03/2017

Size
A3

JC_FM1_5yr_WlDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres
- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

Existing Pipe Network
Proposed Pipe/Culvert Options
20yr Flood Extent
Cadastre - Lots

Study Area Boundary

Properties no longer affected by over-floor flooding - 14

Properties no longer affected by garden flooding - 4

Properties with flood levels reduced by more than 15 cm - 40

DATE PLOTTED: 04-Nov-2016 BY: Matthew.Prumm
FILE: N:\Projects\499\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A2_2_JC_FM1_20yr_WIDiff.wor

INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM1 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_2

Date
03/2017

Size
A3

JC_FM1_20yr_WIDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres
- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

Existing Pipe Network
Proposed Pipe/Culvert Options
100yr Flood Extent
Cadastre - Lots

NORTH

Study Area Boundary

Properties no longer affected by over-floor flooding - 7

Properties no longer affected by garden flooding - 4

Properties with flood levels reduced by more than 15 cm - 40

DATE PLOTTED: 04-Nov-2016 BY: Matthew.Prumm
FILE: N:\Projects\499\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A2_3_JC_FM1_100yr_WlDiff.wor

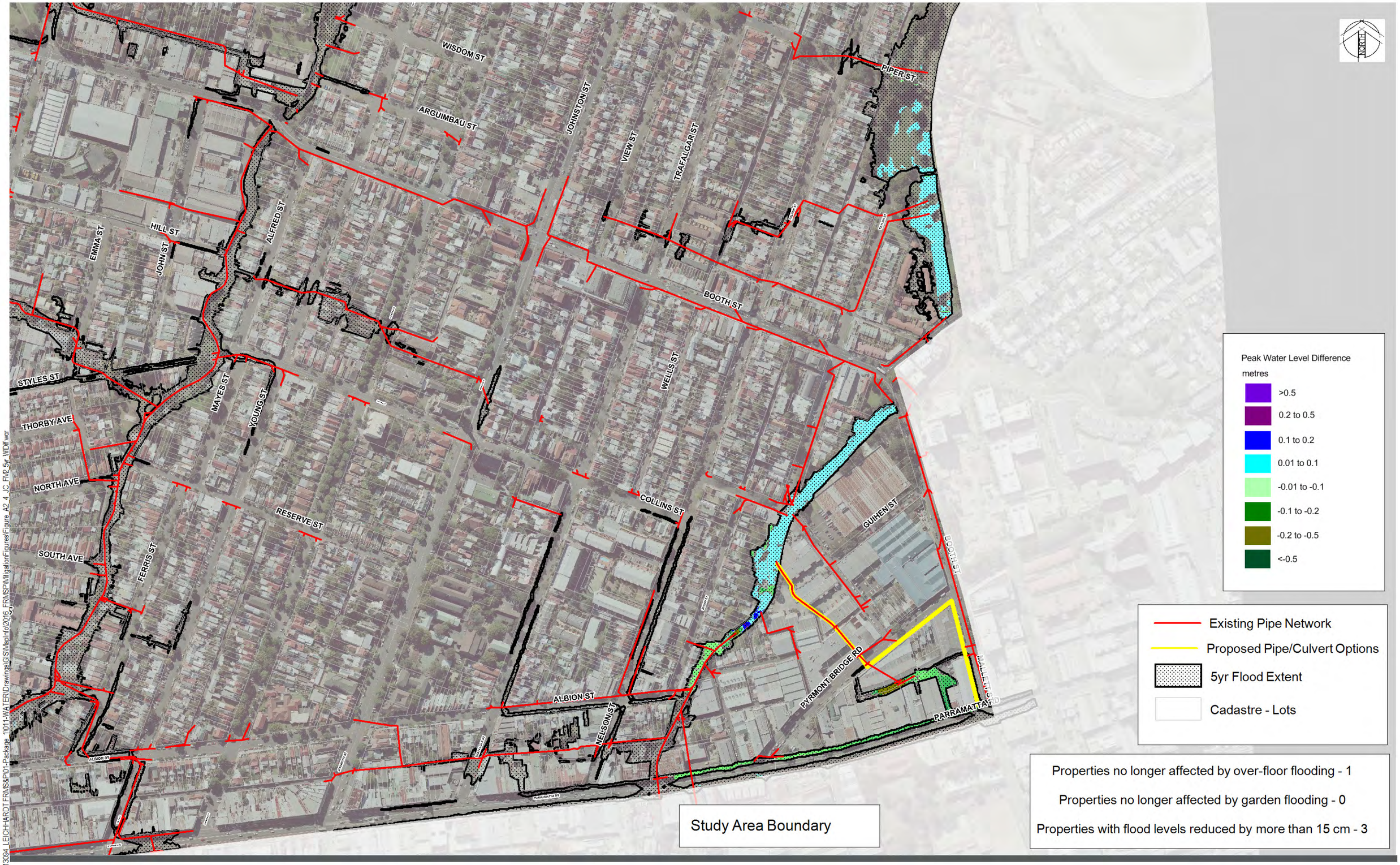
INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM1 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_3

Date
03/2017

Size
A3

JC_FM1_100yr_WlDiff
Drawing Number

03
Revision



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FILE: N:\Projects\499\FY13\NA499713094 LEICHHARDT FRMS&P\01-Package 1\011-WATER\Drawings\GIS\MapInfo\2016 FRMSP\MitigationFigures\Figure_A2_4_JC_FM2_5yr_WIDiff.wor

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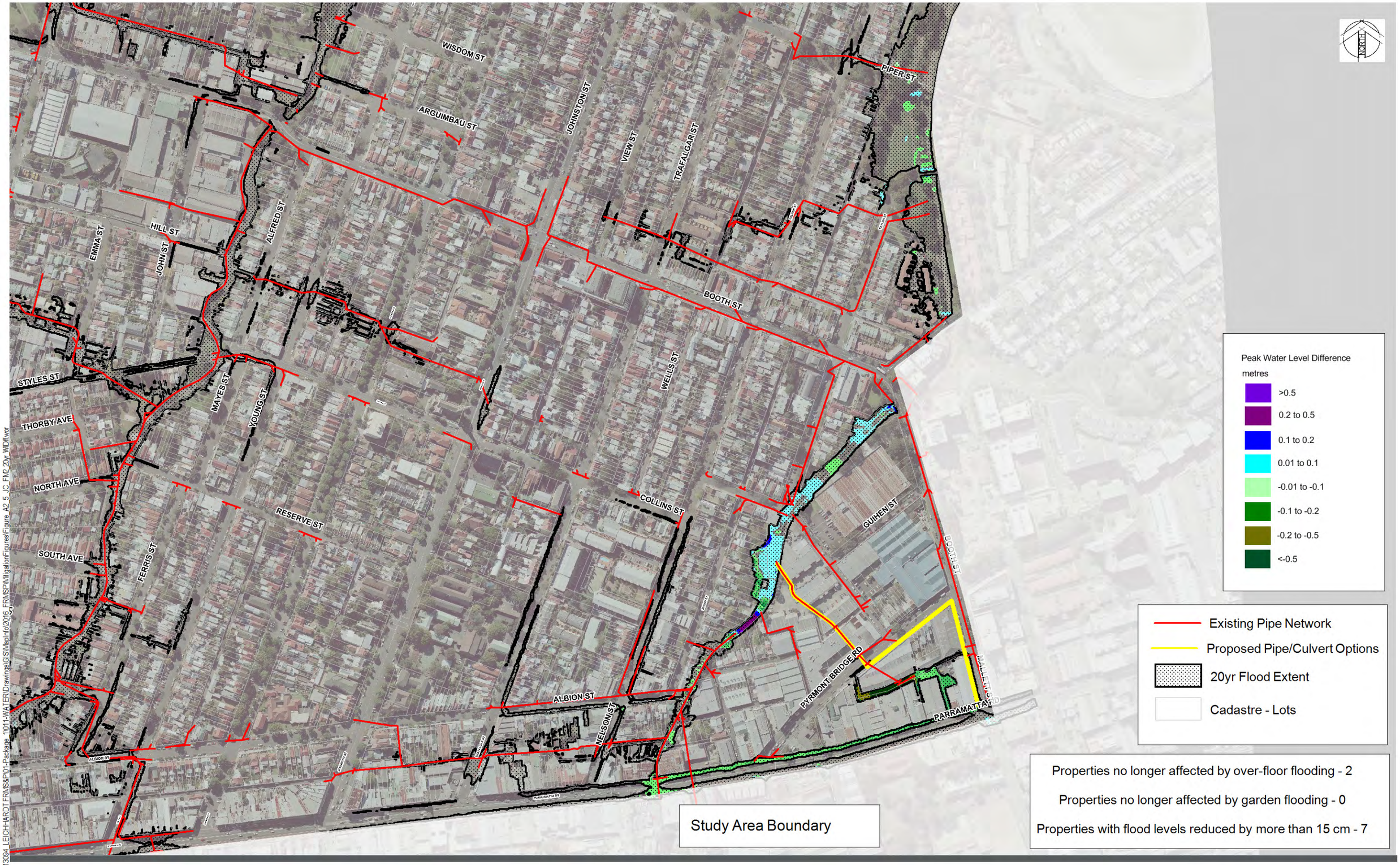
INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM2 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_4

Date
03/2017

Size
A3

JC_FM2_5yr_WIDiff
Drawing Number

03
Revision



DATE PLOTTED: 04-Nov-2016 BY: Matthew.Prumm
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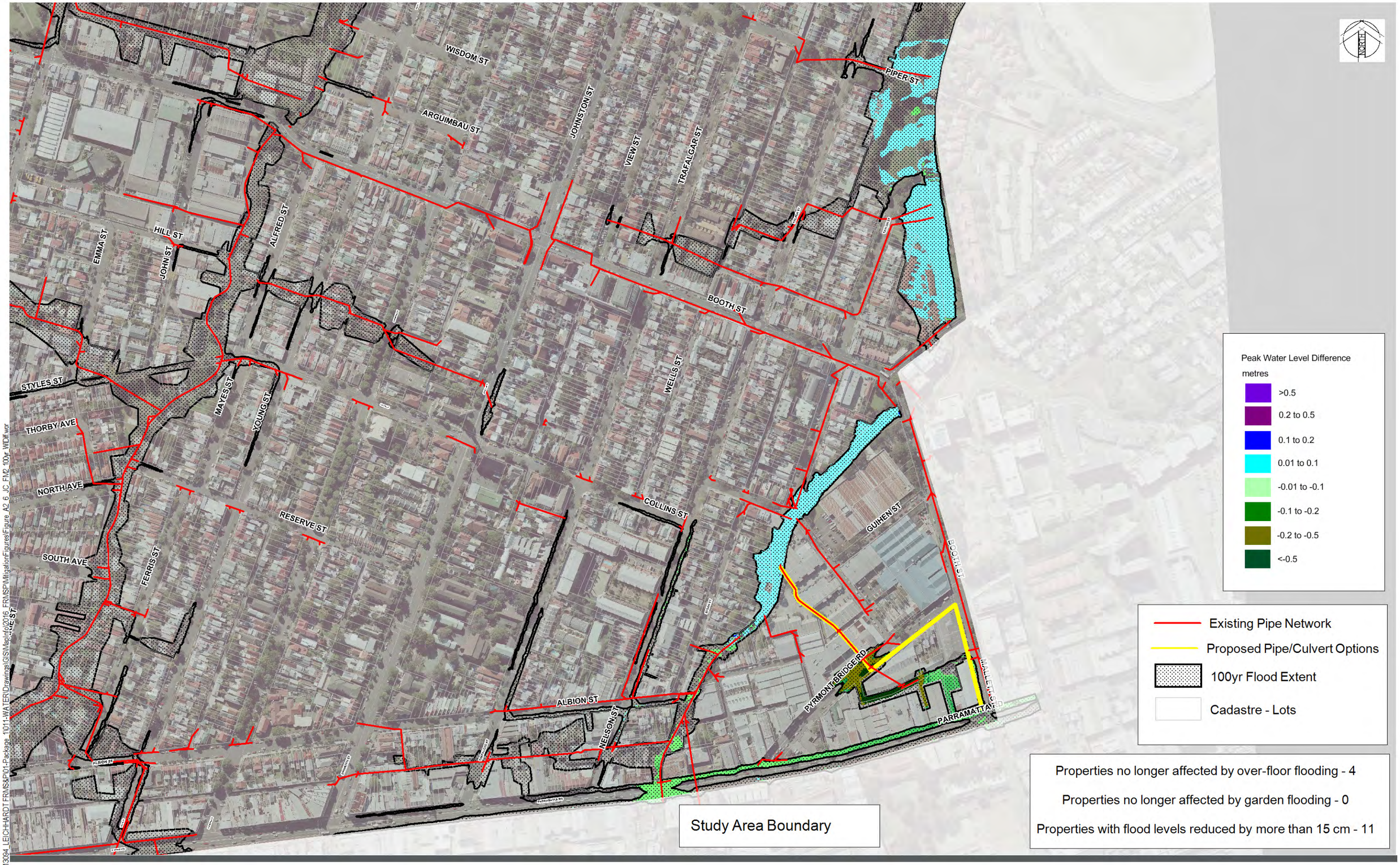
INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM2 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_5

Date
03/2017

Size
A3

JC_FM2_20yr_WIDiff
Drawing Number

03
Revision



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INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM2 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_6

Date
03/2017

Size
A3

JC_FM2_100yr_WIDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

Study Area Boundary

NORTH

TRAFALGAR ST

NELSON ST

TAYLOR ST

BOOTH ST

- Existing Pipe Network
- Proposed Pipe/Culvert Options
- 5yr Flood Extent
- Cadastre - Lots

Properties no longer affected by over-floor flooding - 1

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 2

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM3 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_7

Date
03/2017

Size
A3

JC_FM3_5yr_WlDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

Study Area Boundary

NORTH

TRAFALGAR ST

NELSON ST

TAYLOR ST

BOOTH ST

- Existing Pipe Network
- Proposed Pipe/Culvert Options
- 20yr Flood Extent
- Cadastre - Lots

Properties no longer affected by over-floor flooding - 1

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 5

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FILE: N:\Projects\499\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\Mapinfo\2016_FRMSP\MitigationFigures\Figure_A2_8_JC_FM3_20yr_WDiff.wor

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM3 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_8

Date
03/2017

Size
A3

JC_FM3_20yr_WlDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

VIEW ST

TRAFALGAR ST

NELSON ST

TAYLOR ST

BOOTH ST

NORTH

Study Area Boundary

- Existing Pipe Network
- Proposed Pipe/Culvert Options
- 100yr Flood Extent
- Cadastre - Lots

Properties no longer affected by over-floor flooding - 1

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 5

DATE PLOTTED: 04-Nov-2016 BY: Matthew Prumm
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INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM3 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_9

Date
03/2017

Size
A3

JC_FM3_100yr_WIDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

JOHNSTON ST

VIEW ST

TRAFALGAR ST

ROSE ST

WILLIAM ST

NELSON

THE CRESCENT

Study Area Boundary

- Existing Pipe Network
- Proposed Pipe/Culvert Options
- 5yr Flood Extent
- Cadastre - Lots

Properties no longer affected by over-floor flooding - 4

Properties no longer affected by garden flooding - 1

Properties with flood levels reduced by more than 15 cm - 3

DATE PLOTTED: 04-Nov-2016 BY: Matthew.Prumm
FILE: N:\Projects\499\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A2_10_JC_FM4_5yr_WDiff.wor

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM4 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_10

Date
03/2017

Size
A3

JC_FM4_5yr_WlDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

JOHNSTON ST

VIEW ST

TRAFALGAR ST

ROSE ST

WILLIAM ST

THE CRESCENT

NELSON

Study Area Boundary

NORTH

Existing Pipe Network

Proposed Pipe/Culvert Options

20yr Flood Extent

Cadastre - Lots

Properties no longer affected by over-floor flooding - 2

Properties no longer affected by garden flooding - 1

Properties with flood levels reduced by more than 15 cm - 20

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FILE: N:\Projects\499\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A2_11_JC_FM4_20yr_WlDiff.wor

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM4 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_11

Date
03/2017

Size
A3

JC_FM4_20yr_WlDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

JOHNSTON ST

ROSE ST

VIEW ST

TRAFALGAR ST

WILLIAM ST

THE CRESCENT

NELSON

Study Area Boundary

NORTH

- Existing Pipe Network
- Proposed Pipe/Culvert Options
- 100yr Flood Extent
- Cadastre - Lots

Properties no longer affected by over-floor flooding - 3

Properties no longer affected by garden flooding - 2

Properties with flood levels reduced by more than 15 cm - 28

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FILE: N:\Projects\499\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_10\11-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A2_12_JC_FM4_100yr_WIDiff.wor

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM4 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_12

Date
03/2017

Size
A3

JC_FM4_100yr_WIDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

BAYVIEW CRES
KENTVILLE AVE
ANNANDALE ST
JOHNSTON ST
ROSE ST
VIEW ST
TRAFALGAR ST
WILLIAM ST
NELSON ST
THE CRESCENT
PIPER ST
BOOTH ST
WELLS ST

NORTH

Existing Pipe Network
Proposed Pipe/Culvert Options
5yr Flood Extent
Cadastre - Lots

Properties no longer affected by over-floor flooding - 0

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 2

Study Area Boundary

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LEICHHARDT FRMS&P

JC_FM5 5YR ARI WL DIFF MITIGATION LESS EXISTING

JC_FM5_5yr_WlDiff
Drawing Number

FIG_A2_13

Date
03/2017

Size
A3

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

NORTH

BAYVIEW CRES
CRESCENT
KENTVILLE AVE
ANNANDALE ST
JOHNSTON ST
ROSE ST
VIEW ST
TRAFALGAR ST
WILLIAM ST
NELSON ST
THE CRESCENT
PIPER ST
BOOTH ST
WELLS ST

Existing Pipe Network
Proposed Pipe/Culvert Options
20yr Flood Extent
Cadastre - Lots

Study Area Boundary

Properties no longer affected by over-floor flooding - 0

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 5

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INNER WEST COUNCIL
LEICHHARDT FRMS&P

JC_FM5 20YR ARI WL DIFF MITIGATION LESS EXISTING

FIG_A2_14

Date
03/2017

Size
A3

JC_FM5_20yr_WlDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

NORTH

CRESCENT
BAYVIEW CRES
KENTVILLE AVE
ANNANDALE ST
JOHNSTON ST
ROSE ST
VIEW ST
TRAFALGAR ST
WILLIAM ST
THE CRESCENT
NELSON ST
PIPER ST
BOOTH ST
WELLS ST

Existing Pipe Network
Proposed Pipe/Culvert Options
100yr Flood Extent
Cadastre - Lots

Study Area Boundary

Properties no longer affected by over-floor flooding - 0

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 5

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INNER WEST COUNCIL
LEICHHARDT FRMS&P

JC_FM5 100YR ARI WL DIFF MITIGATION LESS EXISTING
FIG_A2_15

Date 03/2017

Size A3

JC_FM5_100yr_WlDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

NORTH

PIPER ST

TRAFALGAR ST

NELSON ST

TAYLOR ST

Study Area Boundary

- Existing Pipe Network
- Proposed Levee
- Proposed Pipe/Culvert Options
- 5yr Flood Extent
- Cadastre - Lots

Properties no longer affected by over-floor flooding - 0

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 0

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM6 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_16

Date
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Size
A3

JC_FM6_5yr_WlDiff
Drawing Number

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Revision

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LEICHHARDT FRMS&P
JC_FM6 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_17

Date
03/2017

Size
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JC_FM6_20yr_WIDiff
Drawing Number

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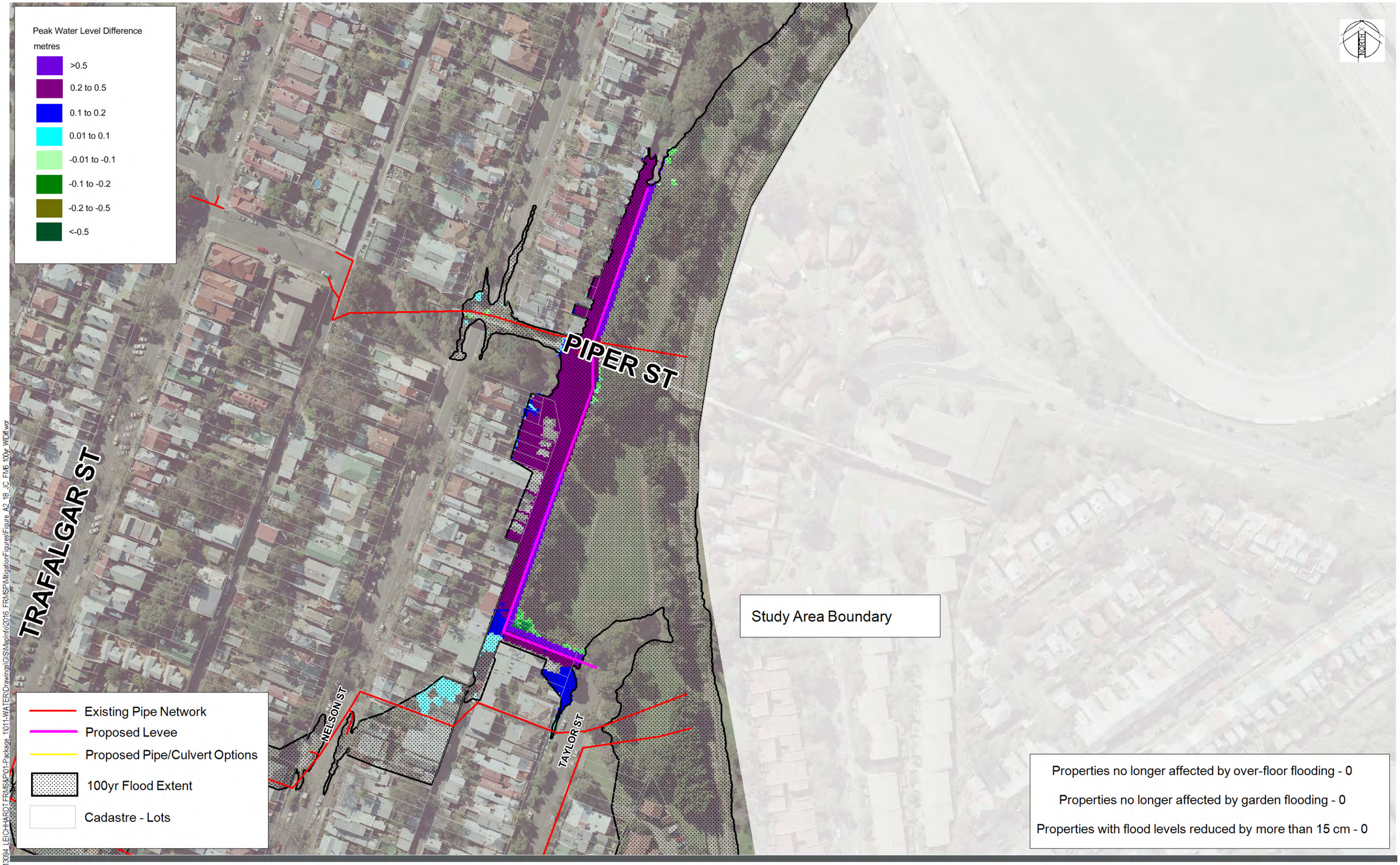
Revision



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INNER WEST COUNCIL
LEICHHARDT FRMS&P
JC_FM6 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A2_18

Date
03/2017

Size
A3

JC_FM6_100yr_WlDiff
Drawing Number

03
Revision

Area 3 - Whites Creek Options Assessment

Leichhardt Flood Risk Management Study and Plan

NA49913094

Prepared for
Inner West Council

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Shaping the Future

Table of Contents

Tables

Figures

1 Whites Creek Catchment Description

The Whites Creek catchment includes areas to the south of Parramatta Road (outside of the study area)., The catchment area within the study area includes portions of Leichhardt and Annandale. The southern portion of Whites Creek is a box culvert and Whites Creek Lane follows the majority of the length of this culvert. The culvert becomes an open channel between Booth Street and Piper Street, and eventually discharges into Rozelle Bay to the east of The Crescent.

Flooding in the area occurs along both the creek itself and a number of overland flow tributaries that connect with the creek. The major flowpath tends to follow Whites Creek Lane. Downstream of the culvert section of Whites Creek, the creek is bounded by parkland on both sides for the majority of the length. Flooding downstream of the culvert is primarily limited to the parkland, although a number of adjacent properties are affected. A number of properties are also impacted by overland flooding from tributaries to the main Whites Creek flowpath.

The options proposed for assessment in the report are located within the study area portion of the Whites Creek Catchment.

The location of the Whites Creek Catchment within the study area is shown in **Figure 1-1**.

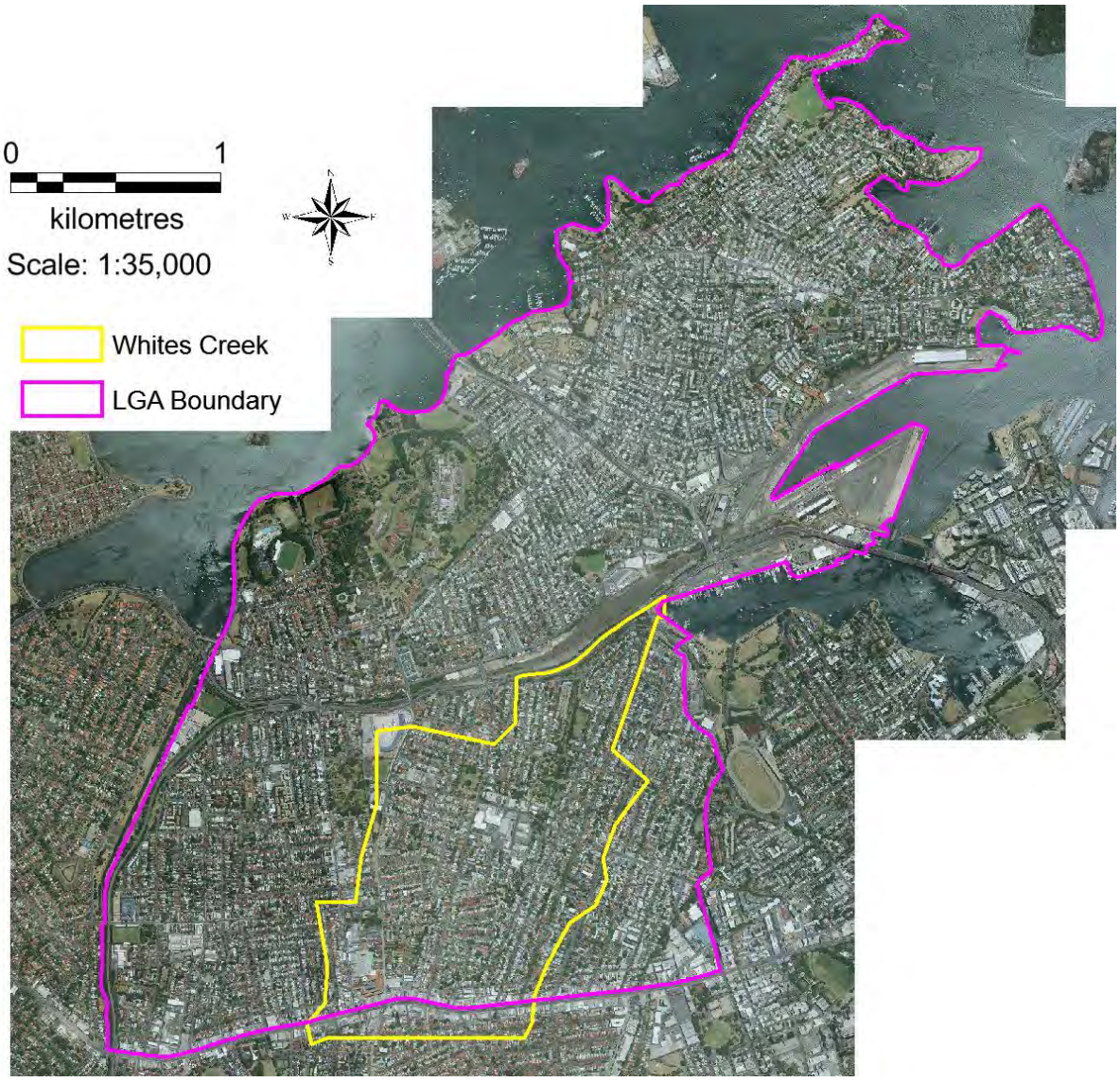

Figure 1-1 Whites Creek Catchment Location

2 Flood Mitigation Options Identification

2.1 Flood Modification Measures for Whites Creek

The existing flood behaviour within the Whites Creek Catchment is detailed in the Leichhardt Flood Study (Cardno 2014). Based on the flood model results, historical information and engineering judgement, possible flood modification measures (i.e. structural measures) for the study area were identified.

The various management options were identified taking into consideration the:

- flood behaviour and flow in the 20 year ARI event;
- grade of pipe (upstream and downstream); and
- preliminary availability and location of easements.

It should also be noted that Sydney Water and RMS may also play a major role in regards to fund allocation for the options recommended. Sydney Water's approach to flood-related improvement works on its assets is that Sydney Water will work with Councils to deliver the works (typically on a 50:50 cost-sharing basis) and provided Sydney Water has funding available within its Flood Risk Program.

Flood modification measures for the Whites Creek Catchment have been identified based on opportunities to connect with future upgrades and improvements.

2.2 Whites Creek Flood Mitigation Options

Within the Whites Creek catchment thirteen (13) sets of options were modelled. These are shown in **Table 2-1** and **Figure 2-1-1**. The 100yr, 20yr and 5yr ARI peak water level difference plots for each mitigation option are attached at the end of this appendix report.

Table 2-1 Whites Creek Mitigation Options

Option Description	Option Name	ID
Whites Creek Culvert – Proposing additional culvert or duplication of existing Whites Creek culvert from Parramatta Rd to the open channel downstream of Moore St (at Wisdom Street). Also combining WC-FM2 along with this option.	Whites Creek Culvert WC-FM1	WC-FM1
Young Street Flow Path – Proposing new pipe network from Young Street/Parramatta Road to Whites Creek culvert via Young St, Albion St, Ferris St and Clarke St. Additional pipe network from Young St to Albion Street.	Young Street Branch WC-FM2	WC-FM2
Balmain Road Flow Path – Additional pipe from the low point on Norton St to the existing pipe network (towards Parramatta Rd). Duplication of existing pipe network or extra pipes from Balmain Rd to Whites Creek Culvert at Hearn St.	Balmain Road Branch WC-FM3	WC-FM3
Hearn Street – Detention Basin or Large Inlet Pits at Hearn St to collect flood waters and convey into the proposed Whites Creek Culvert. Additional pipes from Albion St to Whites Creek culvert.	Hearn Street Proposed Basin WC-FM4	WC-FM4
Detention Basin at Mackenzie Street (upstream at the intersection of Mackenzie and Milton St)	Mackenzie Street Proposed Basin WC-FM5	WC-FM5
Styles Street Flow Path – Additional pipes from Mackenzie St to Whites Creek Culvert.	Styles Street Branch WC-FM6	WC-FM6

Option Description	Option Name	ID
Detention Basin at Evan Jones Park	Evan Jones Park Proposed Basin WC-FM7	WC-FM7
Annandale Street Flow Path – Duplication of existing pipe network or additional pipes from Annandale St to Whites Creek culvert.	Annandale Street Branch WC-FM8	WC-FM8
Detention Basin at Catherine Street (War Memorial Park)	Moore Street Proposed Basin WC-FM10	WC-FM10
Moore Street Flow Path – Additional Pipes from Catherine St to Whites Creek along Moore Lane.	Moore Street Branch WC-FM11	WC-FM11
Additional pipes at Brenan St and Railway PDE to reduce flooding on the roads.	Brenan Street Branch WC-FM12	WC-FM12
Whites Creek Culvert/Open Channel – Proposing additional culvert or duplication of existing Whites Creek culvert from Parramatta Rd to the open channel downstream of Moore St (WC-FM1). Widening of the open channel to convey additional flows. Upgrade Bridges at Piper Street and Brenan Street (WC-FM14)	Whites Creek Culvert WC-FM13	WC-FM13
Whites Creek Bridge Upgrades–Upgrade Bridges at Piper Street and Brenan Street.	Whites Creek Culvert WC-FM14	WC-FM14

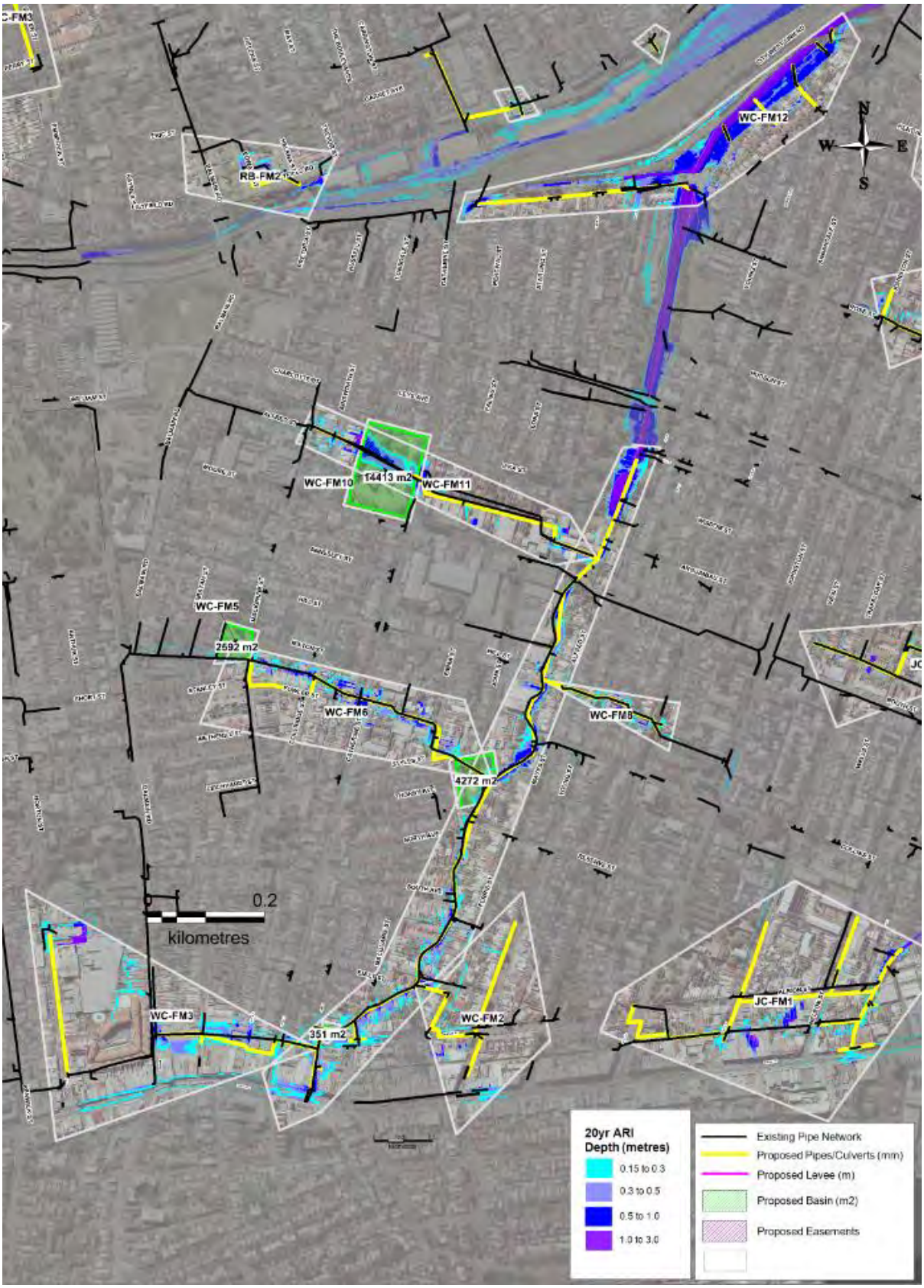

Figure 2-1 Whites Creek Mitigation Options Locations

2.2.1 Whites Creek Culvert WC-FM1

Whites Creek Culvert consists of various box culverts with a combined length of 1,395m that start from Parramatta Road, traveling along Whites Creek Lane and then coming to an end at Whites Creek Valley Park. The culvert has several pipes (1650mm diameter and 1200mm diameter) feeding into it upstream of the catchment. The box culvert sizes are 1.8m x 1.2m (100m), 2.1m x 1.8m (210m), 2.4m x 1.8m (400m), 2.7m x 2.1m (470m) and 3.1m x 2.1m (215m). This option (WC-FM1) proposes to duplicate these existing culverts.

A potential issue in regards to this option are road closures and traffic disruption during construction of the system and potential impacts to Whites Creek Valley Park, depending on the configuration of the adopted works.

Funding from Sydney Water (for the main trunk drainage) and RMS funding is potentially available for a majority of the cost. The RMS funding has been allocated towards the transverse pipe upgrades on Parramatta Road, Styles Street and Moore Street.

2.2.2 Young Street Branch WC-FM2

WC-FM2 consists of a pipe and a culvert. The culvert (1.5m x 0.9m) starts from Young Street/ Parramatta Road conveying runoff into Whites Creek culvert via Young Street, Albion Street, Ferris Street and Clarke Street. The 750mm diameter pipe network runs from Young St (north of Albion St) to the Young Street/Albion Street junction, then connects to the proposed culvert in Albion Street.

Potential constraints for this measure include road closures and traffic disruption during construction.

Funding from Sydney Water may be available for the works that include the Sydney Water main trunk drainage.

2.2.3 Balmain Road Branch WC-FM3

This option proposes additional pipes in two sections. One section is from the low point on Norton Street to the existing pipe network (towards Parramatta Road) with a 450mm diameter pipe (250m in length). The other section includes duplication of the existing pipe network or additional pipes from Balmain Road to Whites Creek Culvert at Hearn Street. Pipes in the second section comprise of 1650mm, 1350mm and 1200mm diameters.

Within the first section of proposed pipe there are existing flood depths in the 20 Year ARI up to 2m. Within the second section the 20 Year ARI flood depths reach approximately 0.7m.

Constraints for this measure include interaction with private property, road closures and traffic disruption during construction of the option.

2.2.4 Hearn Street Proposed Basin WC-FM4

This option proposes the use of either a detention basin and large inlet pits at Hearn Street to collect and convey flood waters into the proposed Whites Creek Culvert. Additional pipes from Albion Street to Whites Creek culvert have also been proposed. During the development of this option it was identified that there is insufficient space for a retarding basin in this location.

2.2.5 Mackenzie Street Proposed Basin WC-FM5

WC-FM5 is a detention basin that has been proposed to be located at the 36th Battalion Park (upstream from the intersection of Mackenzie and Milton St). The basin has an area of 2,592 square meters and is required to hold a volume of around 1,505 cubic meters. The aim of the basin is to mitigate flood inundation downstream of Mackenzie Street. Flood depths in this area under existing conditions reach around 0.6m in the 20 year ARI storm event.

Potential constraints for this measure includes vegetation removal in 36th Battalion Park and changes to recreational use of 36th Battalion Park, depending on the configuration of the basin and if underground storage is adopted.

2.2.6 Styles Street Branch WC-FM6

This option proposes additional pipes from Mackenzie Street to Whites Creek Culvert. The proposed pipes include a 1500mm diameter pipe from Mackenzie Street (the pipe crosses Coleridge and Catherine Streets) that then drains into a proposed 1650mm diameter pipe that travels from Catherine Street through to Styles Street, eventually draining into the Whites Creek Culvert. Additionally, there is a proposed 900mm diameter branch on Coleridge Street that drain onto the proposed 1500mm diameter branch.

The area currently experiences flood depths of around 1.4m in the 20 year ARI storm event.

Potential constraints for this measure includes interaction with private property and pipe crossings of roads with associated costs due to construction, services and traffic management requirements.

A majority of the cost could potentially be sourced from Sydney Water.

2.2.7 Evan Jones Park Proposed Basin WC-FM7

WC-FM7 is a proposed detention Basin at Evan Jones Park. Potential constraints for this measure include the slope and grades of flow paths and pipes connecting into and from the proposed basin. This is discussed in more detail in **Section 3.7**.

2.2.8 Annandale Street Branch WC-FM8

WC-FM8 consists of the duplication of the existing pipe network from Annandale Street (between Booth Street and Collins Street) to Whites Creek culvert. Two pipes, 900mm diameter each, start from Annandale Street and connect to a 1050mm diameter pipe that eventually connects to Whites Creek Culvert. The area experiences flood depths of around 1.3m due the 20 ARI storm event.

Potential constraints for this measure include the interaction with private property and constructing pipes along narrow easements.

2.2.9 Moore Street Proposed Basin WC-FM10

WC-FM10 proposes a detention basin located at the War Memorial Park which is in the block between Moore Street and Leys Avenue. The basin has an area of 14,400 square metres and conceptually holds a volume of around 2,400 cubic metres. It has been assumed that this basin would be an above ground retarding basin utilising the natural shape of the park.

The aim of the basin is to mitigate flood inundation around that specific block and on Ainsworth Street due to the 20 year ARI storm event. Depths in this area reach around 1.4m in this event.

Potential constraints for this measure includes vegetation removal in War Memorial Park and changes to recreational use of War Memorial Park, depending on the configuration of the basin.

Sydney Water may potentially fund part of the cost. However, it was assumed that all retarding basin maintenance costs will be Council's responsibility.

2.2.10 Moore Street Branch WC-FM11

The Moore Street branch option consists of two sections of proposed additional Pipes from the west end of Alfred Street to Whites Creek along Moore Lane. The second section of the option consists of a 1500mm diameter pipe, which eventually drains into the Whites Creek Culvert.

The major flooding is similar to that experienced by WC-FM10 with a depth of around 1.4m in the vicinity due to the 20 year ARI storm event.

It should be noted that Sydney Water will potentially fund some of the cost associated with this option.

2.2.11 Brenan Street Branch WC-FM12

Additional pipes are proposed in six areas/sections to combine to make up option WC-FM12. The longest section is along Brenan Street and the rest of the sections lie across Railway Parade. All sections have pipes with a 900mm diameter. The peak existing flood depth in the area due to the 20 year ARI storm event is 1.5m.

2.2.12 Whites Creek Culvert & Open Channel WC-FM13

The results of the WC-FM1 modelling indicate that there are likely to be significant flood benefits associated with duplicating the existing culverts and pipes along the Whites Creek main drainage line. However, this option also results in increases in flood levels downstream of the culvert.

This proposed mitigation option includes option WC-FM1 (duplicating of the existing culvert and Young Street works) and widening of the open channel (6m x 1m) from Wisdom Street to Rozelle Bay. The intent of this options is to accommodate the increases resulting from the culvert duplication within the improved open channel. This option also includes upgrading of Piper Street and Brenan Street Bridges (WC-FM14). Funding from Sydney Water (for the main trunk drainage) and RMS funding is potentially available for a majority of the cost.

2.2.13 Whites Creek Bridge Upgrades WC-FM14

This mitigation option includes duplicating of the openings under the existing Piper Street and Brenan Street Bridges.

3 Mitigation Option Modelling Outcomes

The Whites Creek flood mitigation options were assessed for the 5, 10, 20, 50 and 100 Year ARI design flood events, along with the PMF event.

The outcomes of the modelling are shown in the 5, 20, and 100 Year ARI water level difference plots attached at the end of this catchment report.

A summary of the impacts on flood behaviour for each option is provided below.

3.1 Whites Creek Culvert WC-FM1

The proposed mitigation option WC-FM1 shows a significant decrease in water level along the Whites Creek Lane. The water level difference shows a decrease in water levels up to 1.30m in the 100 Year ARI event. In general, the reductions in a 20 Year ARI are in the order of 0.10m to 0.70m. Notable reductions are seen in all the modelled design events along parts of Parramatta Road, Albion Street, Clarke Street and Styles Street. Results indicate that many properties would experience a decrease in water level in a 100 Year ARI due to this mitigation strategy.

However, due to the proposed works (duplicating of the existing culvert), flood level increases are expected to occur downstream of the culvert in an order of 0.01m to 0.25m.

3.2 Young Street Branch WC-FM2

Mitigation option WC-FM2 shows a decrease in water level of up to 0.20m in a 20Year ARI. The reductions of water levels are observed along parts of Young Street, Albion Street, Ferris Street, Clarke Street and downstream of Whites Creek Lane. These reductions in flood levels are primarily contained to roadways and do not result in a significant decrease in the number of properties with over floor flooding.

Slight increases in flood levels are observed in all events, in an order of 0.01m to 0.15m along the open channel. However, these increases are confined to the creek reserve. Results indicate properties along Young Street, Ferris Street and Albion Street would experience a decrease in water level in a 20 Year ARI due to this mitigation strategy.

3.3 Balmain Road Branch WC-FM3

Mitigation option WC-FM3 shows a decrease in water levels of up to 0.40m in a 20 Year ARI. The decreases in levels are observed along the Balmain Road Branch flowpath and along the Whites Creek Lane. The most significant reductions are seen at Balmain Road, Hay Street, Reymond Street, Catherine Street, Albion Street, Hearn Street, Macquarie Street and parts of Whites Creek Lane.

Due to the proposed drainage works slight increases in flood levels in an order of 0.01m to 0.03m are observed in a 100 Year ARI along Whites Creek Lane downstream of South Avenue. Isolated increases in water levels up to 0.15m are seen upstream and downstream of Moore Street bridge in a 100 Year ARI.

3.4 Hearn Street Proposed Basin WC-FM4

The option of proposing a large inlet structures and detention basin at Hearn Street was identified in the preliminary list of options. During the development of this option it was identified that there is insufficient space for a retarding basin in this location. Preliminary modelling only identified minor reductions in flood levels and it was concluded that due to the land space restrictions and lack of flood benefits that this option would not be pursued further.

3.5 Mackenzie Street Proposed Basin WC-FM5

Proposing a detention basin at Mackenzie Street results in reduction of water levels downstream of the basin along the flowpath in an order of 0.01m to 0.25m in a 100 Year ARI event. Notable reductions are seen in all the modelled design events on Mackenzie Street, Coleridge Street, Catherine Street and Styles Street. Results indicate properties downstream of the basin along the flowpath would experience a decrease in water levels up to 0.25m in the 100 Year ARI event due to the proposed basin at Mackenzie Street.

3.6 Styles Street Branch WC-FM6

The proposed drainage works WC-FM6 show significant reductions of water levels along the flow path. The reductions in flood levels are in an order of 0.01m to 0.60m in a 100 Year ARI. The maximum reductions are seen on Catherine Street up to 0.60m. Noticeable reductions are seen in all the modelled design events on Mackenzie Street, Coleridge Street, Catherine Street, Emma Street and parts of Styles Street.

Minor increases in flood levels are observed along parts of Whites Creek Lane in an order of 0.01m to 0.05m upstream and downstream of Styles Street. Isolated increases in water levels up to 0.10m are seen in Vicinity of Reserve Street in a 100 Year ARI.

3.7 Evan Jones Park Proposed Basin WC-FM7

This option of proposing a detention basin at Evan Jones Park was assessed, the results show minor reduction of flood levels downstream of the basin and along the Styles Street flowpath. The reductions are in an order of 0.01m to 0.05m.

It should be noted that although a theoretical allowance of detention storage has been assessed at this location, the technical feasibility of this option may inhibit it from being constructed. The street grades of the pipes entering the basin and shallow grades of the pipes connecting the basin to Whites Creek will likely limit its feasibility. As such, the hydraulic results have been provided for Council, if further consideration of works at this location become viable in the future. However, this option has not been included in the benefit cost analysis or multi-criteria analysis as it is not recommended for implementation based on technical merits.

3.8 Annandale Street Branch WC-FM8

The proposed additional pipe drainage along Annandale Street flow path WC-FM8 shows reduction in water levels along the flowpath in an order of 0.01m to 0.30m in a 100 Year ARI. The reduction in flood levels are seen on Annandale Street, Collins Lane, Young Street, Alfred Street and parts for Whites Creek Lane. Minor increases in flood levels up to 0.05m are seen downstream of Booth Street.

3.9 Moore Street Proposed Basin WC-FM10

The proposed basin at Moore Street WC-FM10 show reduction in flood levels downstream of the proposed basin up to 0.35m in a 100 Year ARI. Significant reductions in water levels are seen on Catherine Street, along Moore Lane and White Street. The regrading of the park also assists in reducing flood levels upstream of the basin. Decreases in levels up to 0.10m are observed on Ainsworth Street.

3.10 Moore Street Branch WC-FM11

Mitigation option WC-FM11 shows a decrease in water level of up to 0.40m in a 100 Year ARI event. The results show decreases in flood depths along the flowpath on Ainsworth Street up to 0.10m, Catherine Street up to 0.20m, along Moore Lane in an order of 0.01m to 0.25m and White Street up to 0.40m in a 100 Year ARI event. Minor increases in a range of 0.01m to 0.05m are observed downstream of Moore Street along Whites Creek Lane.

3.11 Brenan Street Branch WC-FM12

Proposed pipe drainage WC-FM12 shows a reduction of flood levels up to 0.18m on Brenan Street and 0.14m on Railway Parade in the 20 Year ARI event. No notable differences were identified in the 100 Year ARI event. However, the model results were unstable and the model was unable to be verifiably run for this

event, as such no flood impact figure is shown for the 100 Year ARI event and the damages are assumed to be unchanged from the existing conditions.

3.12 Whites Creek Culvert & Open Channel WC-FM13

Mitigation option WC-FM13 shows significant decreases in flood levels along the Whites Creek. The reduction of flood depths along the closed section of the culvert along Whites Creek Lane is up to 1.20m in a 100 Year ARI. The reduction along the open channel section is approx. 0.30m. Reductions in an order of 0.01m to 0.10m are also seen along the Young Street flowpath and Styles Street flowpath because of the additional conveyance downstream.

Notable reductions are seen along parts of Parramatta Road, Albion Street, Clarke Street, Styles Street, Brenan Street and Railway Parade. No increase in flood levels are observed as an outcome of this option.

3.13 Whites Creek Bridge Upgrades WC-FM14

Mitigation option WC-FM14 results show reduction in flood levels upstream of Brenan Street and Piper Street. The reductions are due to more conveyance through the proposed upgraded bridges. The reduction in water levels are in an order of 0.15m to 0.20m in a 20 Year ARI. The reduction of flood depths on Brenan Street are up to 0.07m. Slight increase up to 0.03m are seen downstream of Brenan Street in a 20 Year ARI because of increased flow downstream in Whites Creek.

4 Economic Assessment of Flood Damages in the Whites Creek Catchment

4.1 Whites Creek Mitigation Options Damages Assessment

An assessment of damages for the existing condition in the Whites Creek Catchment is presented in the Floodplain Risk Management Study. The approach adopted for calculating the existing damages has been repeated for the modelling results from the mitigation options proposed for the Whites Creek catchment.

The economic flood damage results for each of the options and the existing scenarios are presented in **Table 4-1** to **Table 4-13**. The reductions in properties affected by overground and overfloor flooding, total damages and AAD are provided. Negative values represent increases from the existing scenario.

The total reduction in damaged properties and the associated reduction in damage costs for each mitigation strategy is summarised in **Table 4-14** This table represents a summary of differences between existing and Mitigation scenarios presented in **Table 4-1** to **Table 4-13**.

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Table 4-1 WC_FM1 Flood Damage Assessment Summary

Event / Property type	Properties with Overfloor Flooding		Properties with Overground Flooding		Estimated Total Damage ($ June 2016)	
	Existing Case	*Mitigation Case*	*Existing Case*	*Mitigation Case*	*Existing Case*	*Mitigation Case*
PMF Event						
Residential	758	742	1332	1324	$ 46,298,929	$ 44,384,607
Commercial	157	155	193	193	$ 10,366,324	$ 10,231,242
Industrial	83	82	89	89	$ 10,580,722	$ 10,098,639
PMF Total	**998**	**979**	**1614**	**1606**	**$ 67,245,974**	**$ 64,714,488**
100yr ARI						
Residential	209	159	396	389	$ 11,288,568	$ 9,098,393
Commercial	46	45	65	64	$ 4,494,647	$ 4,293,657
Industrial	19	17	23	23	$ 1,432,247	$ 914,707
100yr ARI Total	**274**	**221**	**484**	**476**	**$ 17,215,462**	**$ 14,306,757**
50yr ARI						
Residential	171	140	379	373	$ 9,734,166	$ 8,123,884
Commercial	43	43	62	61	$ 4,241,808	$ 4,138,522
Industrial	18	16	22	22	$ 1,207,955	$ 763,732
50yr ARI Total	**232**	**199**	**463**	**456**	**$ 15,183,929**	**$ 13,026,138**
20yr ARI						
Residential	123	107	333	325	$ 7,489,429	$ 6,548,266
Commercial	35	33	55	55	$ 3,904,476	$ 3,805,459
Industrial	10	9	19	19	$ 865,386	$ 598,029
20yr ARI Total	**168**	**149**	**407**	**399**	**$ 12,259,290**	**$ 10,951,753**
10yr ARI						
Residential	94	86	286	280	$ 5,999,116	$ 5,405,309
Commercial	30	28	50	50	$ 3,623,175	$ 3,547,977
Industrial	9	8	15	15	$ 666,535	$ 502,459
10yr ARI Total	**133**	**122**	**351**	**345**	**$ 10,288,826**	**$ 9,455,744**
5yr ARI						
Residential	64	57	210	208	$ 4,488,210	$ 4,106,680
Commercial	29	27	47	47	$ 3,331,915	$ 3,249,711
Industrial	8	6	14	14	$ 510,281	$ 390,208
5yr ARI Total	**101**	**90**	**271**	**269**	**$ 8,330,406**	**$ 7,746,600**
Total Annual Average Damage					**$ 3,740,136**	**$ 3,423,694**

Table 4-2 WC_FM2 Flood Damage Assessment Summary

Event / Property type	Properties with Overfloor Flooding		Properties with Overground Flooding		Estimated Total Damage ($ June 2016)	
	Existing Case	*Mitigation Case*	*Existing Case*	*Mitigation Case*	*Existing Case*	*Mitigation Case*
PMF Event						
Residential	473	473	781	779	$ 28,560,012	$ 28,032,685
Commercial	43	43	55	55	$ 1,637,045	$ 1,619,822
Industrial	63	63	65	65	$ 7,583,825	$ 7,233,871
PMF Total	**579**	**579**	**901**	**899**	**$ 37,780,883**	**$ 36,886,378**
100yr ARI						
Residential	142	139	266	266	$ 8,017,928	$ 7,896,553
Commercial	20	20	25	25	$ 479,971	$ 507,578
Industrial	15	15	16	16	$ 1,333,275	$ 1,298,411
100yr ARI Total	**177**	**174**	**307**	**307**	**$ 9,831,175**	**$ 9,702,543**
50yr ARI						
Residential	115	107	255	254	$ 6,960,315	$ 6,698,338
Commercial	19	19	23	23	$ 447,918	$ 445,021
Industrial	14	14	15	15	$ 1,130,432	$ 1,117,404
50yr ARI Total	**148**	**140**	**293**	**292**	**$ 8,538,666**	**$ 8,260,763**
20yr ARI						
Residential	87	81	223	222	$ 5,568,600	$ 5,382,700
Commercial	15	15	20	20	$ 362,895	$ 362,016
Industrial	9	9	14	14	$ 853,463	$ 850,950
20yr ARI Total	**111**	**105**	**257**	**256**	**$ 6,784,959**	**$ 6,595,666**
10yr ARI						
Residential	72	69	189	188	$ 4,733,374	$ 4,604,973
Commercial	11	11	19	19	$ 268,908	$ 268,607
Industrial	8	8	11	11	$ 656,802	$ 652,115
10yr ARI Total	**91**	**88**	**219**	**218**	**$ 5,659,084**	**$ 5,525,695**
5yr ARI						
Residential	52	52	146	146	$ 3,641,341	$ 3,591,527
Commercial	11	11	18	18	$ 269,999	$ 270,111
Industrial	7	8	11	11	$ 502,629	$ 497,724
5yr ARI Total	**70**	**71**	**175**	**175**	**$ 4,413,969**	**$ 4,359,362**
Total Annual Average Damage					**$ 2,036,589**	**$ 1,996,775**

Table 4-3 WC_FM3 Flood Damage Assessment Summary

Event / Property type	Properties with Overfloor Flooding		Properties with Overground Flooding		Estimated Total Damage ($ June 2016)	
	Existing Case	*Mitigation Case*	*Existing Case*	*Mitigation Case*	*Existing Case*	*Mitigation Case*
PMF Event						
Residential	595	588	1073	1073	$ 35,465,015	$ 34,876,039
Commercial	144	140	178	178	$ 10,209,337	$ 9,810,909
Industrial	75	74	81	81	$ 9,053,927	$ 8,950,717
PMF Total	**814**	**802**	**1332**	**1332**	**$ 54,728,278**	**$ 53,637,664**
100yr ARI						
Residential	172	157	342	344	$ 9,364,092	$ 8,751,559
Commercial	46	36	64	64	$ 4,494,647	$ 3,841,745
Industrial	18	18	19	19	$ 1,414,603	$ 1,410,334
100yr ARI Total	**236**	**211**	**425**	**427**	**$ 15,273,342**	**$ 14,003,638**
50yr ARI						
Residential	137	128	327	327	$ 8,006,158	$ 7,541,842
Commercial	43	33	61	61	$ 4,241,808	$ 3,612,334
Industrial	17	17	18	18	$ 1,193,133	$ 1,242,882
50yr ARI Total	**197**	**178**	**406**	**406**	**$ 13,441,100**	**$ 12,397,059**
20yr ARI						
Residential	104	94	287	287	$ 6,359,028	$ 5,919,056
Commercial	35	28	54	54	$ 3,904,476	$ 2,167,206
Industrial	9	10	16	16	$ 853,463	$ 908,404
20yr ARI Total	**148**	**132**	**357**	**357**	**$ 11,116,967**	**$ 8,994,665**
10yr ARI						
Residential	85	76	244	241	$ 5,284,652	$ 4,767,447
Commercial	30	25	50	50	$ 3,623,175	$ 1,399,564
Industrial	8	9	12	12	$ 656,802	$ 700,483
10yr ARI Total	**123**	**110**	**306**	**303**	**$ 9,564,628**	**$ 6,867,495**
5yr ARI						
Residential	59	55	187	184	$ 4,000,804	$ 3,654,949
Commercial	29	22	47	47	$ 3,331,915	$ 1,153,130
Industrial	7	9	11	11	$ 502,629	$ 544,507
5yr ARI Total	**95**	**86**	**245**	**242**	**$ 7,835,348**	**$ 5,352,585**
Total Annual Average Damage					**$ 3,424,257**	**$ 2,601,498**

Table 4-4 WC_FM4 Flood Damage Assessment Summary

Event / Property type	Properties with Overfloor Flooding		Properties with Overground Flooding		Estimated Total Damage ($ June 2016)	
	Existing Case	*Mitigation Case*	*Existing Case*	*Mitigation Case*	*Existing Case*	*Mitigation Case*
PMF Event						
Residential	270	270	450	449	$ 15,403,960	$ 15,176,396
Commercial	132	128	161	161	$ 9,877,658	$ 9,788,653
Industrial	0	0	0	0	$ -	$ -
PMF Total	**402**	**398**	**611**	**610**	**$ 25,281,618**	**$ 24,965,049**
100yr ARI						
Residential	76	44	163	162	$ 3,737,977	$ 2,467,169
Commercial	46	41	63	63	$ 4,494,647	$ 4,294,602
Industrial	0	0	0	0	$ -	$ -
100yr ARI Total	**122**	**85**	**226**	**225**	**$ 8,232,624**	**$ 6,761,770**
50yr ARI						
Residential	58	59	160	160	$ 3,140,633	$ 3,098,792
Commercial	43	43	60	61	$ 4,241,808	$ 4,252,541
Industrial	0	0	0	0	$ -	$ -
50yr ARI Total	**101**	**102**	**220**	**221**	**$ 7,382,442**	**$ 7,351,333**
20yr ARI						
Residential	43	43	143	143	$ 2,326,527	$ 2,317,737
Commercial	35	35	53	53	$ 3,904,476	$ 3,902,580
Industrial	0	0	0	0	$ -	$ -
20yr ARI Total	**78**	**78**	**196**	**196**	**$ 6,231,002**	**$ 6,220,316**
10yr ARI						
Residential	33	33	128	127	$ 1,866,810	$ 1,786,925
Commercial	30	31	50	50	$ 3,623,175	$ 3,635,536
Industrial	0	0	0	0	$ -	$ -
10yr ARI Total	**63**	**64**	**178**	**177**	**$ 5,489,985**	**$ 5,422,461**
5yr ARI						
Residential	24	24	100	100	$ 1,322,908	$ 1,260,293
Commercial	29	27	47	47	$ 3,331,915	$ 3,295,607
Industrial	0	0	0	0	$ -	$ -
5yr ARI Total	**53**	**51**	**147**	**147**	**$ 4,654,823**	**$ 4,555,900**
Total Annual Average Damage					**$ 1,948,320**	**$ 1,906,131**

Table 4-5 WC_FM5 Flood Damage Assessment Summary

Event / Property type	Properties with Overfloor Flooding		Properties with Overground Flooding		Estimated Total Damage ($ June 2016)	
	Existing Case	*Mitigation Case*	*Existing Case*	*Mitigation Case*	*Existing Case*	*Mitigation Case*
PMF Event						
Residential	114	97	222	219	$ 6,877,748	$ 5,881,107
Commercial	1	1	2	2	$ 82,822	$ 80,761
Industrial	0	0	0	0	$ -	$ -
PMF Total	**115**	**98**	**224**	**221**	**$ 6,960,571**	**$ 5,961,869**
100yr ARI						
Residential	45	24	72	66	$ 2,814,421	$ 1,942,722
Commercial	0	0	1	1	$ -	$ -
Industrial	0	0	0	0	$ -	$ -
100yr ARI Total	**45**	**24**	**73**	**67**	**$ 2,814,421**	**$ 1,942,722**
50yr ARI						
Residential	37	19	69	61	$ 2,486,852	$ 1,586,994
Commercial	0	0	1	1	$ -	$ -
Industrial	0	0	0	0	$ -	$ -
50yr ARI Total	**37**	**19**	**70**	**62**	**$ 2,486,852**	**$ 1,586,994**
20yr ARI						
Residential	27	19	60	57	$ 2,063,269	$ 1,674,762
Commercial	0	0	1	1	$ -	$ -
Industrial	0	0	0	0	$ -	$ -
20yr ARI Total	**27**	**19**	**61**	**58**	**$ 2,063,269**	**$ 1,674,762**
10yr ARI						
Residential	24	19	55	54	$ 1,801,852	$ 1,579,099
Commercial	0	0	0	0	$ -	$ -
Industrial	0	0	0	0	$ -	$ -
10yr ARI Total	**24**	**19**	**55**	**54**	**$ 1,801,852**	**$ 1,579,099**
5yr ARI						
Residential	17	9	46	42	$ 1,540,111	$ 1,188,537
Commercial	0	0	0	0	$ -	$ -
Industrial	0	0	0	0	$ -	$ -
5yr ARI Total	**17**	**9**	**46**	**42**	**$ 1,540,111**	**$ 1,188,537**
Total Annual Average Damage					**$ 638,371**	**$ 504,103**

Table 4-6 WC_FM6 Flood Damage Assessment Summary

Event / Property type	Properties with Overfloor Flooding		Properties with Overground Flooding		Estimated Total Damage ($ June 2016)	
	Existing Case	*Mitigation Case*	*Existing Case*	*Mitigation Case*	*Existing Case*	*Mitigation Case*
PMF Event						
Residential	206	193	357	353	$ 12,359,434	$ 11,252,476
Commercial	1	1	2	2	$ 82,822	$ 83,346
Industrial	20	20	21	21	$ 2,196,132	$ 2,074,153
PMF Total	**227**	**214**	**380**	**376**	**$ 14,638,389**	**$ 13,409,975**
100yr ARI						
Residential	67	35	109	97	$ 3,685,523	$ 2,281,641
Commercial	0	0	1	1	$ -	$ -
Industrial	5	5	5	5	$ 731,197	$ 713,504
100yr ARI Total	**72**	**40**	**115**	**103**	**$ 4,416,720**	**$ 2,995,145**
50yr ARI						
Residential	52	25	103	92	$ 3,057,293	$ 1,917,899
Commercial	0	0	1	1	$ -	$ -
Industrial	5	5	5	5	$ 617,342	$ 587,326
50yr ARI Total	**57**	**30**	**109**	**98**	**$ 3,674,635**	**$ 2,505,224**
20yr ARI						
Residential	33	17	90	83	$ 2,362,296	$ 1,563,075
Commercial	0	0	1	1	$ -	$ -
Industrial	3	3	4	4	$ 406,674	$ 395,256
20yr ARI Total	**36**	**20**	**95**	**88**	**$ 2,768,970**	**$ 1,958,331**
10yr ARI						
Residential	26	10	81	76	$ 1,944,399	$ 1,378,005
Commercial	0	0	0	0	$ -	$ -
Industrial	2	3	3	3	$ 305,484	$ 306,279
10yr ARI Total	**28**	**13**	**84**	**79**	**$ 2,249,883**	**$ 1,684,284**
5yr ARI						
Residential	19	10	63	59	$ 1,638,707	$ 1,260,337
Commercial	0	0	0	0	$ -	$ -
Industrial	2	2	4	4	$ 247,083	$ 243,647
5yr ARI Total	**21**	**12**	**67**	**63**	**$ 1,885,790**	**$ 1,503,983**
Total Annual Average Damage					**$ 847,500**	**$ 652,549**

Table 4-7 WC_FM7 Flood Damage Assessment Summary

Event / Property type	Properties with Overfloor Flooding		Properties with Overground Flooding		Estimated Total Damage ($ June 2016)	
	Existing Case	*Mitigation Case*	*Existing Case*	*Mitigation Case*	*Existing Case*	*Mitigation Case*
PMF Event						
Residential	97	82	130	129	$ 5,504,663	$ 4,379,051
Commercial	0	0	0	0	$ -	$ -
Industrial	30	27	31	31	$ 2,928,380	$ 2,188,136
PMF Total	**127**	**109**	**161**	**160**	**$ 8,433,043**	**$ 6,567,188**
100yr ARI						
Residential	20	17	41	41	$ 780,336	$ 737,628
Commercial	0	0	0	0	$ -	$ -
Industrial	6	6	6	6	$ 746,560	$ 739,197
100yr ARI Total	**26**	**23**	**47**	**47**	**$ 1,526,895**	**$ 1,476,825**
50yr ARI						
Residential	13	13	35	35	$ 480,325	$ 516,218
Commercial	0	0	0	0	$ -	$ -
Industrial	6	6	6	6	$ 630,621	$ 617,975
50yr ARI Total	**19**	**19**	**41**	**41**	**$ 1,110,946**	**$ 1,134,193**
20yr ARI						
Residential	5	5	30	30	$ 254,769	$ 260,464
Commercial	0	0	0	0	$ -	$ -
Industrial	4	4	5	5	$ 417,537	$ 404,873
20yr ARI Total	**9**	**9**	**35**	**35**	**$ 672,306**	**$ 665,337**
10yr ARI						
Residential	2	2	21	21	$ 100,683	$ 97,465
Commercial	0	0	0	0	$ -	$ -
Industrial	3	3	4	4	$ 311,637	$ 302,085
10yr ARI Total	**5**	**5**	**25**	**25**	**$ 412,320**	**$ 399,550**
5yr ARI						
Residential	2	2	13	13	$ 77,427	$ 70,541
Commercial	0	0	0	0	$ -	$ -
Industrial	3	2	5	5	$ 249,677	$ 189,174
5yr ARI Total	**5**	**4**	**18**	**18**	**$ 327,105**	**$ 259,715**
Total Annual Average Damage					**$ 202,885**	**$ 178,807**

Table 4-8 WC_FM8 Flood Damage Assessment Summary

Event / Property type	Properties with Overfloor Flooding		Properties with Overground Flooding		Estimated Total Damage ($ June 2016)	
	Existing Case	*Mitigation Case*	*Existing Case*	*Mitigation Case*	*Existing Case*	*Mitigation Case*
PMF Event						
Residential	105	102	156	155	$ 6,774,335	$ 6,544,519
Commercial	1	1	1	1	$ 38,276	$ 36,190
Industrial	37	37	38	38	$ 3,933,298	$ 3,710,476
PMF Total	**143**	**140**	**195**	**194**	**$ 10,745,910**	**$ 10,291,185**
100yr ARI						
Residential	35	30	58	56	$ 1,996,739	$ 1,784,282
Commercial	0	0	0	0	$ -	$ -
Industrial	11	11	11	11	$ 1,294,779	$ 1,240,750
100yr ARI Total	**46**	**41**	**69**	**67**	**$ 3,291,518**	**$ 3,025,033**
50yr ARI						
Residential	30	29	53	52	$ 1,741,156	$ 1,614,894
Commercial	0	0	0	0	$ -	$ -
Industrial	11	11	11	11	$ 1,095,928	$ 1,108,127
50yr ARI Total	**41**	**40**	**64**	**63**	**$ 2,837,085**	**$ 2,723,021**
20yr ARI						
Residential	25	22	48	47	$ 1,446,881	$ 1,308,518
Commercial	0	0	0	0	$ -	$ -
Industrial	8	8	10	10	$ 824,133	$ 825,029
20yr ARI Total	**33**	**30**	**58**	**57**	**$ 2,271,015**	**$ 2,133,547**
10yr ARI						
Residential	21	17	40	38	$ 1,254,514	$ 1,117,084
Commercial	0	0	0	0	$ -	$ -
Industrial	7	7	9	9	$ 630,045	$ 633,474
10yr ARI Total	**28**	**24**	**49**	**47**	**$ 1,884,559**	**$ 1,750,558**
5yr ARI						
Residential	12	10	24	23	$ 838,178	$ 747,506
Commercial	0	0	0	0	$ -	$ -
Industrial	6	7	10	10	$ 477,571	$ 478,087
5yr ARI Total	**18**	**17**	**34**	**33**	**$ 1,315,749**	**$ 1,225,593**
Total Annual Average Damage					**$ 638,712**	**$ 597,912**

Table 4-9 WC_FM10 Flood Damage Assessment Summary

Event / Property type	Properties with Overfloor Flooding		Properties with Overground Flooding		Estimated Total Damage ($ June 2016)	
	Existing Case	*Mitigation Case*	*Existing Case*	*Mitigation Case*	*Existing Case*	*Mitigation Case*
PMF Event						
Residential	51	39	90	89	$ 2,921,353	$ 2,296,102
Commercial	0	0	0	0	$ -	$ -
Industrial	27	22	28	28	$ 2,229,886	$ 1,928,293
PMF Total	**78**	**61**	**118**	**117**	**$ 5,151,239**	**$ 4,224,395**
100yr ARI						
Residential	8	6	35	34	$ 468,429	$ 323,175
Commercial	0	0	0	0	$ -	$ -
Industrial	9	3	10	10	$ 188,626	$ 86,915
100yr ARI Total	**17**	**9**	**45**	**44**	**$ 657,055**	**$ 410,089**
50yr ARI						
Residential	6	6	32	31	$ 386,234	$ 288,509
Commercial	0	0	0	0	$ -	$ -
Industrial	8	3	9	9	$ 147,917	$ 82,349
50yr ARI Total	**14**	**9**	**41**	**40**	**$ 534,151**	**$ 370,858**
20yr ARI						
Residential	6	6	25	25	$ 341,113	$ 277,359
Commercial	0	0	0	0	$ -	$ -
Industrial	2	2	8	8	$ 58,225	$ 42,617
20yr ARI Total	**8**	**8**	**33**	**33**	**$ 399,338**	**$ 319,976**
10yr ARI						
Residential	5	4	12	12	$ 254,581	$ 191,118
Commercial	0	0	0	0	$ -	$ -
Industrial	2	2	5	5	$ 43,128	$ 37,640
10yr ARI Total	**7**	**6**	**17**	**17**	**$ 297,709**	**$ 228,758**
5yr ARI						
Residential	4	3	10	10	$ 204,153	$ 127,816
Commercial	0	0	0	0	$ -	$ -
Industrial	2	1	3	3	$ 25,058	$ 24,102
5yr ARI Total	**6**	**4**	**13**	**13**	**$ 229,211**	**$ 151,918**
Total Annual Average Damage					**$ 127,151**	**$ 92,977**

Table 4-10 WC_FM11 Flood Damage Assessment Summary

Event / Property type	Properties with Overfloor Flooding		Properties with Overground Flooding		Estimated Total Damage ($ June 2016)	
	Existing Case	*Mitigation Case*	*Existing Case*	*Mitigation Case*	*Existing Case*	*Mitigation Case*
PMF Event						
Residential	66	64	132	132	$ 4,430,637	$ 4,221,984
Commercial	1	1	1	1	$ 38,276	$ 35,241
Industrial	30	28	31	31	$ 2,851,231	$ 2,706,696
PMF Total	**97**	**93**	**164**	**164**	**$ 7,320,144**	**$ 6,963,921**
100yr ARI						
Residential	15	13	43	43	$ 1,260,966	$ 1,114,960
Commercial	0	0	0	0	$ -	$ -
Industrial	12	5	13	13	$ 668,043	$ 422,590
100yr ARI Total	**27**	**18**	**56**	**56**	**$ 1,929,009**	**$ 1,537,550**
50yr ARI						
Residential	13	13	40	39	$ 1,158,300	$ 1,066,223
Commercial	0	0	0	0	$ -	$ -
Industrial	11	5	12	12	$ 562,512	$ 408,585
50yr ARI Total	**24**	**18**	**52**	**51**	**$ 1,720,812**	**$ 1,474,807**
20yr ARI						
Residential	13	13	32	32	$ 1,081,999	$ 1,034,145
Commercial	0	0	0	0	$ -	$ -
Industrial	5	3	11	11	$ 435,927	$ 270,197
20yr ARI Total	**18**	**16**	**43**	**43**	**$ 1,517,926**	**$ 1,304,342**
10yr ARI						
Residential	12	12	19	19	$ 929,650	$ 943,369
Commercial	0	0	0	0	$ -	$ -
Industrial	5	3	8	8	$ 345,165	$ 217,858
10yr ARI Total	**17**	**15**	**27**	**27**	**$ 1,274,815**	**$ 1,161,227**
5yr ARI						
Residential	10	10	17	17	$ 837,592	$ 839,900
Commercial	0	0	0	0	$ -	$ -
Industrial	4	3	6	5	$ 252,952	$ 220,527
5yr ARI Total	**14**	**13**	**23**	**22**	**$ 1,090,543**	**$ 1,060,427**
Total Annual Average Damage					**$ 464,739**	**$ 431,038**

Table 4-11 WC_FM12 Flood Damage Assessment Summary

Event / Property type	Properties with Overfloor Flooding		Properties with Overground Flooding		Estimated Total Damage ($ June 2016)	
	Existing Case	*Mitigation Case*	*Existing Case*	*Mitigation Case*	*Existing Case*	*Mitigation Case*
PMF Event						
Residential	27	27	28	28	$ 1,946,798	$ 1,946,798
Commercial	0	0	0	0	$ -	$ -
Industrial	0	0	0	0	$ -	$ -
PMF Total	**27**	**27**	**28**	**28**	**$ 1,946,798**	**$ 1,946,798**
100yr ARI						
Residential	19	19	25	25	$ 818,980	$ 818,980
Commercial	0	0	0	0	$ -	$ -
Industrial	0	0	0	0	$ -	$ -
100yr ARI Total	**19**	**19**	**25**	**25**	**$ 818,980**	**$ 818,980**
50yr ARI						
Residential	16	8	24	24	$ 677,012	$ 335,386
Commercial	0	0	0	0	$ -	$ -
Industrial	0	0	0	0	$ -	$ -
50yr ARI Total	**16**	**8**	**24**	**24**	**$ 677,012**	**$ 335,386**
20yr ARI						
Residential	6	-4	22	22	$ 268,486	-$ 99,577
Commercial	0	0	0	0	$ -	$ -
Industrial	0	0	0	0	$ -	$ -
20yr ARI Total	**6**	**-4**	**22**	**22**	**$ 268,486**	**-$ 99,577**
10yr ARI						
Residential	0	0	20	20	$ 35,938	-$ 11,941
Commercial	0	0	0	0	$ -	$ -
Industrial	0	0	0	0	$ -	$ -
10yr ARI Total	**0**	**0**	**20**	**20**	**$ 35,938**	**-$ 11,941**
5yr ARI						
Residential	0	0	11	11	$ 5,999	$ -
Commercial	0	0	0	0	$ -	$ -
Industrial	0	0	0	0	$ -	$ -
5yr ARI Total	**0**	**0**	**11**	**11**	**$ 5,999**	$ -
Total Annual Average Damage					**$ 46,097**	**$ 19,751**

Table 4-12 WC_FM13 Flood Damage Assessment Summary

Event / Property type	Properties with Overfloor Flooding		Properties with Overground Flooding		Estimated Total Damage ($ June 2016)	
	Existing Case	*Mitigation Case*	*Existing Case*	*Mitigation Case*	*Existing Case*	*Mitigation Case*
PMF Event						
Residential	595	558	997	986	$ 35,598,770	$ 31,641,961
Commercial	135	134	165	165	$ 10,011,863	$ 9,944,936
Industrial	75	71	81	81	$ 9,053,927	$ 7,797,374
PMF Total	**805**	**763**	**1243**	**1232**	**$ 54,664,560**	**$ 49,384,271**
100yr ARI						
Residential	185	101	364	352	$ 9,884,855	$ 6,314,795
Commercial	46	45	64	63	$ 4,494,647	$ 4,376,377
Industrial	18	16	19	19	$ 1,414,603	$ 856,841
100yr ARI Total	**249**	**162**	**447**	**434**	**$ 15,794,106**	**$ 11,548,013**
50yr ARI						
Residential	147	86	346	340	$ 8,364,273	$ 5,375,188
Commercial	43	43	61	60	$ 4,241,808	$ 4,134,528
Industrial	17	15	18	18	$ 1,193,133	$ 750,816
50yr ARI Total	**207**	**144**	**425**	**418**	**$ 13,799,214**	**$ 10,260,532**
20yr ARI						
Residential	99	62	302	293	$ 6,247,307	$ 4,371,725
Commercial	35	33	54	54	$ 3,904,476	$ 3,812,438
Industrial	9	8	16	16	$ 853,463	$ 579,698
20yr ARI Total	**143**	**103**	**372**	**363**	**$ 11,005,246**	**$ 8,763,861**
10yr ARI						
Residential	74	59	256	250	$ 4,881,454	$ 3,940,039
Commercial	30	28	50	50	$ 3,623,175	$ 3,547,496
Industrial	8	7	12	12	$ 656,802	$ 453,736
10yr ARI Total	**112**	**94**	**318**	**312**	**$ 9,161,431**	**$ 7,941,271**
5yr ARI						
Residential	53	43	194	192	$ 3,801,472	$ 3,260,299
Commercial	29	27	47	47	$ 3,331,915	$ 3,250,218
Industrial	7	5	11	11	$ 502,629	$ 361,845
5yr ARI Total	**89**	**75**	**252**	**250**	**$ 7,636,016**	**$ 6,872,363**
Total Annual Average Damage					**$ 3,361,733**	**$ 2,888,204**

Table 4-13 WC_FM14 Flood Damage Assessment Summary

Event / Property type	Properties with Overfloor Flooding		Properties with Overground Flooding		Estimated Total Damage ($ June 2016)	
	Existing Case	*Mitigation Case*	*Existing Case*	*Mitigation Case*	*Existing Case*	*Mitigation Case*
PMF Event						
Residential	64	62	96	92	$ 4,431,593	$ 4,222,109
Commercial	2	2	2	2	$ 51,383	$ 48,738
Industrial	0	0	0	0	$ -	$ -
PMF Total	**66**	**64**	**98**	**94**	**$ 4,482,976**	**$ 4,270,848**
100yr ARI						
Residential	35	33	49	47	$ 1,669,281	$ 1,552,234
Commercial	0	0	0	0	$ -	$ -
Industrial	0	0	0	0	$ -	$ -
100yr ARI Total	**35**	**33**	**49**	**47**	**$ 1,669,281**	**$ 1,552,234**
50yr ARI						
Residential	32	27	47	47	$ 1,474,196	$ 1,220,057
Commercial	0	0	0	0	$ -	$ -
Industrial	0	0	0	0	$ -	$ -
50yr ARI Total	**32**	**27**	**47**	**47**	**$ 1,474,196**	**$ 1,220,057**
20yr ARI						
Residential	16	12	43	41	$ 858,709	$ 726,592
Commercial	0	0	0	0	$ -	$ -
Industrial	0	0	0	0	$ -	$ -
20yr ARI Total	**16**	**12**	**43**	**41**	**$ 858,709**	**$ 726,592**
10yr ARI						
Residential	7	7	39	39	$ 475,851	$ 464,366
Commercial	0	0	0	0	$ -	$ -
Industrial	0	0	0	0	$ -	$ -
10yr ARI Total	**7**	**7**	**39**	**39**	**$ 475,851**	**$ 464,366**
5yr ARI						
Residential	4	4	21	21	$ 286,855	$ 276,989
Commercial	0	0	0	0	$ -	$ -
Industrial	0	0	0	0	$ -	$ -
5yr ARI Total	**4**	**4**	**21**	**21**	**$ 286,855**	**$ 276,989**
Total Annual Average Damage					**$ 195,997**	**$ 180,564**

Table 4-14 Reduction in Damages Associated with Each Option

	Overfloor flooding properties reduction	Overground flooding properties reduction	Total Damage Reduction ($)	AAD Reduction ($)
WC-FM1				
PMF event	19	8	$ 2,531,486	$27,198
100yr ARI event	53	8	$ 2,908,705	$25,332
50yr ARI event	33	7	$ 2,157,791	$51,980
20yr ARI event	19	8	$ 1,307,537	$53,515
10yr ARI event	11	6	$ 833,081	$70,844
5yr ARI event	11	2	$ 583,806	$87,571
Total				**$316,441**
WC-FM2				
PMF event	0	2	$ 894,505	$5,115
100yr ARI event	3	0	$ 128,632	$2,033
50yr ARI event	8	1	$ 277,903	$7,008
20yr ARI event	6	1	$ 189,293	$8,067
10yr ARI event	3	1	$ 133,388	$9,400
5yr ARI event	-1	0	$ 54,607	$8,191
Total				**$39,814**
WC-FM3				
PMF event	12	0	$ 1,090,614	$11,800
100yr ARI event	25	-2	$ 1,269,704	$11,569
50yr ARI event	19	0	$ 1,044,041	$47,495
20yr ARI event	16	0	$ 2,122,301	$120,486
10yr ARI event	13	3	$ 2,697,134	$258,995
5yr ARI event	9	3	$ 2,482,762	$372,414
Total				**$822,759**
WC-FM4				
PMF event	4	1	$ 316,569	$8,936
100yr ARI event	37	1	$ 1,470,854	$7,510
50yr ARI event	-1	-1	$ 31,109	$627
20yr ARI event	0	0	$ 10,686	$1,955
10yr ARI event	-1	1	$ 67,524	$8,322
5yr ARI event	2	0	$ 98,923	$14,838
Total				**$42,189**
WC-FM5				
PMF event	17	3	$ 998,702	$9,351
100yr ARI event	21	6	$ 871,699	$8,858
50yr ARI event	18	8	$ 899,858	$19,325
20yr ARI event	8	3	$ 388,507	$15,281
10yr ARI event	5	1	$ 222,753	$28,716
5yr ARI event	8	4	$ 351,574	$52,736
Total				**$134,268**
WC-FM6				
PMF event	13	4	$ 1,228,414	$13,249
100yr ARI event	32	0	$ 1,421,575	$12,955
50yr ARI event	27	11	$ 1,169,411	$29,701

	Overfloor flooding properties reduction	Overground flooding properties reduction	Total Damage Reduction ($)	AAD Reduction ($)
20yr ARI event	16	7	$ 810,639	$34,406
10yr ARI event	15	5	$ 565,599	$47,370
5yr ARI event	9	4	$ 381,806	$57,271
Total				**$194,951**
		WC-FM7		
PMF event	18	1	$ 1,865,856	$9,579
100yr ARI event	3	0	$ 50,070	$134
50yr ARI event	0	0	-$ 23,247	-$244
20yr ARI event	0	0	$ 6,969	$493
10yr ARI event	0	0	$ 12,769	$4,008
5yr ARI event	1	0	$ 67,389	$10,108
Total				**$24,078**
		WC-FM8		
PMF event	3	1	$ 454,725	$3,606
100yr ARI event	5	0	$ 266,486	$1,903
50yr ARI event	1	1	$ 114,064	$3,773
20yr ARI event	3	1	$ 137,468	$6,787
10yr ARI event	4	2	$ 134,001	$11,208
5yr ARI event	1	1	$ 90,156	$13,523
Total				**$40,799**
		WC-FM10		
PMF event	17	1	$ 926,845	$5,868
100yr ARI event	8	0	$ 246,966	$2,051
50yr ARI event	5	1	$ 163,293	$3,640
20yr ARI event	0	0	$ 79,362	$3,708
10yr ARI event	1	0	$ 68,951	$7,312
5yr ARI event	2	0	$ 77,293	$11,594
Total				**$34,174**
		WC-FM11		
PMF event	4	0	$ 356,223	$3,738
100yr ARI event	9	0	$ 391,459	$3,187
50yr ARI event	6	1	$ 246,005	$6,894
20yr ARI event	2	0	$ 213,584	$8,179
10yr ARI event	2	0	$ 113,588	$7,185
5yr ARI event	1	1	$ 30,117	$4,518
Total				**$33,701**
		WC-FM12		
PMF event	0	0	$ -	$0
100yr ARI event	0	0	$ -	$1,708
50yr ARI event	8	0	$ 341,625	$10,645

	Overfloor flooding properties reduction	Overground flooding properties reduction	Total Damage Reduction ($)	AAD Reduction ($)
20yr ARI event	10	0	$ 368,064	$10,399
10yr ARI event	0	0	$ 47,879	$2,694
5yr ARI event	0	0	$ 5,999	$900
Total				**$26,346**
		WC-FM13		
PMF event	42	11	$ 5,280,289	$47,627
100yr ARI event	87	0	$ 4,246,093	$38,924
50yr ARI event	63	7	$ 3,538,682	$86,701
20yr ARI event	40	9	$ 2,241,385	$86,539
10yr ARI event	18	6	$ 1,220,160	$99,191
5yr ARI event	14	2	$ 763,652	$114,548
Total				**$473,529**
		WC-FM14		
PMF event	2	4	$ 212,128	$1,646
100yr ARI event	2	0	$ 117,047	$1,856
50yr ARI event	5	0	$ 254,139	$5,794
20yr ARI event	4	2	$ 132,116	$3,590
10yr ARI event	0	0	$ 11,485	$1,068
5yr ARI event	0	0	$ 9,866	$1,480
Total				**$15,433**

4.2 Benefit to Cost Ratio of Options

The economic evaluation of each modelled measure was assessed by considering the reduction in the amount of flood damages incurred for the design events and by then comparing this value with the cost of implementing the measure.

0 summarises the results of the economic assessment of each of the flood management options. The indicator adopted to rank these measures on economic merit is the benefit-cost ratio (B/C), which is based on the net present worth (NPW) of the benefits (reduction in AAD) and the costs (capital and ongoing), adopting a 7% discount rate and an implementation period of 50 years.

The benefit-cost ratio provides an insight into how the damage savings from a measure, relate to its cost of construction and maintenance:

- Where the benefit-cost is greater than 1 the economic benefits are greater than the cost of implementing the measure;
- Where the benefit-cost is less than 1 but greater than 0, there is still an economic benefit from implementing the measure but the cost of implementing the measure is greater than the economic benefit;
- Where the benefit-cost is equal to zero, there is no economic benefit from implementing the measure; and
- Where the benefit-cost is less than zero, there is a negative economic impact of implementing the measure.

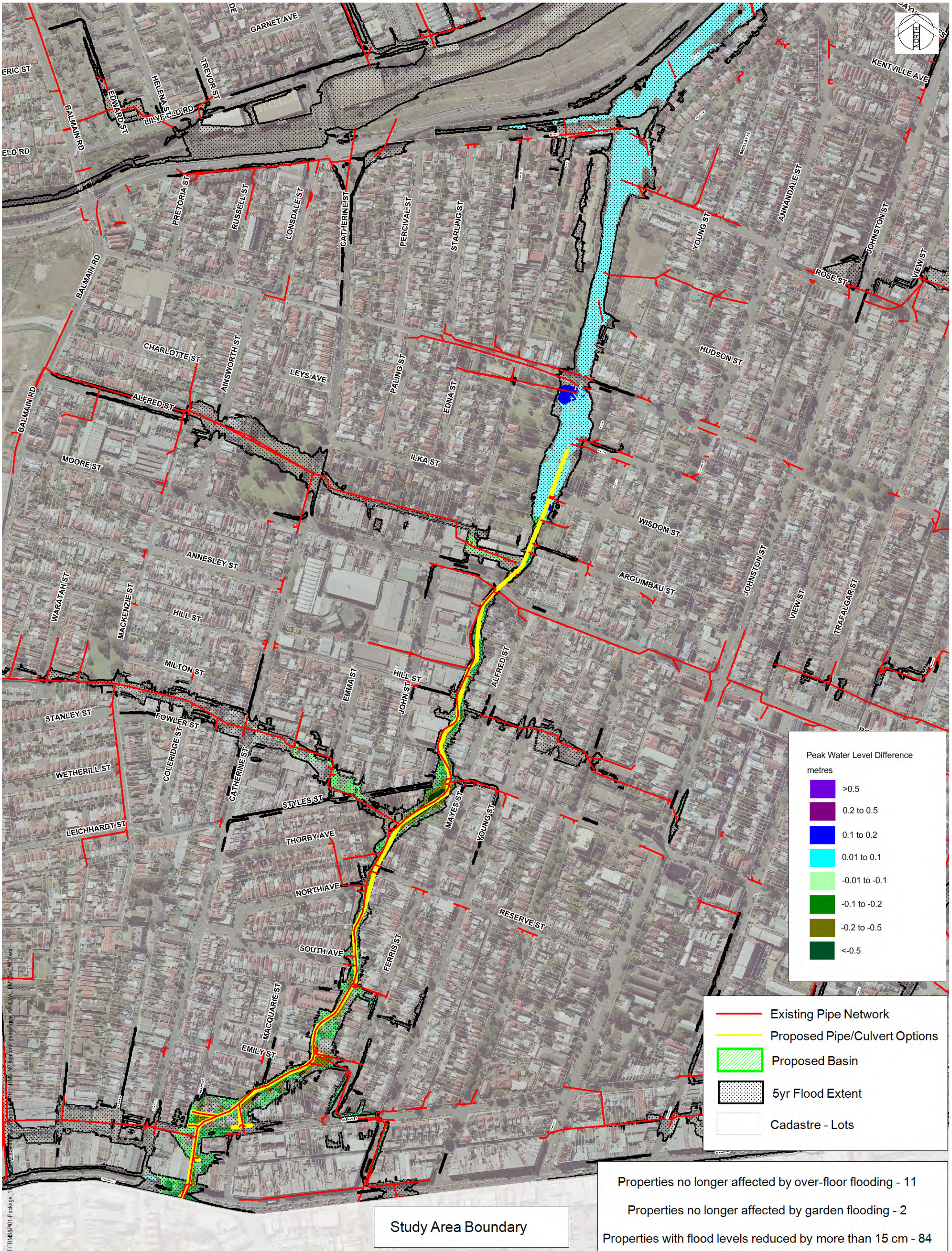
Table 4-15 Summary of Economic Assessment of Flood Management Options

Option ID	Option Description	NPW of Reduction in AAD	NPW of Cost of Implementation	B/C Ratio	Economic Ranking
WC-FM1	Whites Creek Culvert – Proposing additional culvert or duplication of existing Whites Creek culvert from Parramatta Rd to the open channel downstream of Moore St (at Wisdom Street). Also combining WC-FM2 along with this option.	$4,367,000	$20,673,000	0.21	6
WC-FM2	Young Street Flow Path – Proposing new pipe network from Young Street/Parramatta Road to Whites Creek culvert via Young St, Albion St, Ferris St and Clarke St. Additional pipe network from Young St to Albion Street.	$549,000	$4,293,000	0.13	9
WC-FM3	Balmain Road Flow Path – Additional pipe from the low point on Norton St to the existing pipe network (towards Parramatta Rd). Duplication of existing pipe network or extra pipes from Balmain Rd to Whites Creek Culvert at Hearn St.	$11,355,000	$7,148,000	1.59	2
WC-FM4	Hearn Street – Detention Basin or Large Inlet Pits at Hearn St to collect flood waters and convey into the proposed Whites Creek Culvert. Additional pipes from Albion St to Whites Creek culvert.	*Not Feasible*			
WC-FM5	Detention Basin at Mackenzie Street (upstream at the intersection of Mackenzie and Milton St)	$1,853,000	$1,003,000	1.85	1
WC-FM6	Styles Street Flow Path – Additional pipes from Mackenzie St to Whites Creek Culvert.	$2,690,000	$9,483,000	0.28	3
WC-FM7	Detention Basin at Evan Jones Park	*Not Feasible*			
WC-FM8	Annandale Street Flow Path – Duplication of existing pipe network or additional pipes from Annandale St to Whites Creek culvert.	$563,000	$3,969,000	0.14	7
WC-FM10	Detention Basin at Catherine Street (War Memorial Park)	$472,000	$2,221,000	0.21	5
WC-FM11	Moore Street Flow Path – Additional Pipes from Catherine St to Whites Creek along Moore Lane.	$465,000	$3,719,000	0.13	10
WC-FM12	Additional pipes at Brenan St and Railway PDE to reduce flooding on the roads.	$364,000	$2,788,000	0.13	8

Option ID	Option Description	NPW of Reduction in AAD	NPW of Cost of Implementation	B/C Ratio	Economic Ranking
WC-FM13	Whites Creek Culvert/Open Channel – Proposing additional culvert or duplication of existing Whites Creek culvert from Parramatta Rd to the open channel downstream of Moore St (WC-FM1). Widening of the open channel to convey additional flows. Upgrade Bridges at Piper Street and Brenan Street (WC-FM14)	$6,535,000	$28,738,000	0.23	4
WC-FM14	Whites Creek Bridge Upgrades – Upgrade Bridges at Piper Street and Brenan Street.	$213,000	$6,620,000	0.03	11

Whites Creek Mitigation Options Figures

Figure WC_FM1_5yr_WlDiff
Figure WC_FM1_20yr_WlDiff
Figure WC_FM1_100yr_WlDiff
Figure WC_FM2_5yr_WlDiff
Figure WC_FM2_20yr_WlDiff
Figure WC_FM2_100yr_WlDiff
Figure WC_FM3_5yr_WlDiff
Figure WC_FM3_20yr_WlDiff
Figure WC_FM3_100yr_WlDiff
Figure WC_FM5_5yr_WlDiff
Figure WC_FM5_20yr_WlDiff
Figure WC_FM5_100yr_WlDiff
Figure WC_FM6_5yr_WlDiff
Figure WC_FM6_20yr_WlDiff
Figure WC_FM6_100yr_WlDiff
Figure WC_FM7_5yr_WlDiff
Figure WC_FM7_20yr_WlDiff
Figure WC_FM7_100yr_WlDiff
Figure WC_FM8_5yr_WlDiff
Figure WC_FM8_20yr_WlDiff
Figure WC_FM8_100yr_WlDiff
Figure WC_FM10_5yr_WlDiff
Figure WC_FM10_20yr_WlDiff
Figure WC_FM10_100yr_WlDiff
Figure WC_FM11_5yr_WlDiff
Figure WC_FM11_20yr_WlDiff
Figure WC_FM11_100yr_WlDiff
Figure WC_FM12_5yr_WlDiff
Figure WC_FM12_20yr_WlDiff
Figure WC_FM13_5yr_WlDiff
Figure WC_FM13_20yr_WlDiff
Figure WC_FM13_100yr_WlDiff
Figure WC_FM14_5yr_WlDiff
Figure WC_FM14_20yr_WlDiff
Figure WC_FM14_100yr_WlDiff



DATE PLOTTED: 04-Nov-2016 BY: Matthew Plum
FILE: N:\Projects\49\91FY13\NA49913094_LEICH...RDT FRMS&P\01-Package_1\...\Mapping\16-FRMSP\MitigationFigures\Figure_A3-1_WC_FM1_5yr_WLDiff.wor

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INNER WEST COUNCIL
LEICHHARDT FRMS&P

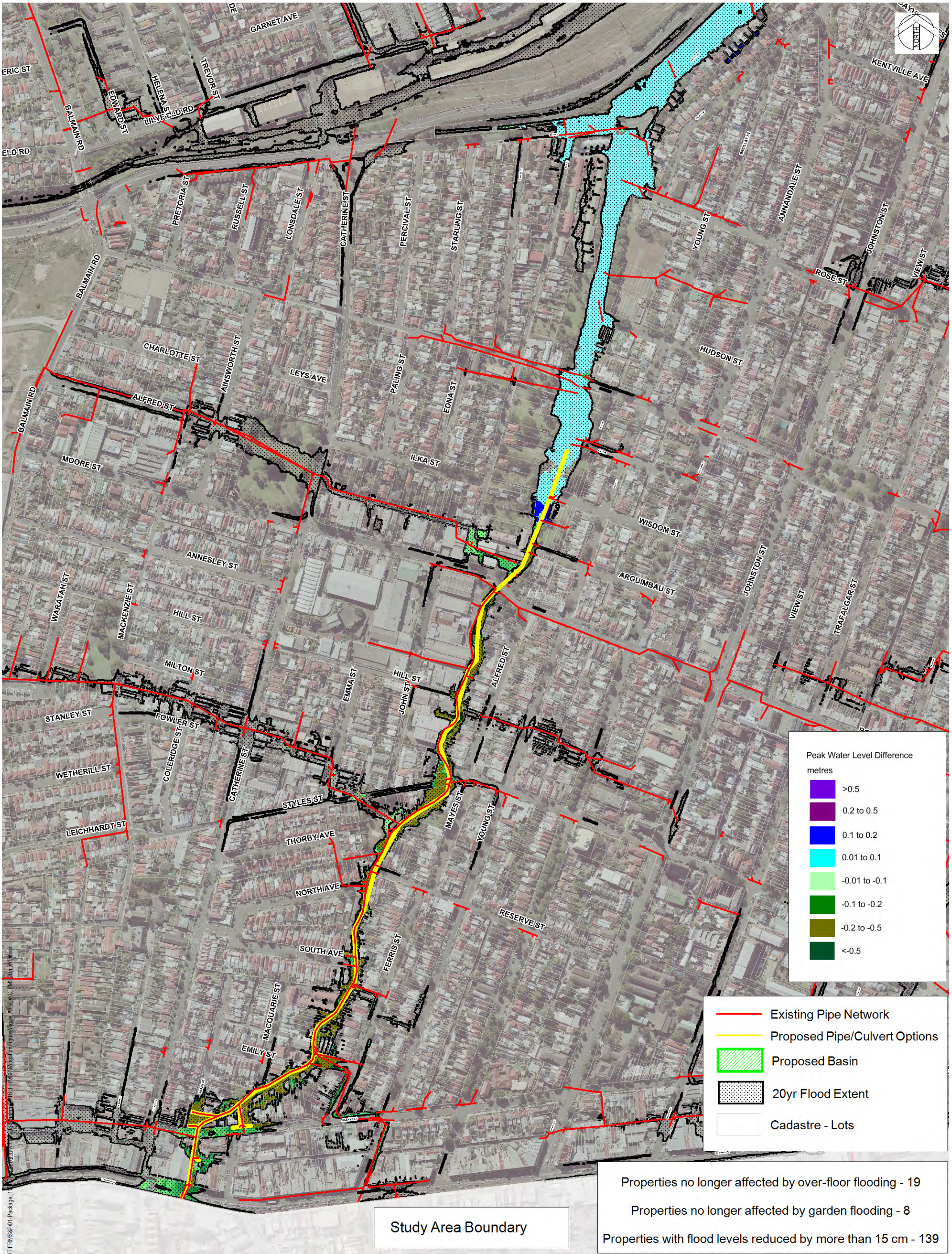
WC_FM1 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_1

Date
03/2017

Size
A3

WC_FM1_5yr_WlDiff
Drawing Number

03
Revision



DATE PLOTTED: 04-Nov-2016 BY: Matthew Plum
FILE: N:\Projects\49\91FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\...\WC_FM1_20yr_WLDiff.dgn

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LEICHHARDT FRMS&P

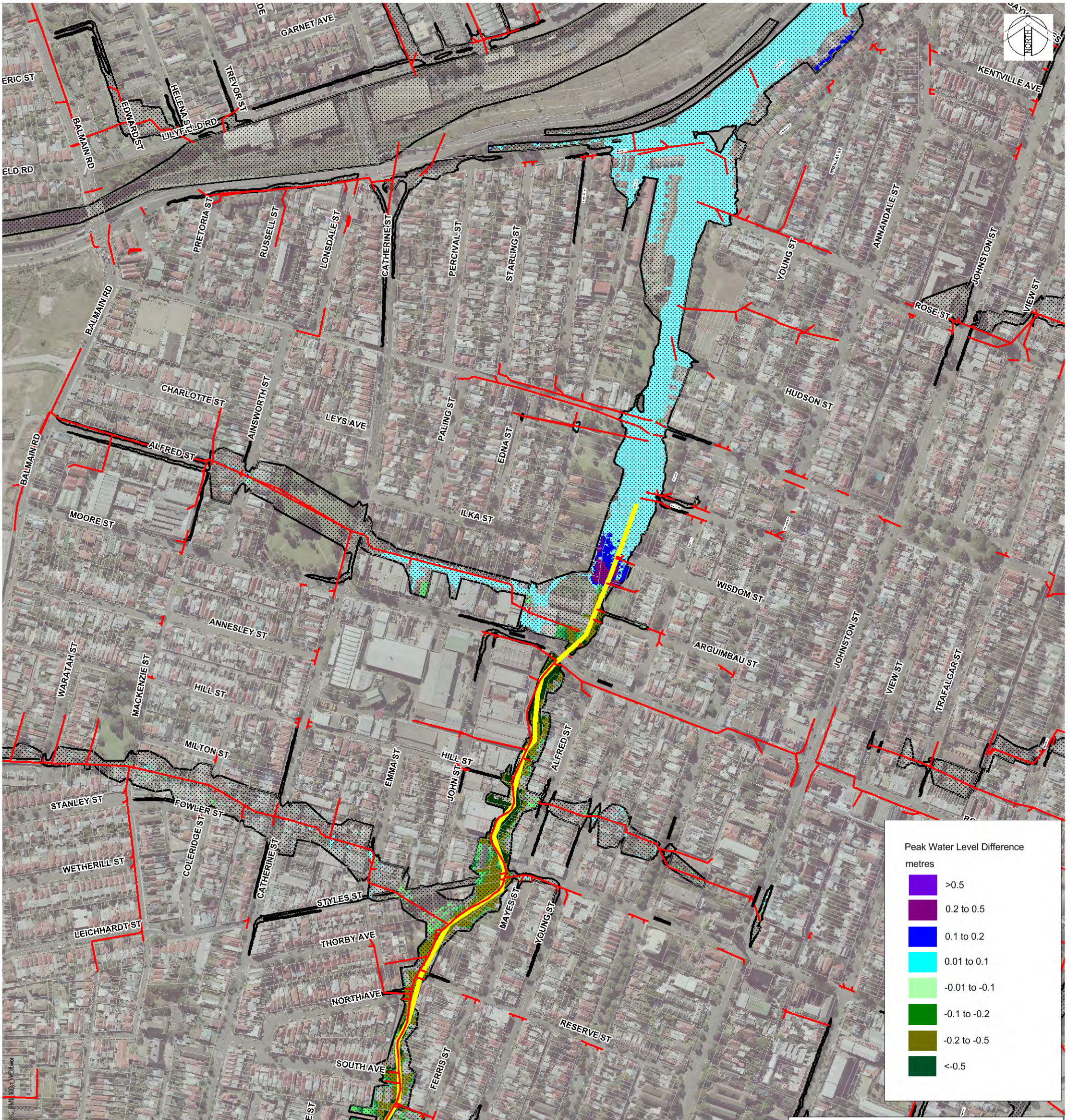
WC_FM1 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_2

Date
03/2017

Size
A3

WC_FM1_20yr_WlDiff
Drawing Number

03
Revision



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LEICHHARDT FRMS&P

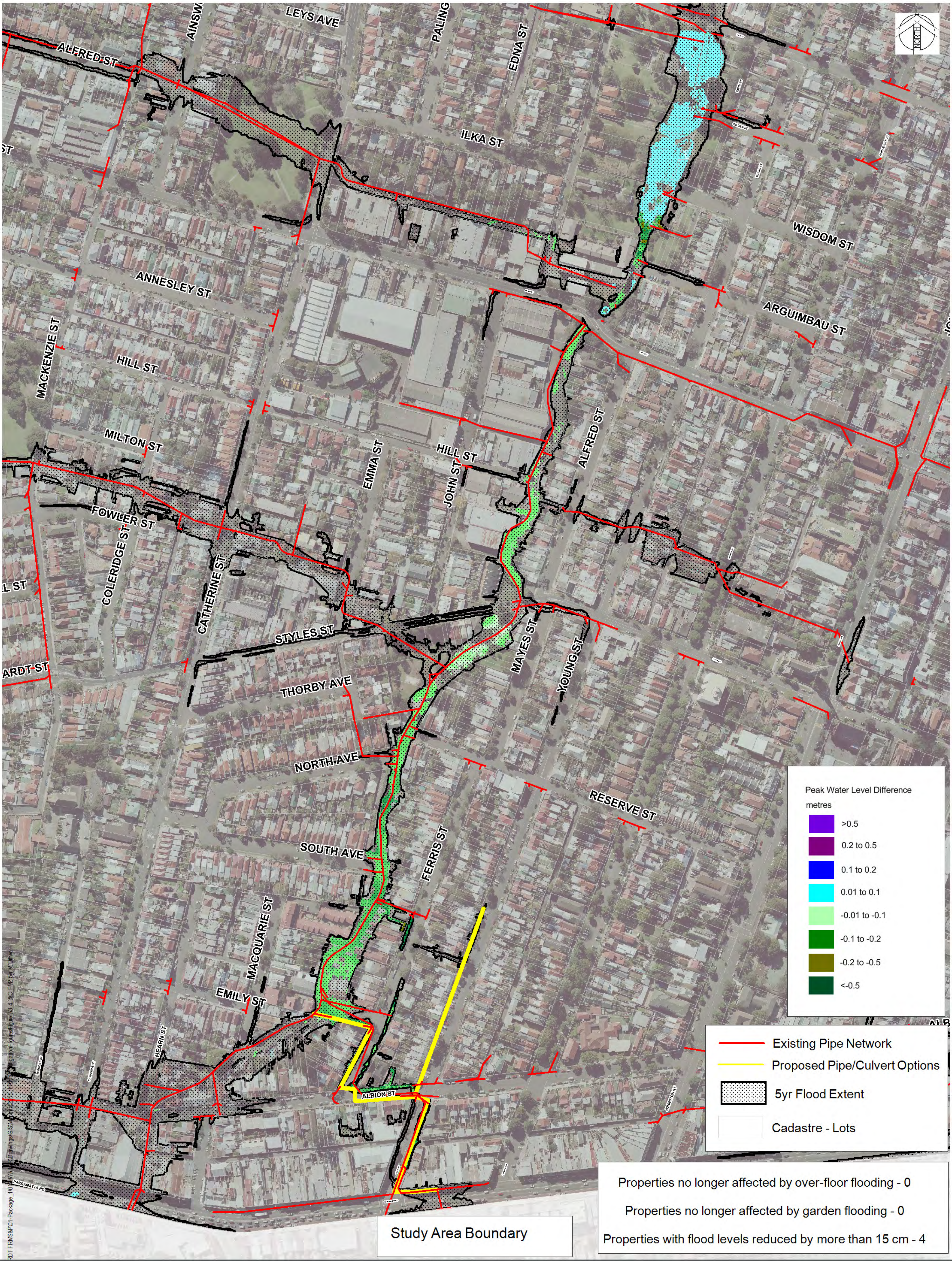
WC_FM1 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_3

Date
03/2017

Size
A3

WC_FM1_100yr_WlDiff
Drawing Number

03
Revision



Properties no longer affected by over-floor flooding - 0

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 4

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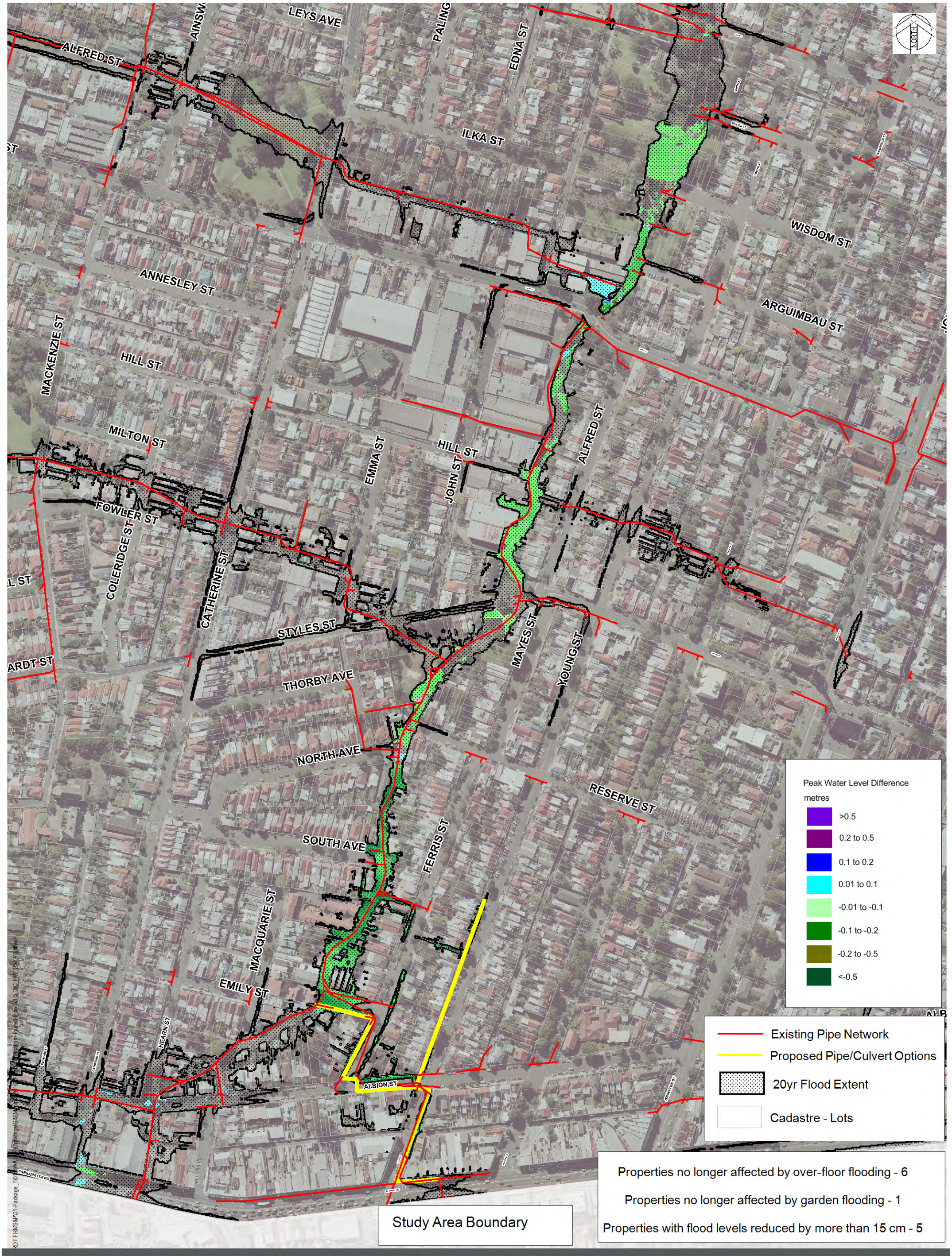
LEICHHARDT FRMS&P
WC_FM2 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_4

Date
03/2017

Size
A3

WC_FM2_5yr_WlDiff
Drawing Number

03
Revision



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FILE: N:\Projects\4599\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\04-Drawings\GIS\MXD\Flood Modification Figures\Figure A3.5_WC_FM2_20yr_WLDiff.mxd

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LEICHHARDT FRMS&P

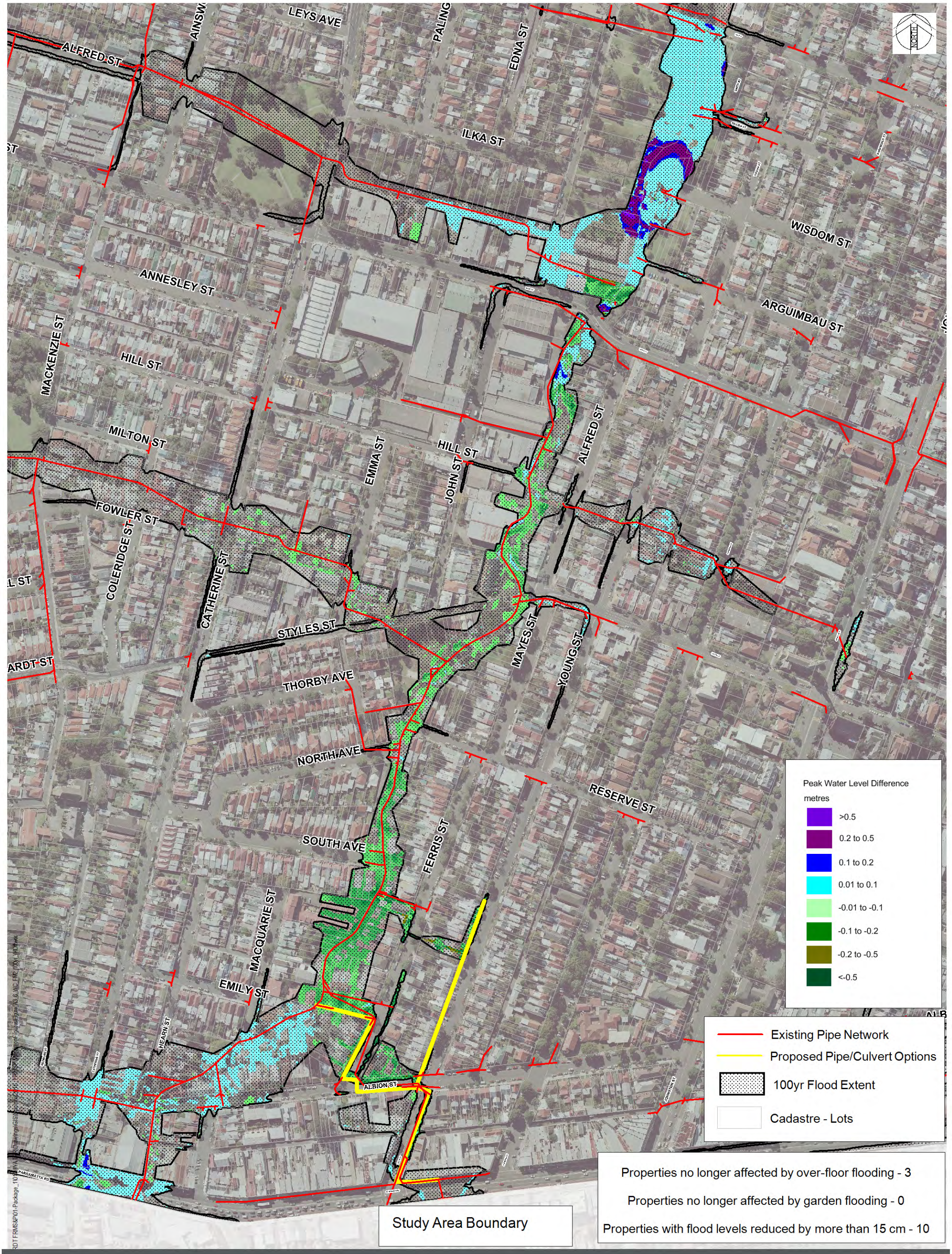
WC_FM2 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_5

Date
03/2017

Size
A3

WC_FM2_20yr_WlDiff
Drawing Number

03
Revision



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LEICHHARDT FRMS&P

WC_FM2 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_6

Date
03/2017

Size
A3

WC_FM2_100yr_WlDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres
- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

Existing Pipe Network

Proposed Pipe/Culvert Options

5yr Flood Extent

Cadastre - Lots

Study Area Boundary

Properties no longer affected by over-floor flooding - 9

Properties no longer affected by garden flooding - 3

Properties with flood levels reduced by more than 15 cm - 50

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM3 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_7

Date
03/2017

Size
A3

WC_FM3_5yr_WlDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

Existing Pipe Network

Proposed Pipe/Culvert Options

20yr Flood Extent

Cadastre - Lots

Study Area Boundary

Properties no longer affected by over-floor flooding - 16

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 65

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM3 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_8

Date
03/2017

Size
A3

WC_FM3_20yr_WIDiff
Drawing Number

03
Revision

Peak Water Level Difference
metres
- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

Existing Pipe Network

Proposed Pipe/Culvert Options

100yr Flood Extent

Cadastre - Lots

Study Area Boundary

Properties no longer affected by over-floor flooding - 25

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 67

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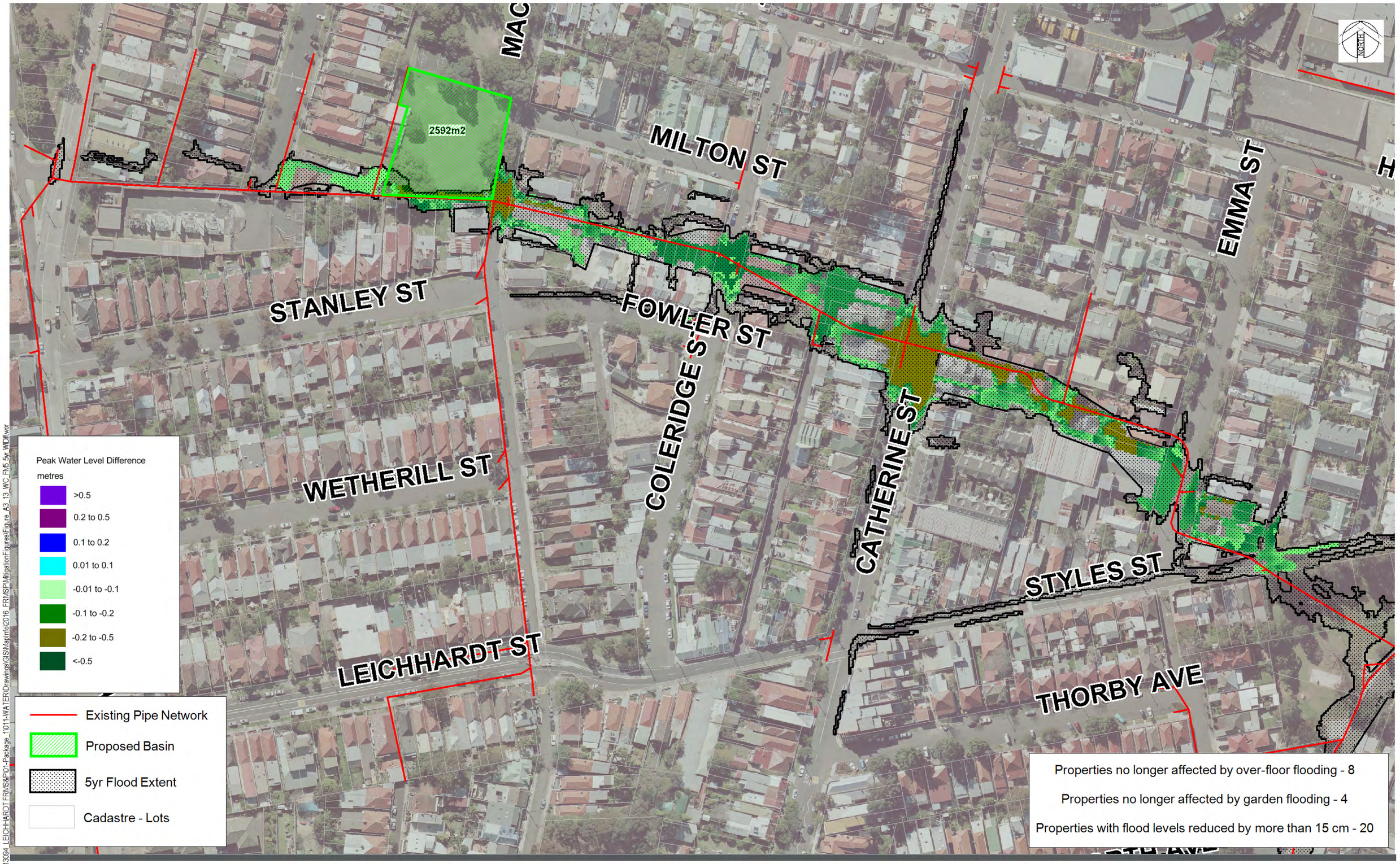
LEICHHARDT FRMS&P
WC_FM3 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_9

Date
03/2017

Size
A3

WC_FM3_100yr_WIDiff
Drawing Number

03
Revision



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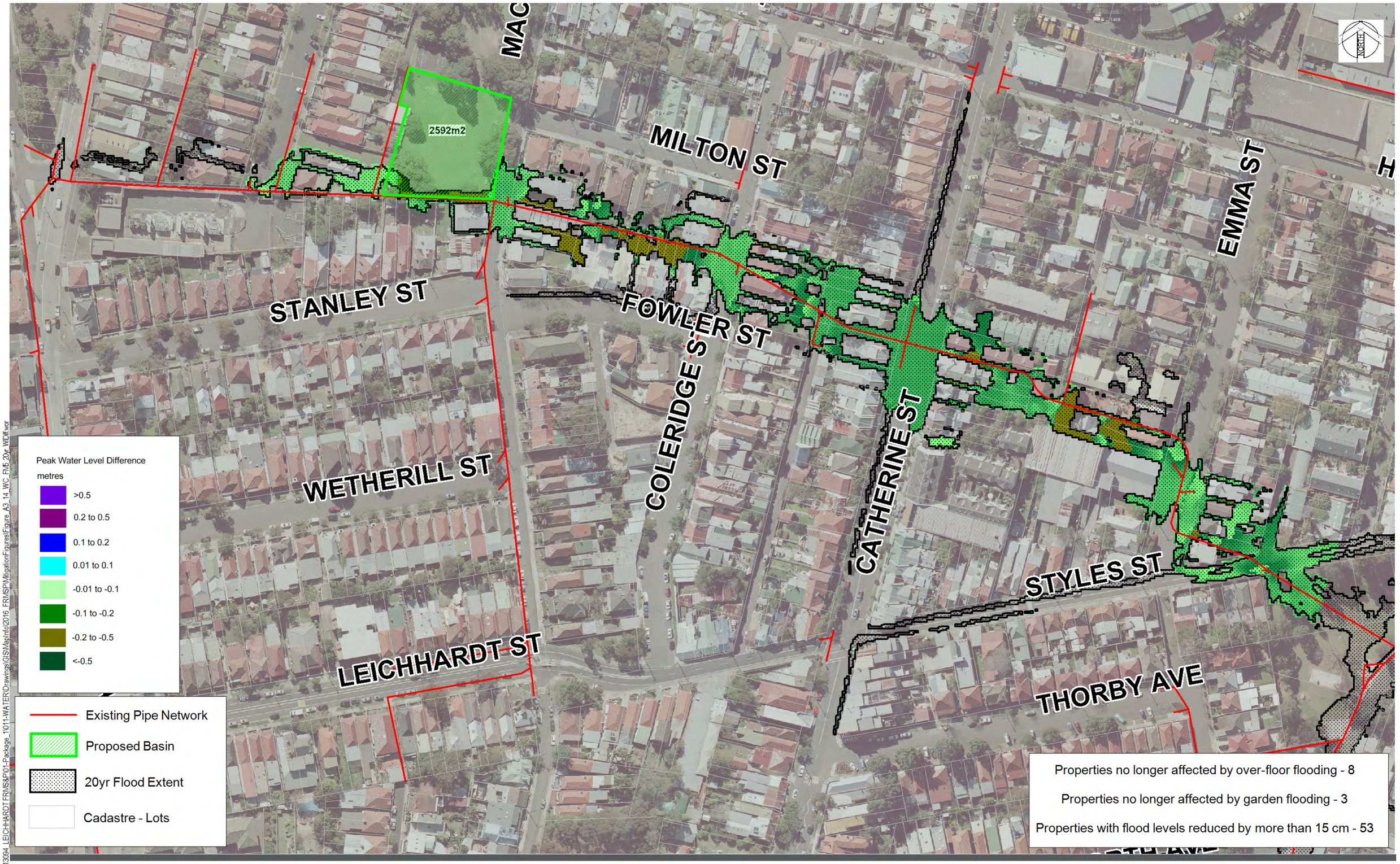
INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM5 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_13

Date
03/2017

Size
A3

WC_FM5_5yr_WlDiff
Drawing Number

03
Revision



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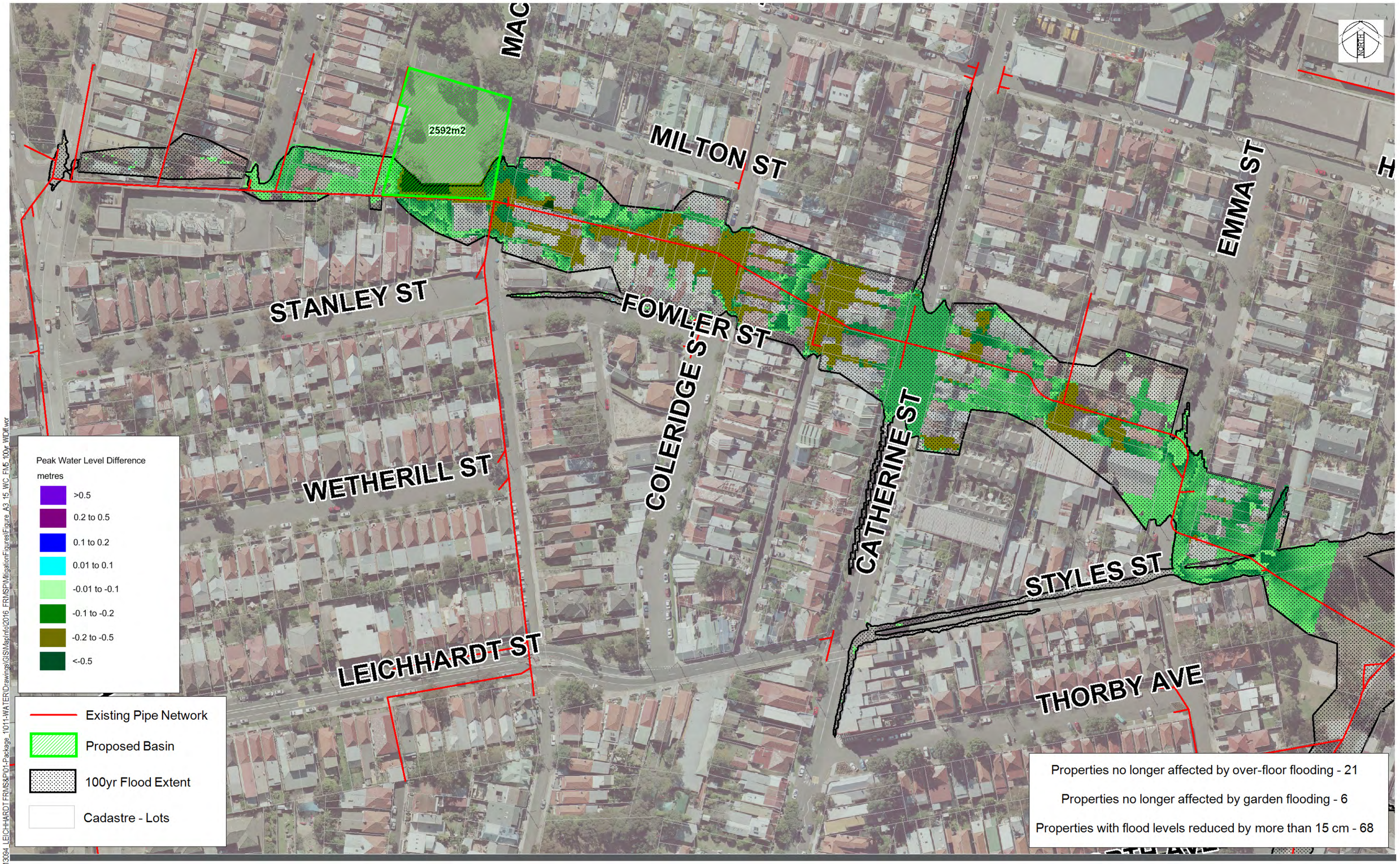
INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM5 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_14

Date
03/2017

Size
A3

WC_FM5_20yr_WlDiff
Drawing Number

03
Revision



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INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM5 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_15

Date
03/2017

Size
A3

WC_FM5_100yr_WlDiff
Drawing Number

03
Revision

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM6 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_16

Date
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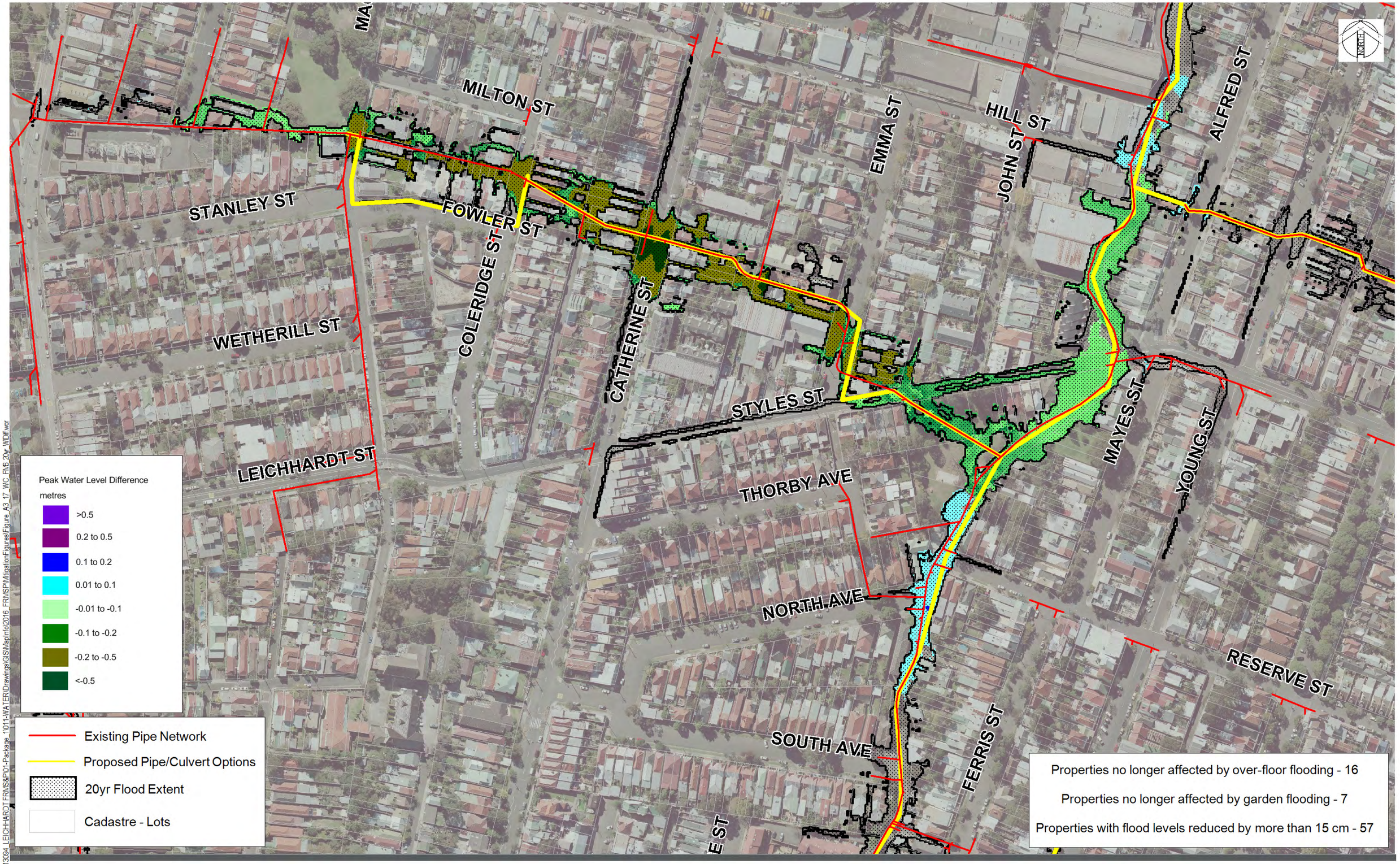
Size
A3

WC_FM6_5yr_WIDiff
Drawing Number

03
Revision



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INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM6 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_17

Date
03/2017

Size
A3

WC_FM6_20yr_WIDiff
Drawing Number

03
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INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM6 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_18

Date
03/2017

Size
A3

WC_FM6_100yr_WIDiff
Drawing Number

03
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WC_FM7 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_19

Date
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Size
A3

WC_FM7_5yr_WIDiff
Drawing Number

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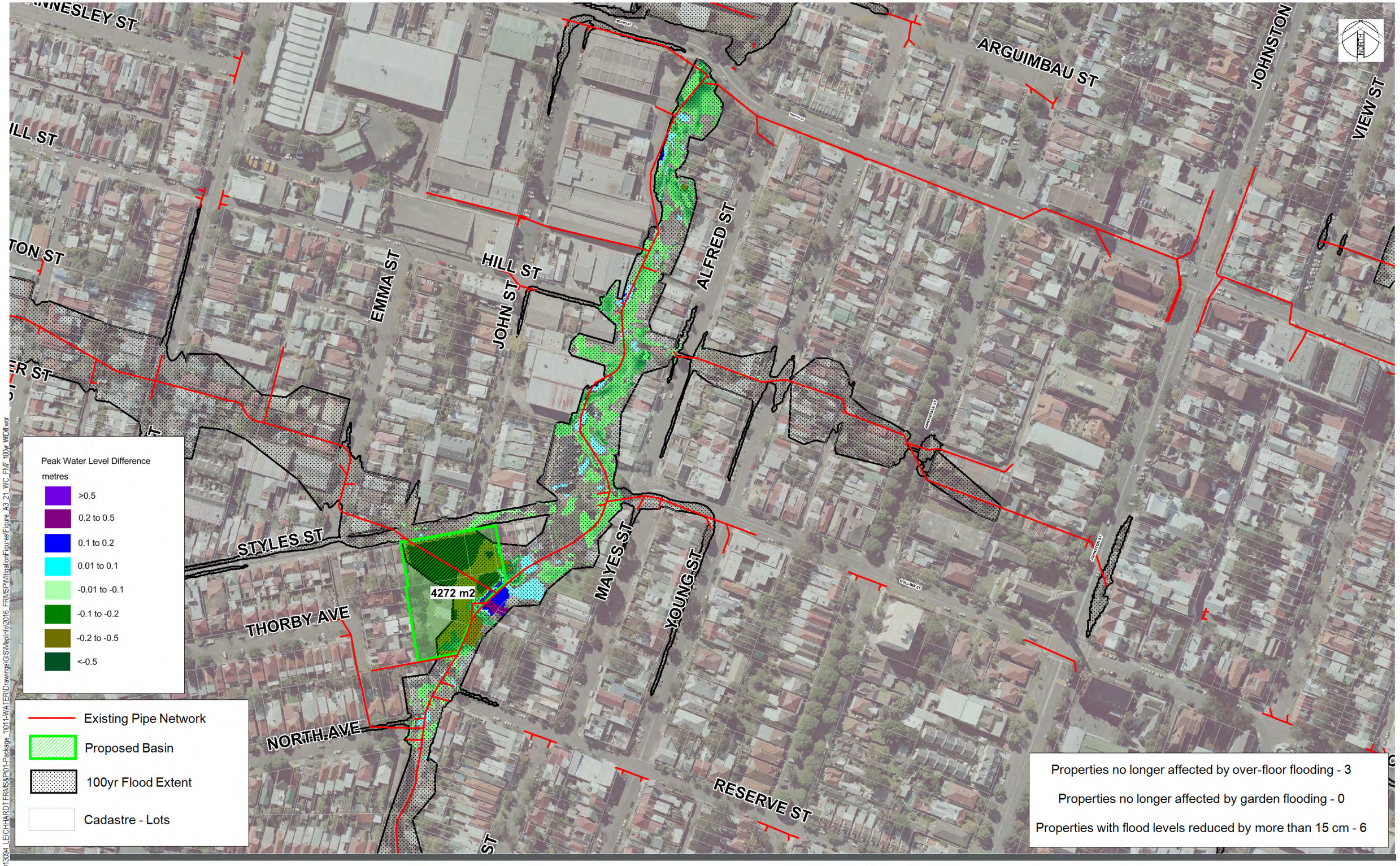
INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM7 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_20

Date
03/2017

Size
A3

WC_FM7_20yr_WIDiff
Drawing Number

03
Revision



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INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM7 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_21

Date
03/2017

Size
A3

WC_FM7_100yr_WIDiff
Drawing Number

03
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FILE: N:\Projects\499\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A3_22_WC_FM8_5yr_WLDiff.wor

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WC_FM8 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_22

Date
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Size
A3

WC_FM8_5yr_WlDiff
Drawing Number

03
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LEICHHARDT FRMS&P
WC_FM8 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_23

Date
03/2017

Size
A3

WC_FM8_20yr_WIDiff
Drawing Number

03
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FILE: N:\Projects\4999\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A3_24_WC_FM8_100yr_WLDiff.wor

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM8 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_24

Date
03/2017

Size
A3

WC_FM8_100yr_WLDiff
Drawing Number

03
Revision

CHARLOTTE ST

AINSWORTH

LEYS AVE

PALING ST

EDNA ST

ALFRED ST

ORE ST

ILKA ST

ANNESLEY ST

MOORE ST

14413 m2

NORTH

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

Existing Pipe Network

Proposed Basin

5yr Flood Extent

Cadastre - Lots

Properties no longer affected by over-floor flooding - 2

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 5

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FILE: N:\Projects\499\FY13\NA499113094_LEICHHARDT FRMS&P\01-Package_1\01I-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A3_28_WC_FM10_5yr_WlDiff.wor

INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM10 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_28

Date
03/2017

Size
A3

WC_FM10_5yr_WlDiff
Drawing Number

03
Revision

CHARLOTTE ST

AINSWORTH

LEYS AVE

PALING ST

EDNA ST

ALFRED ST

ORE ST

ILKA ST

ANNESLEY ST

MOORE ST

14413 m2

NORTH

Peak Water Level Difference
metres

- >0.5
- 0.2 to 0.5
- 0.1 to 0.2
- 0.01 to 0.1
- -0.01 to -0.1
- -0.1 to -0.2
- -0.2 to -0.5
- <-0.5

- Existing Pipe Network
- Proposed Basin
- 20yr Flood Extent
- Cadastre - Lots

Properties no longer affected by over-floor flooding - 0

Properties no longer affected by garden flooding - 0

Properties with flood levels reduced by more than 15 cm - 7

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FILE: N:\Projects\499\FY13\N449913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A3_29_WC_FM10_20yr_WIDiff.wor

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM10 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_29

Date
03/2017

Size
A3

WC_FM10_20yr_WIDiff
Drawing Number

03
Revision

DATE PLOTTED: 04-Nov-2016 BY: Matthew.Prumm
FILE: N:\Projects\4999\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A3_30_WC_FM10_100yr_WLDiff.wor

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM10 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_30

Date
03/2017

Size
A3

WC_FM10_100yr_WlDiff
Drawing Number

03
Revision

DATE PLOTTED: 04-Nov-2016 BY: Matthew.Prumm
FILE: N:\Projects\4999\FY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\MapInfo\2016_FRMSP\MitigationFigures\Figure_A3_31_WC_FM11_5yr_WIDiff.wor

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM11 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_31

Date
03/2017

Size
A3

WC_FM11_5yr_WIDiff
Drawing Number

03
Revision

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM11 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_32

Date
03/2017

Size
A3

WC_FM11_20yr_WIDiff
Drawing Number

03
Revision

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INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM11 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_33

Date
03/2017

Size
A3

WC_FM11_100yr_WlDiff
Drawing Number

03
Revision

DATE PLOTTED: 04-Nov-2016 BY: Matthew.Prumm
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INNER WEST COUNCIL
LEICHHARDT FRMS&P
WC_FM12 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_34

Date
03/2017

Size
A3

WC_FM12_5yr_WIDiff
Drawing Number

03
Revision

DATE PLOTTED: 04-Nov-2016 BY: Matthew.Prumm
FILE: N:\Projects\49GFY13\NA49913094_LEICHHARDT FRMS&P\01-Package_1\011-WATER\Drawings\GIS\Map\Info\2016_FRMSP\MitigationFigures\Figure_A3_35_WC_FM12_20yr_WDiff.mxd

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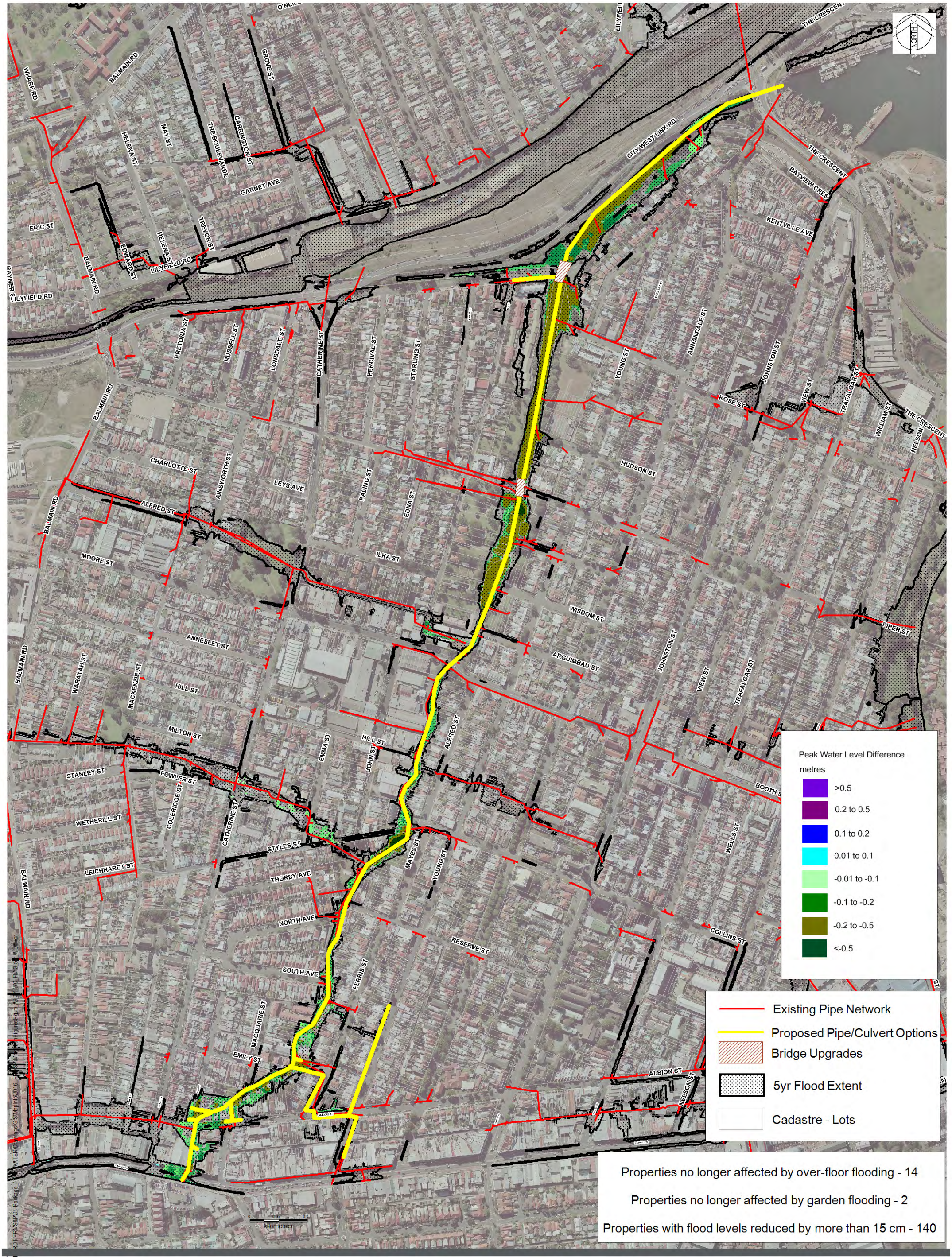
MITIGATION LESS EXISTING
FIG_A3_35

Date
03/2017

Size
A3

WC_FM12_20yr_WlDiff
Drawing Number

03
Revision



DATE PLOTTED: 04-Nov-2016 BY: Matthew Phur
FILE: N:\Projects\49\91FY13\NA49913094_LEICH

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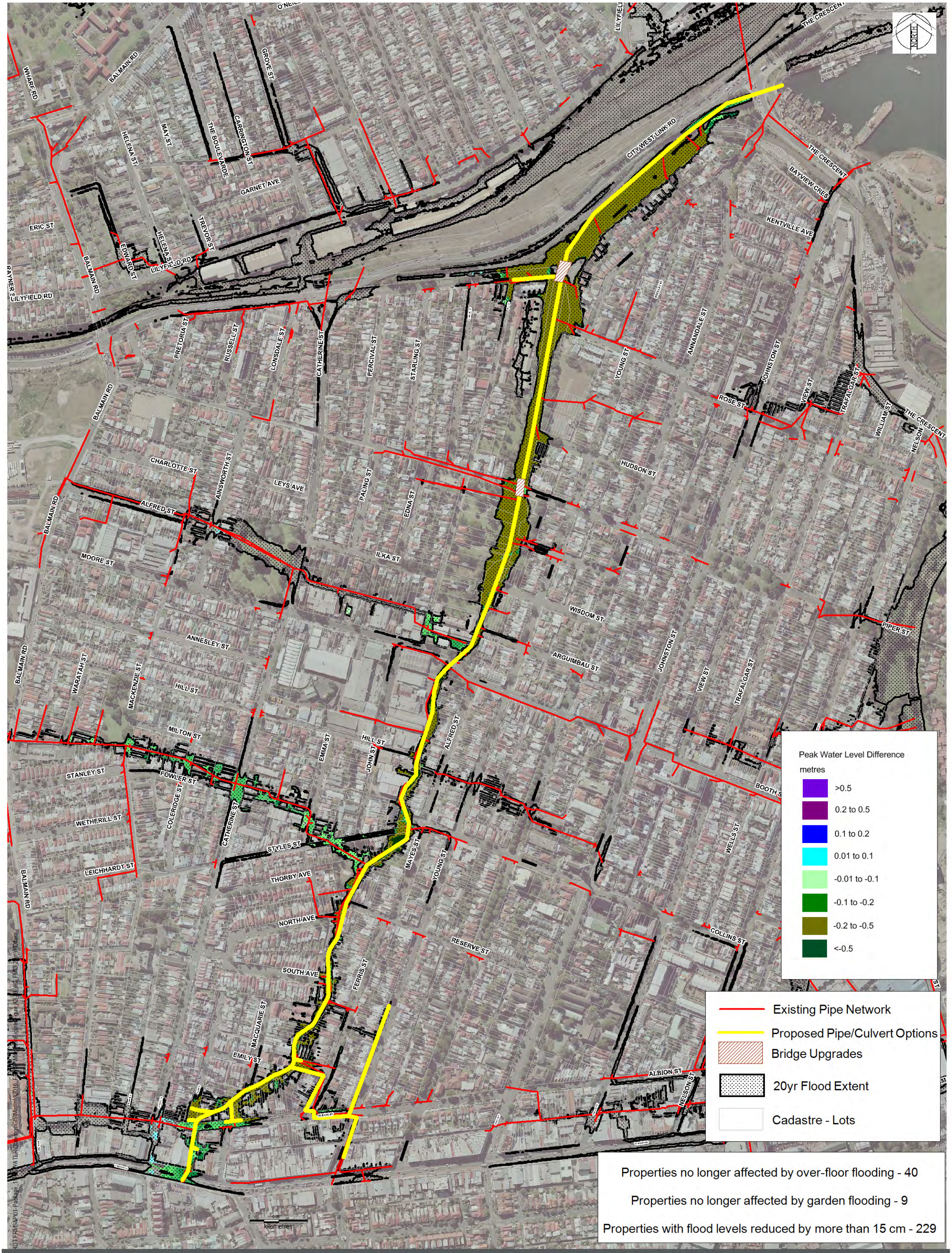
MITIGATION LESS EXISTING
FIG_A3_37

Date
03/2017

Size
A3

WC_FM13_5yr_WlDiff
Drawing Number

03
Revision



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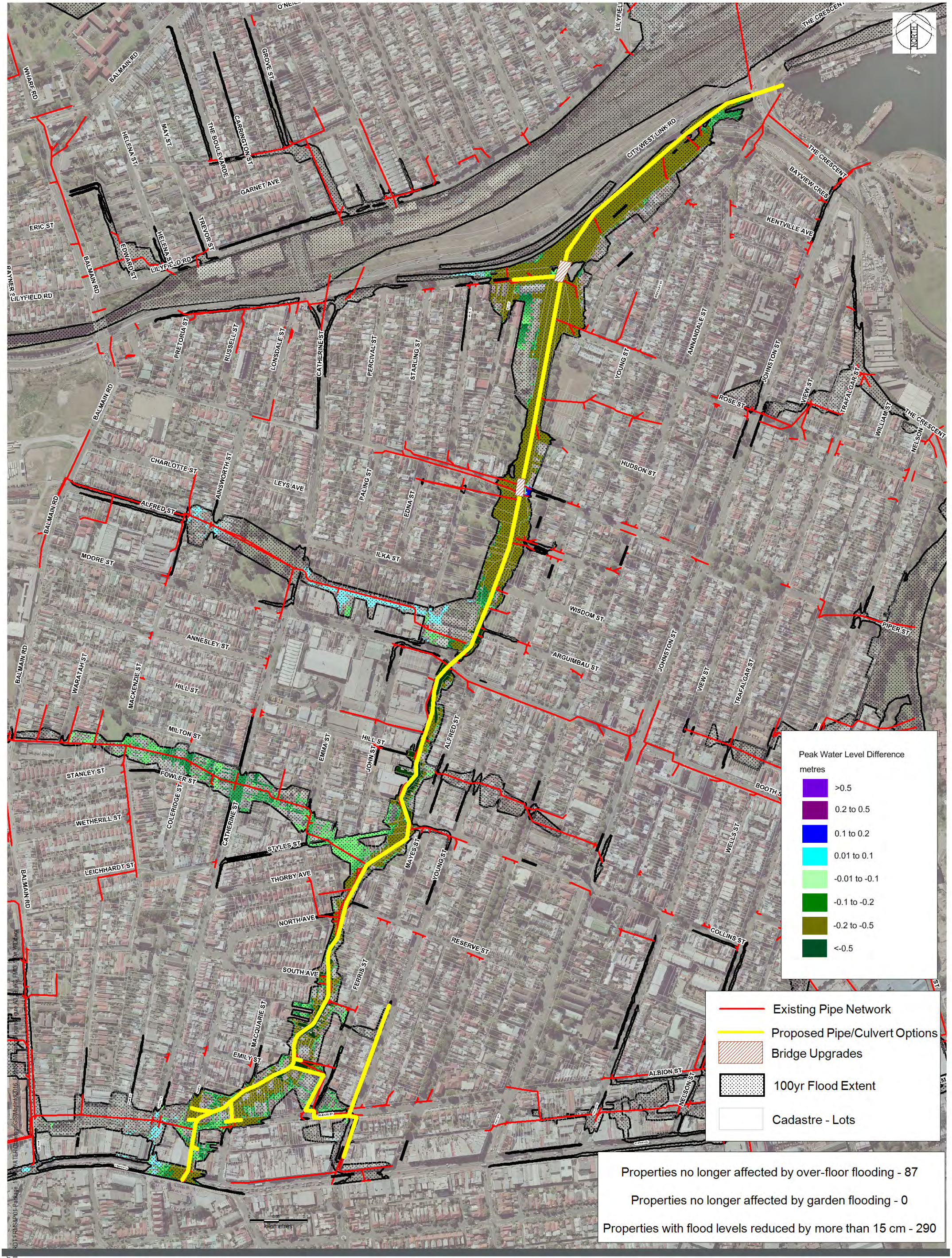
WC_FM13 20YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_38

Date
03/2017

Size
A3

WC_FM13_20yr_WlDiff
Drawing Number

03
Revision



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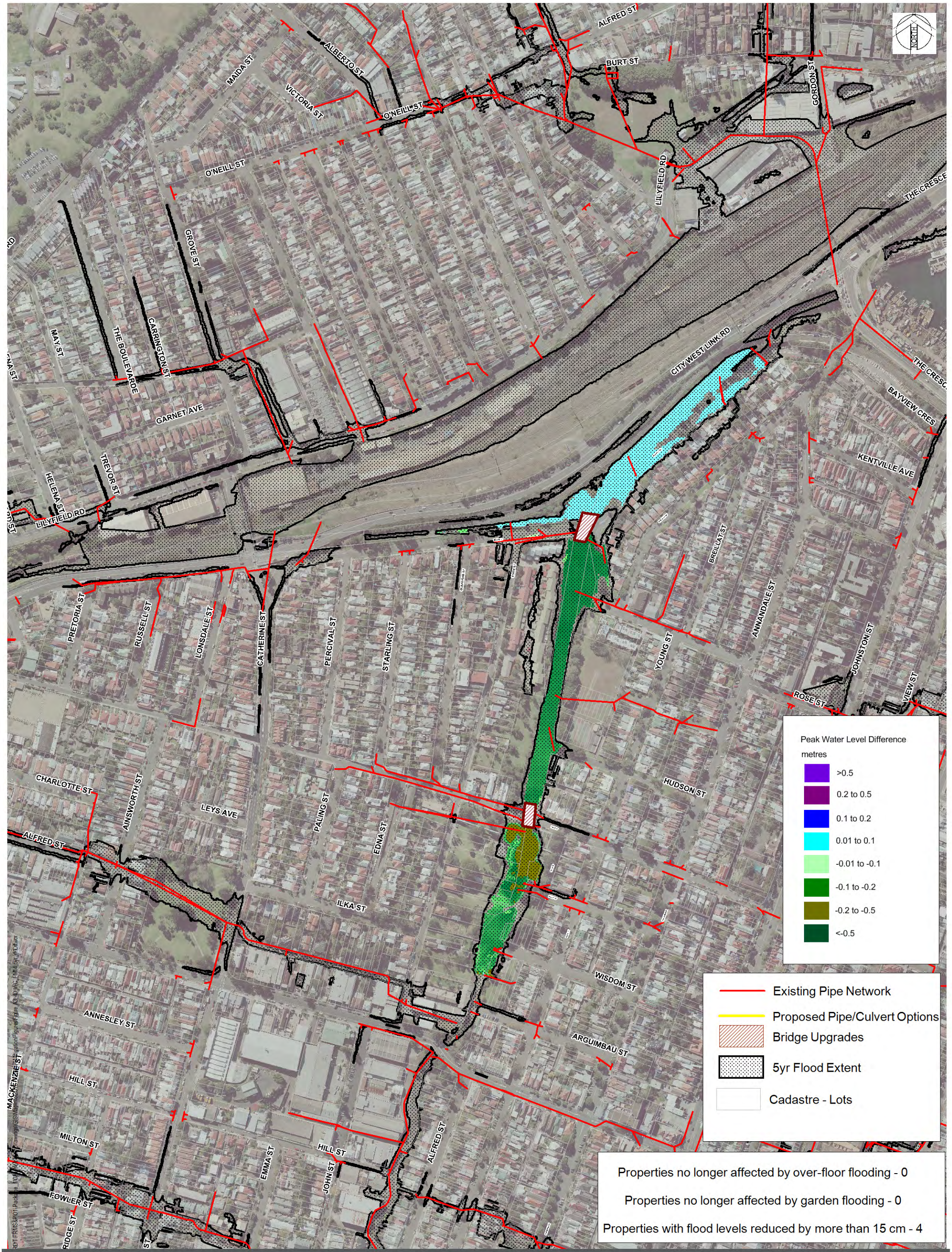
WC_FM13 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_39

Date
03/2017

Size
A3

WC_FM13_100yr_WlDiff
Drawing Number

03
Revision



DATE PLOTTED: 04-Nov-2016 BY: Matthew.Plum
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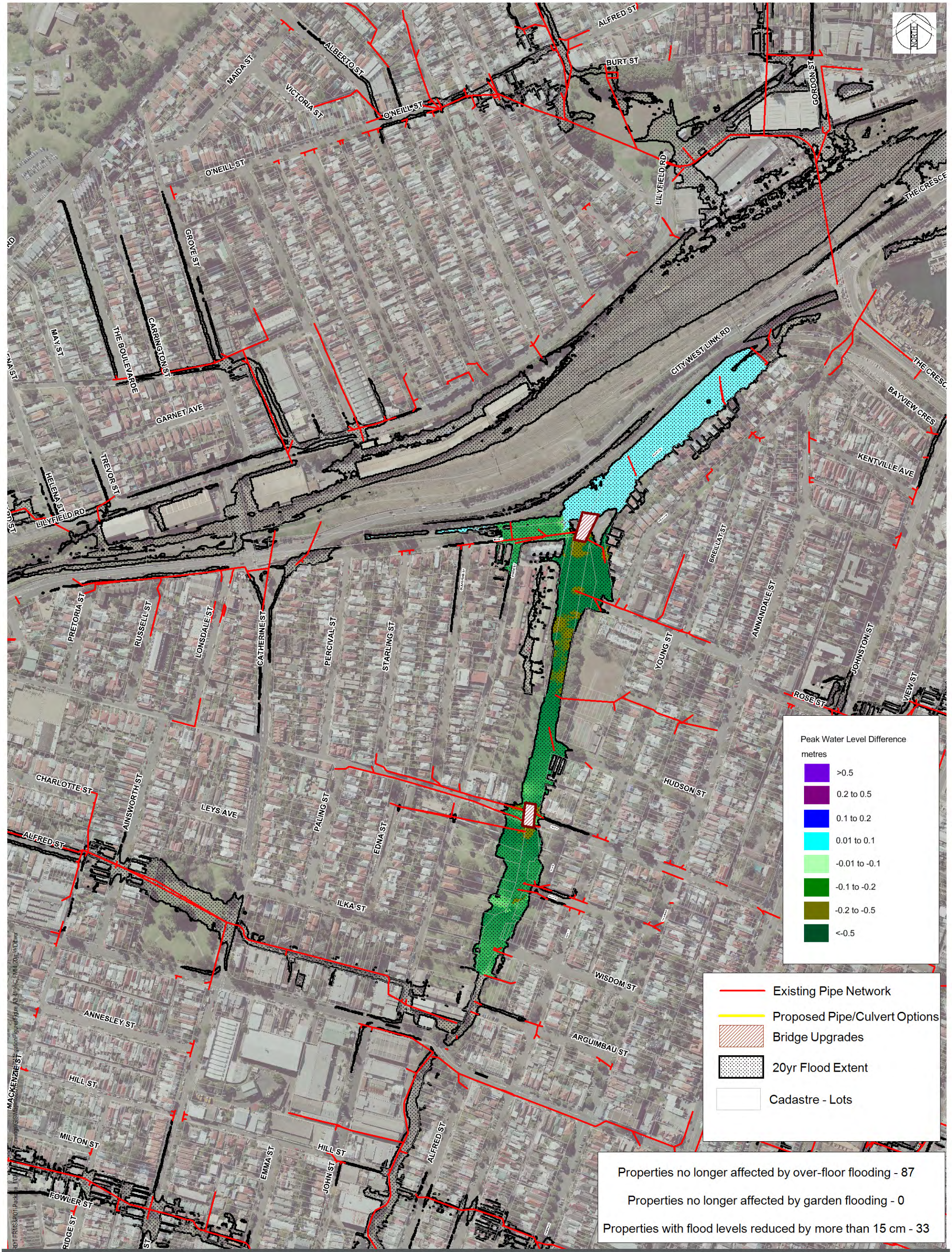
WC_FM14 5YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_40

Date
03/2017

Size
A3

WC_FM14_5yr_WlDiff
Drawing Number

03
Revision



DATE PLOTTED: 04-Nov-2016 BY: Matthew.Plum
FILE: N:\Projects\4990\FY19\NA4991094_LEICH

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WC_FM14 20YR ARI WL DIFF MITIGATION LESS EXISTING
FIG_A3_41

Date
03/2017

Size
A3

WC_FM14_20yr_WlDiff
Drawing Number

03
Revision

DATE PLOTTED: 04-Nov-2016 BY: Matthew.Plum
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WC_FM14 100YR ARI WL DIFF
MITIGATION LESS EXISTING
FIG_A3_42

Date
03/2017

Size
A3

WC_FM14_100yr_WlDiff
Drawing Number

03
Revision