



QUEANBEYAN-PALERANG REGIONAL COUNCIL

**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**

SEPTEMBER 2021

VOLUME 2 – FIGURES

LIST OF FIGURES

- 1.1 Study Location Plan

- 2.1 Existing Drainage System in Vicinity of Proposed Sports Complex
- 2.2 Cumulative Rainfall and Discharge Hydrographs for Historic Storm Events (2 Sheets)
- 2.3 Intensity-Frequency-Duration Curves and Historic Rainfall (3 Sheets)
- 2.4 Isohyetal Map – Rain Days of 10–11 February 1971
- 2.5 Isohyetal Map – Rain Days of 27–29 August 1974
- 2.6 Isohyetal Map – Rain Days of 16–17 October 1976
- 2.7 Isohyetal Map – Rain Day of 29 January 1995
- 2.8 Rating Curves and Cross Section – Jerrabomberra Creek at Four Mile Creek Stream Gauge (GS 410743)
- 2.9 Four Mile Creek HEC-RAS Model Layout
- 2.10 Historic Water Surface Profiles – Jerrabomberra Creek at Four Mile Creek Stream Gauge (GS 410743)
- 2.11 Flood Frequency Relationship – Log-Pearson 3 Annual Series 1969-1997 – Jerrabomberra Creek at Four Mile Creek Stream Gauge (GS 410743)

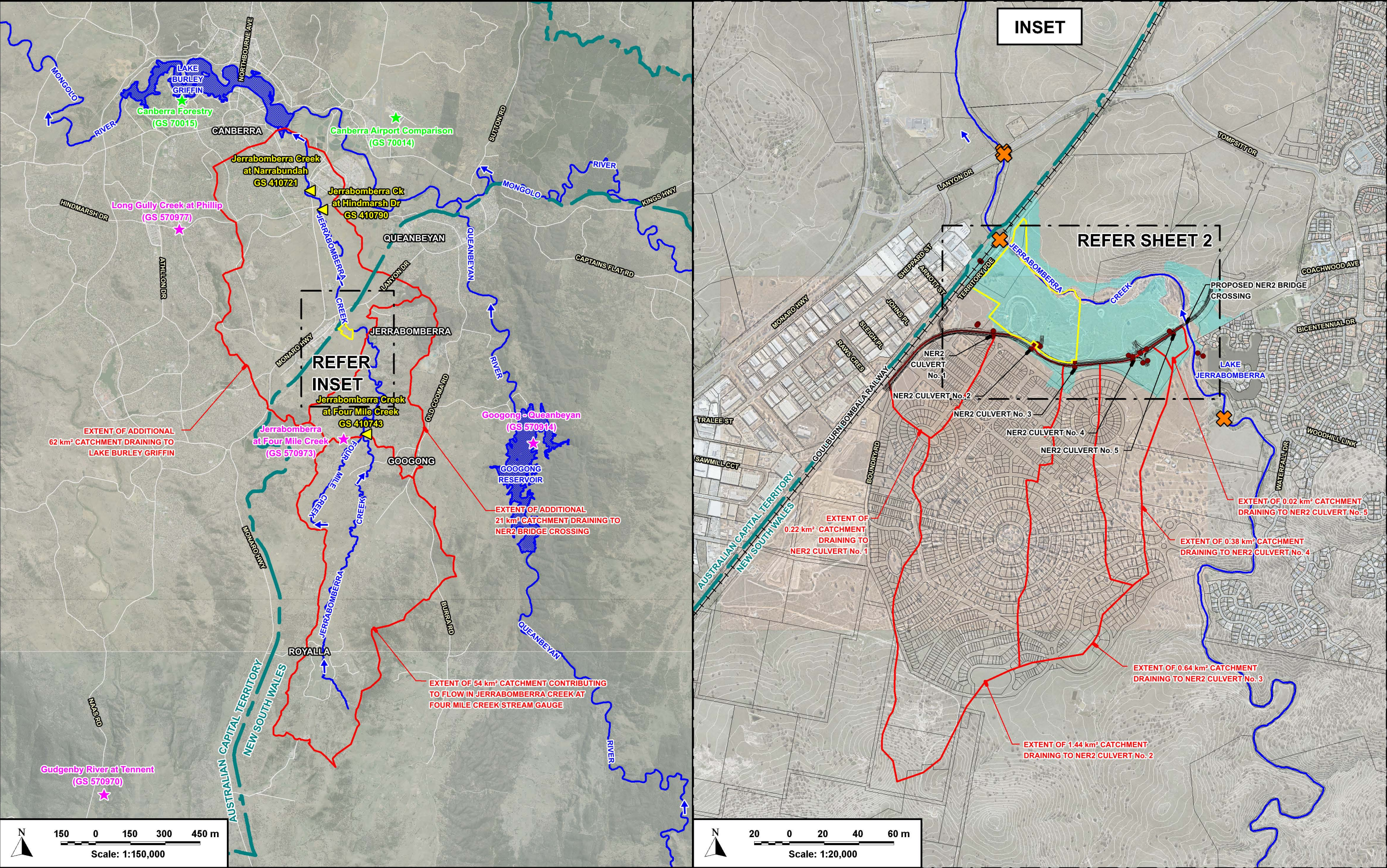
- 3.1 Jerrabomberra Creek Hydrologic Model Layout
- 3.2 Adjusted Probability Neutral Burst Initial Losses

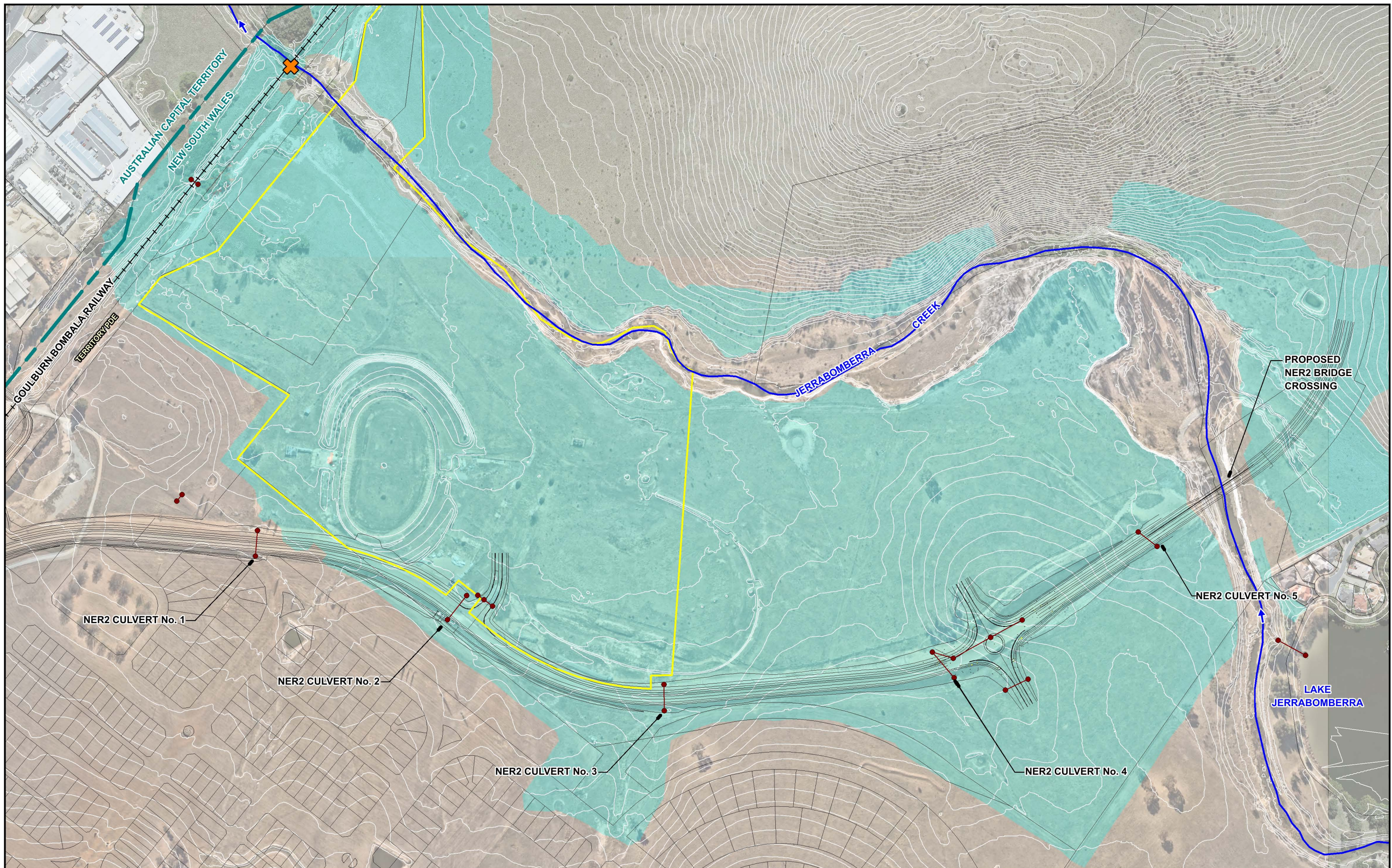
- 4.1 Jerrabomberra Creek TUFLOW Model Layout
- 4.2 Indicative Extent and Depth of Inundation – Present Day Conditions – 20% AEP (2 Sheets)
- 4.3 Maximum Flow Velocities – Present Day Conditions – 20% AEP (2 Sheets)
- 4.4 Indicative Extent and Depth of Inundation – Present Day Conditions – 5% AEP (2 Sheets)
- 4.5 Maximum Flow Velocities – Present Day Conditions – 5% AEP (2 Sheets)
- 4.6 Indicative Extent and Depth of Inundation – Present Day Conditions – 1% AEP (2 Sheets)
- 4.7 Maximum Flow Velocities – Present Day Conditions – 1% AEP (2 Sheets)
- 4.8 Indicative Extent and Depth of Inundation – Present Day Conditions – 0.5% AEP (2 Sheets)
- 4.9 Maximum Flow Velocities – Present Day Conditions – 0.5% AEP (2 Sheets)
- 4.10 Indicative Extent and Depth of Inundation – Present Day Conditions – 0.2% AEP (2 Sheets)
- 4.11 Maximum Flow Velocities – Present Day Conditions – 0.2% AEP (2 Sheets)
- 4.12 Indicative Extent and Depth of Inundation – Present Day Conditions – PMF (2 Sheets)
- 4.13 Maximum Flow Velocities – Present Day Conditions – PMF (2 Sheets)
- 4.14 Design Water Surface Profiles

CONTINUED OVER

LIST OF FIGURES (Cont'd)

- 5.1 Layout of Proposed Sports Complex and Assessed Stormwater Drainage Strategy
- 5.2 Indicative Extent and Depth of Inundation – Post-Project Conditions – 20% AEP
- 5.3 Impact of Proposed Sports Complex on Flood Behaviour – 20% AEP
- 5.4 Maximum Flow Velocities – Post-Project Conditions – 20% AEP
- 5.5 Impact of Proposed Sports Complex on Maximum Flow Velocities – 20% AEP
- 5.6 Flood Hazard Vulnerability Classification – Post-Project Conditions – 20% AEP
- 5.7 Indicative Extent and Depth of Inundation – Post-Project Conditions – 5% AEP
- 5.8 Impact of Proposed Sports Complex on Flood Behaviour – 5% AEP
- 5.9 Maximum Flow Velocities – Post-Project Conditions – 5% AEP
- 5.10 Impact of Proposed Sports Complex on Maximum Flow Velocities – 5% AEP
- 5.11 Flood Hazard Vulnerability Classification – Post-Project Conditions – 5% AEP
- 5.12 Indicative Extent and Depth of Inundation – Post-Project Conditions – 1% AEP
- 5.13 Impact of Proposed Sports Complex on Flood Behaviour – 1% AEP
- 5.14 Maximum Flow Velocities – Post-Project Conditions – 1% AEP
- 5.15 Impact of Proposed Sports Complex on Maximum Flow Velocities – 1% AEP
- 5.16 Flood Hazard Vulnerability Classification – Post-Project Conditions – 1% AEP
- 5.17 Indicative Extent and Depth of Inundation – Post-Project Conditions – 0.5% AEP
- 5.18 Impact of Proposed Sports Complex on Flood Behaviour – 0.5% AEP
- 5.19 Maximum Flow Velocities – Post-Project Conditions – 0.5% AEP
- 5.20 Impact of Proposed Sports Complex on Maximum Flow Velocities – 0.5% AEP
- 5.21 Flood Hazard Vulnerability Classification – Post-Project Conditions – 0.5% AEP
- 5.22 Indicative Extent and Depth of Inundation – Post-Project Conditions – 0.2% AEP
- 5.23 Impact of Proposed Sports Complex on Flood Behaviour – 0.2% AEP
- 5.24 Maximum Flow Velocities – Post-Project Conditions – 0.2% AEP
- 5.25 Impact of Proposed Sports Complex on Maximum Flow Velocities – 0.2% AEP
- 5.26 Flood Hazard Vulnerability Classification – Post-Project Conditions – 0.2% AEP
- 5.27 Indicative Extent and Depth of Inundation – Post-Project Conditions – PMF
- 5.28 Impact of Proposed Sports Complex on Flood Behaviour – PMF
- 5.29 Maximum Flow Velocities – Post-Project Conditions – PMF
- 5.30 Impact of Proposed Sports Complex on Maximum Flow Velocities – PMF
- 5.31 Flood Hazard Vulnerability Classification – Post-Project Conditions – PMF
- 5.32 Sensitivity Analysis – Impact of Reduction in Continuing Loss Rate on Flood Behaviour – Post-Project Conditions – 1% AEP
- 5.33 Sensitivity Analysis – Impact of Reduction in Continuing Loss Rate on Maximum Flow Velocities – Post-Project Conditions – 1% AEP





N

40 0 40 80 120 m

Scale: 1:4,000

Lyall & Associates

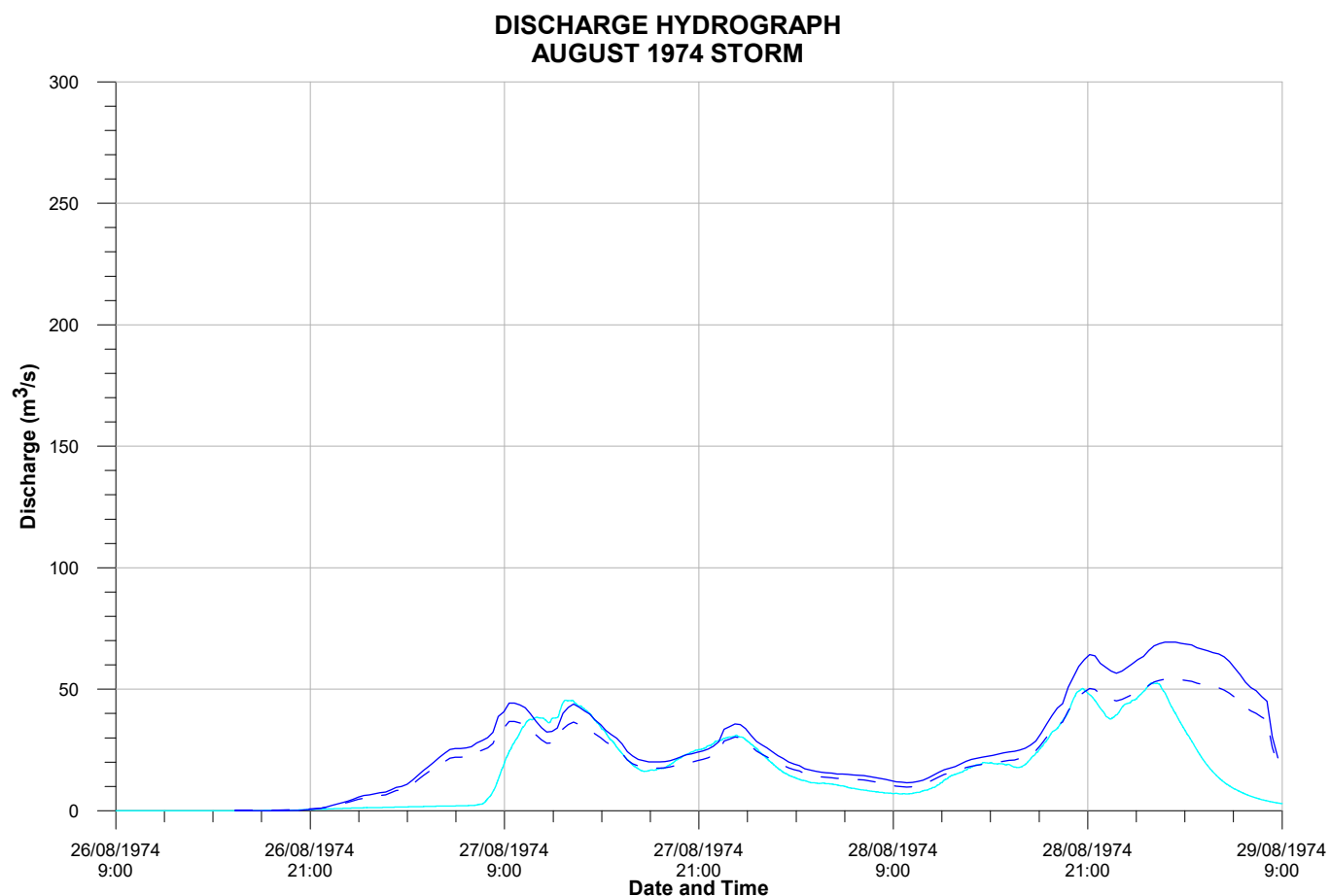
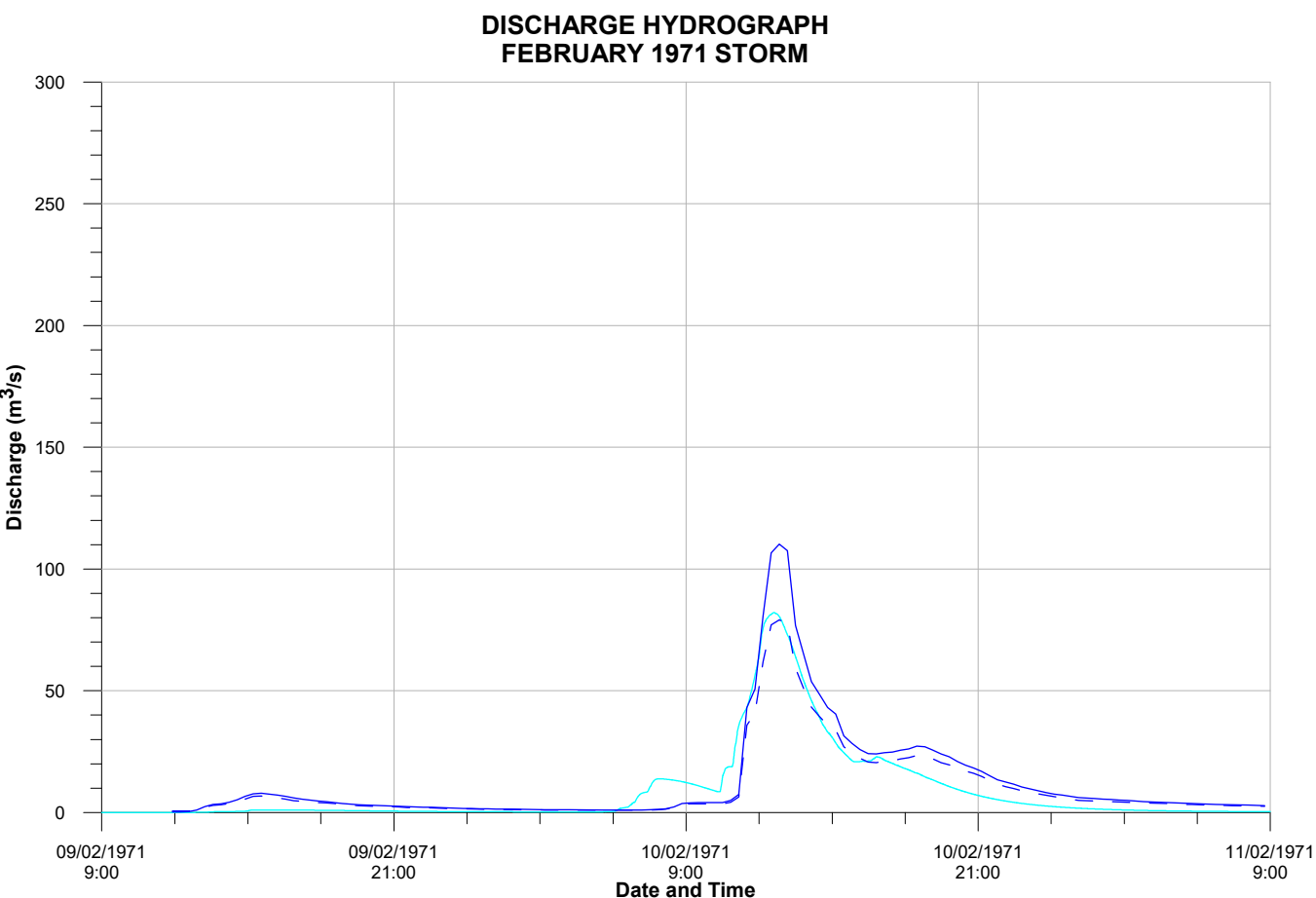
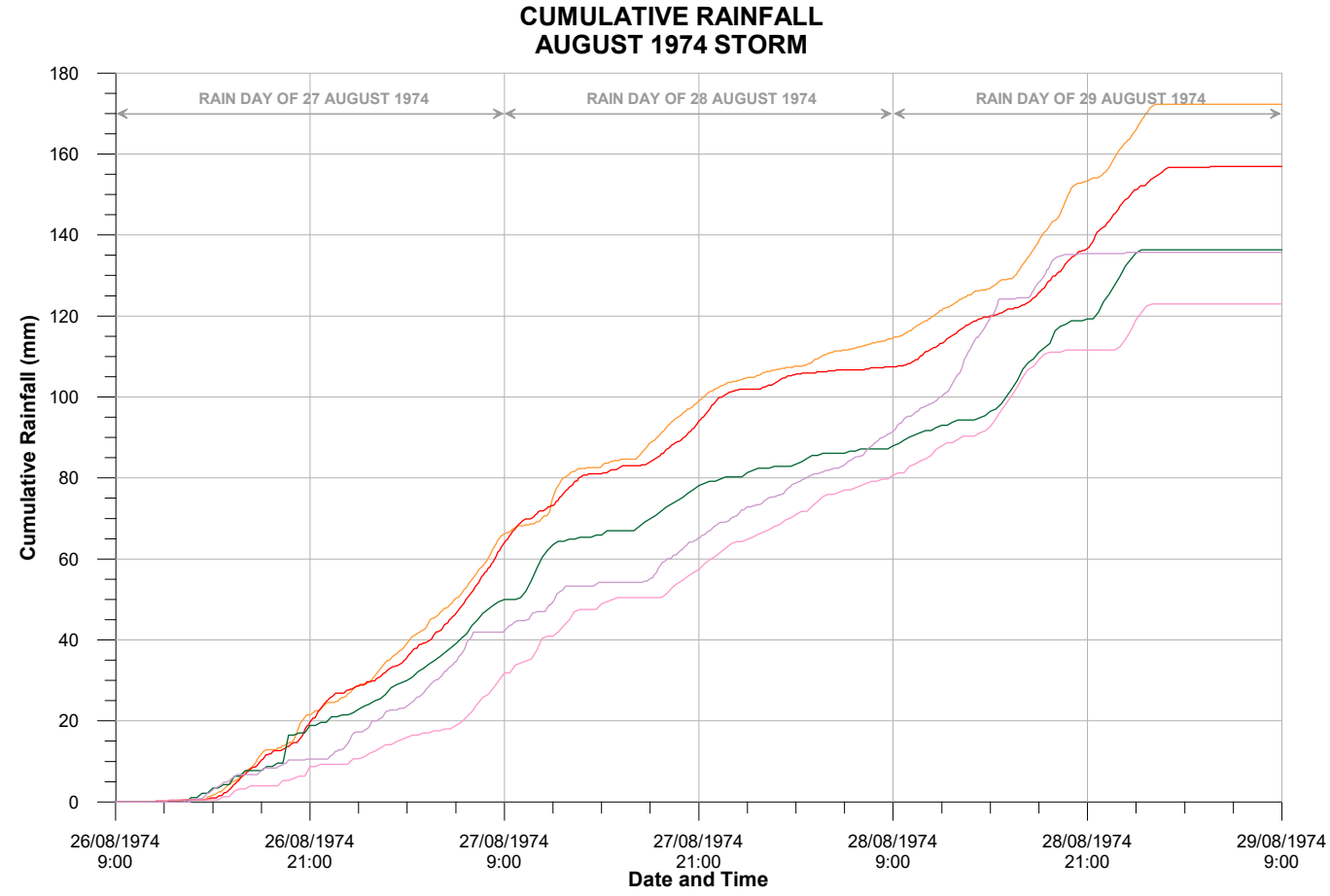
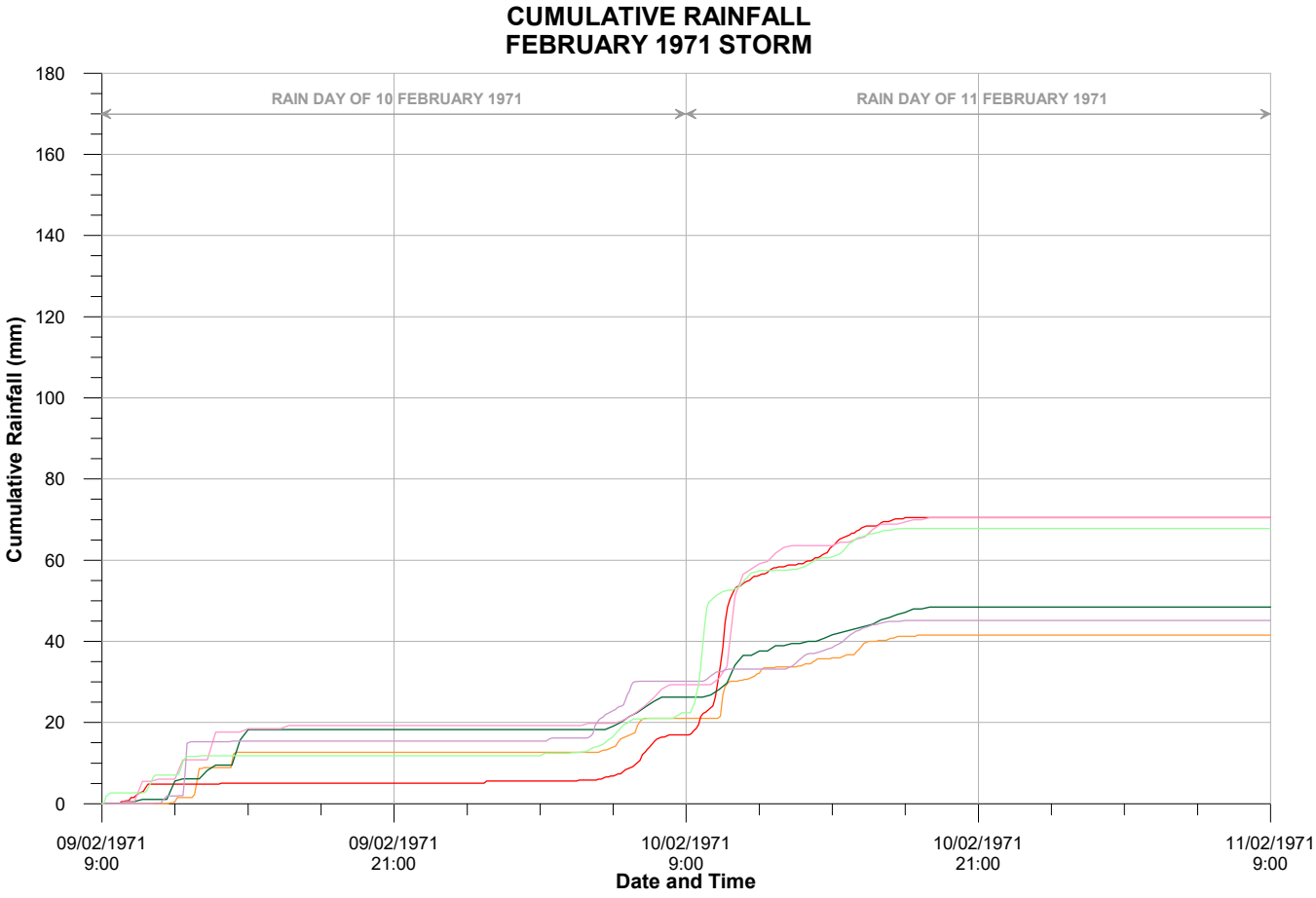
LEGEND

	Bridge		NER2 Design Strings
	Existing Drainage Network		Proposed Sports Complex Boundary
			Extent of Detailed Ground Survey

**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**

Figure 2.1

EXISTING DRAINAGE SYSTEM
IN VICINITY OF PROPOSED SPORTS COMPLEX

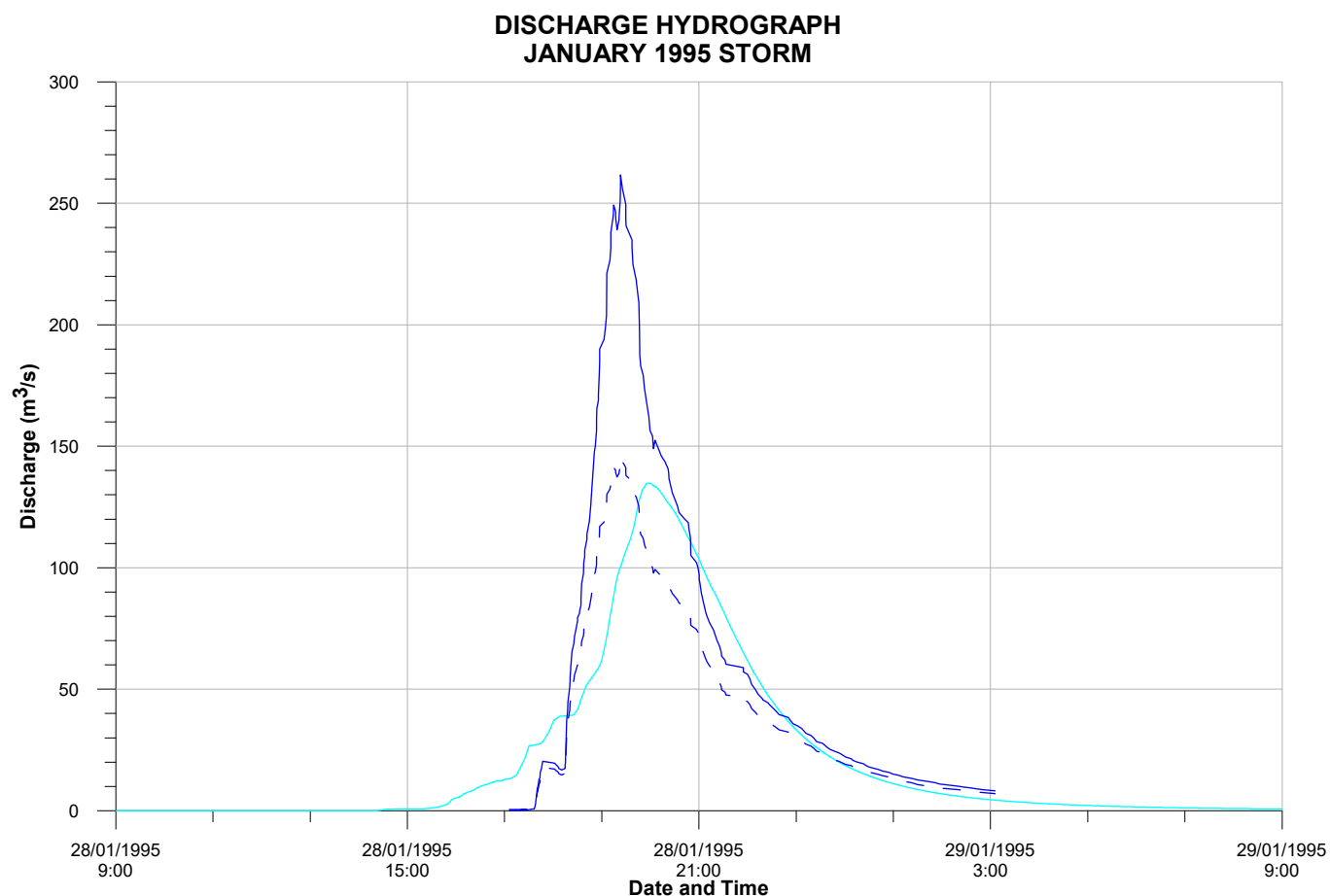
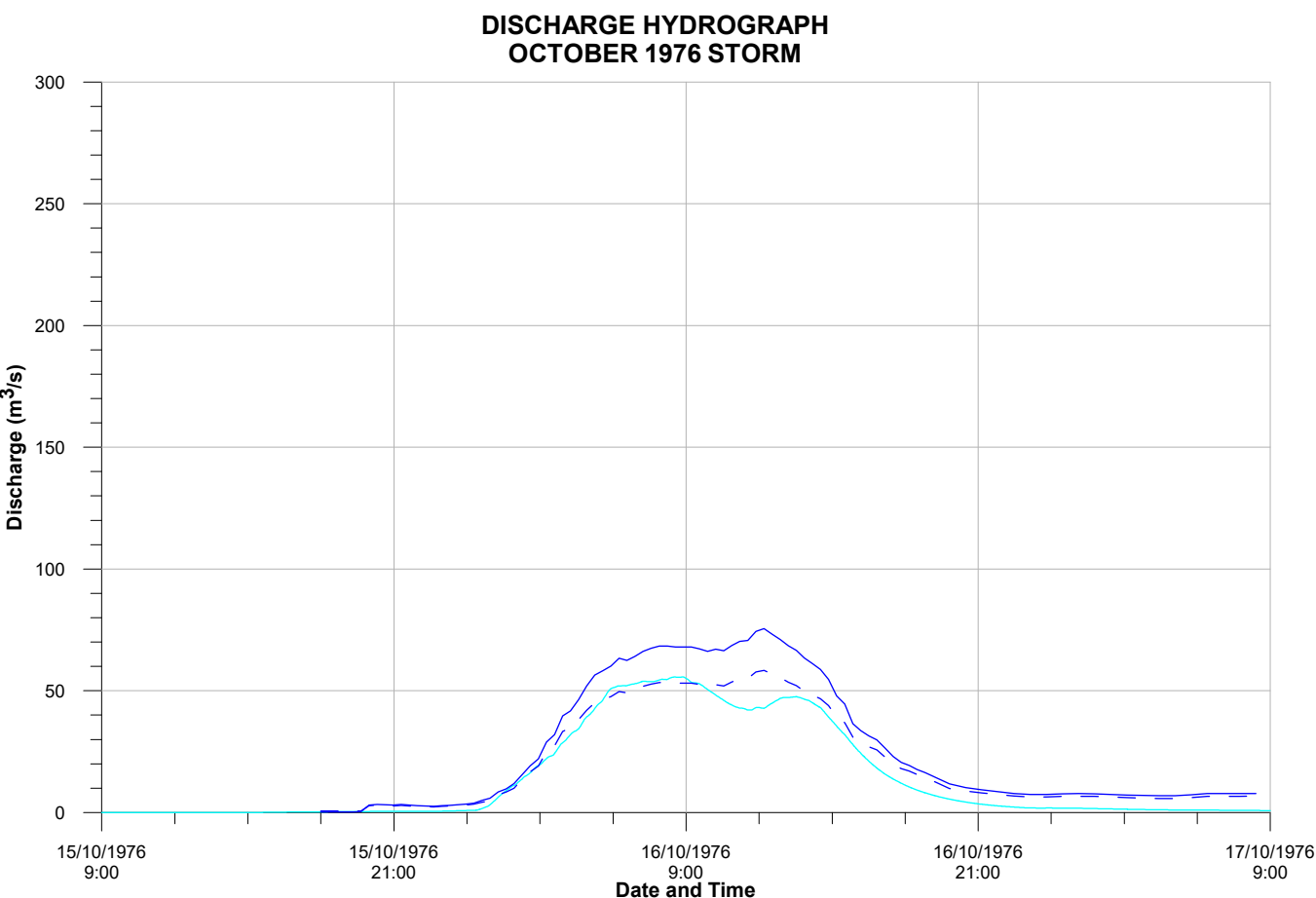
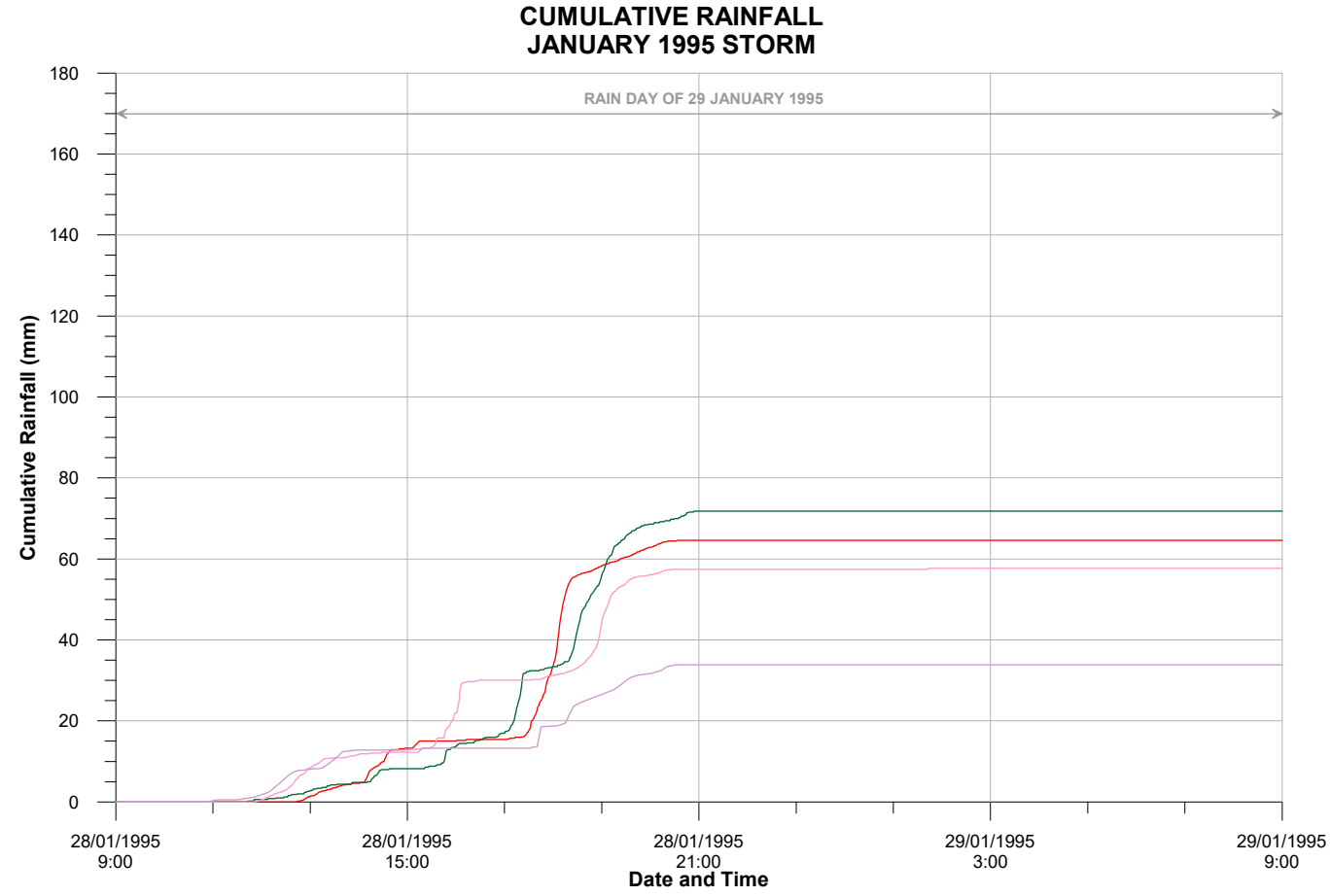
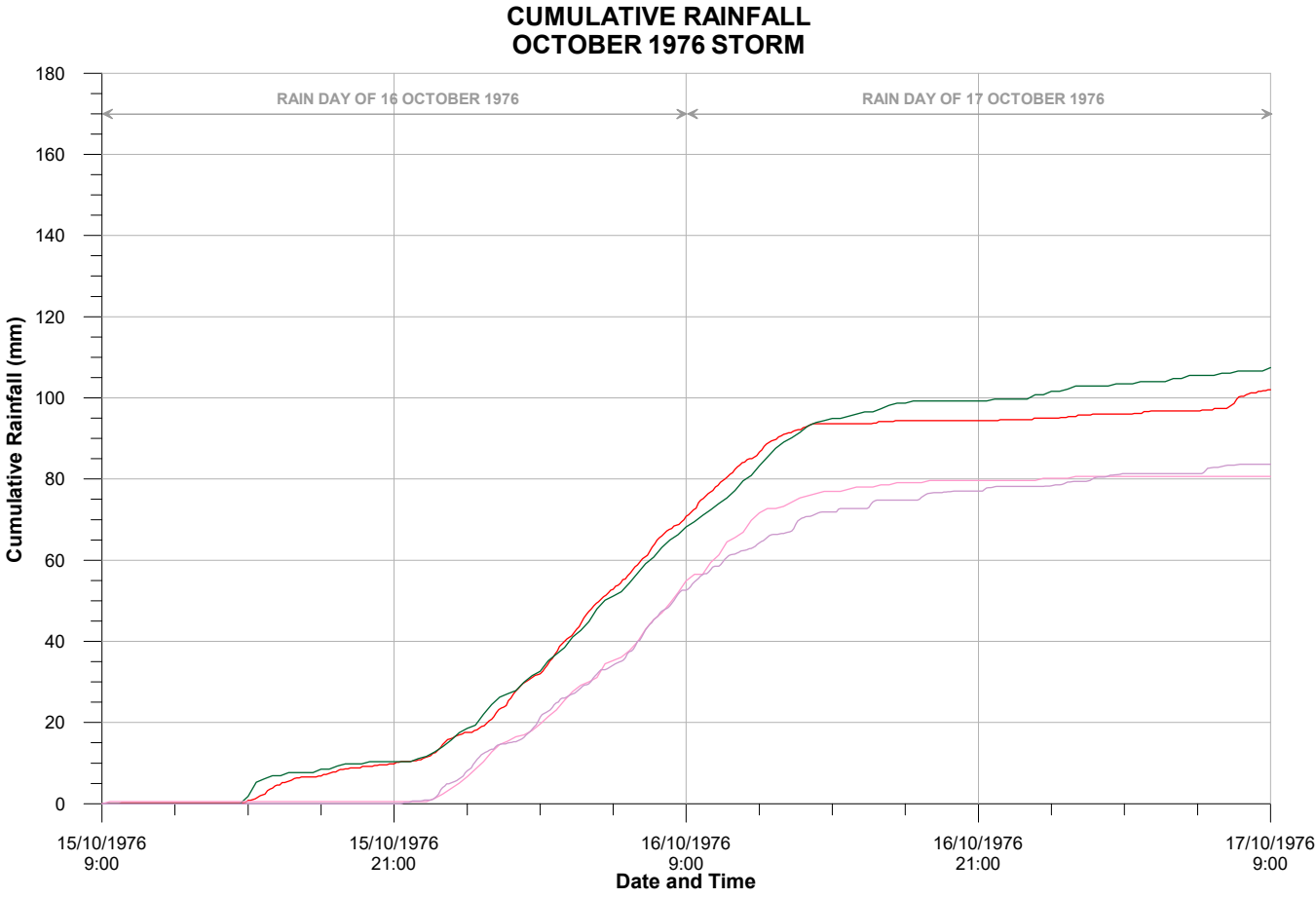


- | STREAM GAUGE DATA | | RAIN GAUGE DATA | | | |
|-------------------|---|-----------------|--|---|--|
| — | Recorded (EPSDD Rating Curve) | — | Gudgenby River at Tennet (GS 570970) | — | Googong at Queanbeyan (GS 570914) |
| - - | Recorded (L&A Derived Rating Curve) | — | Jerrabomberra at Four Mile Creek (GS 570973) | — | Canberra Airport Comparison (GS 70014) |
| — | Modelled (Jerrabomberra Creek DRAINS Model) | — | Long Gully Creek at Phillip (GS 570977) | — | Canberra Forestry (GS 70015) |

**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**

Figure 2.2
(Sheet 1 of 2)

CUMULATIVE RAINFALL AND DISCHARGE HYDROGRAPHS
FOR HISTORIC STORM EVENTS

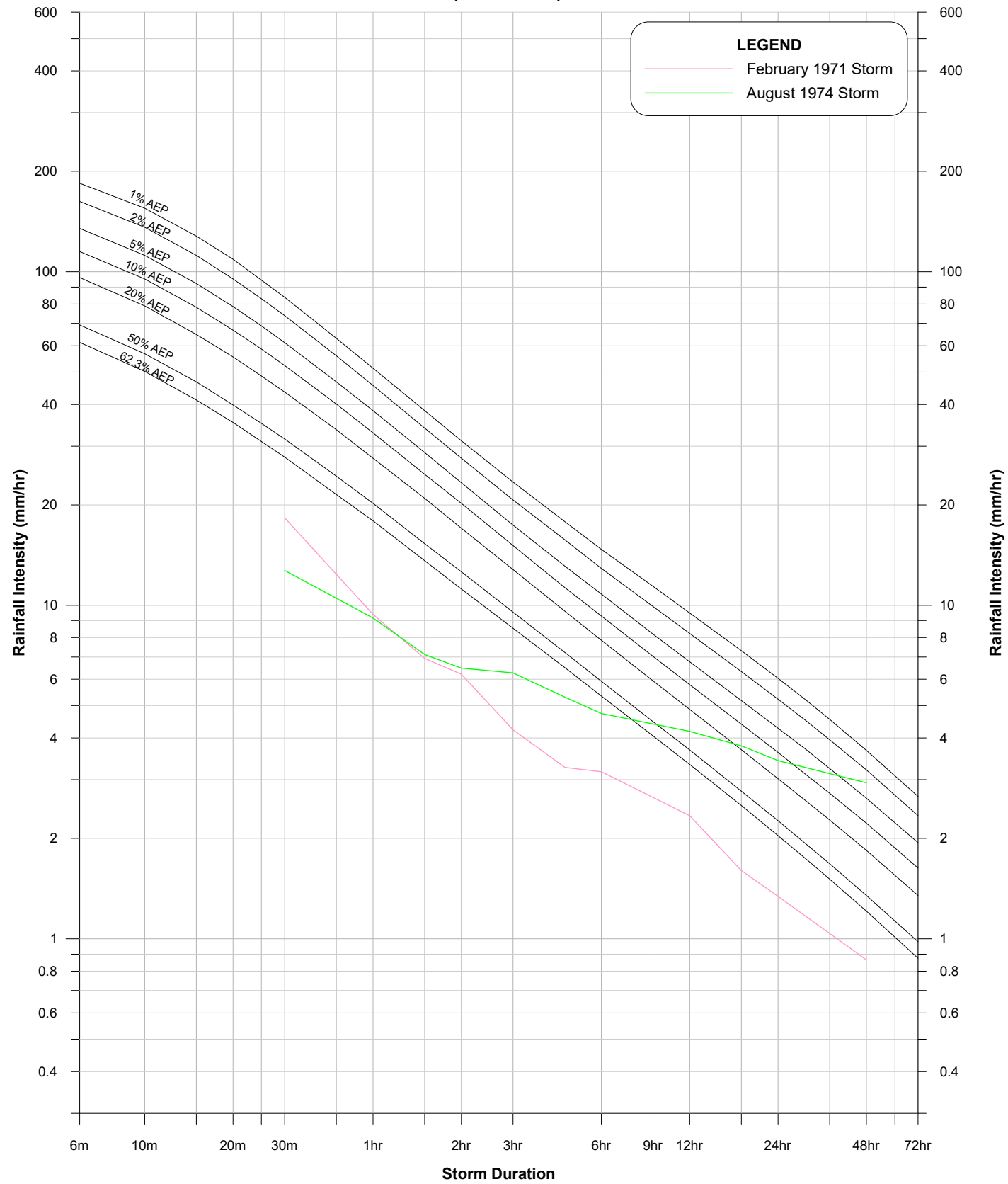


- | STREAM GAUGE DATA | | RAIN GAUGE DATA | | | |
|-------------------|---|-----------------|--|---|---|
| — | Recorded (EPSDD Rating Curve) | — | Gudgenby River at Tennet (GS 570970) | — | Long Gully Creek at Phillip (GS 570977) |
| - - | Recorded (L&A Derived Rating Curve) | — | Jerrabomberra at Four Mile Creek (GS 570973) | — | Canberra Airport Comparison (GS 70014) |
| — | Modelled (Jerrabomberra Creek DRAINS Model) | | | | |

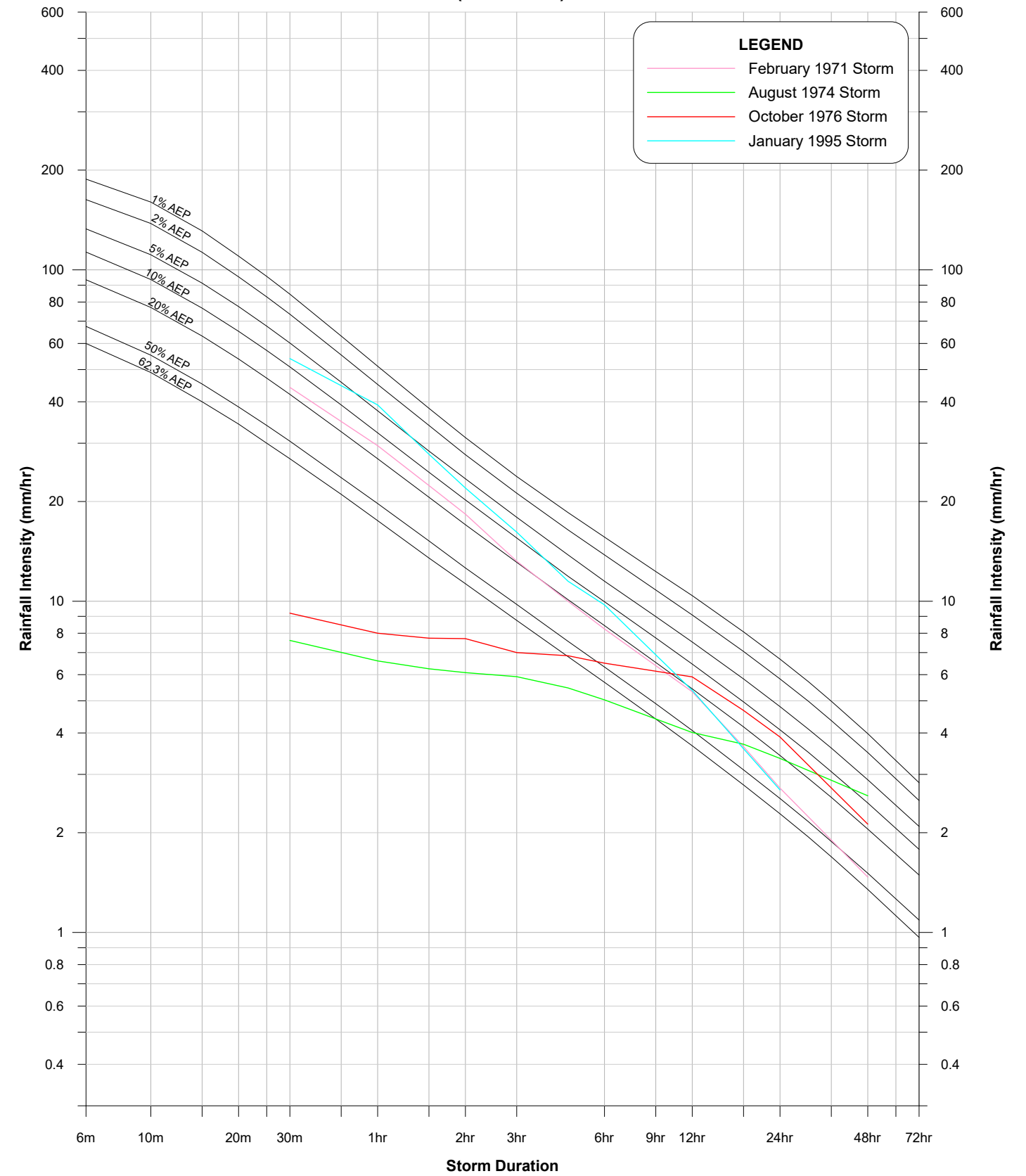
**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**

Figure 2.2
(Sheet 2 of 2)
CUMULATIVE RAINFALL AND DISCHARGE HYDROGRAPHS
FOR HISTORIC STORM EVENTS

**GOOGONG AT QUEANBEYAN
(GS 570914)**



**GUDGENBY RIVER AT TENNET
(GS 570970)**

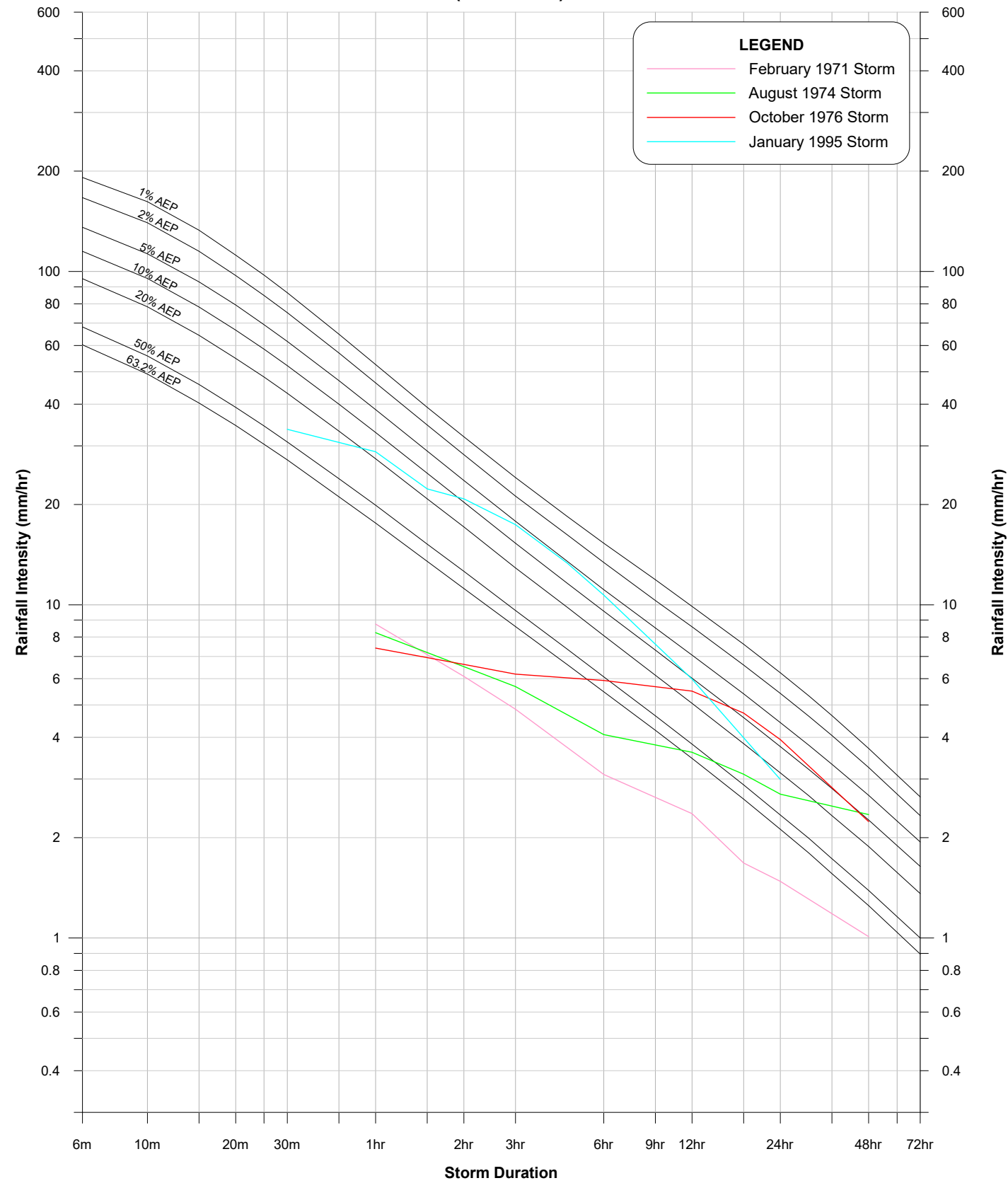


**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**

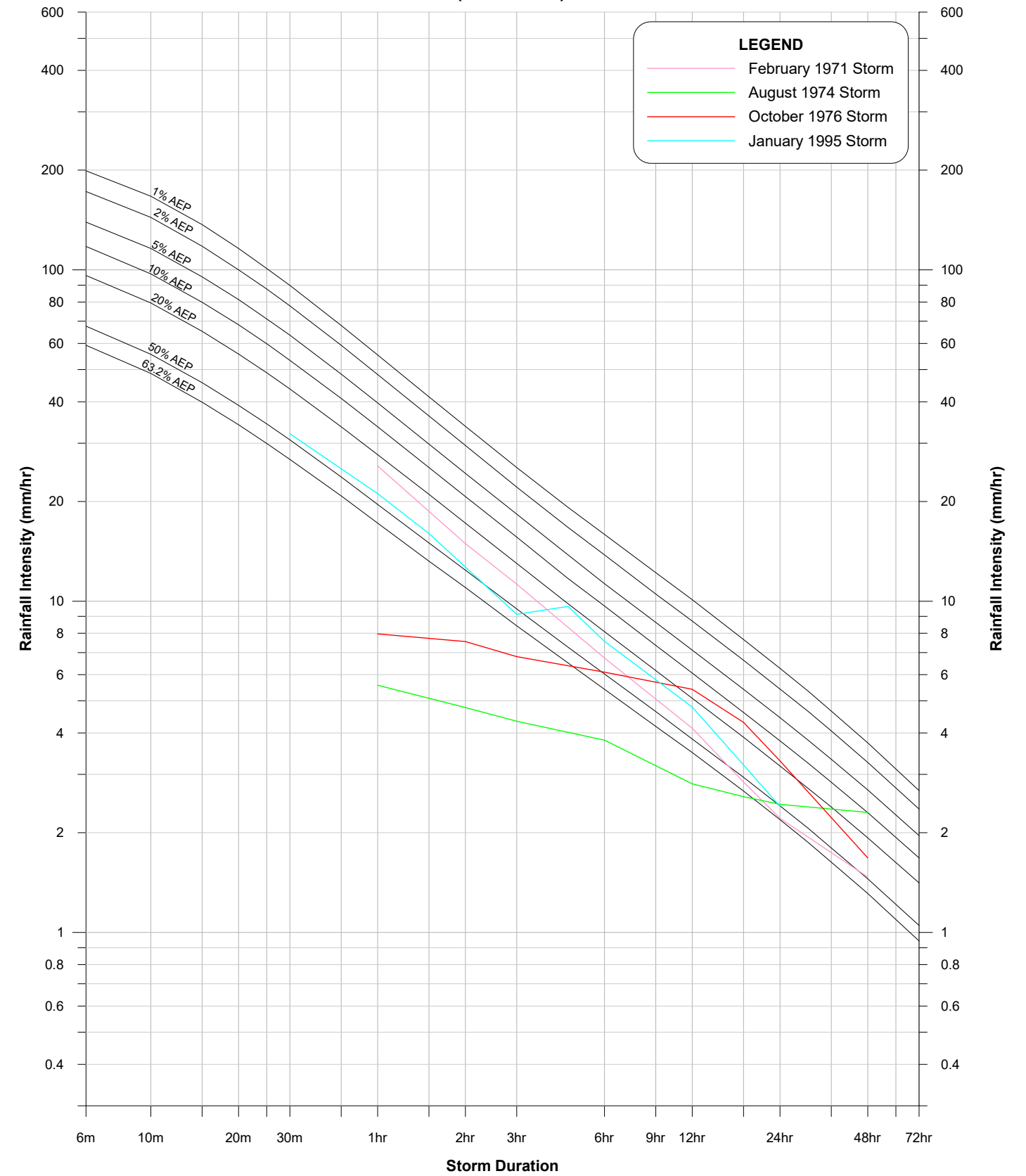
Figure 2.3
(Sheet 1 of 3)

INTENSITY-FREQUENCY-DURATION CURVES
AND HISTORIC RAINFALL

JERRABOMBERRA AT FOUR MILE CREEK (GS 570973)



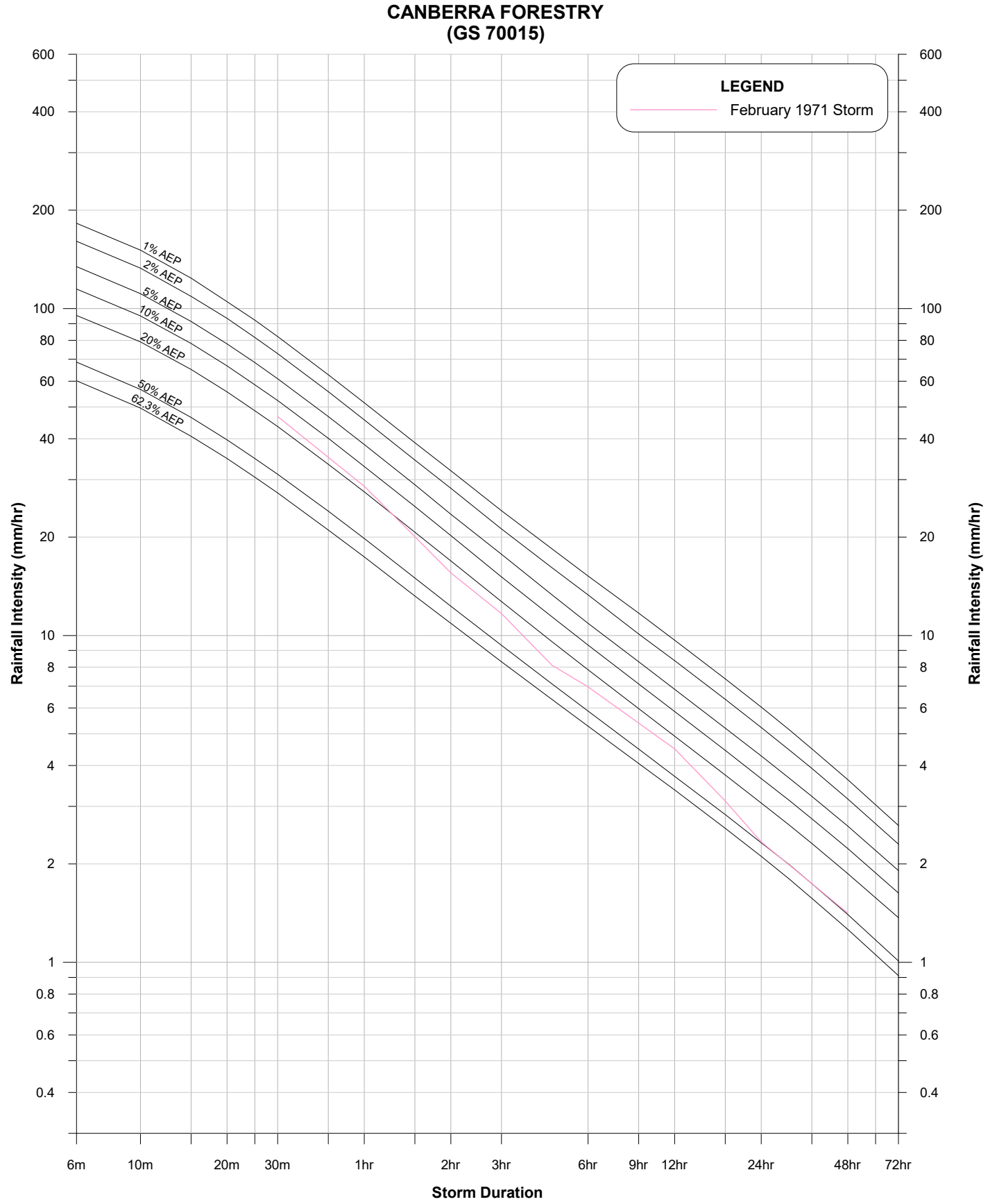
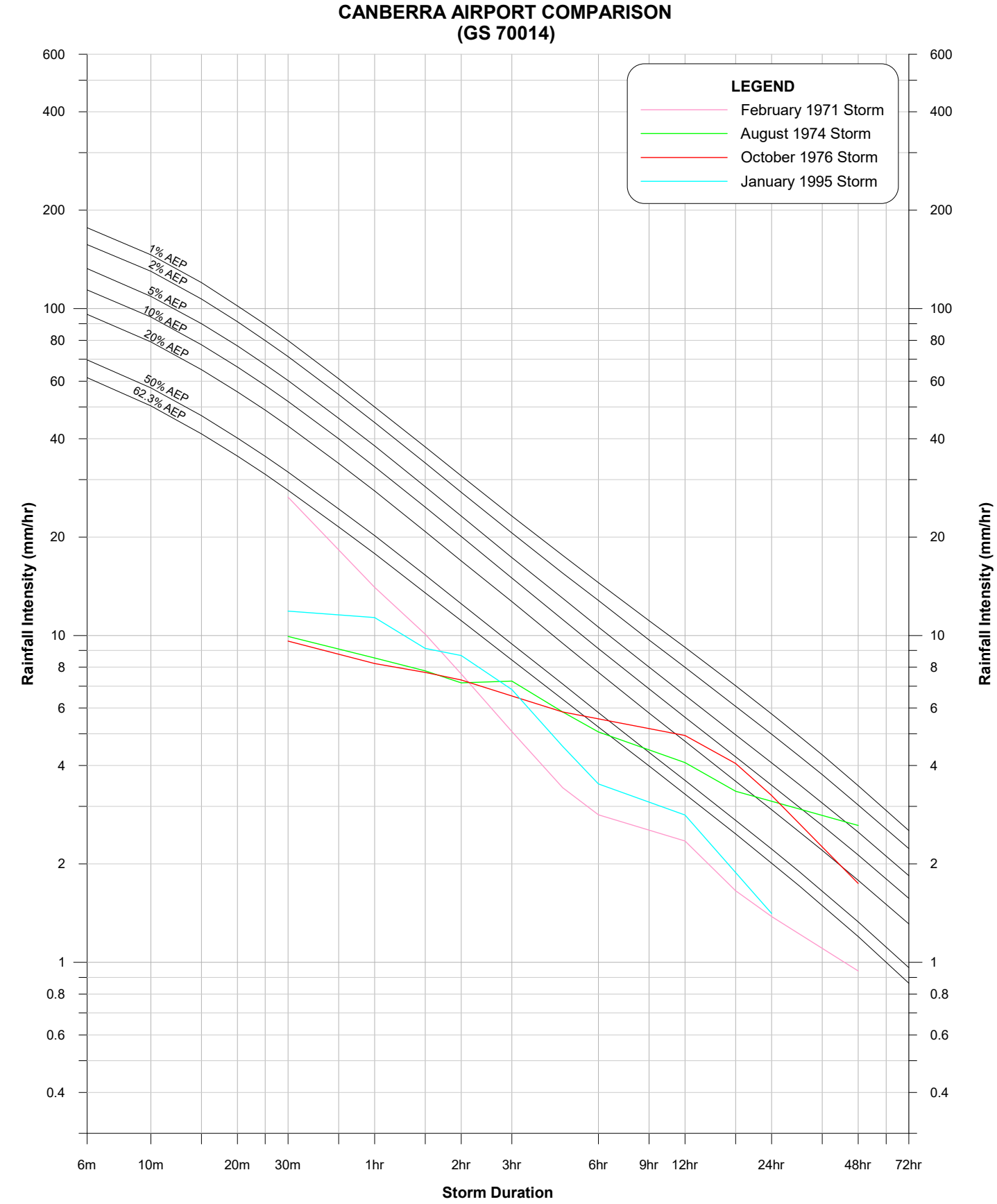
LONG GULLY CREEK AT PHILLIP (GS 570977)



JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX FLOODING AND DRAINAGE INVESTIGATION

Figure 2.3
(Sheet 2 of 3)

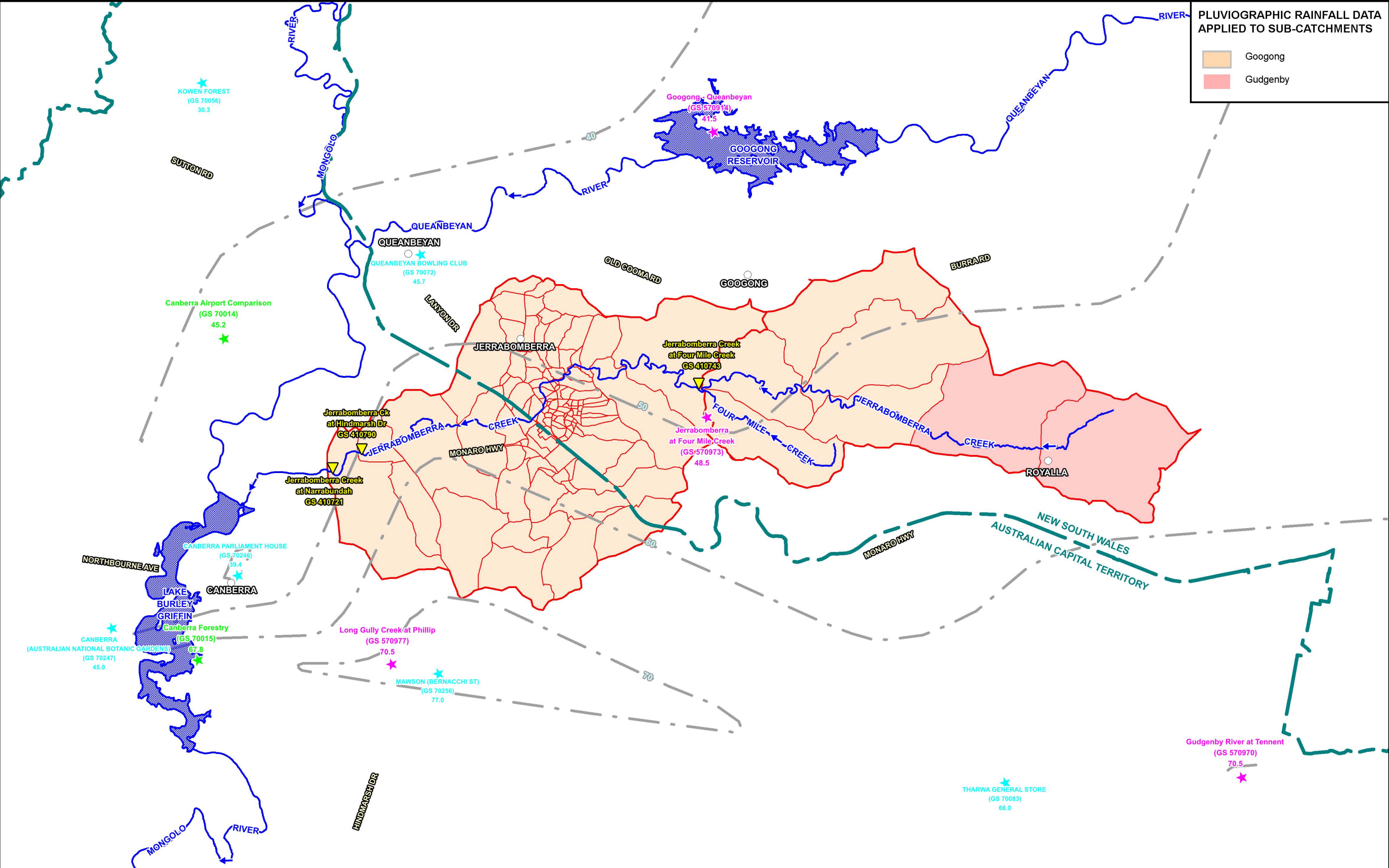
INTENSITY-FREQUENCY-DURATION CURVES
AND HISTORIC RAINFALL

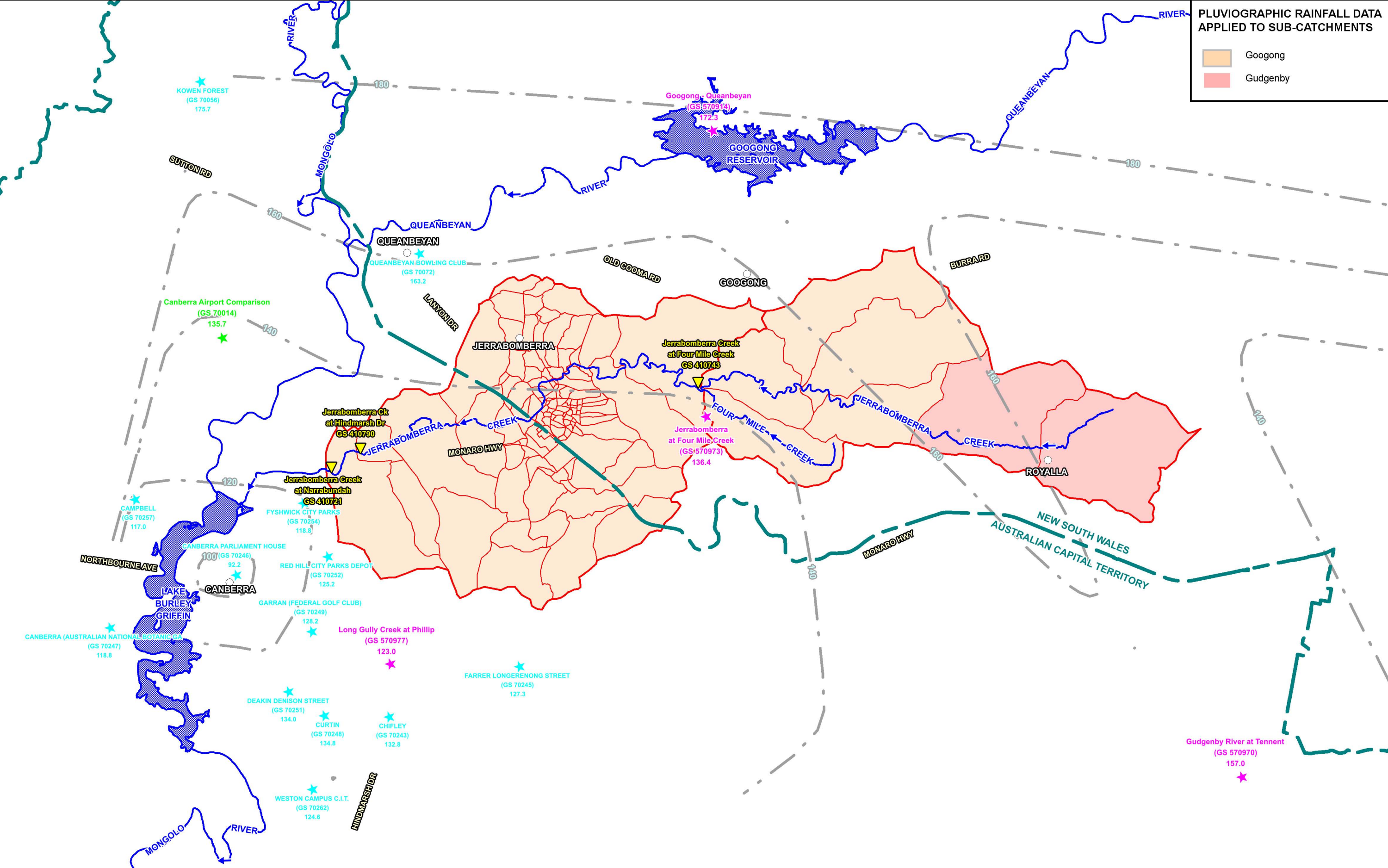


**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**



Figure 2.3
(Sheet 3 of 3)
INTENSITY-FREQUENCY-DURATION CURVES
AND HISTORIC RAINFALL





1,000 0 1,000 2,000 3,000 m
Scale: 1:100,000

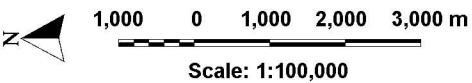
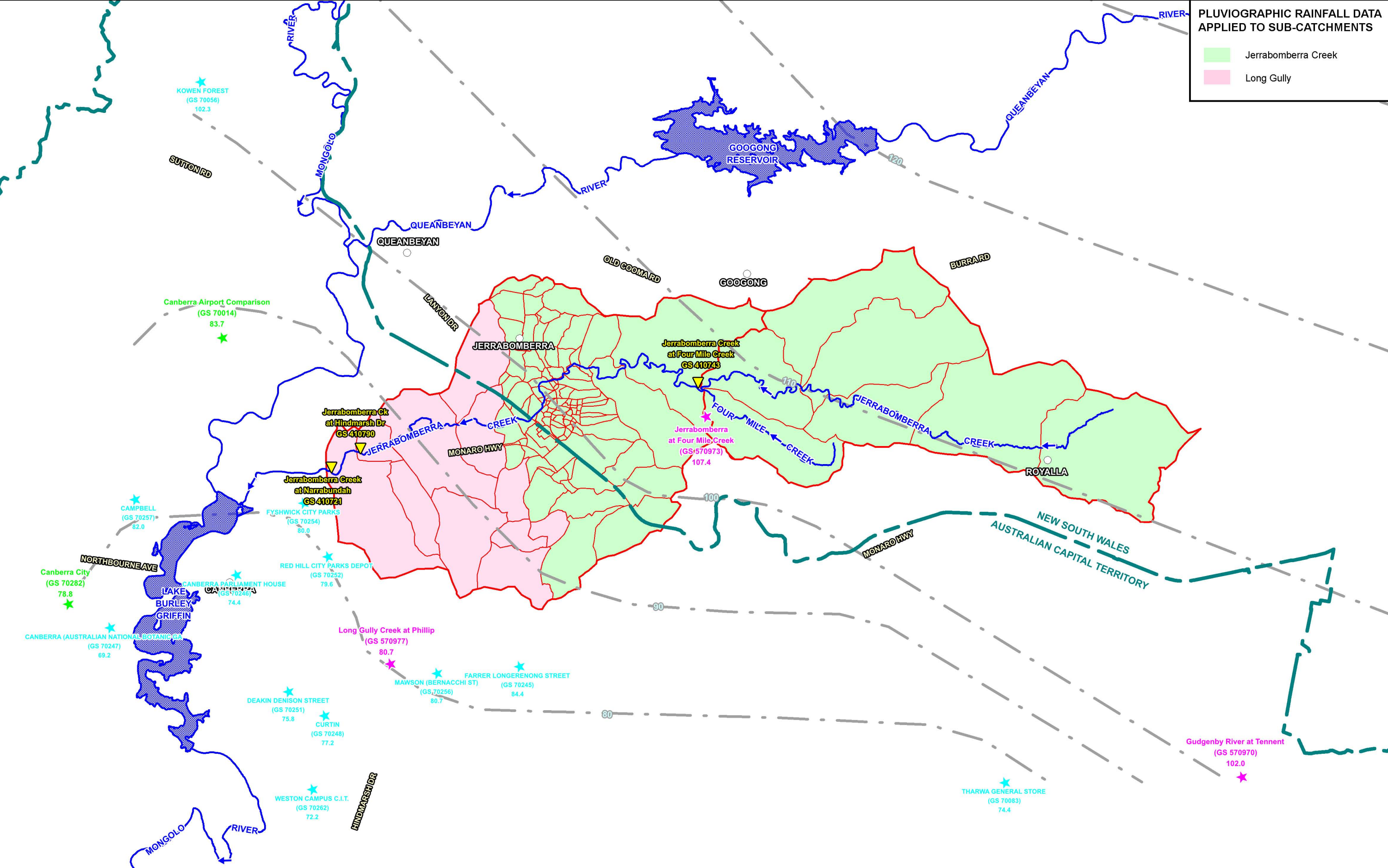
Lyall & Associates

- LEGEND**
- Catchment Boundary
 - Sub-Catchment Boundary
 - EPSDD Stream Gauge
 - All Weather Stations and Recorded Depth (BoM)
 - Daily Rainfall Station and Recorded Depth (BoM)
 - EPSDD Pluviographic Rainfall Station and Recorded Depth

**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**

Figure 2.5

ISOHYETAL MAP
RAIN DAYS OF 27 - 29 AUGUST 1974



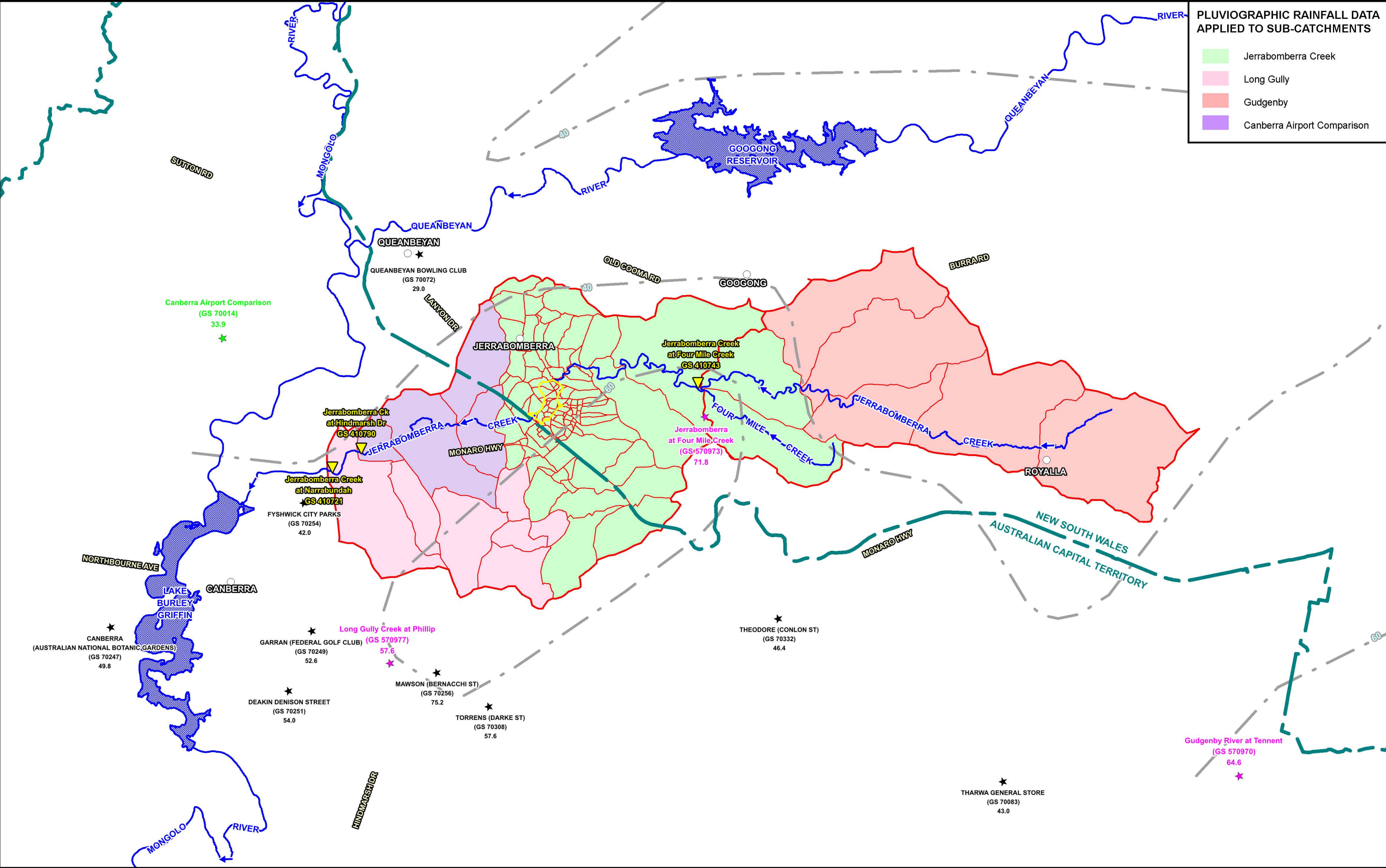
Lyall & Associates

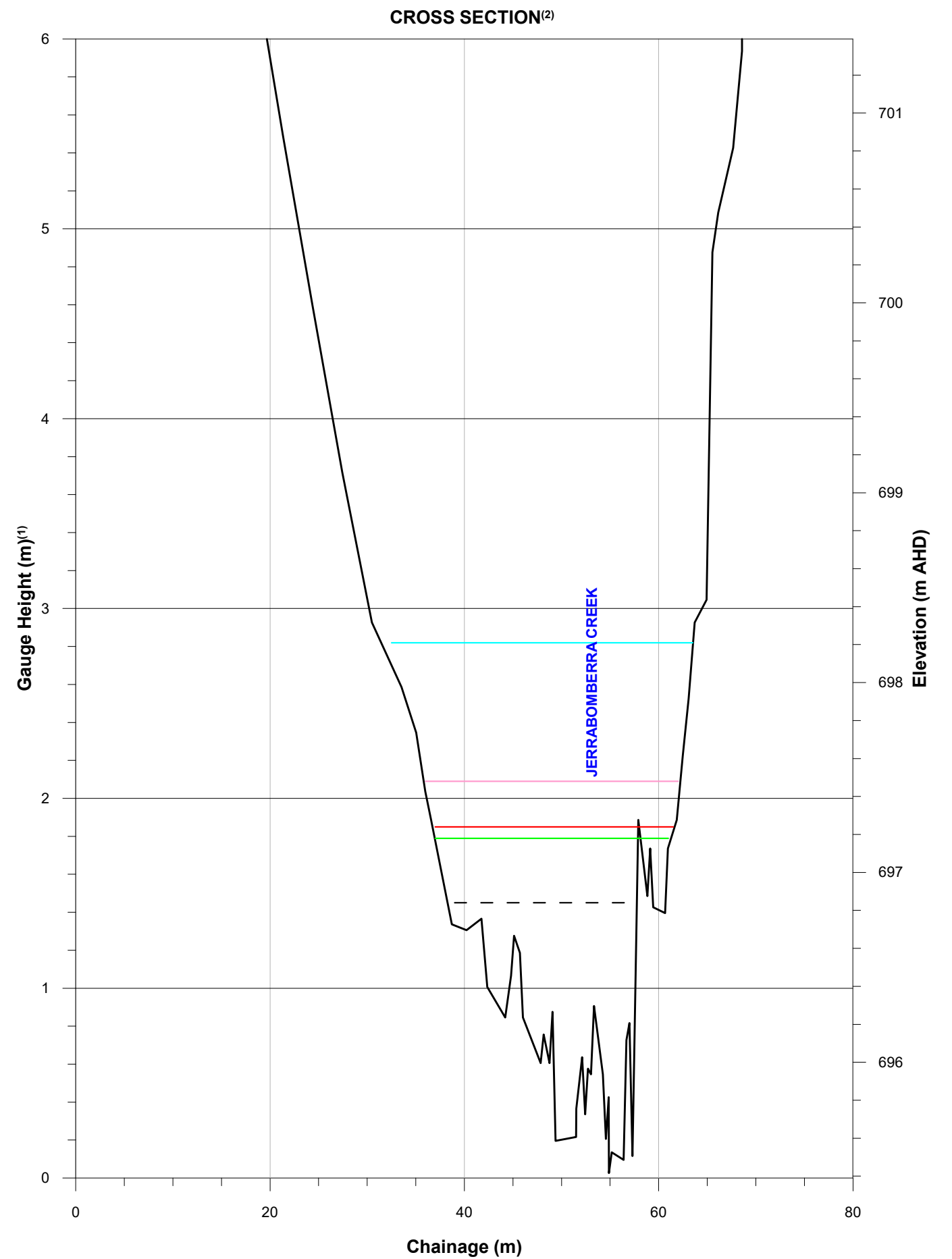
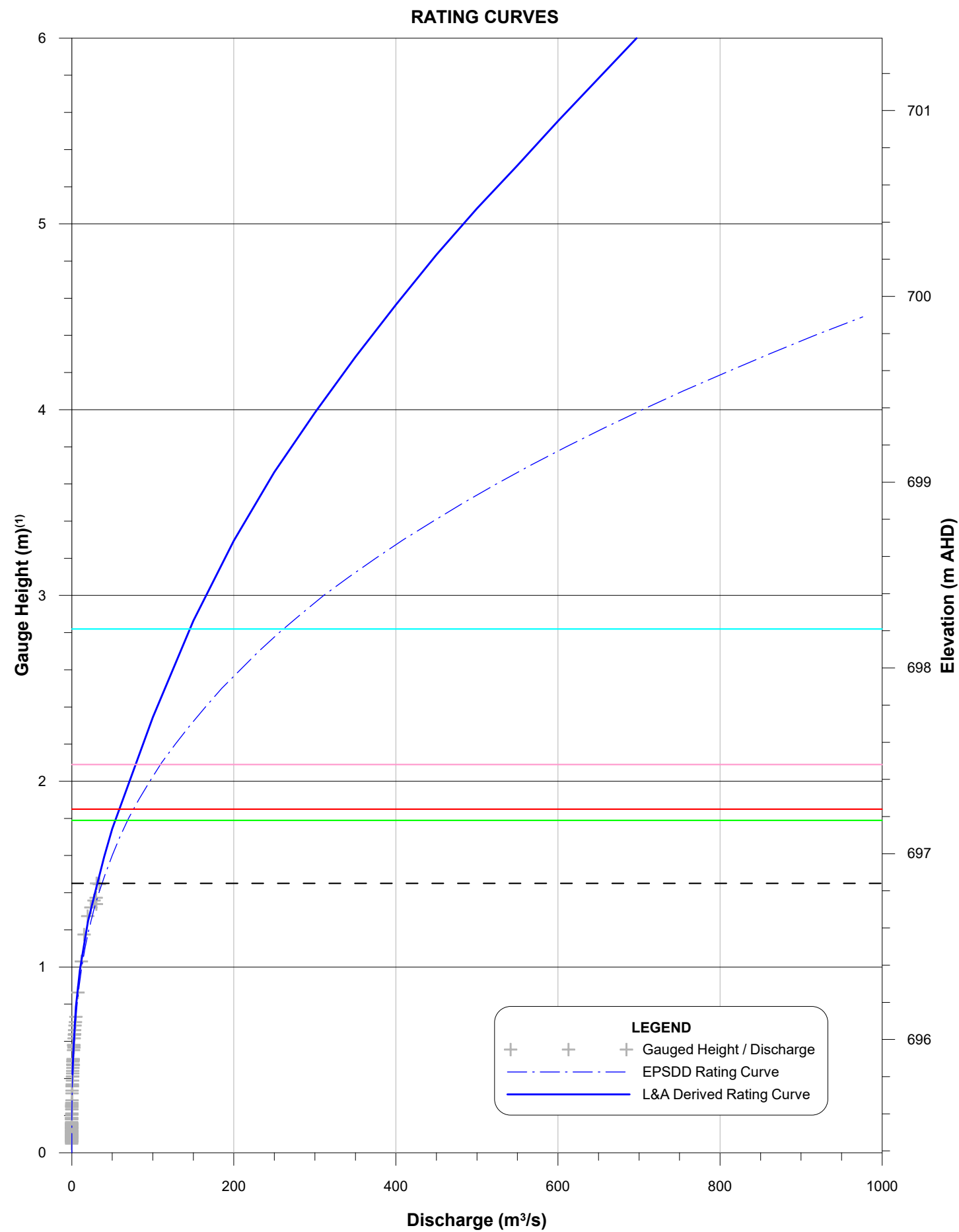
- LEGEND**
- Catchment Boundary
 - Sub-Catchment Boundary
 - EPSDD Stream Gauge
 - All Weather Stations and Recorded Depth (BoM)
 - Daily Rainfall Station and Recorded Depth (BoM)
 - EPSDD Pluviographic Rainfall Station and Recorded Depth

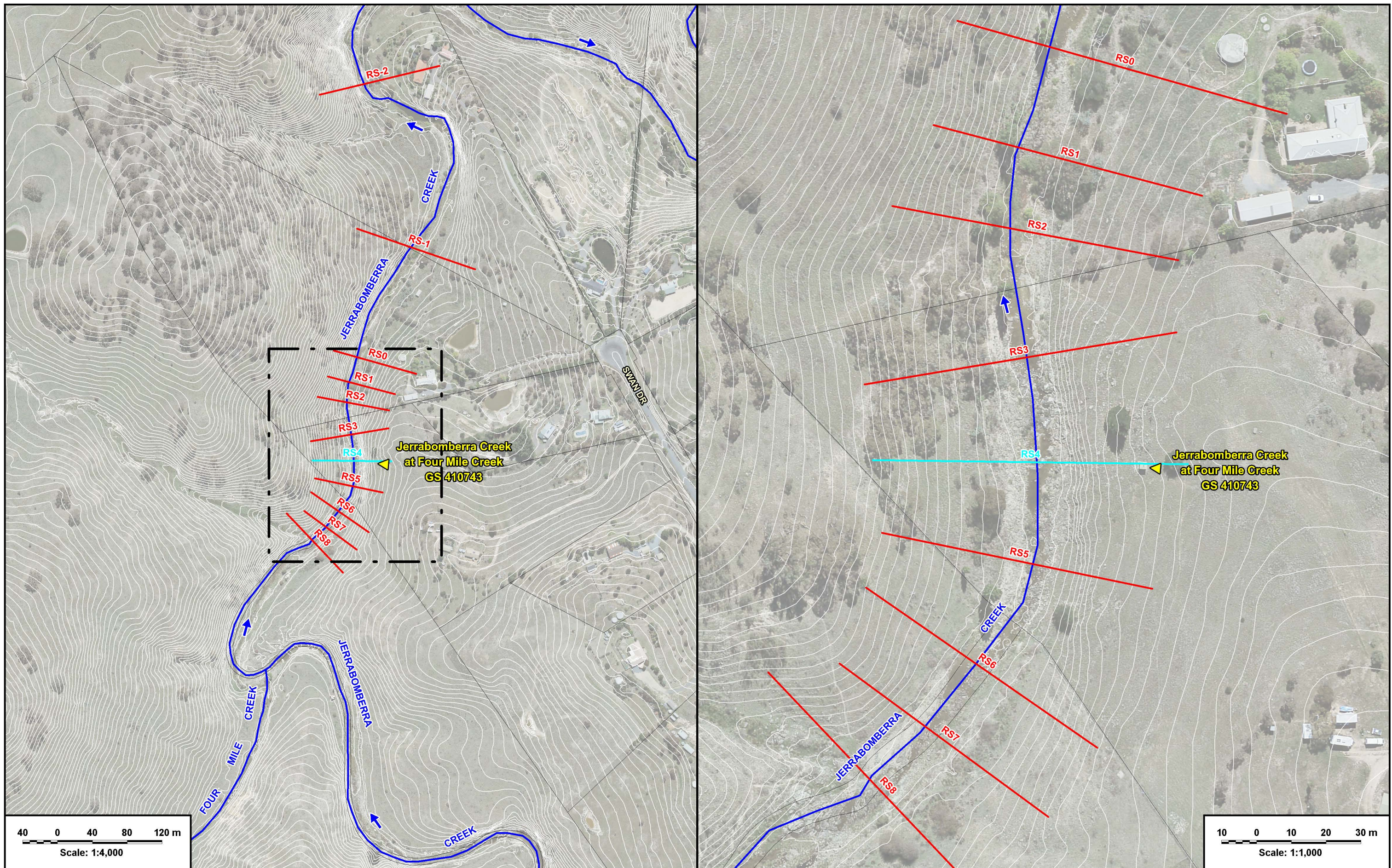
**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**

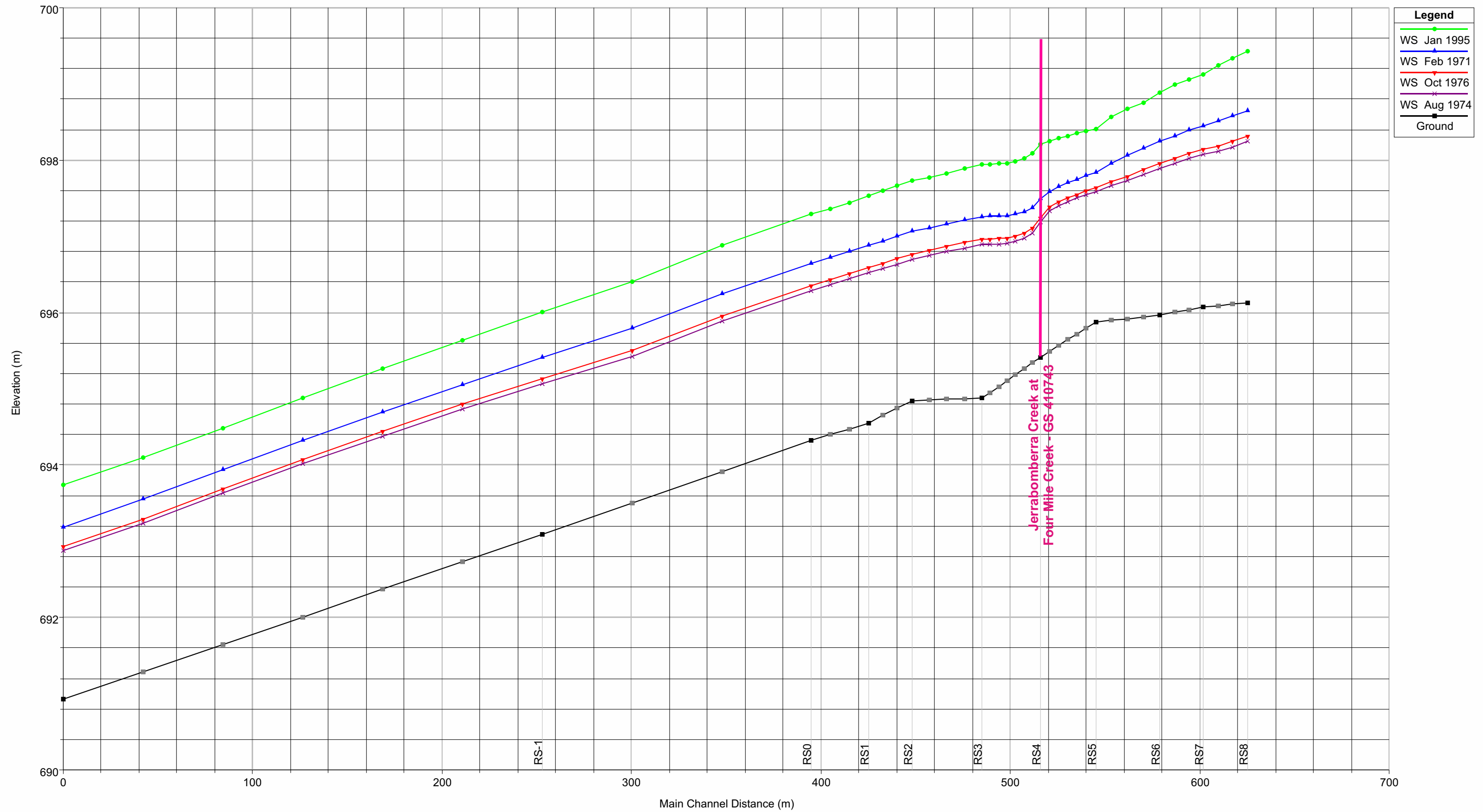
Figure 2.6

ISOHYETAL MAP
RAIN DAYS OF 16 - 17 OCTOBER 1976



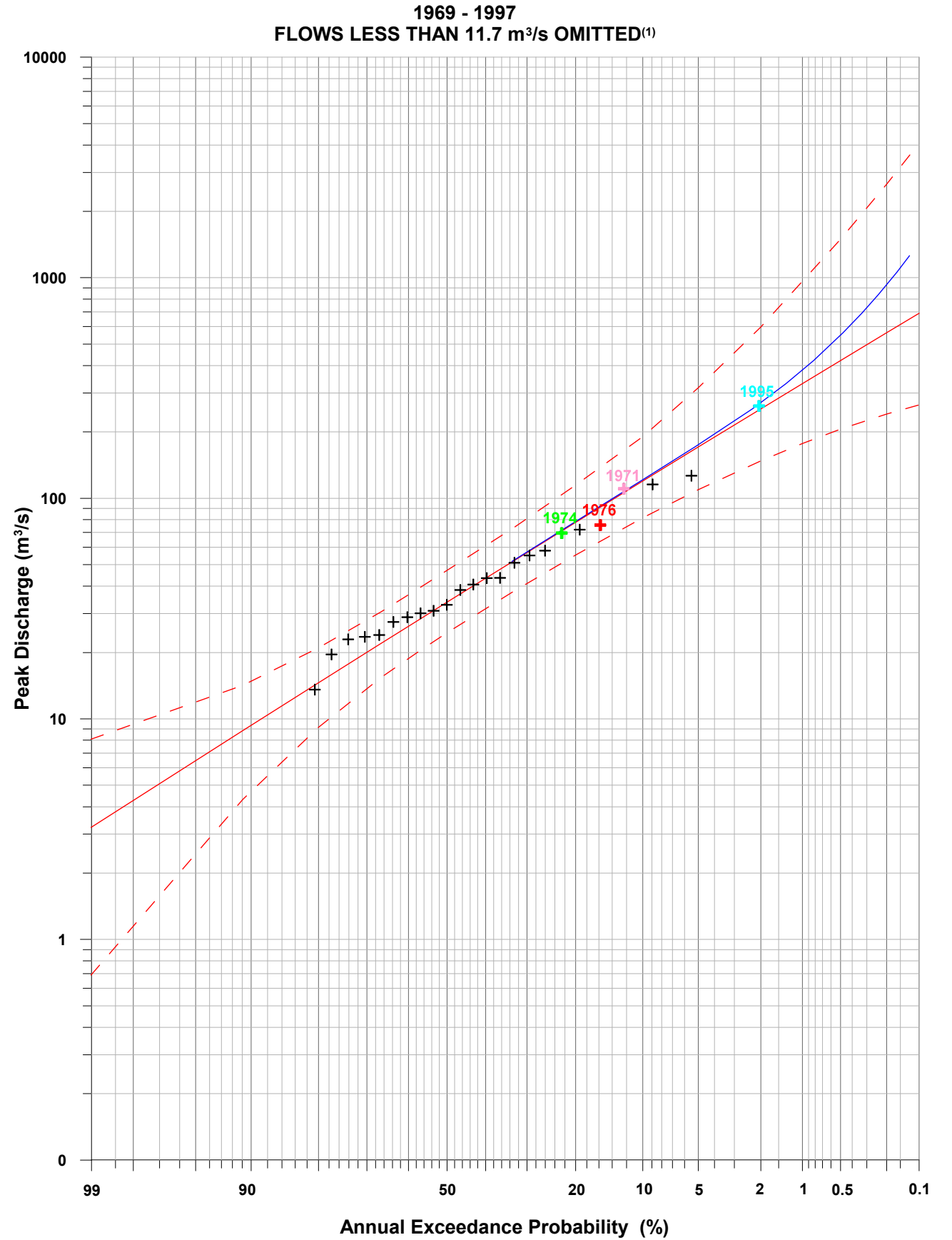
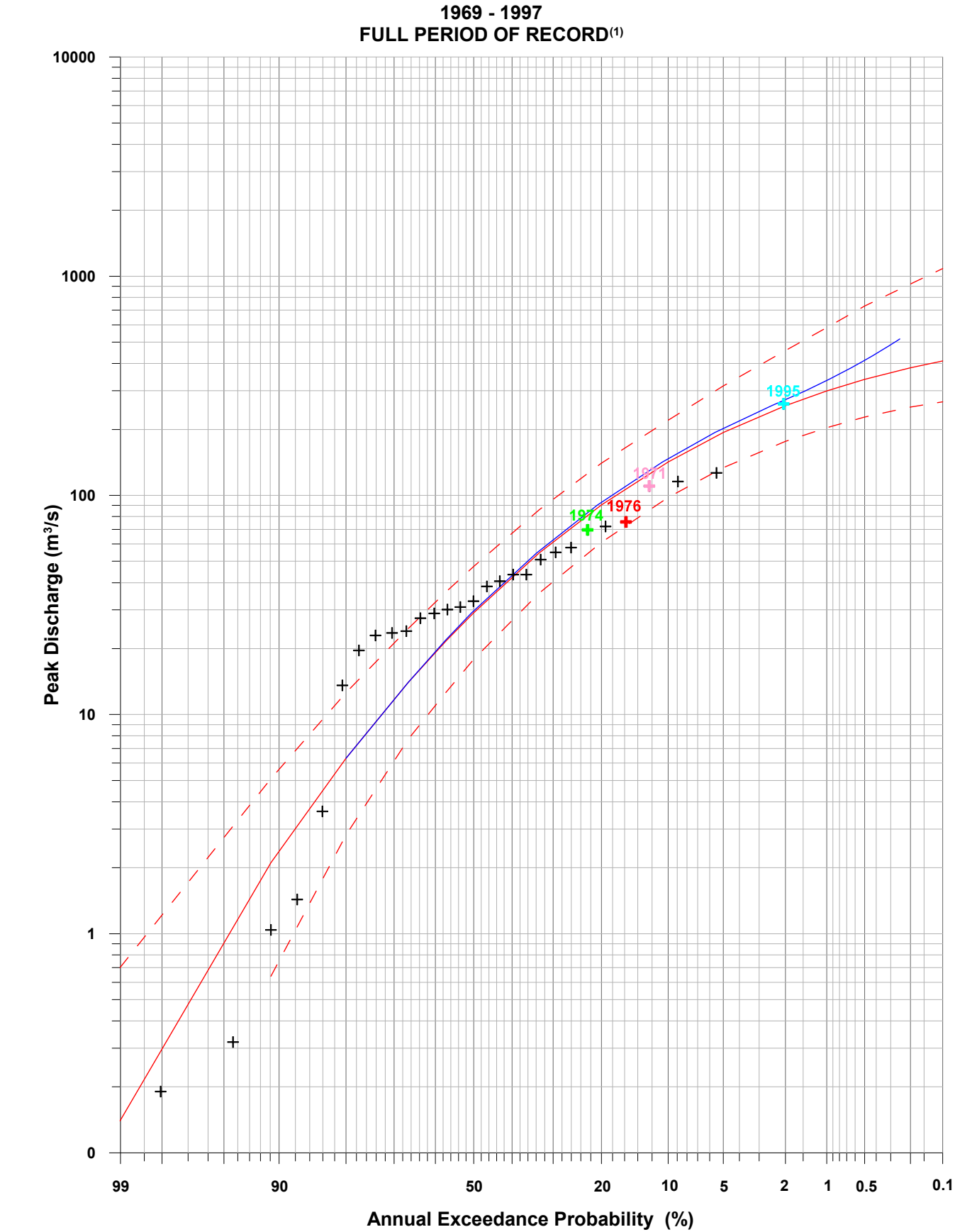






**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**

Figure 2.10



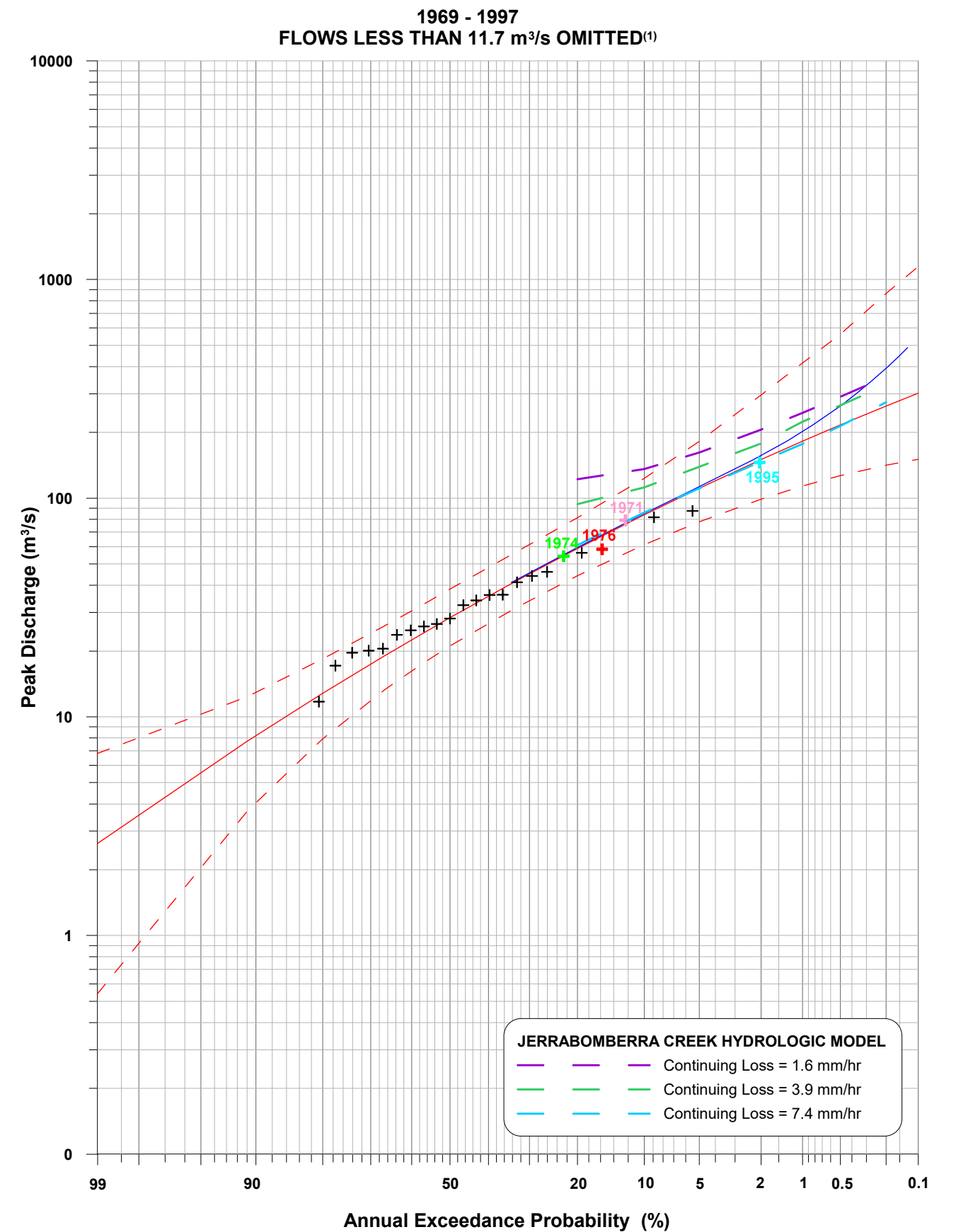
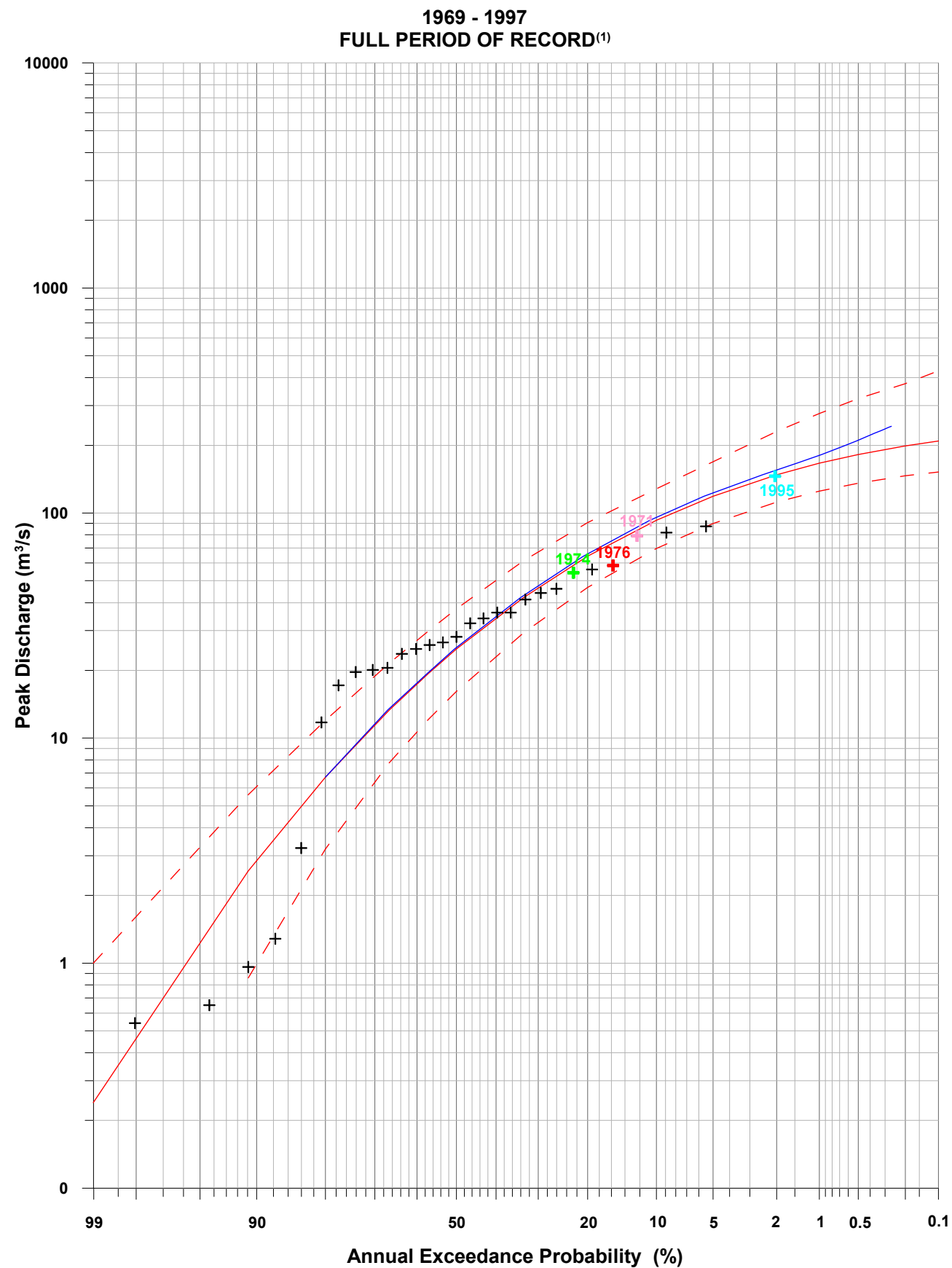
NOTES:
1. Based on annual series of peak flows derived using EPSDD Rating Curve

- LEGEND**
- Expected Probability Adjustment
 - - - Log-Pearson III 5 and 95% Confidence Limits
 - Log-Pearson III Fit
 - + Recorded Annual Maximum Discharge

**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**

Figure 2.11
(Sheet 1 of 2)

FLOOD FREQUENCY RELATIONSHIP
LOG-PEARSON 3 ANNUAL SERIES 1969-1997
JERRABOMBERRA CREEK AT FOUR MILE CREEK STREAM GAUGE (GS 410743)



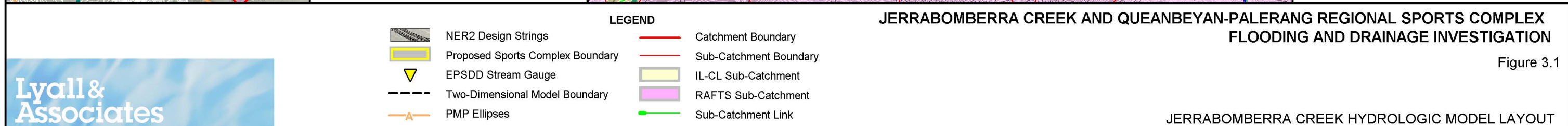
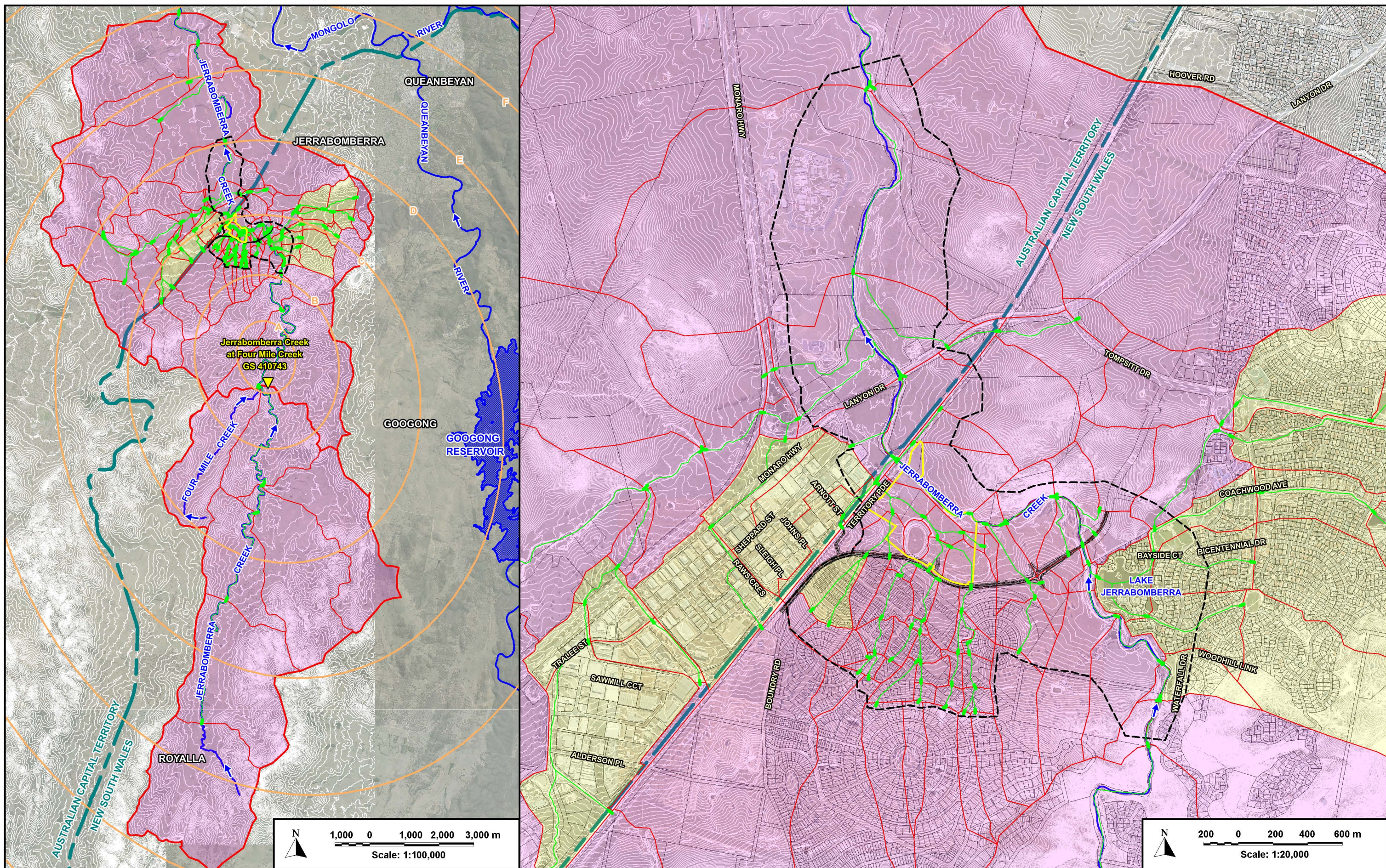
NOTES:
1. Based on annual series of peak flows derived using L&A Derived Rating Curve

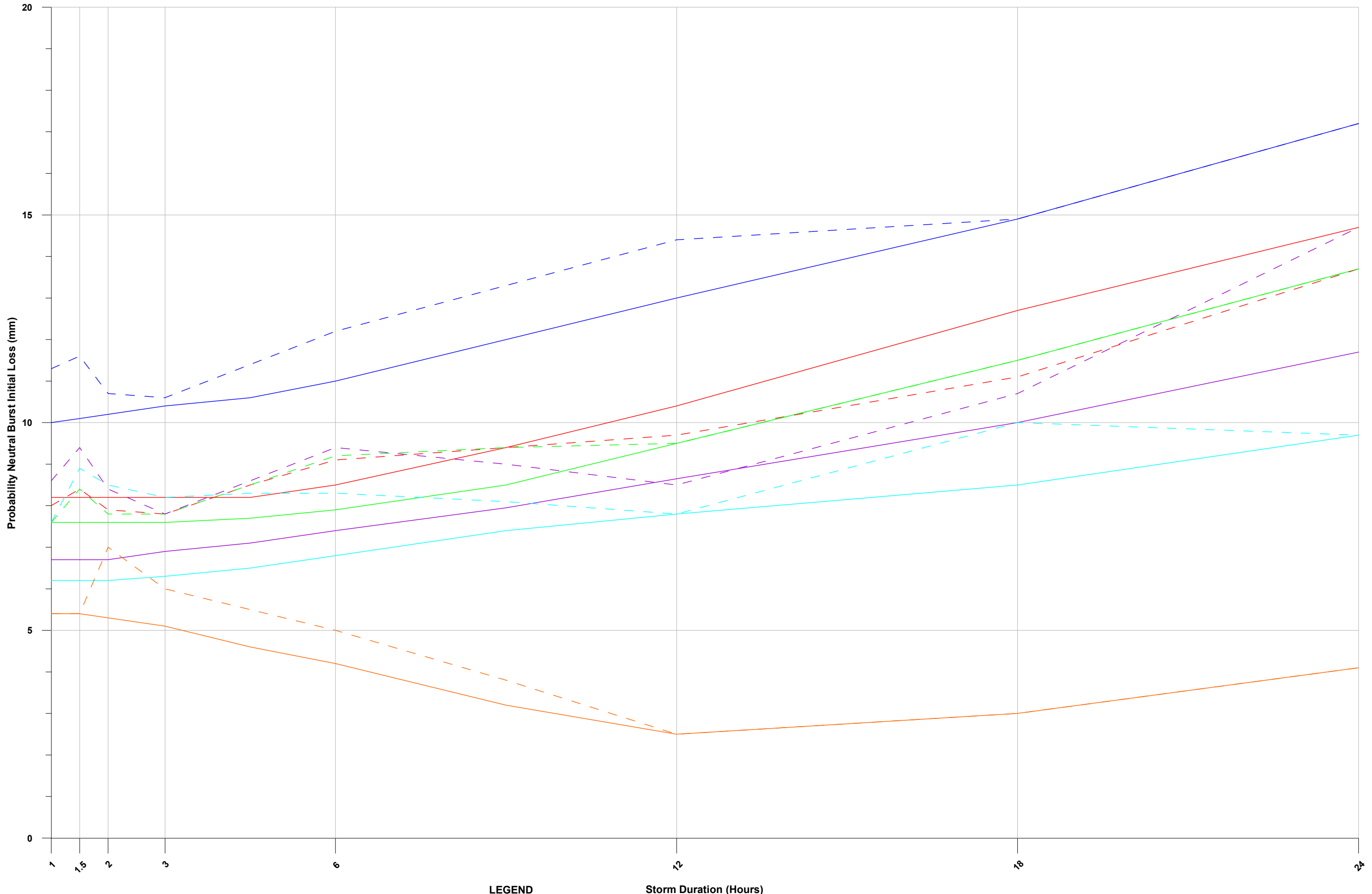
- LEGEND**
- Expected Probability Adjustment
 - Log-Pearson III 5 and 95% Confidence Limits
 - Log-Pearson III Fit
 - Recorded Annual Maximum Discharge

JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX FLOODING AND DRAINAGE INVESTIGATION

Figure 2.11
(Sheet 2 of 2)

FLOOD FREQUENCY RELATIONSHIP
LOG-PEARSON 3 ANNUAL SERIES 1969-1997
JERRABOMBERRA CREEK AT FOUR MILE CREEK STREAM GAUGE (GS 410743)





LEGEND

	Original ARR Data Hub Loss Values	Adjusted ARR Data Hub Loss Values
50% AEP	---	—
20% AEP	---	—
10% AEP	---	—
5% AEP	---	—
2% AEP	---	—
1% AEP	---	—

**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**

Figure 3.2

ADJUSTED PROBABILITY NEUTRAL BURST INITIAL LOSSES

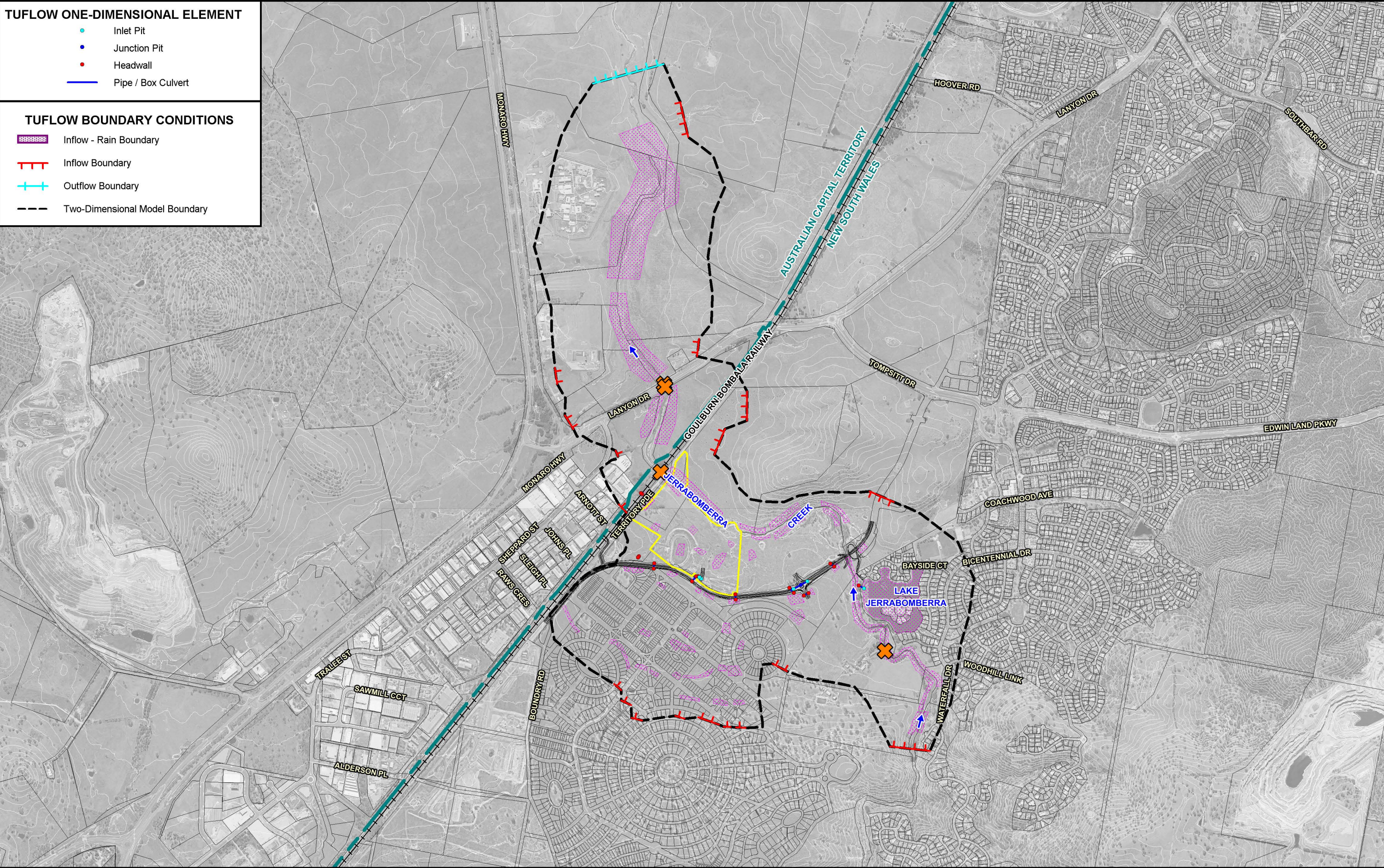


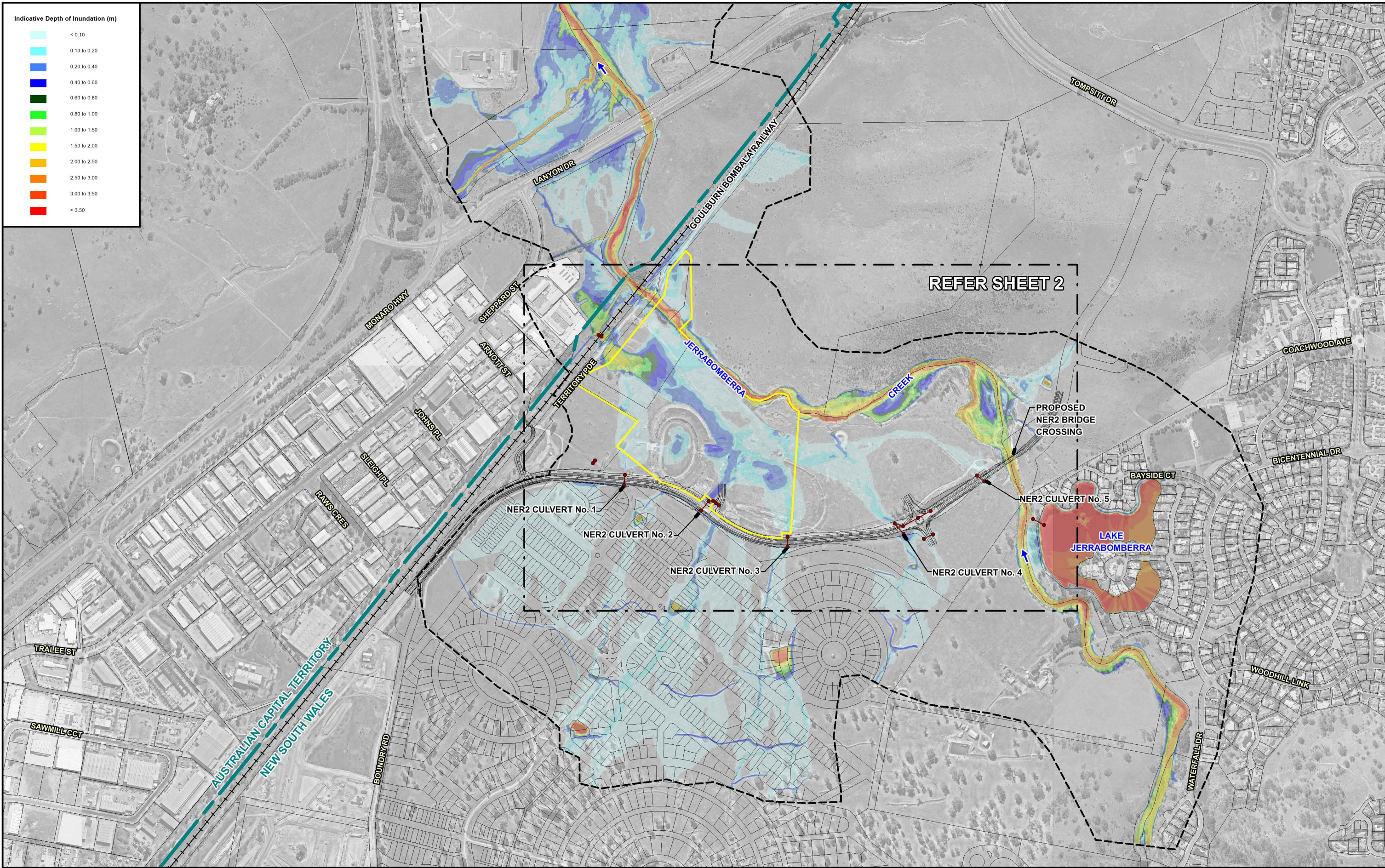
TUFLOW ONE-DIMENSIONAL ELEMENT

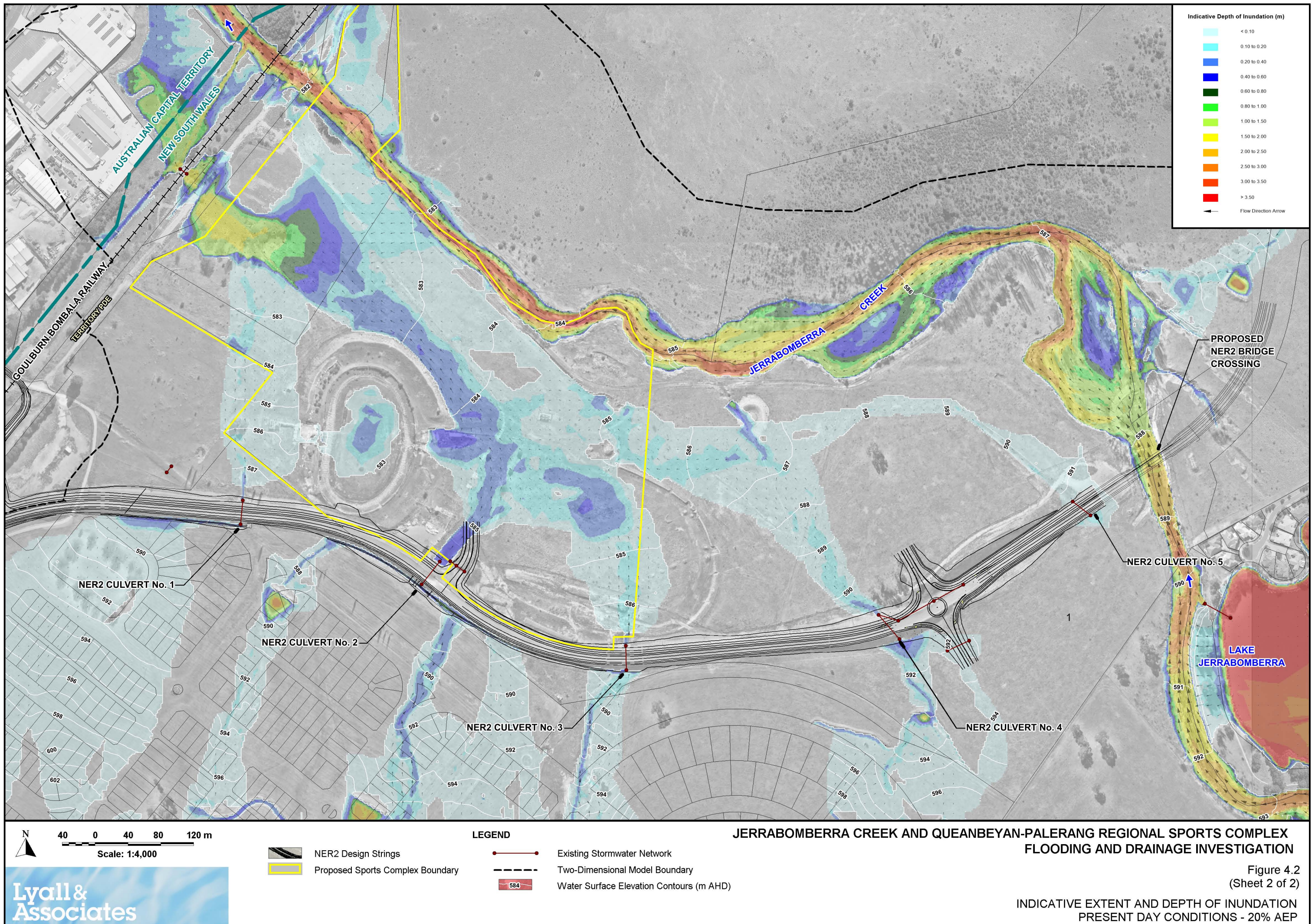
- Inlet Pit
- Junction Pit
- Headwall
- Pipe / Box Culvert

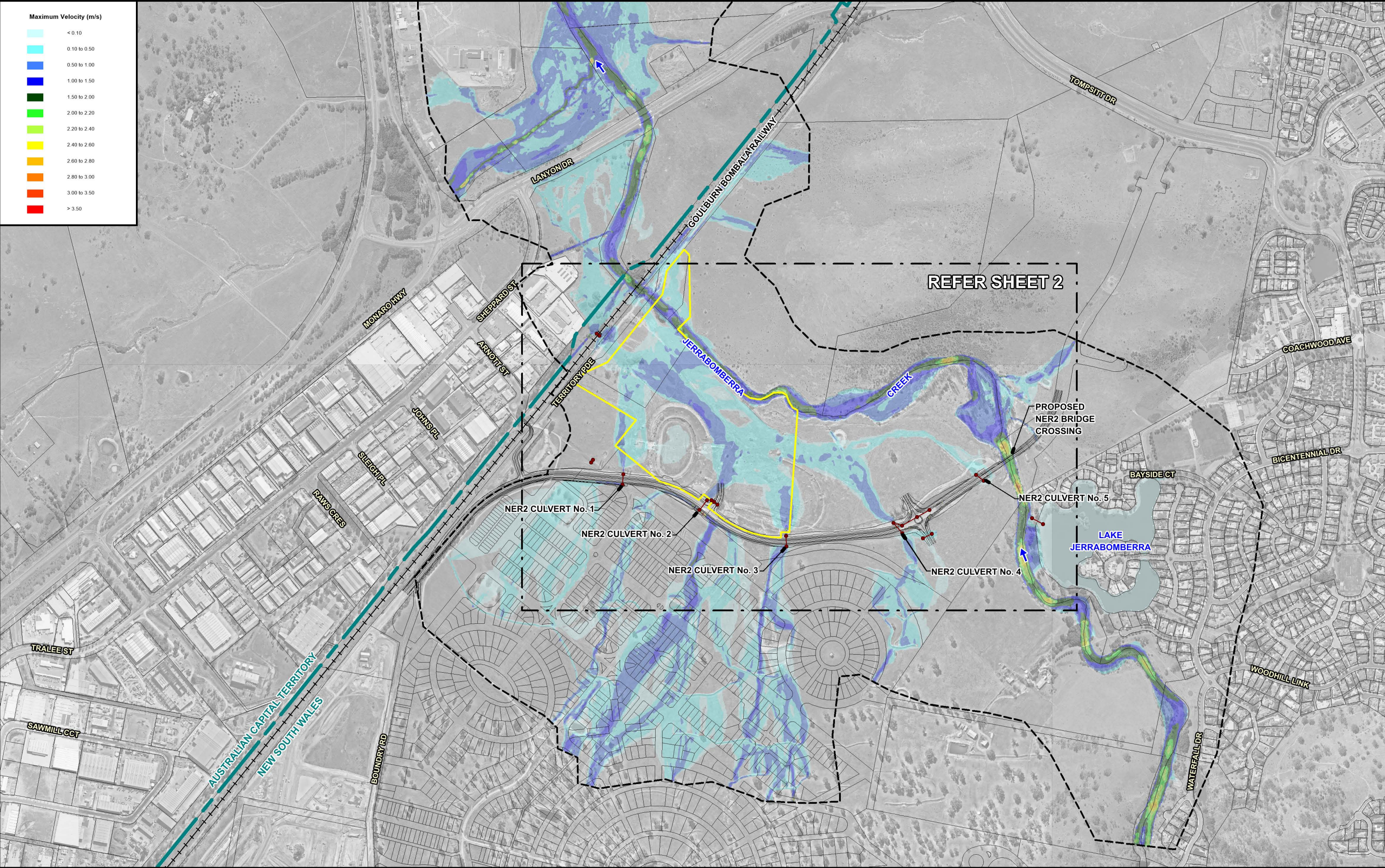
TUFLOW BOUNDARY CONDITIONS

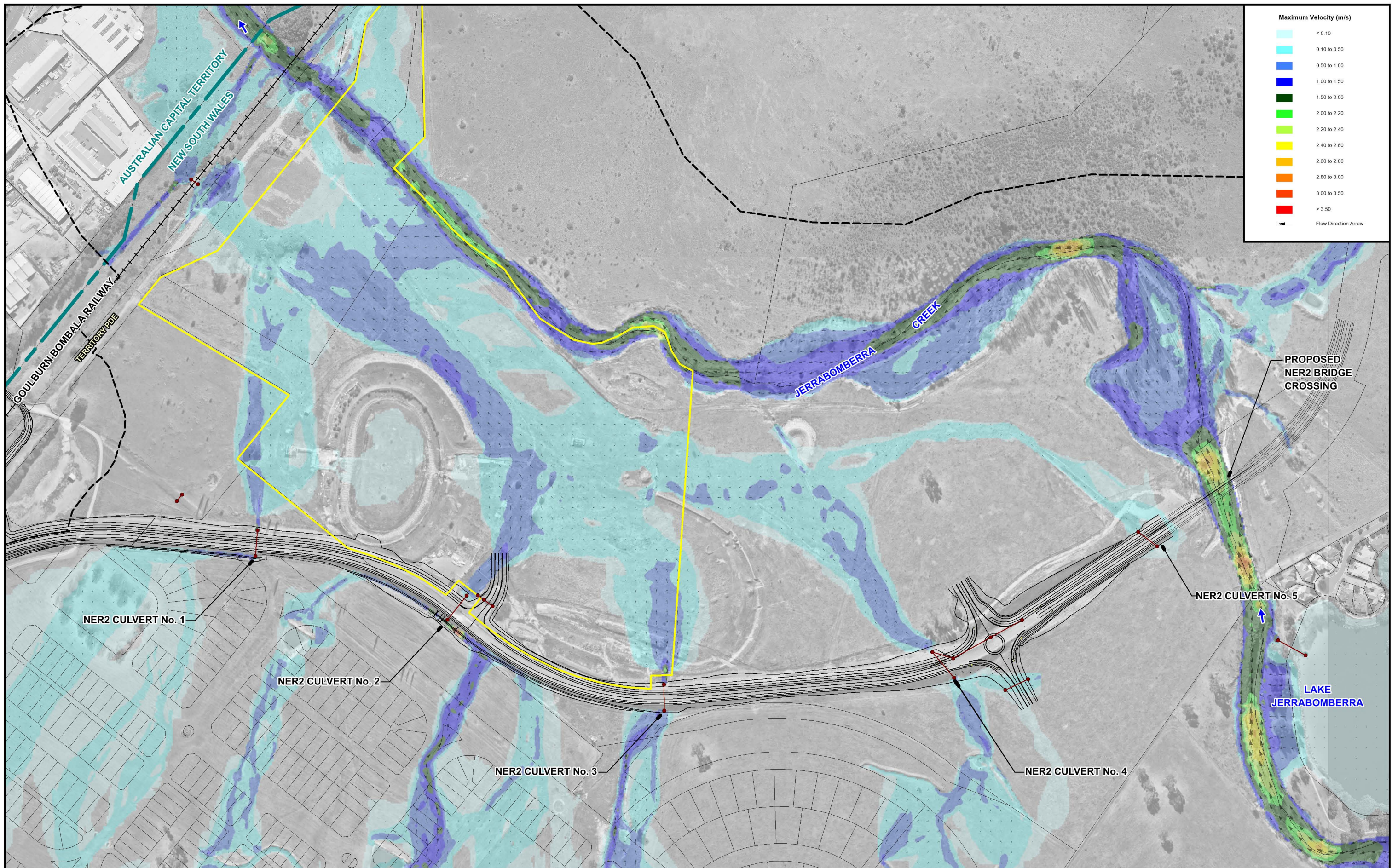
- Inflow - Rain Boundary
- Inflow Boundary
- Outflow Boundary
- Two-Dimensional Model Boundary

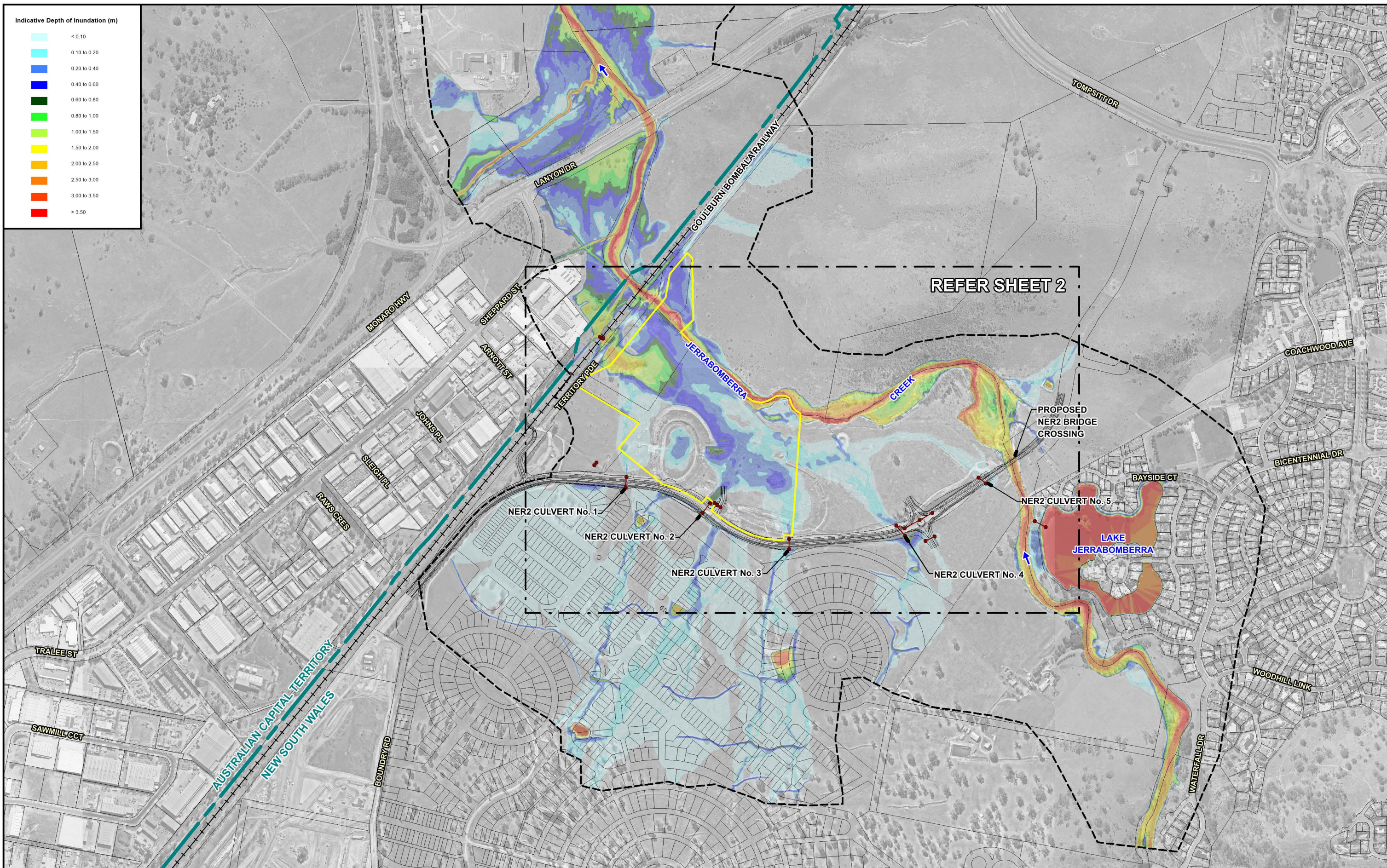


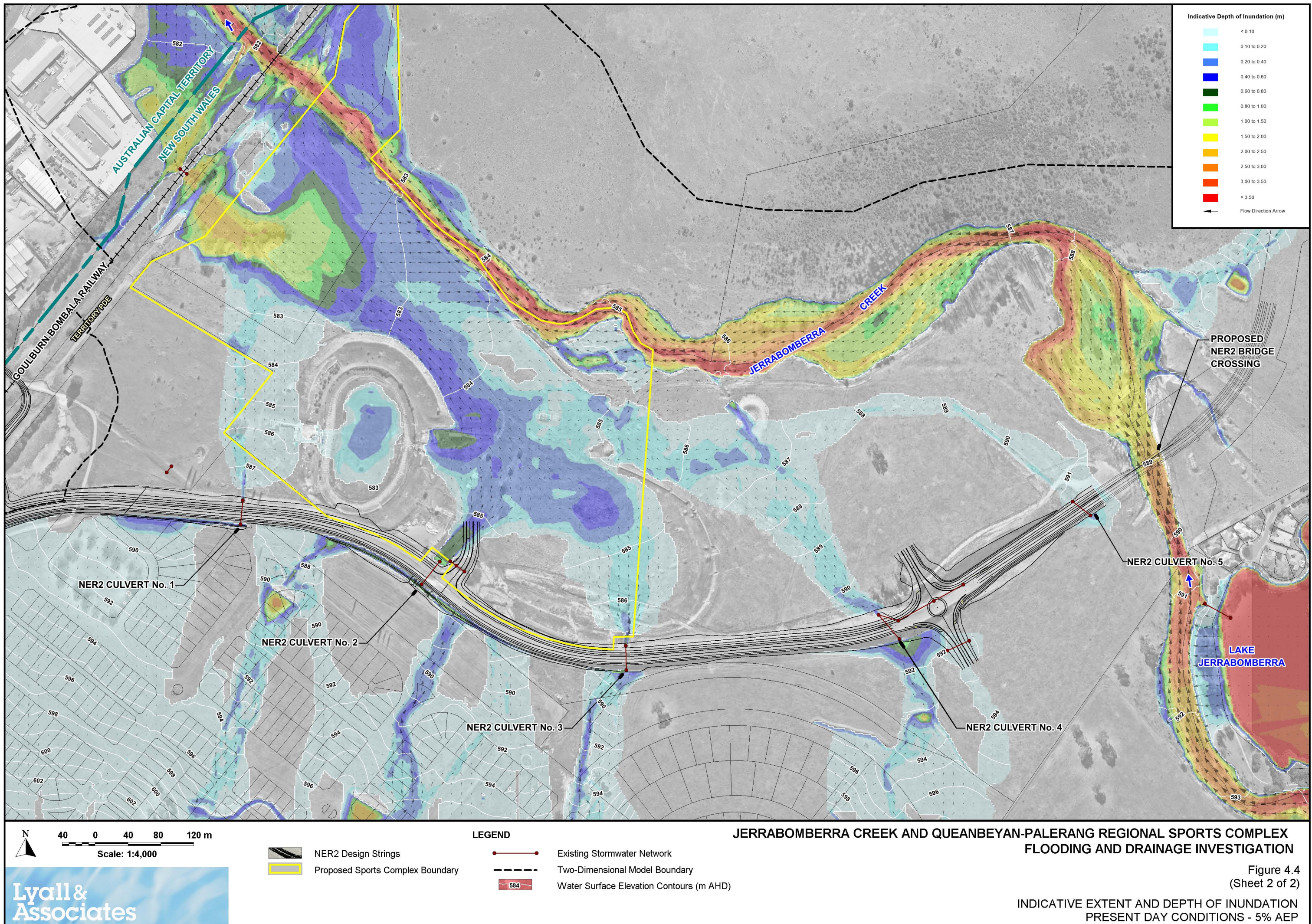


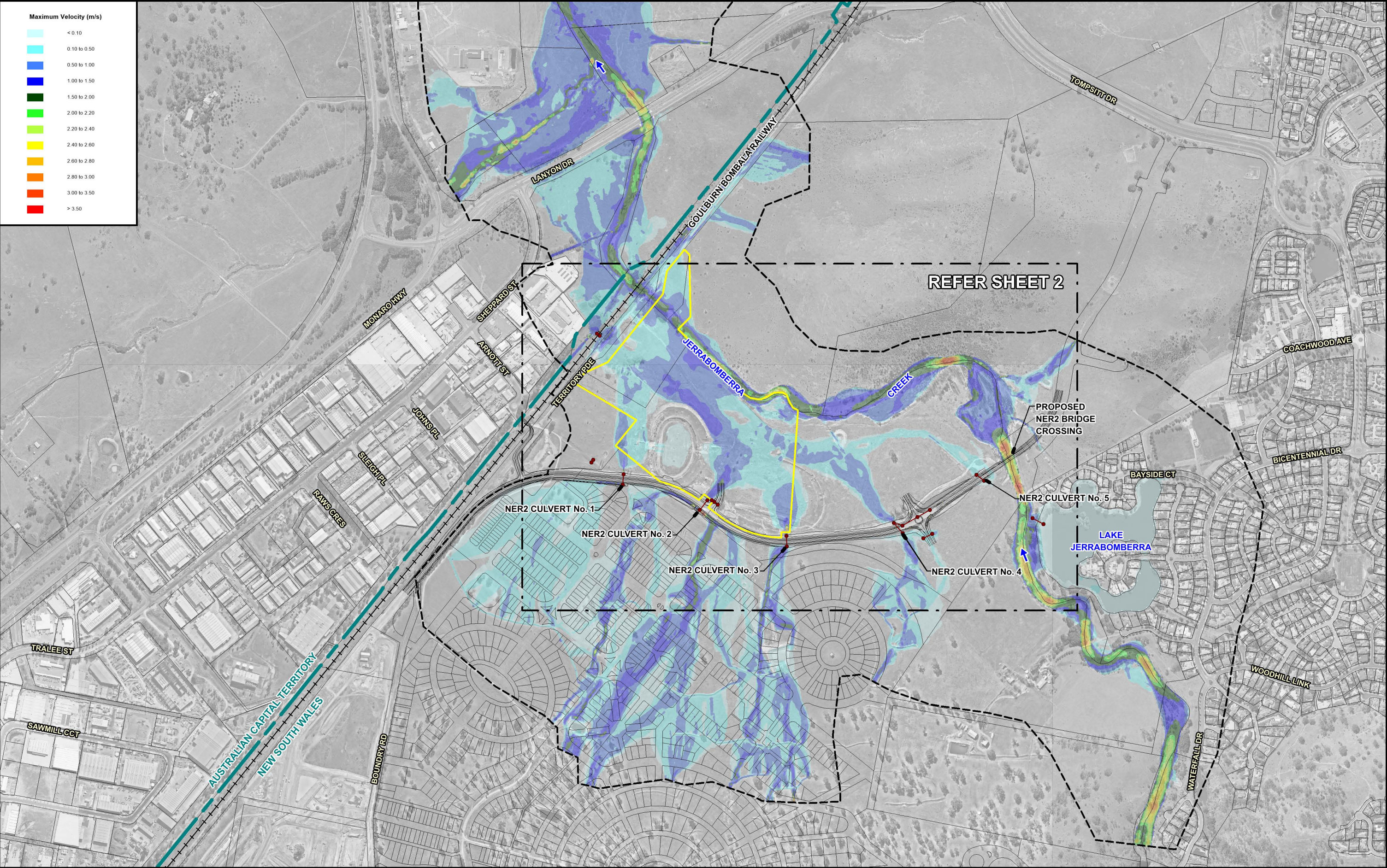


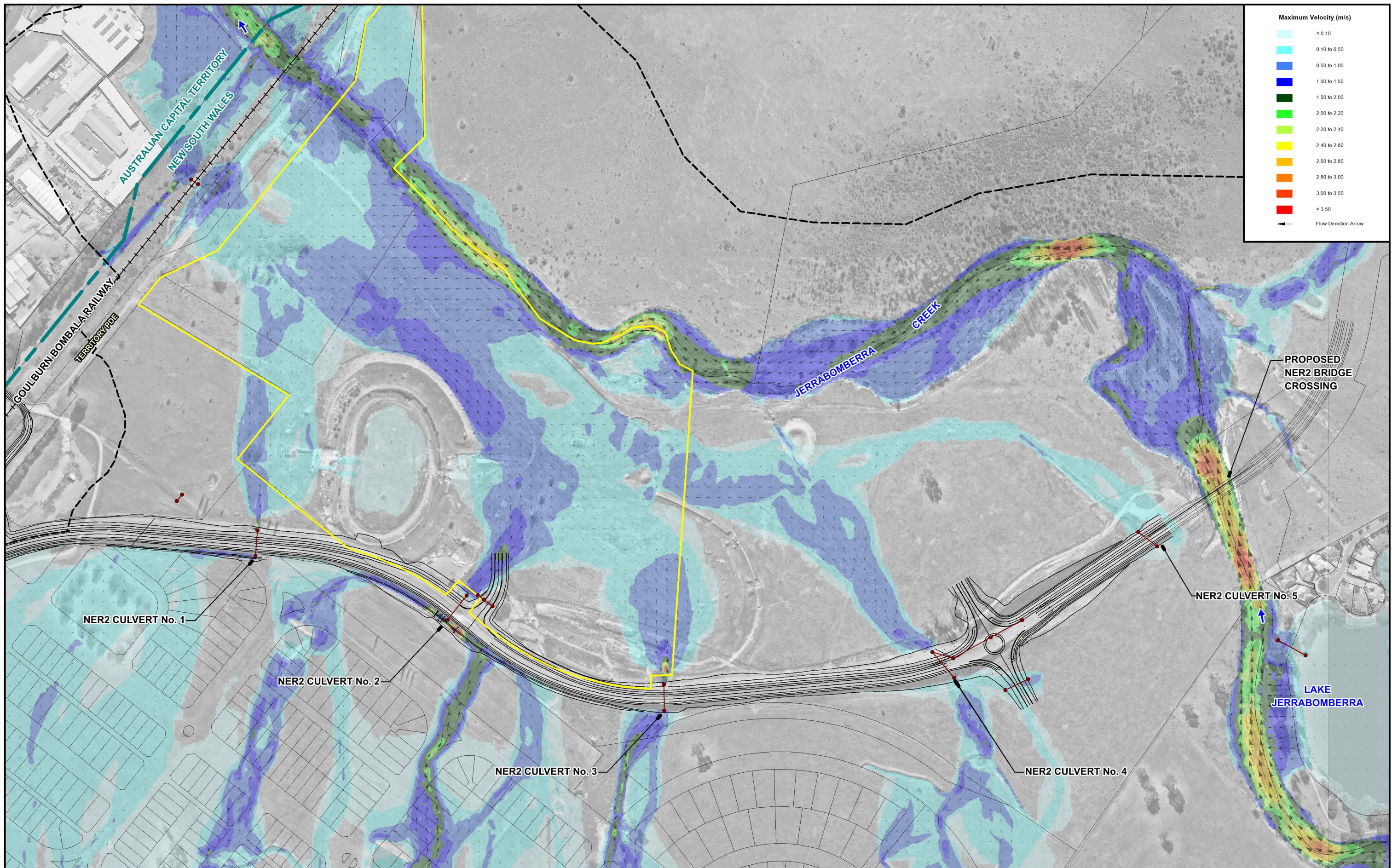


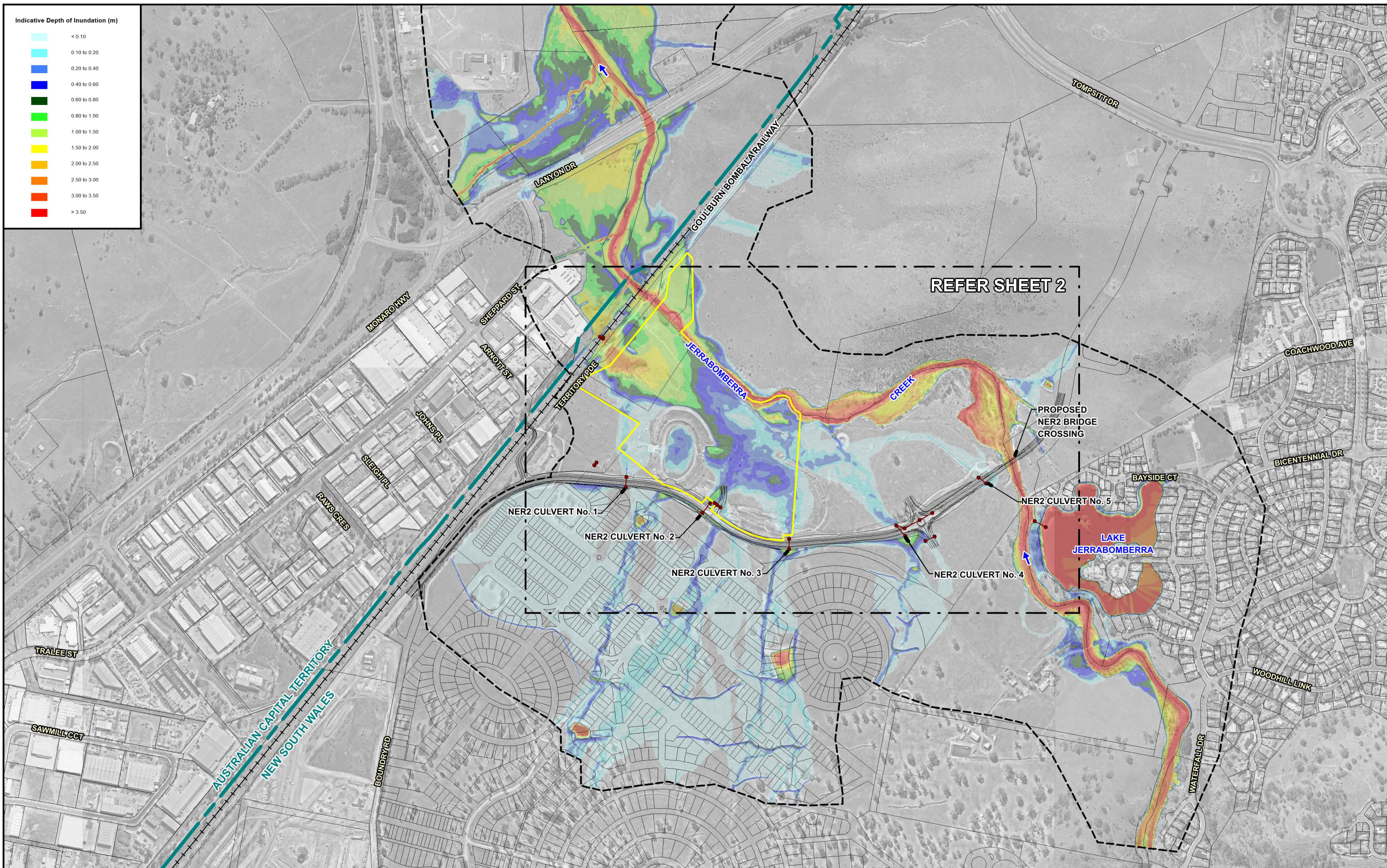


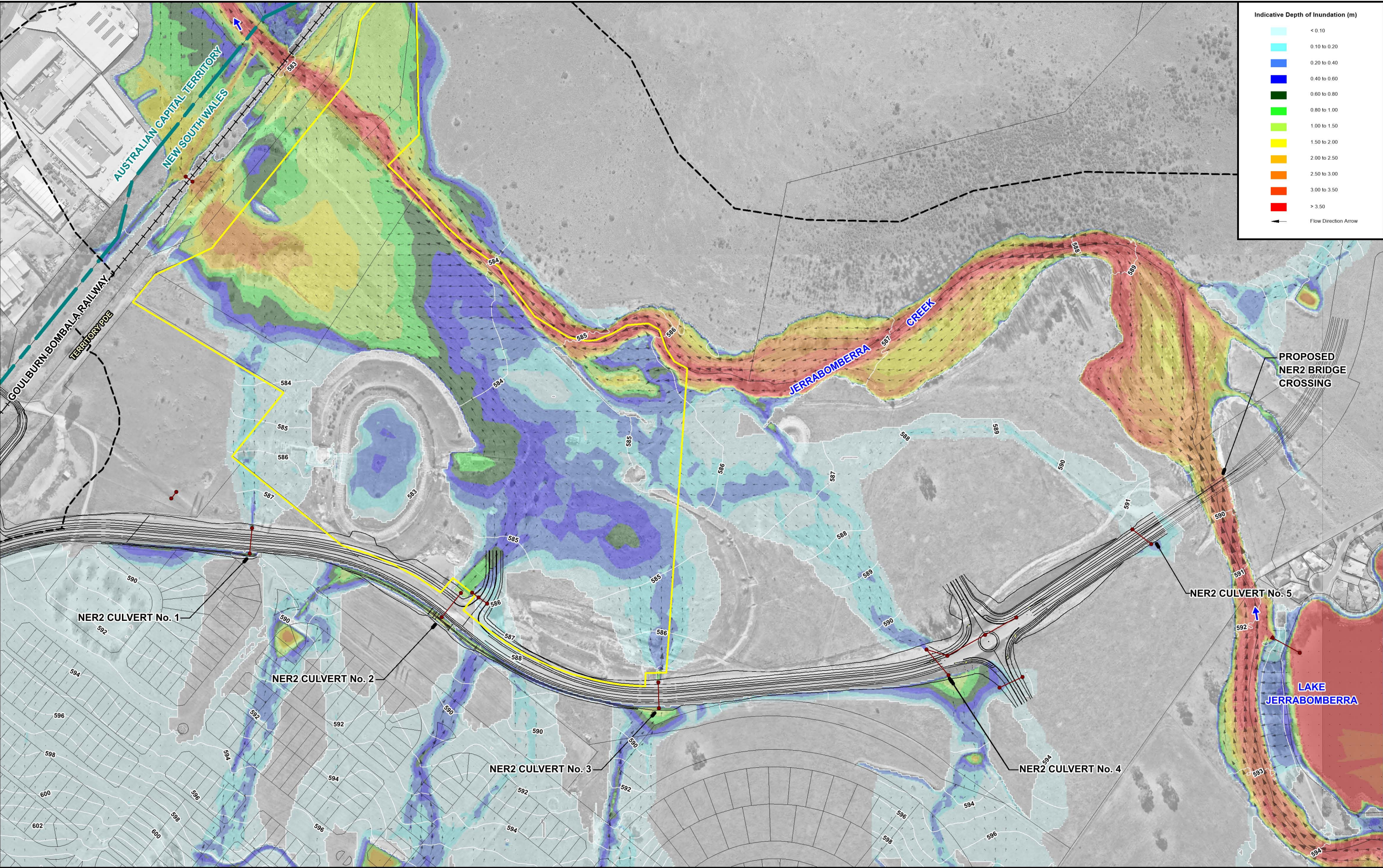












N

40 0 40 80 120 m

Scale: 1:4,000

Lyll & Associates

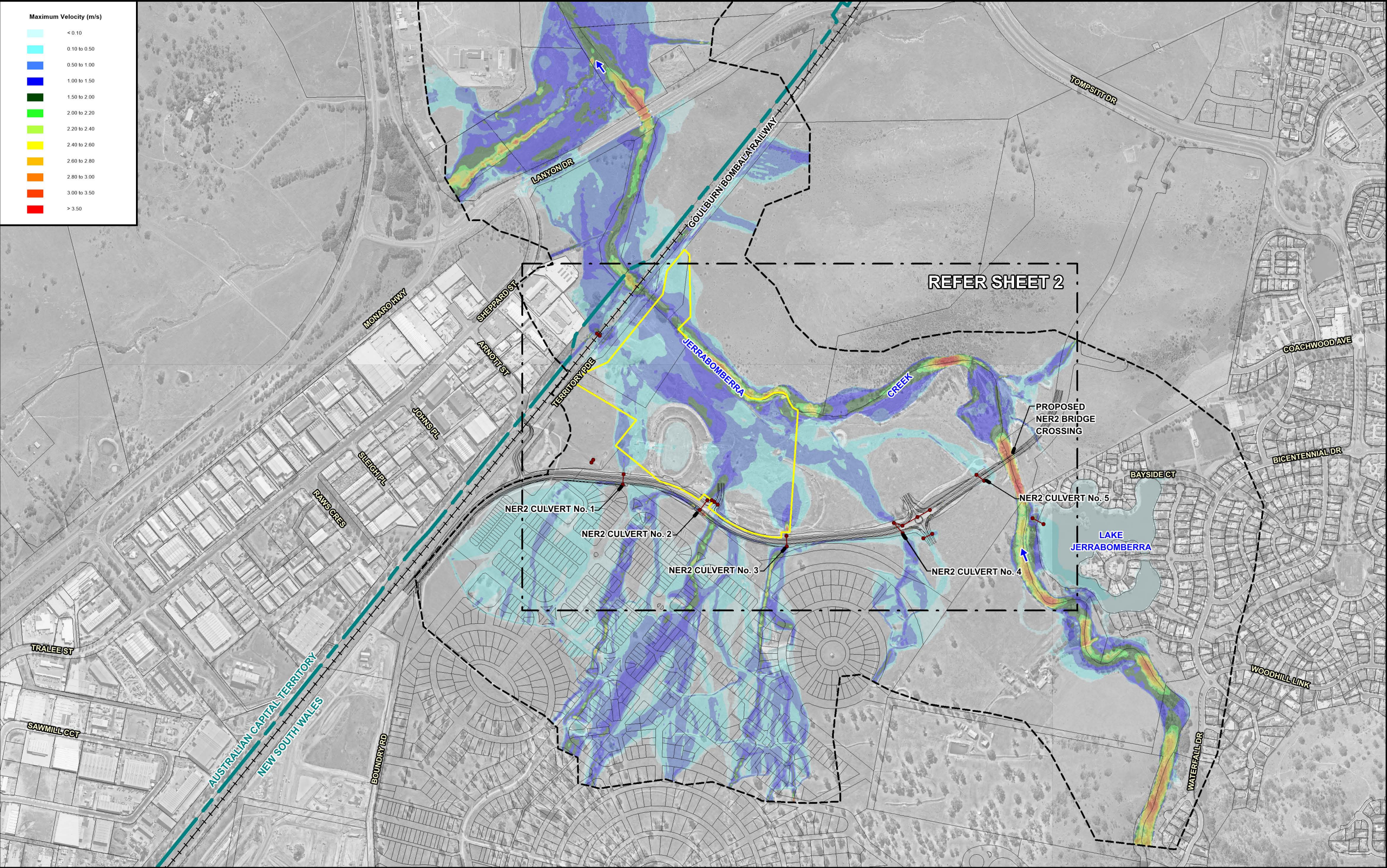
LEGEND

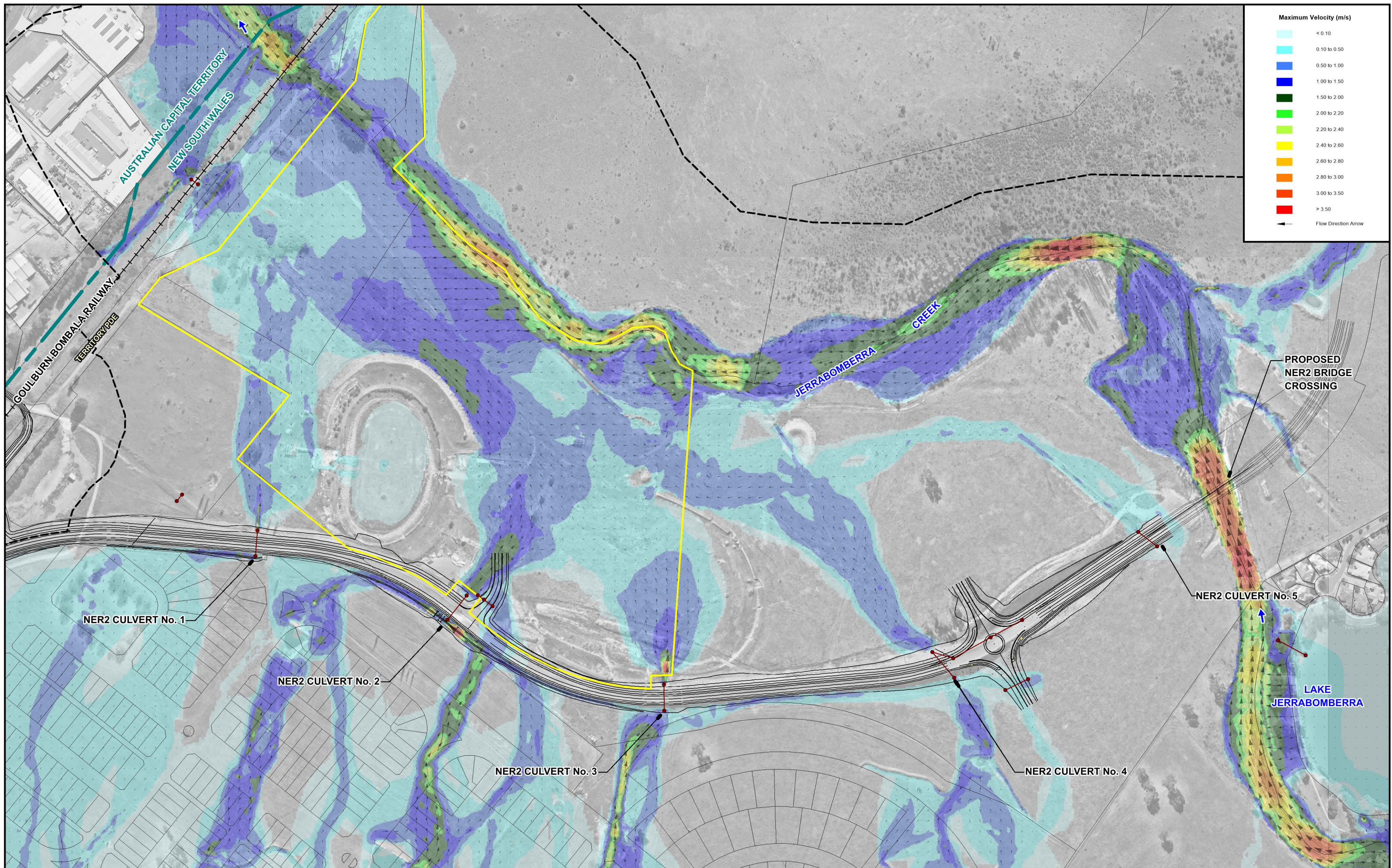
	NER2 Design Strings		Existing Stormwater Network
	Proposed Sports Complex Boundary		Two-Dimensional Model Boundary
			Water Surface Elevation Contours (m AHD)

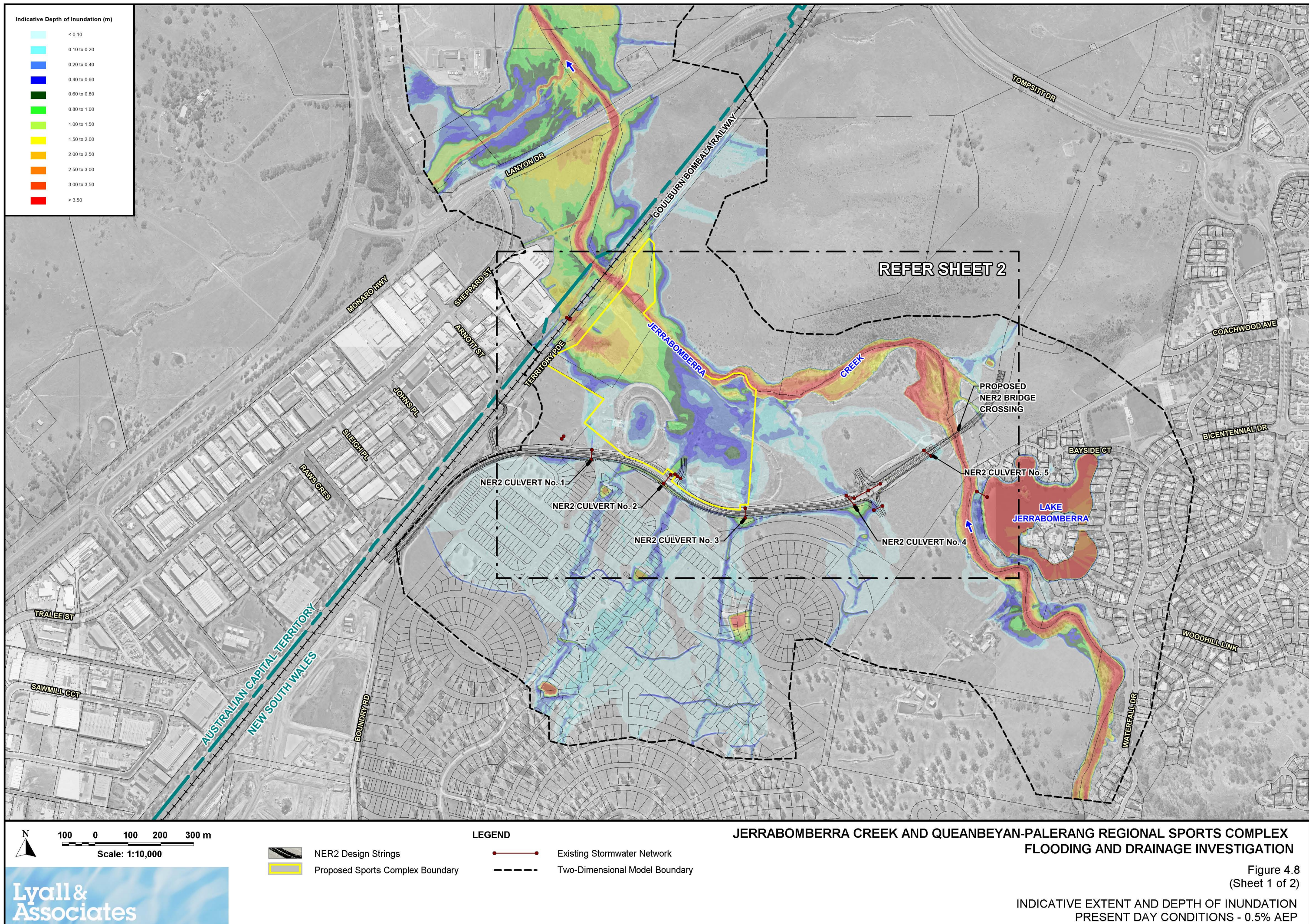
**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**

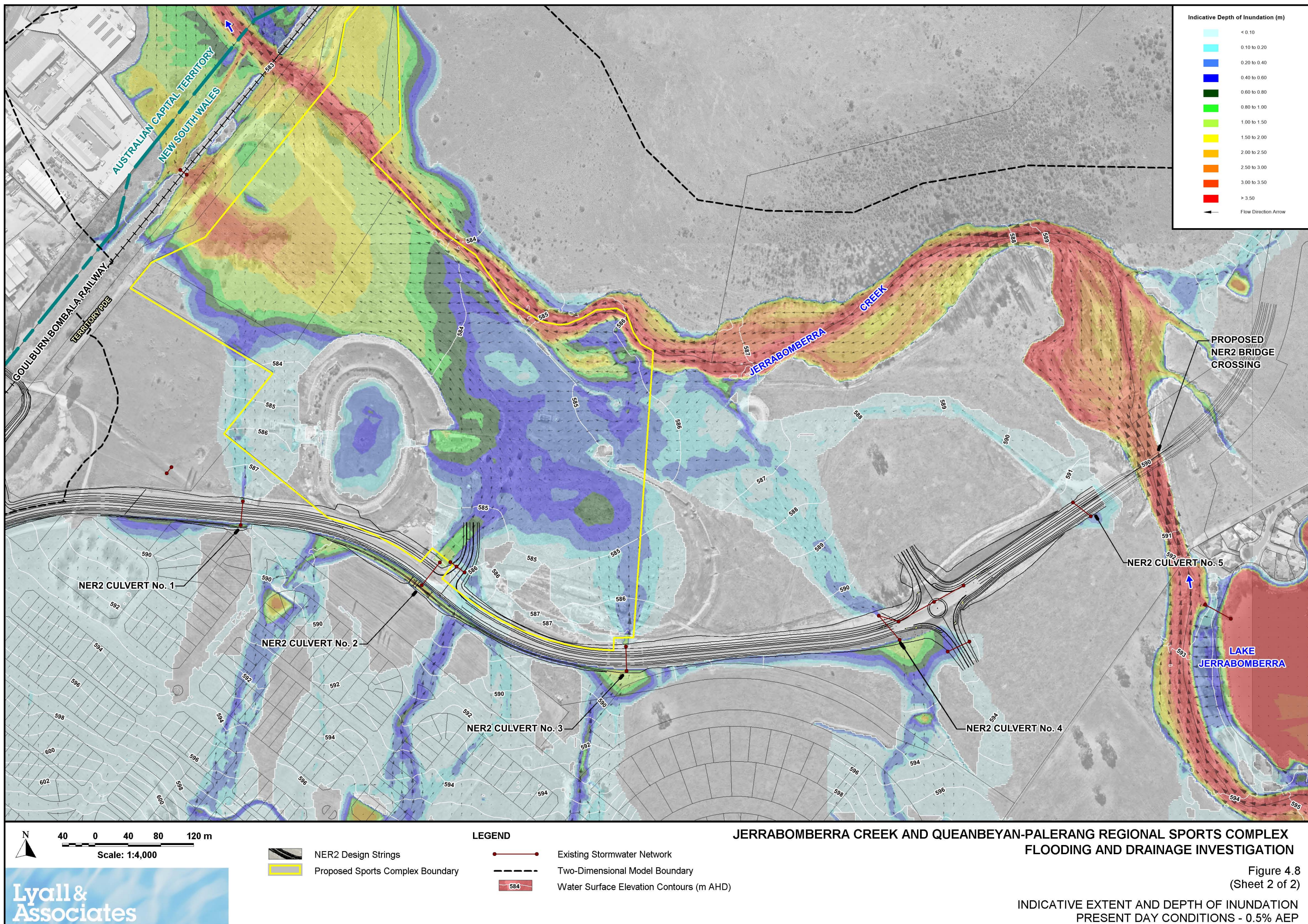
Figure 4.6
(Sheet 2 of 2)

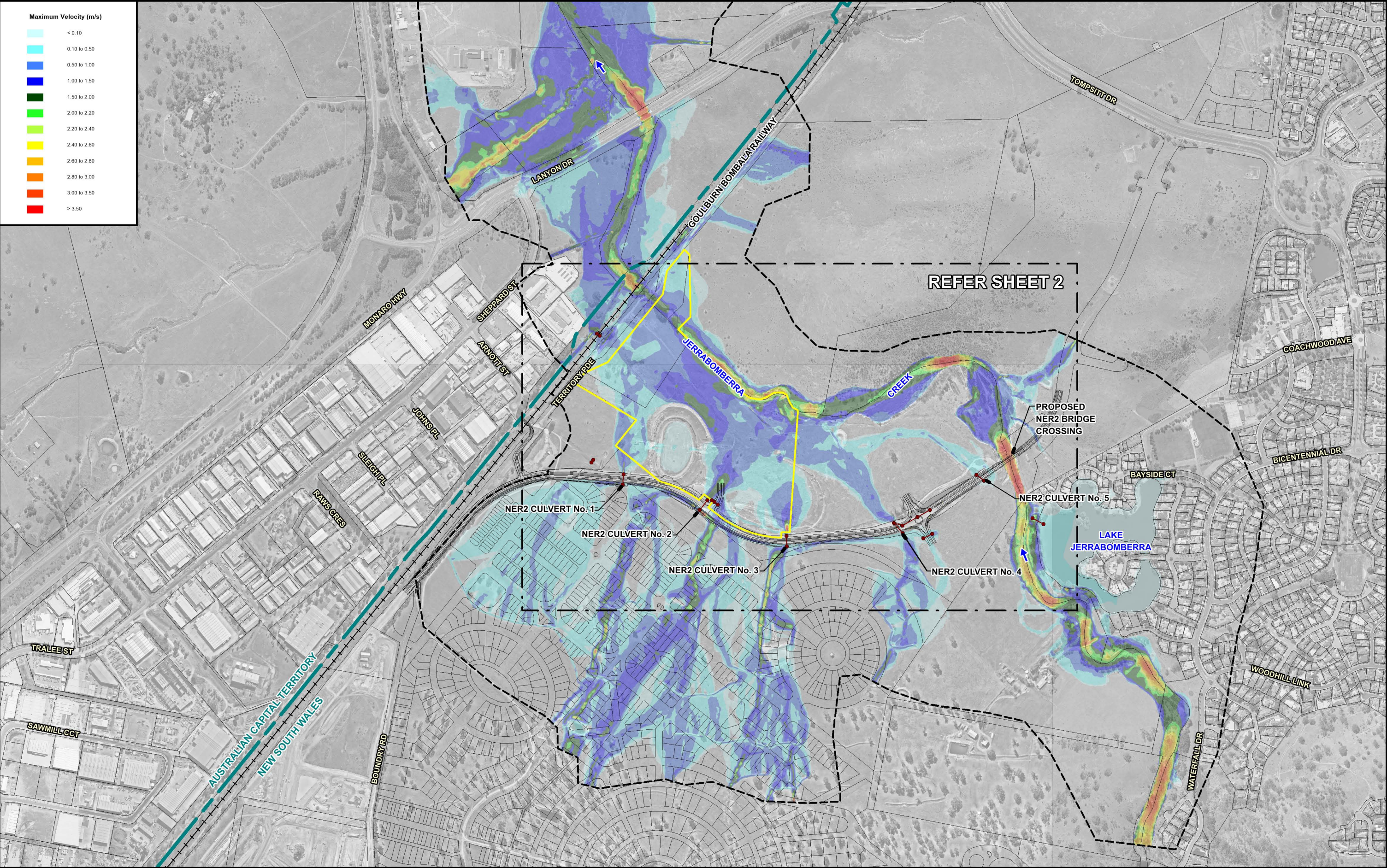
INDICATIVE EXTENT AND DEPTH OF INUNDATION
PRESENT DAY CONDITIONS - 1% AEP

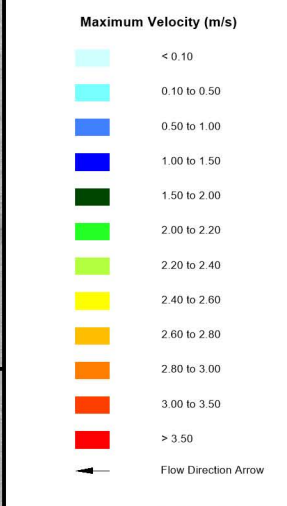
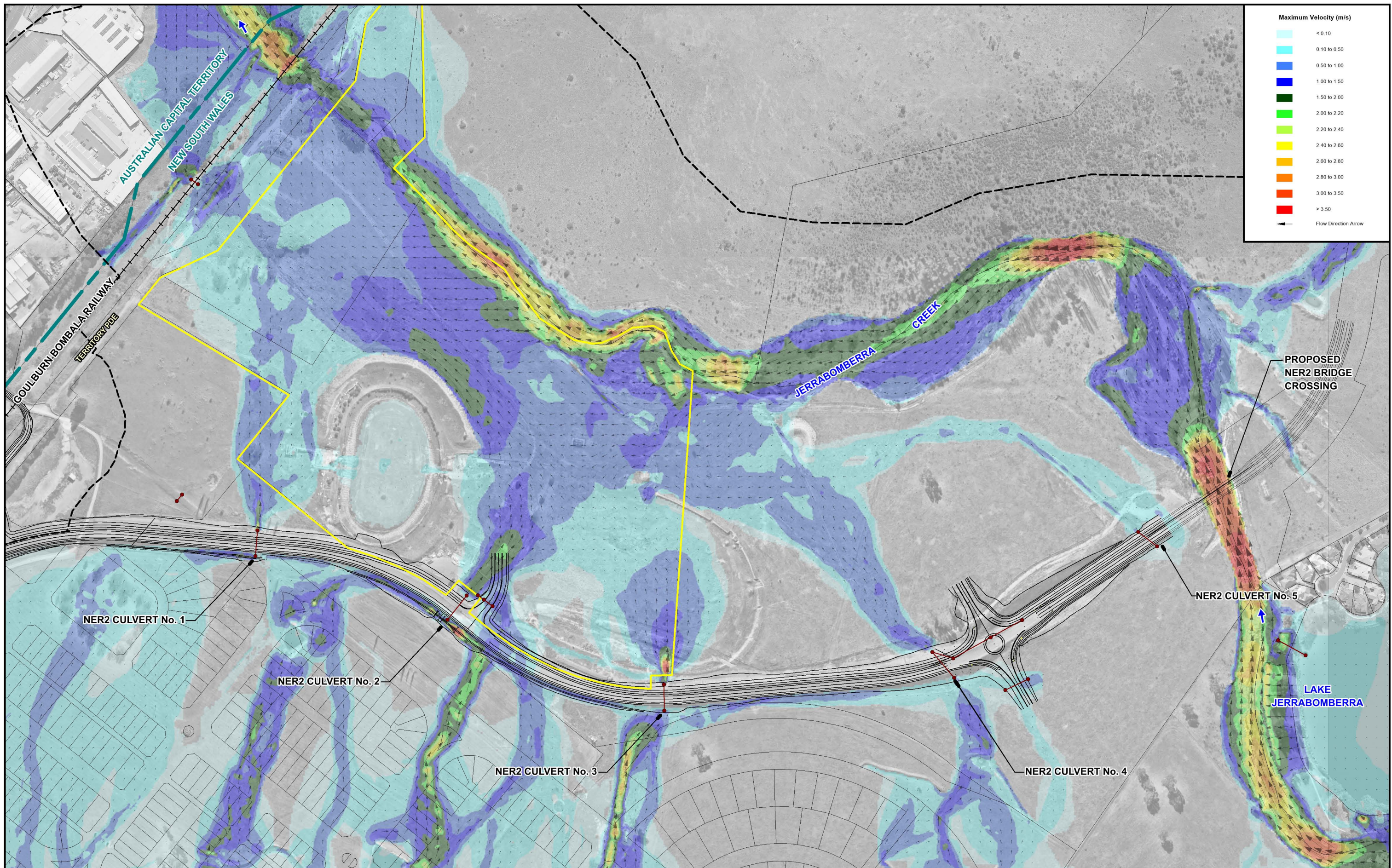


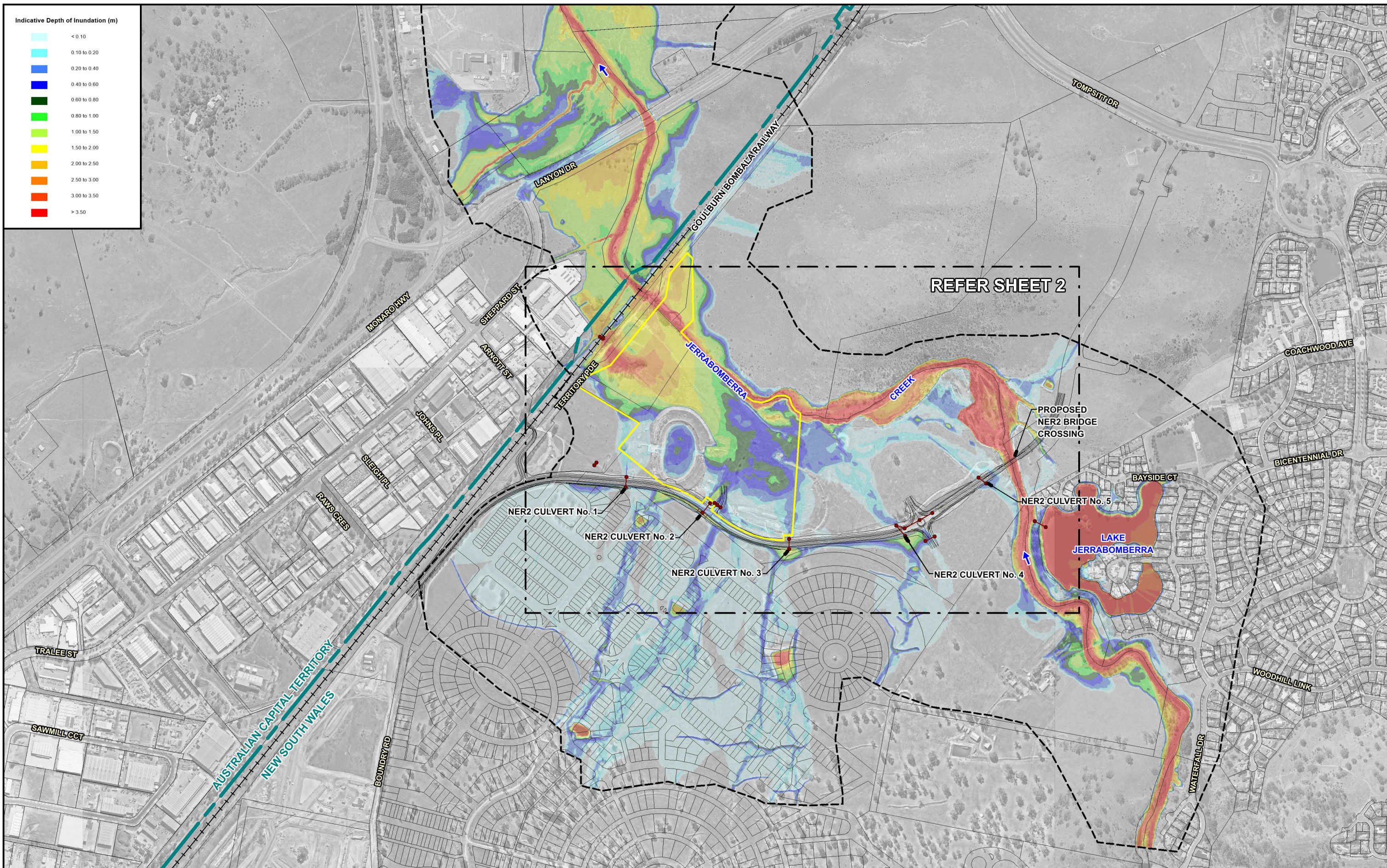


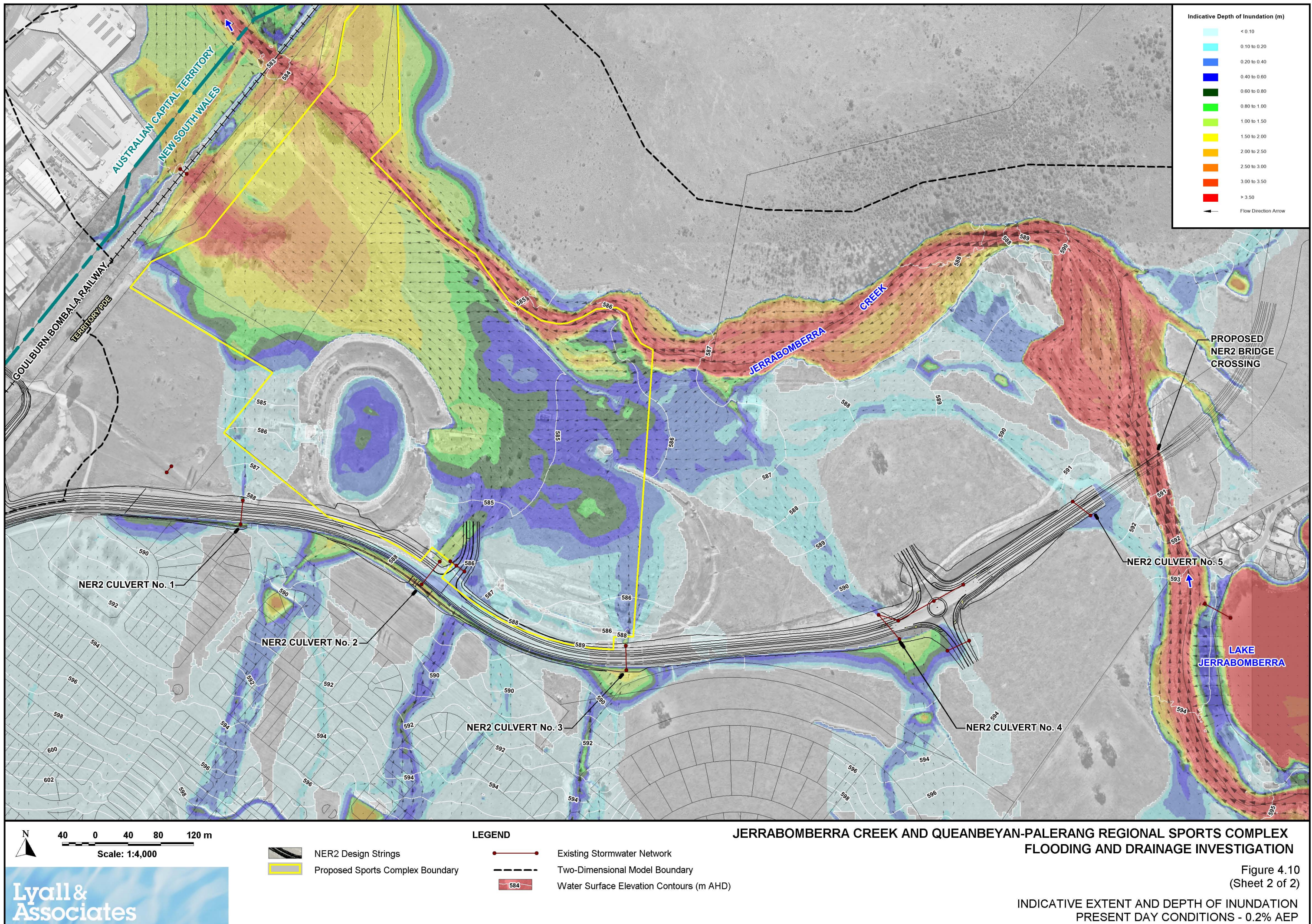


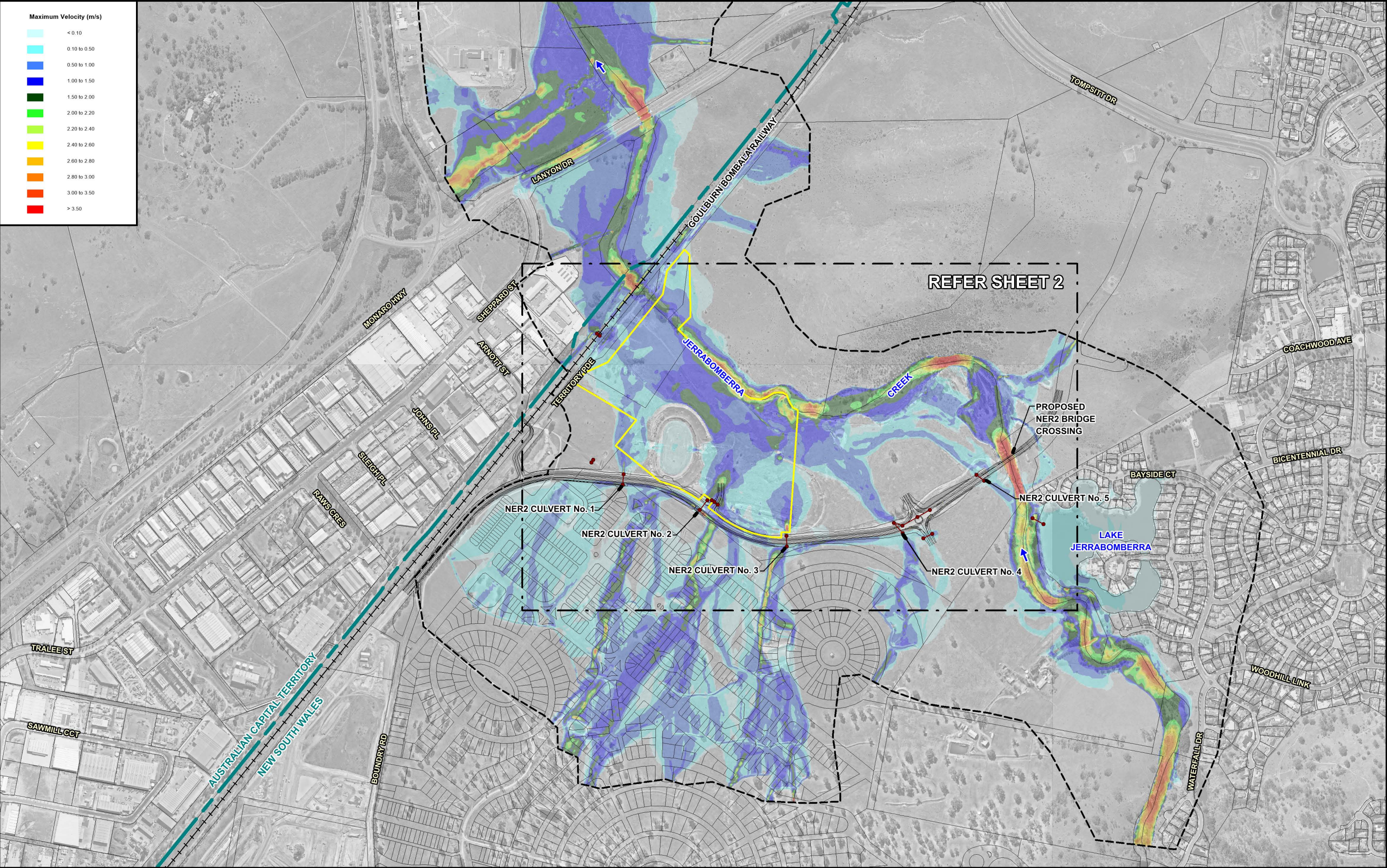


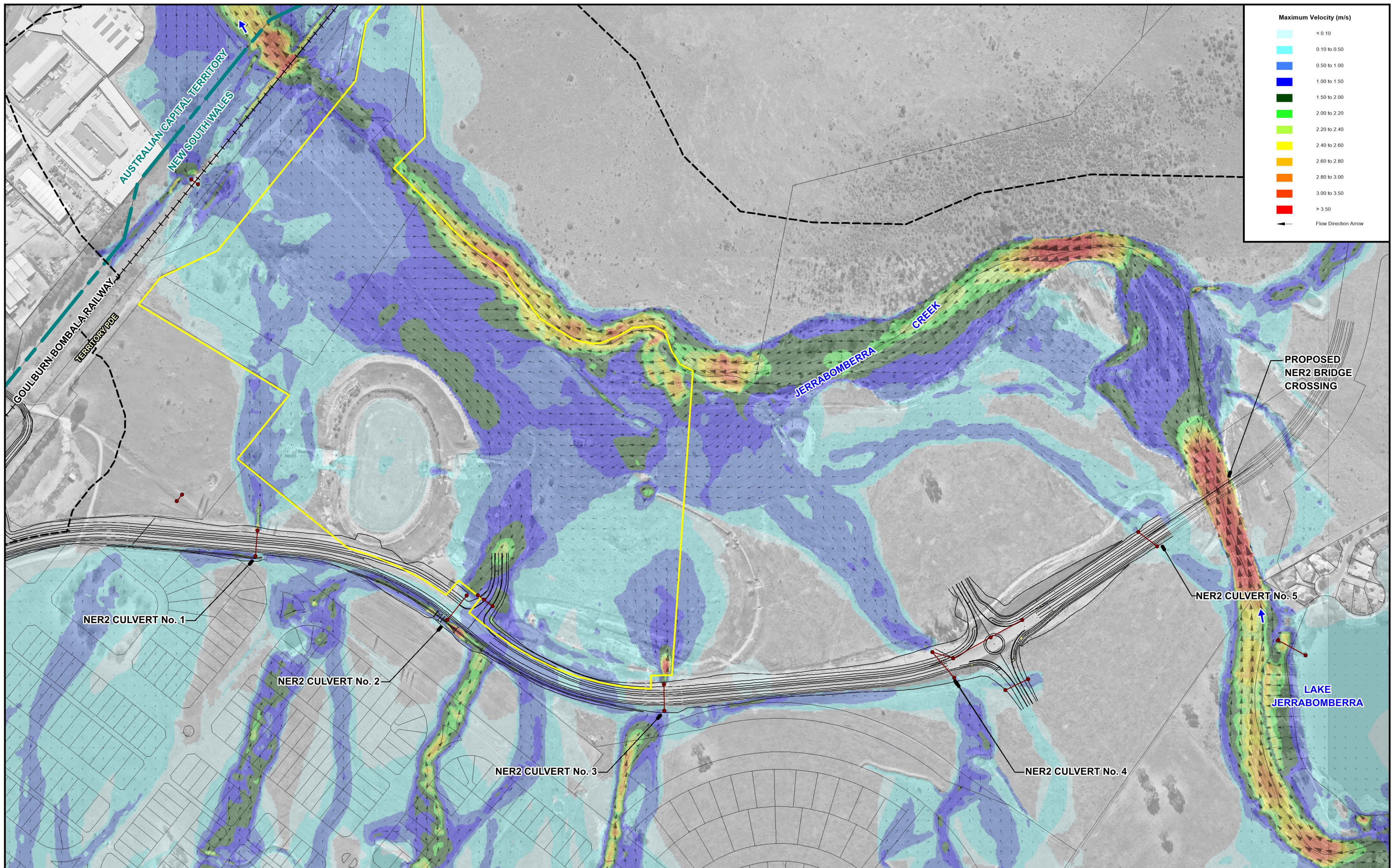


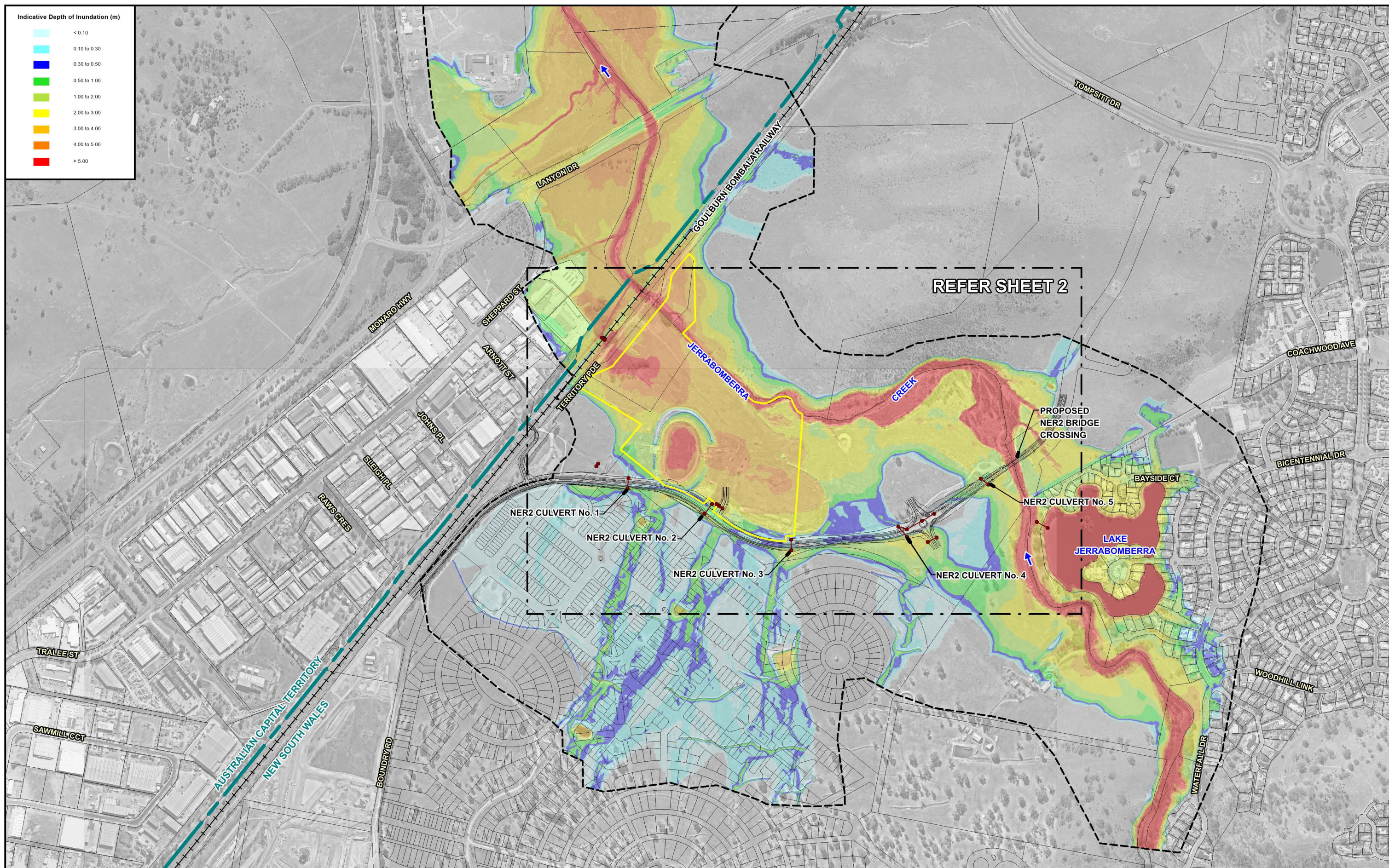


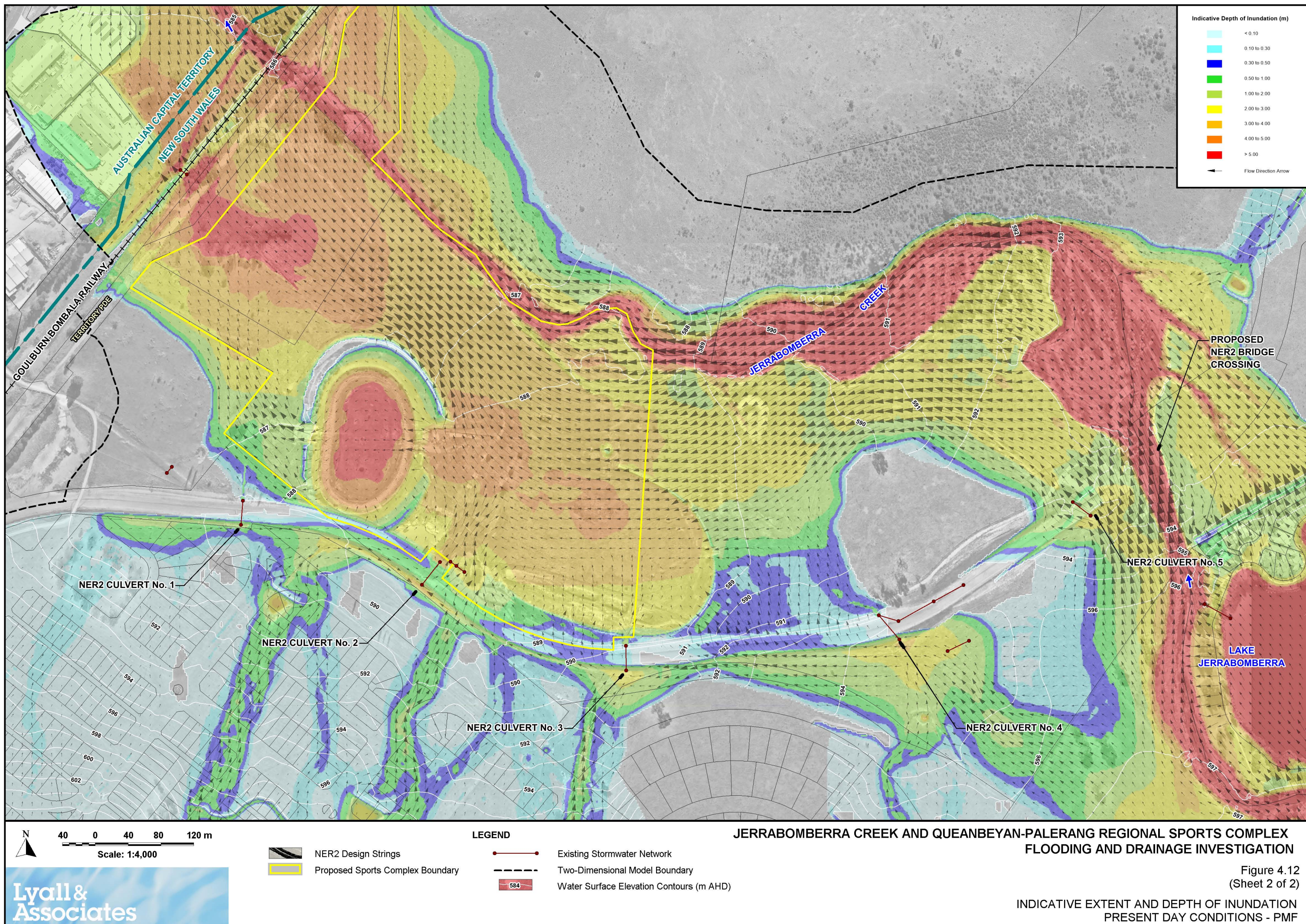


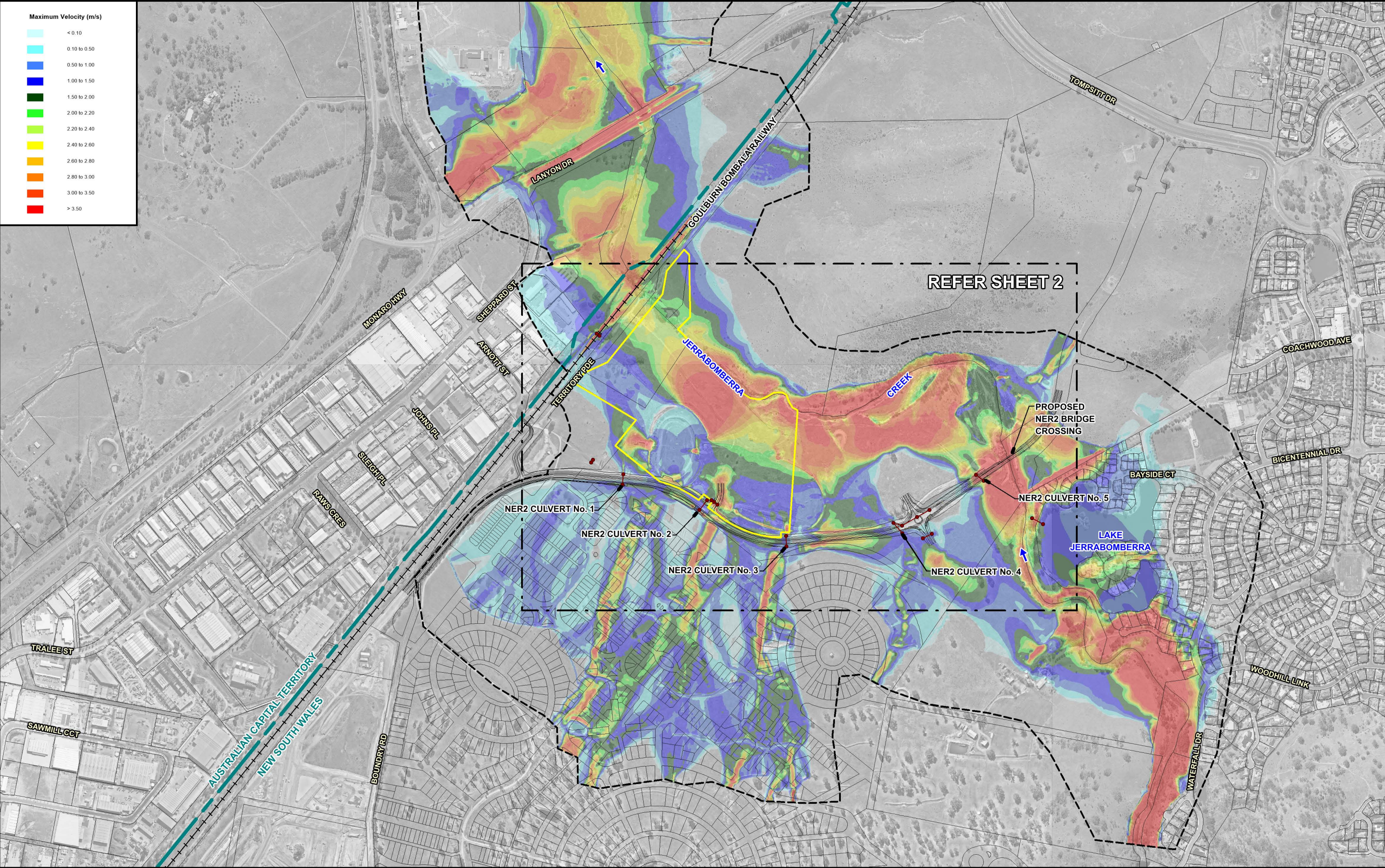


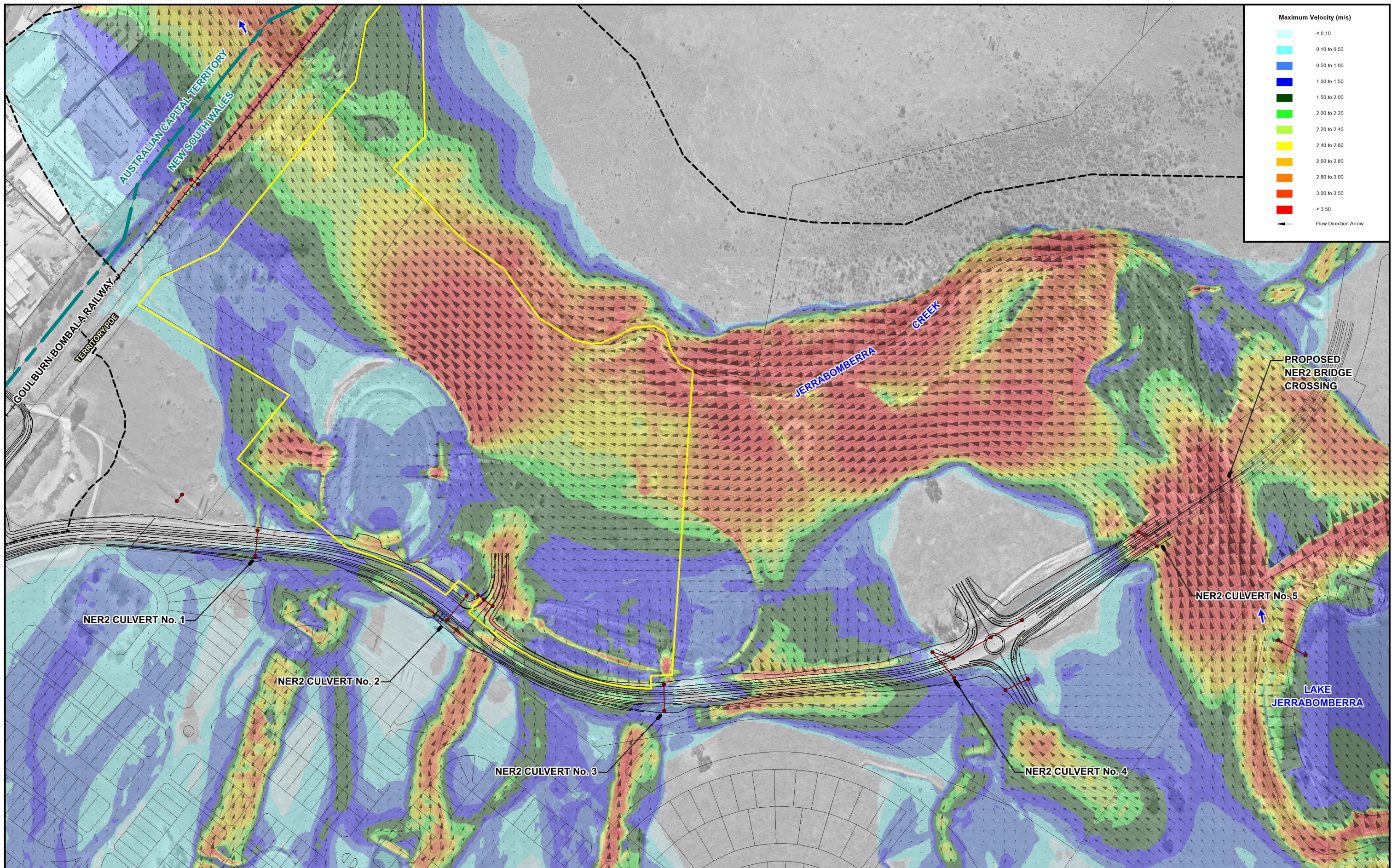


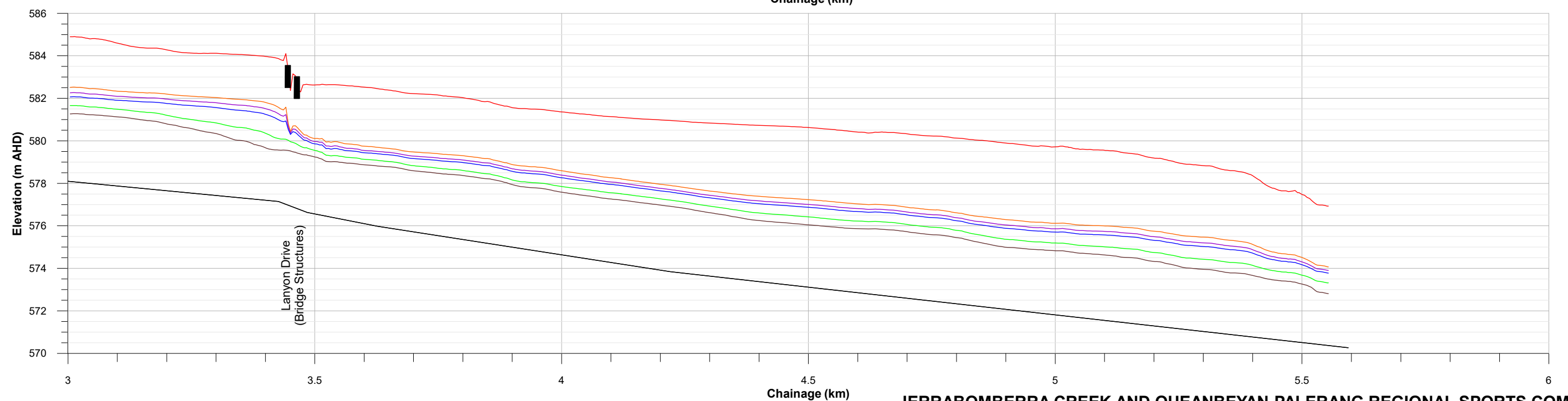
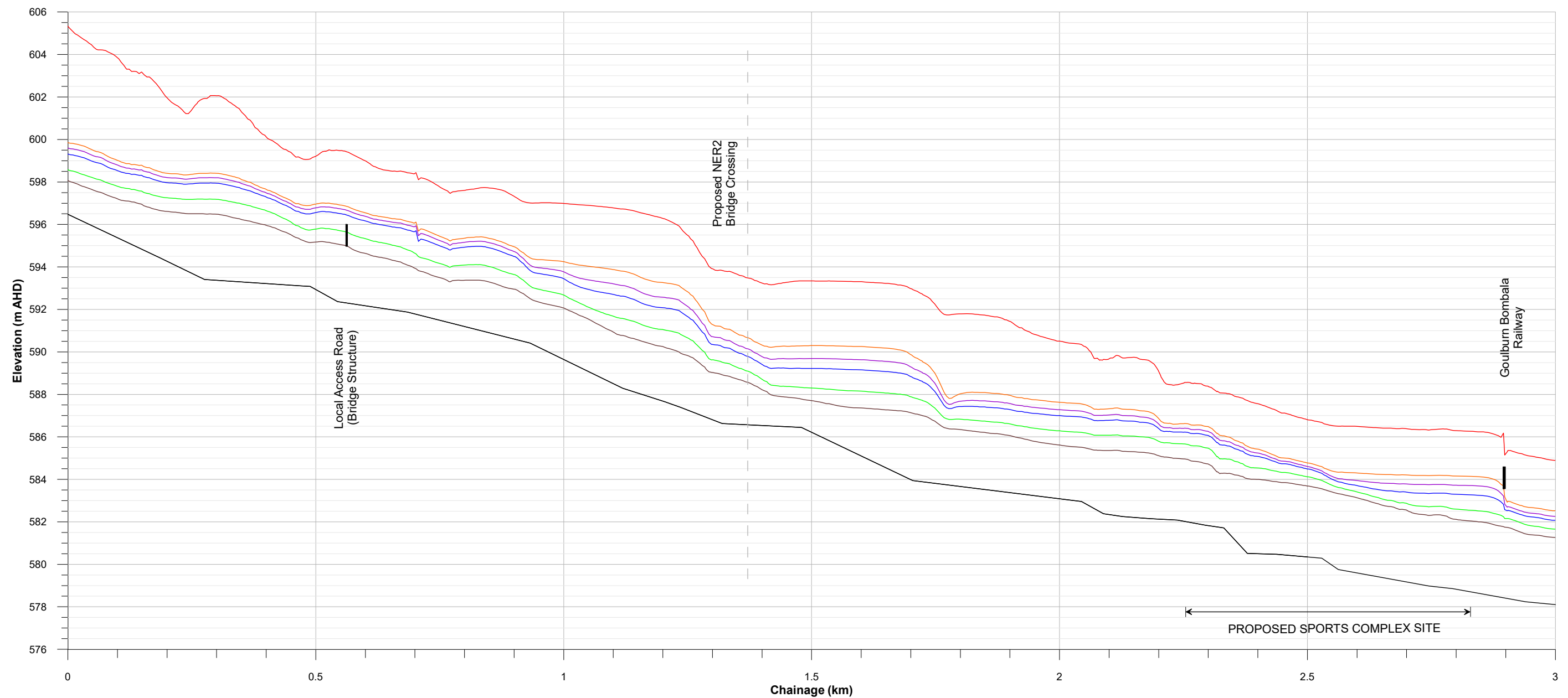












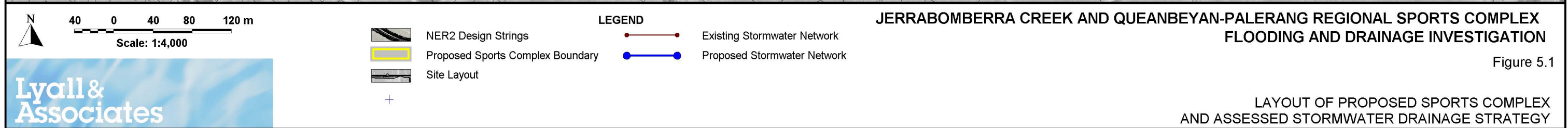
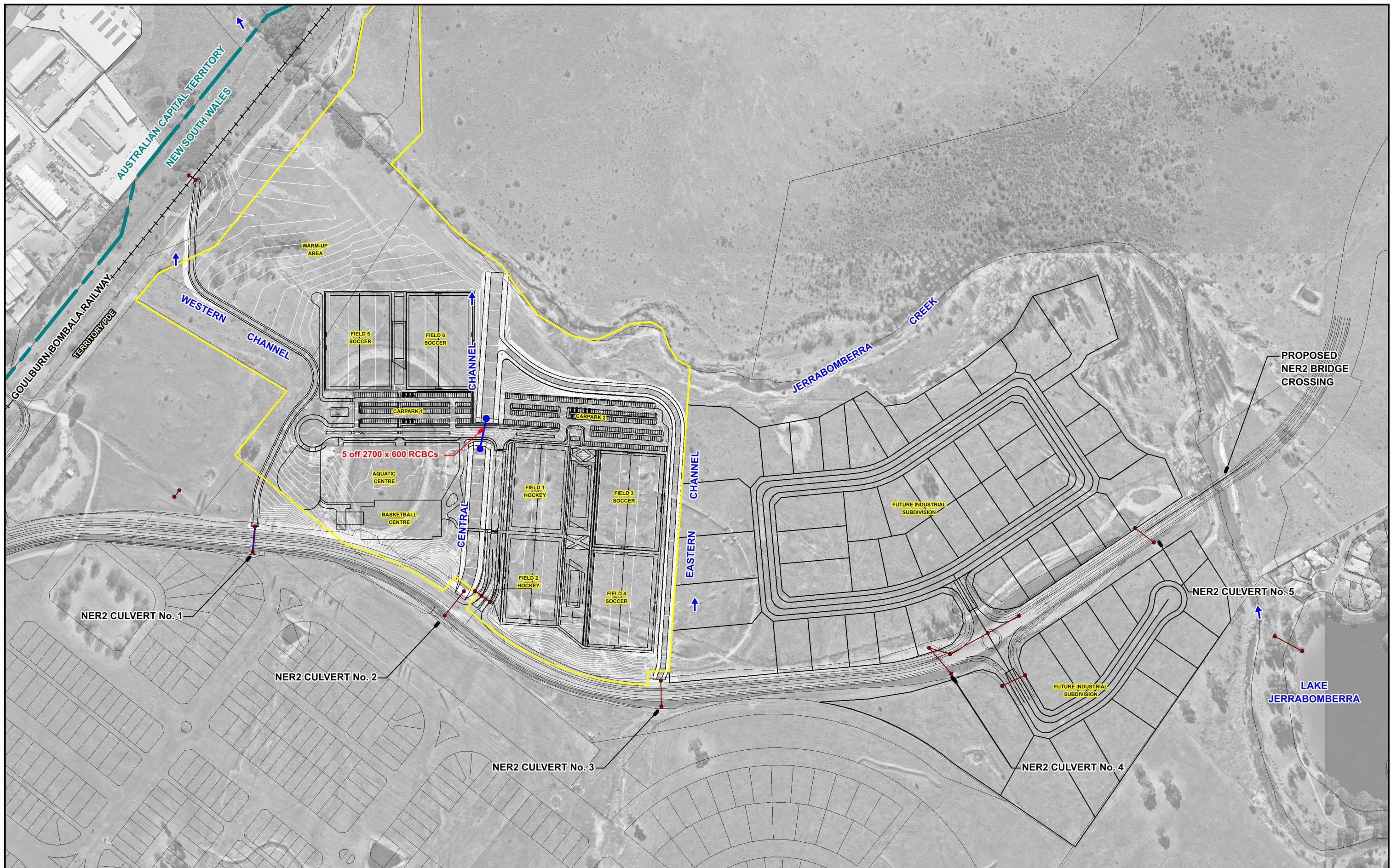
LEGEND

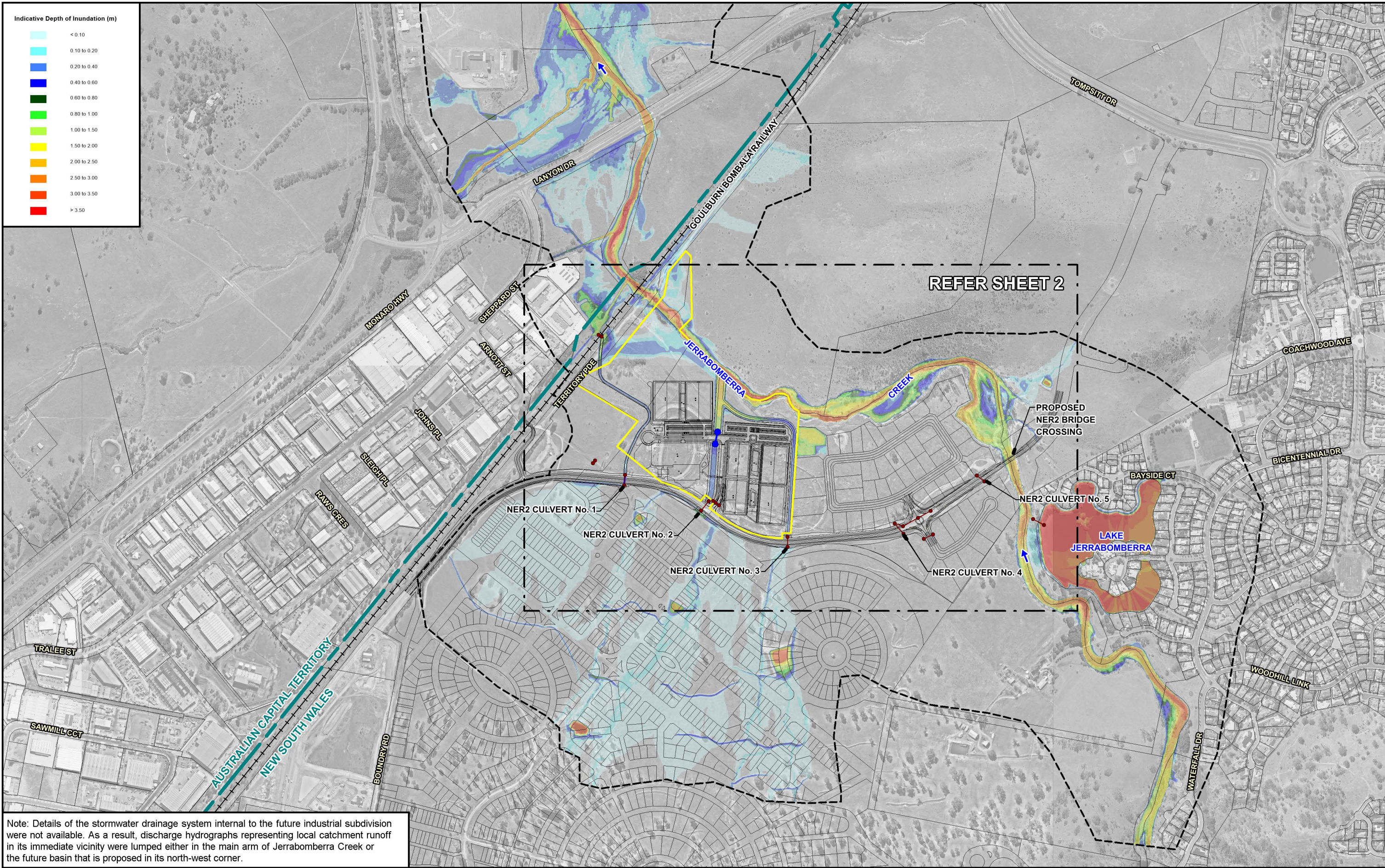
- PMF
- 0.2% AEP
- 0.5% AEP
- 1% AEP
- 5% AEP
- 20% AEP

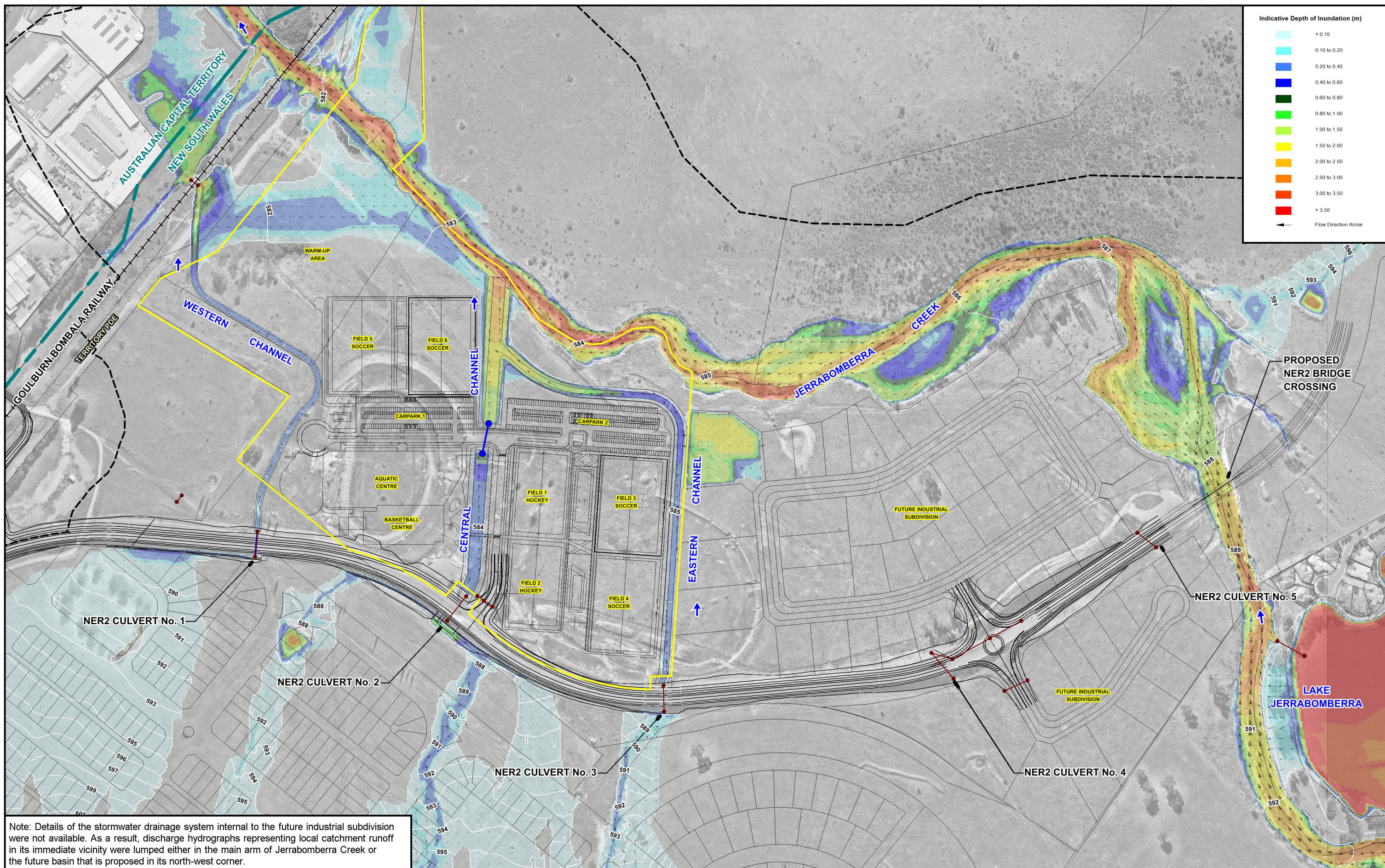
JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION

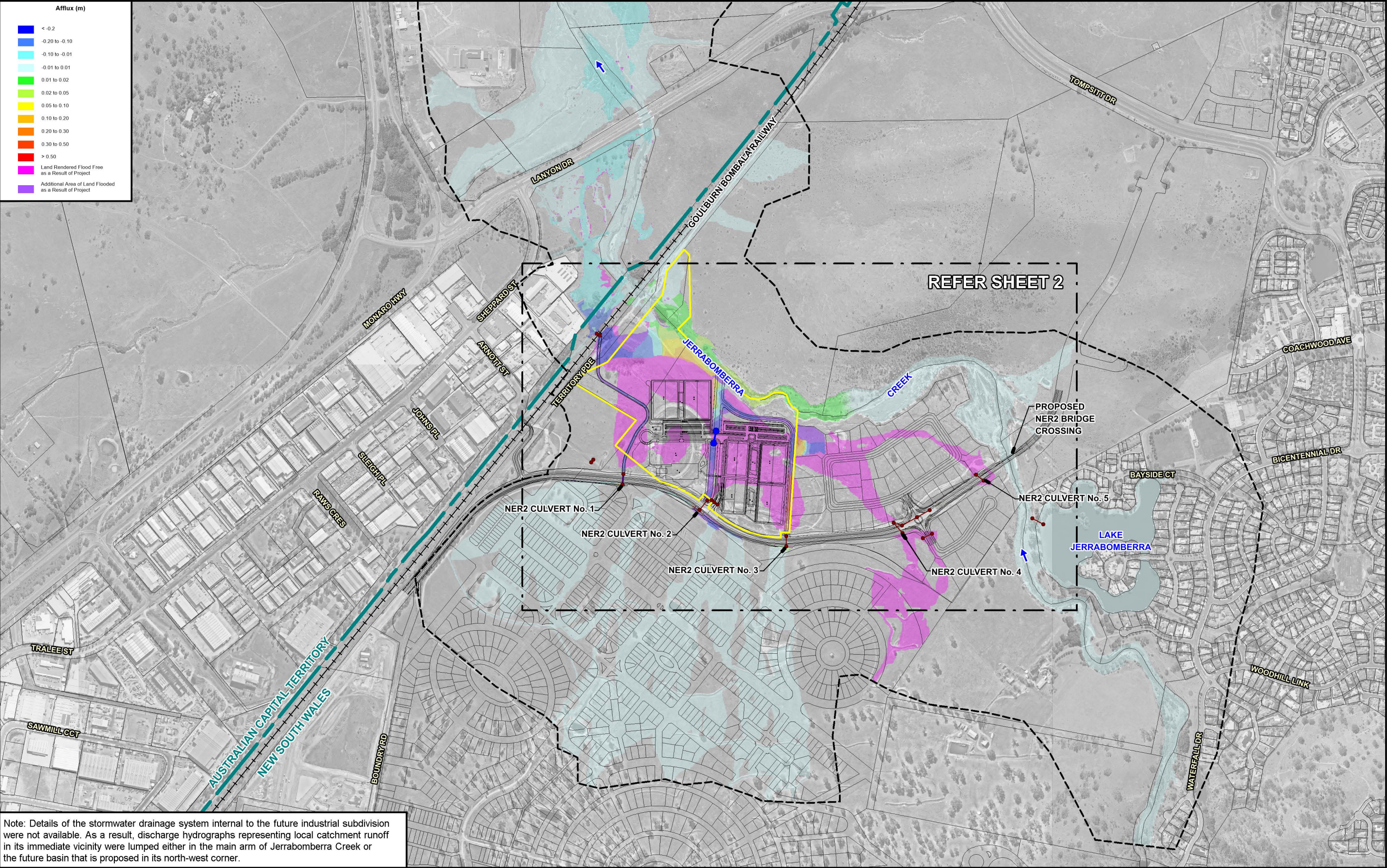
Figure 4.14

DESIGN WATER SURFACE PROFILES









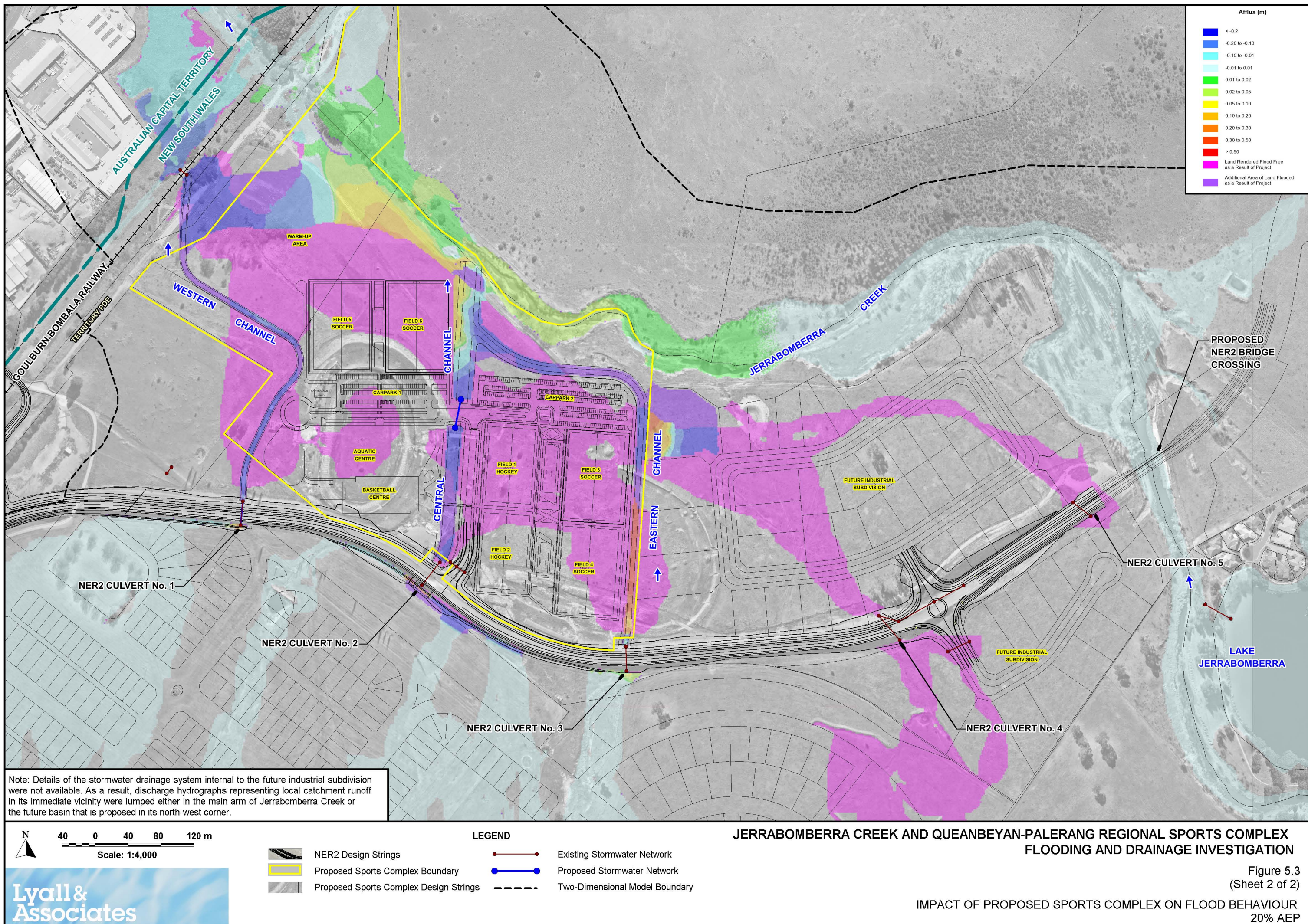
100 0 100 200 300 m
Scale: 1:10,000

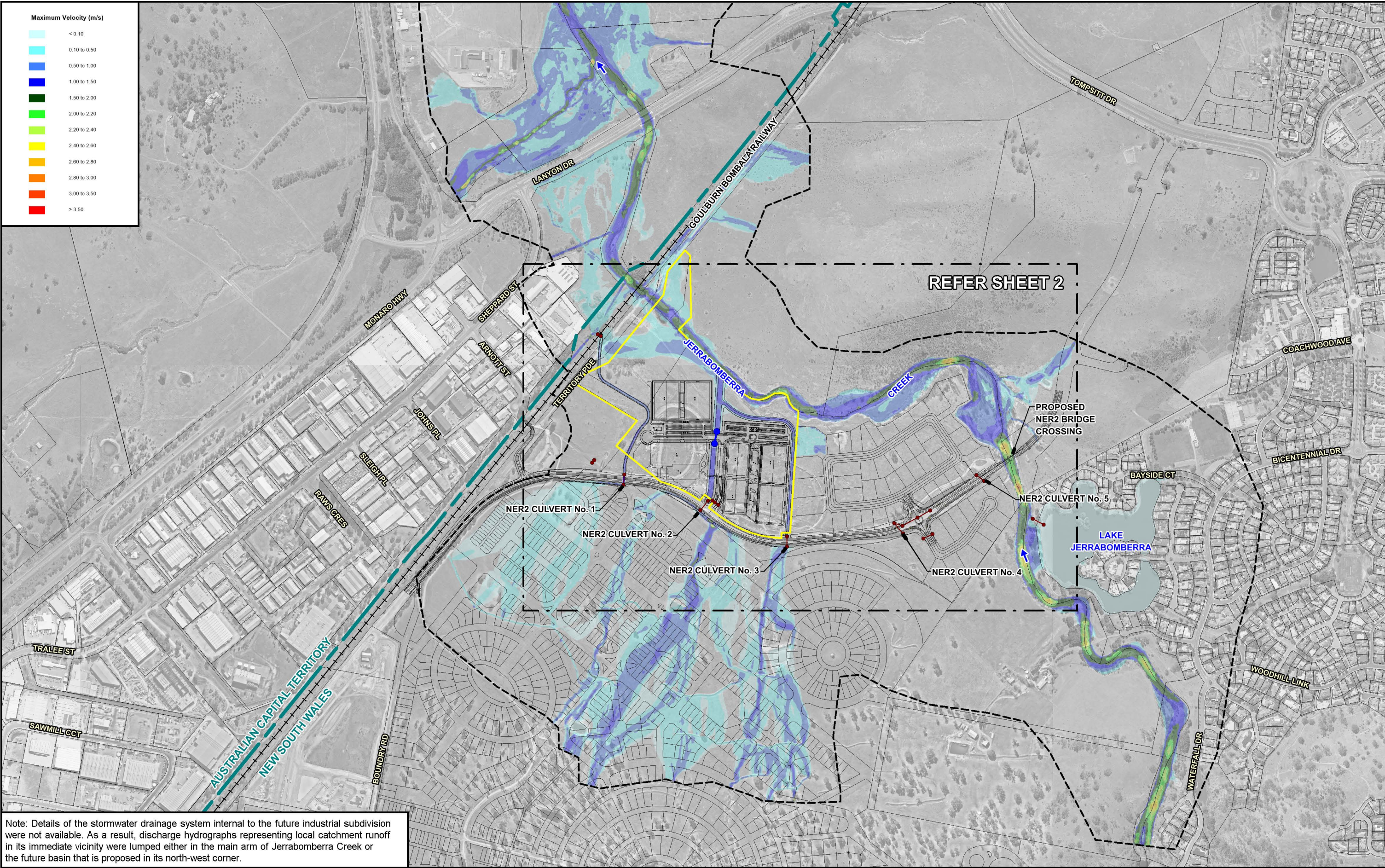
Lyall & Associates

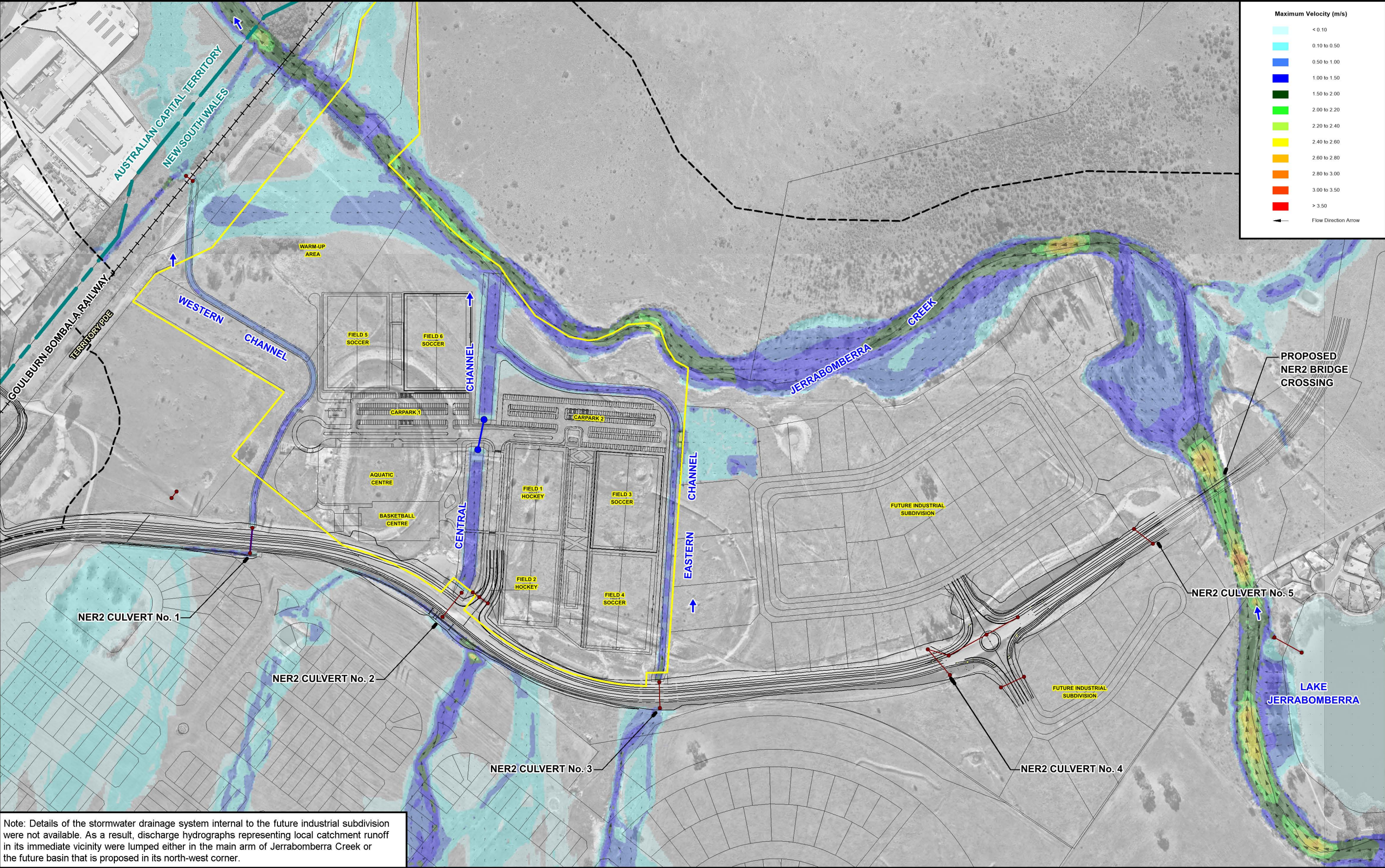
- LEGEND**
- NER2 Design Strings
 - Proposed Sports Complex Boundary
 - Proposed Sports Complex Design Strings
 - Existing Stormwater Network
 - Proposed Stormwater Network
 - Two-Dimensional Model Boundary

**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**

Figure 5.3
(Sheet 1 of 2)
IMPACT OF PROPOSED SPORTS COMPLEX ON FLOOD BEHAVIOUR
20% AEP







Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

N

40

0

40

80

120 m

Scale: 1:4,000

NER2 Design Strings

Proposed Sports Complex Boundary

Proposed Sports Complex Design Strings

Existing Stormwater Network

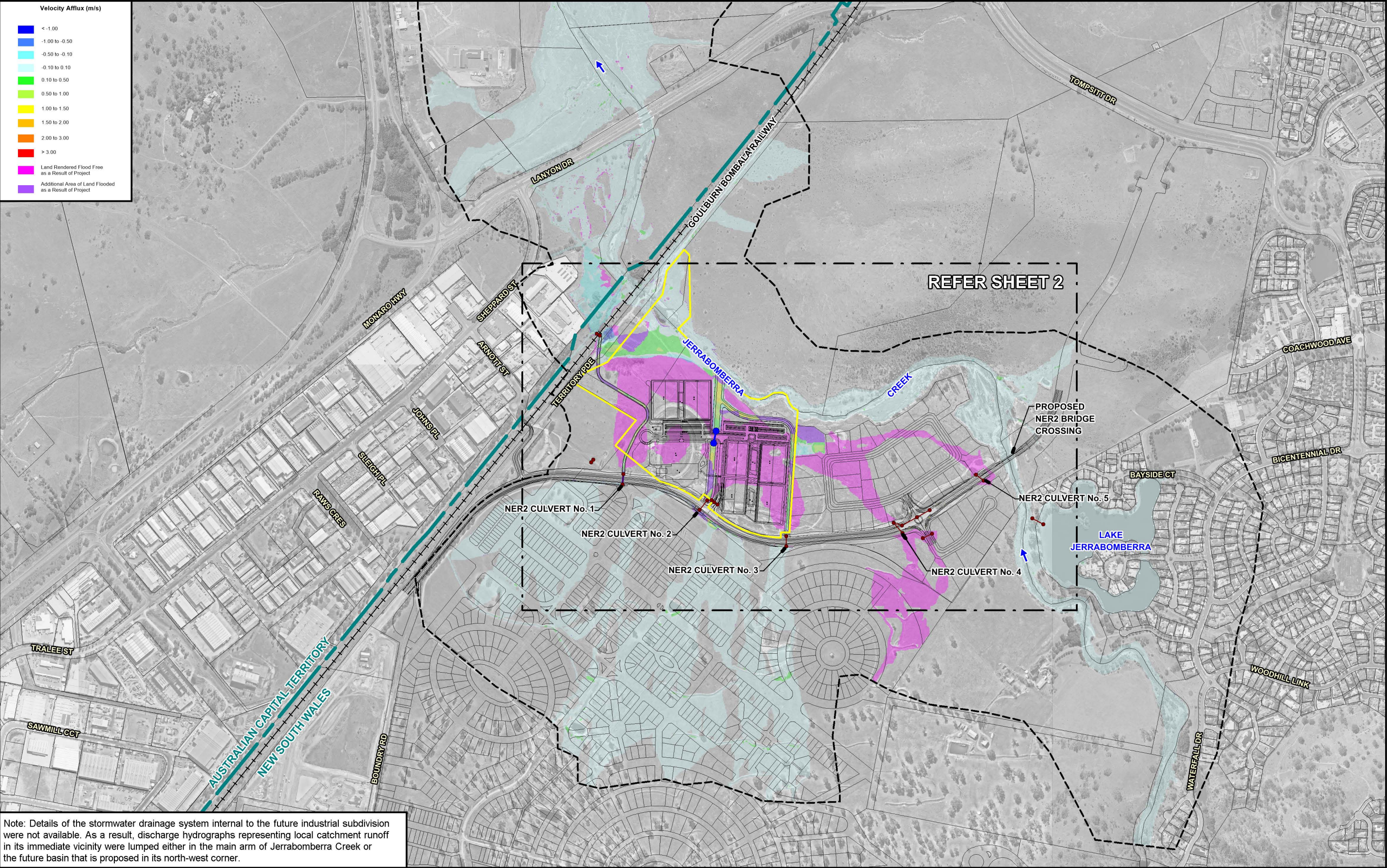
Proposed Stormwater Network

Two-Dimensional Model Boundary

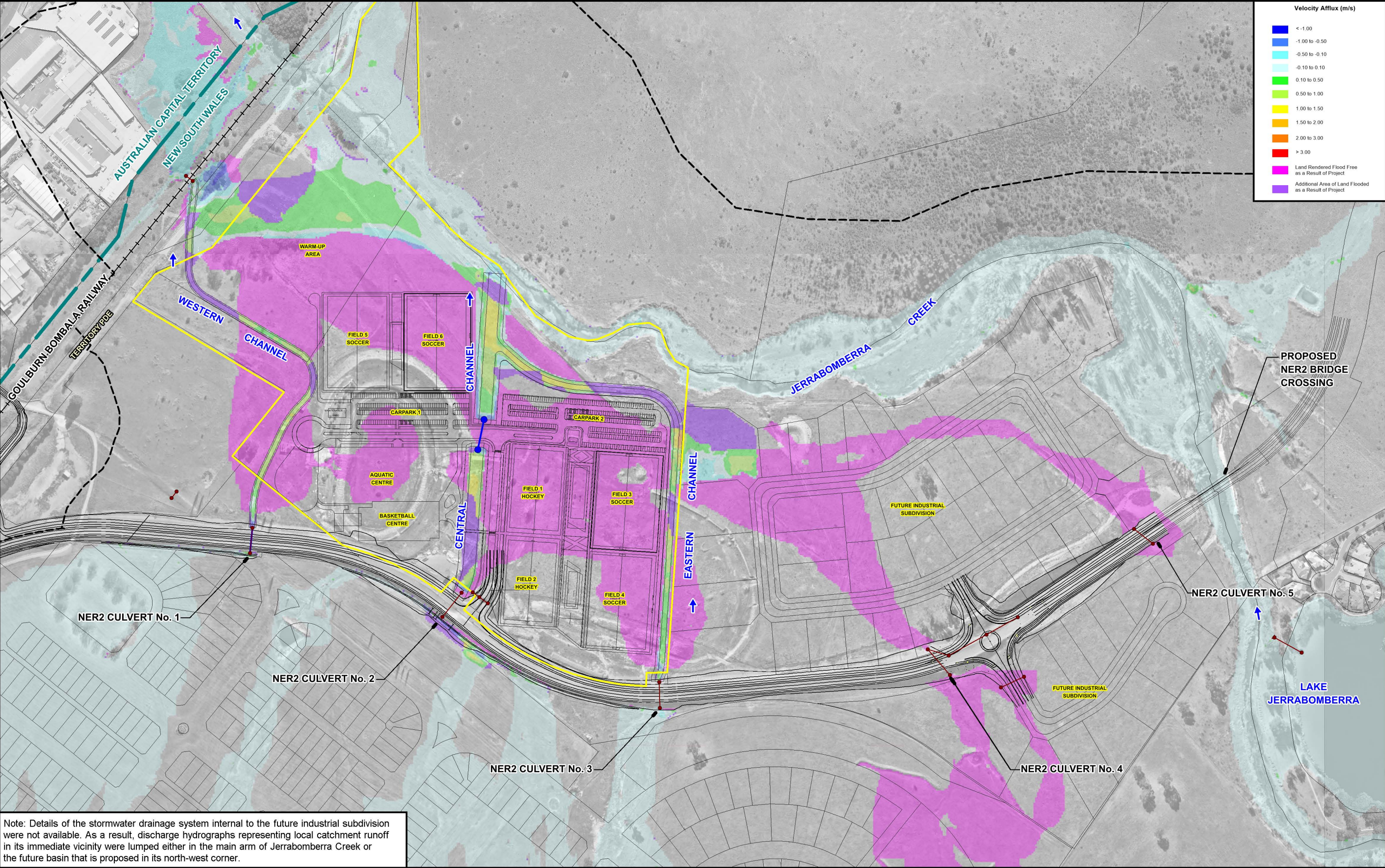
JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION

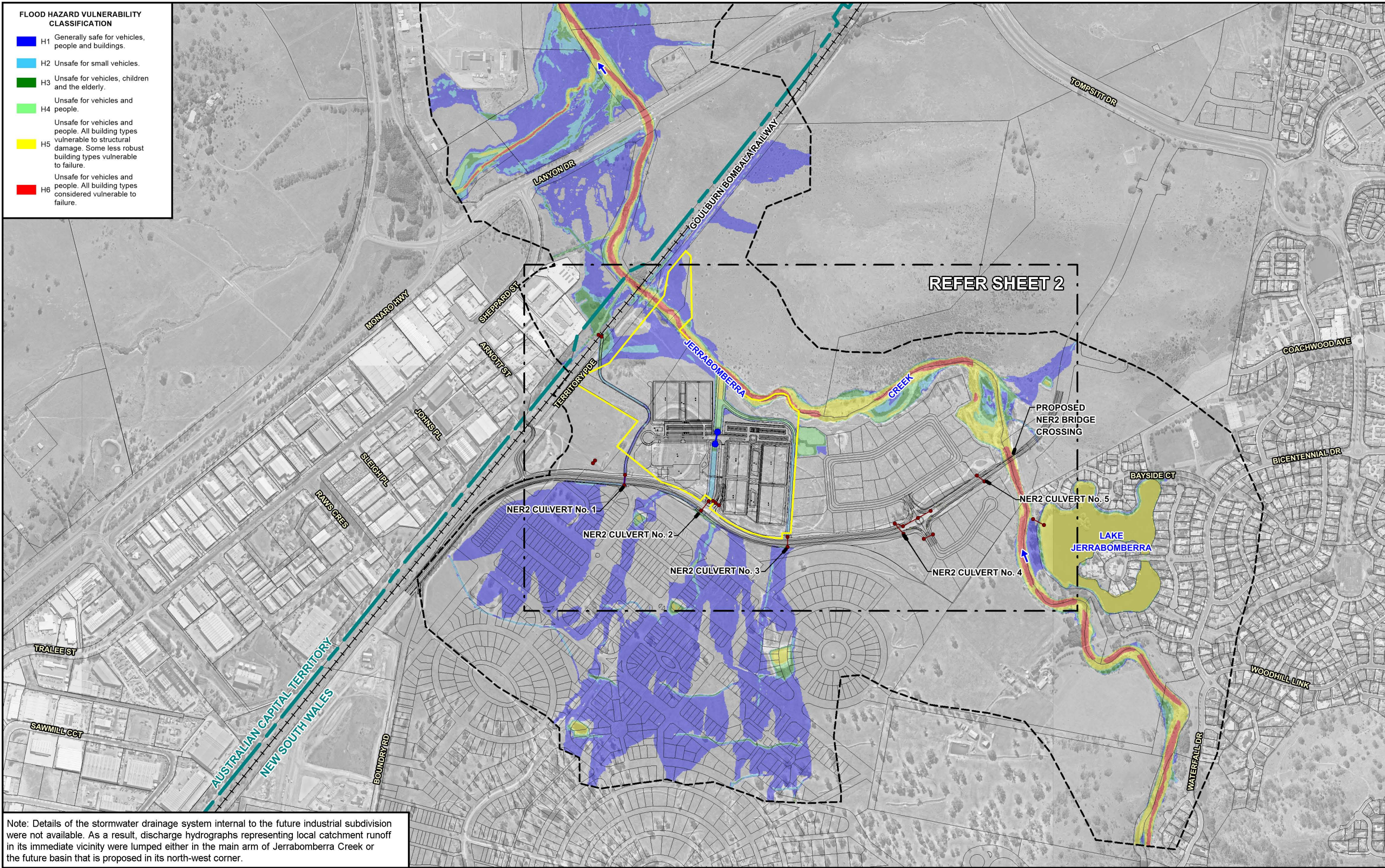
Figure 5.4
(Sheet 2 of 2)

MAXIMUM FLOW VELOCITIES
POST-PROJECT CONDITIONS - 20% AEP



Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.





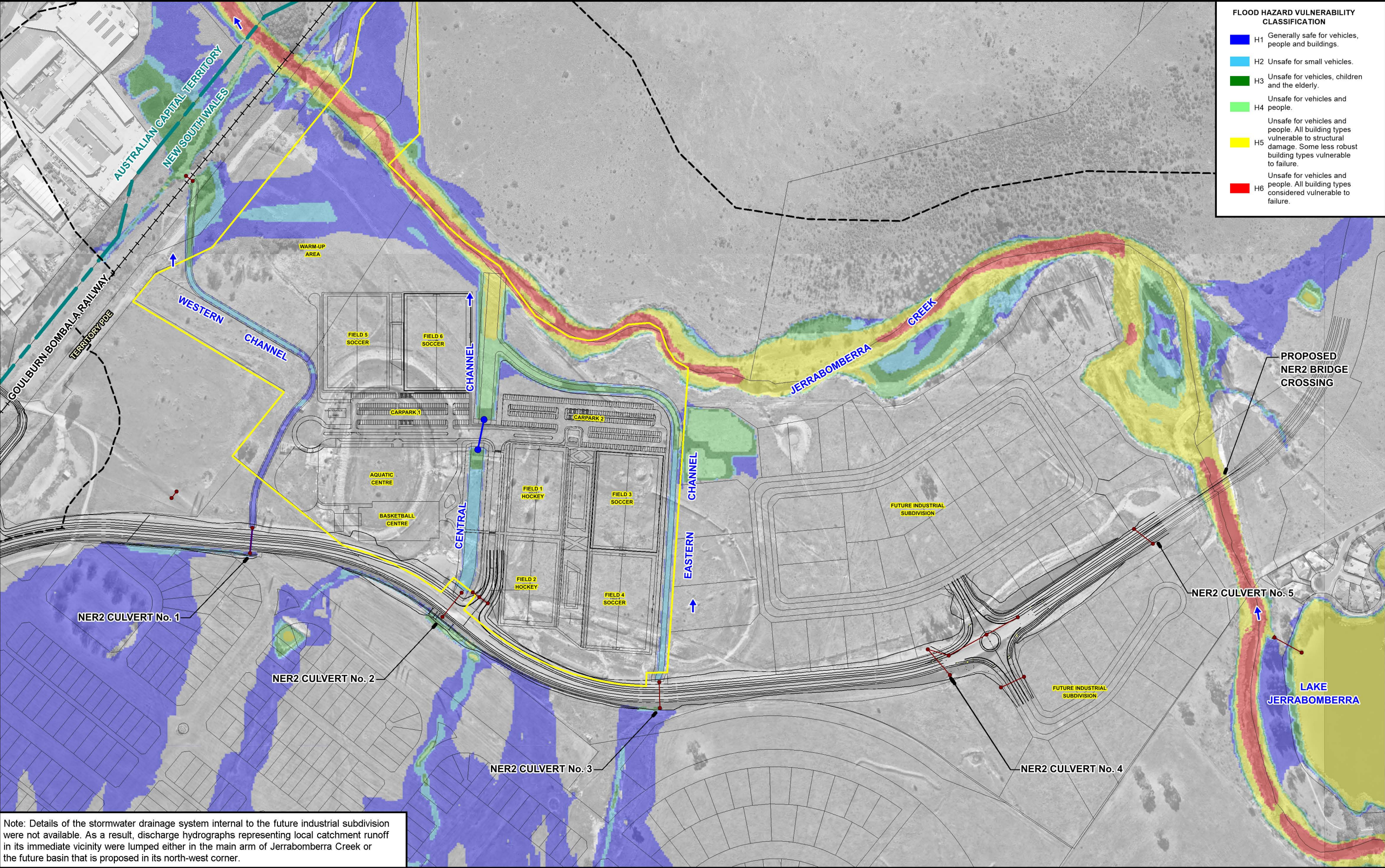
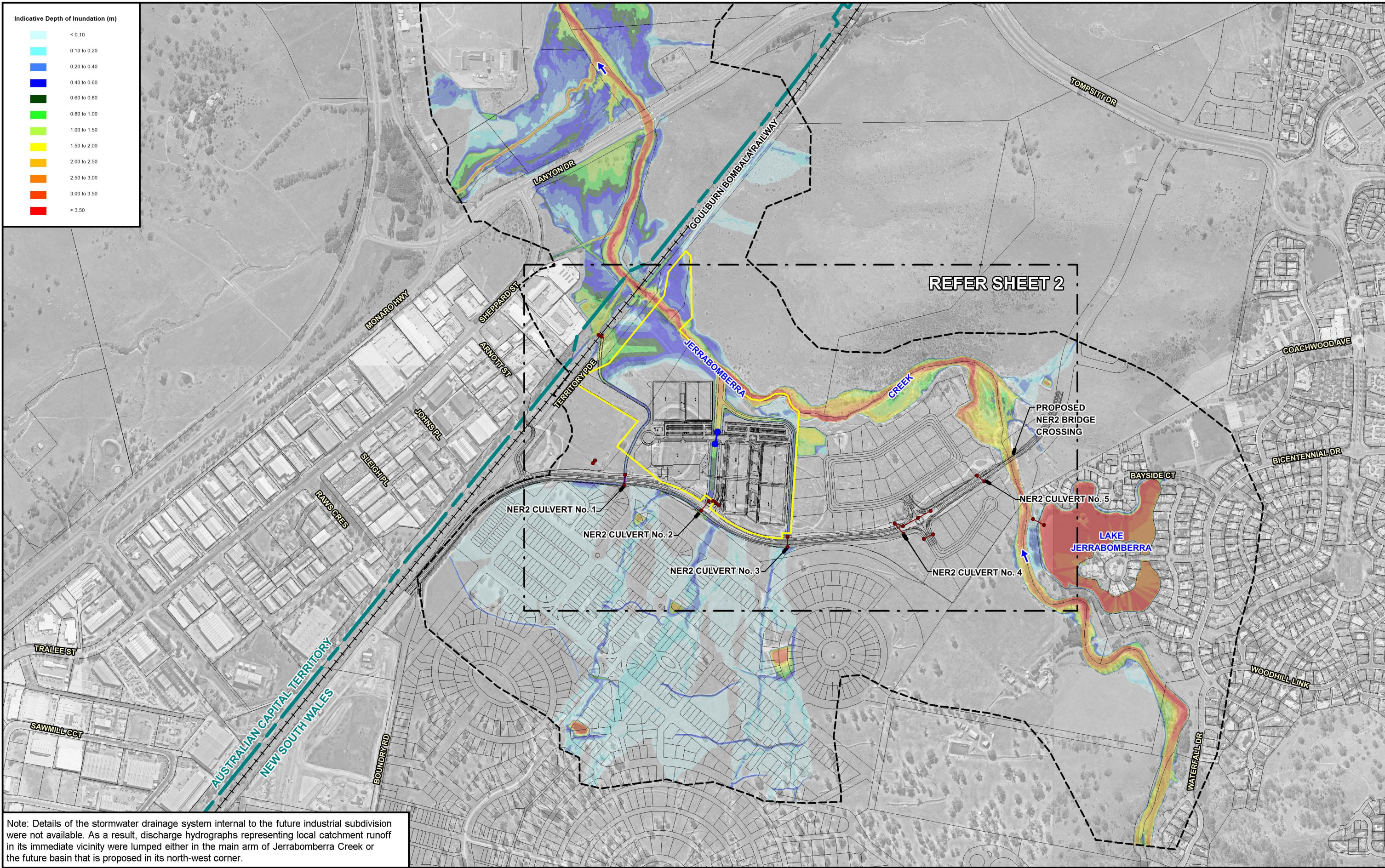
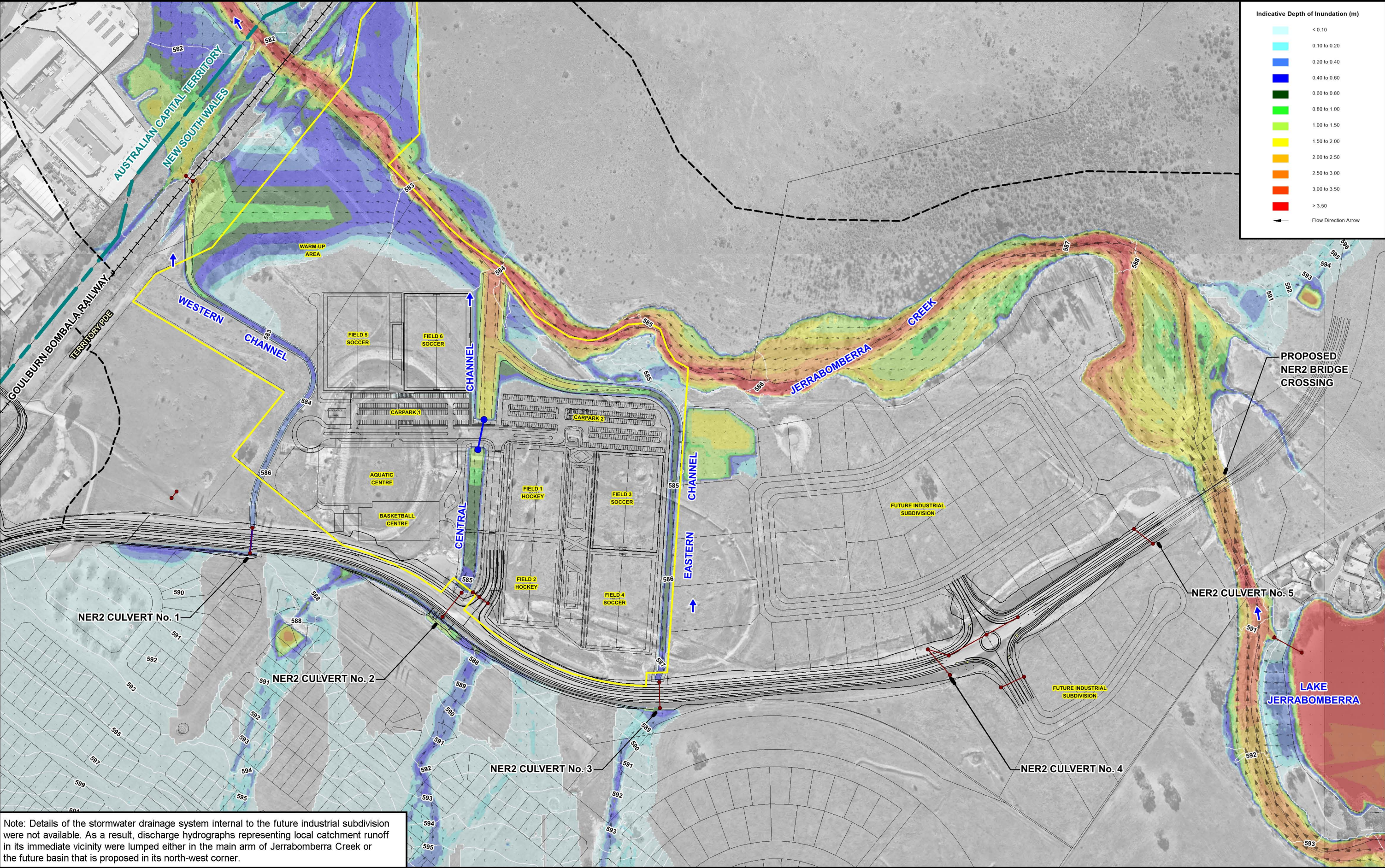


Figure 5.6
(Sheet 2 of 2)



Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.



40 0 40 80 120 m

Scale: 1:4,000

Lyall & Associates

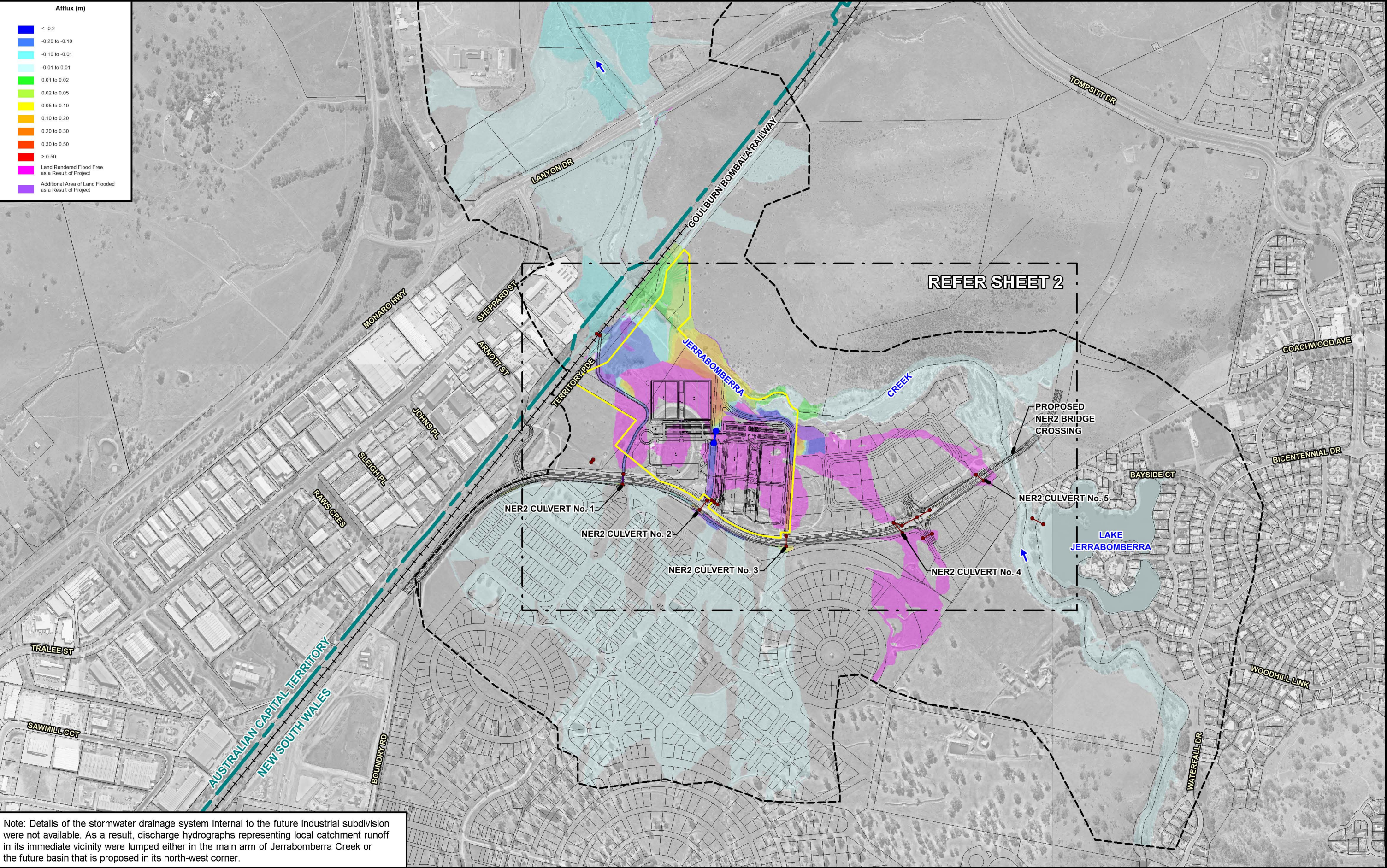
LEGEND

	NER2 Design Strings		Existing Stormwater Network
	Proposed Sports Complex Boundary		Proposed Stormwater Network
	Proposed Sports Complex Design Strings		Two-Dimensional Model Boundary
			Water Surface Elevation Contours (m AHD)

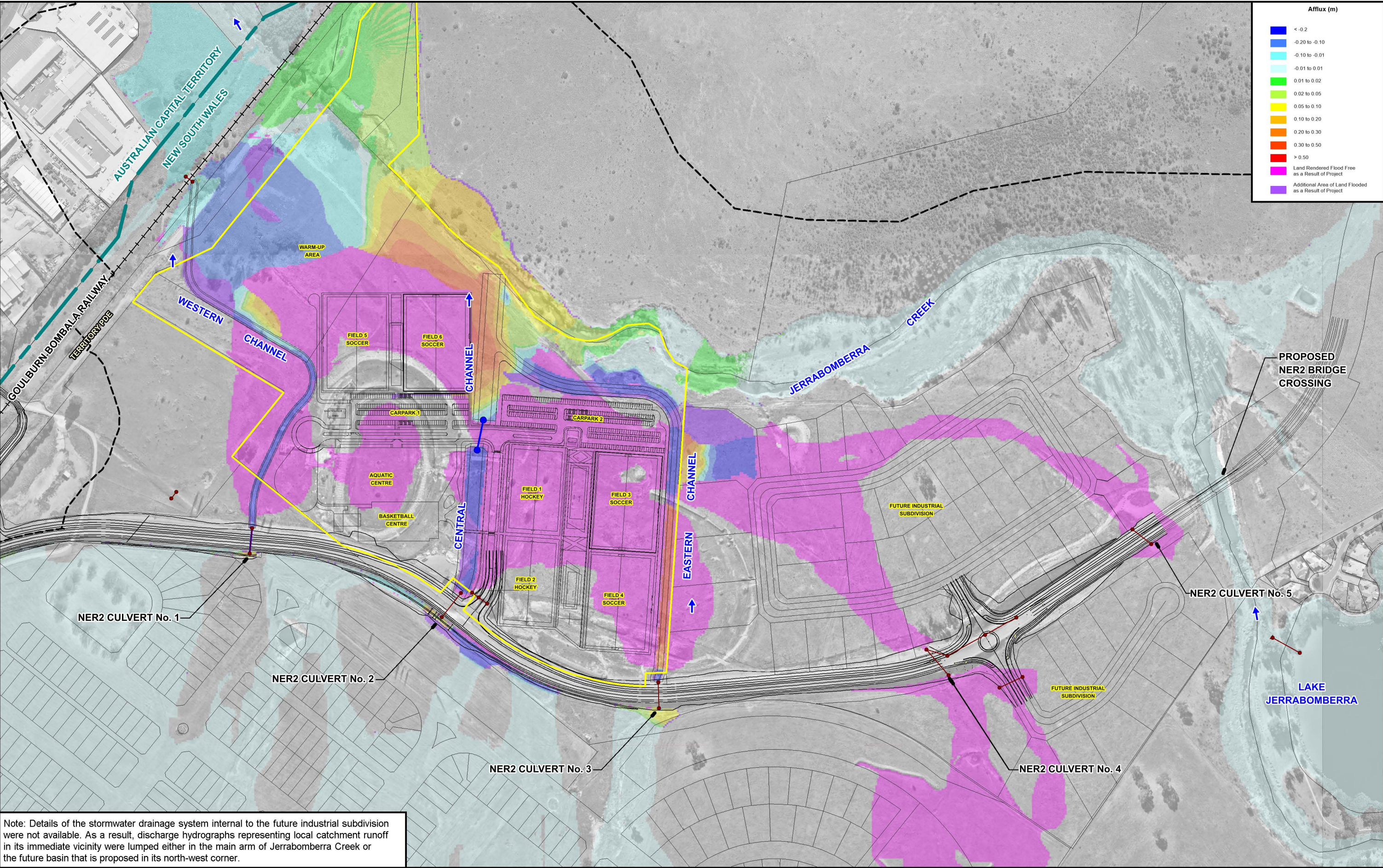
**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**

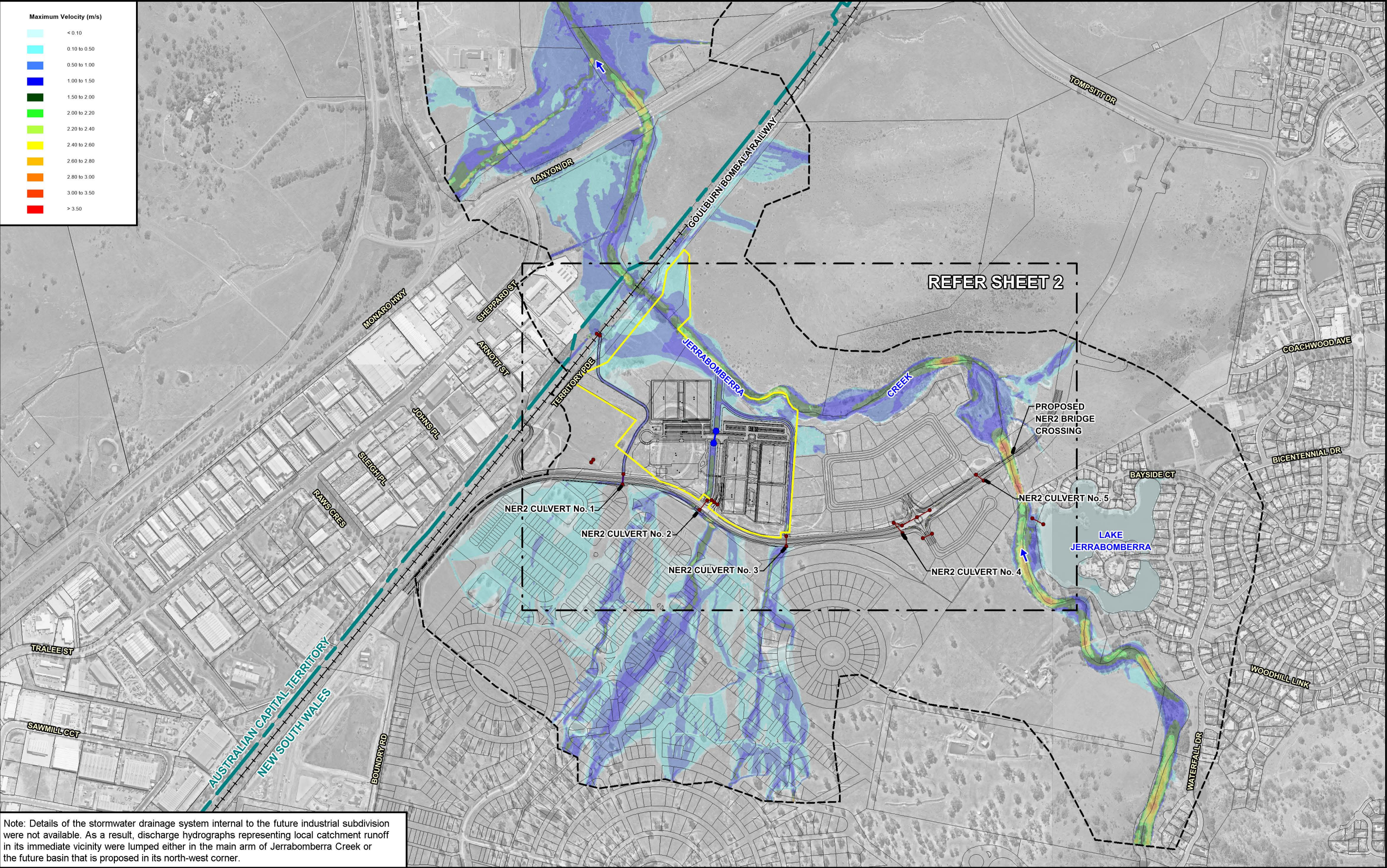
Figure 5.7
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTH OF INUNDATION
POST-PROJECT CONDITIONS - 5% AEP



Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.





Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

- LEGEND
- NER2 Design Strings

Proposed Sports Complex Boundary

Proposed Sports Complex Design Strings

Existing Stormwater Network

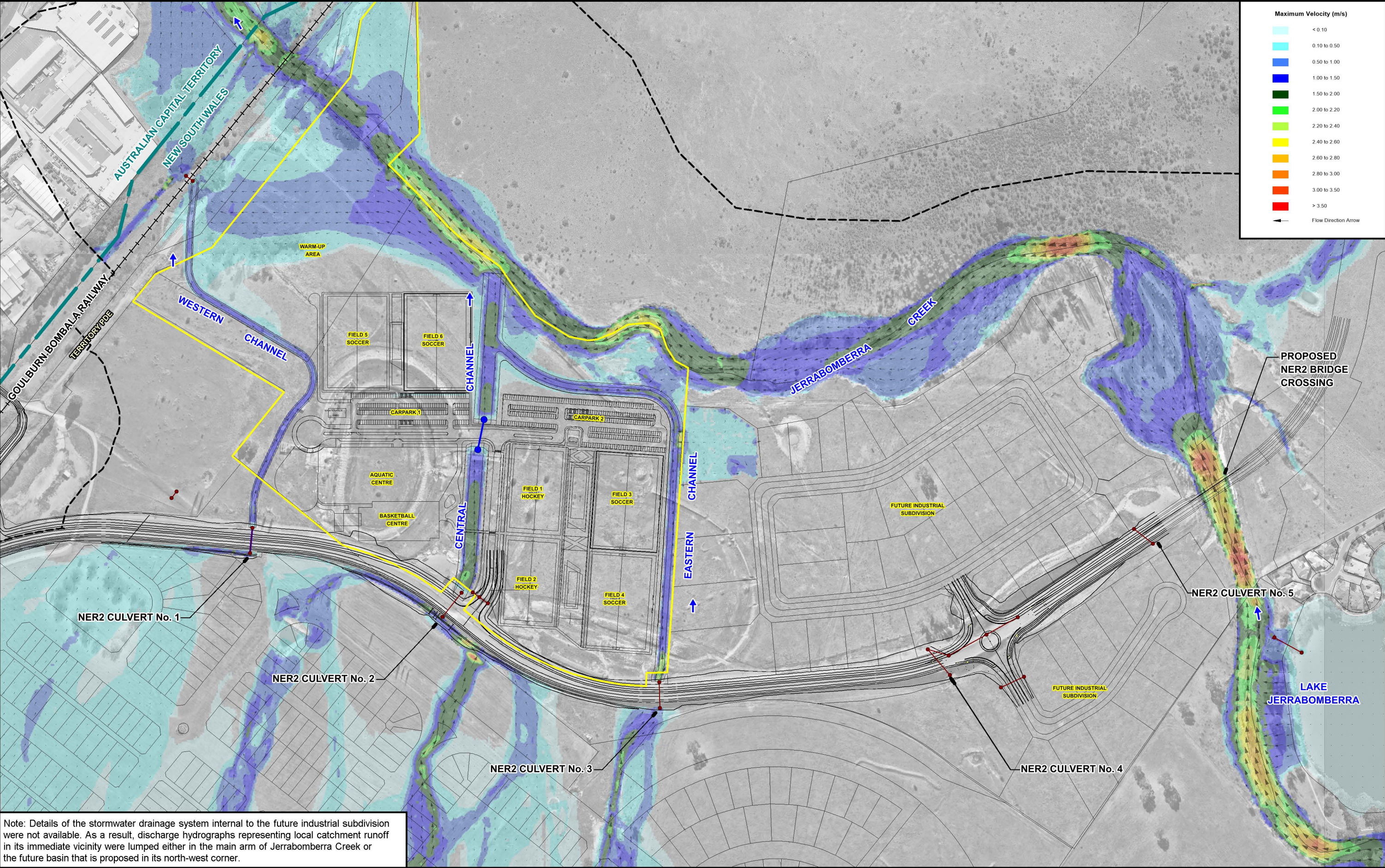
Proposed Stormwater Network

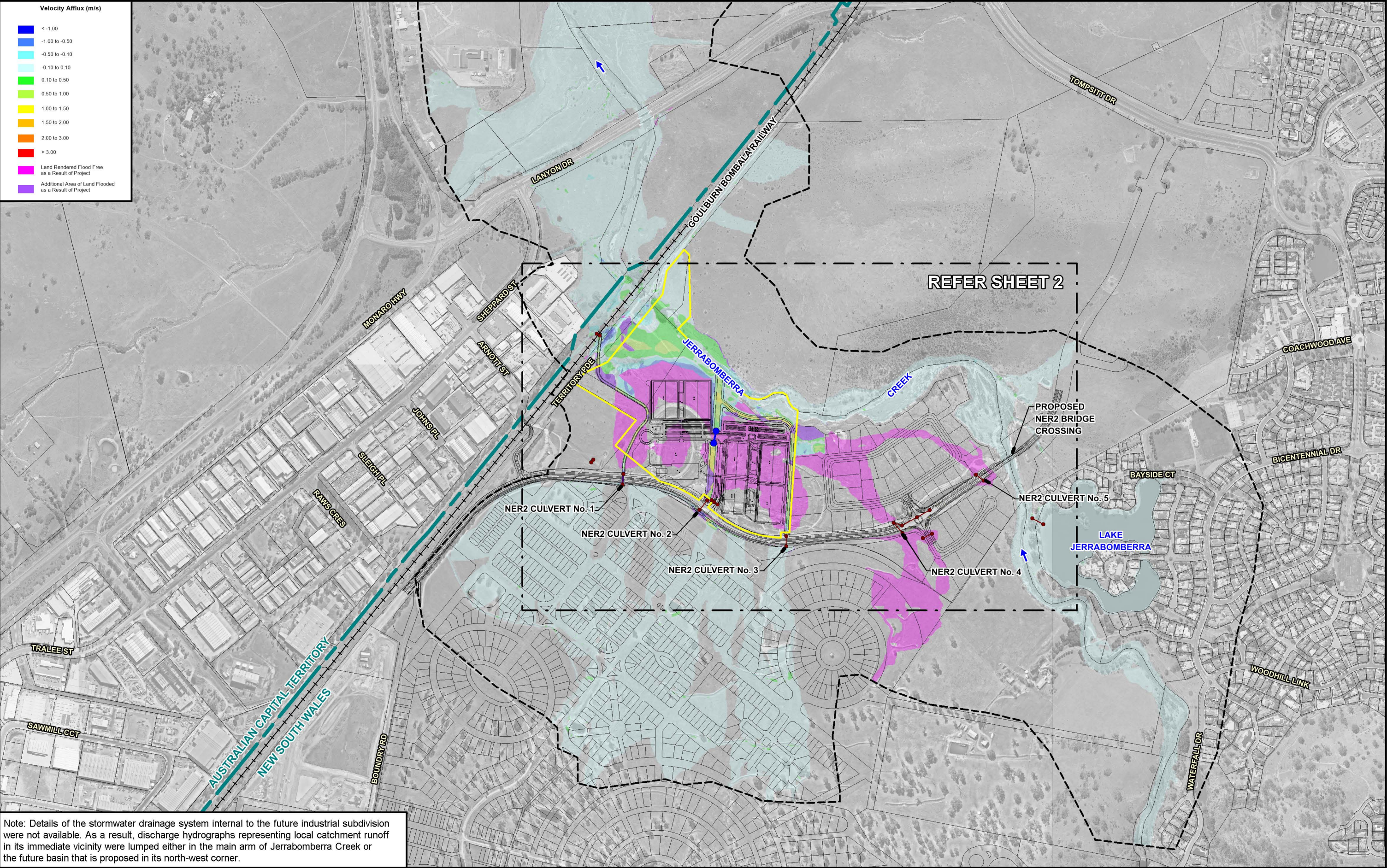
Two-Dimensional Model Boundary

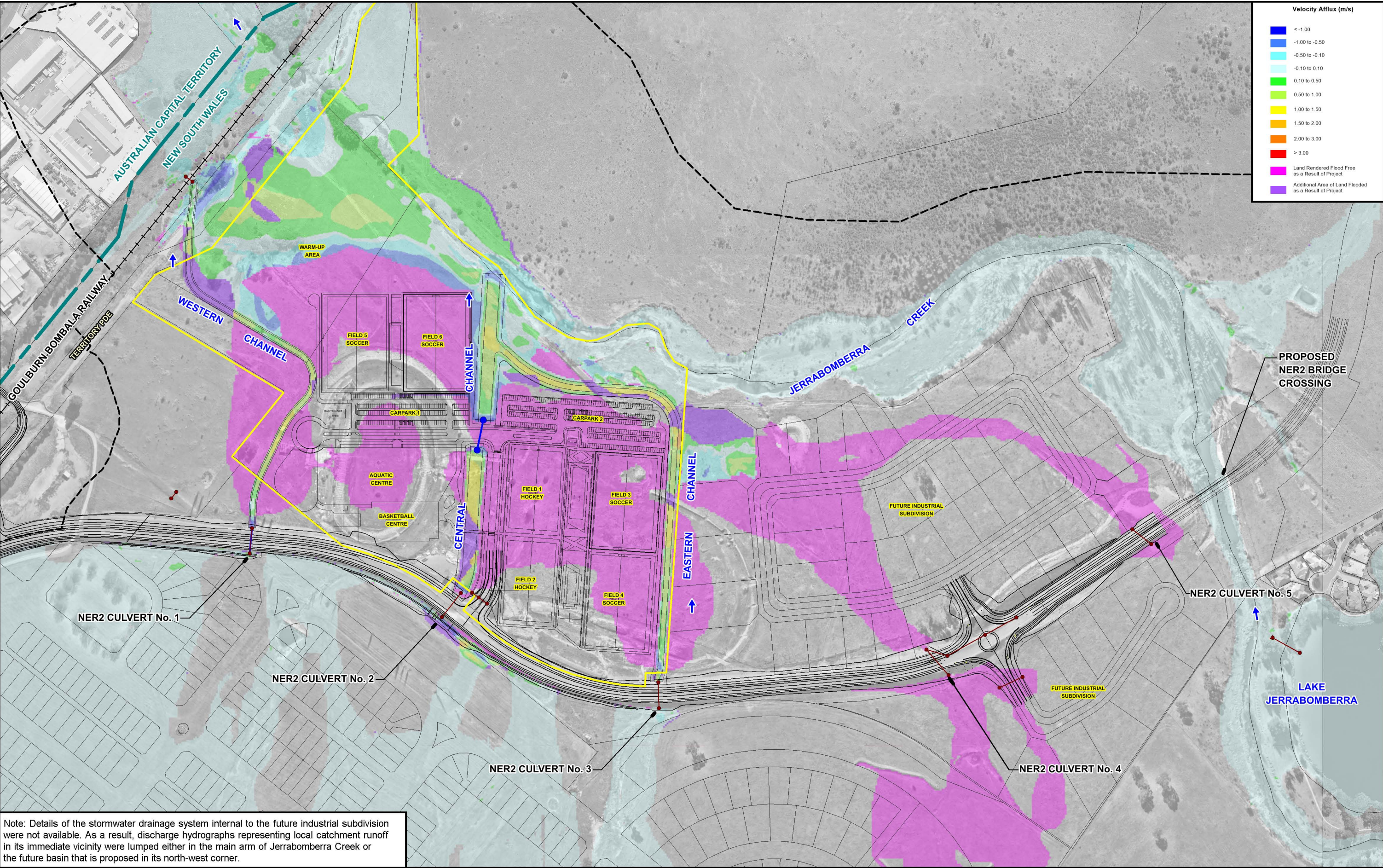
JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION

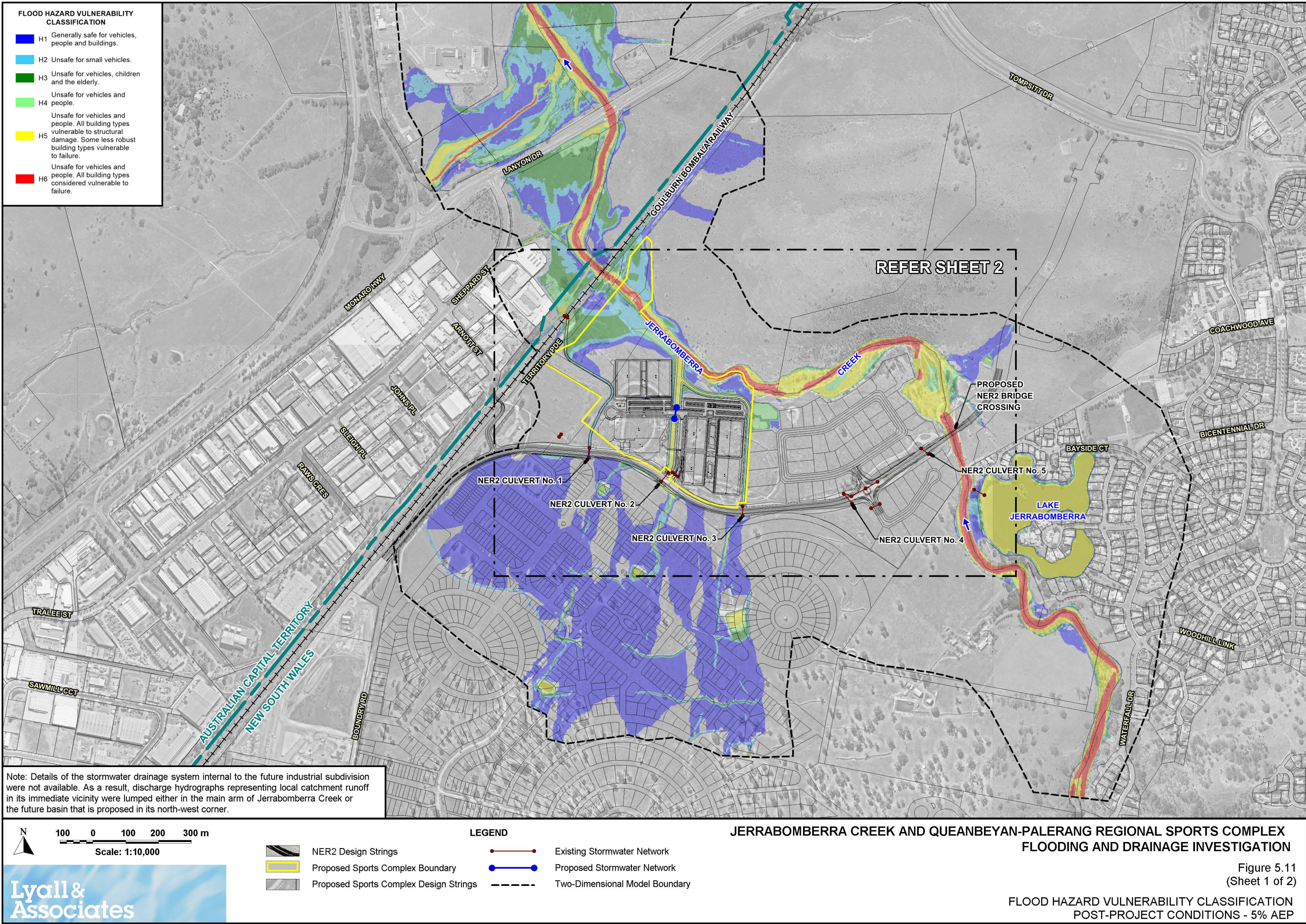
Figure 5.9
(Sheet 1 of 2)

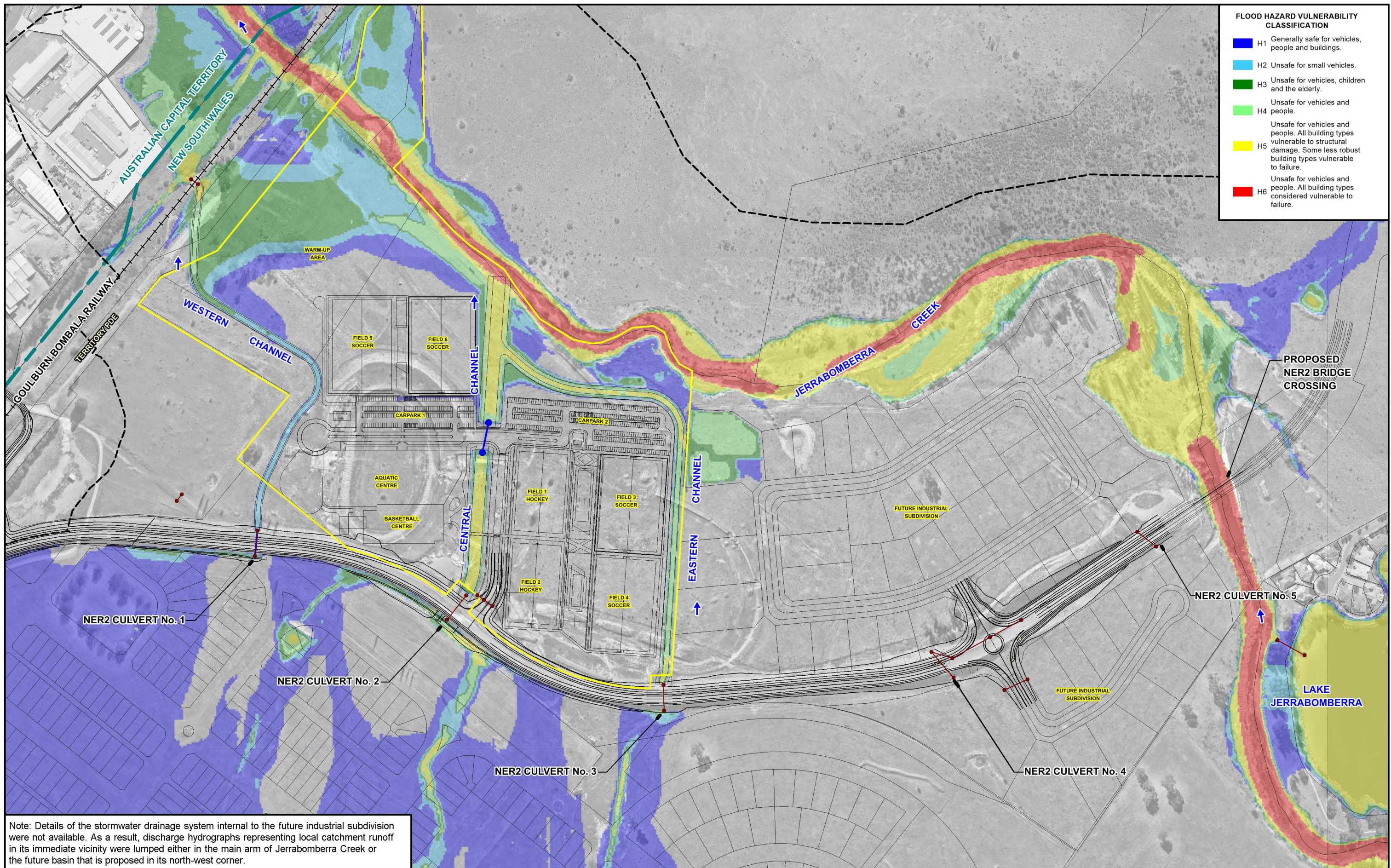
MAXIMUM FLOW VELOCITIES
POST-PROJECT CONDITIONS - 5% AEP

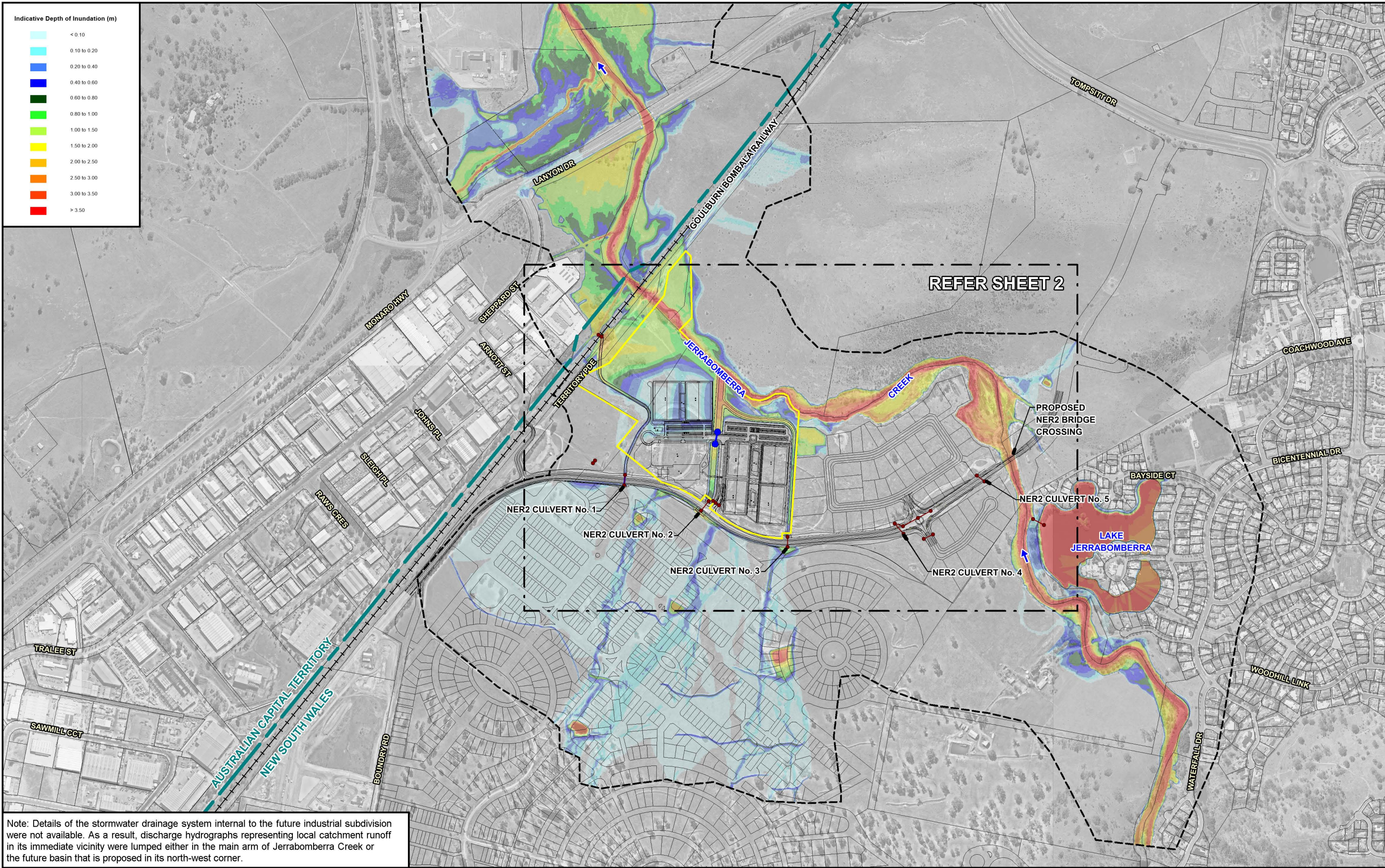








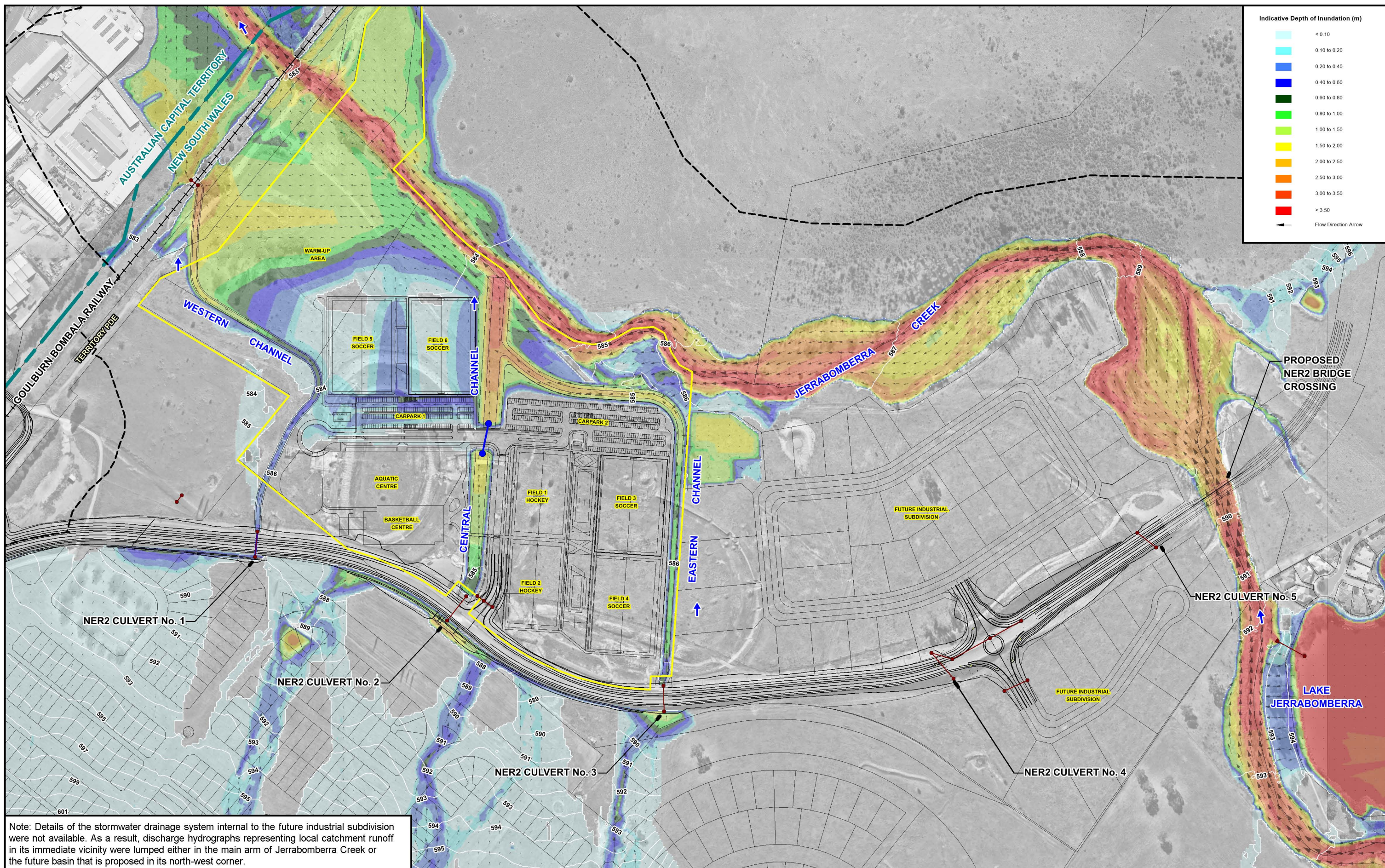


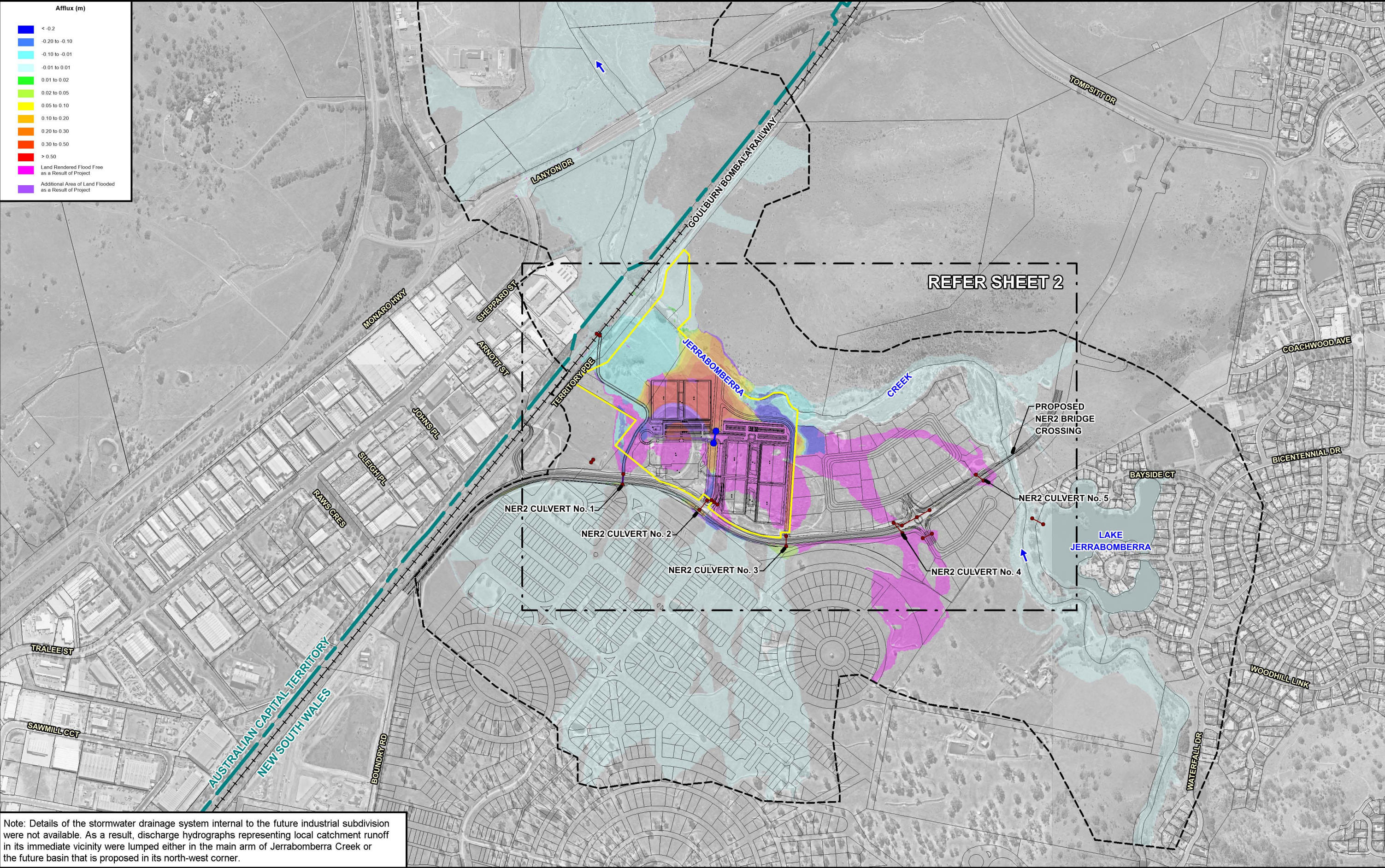


Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

N
100 0 100 200 300 m
Scale: 1:10,000

Lyall & Associates

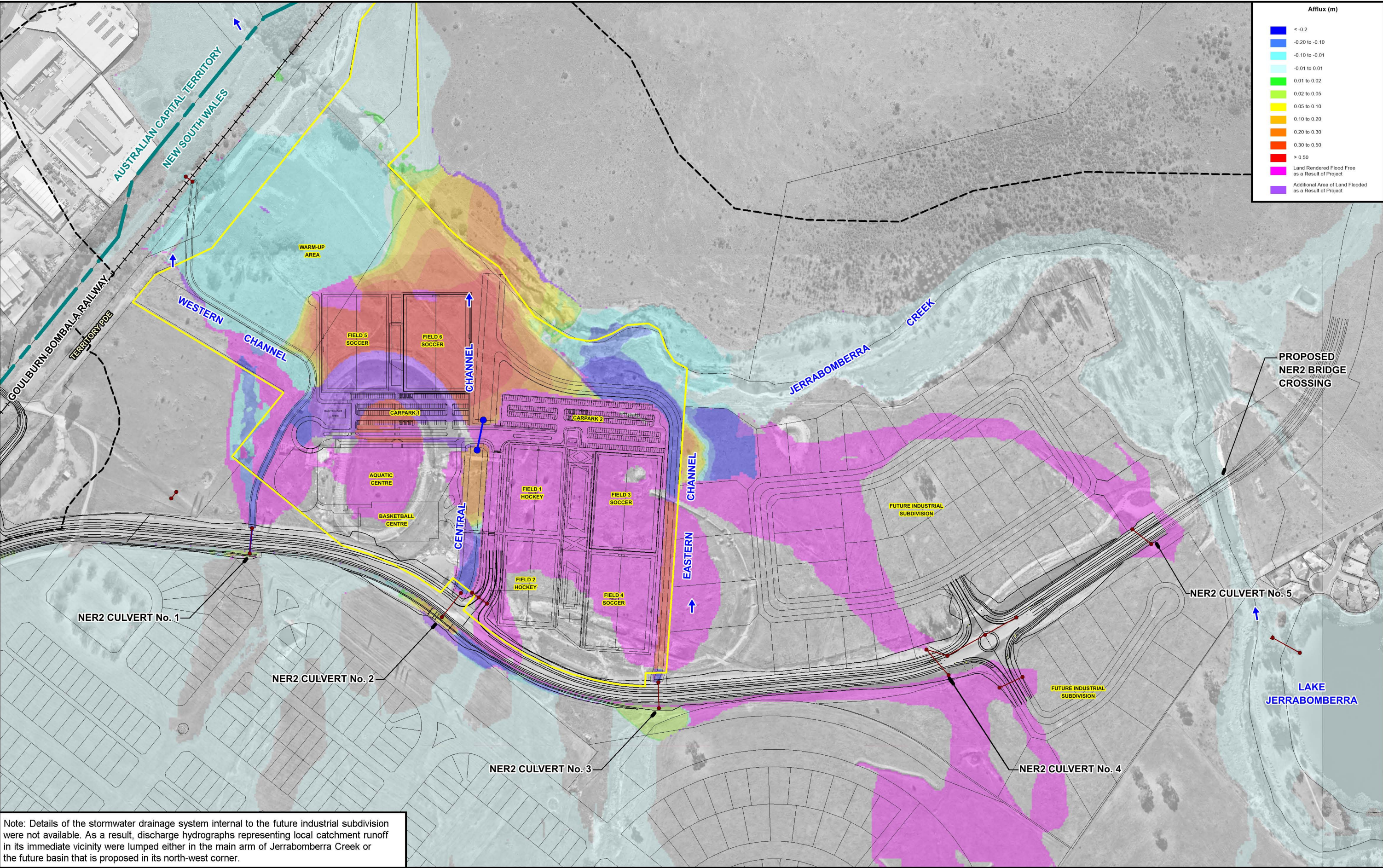




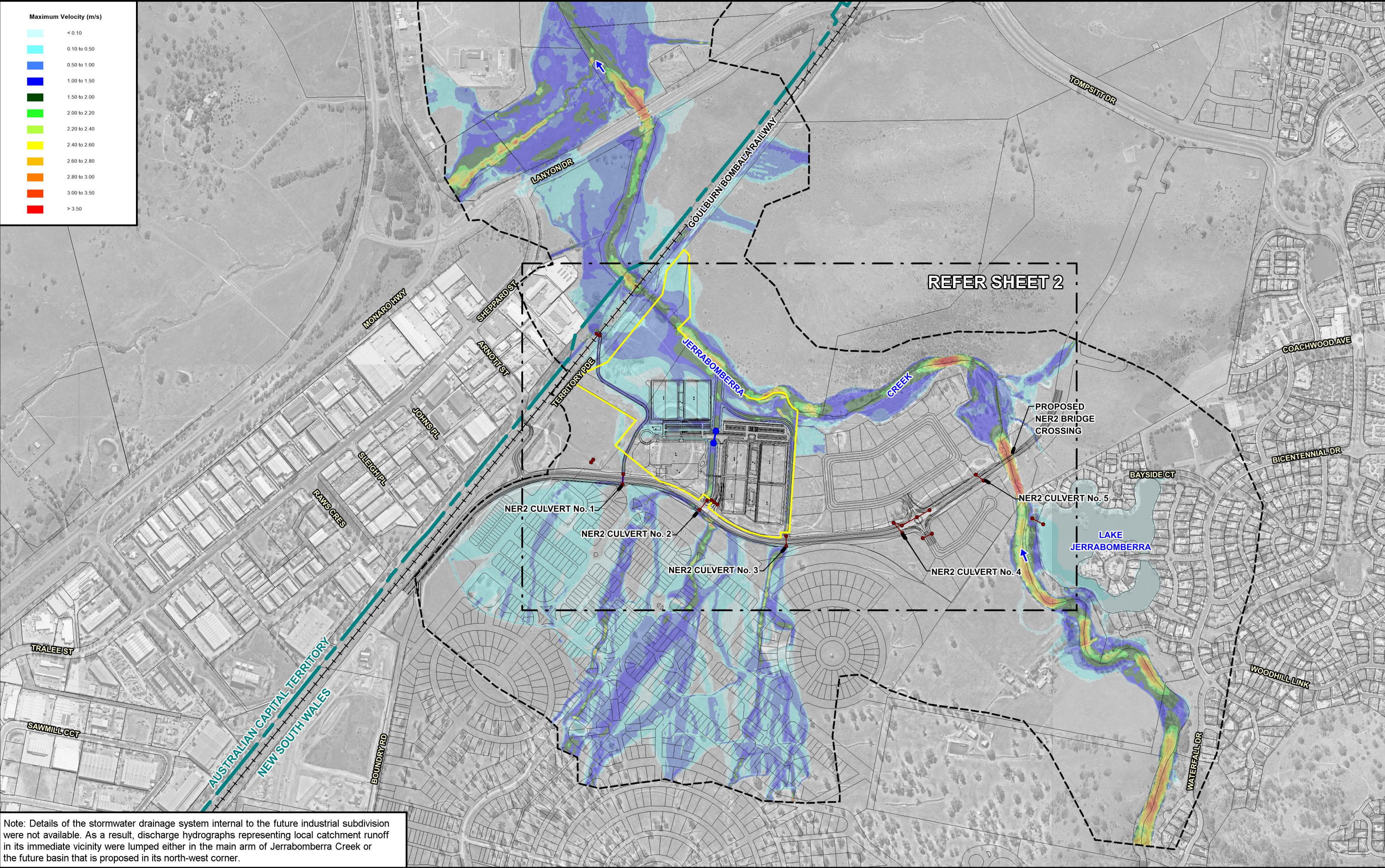
Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

- LEGEND**
- NER2 Design Strings
 - Proposed Sports Complex Boundary
 - Proposed Sports Complex Design Strings
 - Existing Stormwater Network
 - Proposed Stormwater Network
 - Two-Dimensional Model Boundary

**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**



Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.



Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

LEGEND

NER2 Design Strings

Proposed Sports Complex Boundary

Proposed Sports Complex Design Strings

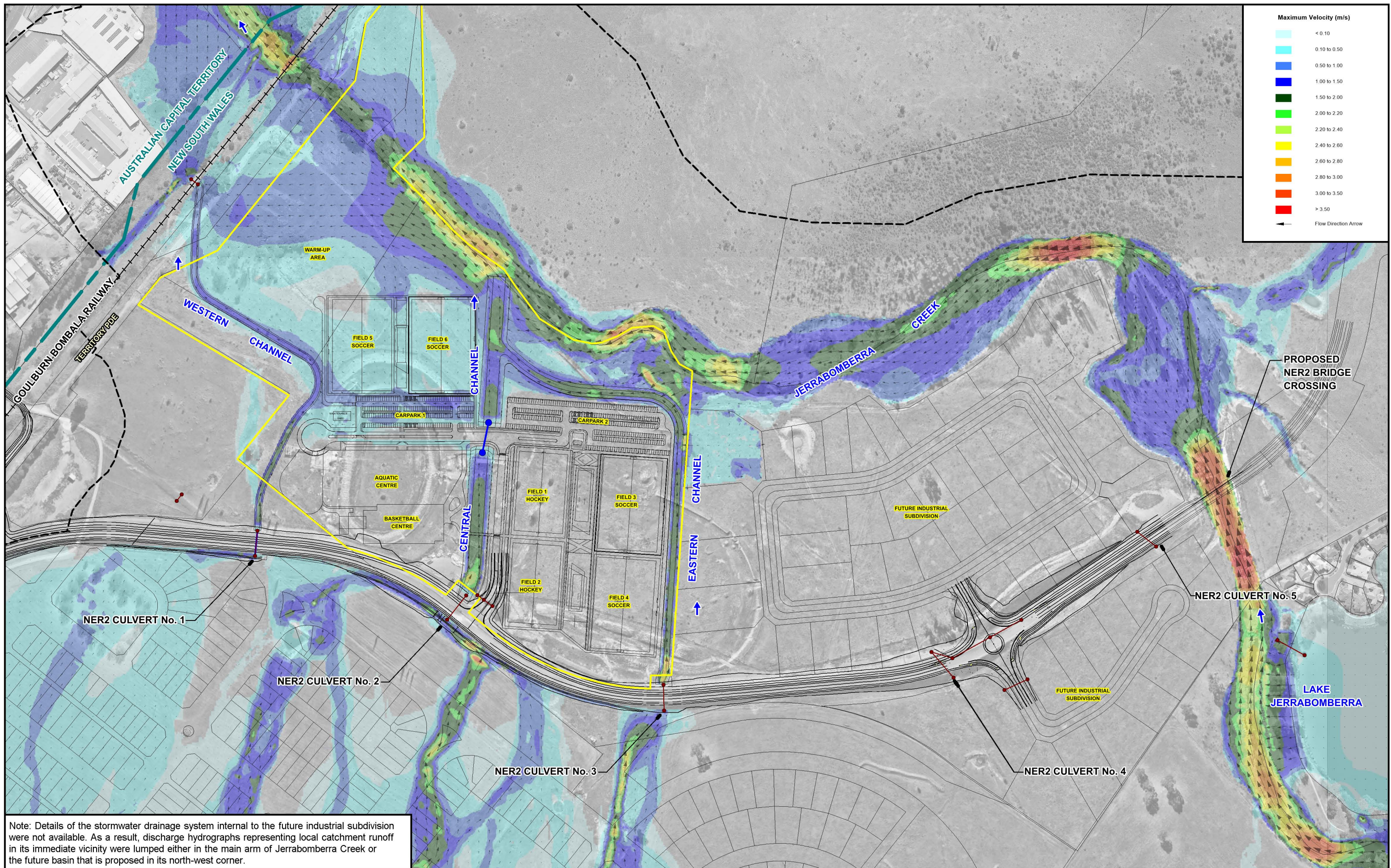
Existing Stormwater Network

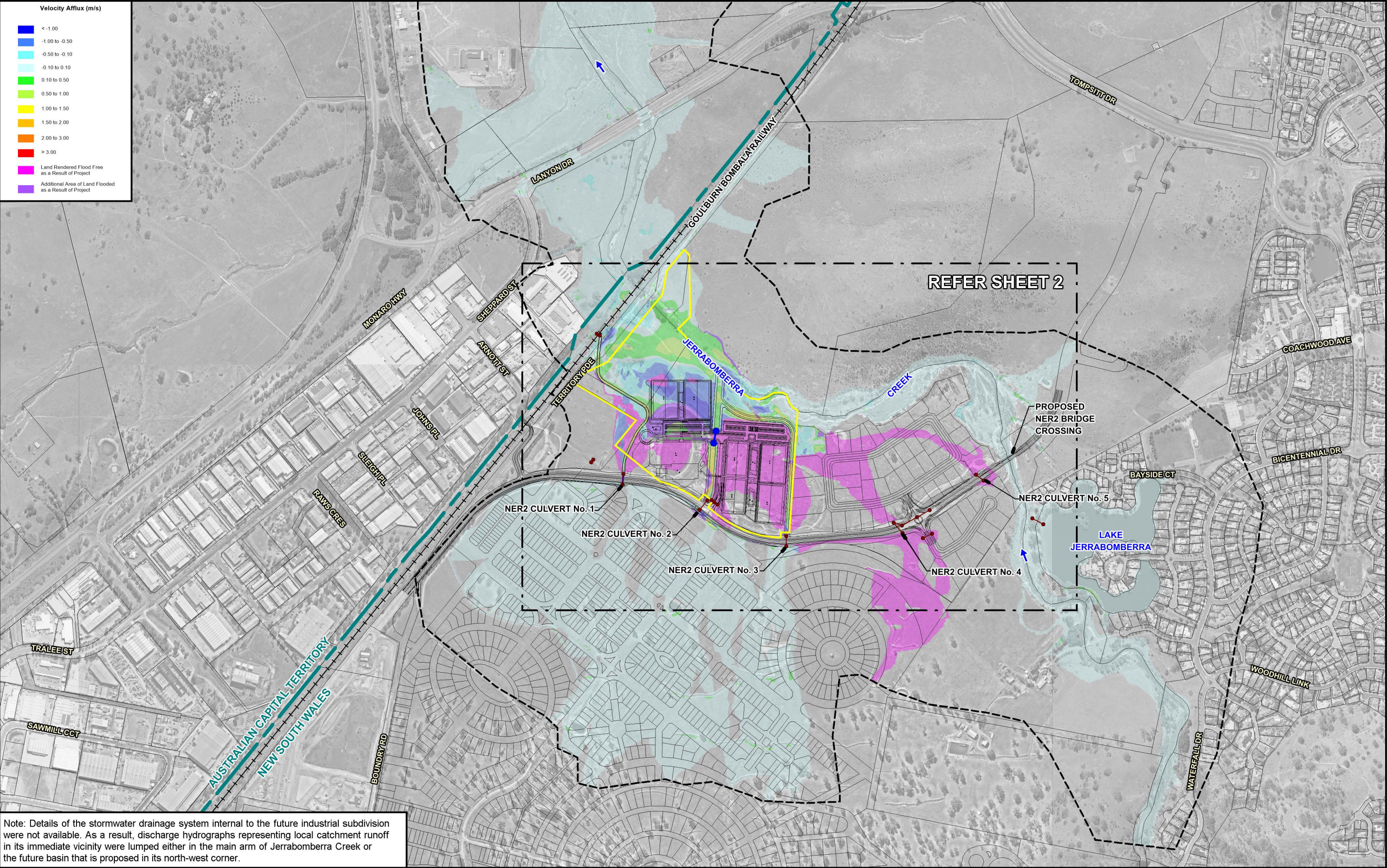
Proposed Stormwater Network

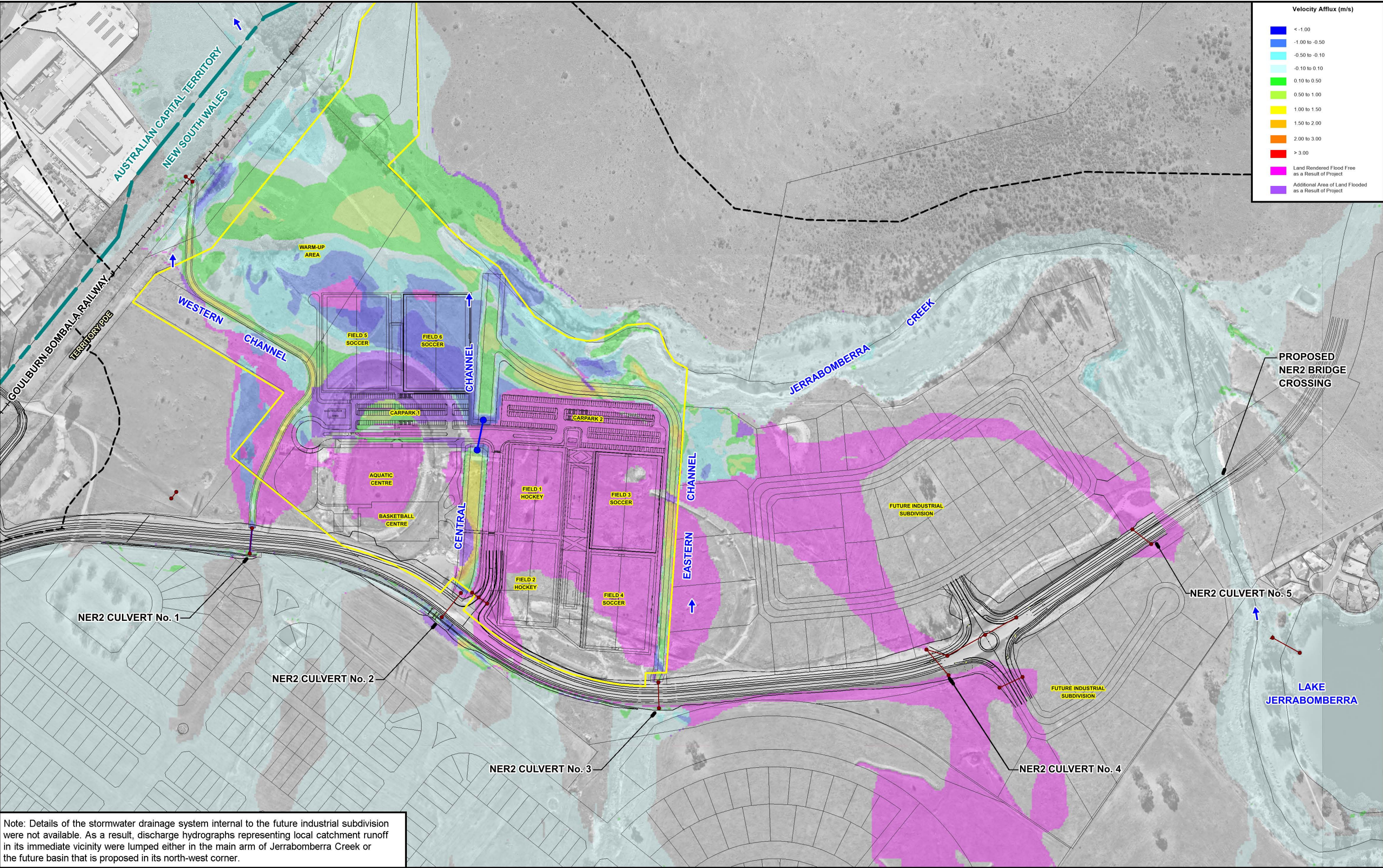
Two-Dimensional Model Boundary

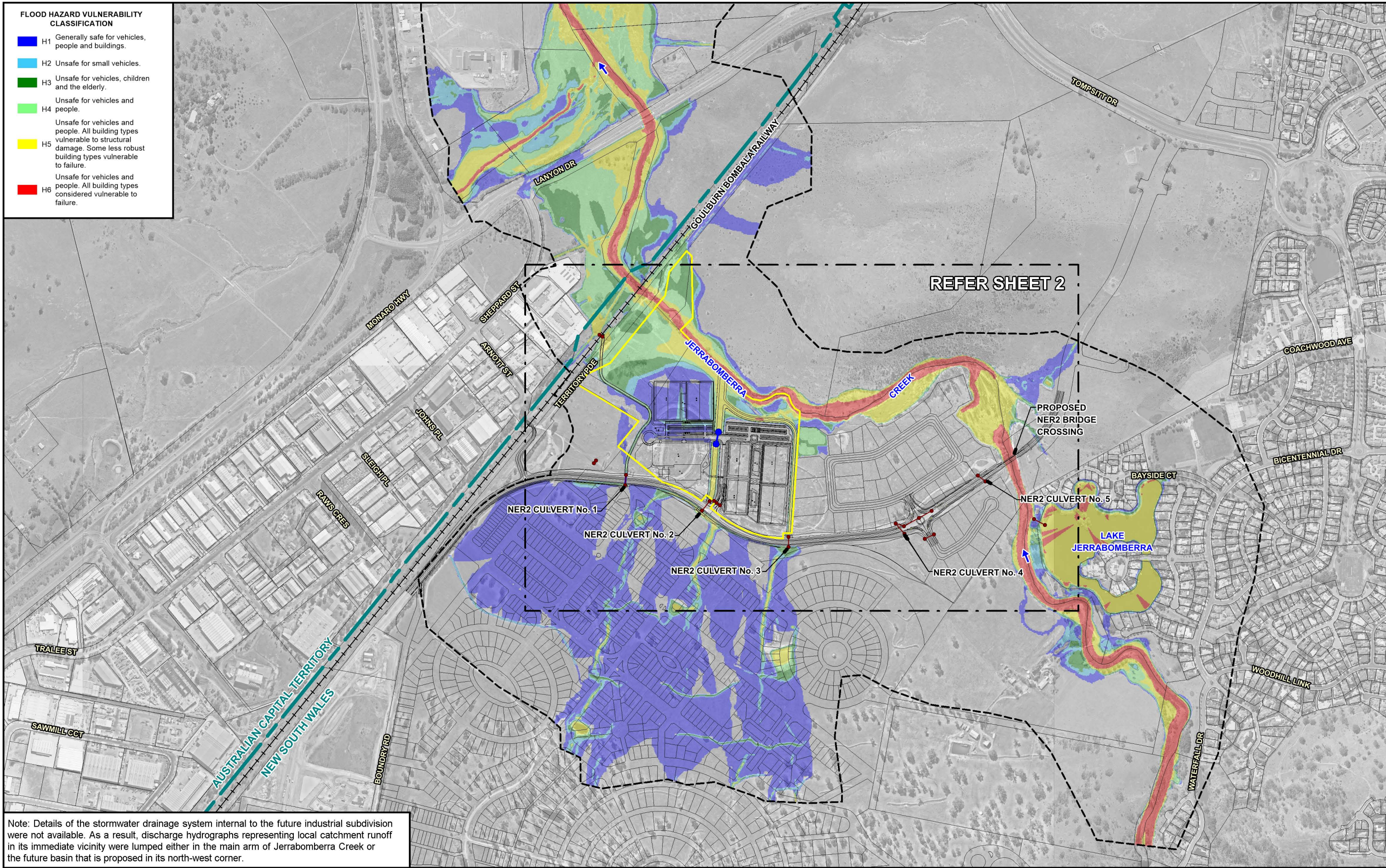
JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION

Figure 5.14
(Sheet 1 of 2)
MAXIMUM FLOW VELOCITIES
POST-PROJECT CONDITIONS - 1% AEP









Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

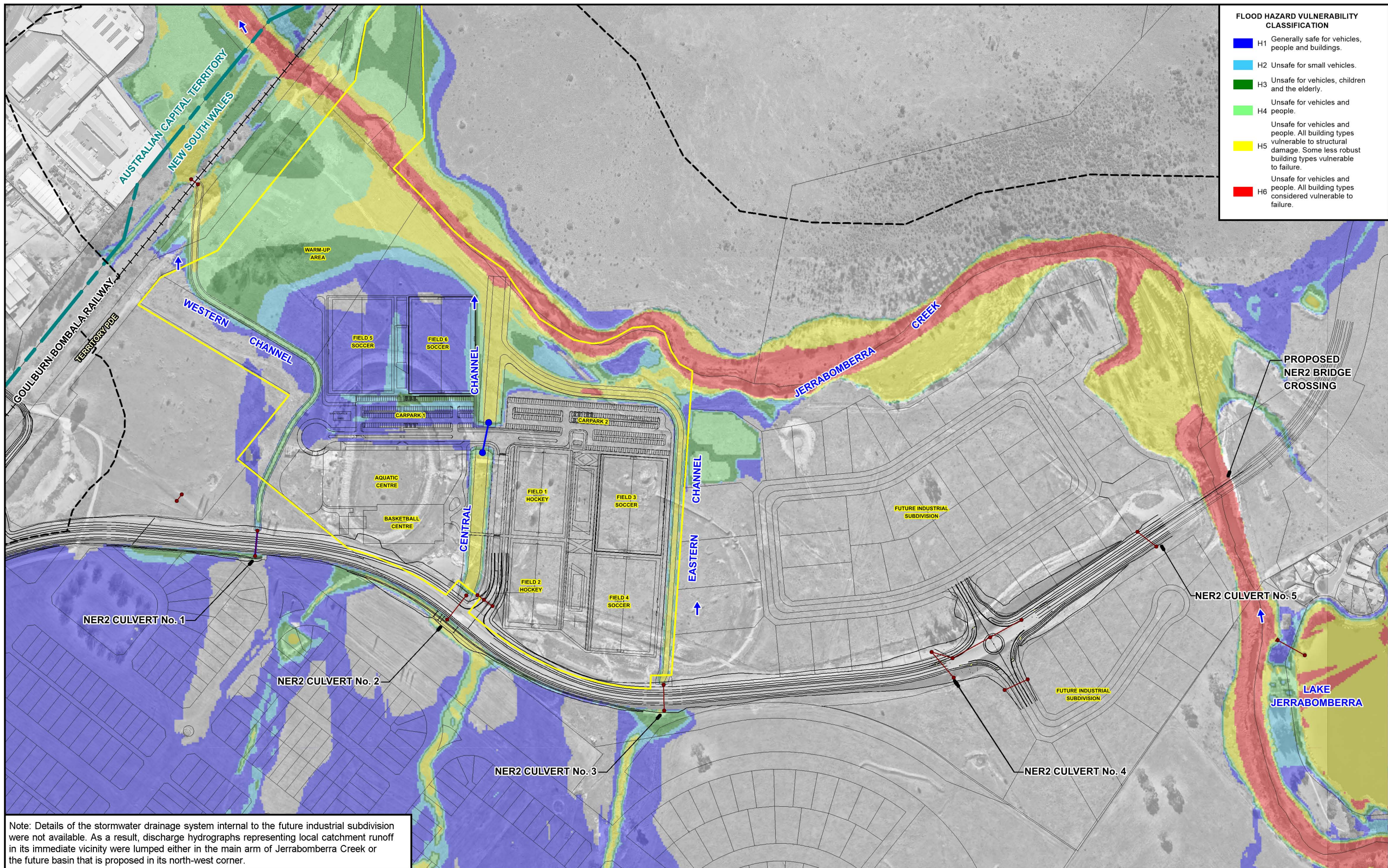
LEGEND

	NER2 Design Strings		Existing Stormwater Network
	Proposed Sports Complex Boundary		Proposed Stormwater Network
	Proposed Sports Complex Design Strings		Two-Dimensional Model Boundary

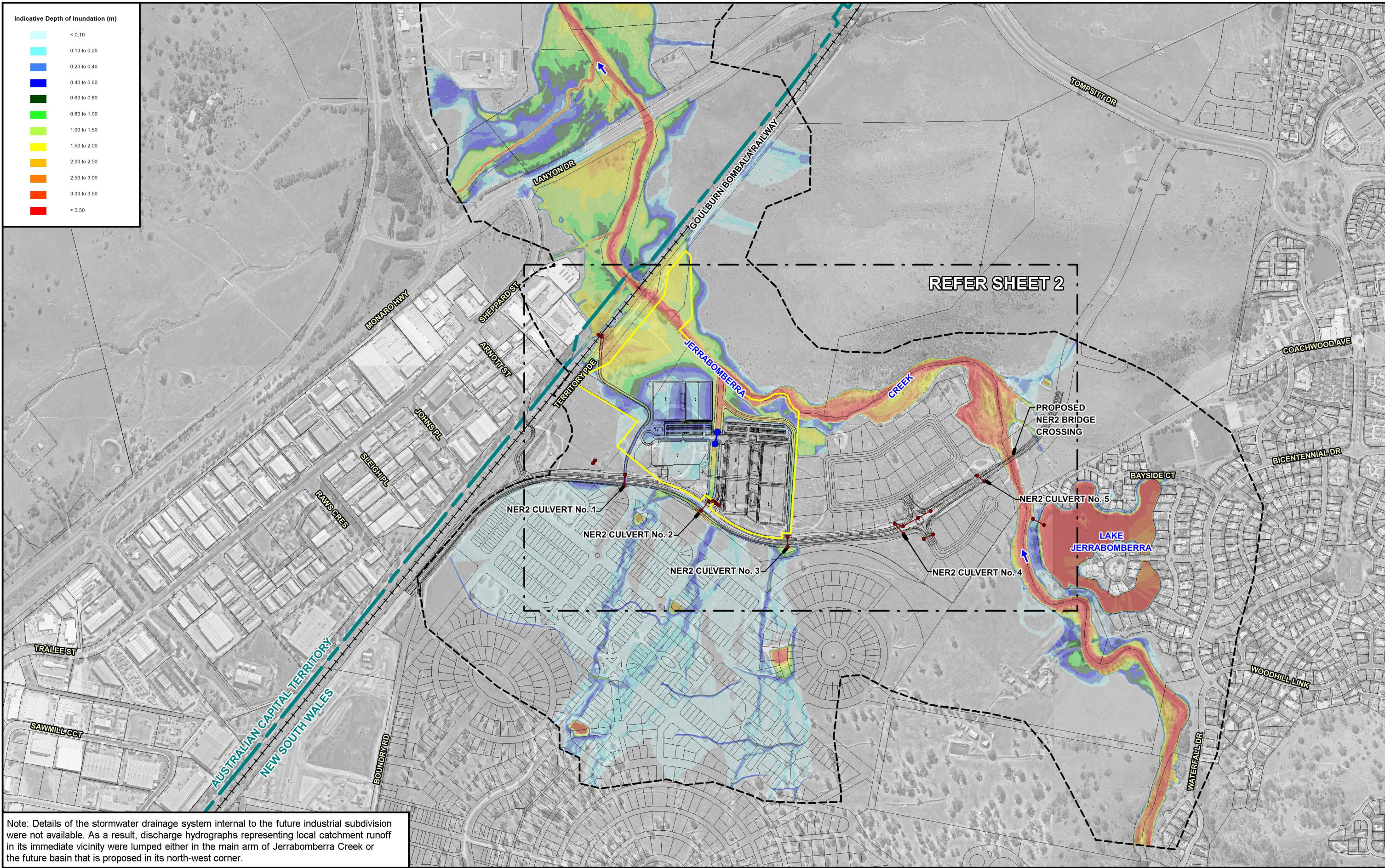
**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**

Figure 5.16
(Sheet 1 of 2)

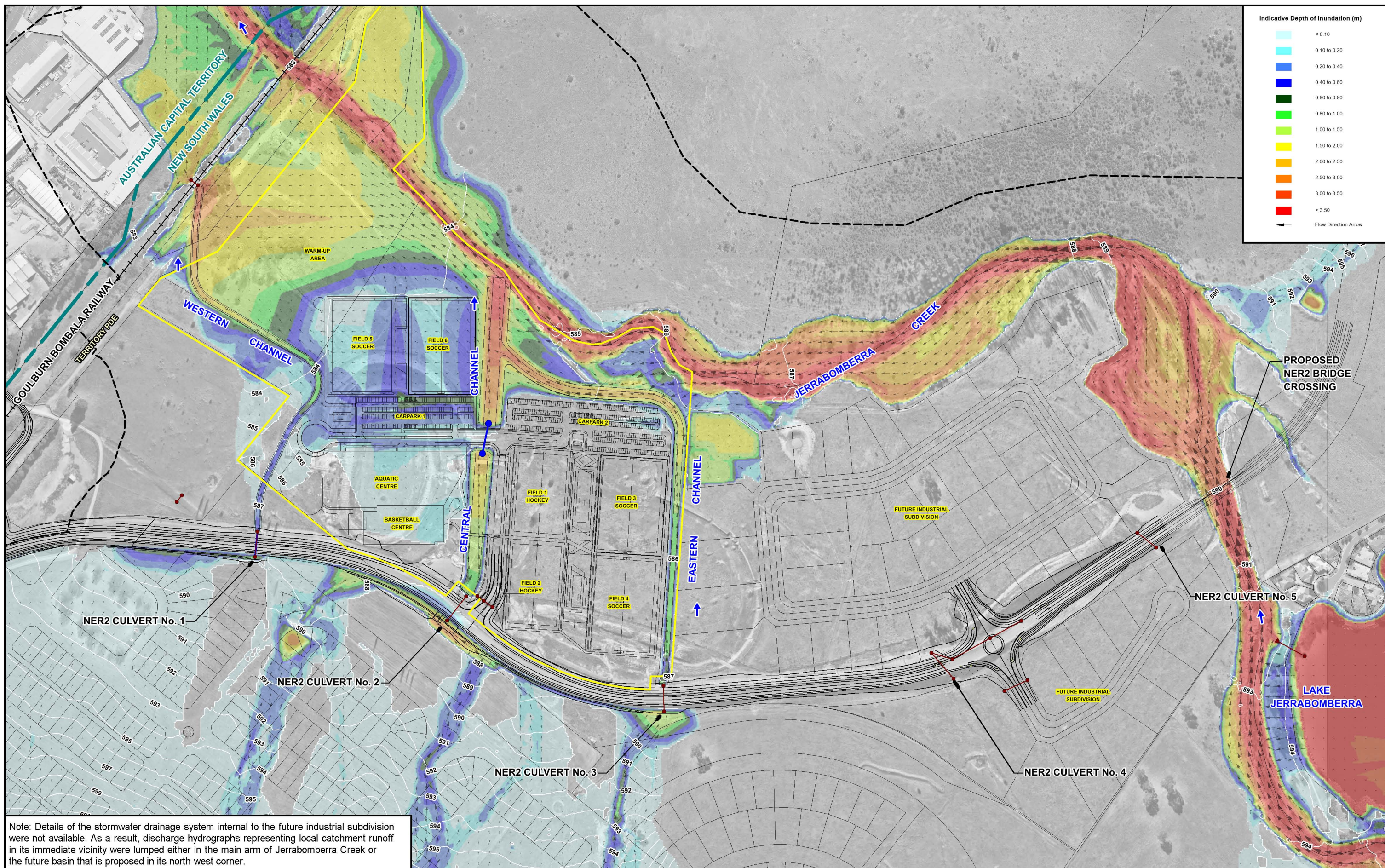
FLOOD HAZARD VULNERABILITY CLASSIFICATION
POST-PROJECT CONDITIONS - 1% AEP



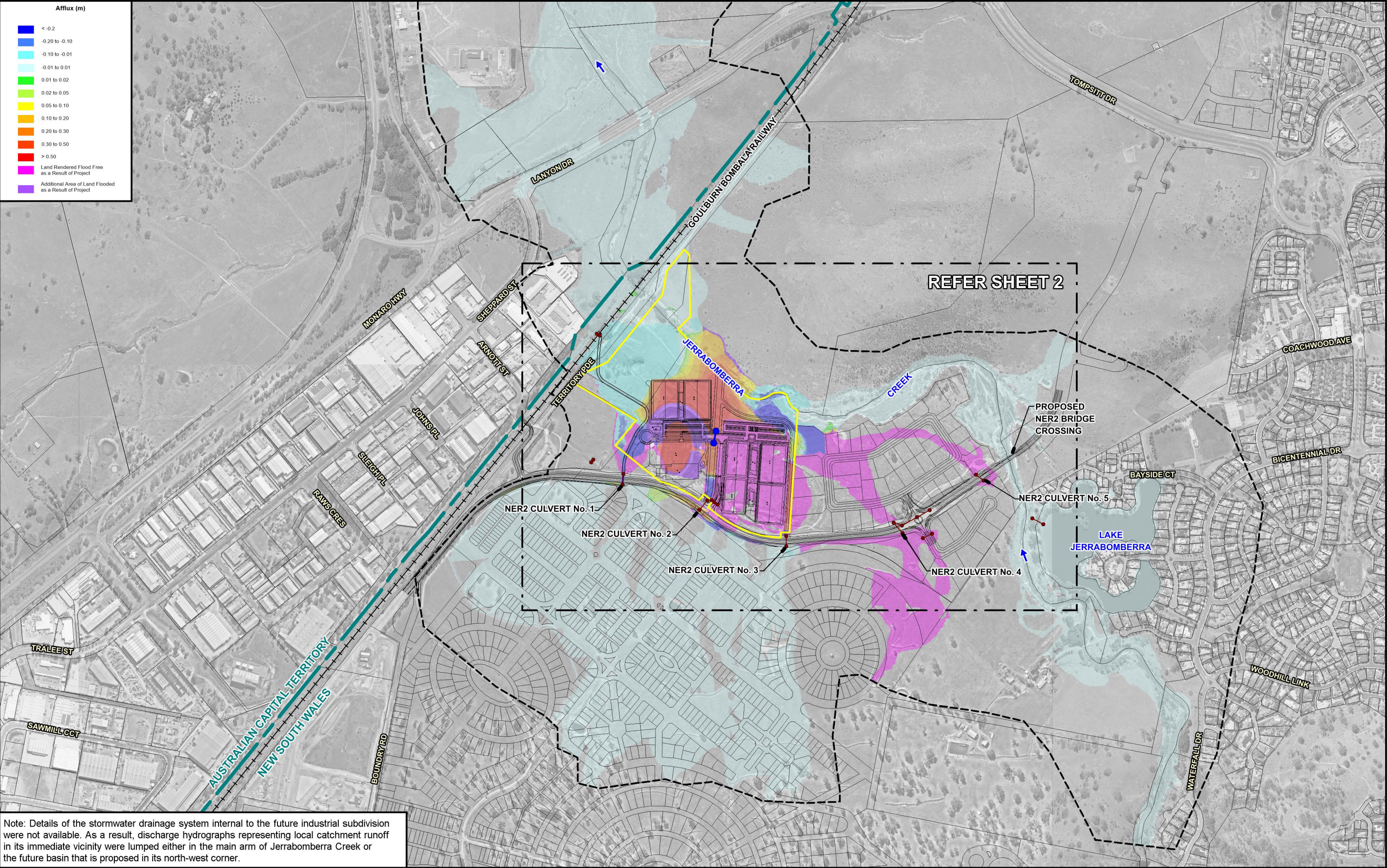
Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

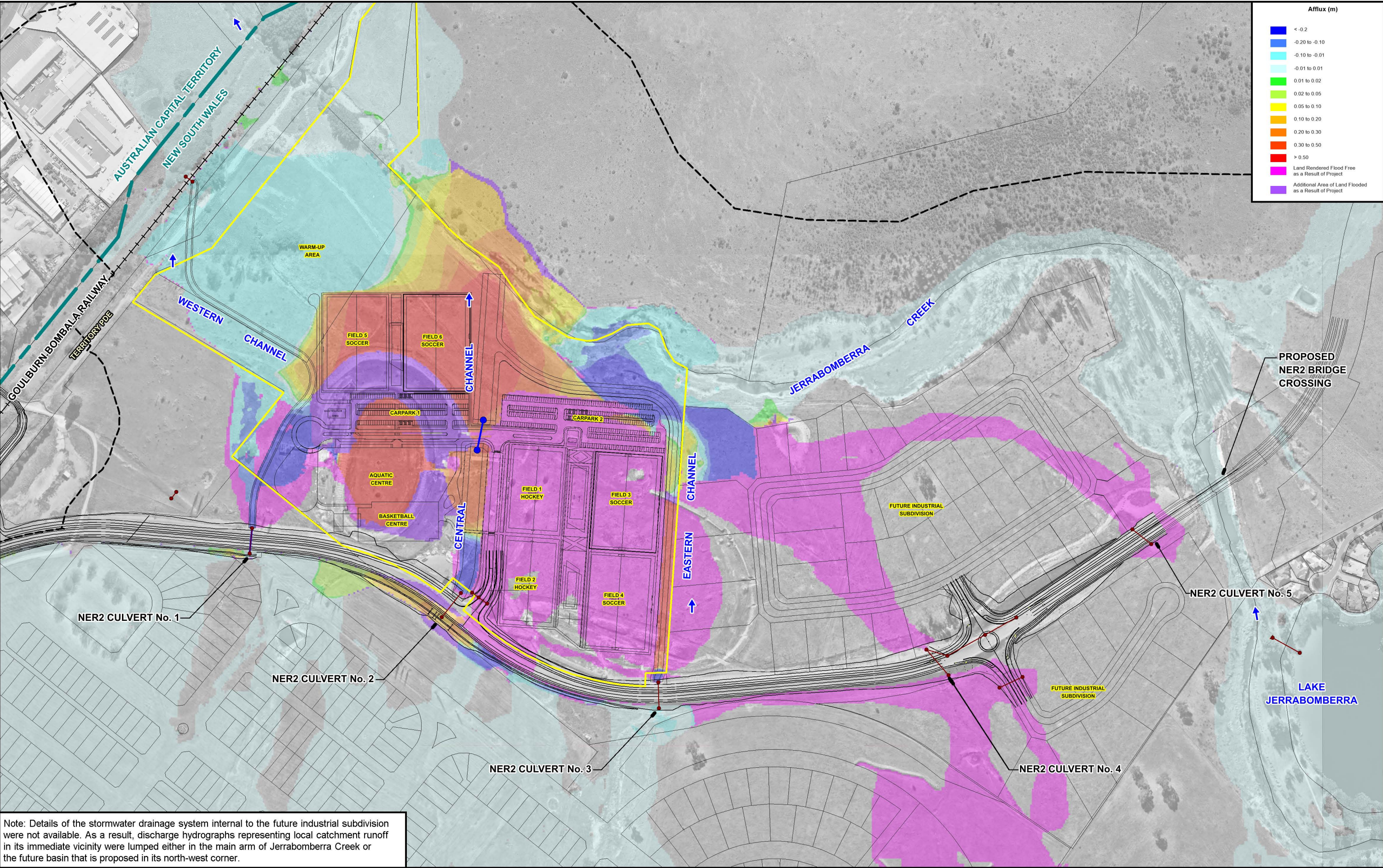


Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

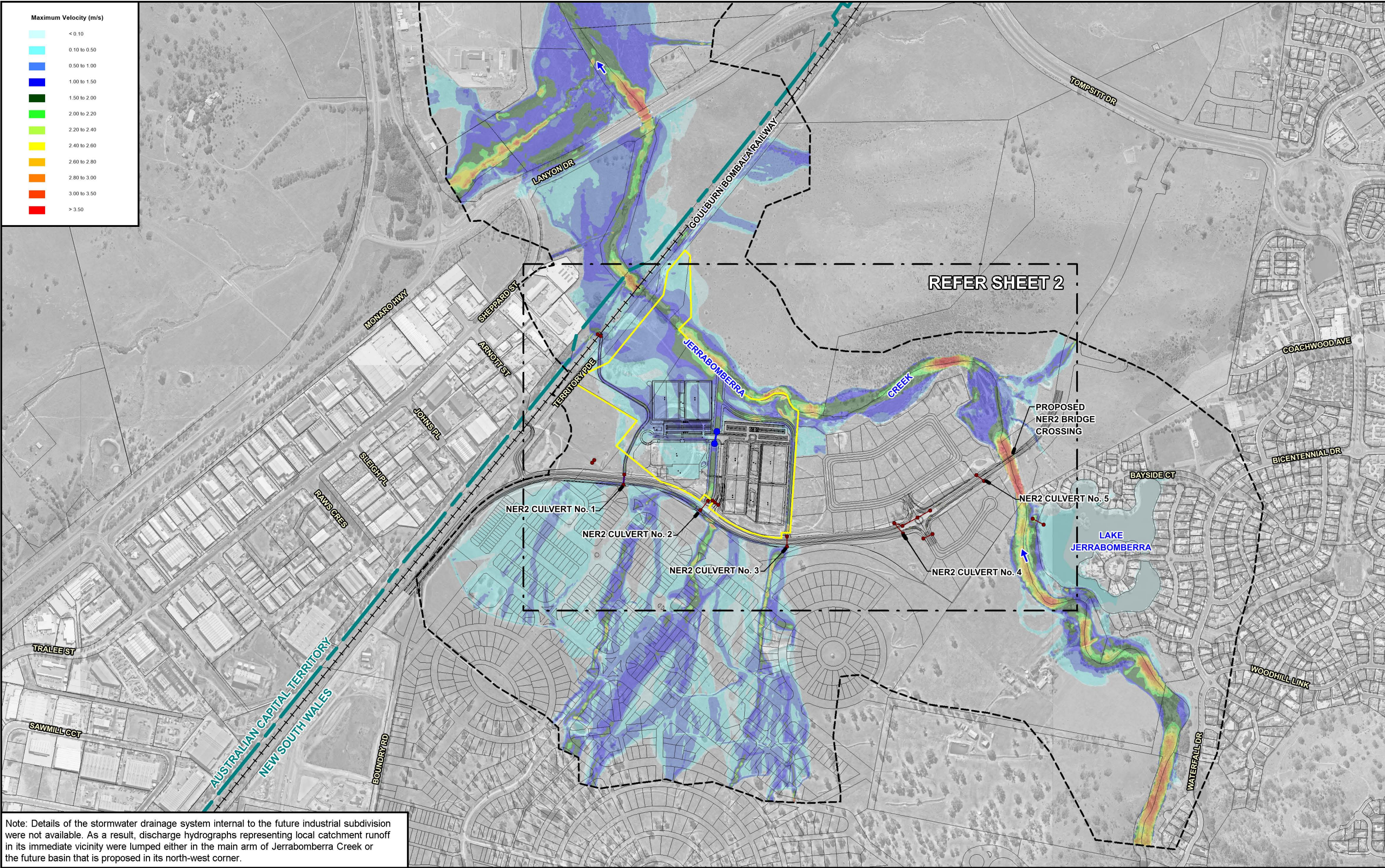


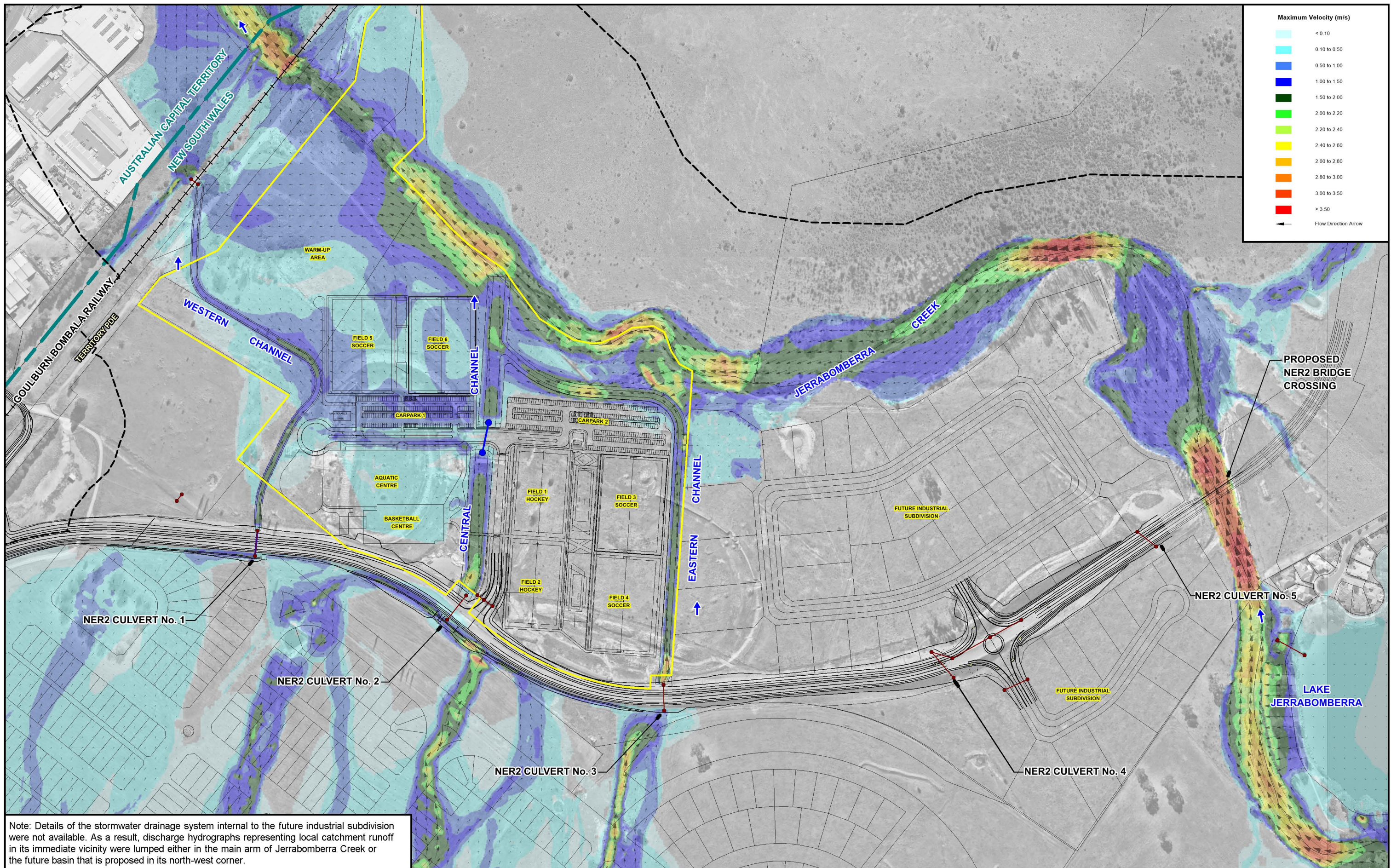
Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

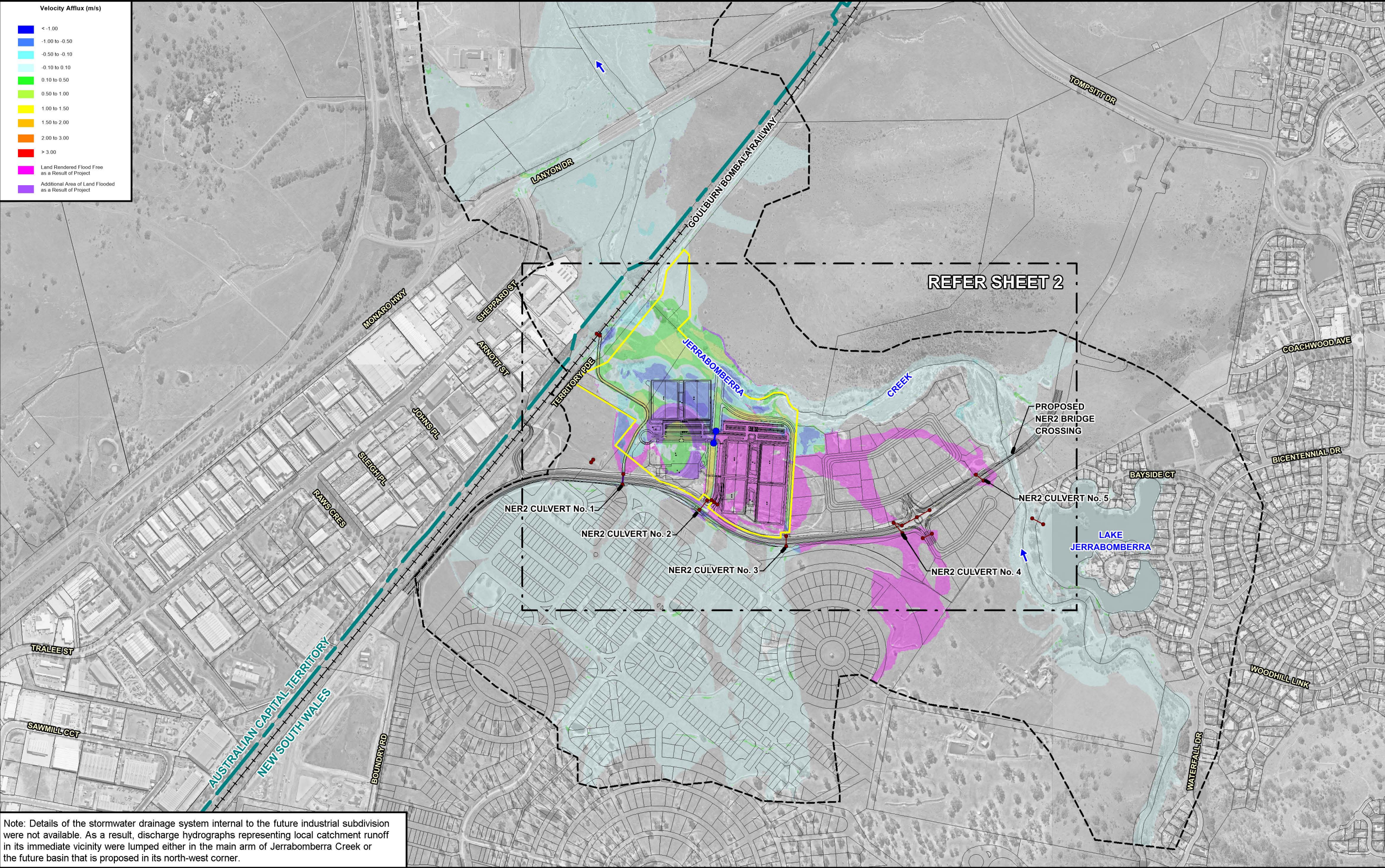




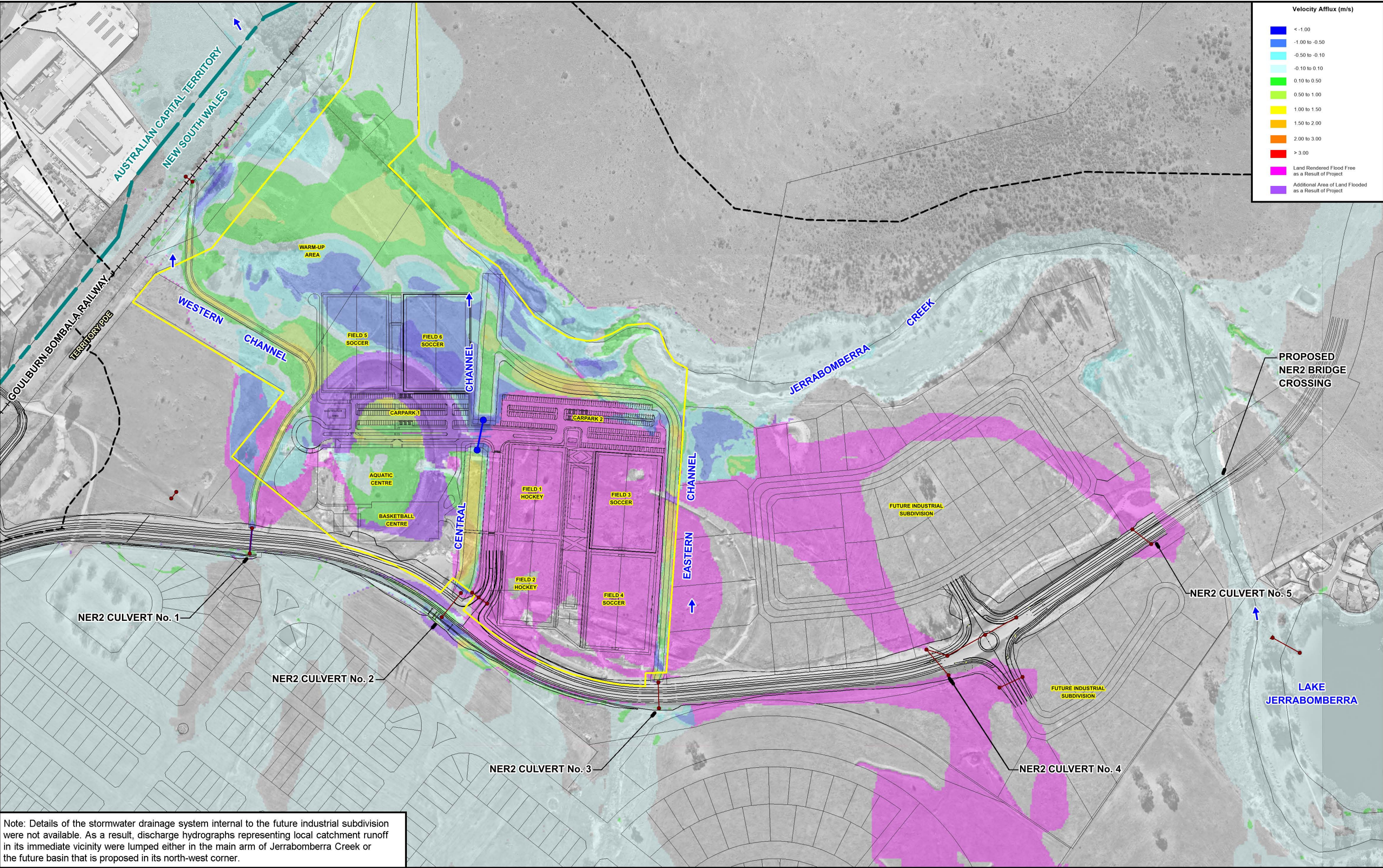
Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.



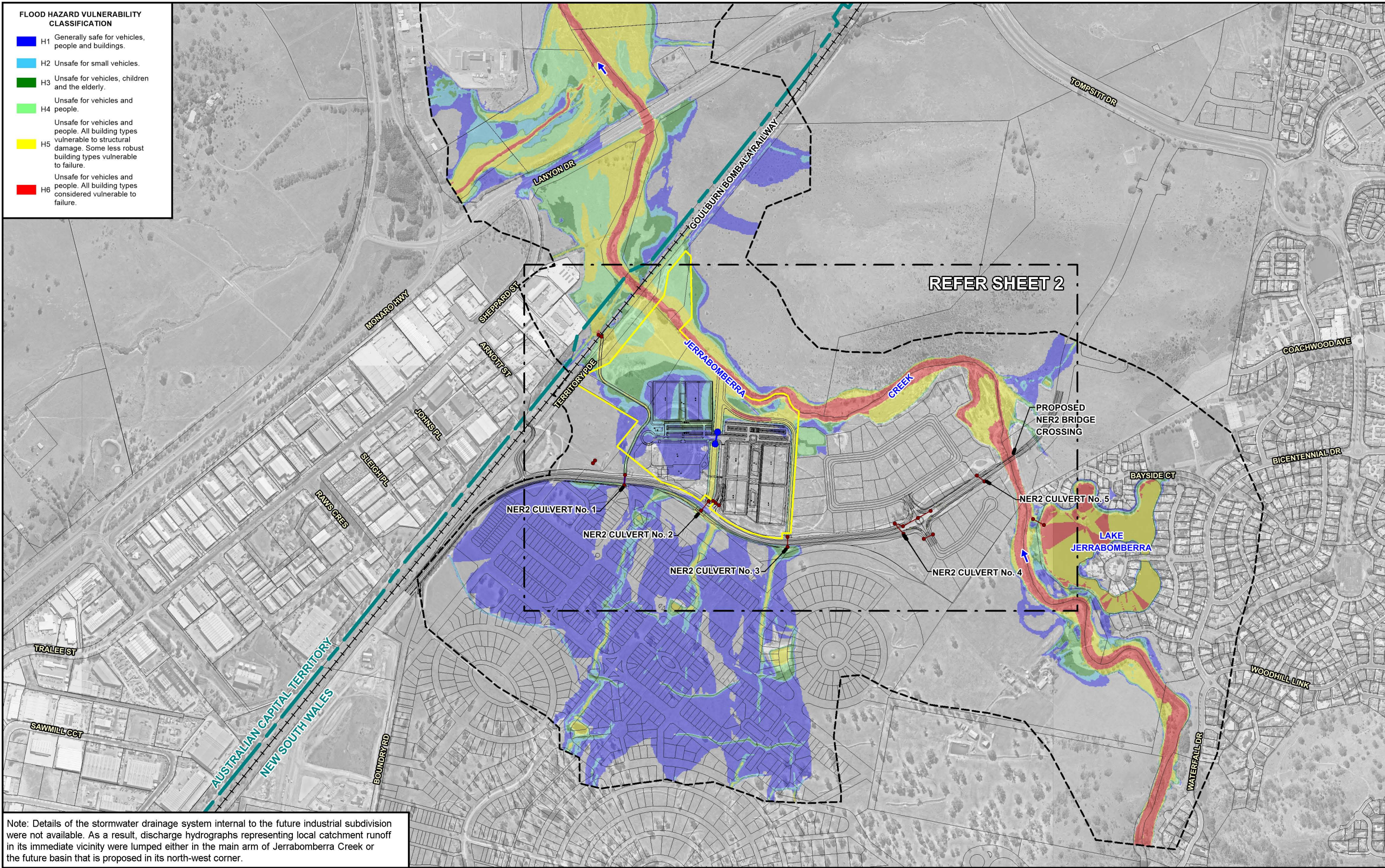




Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.



Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.



Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

N

100 0 100 200 300 m

Scale: 1:10,000

Lyall & Associates

LEGEND

	NER2 Design Strings		Existing Stormwater Network
	Proposed Sports Complex Boundary		Proposed Stormwater Network
	Proposed Sports Complex Design Strings		Two-Dimensional Model Boundary

**JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION**

Figure 5.21
(Sheet 1 of 2)

FLOOD HAZARD VULNERABILITY CLASSIFICATION
POST-PROJECT CONDITIONS - 0.5% AEP

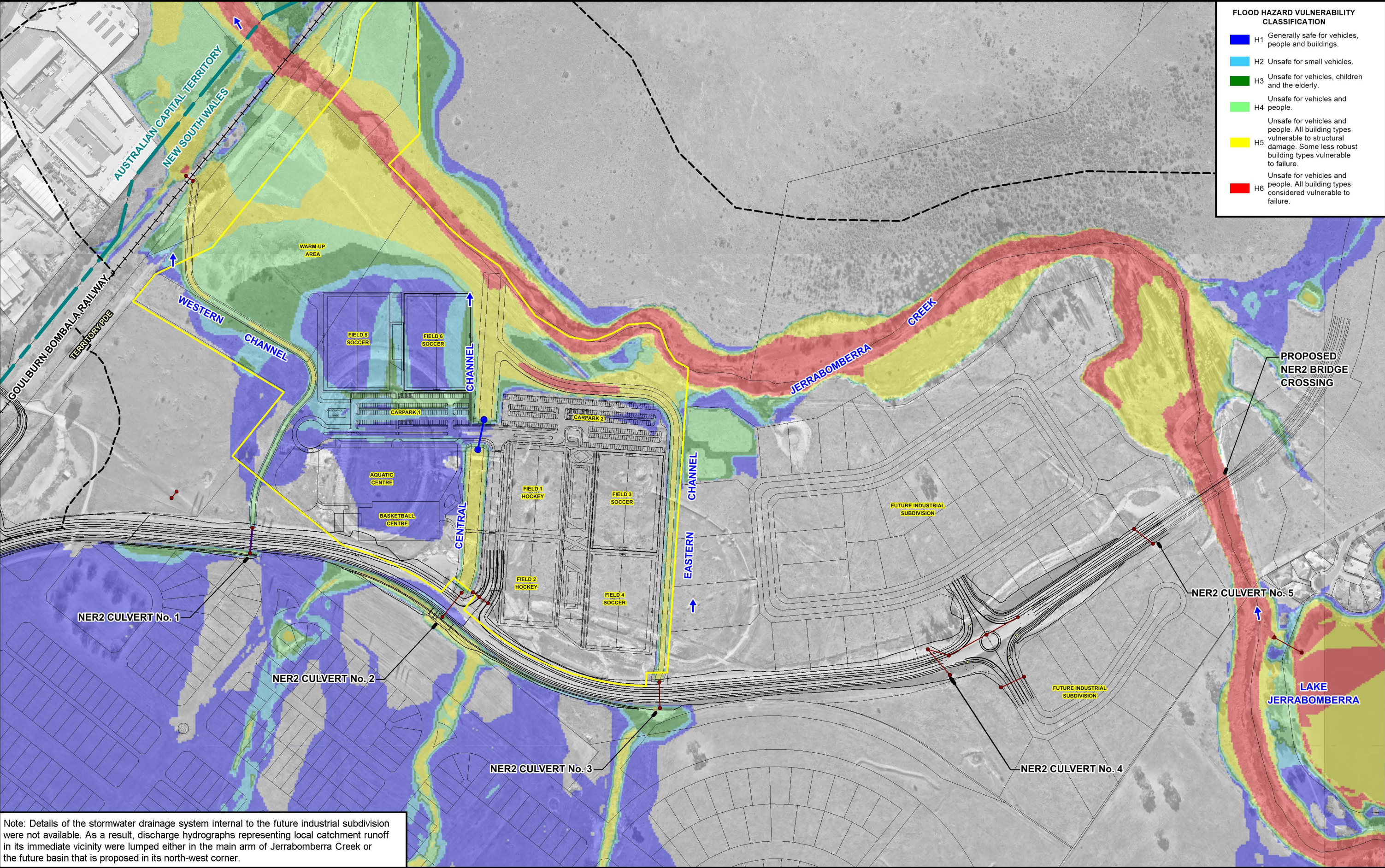
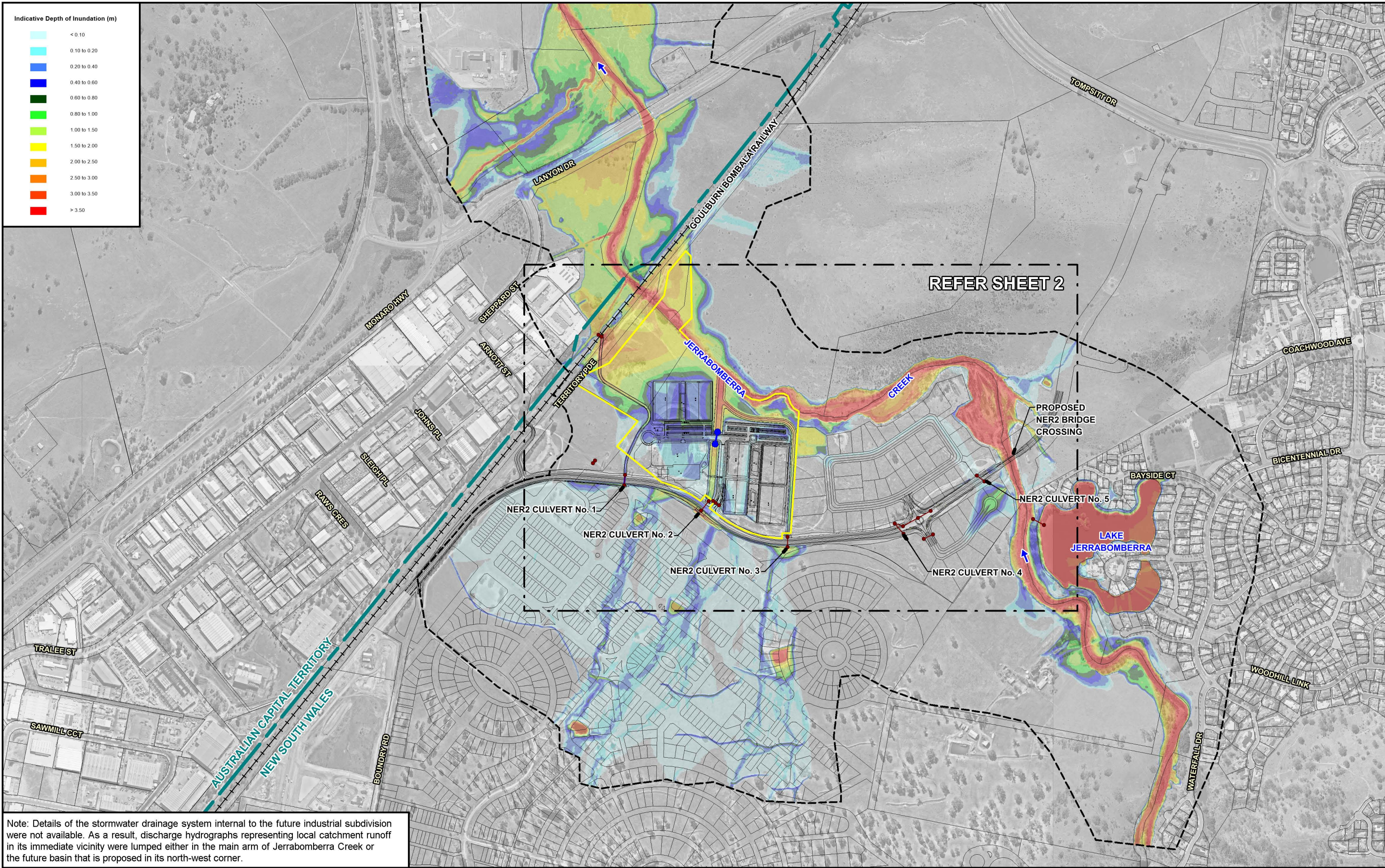
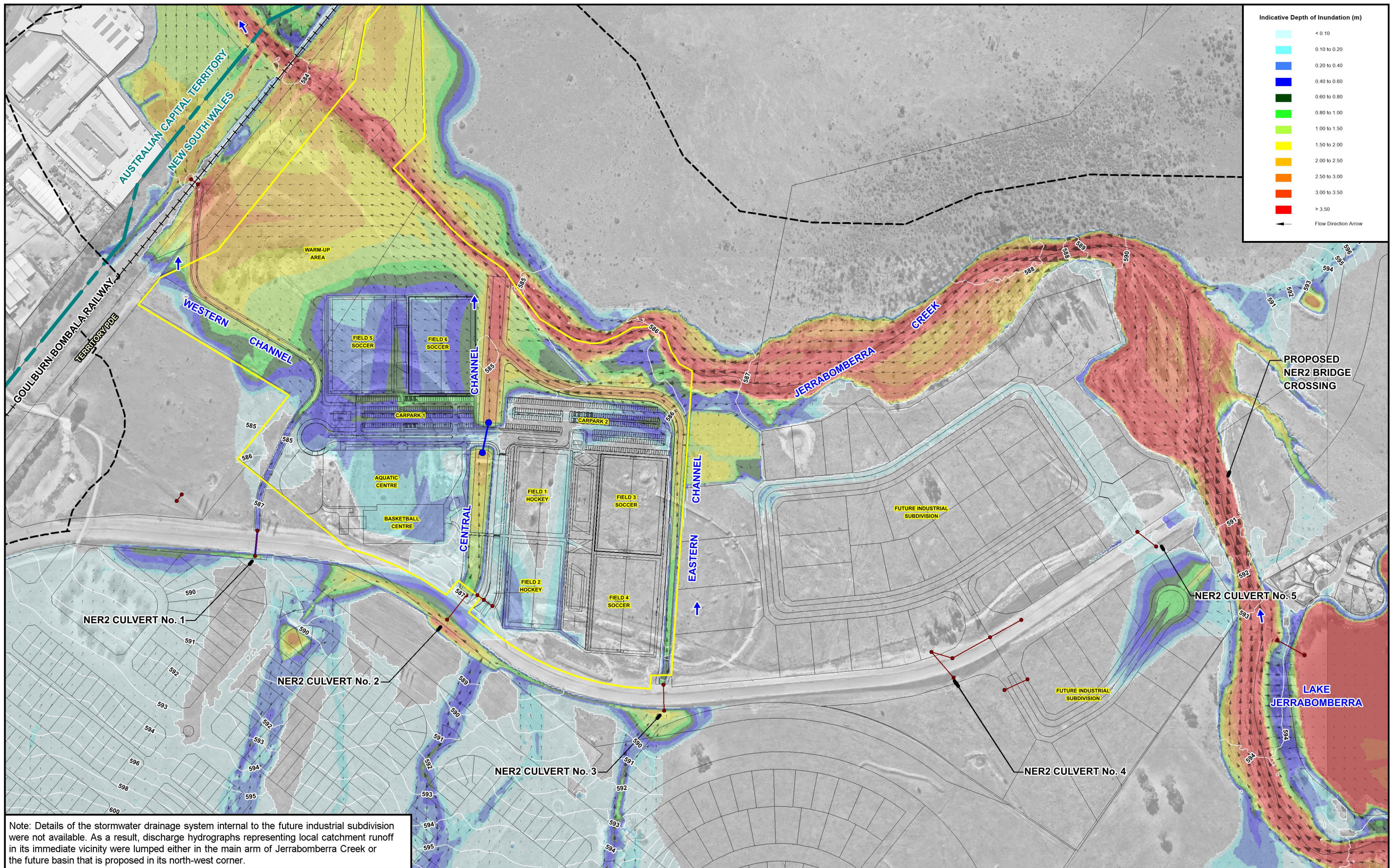


Figure 5.21
(Sheet 2 of 2)

FLOOD HAZARD VULNERABILITY CLASSIFICATION
POST-PROJECT CONDITIONS - 0.5% AEP



Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

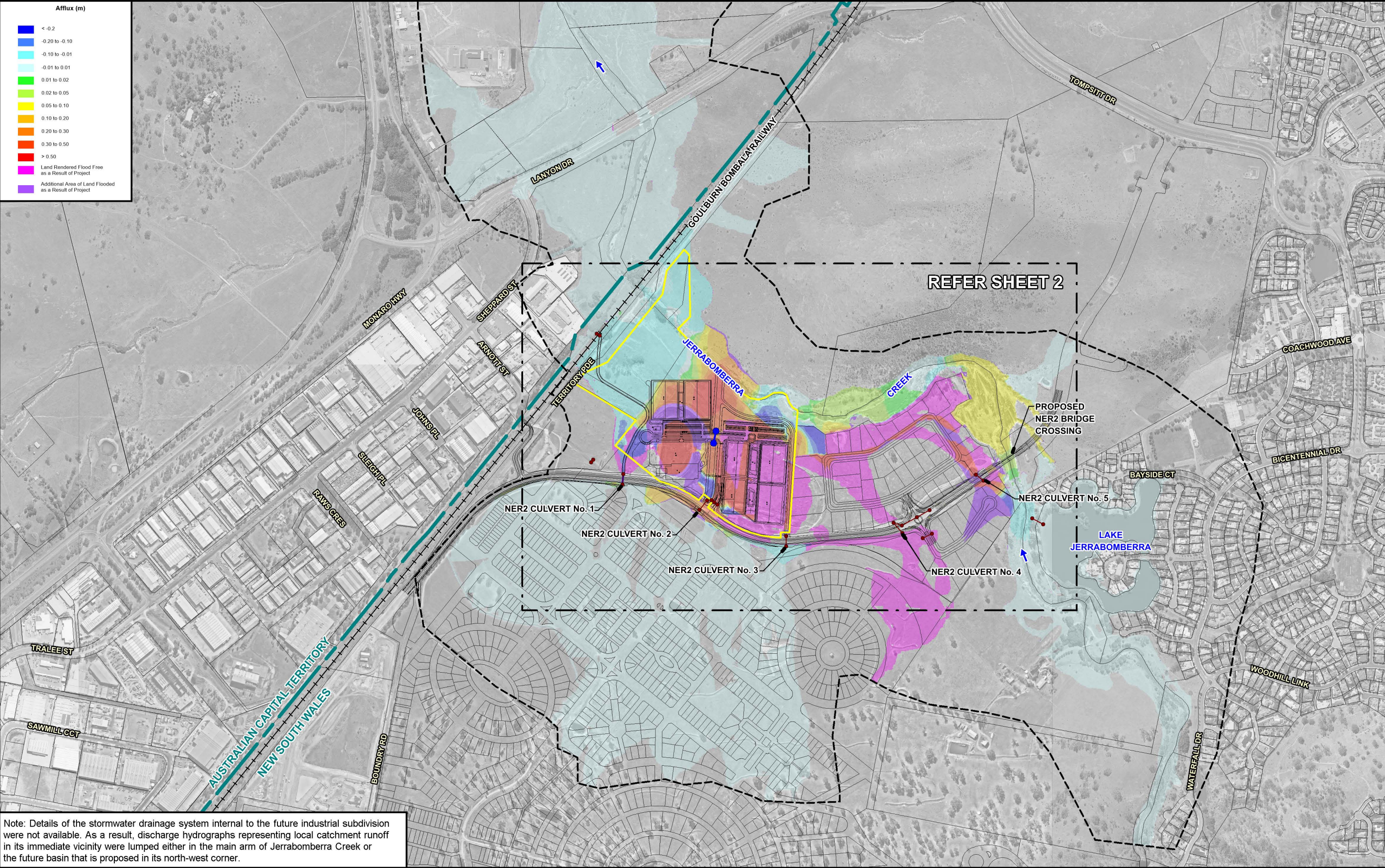


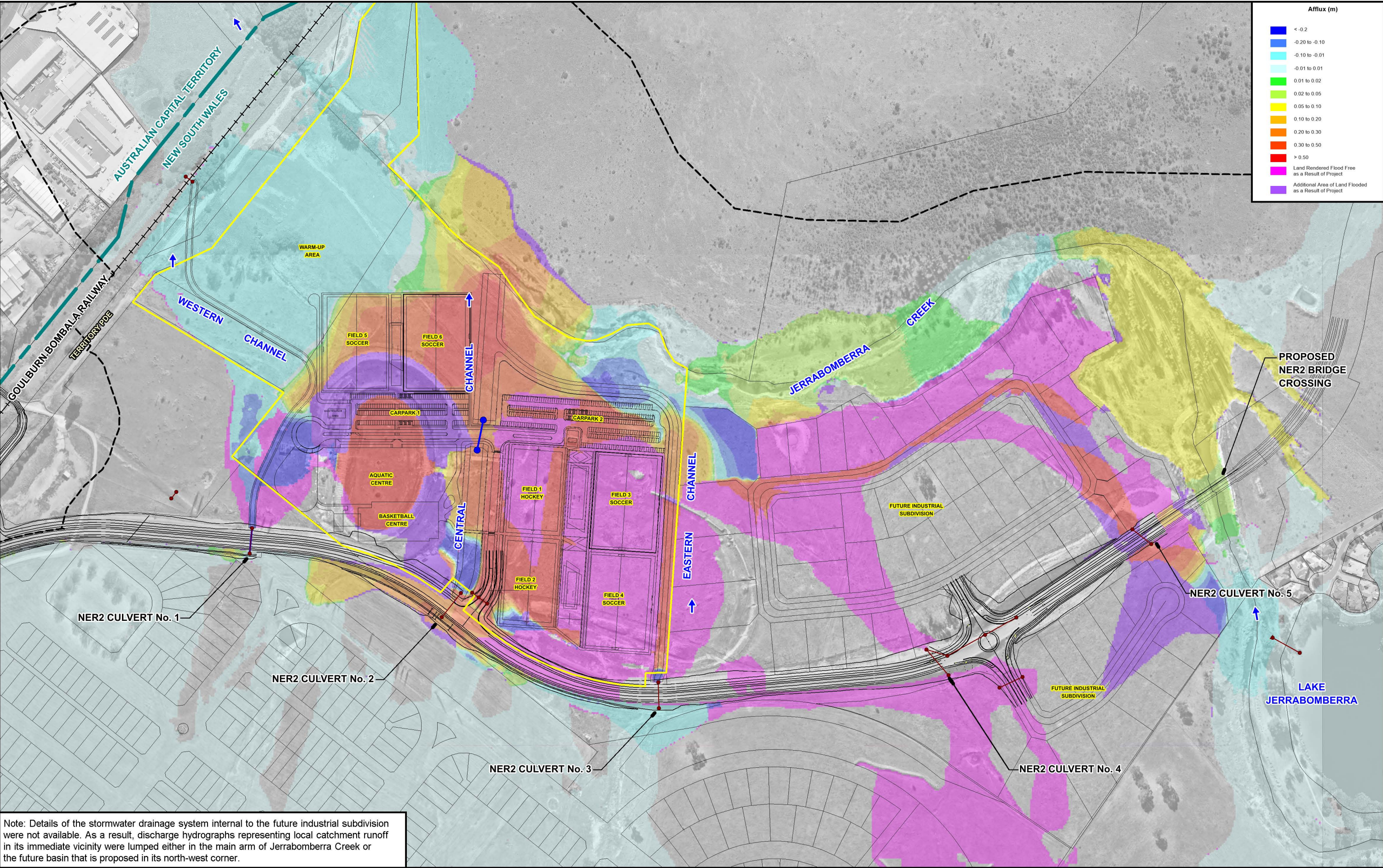
Scale: 1:4,000

Lyll & Associates

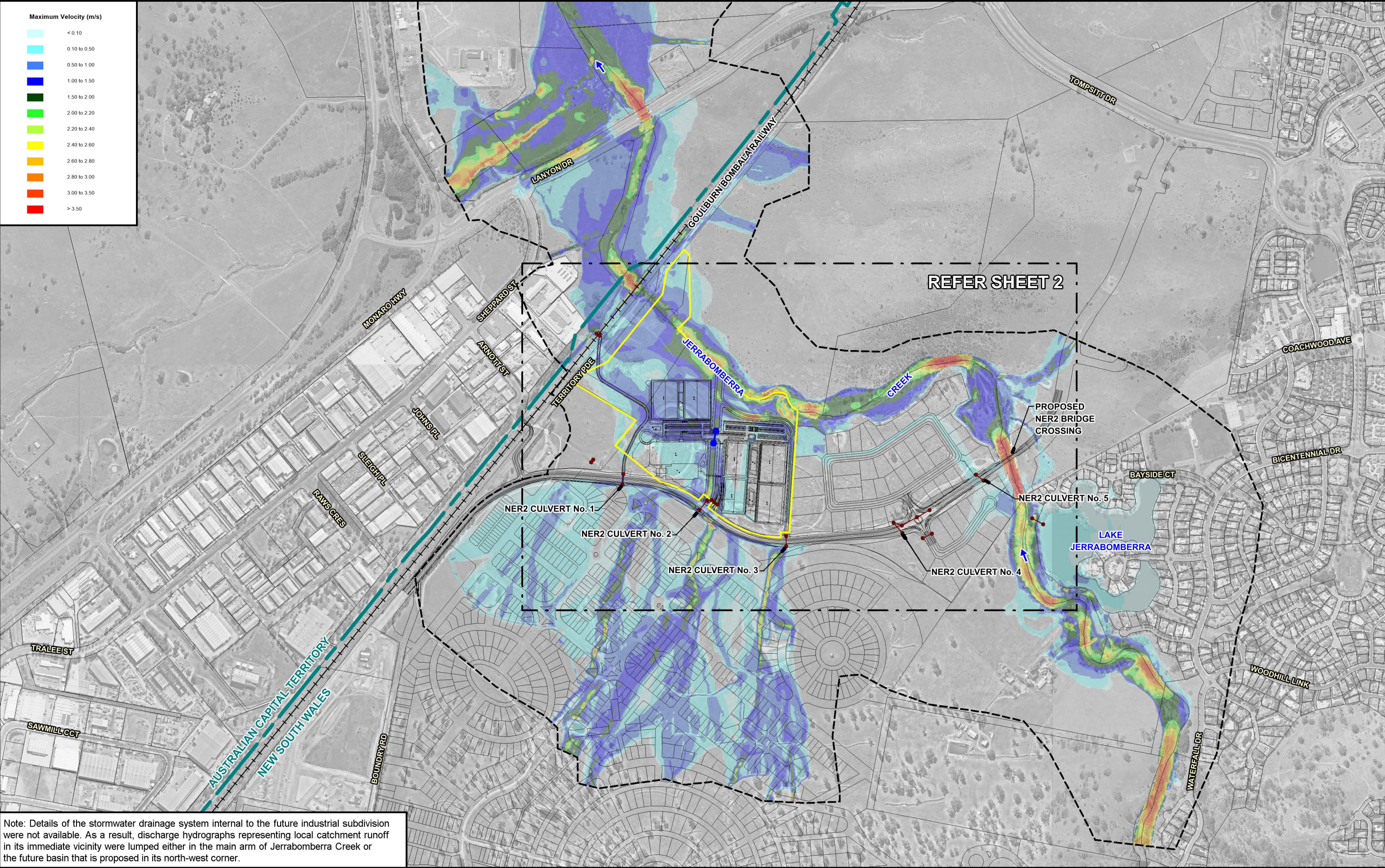
Figure 5.22
(Sheet 2 of 2)

INDICATIVE EXTENT AND DEPTH OF INUNDATION
POST-PROJECT CONDITIONS - 0.2% AEP





Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.



Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

N

100

0

100

200

300 m

Scale: 1:10,000

NER2 Design Strings

Proposed Sports Complex Boundary

Proposed Sports Complex Design Strings

Existing Stormwater Network

Proposed Stormwater Network

Two-Dimensional Model Boundary

JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX

FLOODING AND DRAINAGE INVESTIGATION

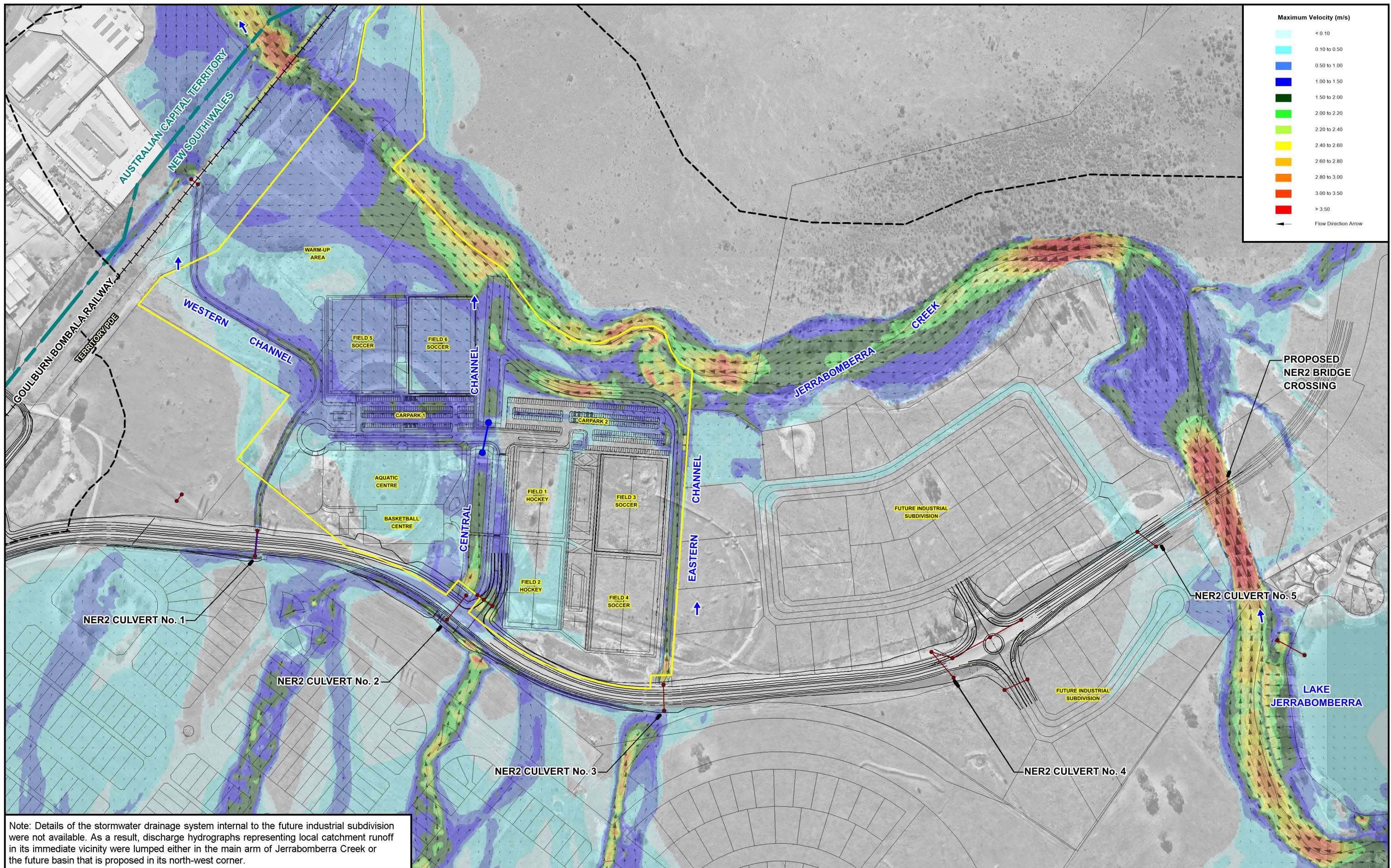
Figure 5.24

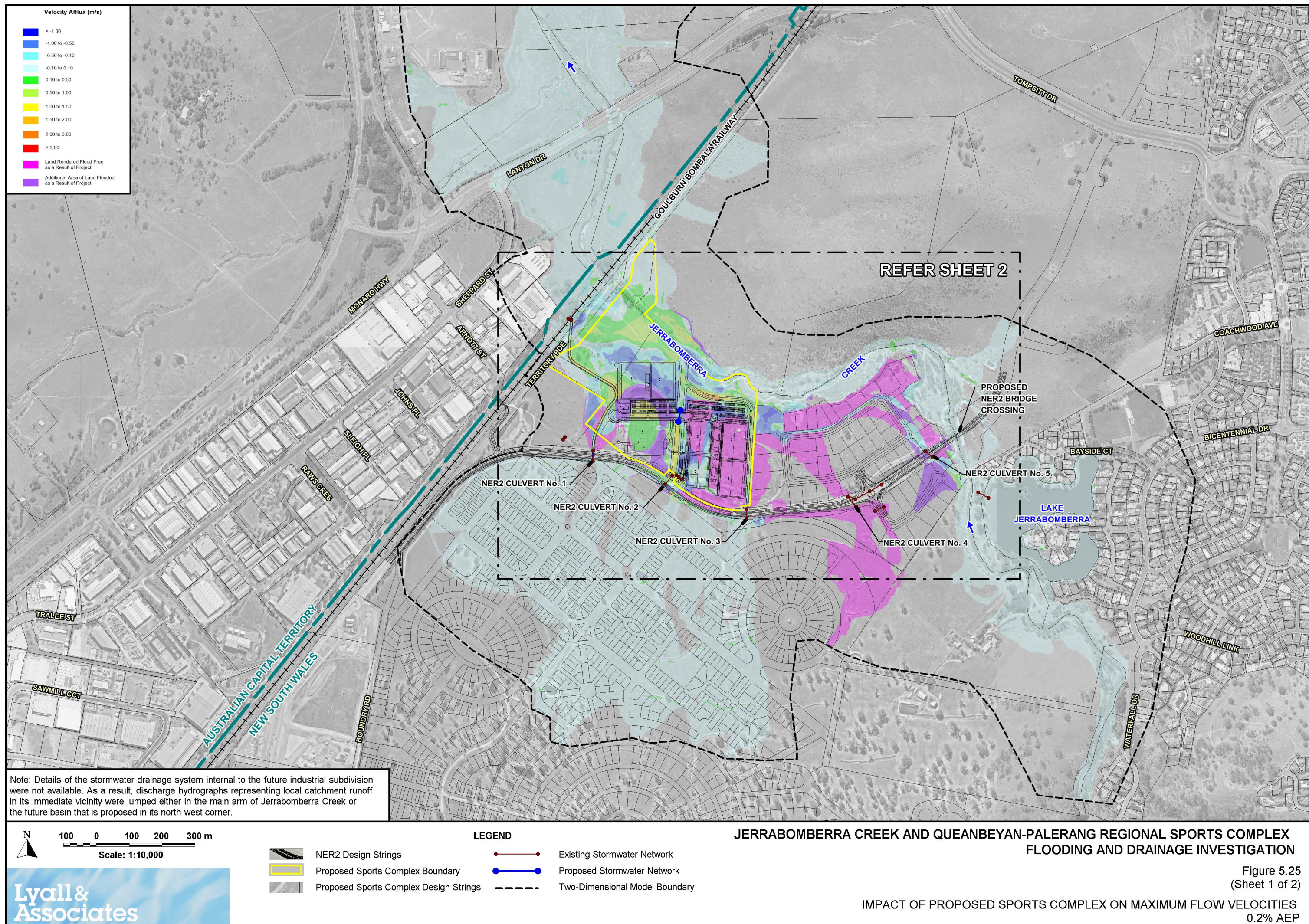
(Sheet 1 of 2)

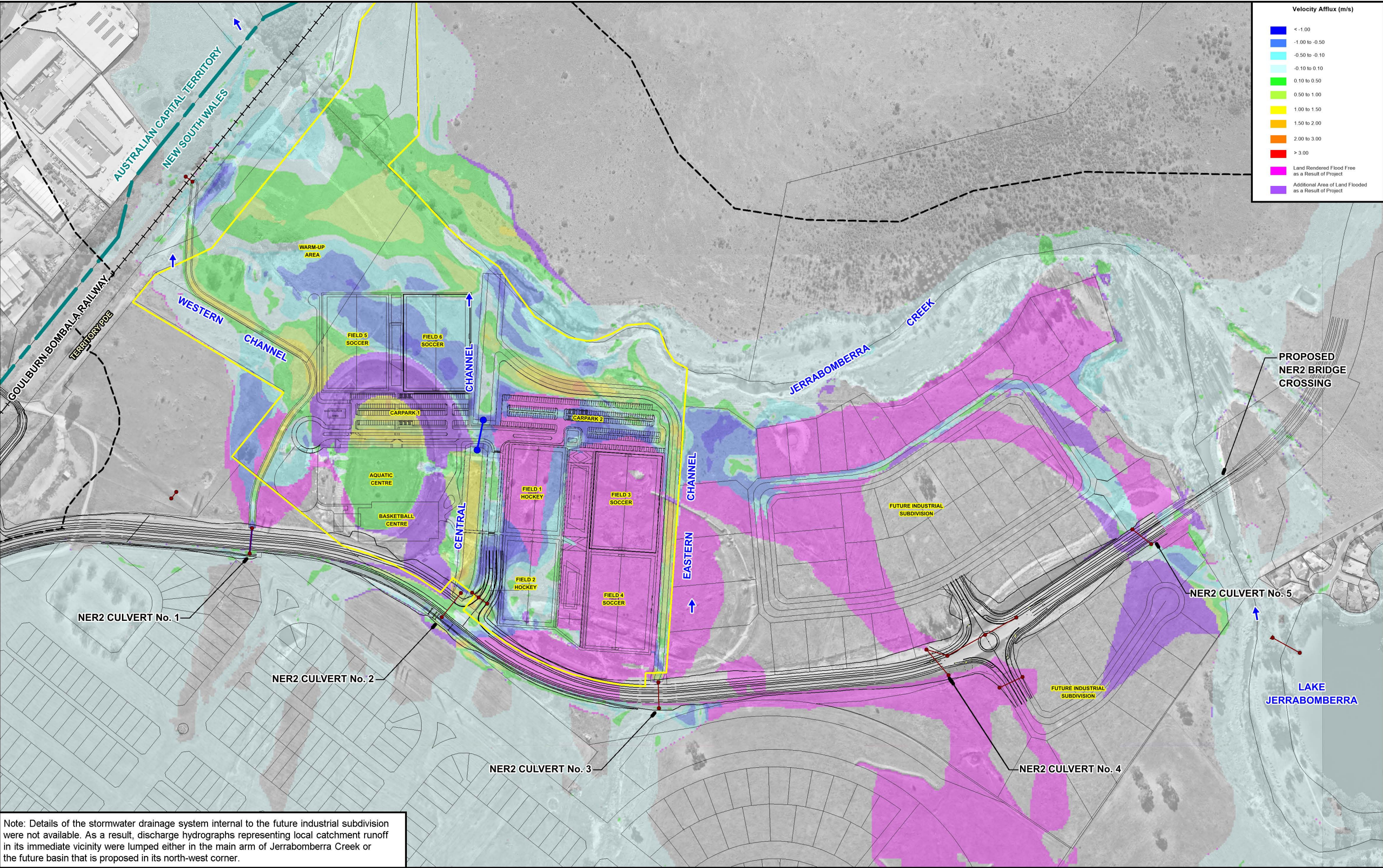
MAXIMUM FLOW VELOCITIES

POST-PROJECT CONDITIONS - 0.2% AEP

Lyall & Associates







Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

N

4004080120 m

Scale: 1:4,000

Lyall & Associates

LEGEND

NER2 Design Strings

Proposed Sports Complex Boundary

Proposed Sports Complex Design Strings

Existing Stormwater Network

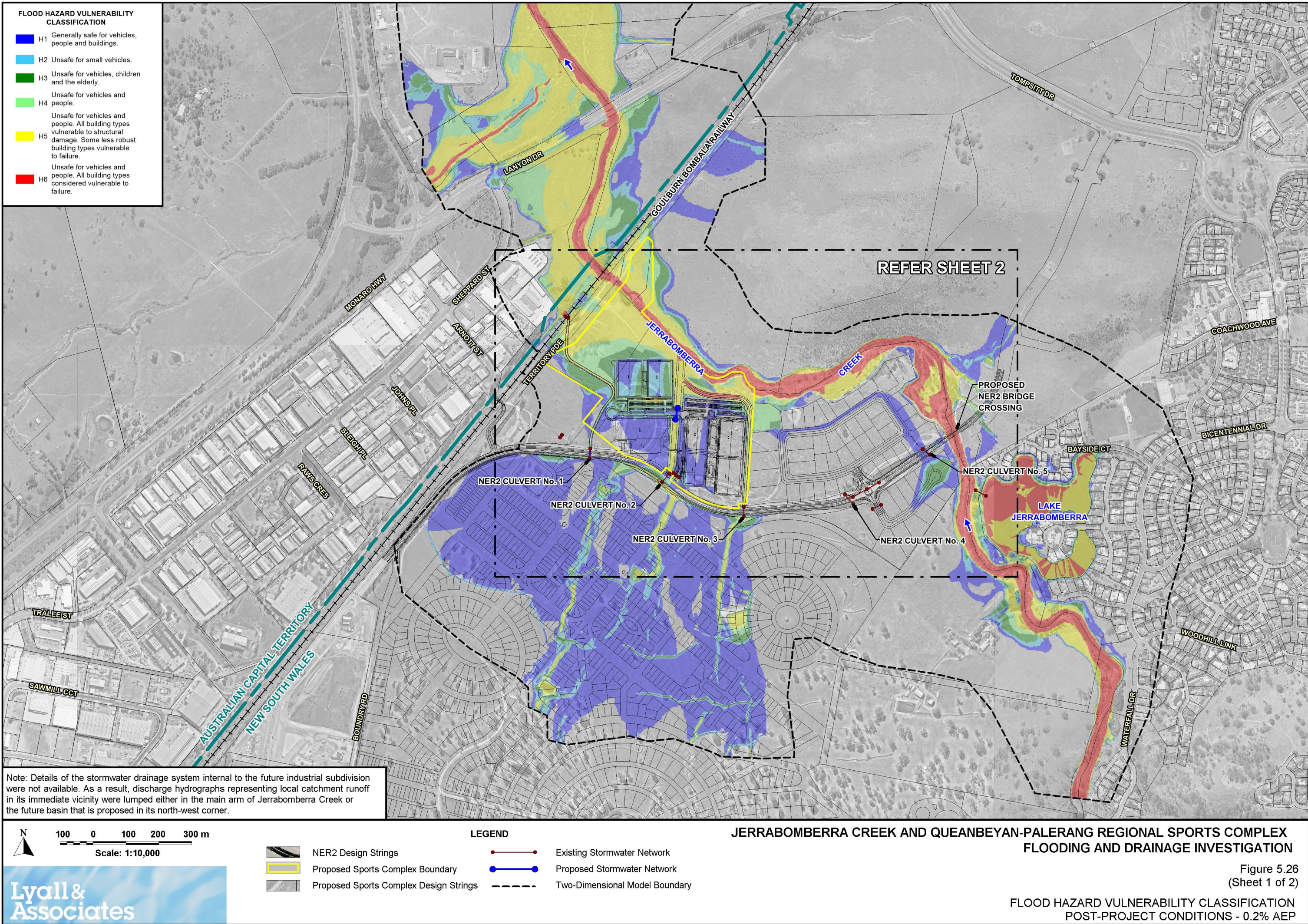
Proposed Stormwater Network

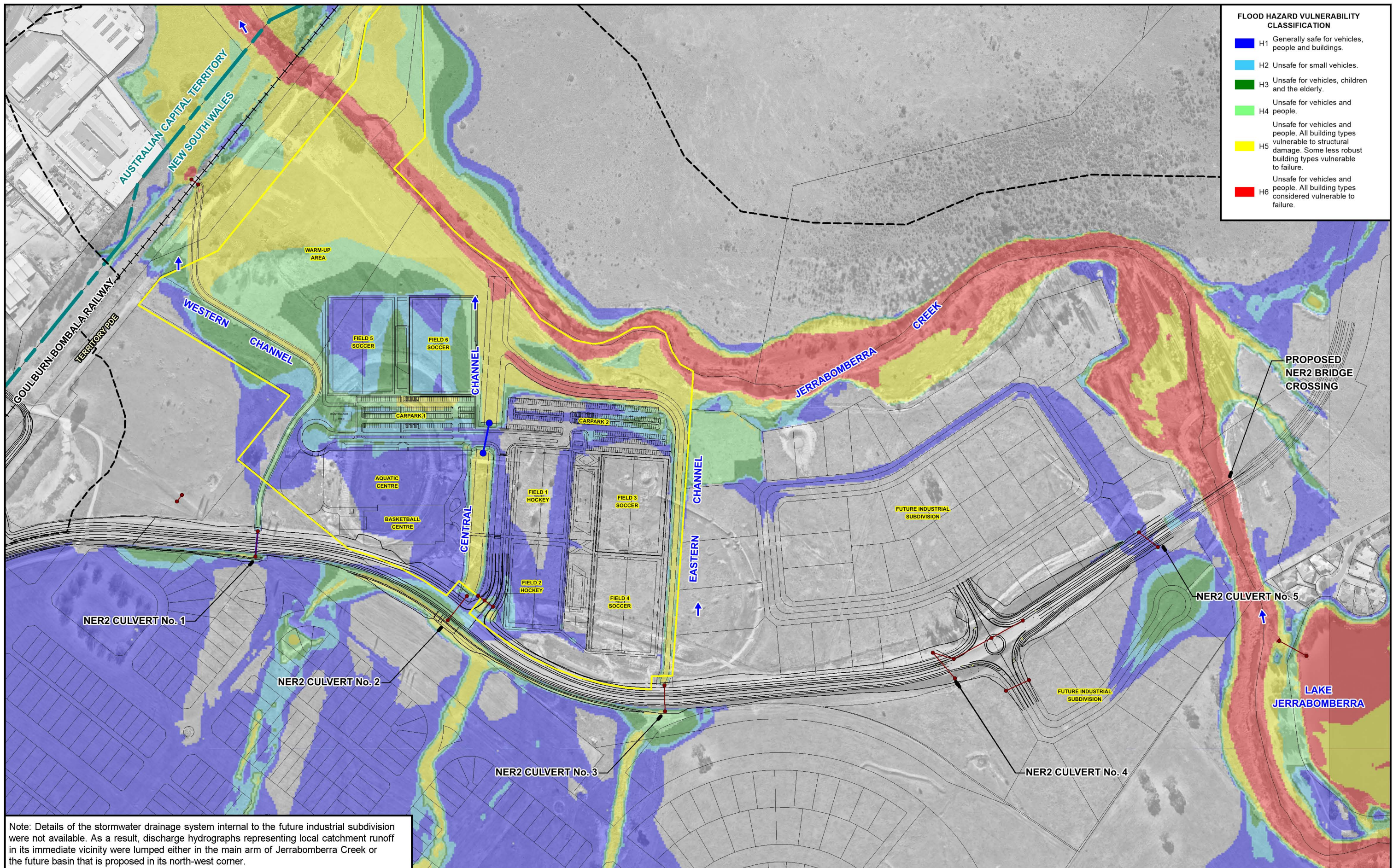
Two-Dimensional Model Boundary

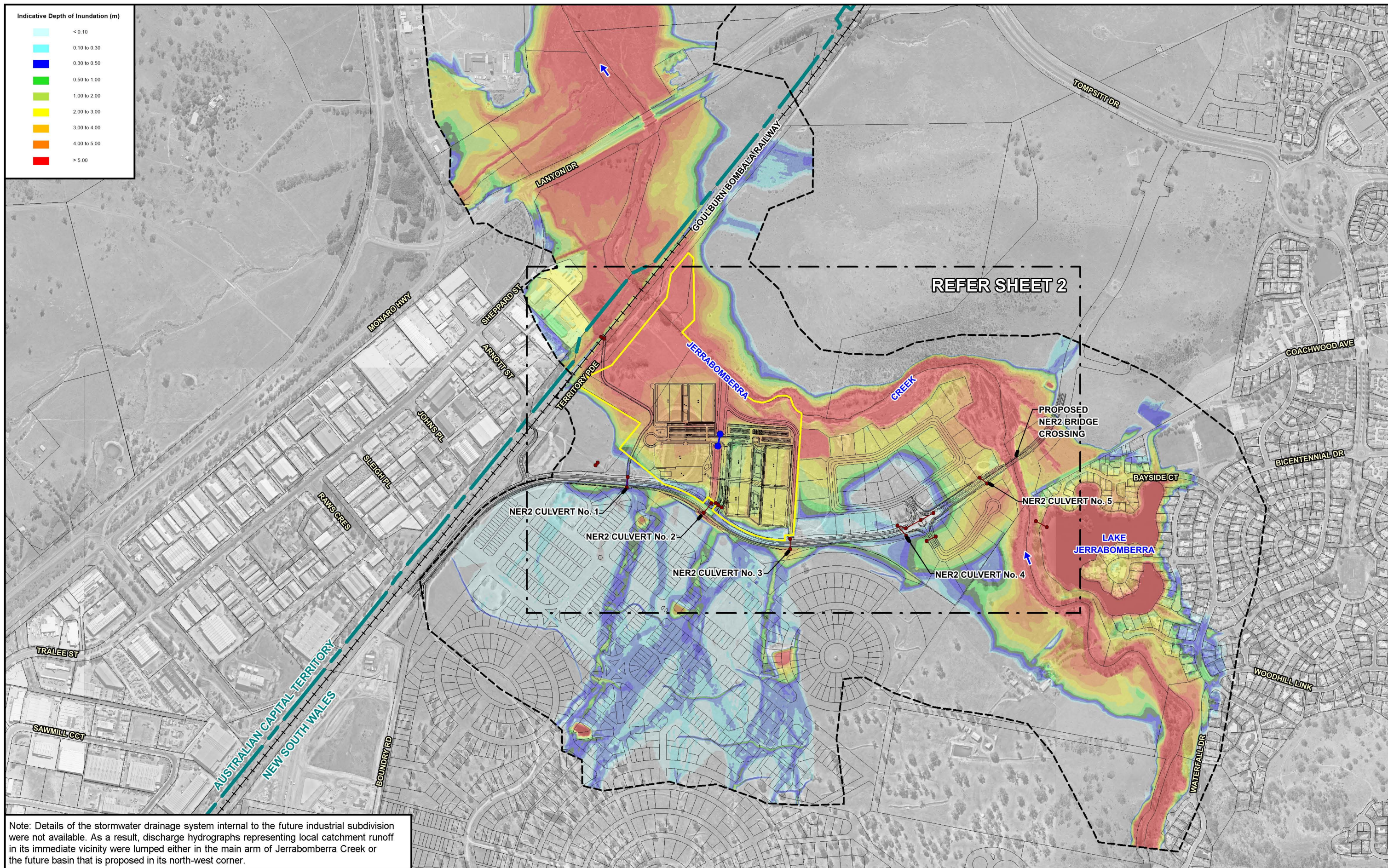
JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION

Figure 5.25
(Sheet 2 of 2)

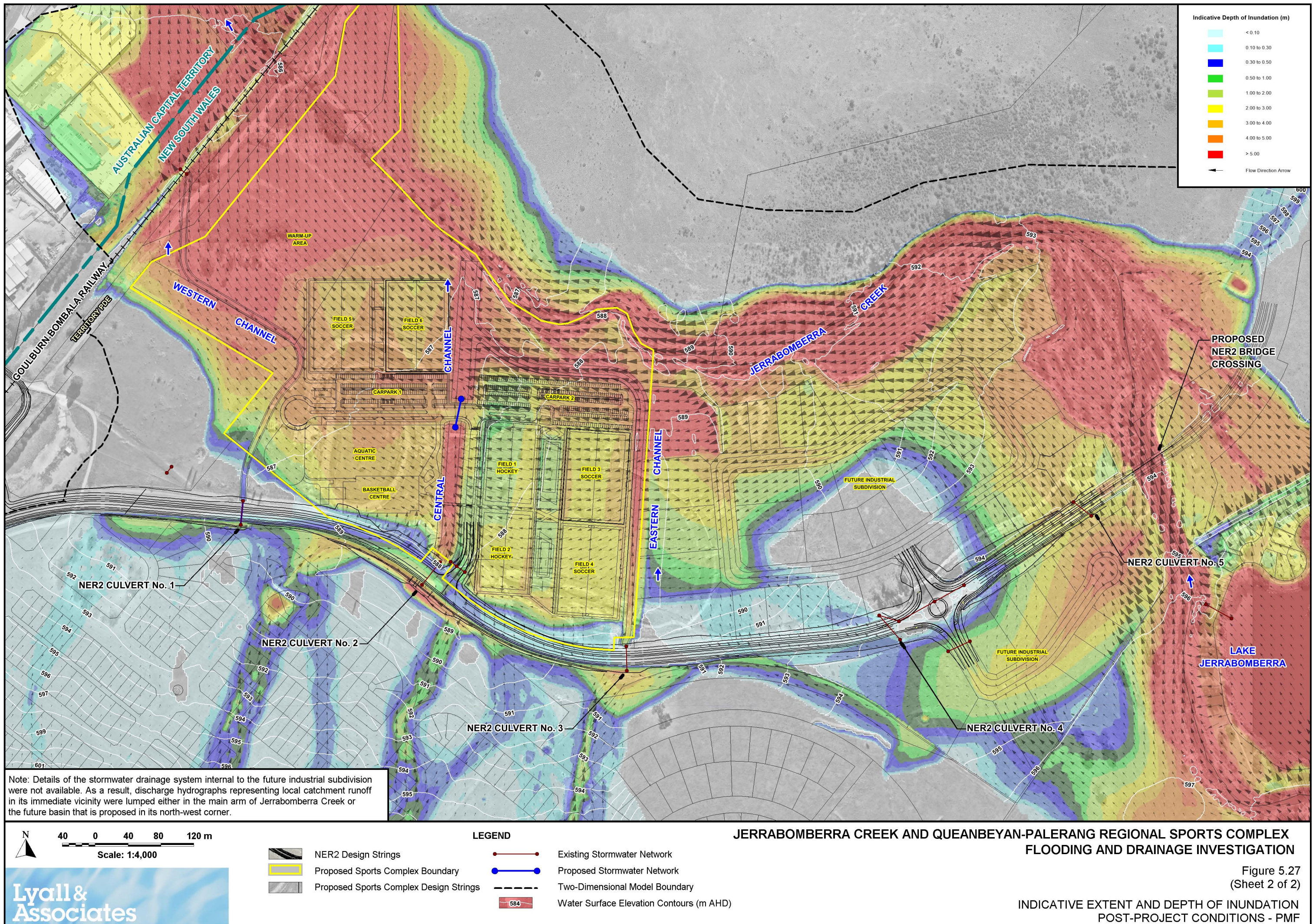
IMPACT OF PROPOSED SPORTS COMPLEX ON MAXIMUM FLOW VELOCITIES
0.2% AEP

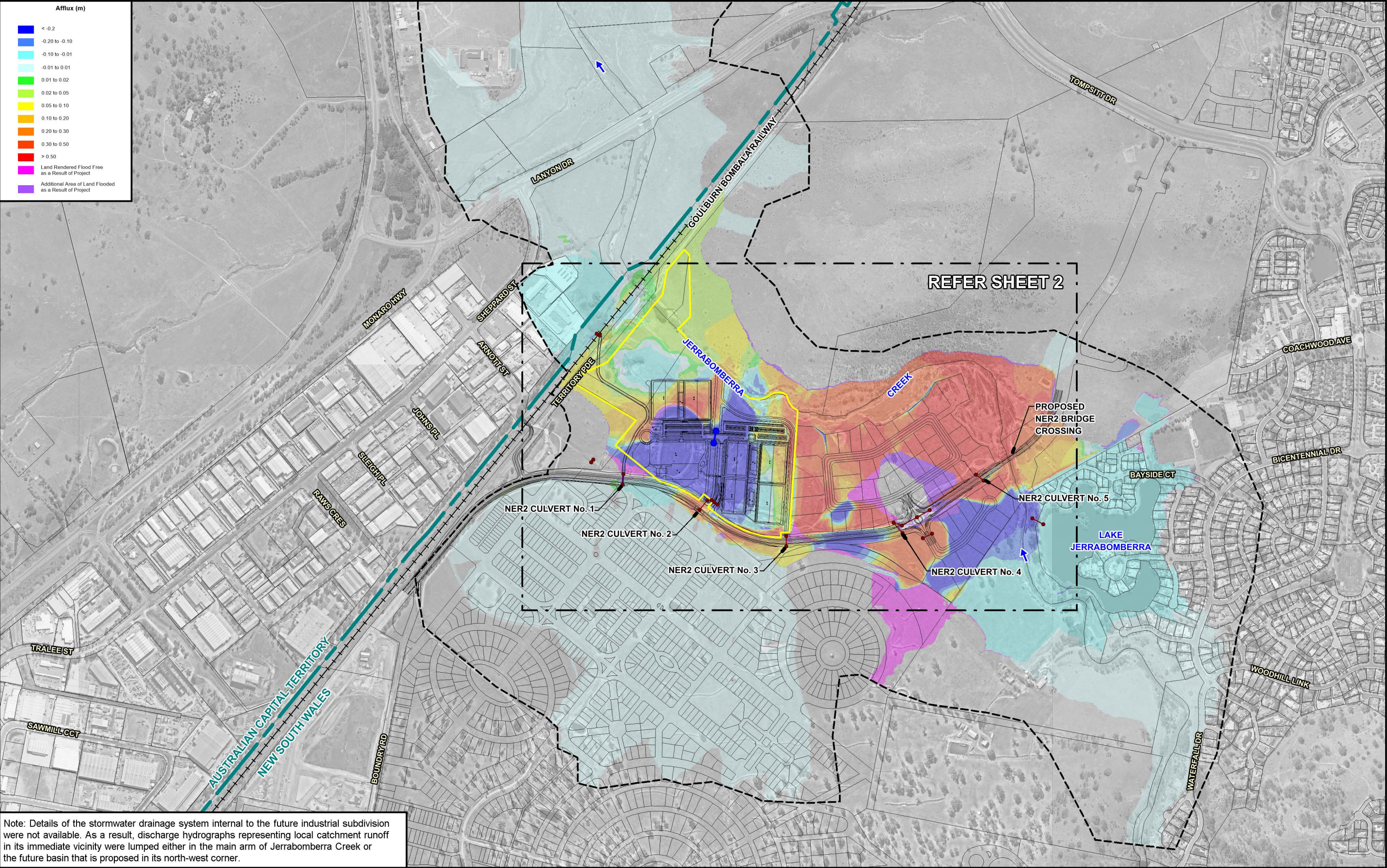




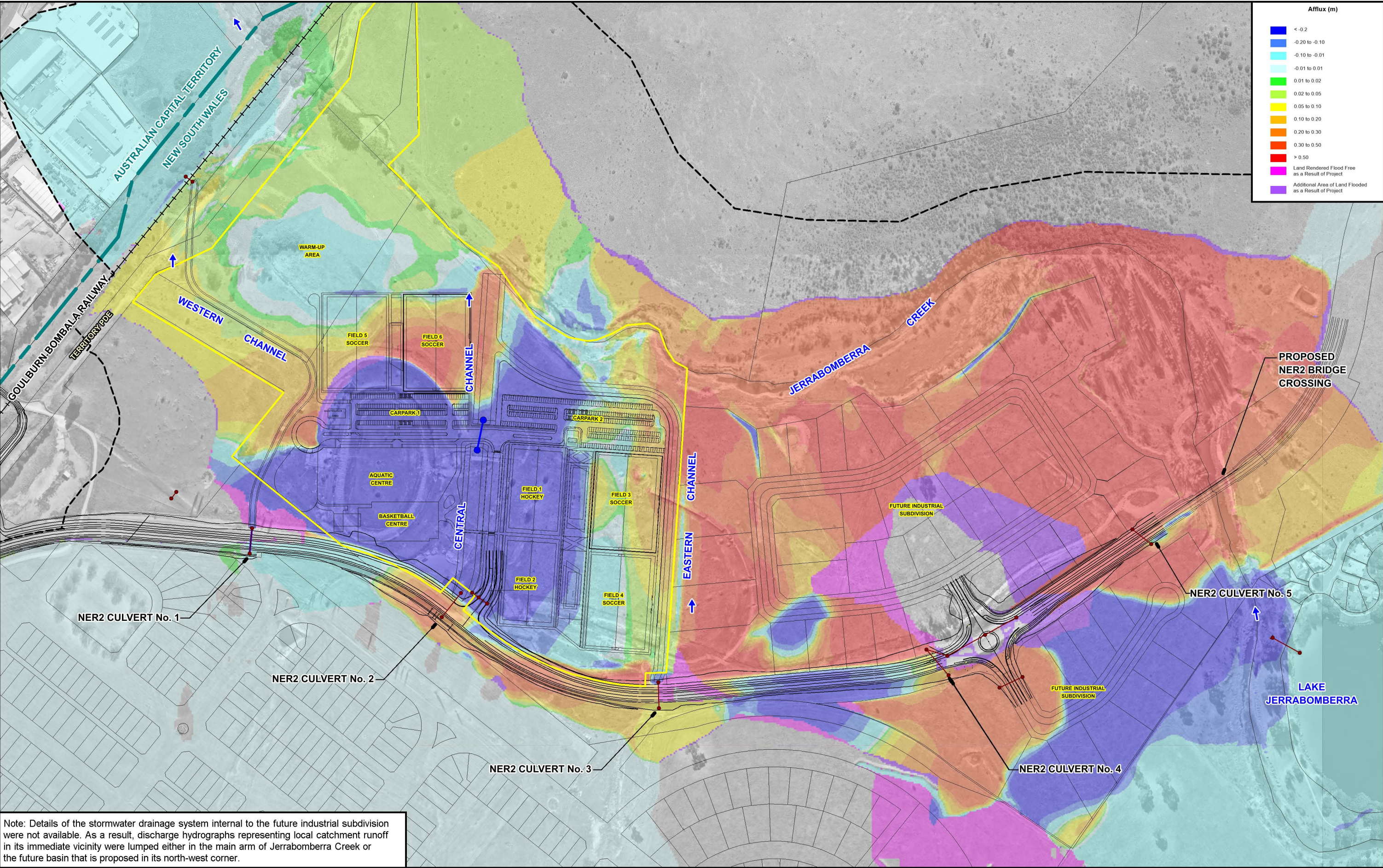


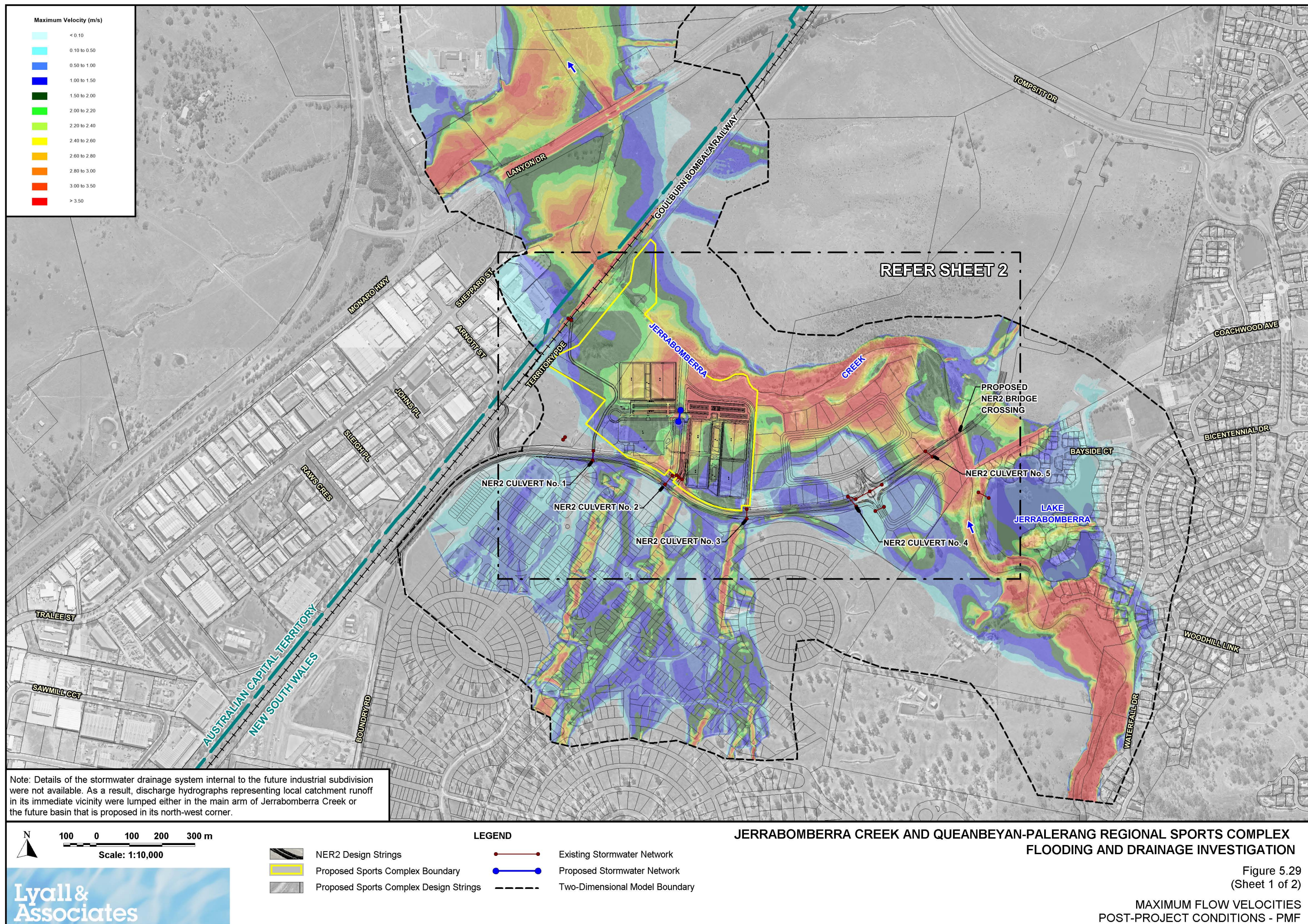
Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

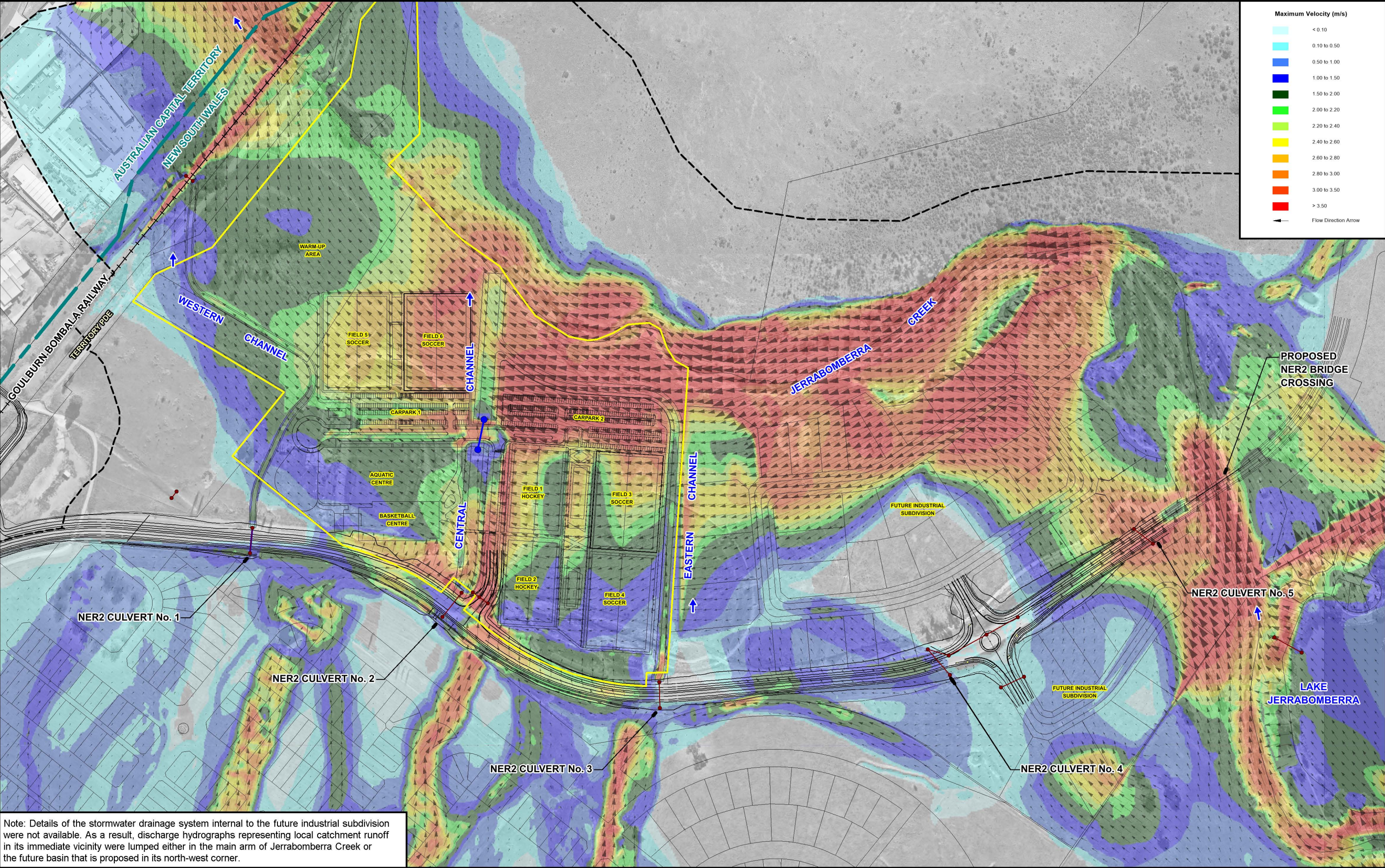




Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.







Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

N

40

0

40

80

120 m

Scale: 1:4,000

NER2 Design Strings

Proposed Sports Complex Boundary

Proposed Sports Complex Design Strings

Existing Stormwater Network

Proposed Stormwater Network

Two-Dimensional Model Boundary

JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX

FLOODING AND DRAINAGE INVESTIGATION

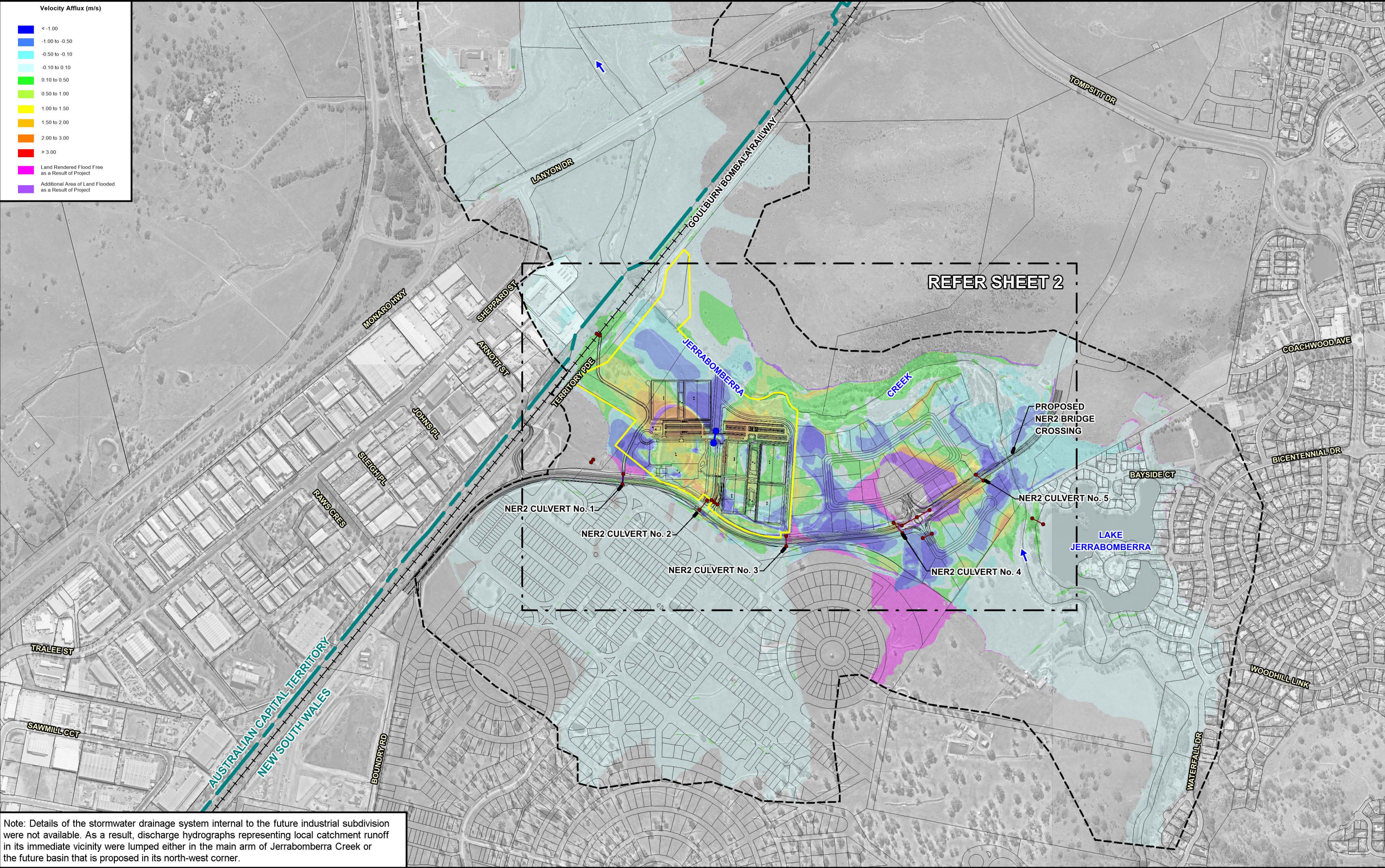
Figure 5.29

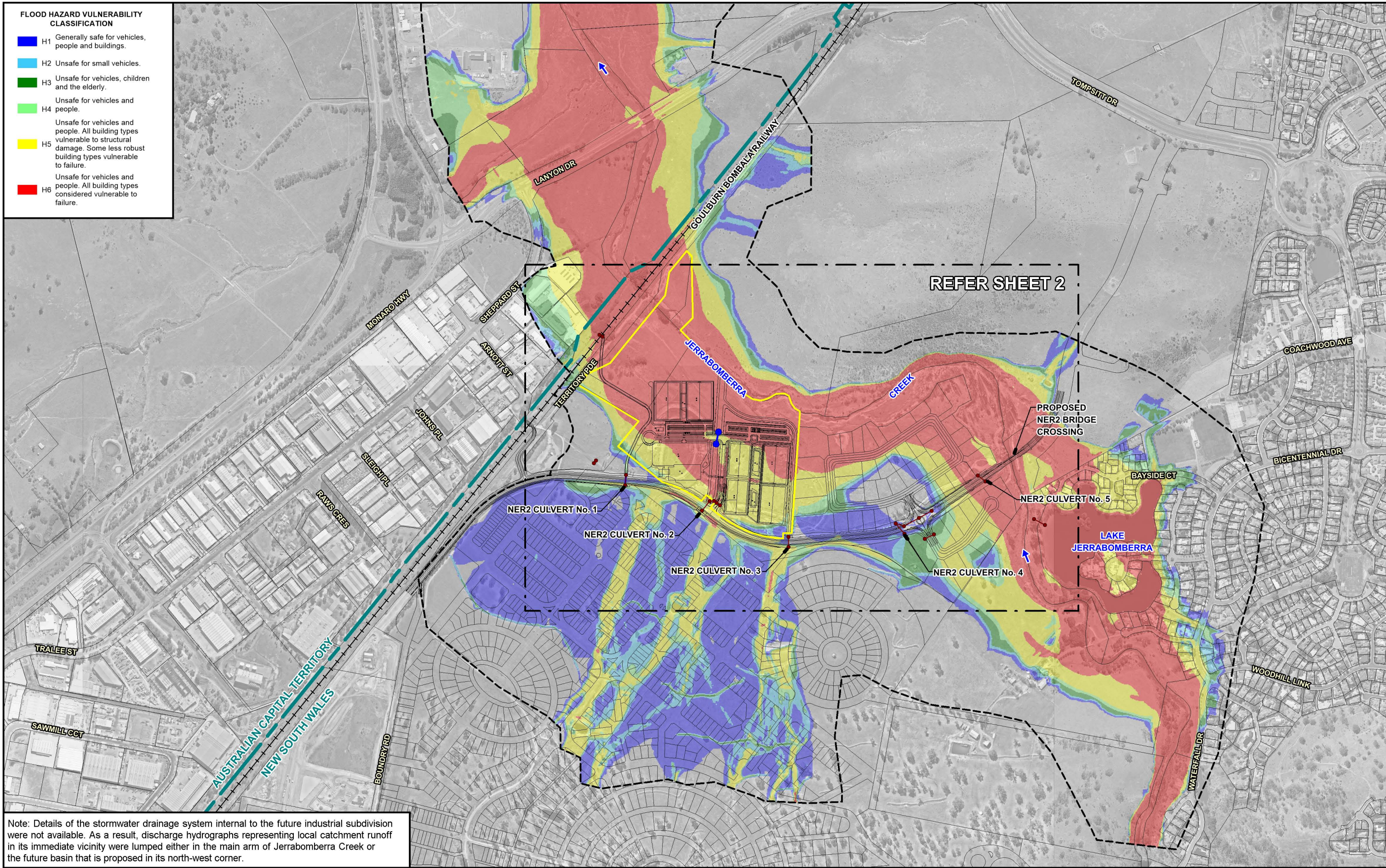
(Sheet 2 of 2)

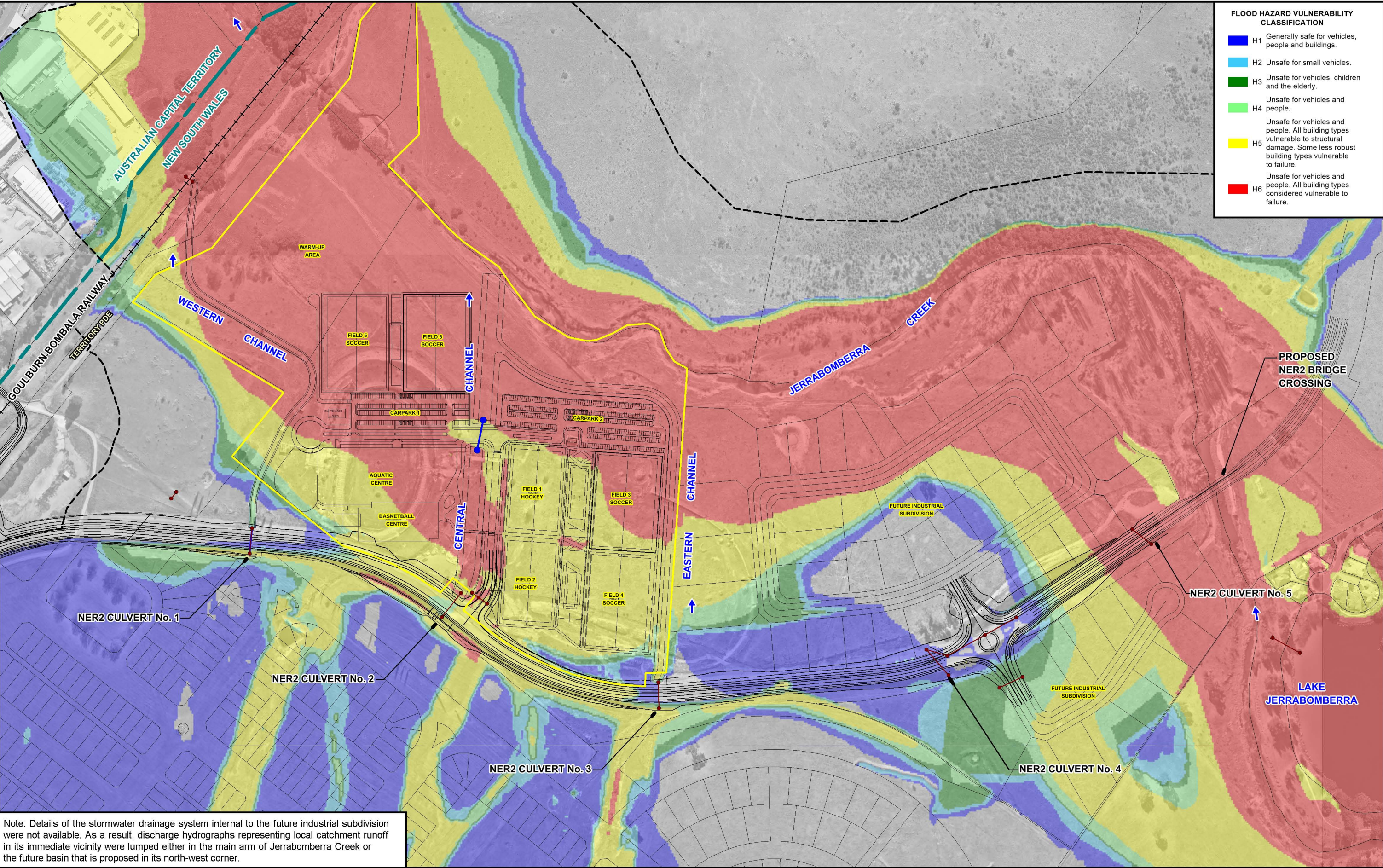
MAXIMUM FLOW VELOCITIES

POST-PROJECT CONDITIONS - PMF

Lyll & Associates







FLOOD HAZARD VULNERABILITY CLASSIFICATION

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

Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

N

40080120

m

Scale: 1:4,000

L

y

a

l

l

&

A

s

s

o

c

i

a

t

e

s

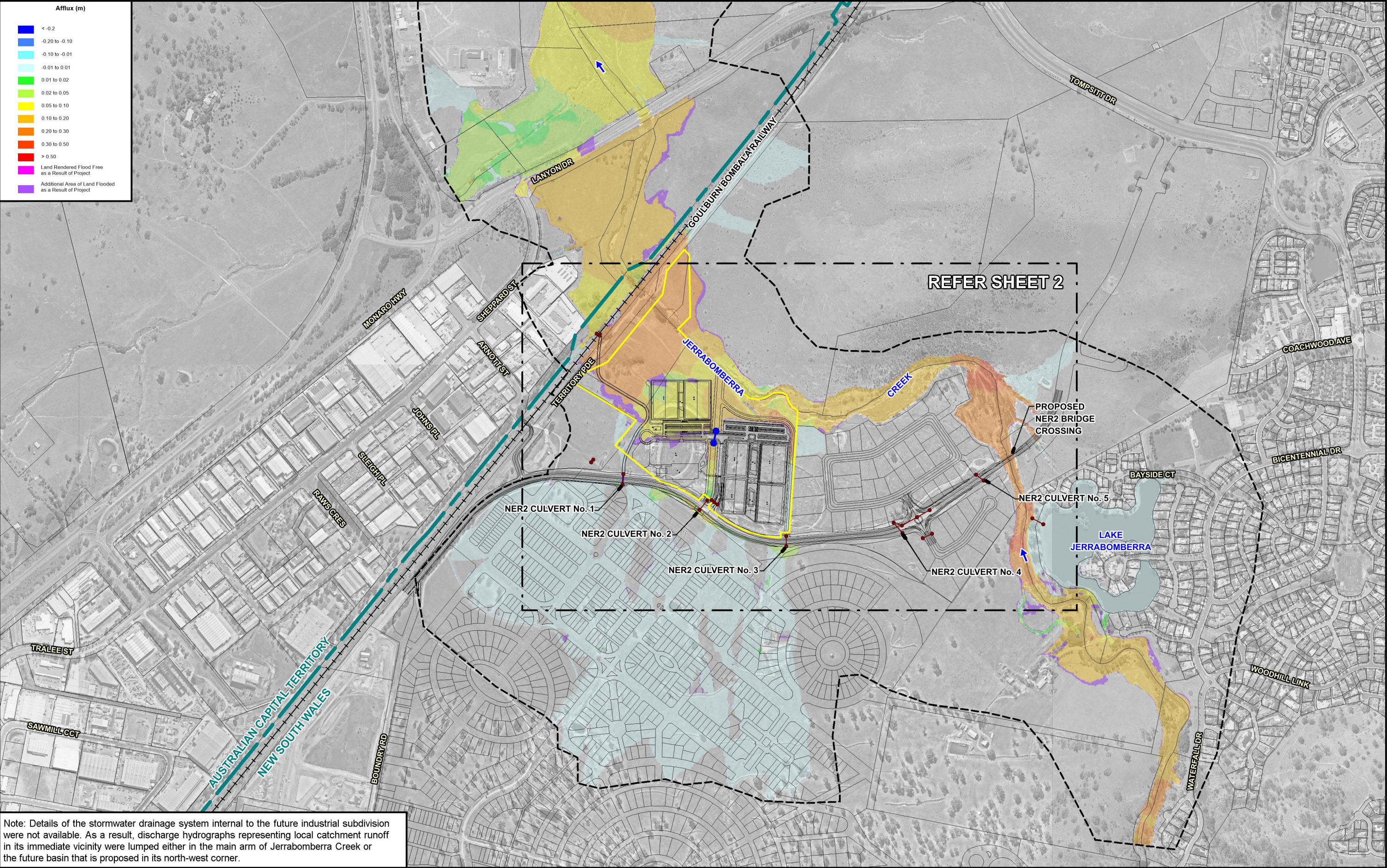
LEGEND

	NER2 Design Strings		Existing Stormwater Network
	Proposed Sports Complex Boundary		Proposed Stormwater Network
	Proposed Sports Complex Design Strings		Two-Dimensional Model Boundary

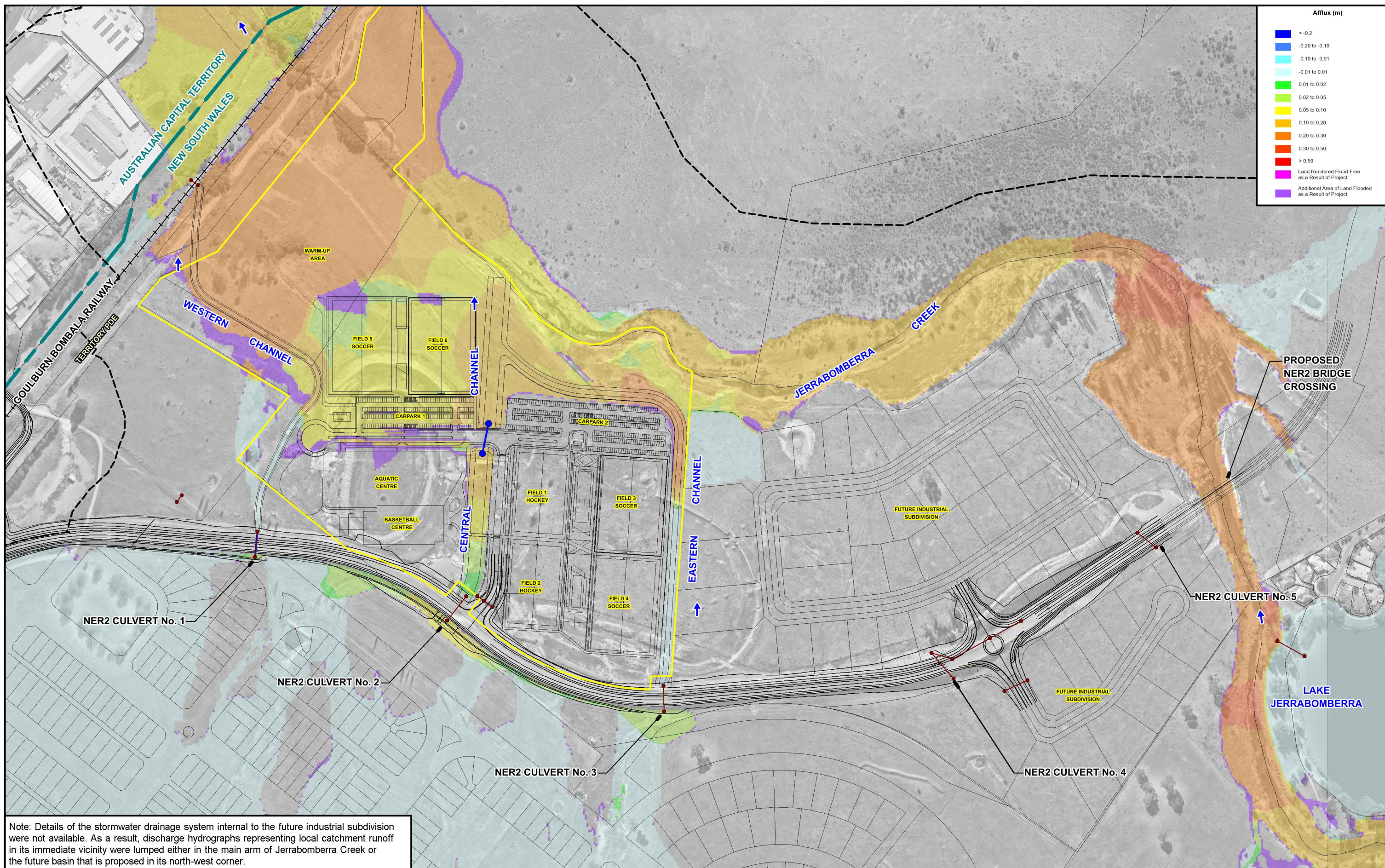
JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
FLOODING AND DRAINAGE INVESTIGATION

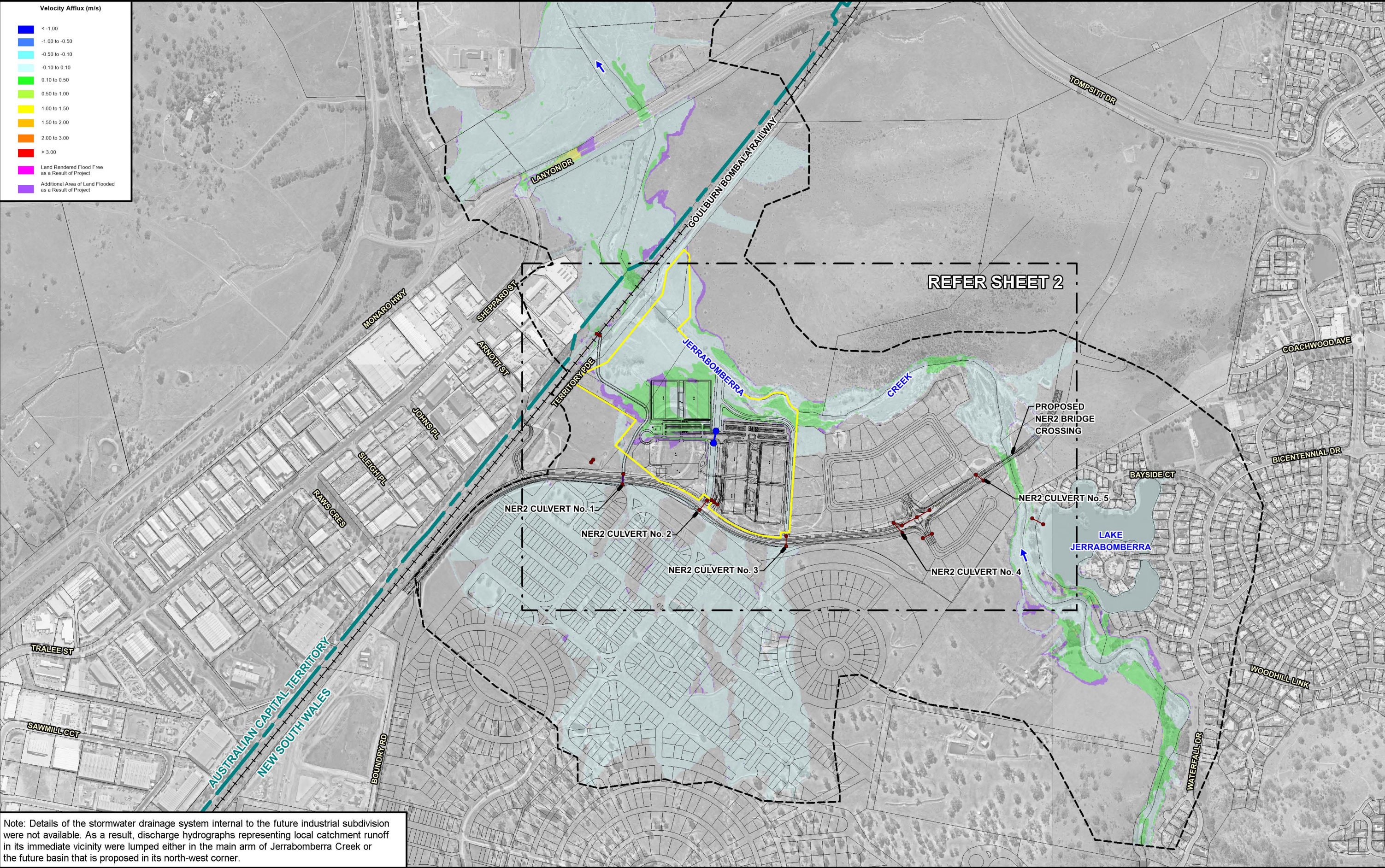
Figure 5.31
(Sheet 2 of 2)

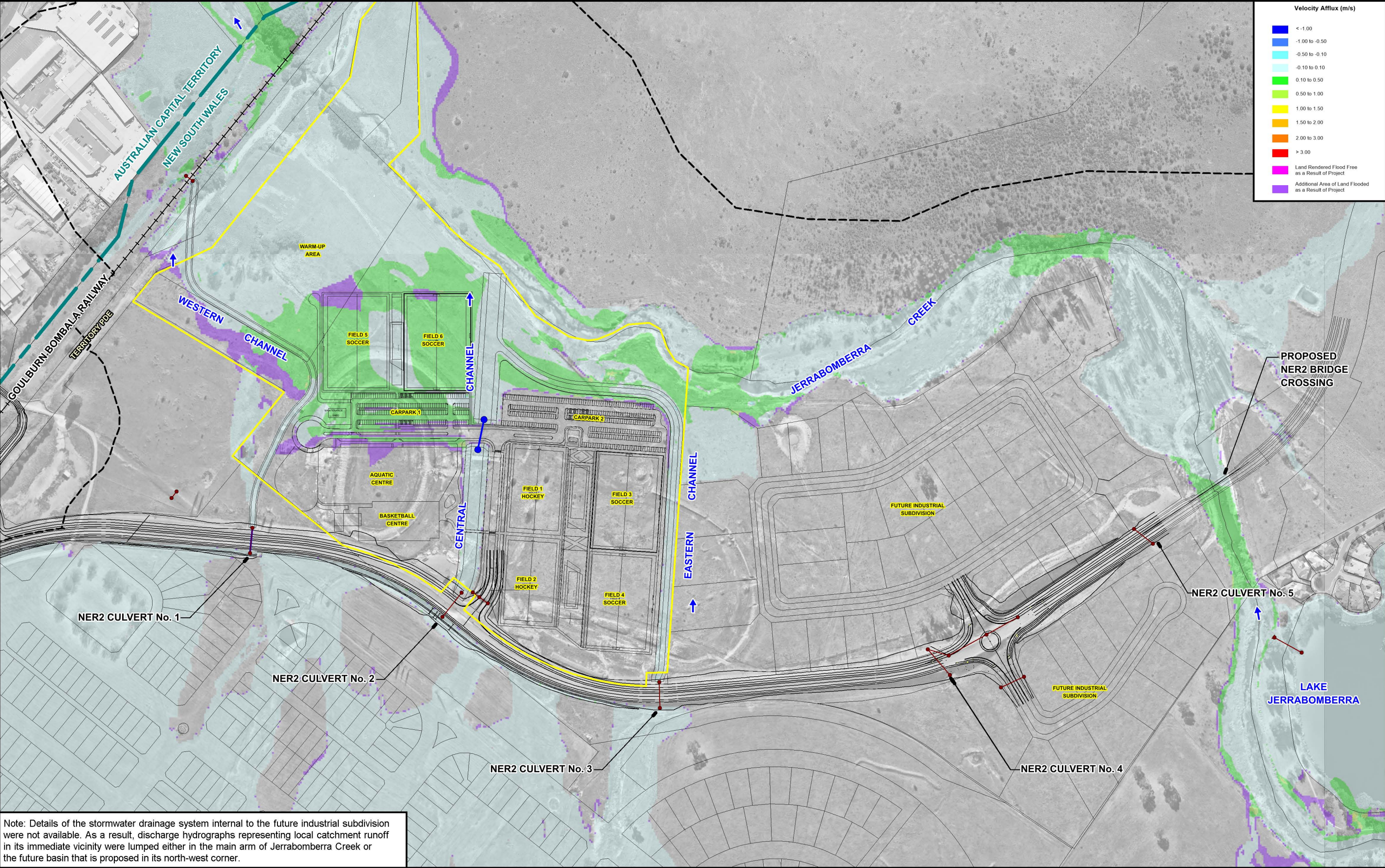
FLOOD HAZARD VULNERABILITY CLASSIFICATION
POST-PROJECT CONDITIONS - PMF



Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.







Note: Details of the stormwater drainage system internal to the future industrial subdivision were not available. As a result, discharge hydrographs representing local catchment runoff in its immediate vicinity were lumped either in the main arm of Jerrabomberra Creek or the future basin that is proposed in its north-west corner.

N

40

0

40

80

120 m

Scale: 1:4,000

NER2 Design Strings

Proposed Sports Complex Boundary

Proposed Sports Complex Design Strings

Existing Stormwater Network

Proposed Stormwater Network

Two-Dimensional Model Boundary

JERRABOMBERRA CREEK AND QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX

FLOODING AND DRAINAGE INVESTIGATION

Figure 5.33

(Sheet 2 of 2)

SENSITIVITY ANALYSIS - IMPACT OF REDUCTION IN CONTINUING LOSS RATE ON MAXIMUM FLOW VELOCITIES

POST-PROJECT CONDITIONS - 1% AEP

Lyll & Associates