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Nambrok Creek Flood Assessment

2015



Explanatory Summary

Report has been reviewed and its status marked as final by West Gippsland Catchment Management Authority.

This flood assessment overlaps with the VicRoads Princes Highway East Duplication – Kilmany Section which was completed in 2018. Where the two flood studies overlap, the 2018 study is used instead of this flood study. However, this flood study (2015) extends further south-east than the 2018 study, in these areas, this flood study is the best available information.

The model uses rational method to determine the time of concentration and peak flow to develop simplified triangular hydrographs. These hydrographs are then run through a 2D flood model.

The original report (with some minor adjustments figures and paragraph spacing to fit the pages) is below.

The original report and flood study were completed in 2015. This report was finalised and this **Explanatory Summary** written in 2026.

Nambrok Creek**Catchment Area 1:** 59.31 Km²

Creek Length: 21.284 Km = 21284 m

Rise: 22 m

Time of Concentration: 215.156 min = 3.5 hrs = 12909.36 sec

Velocity = 1.65 m/s

 $C_{10} = 0.16133$

Fraction Impervious: 0.1

Using Victorian and eastern NSW catchments for time of concentration

Catchment	Area (Km ²)	Stream Length (Km)	Rise (m)	Time of Concentration	Fraction Impervious
1	59.1	59.31	22	3hrs	0.1
2	44.62	17.15	18	3hrs	0.1
Total	103.72				

Catchment 1				
ARI (years)	Runoff Coefficient	Rainfall Intensity (mm/hr)	Rational Method Design Flows (m ³ /s)	Regional Method Flows (m ³ /s)
1	0.188	6.6	20.4	
2	0.200	8.8	29.0	
5	0.223	11.9	43.7	
10	0.235	14.1	54.6	
20	0.247	16.9	68.8	
50	0.270	20.9	93.0	
100	0.282	24.3	112.9	105.2

Catchment Area 2: 44.62 Km²

Creek Length: 17.149 Km = 17,149m

Rise: 18 m

Time of Concentration: 193.102 min = 3.2 hrs = 11586.12

Velocity = 1.48 m/s

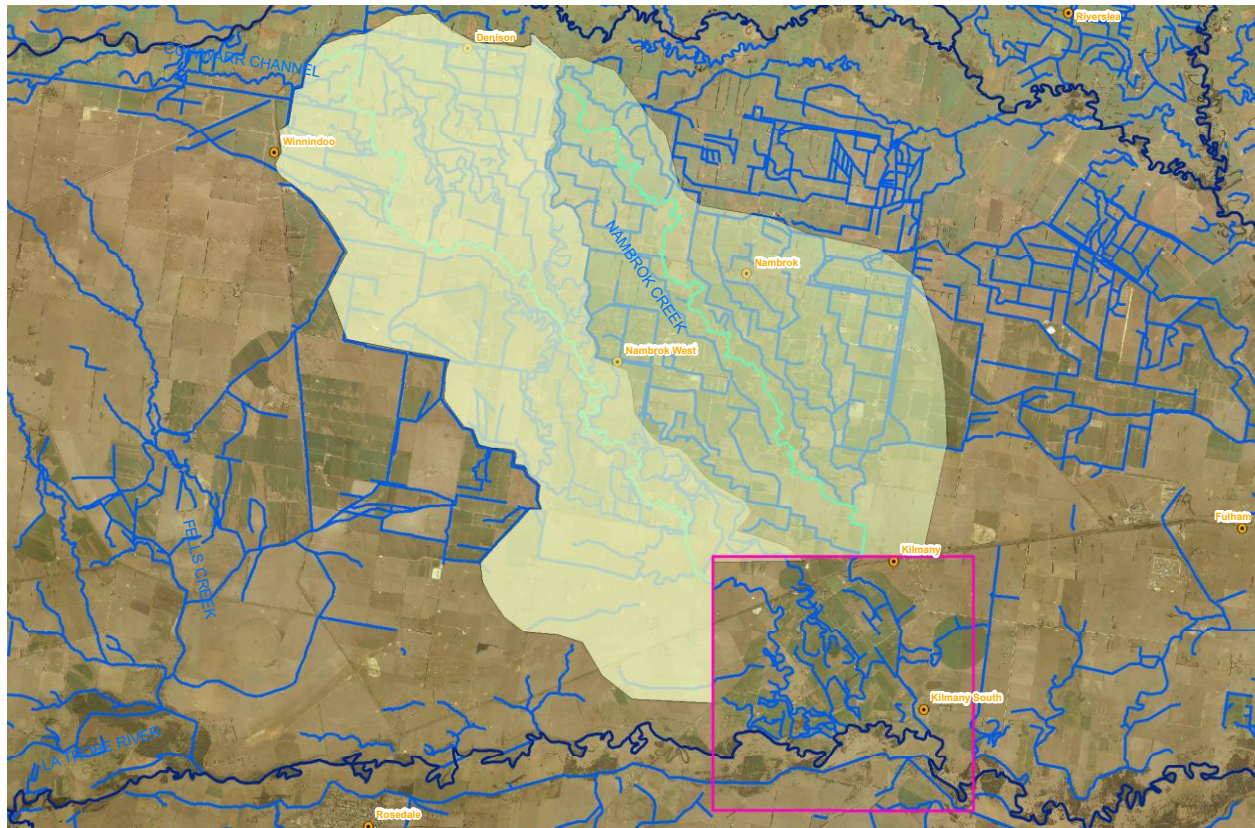
 $C_{10} = 0.153333$

Fraction Impervious: 0.1

Using Victorian and eastern NSW catchments for time of concentration

Catchment 2				
ARI (years)	Runoff Coefficient	Rainfall Intensity (mm/hr)	Rational Method Design Flows (m ³ /s)	Regional Method Flows (m ³ /s)
1	0.182	6.7	15.1	
2	0.194	8.8	21.2	
5	0.217	11.9	32.0	
10	0.228	14.0	39.6	
20	0.239	16.7	49.5	
50	0.262	20.7	67.2	
100	0.274	23.9	81.2	84.7

Figure 2: Nambrok Creek Catchment Areas and Study Area 2



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Roughness Coefficient 0.03

Sobek

Case: [10x10gridRun1 – 100yrinflow&outflow]

2 hour outputs over a period of 2 days – constant inflow

Outflow from Latrobe River Flood Study 100yr ARI constant water level of 10.4m

Case: [10x10gridRun1 – 100yrinflow&10yroutflow]

2 hour outputs over a period of 2 days –constant inflow

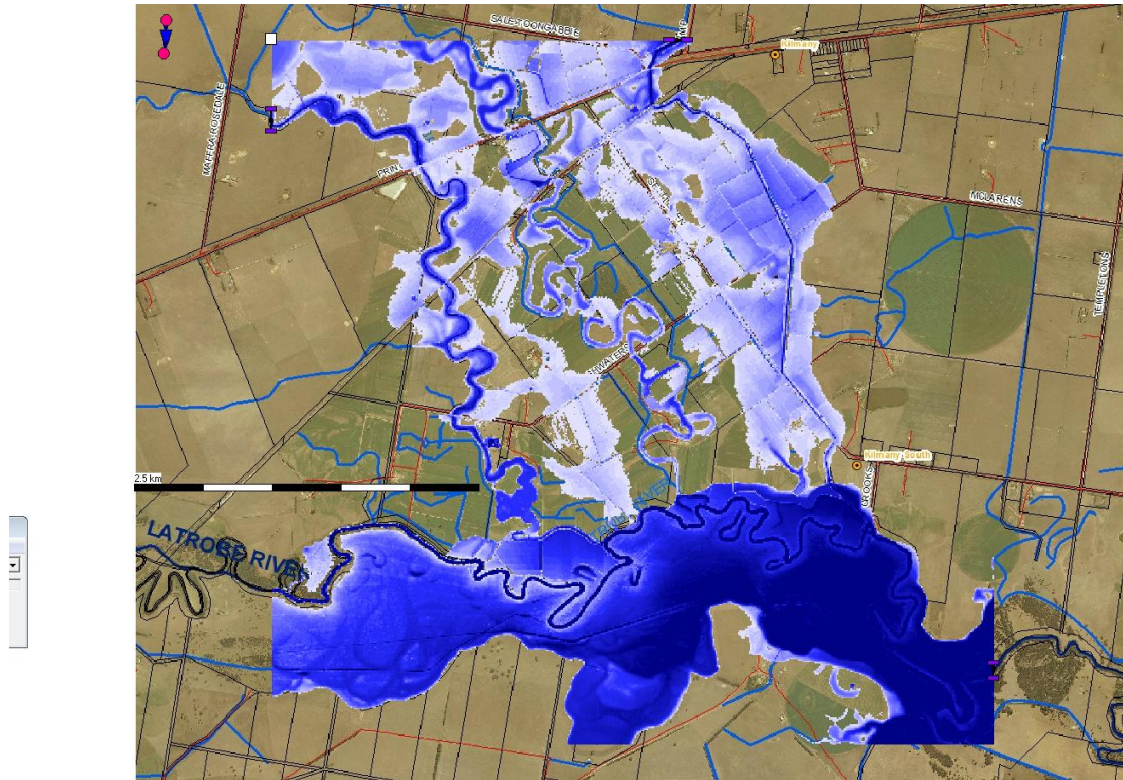
Outflow from Latrobe River Flood Study 10yr ARI constant water level of 9.2m

Case: [10x10extendedgrid2Run1 – 2x100yrinflow&10yroutflow]

6 hour outputs over a period of 1 days –hydrograph inflow

Outflow from Latrobe River Flood Study 10yr ARI constant water level of 9.2m

Topography grid size	
Parameters	Value
Grid Cells Size	10m x 10m
Grid Cells (x direction)	526 columns
Grid Cells (y direction)	512 rows
Total Grid Cells	269,312



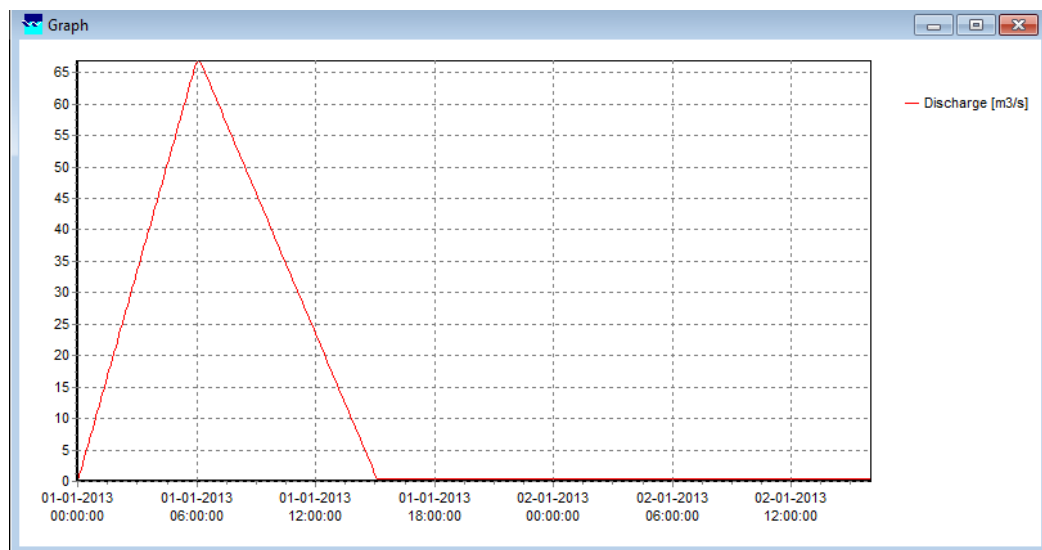
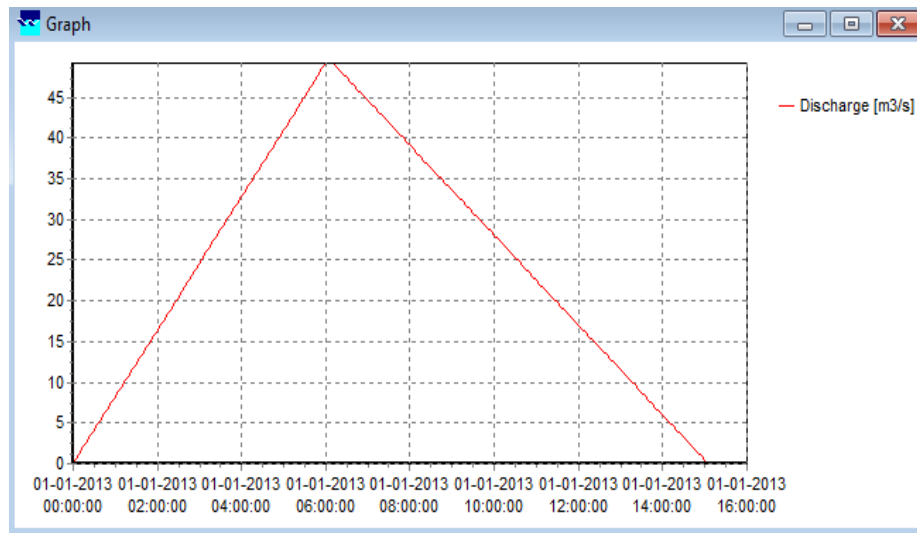
Tc=6hrs (closer to the average of 8hrs)

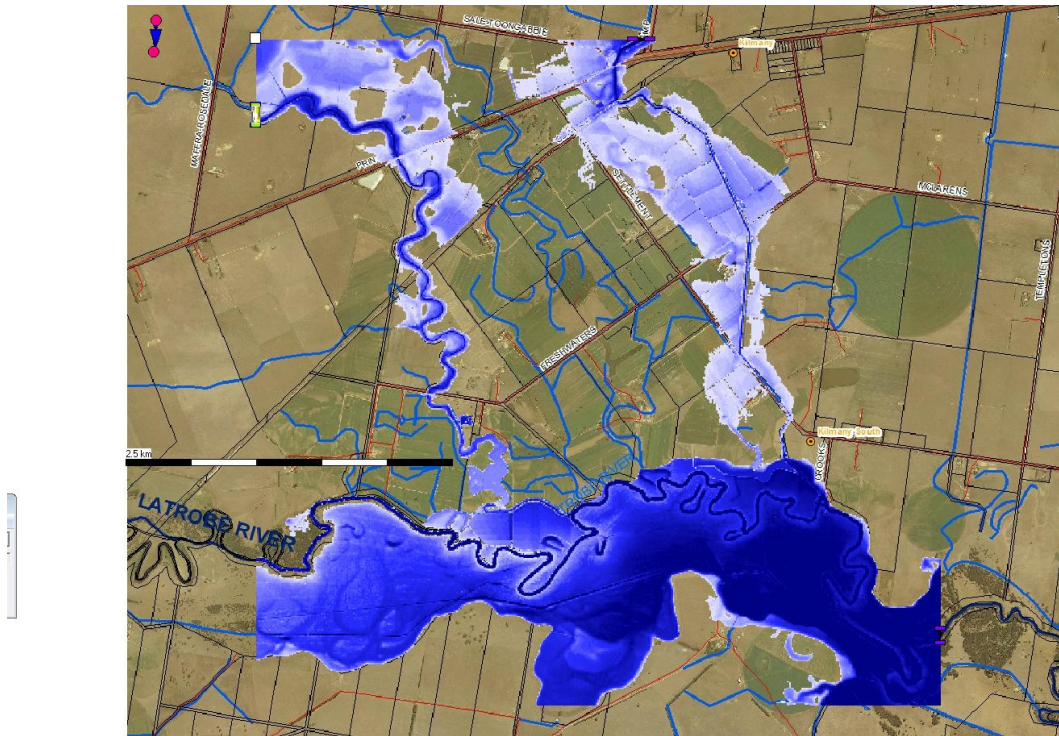
Mannings n = 0.05

Catchment	Area (Km ²)	Stream Length (Km)	Rise (m)	Time of Concentration	Fraction Impervious
1	59.1	59.31	22	6hrs	0.1
2	44.62	17.15	18	6hrs	0.1
Total	103.72				

Catchment 1				
ARI (years)	Runoff Coefficient	Rainfall Intensity (mm/hr)	Rational Method Design Flows (m ³ /s)	Regional Method Flows (m ³ /s)
1	0.188	4.3	13.3	
2	0.200	5.6	18.5	
5	0.223	7.5	27.6	
10	0.235	8.7	33.7	
20	0.247	10.3	41.9	
50	0.270	12.6	56.0	
100	0.282	14.4	66.9	105.2

Catchment 2				
ARI (years)	Runoff Coefficient	Rainfall Intensity (mm/hr)	Rational Method Design Flows (m³/s)	Regional Method Flows (m³/s)
1	0.182	4.3	9.7	
2	0.194	5.6	13.5	
5	0.217	7.5	20.2	
10	0.228	8.7	24.6	
20	0.239	10.3	30.5	
50	0.262	12.6	40.9	
100	0.274	14.5	49.2	84.7





$T_c = 12$ hours (Bransby William Formula)

Catchment 1				
ARI (years)	Runoff Coefficient	Rainfall Intensity (mm/hr)	Rational Method Design Flows (m ³ /s)	Regional Method Flows (m ³ /s)
1	0.188	2.7	8.4	
2	0.200	3.6	11.9	
5	0.223	4.7	17.3	
10	0.235	5.4	20.9	
20	0.247	6.4	26.0	
50	0.270	7.8	34.7	
100	0.282	8.9	41.3	105.2

Catchment 2				
ARI (years)	Runoff Coefficient	Rainfall Intensity (mm/hr)	Rational Method Design Flows (m ³ /s)	Regional Method Flows (m ³ /s)
1	0.182	2.7	6.1	
2	0.194	3.6	8.7	
5	0.217	4.7	12.6	
10	0.228	5.5	15.5	
20	0.239	6.5	19.3	
50	0.262	7.9	25.7	
100	0.274	9.1	30.9	84.7

IFD Table for Catchment 1

DURATION	1 Year	2 years	5 years	10 years	20 years	50 years	100 years
5Mins	43.8	59.6	86.4	106.0	131.0	169.0	201.0
6Mins	40.9	55.7	80.6	98.5	122.0	157.0	187.0
10Mins	33.4	45.2	65.1	79.2	97.9	125.0	149.0
20Mins	24.1	32.6	46.5	56.3	69.2	88.2	104.0
30Mins	19.5	26.3	37.3	45.0	55.2	70.2	82.8
1Hr	13.1	17.6	24.7	29.6	36.1	45.6	53.5
2Hrs	8.6	11.4	15.7	18.6	22.5	28.2	32.8
3Hrs	6.6	8.8	11.9	14.1	16.9	20.9	24.3
6Hrs	4.3	5.6	7.5	8.7	10.3	12.6	14.4
12Hrs	2.7	3.6	4.7	5.4	6.4	7.8	8.9
24Hrs	1.7	2.3	3.0	3.5	4.2	5.1	5.9
48Hrs	1.0	1.4	1.9	2.2	2.7	3.4	4.0
72Hrs	0.7	1.0	1.4	1.7	2.0	2.6	3.0

IFD Table for Catchment 2

DURATION	1 Year	2 years	5 years	10 years	20 years	50 years	100 years
5Mins	43.9	59.5	85.7	104.0	129.0	165.0	196.0
6Mins	40.9	55.5	79.9	97.4	120.0	154.0	183.0
10Mins	33.3	45.1	64.5	78.2	96.2	123.0	145.0
20Mins	24.2	32.6	46.0	55.3	67.7	85.7	101.0
30Mins	19.6	26.3	36.9	44.2	53.9	68.0	79.8
1Hr	13.1	17.6	24.4	29.0	35.2	44.2	51.6
2Hrs	8.6	11.4	15.6	18.4	22.2	27.6	32.0
3Hrs	6.7	8.8	11.9	14.0	16.7	20.7	23.9
6Hrs	4.3	5.6	7.5	8.7	10.3	12.6	14.5
12Hrs	2.7	3.6	4.7	5.5	6.5	7.9	9.1
24Hrs	1.7	2.3	3.0	3.5	4.2	5.2	6.0
48Hrs	1.0	1.4	1.9	2.3	2.8	3.5	4.1
72Hrs	0.7	1.0	1.4	1.7	2.1	2.6	3.1