AVINGTON

Lake Nagambie

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Hallmarc DEVELOPMENTS

LAKE NAGAMBIE RESORT - STAGE A INFRASTRUCTURE MANAGEMENT PLAN

June 2023

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1. INTRODUCTION

The 'Lake Nagambie Resort Stage A Infrastructure Management Plan' has been prepared in accordance with the requirements of Schedule 1 of the Comprehensive Development Zone with the Strathbogie Planning Scheme (**CDZ1**).

In response to these requirements, the following documentation transmittal provides a comprehensive list of the plans and guidelines prepared by Hallmarc Developments Pty Ltd (**Hallmarc**) that form a part of the Lake Nagambie Resort Stage A Infrastructure Management Plan. The following documents are **annexed** to this Infrastructure Management Plan.

ID	DOCUMENT	CONTENTS
'LAKE NAGAMBIE RESORT STAGE A INFRASTRUCTURE MANAGEMENT PLAN'		
A	Stage A Services Strategy Report by Urban Design Management	The Stage A Services Strategy Report outlines the details pertaining to the infrastructure services to be associated with the development.
B	Stage A Stormwater Management Plan	The Stage A Stormwater Management Plan outlines the details relating to the management of stormwater for the development.

2. DOCUMENT SCOPE

Hallmarc is proposing to develop the land as a lifestyle village in accordance with the 2008 Lake Nagambie Resort Master Plan. This Infrastructure Management Plan has been prepared to support the proposed development pursuant to the CDZ1.

The Stage A Infrastructure Management Plan describes the location and nature of the infrastructure services that are associated with the proposal. Considerable detail has gone into the design of the infrastructure services to ensure that the development achieves industry best practice strategies, and where possible, enhances the environmental outcomes of the development. Particular attention was given to ensuring that all native vegetation is preserved.

The Stage A Infrastructure Management Plan consists of two reports; a Services Strategy Report, a Water Sensitive Urban Design Plan. Together, these documents form the Lake Nagambie Resort Stage A Infrastructure Management Plan.

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APPENDIX A

"LAKE NAGAMBIE RESORT STAGE A PRELIMINARY SERVICES STRATEGY REPORT"
Prepared by Urban Design and Management May 2023

UrbanDesign
and management

Land Development | Project Management
Planning | Urban Design | Civil Engineering

Preliminary Servicing Report

Avington Living Nagambie

June 2023

Photo from Nearmaps

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Quality Assurance Record

Prepared By	G. Healey
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1 Introduction

Urban Design and Management (UDM) has been requested to prepare a preliminary Engineering Servicing Report for Avington Living (residential village), Elloura Drive, Nagambie to assess existing and proposed engineering services required for development of the site as a residential village.

The approximately 22 Ha subject site is located nominally 400m southwest of the Nagambie central and is zoned Comprehensive Development Zone – Schedule 1 (CDZ1) under the Strathbogie Planning Scheme.

The site is located within the local government area of Strathbogie Shire Council.

2 Site

2.1 Existing

The vacant subject site is generally flat with a natural depression and tree-lined water course along the eastern boundary. The site naturally drains to the natural depression.

Refer to Figure 1 for an indication of site conditions.

2.2 Proposed

The proposed residential village development will incorporate:

- Cabins / caravan sites.
- A community clubhouse
- Associated community facilities including playgrounds, a lawn bowls green, a tennis court, storage sheds and pedestrian pathways.

Refer to Figure 2 for a conceptual layout of the proposed development.

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Figure 1: Aerial view of subject site – existing conditions.
(Image: 'Google Maps' - April 2021)

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Figure 2 – Proposed site development plan

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3 Engineering Services

3.1 Road Network

3.1.1 Existing

The site is directly accessible from Vickers Road and Elloura Drive. (Refer to Figure 1)

Refer to Figure 3 for an indication of existing road conditions along Vickers Rd.

3.1.2 Proposed

The proposed street network is indicated in Figure 4.

- Elloura Drive is the primary connector road and main access into Elloura estate.
- There is 1 street connection proposed into Avington Living from Elloura Drive.

Figure 3: Vickers Rd. View from southeastern corner of the site looking west
(Image: 'Google Maps' – April 2021)

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Figure 4 – Site interface with the existing local street network. Arrow indicates primary access point.

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3.2 Drainage

3.2.1 Existing

A natural depression exists located along the eastern boundary of the site where the site naturally falls.

Currently, the site has a few minor drainage lines cut into the land allowing stormwater to drain to the depression.

3.2.2 Proposed

Elloura Estate is required to achieve best practice pollutant reduction targets for stormwater runoff, before discharging to the receiving waterbody of Lake Nagambie.

Numerous stormwater treatment strategies exist to achieve the required targets. But to improve the overall health of Lake Nagambie, it is proposed to utilise a combination of gross pollutant traps, a sedimentation pond and a macrophyte zone constructed within the base of the existing waterway to achieve the best stormwater treatment outcome.

The proposed stormwater management strategy will treat combined flows from:

- the new Elloura Estate development; and
- the overall contributing catchment.

This approach delivers a holistic stormwater treatment strategy that has enough capacity for Elloura Estate to exceed best-practice stormwater pollution reduction targets, in addition to reducing the nutrient and pollution loads from the overall contributing catchment.

The 'Water Sensitive Urban Design' (WSUD) report for the subject site proposes that the estate is divided in to two drainage catchments:

- A northern catchment that services the proposed residential subdivision; and
- A southern catchment that services the proposed residential village.

The drainage outfall for both catchments shall discharge to the existing eastern depression.

The proposed stormwater treatment strategy for both catchments is:

Northern Catchment:	Incorporate gross pollutant traps prior to discharge into the existing depression.
Southern Catchment:	Incorporate a sedimentation pond and wetland within the existing depression. This proposal will require some augmentation of the existing depression to facilitate construction of the new wetland.

Refer to Figure 6 for a general arrangement of the proposed drainage strategy outlined in the Elloura Estate - Water Sensitive Urban Design (WSUD) Report (Incitus Doc. 1920, Rev 2 – Apr. 2023)

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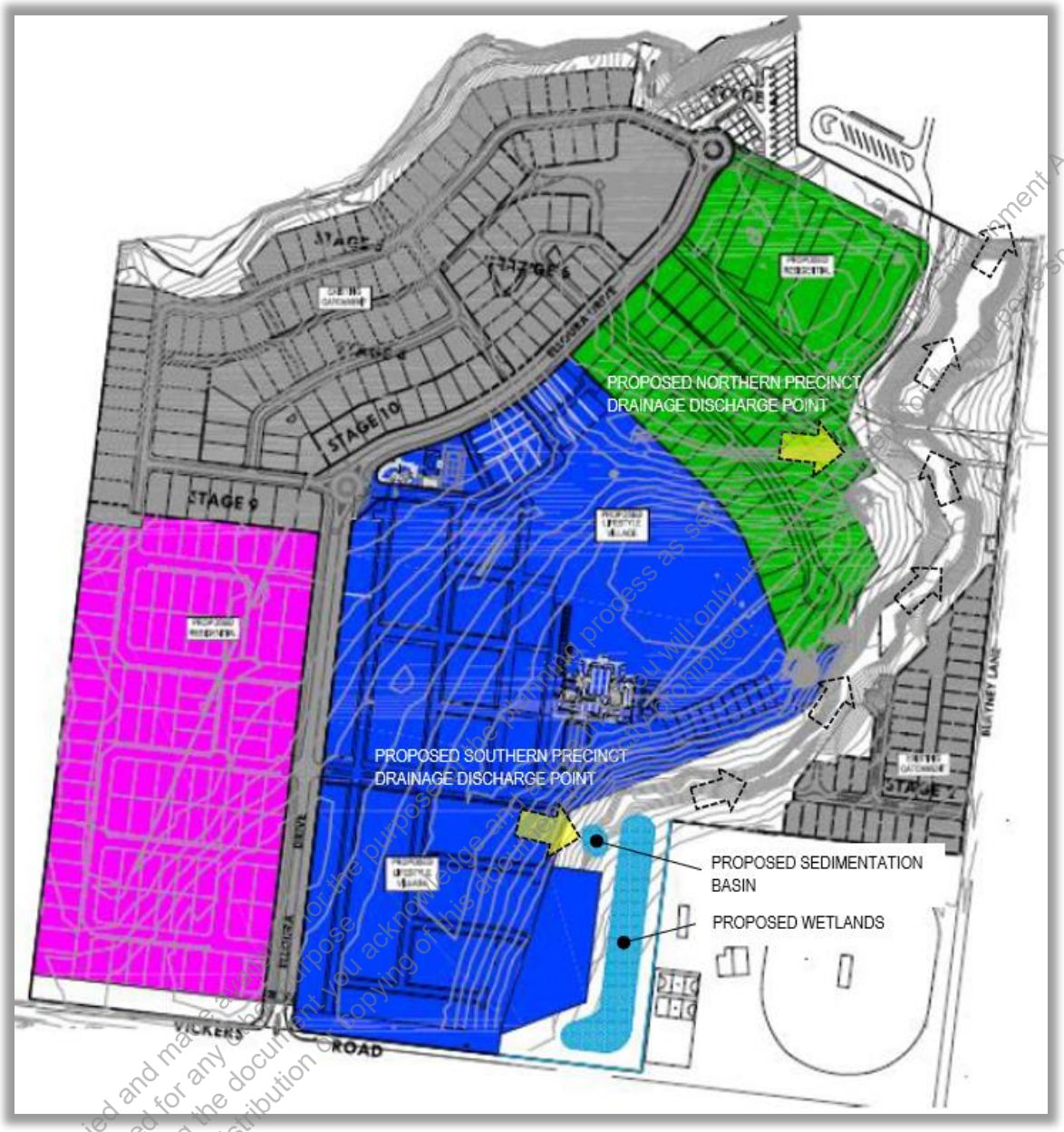

Figure 6 – Proposed holistic drainage strategy for the Ellora Estate
(Reference: Incitus Doc 1920 - Elloura Estate WSUD Report – Rev 2 – April '23)

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3.3 Sewerage

3.3.1 Existing

Goulburn Valley Water are the responsible service authority for the provision and approval of reticulated sewerage for the Nagambie township.

A Goulburn Valley Water asset investigation confirms that there is existing reticulated sewer adjacent and through the northern part of the subject site. Refer to Figure 7 for details.

3.3.2 Proposed

The developer is responsible for the construction of reticulated sewer within the future development. Details of the sewer reticulation and connection works will be confirmed by a formal Goulburn Valley Water Development Deed.

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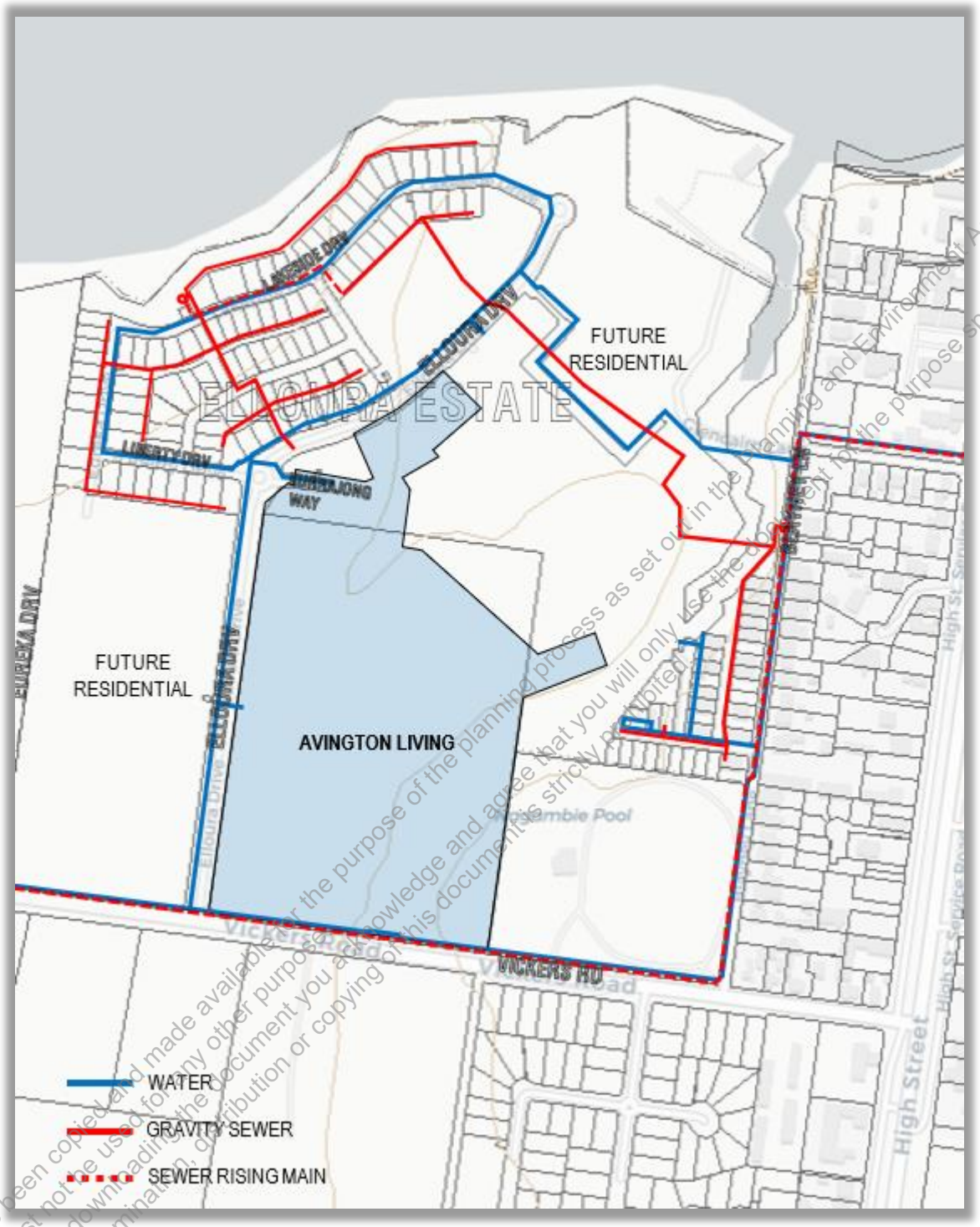

Figure 7 – Existing water and sewer services to the subject site
(Reproduced from Goulburn Valley Water Asset Map)

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3.4 Water

3.4.1 Existing

Goulburn Valley Water are the responsible service authority for the provision and approval of the reticulated water supply for the Nagambie township.

A Goulburn Valley Water asset investigation confirms that there is an existing reticulated water supply available directly to, and through, the subject site. Refer to Figure 7 for details.

3.4.2 Proposed

The developer is responsible for the construction of reticulated water within the future development. Details of the water reticulation and connection works will be confirmed by a formal Goulburn Valley Water Development Deed.

3.1 Gas

3.1.1 Existing

Reticulated gas is not available to the subject site.

3.2 Electrical

3.2.1 Existing

The following electrical services are currently available from Vickers Rd and Elloura Drive.

- 22kV high voltage overhead. – Vickers Rd
- 22kV high voltage underground. – Elloura Drive

Refer to Figure 8 for details.

Proposed

Details of the requirements for supply will be subject to receipt of formal offer from the responsible electricity authority at the time of development and detailed electrical design. Electricity supply within the development will typically be via underground infrastructure.

The developer is responsible for the construction of electricity infrastructure within the development.

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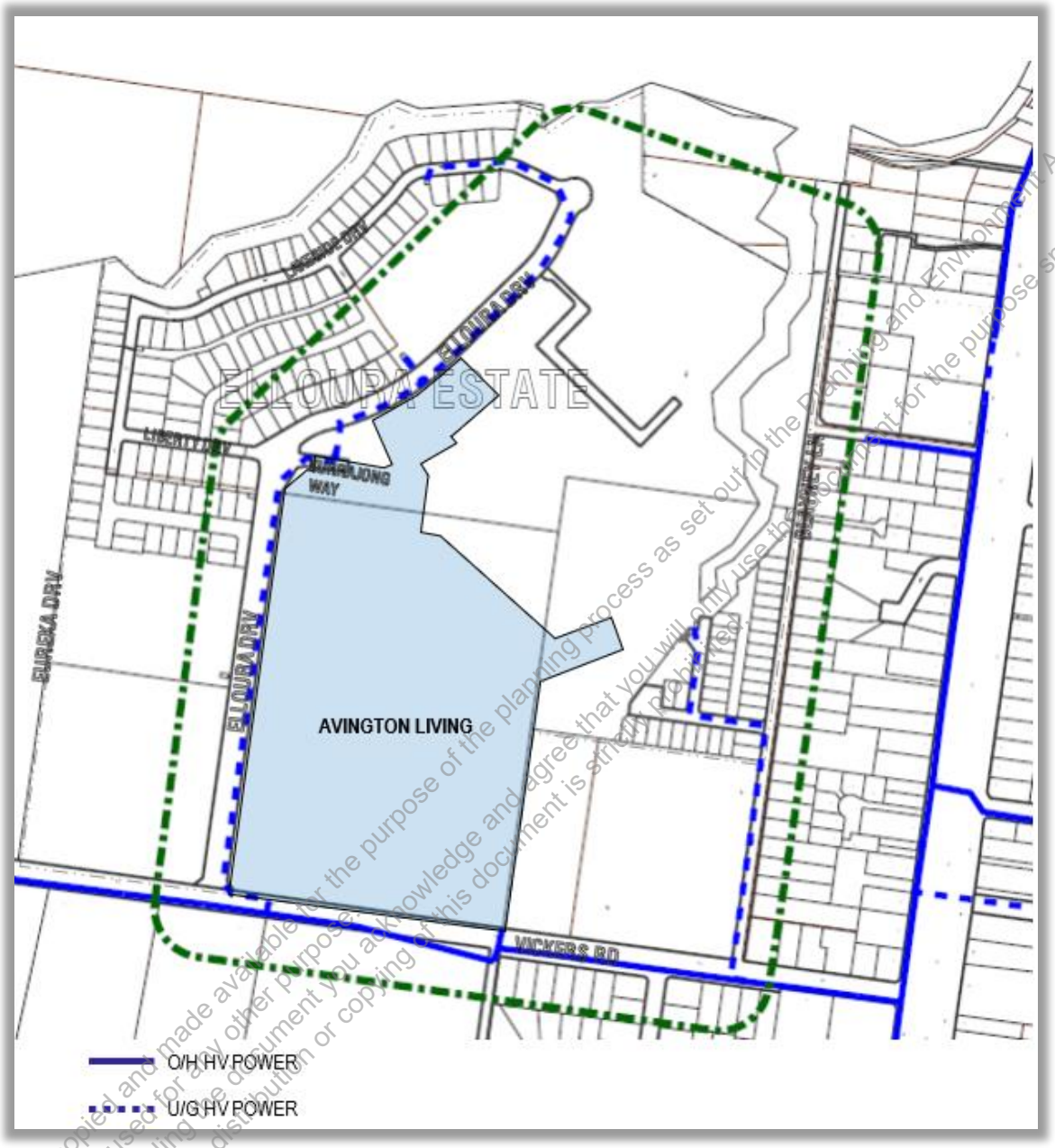

Figure 8 – Existing electrical services to the subject site
(Image from Ausnet DBYD)

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3.3 Communications

3.3.1 Existing

DBYD data confirms that the subject site has access to fibre optic communication reticulation infrastructure in Vickers Road, Elloura Drive.

3.3.2 Proposed

Details of pit and pipe infrastructure to be delivered as part of this development will be confirmed via application to NBN Co and the developer will be required to install pit and pipe infrastructure suitable for optical fibre installation as part of the National Broadband Network (NBN).

3.4 General

There are sufficient existing engineering services available to service the subject site.

Further detailed engineering design and consultation with the respective service authorities is necessary to determine the extent of additional infrastructure necessary to adequately service the subject site.

3.5 Qualification

We highlight that this Servicing Report is based on preliminary information and informal discussions with appropriate service authority representatives and may be subject to future amendment. Urban Design and Management Pty Ltd cannot accept any responsibility should an authority change its future position, strategy and/or requirements.

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APPENDIX B

"LAKE NAGAMBIE RESORT STAGE A WATER SENSITIVE URBAN DESIGN REPORT"
Prepared by Incitus April 2023

Elloura Estate, Nagambie

Water Sensitive Urban Design

Hallmarc

28 April 2023

Revision: 2

Reference: 1920

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1 Introduction

Hallmarc has engaged Incitus to undertake an assessment of the stormwater quality opportunities for the balance of Elloura Estate, Nagambie.

The land is located approximately 90 minutes north of Melbourne in Nagambie. The site is bounded by Vickers Road to the south, existing residential development to the west, a park to the north, and a waterway to the east. The site is illustrated in **Figure 1.1** below.

Figure 1.1 Elloura Estate, Nagambie

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2 Background

Victorian Planning Provision Clause 56.07

In October 2006, the Victorian Government amended the Victorian Planning Provisions (VPP) relating to residential subdivisions, Clause 56. The amendments resulted in the inclusion of Clause 56.07, Integrated Water Management provisions.

The intent of Clause 56.07 of the VPPs is to provide sustainable water management options that aim to:

- Integrate use of all water resources including rainwater, stormwater and recycled water
- Conserve the supply and reduce the demand on potable water
- Use alternative water sources to potable water where possible
- Use best practice water sensitive urban design techniques to conserve, recycle and reuse water and to manage the quality of stormwater runoff

In relation to this site is the application of Clause 56.07-4 Urban run-off management objectives. The objectives are:

- To minimise damage to properties and inconvenience to residents from urban runoff
- To ensure that the street operates adequately during major storm events and provides for public safety
- To minimise increases in stormwater runoff and protect the environmental values and physical characteristics of receiving waters from degradation by urban runoff

Victorian Planning Provision Clause 53.18

In October 2018, the Victorian Government created the new Clause 53.18, Stormwater Management in Urban Development, in the Victorian Planning Provisions to ensure that stormwater generated from all forms of urban development is managed in an integrated way to mitigate the impacts of stormwater runoff on the environment, property and public safety, and to provide cooling, local habitat and amenity benefits.

One of the key elements to be met under Clause 53.18 of the VPPs is the stormwater management objectives and standards for subdivisions. The objectives for stormwater management for subdivisions are:

- To minimise damage to properties and inconvenience to the public from stormwater
- To ensure that the street operates adequately during major storm events and provides for public safety
- To minimise increases in stormwater and protect the environmental values and physical characteristics of receiving waters from degradation by stormwater
- To encourage stormwater management that maximises the retention and reuse of stormwater
- To encourage stormwater management that contributes to cooling, local habitat improvements and provision of attractive and enjoyable spaces

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Amongst other things, the stormwater system should be Designed to meet the current best practice performance objectives for stormwater quality as contained in the Urban Stormwater - Best Practice Environmental Management Guidelines (Victorian Stormwater Committee,1999).

Best Practice Environmental Management Guidelines

The State Environment Protection Policy (Waters of Victoria) defines the required water quality conditions for urban waterways. The aim of stormwater quality treatment is to reduce typical pollutant loads from urban areas to Best Management Practices as defined in the following targets:

Table 2.1 Best Practice Pollutant Reduction Targets

Pollutant	Performance Objective
Total Suspended Solids (TSS)	80% reduction from typical urban load
Total Phosphorous (TP)	45% reduction from typical urban load
Total Nitrogen (TN)	45% reduction from typical urban load
Gross Pollutants (GP)	70% reduction from typical urban load
Flows	Maintain discharges for the 1.5 year ARI at pre-development levels

Source: Urban Stormwater: Best Practice Environmental Management Guidelines – Victorian Stormwater Committee, 1999.

The additional development of Elloura Estate needs to meet these best practice pollutant reduction targets for stormwater runoff prior to discharging into the receiving waterbody of Lake Nagambie. The development will achieve this through the incorporation of water sensitive urban design (WSUD) measures.

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3 Catchment Characteristics

The future development in Elloura Estate is comprised of 2 catchments, both discharging to the existing waterway to the east of the site. The southern catchment includes the proposed lifestyle village and the proposed residential catchment to the west. There is also a small portion of catchment on the east of the existing waterway, adjacent to the sports reserve. The total area of the southern catchment is 21.2 ha. The northern catchment includes the proposed residential area north of the lifestyle village and adjacent to the existing waterway. The total area of the northern catchment is 5.8 ha.

Figure 3.1 illustrates the delineation of the catchments and the proposed discharge locations.

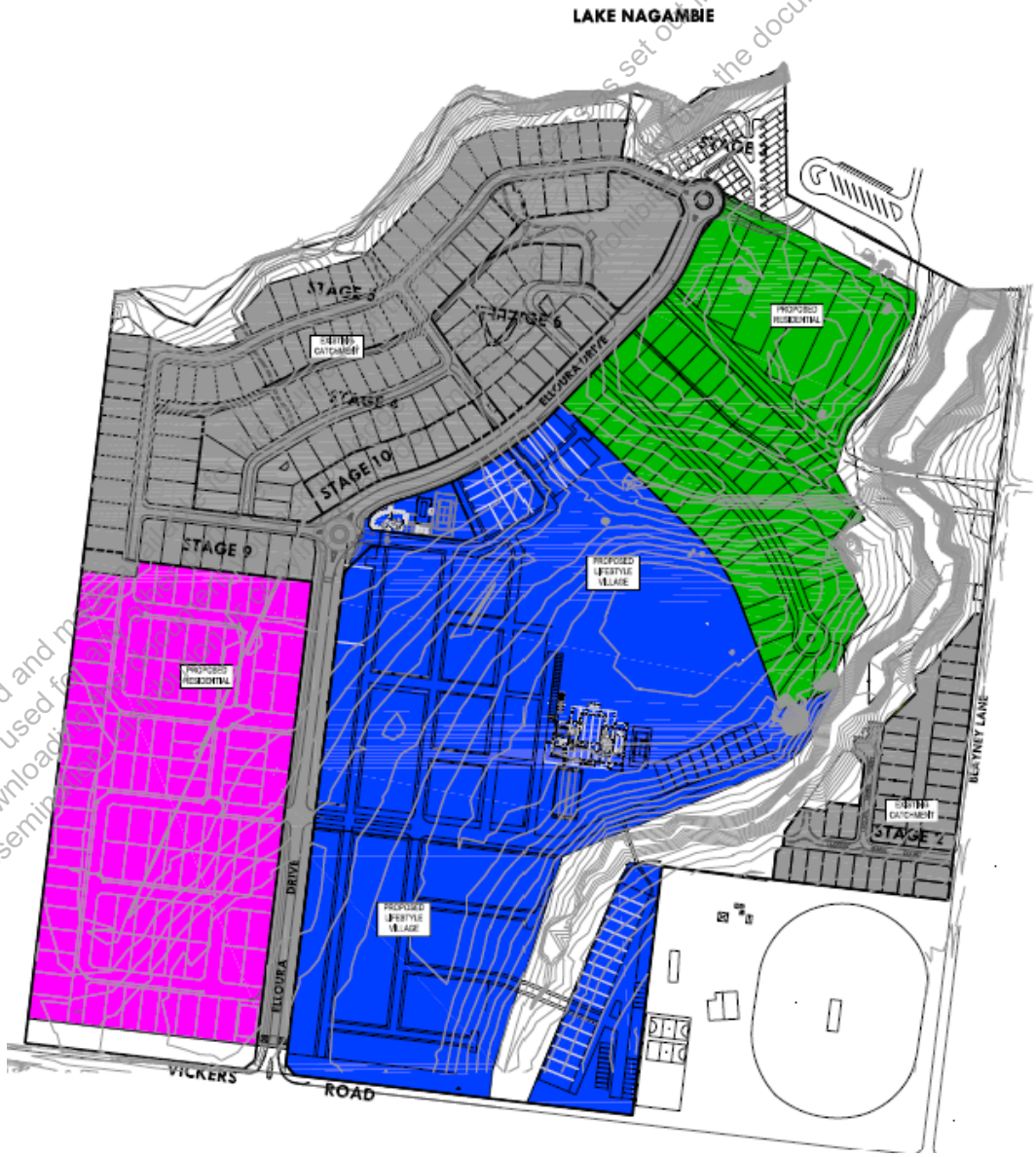

Figure 3.1 Elloura Estate Catchment Delineation

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4 WSUD Options

There are a number of WSUD options which have the potential to be incorporated into the development of Elloura Estate. These can be at-source treatments or end-of-pipe treatments, selected dependent upon the site constraints applicable to the development.

Table 4.1 outlines a suite of treatment options and their applicability to Elloura Estate.

Table 4.1 WSUD Techniques Applicable to the Proposed Development in Elloura Estate

WSUD Technique	Applicability to Elloura (L=Low, M=Medium, H=High)	Discussion
Grassed Swales	L	Suitable for low-density development only. Slopes in Elloura may be too flat to accommodate swales. Can encounter issues with traffic damage. Not suited to small frontage lots where access is from road reserve.
Bioretention Swales	L	Need to be incorporated into the road reserves. Costly and subject to traffic damage. Slopes in Elloura may be too flat to accommodate bioretention swales.
Rain Gardens	H	Small footprint, but requires protection during build-out phase and on-going protection from sediment. Can be located at-source or end-of-pipe. Suitable for catchment up to 20 ha, subject to good design and Council acceptance. Excellent at nutrient reduction and can include a submerged zone for additional denitrification or to raise outfall levels. Suited to the slopes within the development.
Sand Filters / Infiltration Basins	L	Suitable for areas with soils of high permeability. Offer little nutrient reduction but a good reduction in peak flows. Not appropriate for Elloura.
Sediment Ponds	M - H	Offer little nutrient reduction, but good removal of coarse sediments. Great for use as a pre-treatment to rain gardens or constructed wetlands. Only suitable as an end-of-pipe treatment.
Constructed Wetlands	M - H	Large footprint that is an end-of-pipe solution. Excellent nutrient reduction and an aesthetic feature for the community and development. Not suitable for catchments less than 10ha due to minimum size requirements for constructability.
Rainwater Tanks on dwellings	M – H	Small footprint that provides at-source treatment through the reduction in stormwater runoff. Should be sized to achieve six-star building standards and plumbed for toilet flushing. May be difficult to fit on small allotments. Will need to be delivered with build-out, either by developer, or will require a S173 agreement on title, or included in estate design guidelines.

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WSUD Technique	Applicability to Elloura (L=Low, M=Medium, H=High)	Discussion
Gross Pollutant Traps	L - M	Only suitable as a pre-treatment to an end-of-pipe rain garden or constructed wetland. Costly with a small footprint.
Porous Pavements	L	Suitable for public open space areas, does not tend to sustain vehicular trafficked areas well without clogging.
Green Roofs	L-M	Still experimental in the Australian climate. Offer good thermal properties to dwellings, but the onus is on the individual properties to maintain the asset. Better suited to community buildings than private residences.

An alternative to incorporating at source or direct end-of-pipe treatment is to incorporate a constructed wetland system in the existing waterway that is adjacent to the site.

The existing watercourse is often dry and has a lack of regular flow through the watercourse to flush it. The upstream catchment for the existing watercourse, which is approximately 25 km^{2}m at Vickers Road, predominately consists of land used for agricultural purposes and therefore contains high loads of nutrients than those generated from an urbanised catchment.

Adopting a holistic approach to treatment is to have the inclusion of an online wetland system in the existing watercourse. This will help to provide treatment to the runoff generated from the development of Elloura Estate, as well as the overall catchment. This will provide a better quality of water discharging into Lake Nagambie, with lower nutrients and therefore reducing the potential eutrophication occurring from this catchment, and overall, a better outcome to the receiving waterbody than if treatment was to be incorporated prior to discharge into the waterway.

The proposal is to realign the portion of the waterway at the southern end of Elloura Estate, where the waterway has little existing value. The realignment will incorporate the macrophyte zone of the online wetland, with a sediment pond located in the waterway corridor for primary treatment of the flows from the southern catchment of Elloura Estate, but locating the sediment pond offline to the main waterway stream.

It is proposed to incorporate gross pollutant traps for the coarse sediment removal prior to discharging into the waterway for the northern catchment.

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5 Stormwater Quality Treatment Modelling

MUSIC (Model for Urban Stormwater Improvement Conceptualisation) has been used to simulate the stormwater runoff and associated pollutant wash-off, together with the pollutant reduction performance of the nominated treatment system. MUSIC is an industry accepted software modelling tool for demonstrating compliance with stormwater quality targets.

MUSIC uses varying temporal patterns. This requires the input of 6 minute rainfall data, or pluviograph data. Not all rainfall stations record the rainfall data in 6 minute increments. The model has been run utilising a rainfall template which best mimics the long-term average annual rainfall and monthly distribution for Nagambie. Pluviograph data from the Puckapunyal rainfall station #088049 has been used for the model. A statistical analysis of the rainfall data indicates that the total error for the Puckapunyal pluviograph data versus the Nagambie monthly rainfall distribution and total is only 20. This is based on the least error squared method.

Typically, a model is run using 10 years of rainfall data to simulate a range of wetting and drying periods, with the range simulating the long term averages. As the Puckapunyal rainfall station only has 20 years of data, the whole data set has been used for the model. Areal potential evapotranspiration data from the Bureau of Meteorology site has been used in the model. The details of the model rainfall template are included in **Appendix A**.

A constructed wetland system provides excellent nutrient reduction for a catchment with an aesthetically pleasant asset. A constructed wetland system consists of pre-treatment in the form of gross pollutant traps for coarse sediment removal and a macrophyte zone, proposed to sit in the waterway so to provide nutrient reduction to the flows conveyed through this waterway from the external catchment as well.

For Elloura Estate, a macrophyte zone of 5,000 m^2 at normal water level (NWL) with an operating depth of 350 mm is required to achieve the required best practice pollutant reduction targets based on the entire catchment of Elloura Estate contributing to the wetland.

Table 5.1 outlines the treatment performance of the proposed constructed wetland system for the runoff from Elloura Estate only. The total load of nutrients removed by the system will increase as the runoff from the overall catchment passes through the online wetland.

Table 5.1 Treatment Performance for the Online Constructed Wetland System for Elloura Estate Only

Pollutant	Source Load (kg/yr)	Residual Load (kg/yr)	% Reduction
Total Suspended Solids (TSS)	15,200	2,350	84.5%
Total Phosphorous (TP)	31.7	9.68	69.5%
Total Nitrogen (TN)	228	119	47.8%
Gross Pollutants (GP)	3,080	0	100%

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The entire Elloura Estate will not contribute to the wetland, with the northern portion connecting directly to the waterway with primary treatment. However, the external catchment will receive pollutant reduction from the proposed online wetland.

Modelling the online wetland with a macrophyte zone of 5,000 m2 and including the online wetland results in the pollutant loads removed exceeding the required targets for Elloura Estate. This is demonstrated in Table 5.2.

Table 5.2 Pollutant Load Reduction for the Online Constructed Wetland System

Pollutant	Source Load (kg/yr)	Residual Load (kg/yr)	Load Removed (kg/yr)	Elloura Required Load Reduction (kg/yr)
Total Suspended Solids (TSS)	403,000	355,000	48,000	12,080
Total Phosphorous (TP)	1,140	1,040	100	14.31
Total Nitrogen (TN)	8,160	7,770	390	103
Gross Pollutants (GP)	70,400	0	70,400	2,156

The constructed wetland provides a water feature for the community and are typically used to service catchments greater than 20 ha. There are often concerns regarding the sustainability of wetlands in areas of low average annual rainfall. A wetland should have its water turned over every 5 to 10 days to prevent stagnant water, potential eutrophication occurring and possible outbreaks of cyanobacteria (blue green) algae. This proposed wetland has an average turnover period of just under 9 days, based on just the flow contributing from Elloura Estate only. The wetland will turnover approximately every 4 days on average with the contribution of the runoff from the total catchment, further improving the sustainability of the macrophyte zone.

Figure 5.1 illustrates a potential overall footprint for the constructed wetland system in the waterway with the proposed waterway diversion.

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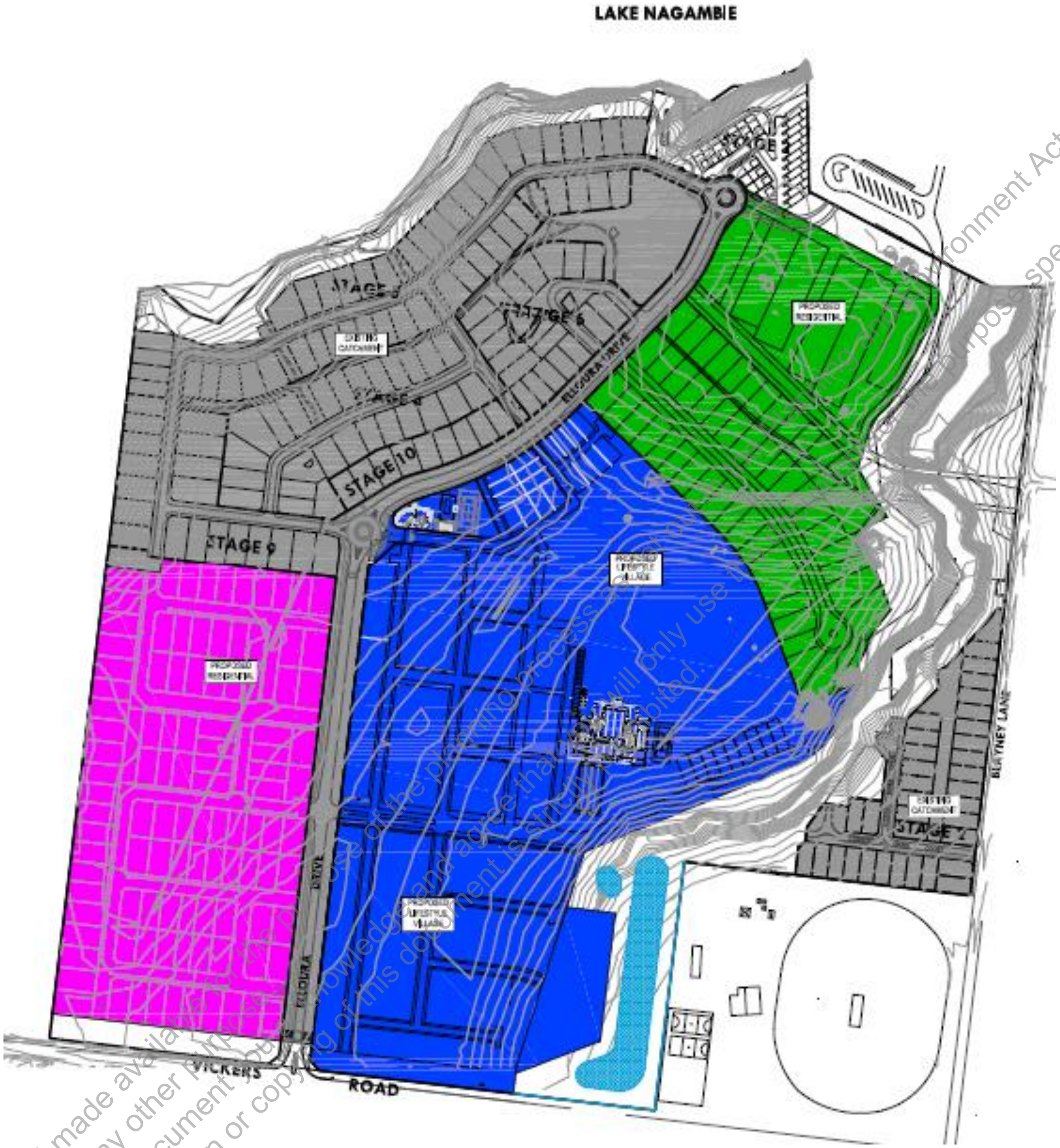

Figure 5.1 Possible Constructed Wetland System

It is common to construct online wetland systems in areas of low rainfall where the waterway is predominantly dry and does not contain permanent water. **Figure 5.2** and **Figure 5.3** shows an example of an online wetland system in a new residential development in Shepparton which is what is proposed to be constructed in the existing waterway.

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Figure 5.2 Existing Online Wetland System in Shepparton

Figure 5.3 Existing Online Wetland System in Shepparton

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6 Conclusion

The development of Elloura Estate in Nagambie is required to achieve best practice pollutant reduction targets for stormwater runoff generated from the future development prior to discharging into the receiving waterbody of Lake Nagambie.

Numerous options exist for the treatment of the stormwater runoff to achieve the required targets. For the overall health of Lake Nagambie, it is proposed to construct a macrophyte zone within the base of the existing waterway to provide treatment to the runoff from the development, as well as additional pollutant load reductions from the overall catchment contributing to this waterway. The catchments contributing from Elloura Estate will have gross pollutant traps for coarse sediment reduction prior to connection to the waterway.

The analysis has been based on achieving the required pollutant reduction targets holistically for the site. The proposed system will provide additional nutrient reduction for the overall catchment, and this has also been demonstrated, showing the inclusion of this proposal results in a greater pollutant reduction than that which is required to meet best practice targets for Elloura Estate.

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Appendix A – Rainfall Data

Nagambie Long Term Average Rainfall Data (Rainfall Station #081019) (mm)

J	F	M	A	M	J	J	A	S	O	N	D	T
37.2	31.6	38.0	37.4	50.2	53.2	54.6	53.2	52.8	48.1	41.0	37.7	539.9

Puckapunyal Long Term Average Pluviograph Rainfall Data (Rainfall Station #088049) (mm)

J	F	M	A	M	J	J	A	S	O	N	D	T
38.7	33.7	38.7	41.9	65.5	46.5	53.8	62.6	52.3	49.7	40.5	34.1	555.5

Error Square Analysis

J	F	M	A	M	J	J	A	S	O	N	D	Total Error
2.213	4.531	0.444	19.921	233.871	45.005	0.568	88.674	0.272	2.560	0.245	12.765	20.275

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Appendix B – Intensity Frequency Duration Data

Nagambie Intensity Frequency Duration Table

Label: Nagambie
Latitude: Requested: -36.788378 Nearest grid cell: 36.7875 (S)
Longitude: Requested: 145.1463 Nearest grid cell: 145.1375 (E)

Duration	Average Exceedance Probability						
	1EY	0.5EY	0.2EY / 18%	10%	5%	2%	1%
1 min	94.4	108	154	187	222	270	310
2 min	79.9	91.2	129	156	183	220	249
3 min	72.2	82.4	116	141	165	199	226
4 min	66.3	75.7	107	130	153	185	210
5 min	61.5	70.3	99.6	121	142	173	197
10 min	46	52.7	75.1	91.5	109	133	152
15 min	37.3	42.8	61.2	74.7	88.7	109	125
20 min	31.7	36.4	52	63.5	75.5	92.4	106
25 min	27.8	31.9	45.5	55.5	65.9	80.6	92.7
30 min	24.8	28.5	40.6	49.5	58.7	71.7	82.4
45 min	19.2	21.9	31.1	37.7	44.6	54.3	62.2
1 hour	15.8	18.1	25.5	30.8	36.4	44.1	50.4
1.5 hour	12.1	13.7	19.1	23	27	32.6	37.1
2 hour	9.95	11.2	15.5	18.6	21.8	26.2	29.7
3 hour	7.57	8.51	11.6	13.8	16.1	19.2	21.8
4.5 hour	5.76	6.44	8.67	10.3	11.9	14.2	16.1
6 hour	4.75	5.29	7.07	8.36	9.68	11.5	13
9 hour	3.61	4.01	5.32	6.28	7.28	8.66	9.79
12 hour	2.96	3.28	4.36	5.14	5.97	7.12	8.05
18 hour	2.22	2.47	3.29	3.9	4.54	5.44	6.17
24 hour	1.8	2.01	2.69	3.21	3.75	4.5	5.12
30 hour	1.53	1.7	2.3	2.75	3.23	3.89	4.43

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Duration	Average Exceedance Probability						
	1EY	0.5EY	0.2EY / 18%	10%	5%	2%	1%
36 hour	1.33	1.48	2.02	2.42	2.85	3.45	3.94
48 hour	1.06	1.19	1.63	1.97	2.34	2.84	3.25
72 hour	0.764	0.859	1.19	1.45	1.73	2.12	2.43
96 hour	0.601	0.677	0.942	1.15	1.38	1.69	1.94
120 hour	0.499	0.561	0.775	0.945	1.14	1.39	1.6
144 hour	0.428	0.48	0.657	0.797	0.961	1.17	1.36
168 hour	0.377	0.421	0.567	0.685	0.826	1.01	1.16

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