Hayes Park

Flood Risk Assessment

May 2023

Whitby Wood

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Hayes Park

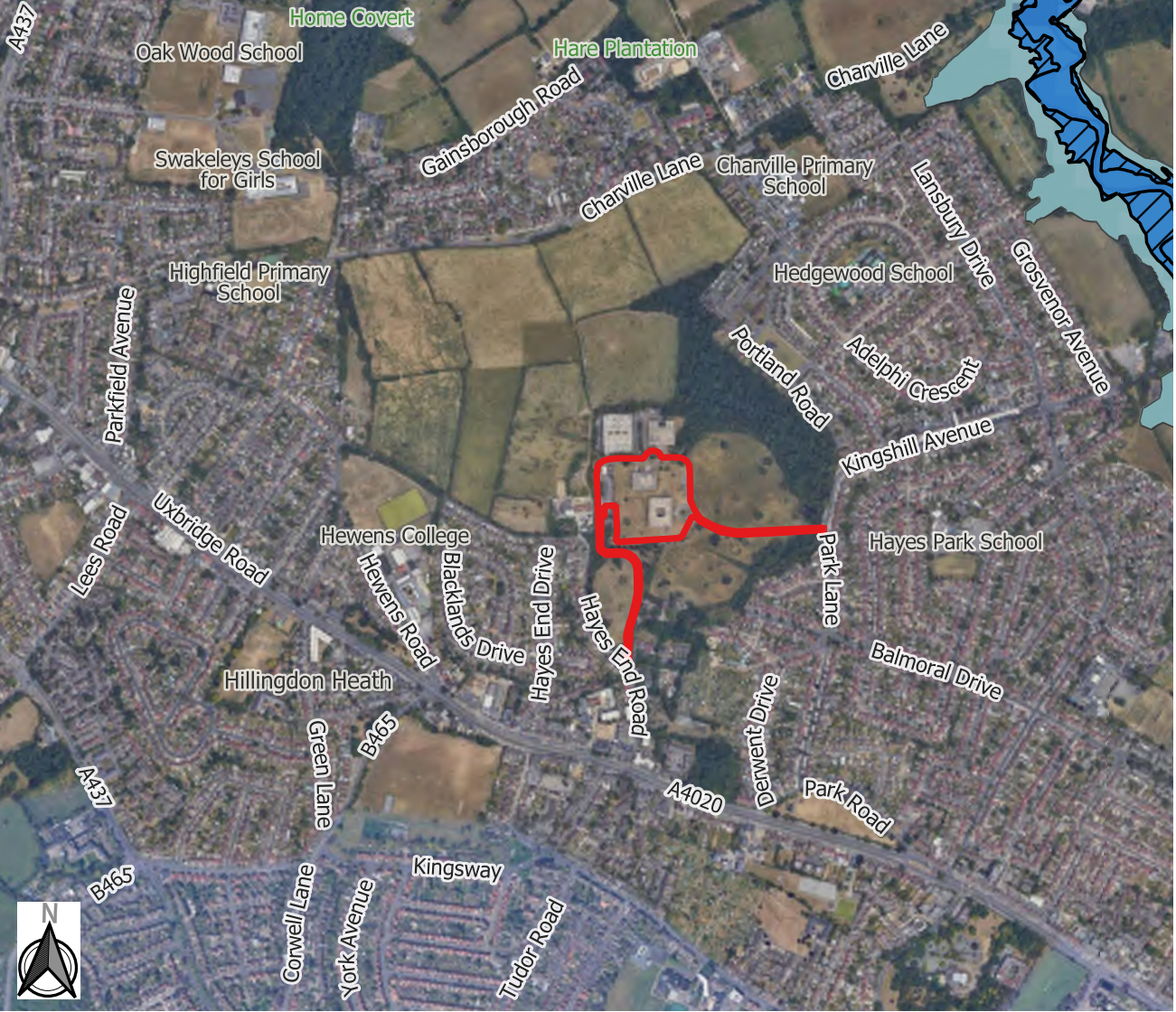
Flood Risk Assessment

Client: Shall Do Hayes Developments Limited

Date: June 2023

P450887-WW-XX-XX-RP-C-0001

Appendix E – Flood Maps



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FLOOD ZONE MAP

Legend

- Site Boundary
- Areas Benefiting from Flood Defences
- Flood Zone 2
- Flood Zone 3

1:15,000

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ARTIFICIAL FLOOD EXTENTS (RESERVOIR FLOODING)

Legend

- Site Boundary
- Reservoir Flood Extents (Dry Day)
- Reservoir Flood Extents (Wet Day)

1:15,000

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RISK OF FLOODING FROM SURFACE WATER (VELOCITY) 1:1000 YEAR EVENT

Legend

Site Boundary

Velocity (m/s)

- 0.00 - 0.25
- 0.25 - 0.50
- 0.50 - 1.00
- 1.00 - 2.00
- > 2.00

1:2,000

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22/03/23

RISK OF FLOODING FROM SURFACE WATER (EXTENT)

Legend

- Site Boundary
- Extent 1in30
- Extent 1in100
- Extent 1in1000

1:2,000

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22/03/23

RISK OF FLOODING FROM SURFACE WATER (HAZARD) 1:1000 YEAR EVENT

Legend

- Site Boundary

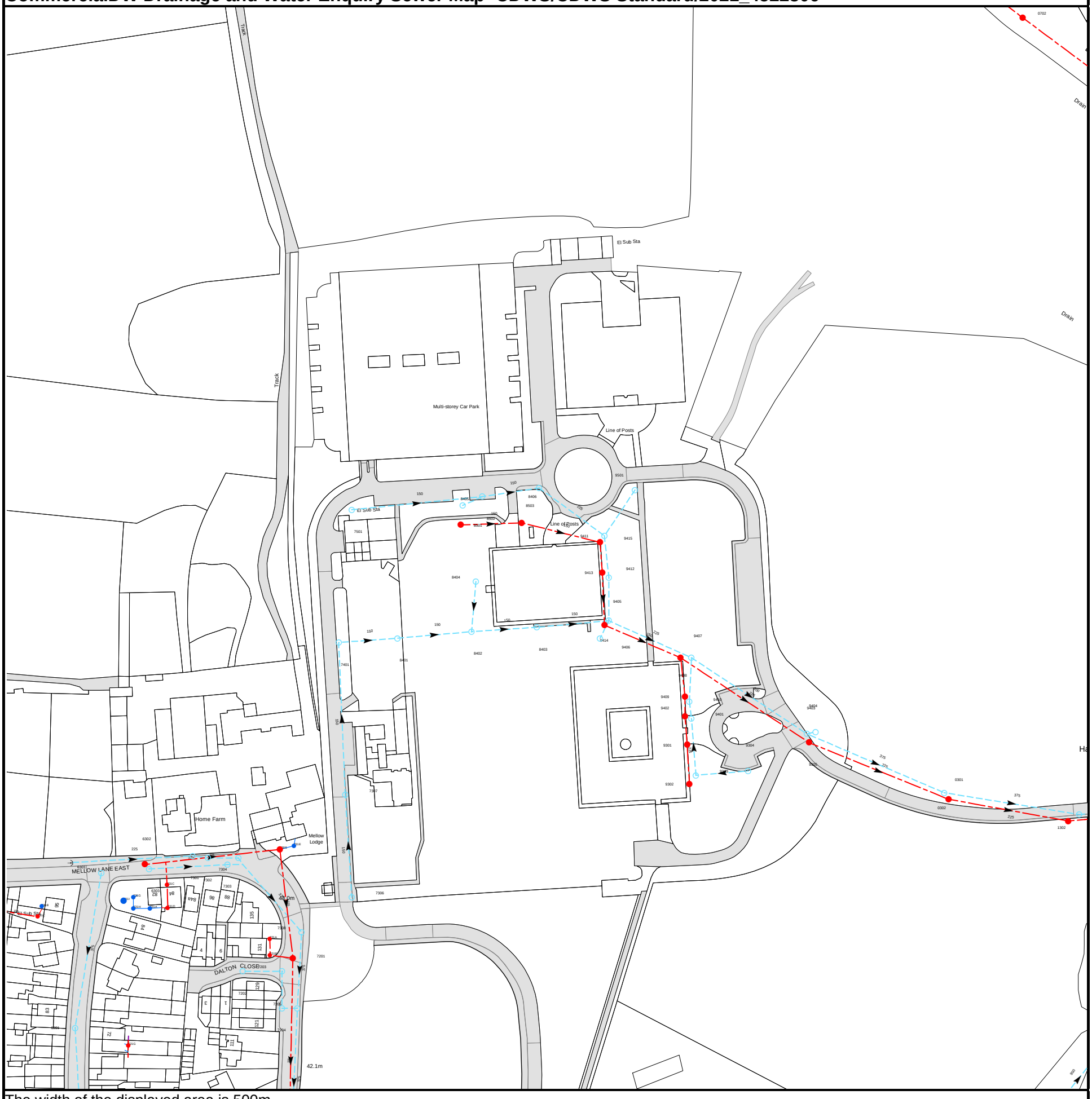
Hazard Rating

- 0.00 - 0.75
- 0.75 - 1.25
- 1.25 - 2.00
- > 2.00

1:2,000

Appendix F – Thames Water Asset Map

CommercialDW Drainage and Water Enquiry Sewer Map- CDWS/CDWS Standard/2021_4522806



The width of the displayed area is 500m

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Appendix G – Greenfield Calculation Sheet

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Tom Tosetti
Site name:	Hayes Park
Site location:	Hayes, London

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	51.52927° N
Longitude:	0.43147° W
Reference:	3650241954
Date:	Mar 23 2023 17:34

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 0.517

Methodology

Q_{BAR} estimation method: Calculate from SPR and SAAR

SPR estimation method: Calculate from SOIL type

Soil characteristics	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics	Default	Edited
SAAR (mm):	623	623
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited
Q_{BAR} (l/s):	2.18	2.18
1 in 1 year (l/s):	1.85	1.85
1 in 30 years (l/s):	5.01	5.01
1 in 100 year (l/s):	6.95	6.95
1 in 200 years (l/s):	8.15	8.15

Pre-development discharge

Site Makeup	Brownfield
Brownfield Method	MRM
Contributing Area (ha)	0.517
PIMP (%)	100
CV	1.000
Time of Concentration (mins)	5.00
Betterment (%)	0

Calc

Return Period (years)	Q (l/s)
1	102.2
30	241.6
100	306.3

EXISITING DISCHARGE RATES - 0% BETTERMENT

Pre-development discharge

Site Makeup	Brownfield
Brownfield Method	MRM
Contributing Area (ha)	0.517
PIMP (%)	100
CV	1.000
Time of Concentration (mins)	5.00
Betterment (%)	50

Calc

Return Period (years)	Q (l/s)
1	51.1
30	120.8
100	153.1

DISCHARGE RATES - 50% BETTERMENT

Pre-development discharge

Site Makeup	Brownfield
Brownfield Method	MRM
Contributing Area (ha)	0.517
PIMP (%)	100
CV	1.000
Time of Concentration (mins)	5.00
Betterment (%)	90

Calc

Return Period (years)	Q (l/s)
1	10.2
30	24.2
100	30.6

DISCHARGE RATES - 90% BETTERMENT

Pre-development discharge

Site Makeup	Brownfield
Brownfield Method	MRM
Contributing Area (ha)	0.517
PIMP (%)	100
CV	1.000
Time of Concentration (mins)	5.00
Betterment (%)	95

Calc

Return Period (years)	Q (l/s)
1	5.1
30	12.1
100	15.3

DISCHARGE RATES - 95% BETTERMENT

HAYES PARK
PRE-DEVELOPMENT EXISTING DISCHARGE RATES
P450887
23.03.2023

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Appendix H – Storage Volume Calculation Sheet

Print Close Report

Surface water storage requirements for sites

www.uksuds.com | Storage estimation tool

Calculated by:	Tom Tosetti
Site name:	Hayes Park
Site location:	Hayes, London

This is an estimation of the storage volume requirements that are needed to meet normal
best practice criteria in line with Environment Agency guidance "Rainfall runoff management
for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and
the non-statutory standards for SuDS (Defra, 2015). It is not to be used for detailed design
of drainage systems. It is recommended that hydraulic modelling software is used to calculate
volume requirements and design details before finalising the design of the drainage scheme.

Site Details

Latitude:	51.53018° N
Longitude:	0.4317° W
Reference:	4214355286
Date:	May 09 2023 18:27

Site characteristics

Total site area (ha):	0.535
Significant public open space (ha):	0
Area positively drained (ha):	0.535
Impermeable area (ha):	0.535
Percentage of drained area that is impermeable (%):	100
Impervious area drained via infiltration (ha):	0
Return period for infiltration system design (year):	10
Impervious area drained to rainwater harvesting (ha):	0
Return period for rainwater harvesting system (year):	10
Compliance factor for rainwater harvesting system (%):	66
Net site area for storage volume design (ha):	0.54
Net impermable area for storage volume design (ha):	0.54
Pervious area contribution to runoff (%):	30

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:	1.4
Urban creep allowance factor:	1.1
Volume control approach	Use long term storage
Interception rainfall depth (mm):	5
Minimum flow rate (l/s):	51.1

Methodology

esti	IH124
Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics	Default	Edited
SOIL type:	4	4
SPR:	0.47	0.47

Hydrological characteristics	Default	Edited
Rainfall 100 yrs 6 hrs:	--	63
Rainfall 100 yrs 12 hrs:	--	93.94
FEH / FSR conversion factor:	1.22	1.22
SAAR (mm):	623	623
M5-60 Rainfall Depth (mm):	20	20
'r' Ratio M5-60/M5-2 day:	0.4	0.4
Hydological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 10 year:	1.62	1.62
Growth curve factor 30 year:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Q_{BAR} for total site area (l/s):	2.25	2.25
Q_{BAR} for net site area (l/s):	2.25	2.25

Site discharge rates	Default	Edited
1 in 1 year (l/s):	51.1	51.1
1 in 30 years (l/s):	51.1	51.1
1 in 100 year (l/s):	51.1	51.1

Estimated storage volumes	Default	Edited
Attenuation storage 1/100 years (m^3):	89	89
Long term storage 1/100 years (m^3):	0	0
Total storage 1/100 years (m^3):	89	89

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