N

Slag Heap

User : BOWMS

Date : 03/04/2019 10:53:07

Map Sheet : NZ5421SE

Title :

Centre Point : 454841,521198

Paper / Scale : A0@1:2500

NORTHUMBRIAN WATER *living water*

25 m

**APPENDIX 3
H R WALLINGFORD RUNOFF ESTIMATIONS**

HR Wallingford
Working with water

Calculated by:	Daniel Porteous
Site name:	Tees Valley BA
Site location:	Grangetown Prairie, Middlesbrough

Site Details

Latitude:	54.58469° N
Longitude:	1.15603° W
Reference:	2267969915
Date:	Feb 17 2022 12:20

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.

Runoff estimation approach   IH124

Site characteristics

Total site area (ha):   4.05

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):	600	600
Hydrological region:	3	3
Growth curve factor 1 year:	0.86	0.86
Growth curve factor 30 years:	1.75	1.75
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

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):	16.33	16.33
1 in 1 year (l/s):	14.04	14.04
1 in 30 years (l/s):	28.57	28.57
1 in 100 year (l/s):	33.96	33.96
1 in 200 years (l/s):	38.69	38.69

APPENDIX 4
H R WALLINGFORD SURFACE WATER STORAGE ESTIMATIONS

Print | Close Report

HR Wallingford
Working with water

Surface water storage requirements for sites

www.uksuds.com | Storage estimation tool

Calculated by:	Daniel Porteous
Site name:	Tees Valley BA
Site location:	Grangetown Prairie, Middlesbrough

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:	54.58468° N
Longitude:	1.15636° W
Reference:	153959918
Date:	Feb 17 2022 12:24

Site characteristics

Total site area (ha):	4.05
Significant public open space (ha):	0
Area positively drained (ha):	4.05
Impermeable area (ha):	4.05
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):	4.05
Net impermable area for storage volume design (ha):	4.05
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
Volume control approach	Use long term storage
Interception rainfall depth (mm):	5
Minimum flow rate (l/s):	2

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:	--	70
Rainfall 100 yrs 12 hrs:	--	89.04
FEH / FSR conversion factor:	1.06	1.06
SAAR (mm):	600	600
M5-60 Rainfall Depth (mm):	20	20
'r' Ratio M5-60/M5-2 day:	0.3	0.3
Hydological region:	3	3
Growth curve factor 1 year:	0.86	0.86
Growth curve factor 10 year:	1.45	1.45
Growth curve factor 30 year:	1.75	1.75
Growth curve factor 100 years:	2.08	2.08
Q_{BAR} for total site area (l/s):	16.33	16.33
Q_{BAR} for net site area (l/s):	16.33	16.33

Site discharge rates	Default	Edited
1 in 1 year (l/s):	14	14
1 in 30 years (l/s):	28.6	28.6
1 in 100 year (l/s):	34	34

Estimated storage volumes	Default	Edited
Attenuation storage 1/100 years (m^3):	3474	3474
Long term storage 1/100 years (m^3):	936	936
Total storage 1/100 years (m^3):	4410	4410