Alternative Temporary Park and Ride and Heavy Goods Vehicle Marshalling Area
Sustainable Drainage Strategy

United Utilities Water Limited

Haweswater Aqueduct Resilience Programme

Planning Application Document RVBC–P&R-APP-RP-005
February 28, 2025

Alternative Temporary Park and Ride and Heavy Goods Vehicle Marshalling Area Sustainable Drainage Strategy

Client name:	United Utilities Water Limited
Project name:	Haweswater Aqueduct Resilience Programme
Project no:	B27070EP
Planning Application Document:	RVBC–P&R-APP-RP-005
Prepared by:	Jacobs U.K. Limited
Date:	28 February 2025
File name:	RVBC–P&R-APP-RP-005 Sustainable Drainage Strategy

Jacobs U.K. Limited

5 First Street
Manchester M15 4GU
United Kingdom

T +44 (0)161 235 6000
F +44 (0)161 235 6001
www.jacobs.com

Contents

Acronyms and Abbreviations

FRA	Flood Risk Assessment
HGV	Heavy Goods Vehicle
LLFA	Lead Local Flood Authority
NPPF	National Planning Policy Framework
SDAA	Site Drainage Attenuation Area
SuDS	Sustainable Drainage System

1. Sustainable Drainage Strategy

1.1 Introduction

1) The following text provides an overview of the approach and general principles relating to site drainage for the Alternative Facility. For further details relating to the Alternative Facility, please refer to Chapter 3 Description of the Alternative Facility, and Chapter 6 Water Environment, of the Environmental Statement (Volume 2). Please also refer to Appendix A.2 Construction Code of Practice (Volume 4) and Chapter 13 Environmental Mitigation (Volume 2) of the Environmental Statement. The key Alternative Facility drainage features are shown on Figure 6.4 of the Environmental Statement (Volume 3).

2) Pre-application consultation was undertaken with Lancashire County Council Lead Local Flood Authority[1] (LLFA) on 24 October 2024 reference FRM1835.

3) During the pre-application consultation it was agreed with the Lancashire LLFA that initial details of the site drainage proposals including works affecting watercourses would be outlined as part of the planning application. It was agreed that the detailed design information would be confirmed in response to planning conditions which would require details to be submitted for acceptance prior to the relevant construction phase. The appointed contractor would be responsible for obtaining any flood risk permits and consents which would be secured from the relevant authorities following determination of the planning application but prior to commencement of development.

4) As a requirement of Lancashire LLFA, a Sustainable Drainage Systems (SuDS) pro forma has been completed as part of this application.

1.2 Alternative Facility Drainage Features

5) The drainage for the Alternative Facility includes:

- New site drainage collection, conveyance and Site Drainage Attenuation Area (SDAA)
- New outfall to Worston Brook
- Minor highways works, including a new access to the site
- Minor temporary welfare buildings, hardstanding and road drainage.

6) The following sections give details on each drainage component.

1.2.1 Site Drainage Collection, Conveyance and Site Drainage Attenuation Area

7) Drainage infrastructure would be built early in the construction phase and would then serve a drainage function during the construction, operational and decommissioning phases until the point at which the drainage infrastructure itself was decommissioned. Site drainage collection would include some form of filter drain or collection drain, where possible by over-the-edge drainage. Discharge would be conveyed by carrier pipe from collection towards the SDAA. An oil interceptor chamber and silt interceptor facility would provide oil and sediment removal. The SDAA would provide sediment removal and attenuation. A flow control would be provided

[1] Pre application consultation was undertaken with Lancashire County Council Lead Local Flood Authority on 24 October 2024 reference FRM1835

at the outlet of the SDAA to restrict discharges to the QMED (median annual maxima flood) Greenfield Runoff Rate.

1.2.2 Outfall to Worston Brook

8) An outfall is proposed to direct a controlled rate of discharge to Worston Brook.

9) Based on detailed design of the outfall, if required, energy dissipation would be included within the apron of the outfall to prevent erosion. It is anticipated that such measures would be included by the contractor and agreed in writing by the local planning authority, in consultation with the Environment Agency and LLFA, prior to any discharges being made. Such details would also be included in an application for consent from the Environment Agency.

1.2.3 Highways Works Including Access for the Site

10) To allow for safe vehicular access to the site, highway works would be required on Pimlico Link Road. The works include a new access arrangement from the existing Pimlico Link Road. All existing road drainage is to remain and any connecting access roads into the site would have dedicated drainage separate from the highway.

1.2.4 Buildings, Hardstanding and Drainage

11) The Alternative Facility includes small site cabins serving security and welfare purposes. To ensure efficient and safe access, a route to these buildings is essential. This access route would facilitate smooth operation and provide necessary support for the site's activities. Most of the hardstanding is designated for car parking and HGV marshalling areas.

12) An assessment of likely significant effects on the water environment and flood risk are addressed in Environmental Statement Chapter 6 Water Environment (Volume 2) and Appendix C.1 Flood Risk Assessment (Volume 4). Effects that are mitigated through embedded mitigation measures are listed in Appendix A.2 Construction Code of Practice, attached to the Environmental Statement.

1.3 Flood Risk Assessment

13) Paragraph 181 of the National Planning Policy Framework[2] (NPPF) states: '*When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment.*'

14) A Flood Risk Assessment (FRA) report for the Alternative Facility has been produced in accordance with the requirements of the NPPF. This is a stand-alone document to support the Environmental Statement for the Alternative Facility and is presented in Appendix C.1 Flood Risk Assessment (Volume 4). The findings of the FRA are summarised in Chapter 6 Water Environment. It is concluded that with mitigation there would be no significant flood risk to or from the Alternative Facility.

[2] Ministry of Housing, Communities and Local Government (2024). National Planning Policy Framework. [Online] Available at: https://assets.publishing.service.gov.uk/media/67aafe8f3b41f783cca46251/NPPF_December_2024.pdf [Accessed: February 2025].

1.4 Sustainable Drainage Systems

15) Paragraph 181 of the NPPF[3] states that developments should incorporate SuDS '*unless there is clear evidence that this would be inappropriate*'.

16) The nature of the development proposals is such that the majority of works are above ground, accepting there would be in-ground drainage and pipework.

17) In terms of drainage hierarchy, the preference is to discharge to ground, then watercourse, then sewer. Initial assessment of the underlying superficial deposits suggests relatively low permeability. Ground infiltration methods are not considered practical in areas of low permeability. The next option within the drainage hierarchy is to discharge to surface water. It is proposed to discharge drainage from the Alternative Facility to an outfall to Worston Brook.

18) The impermeable area is shown in Figure 6.5. It is assumed that all greenfield land not identified as impermeable would operate as existing and rainfall upon would neither be collected nor contribute to the Alternative Facility drainage collection during extreme rainfall events. Therefore, the existing and proposed runoff rates and volumes are based on the proposed collected impermeable and collected areas of the site. Using Flood Estimation Handbook[4] catchment data, the QMED for the site has been identified at 30.2 l/s. In line with Lancashire County Council SuDS guidance[5], an allowance of 2 l/s/ha has been given for all events up to the 1 in 100 year +25% climate change allowance. The existing and proposed greenfield runoff rates are shown in Table 1.1.

Table 1.1: Existing and Proposed Runoff Rates

	QMED (l/s)	1%AEP+25% (l/s)
Existing	30.2	-
Proposed	2.4	2.4

19) The existing and proposed greenfield volumes are shown in Table 1.2. The existing and proposed runoff rates and volumes are based on the proposed collected impermeable areas of the site.

Table 1.2: Existing and Proposed Volume of Runoff

	1% AEP (m^3)
Existing	199
Proposed	311

20) This Sustainable Drainage Strategy allows for the provision of an SDAA at the Alternative Facility site during construction and operation. The size of the SDAA has been estimated using the InfoDrainage Quick Storage Estimate[6] module. Evidence of the calculations undertaken are included in Appendix A Supporting Evidence of Calculations, of this document. A volumetric runoff coefficient of 1 has been applied.

[3] Ministry of Housing, Communities and Local Government (2024). *Op. cit.*

[4] UK Centre for Ecology and Hydrology (2022). Flood Estimation Handbook. [Online] Available at: https://www.ceh.ac.uk/our-science/projects/flood-estimation-handbook [Accessed: February 2025].

[5] Lancashire County Council (2025). Sustainable drainage systems and the planning process. [Online] Available at: https://www.lancashire.gov.uk/council/planning/sustainable-drainage-systems/ [Accessed: February 2025].

[6] InfoDrainage (2025). Quick Storage Estimate Calculator. [Online] Available at: https://help.autodesk.com/view/INFDS/ENU/?guid=GUID-AC5BCFD4-E7D2-4A7E-A44A-0F4719F993EC [Accessed: February 2025].

21) Indicative attenuation volumes and restricted discharge rates for compound drainage are provided in Table 1.3. The proposed attenuation would be a maximum of 1 m deep.

Table 1.3: Indicative Attenuation Volumes for Proposed Drainage

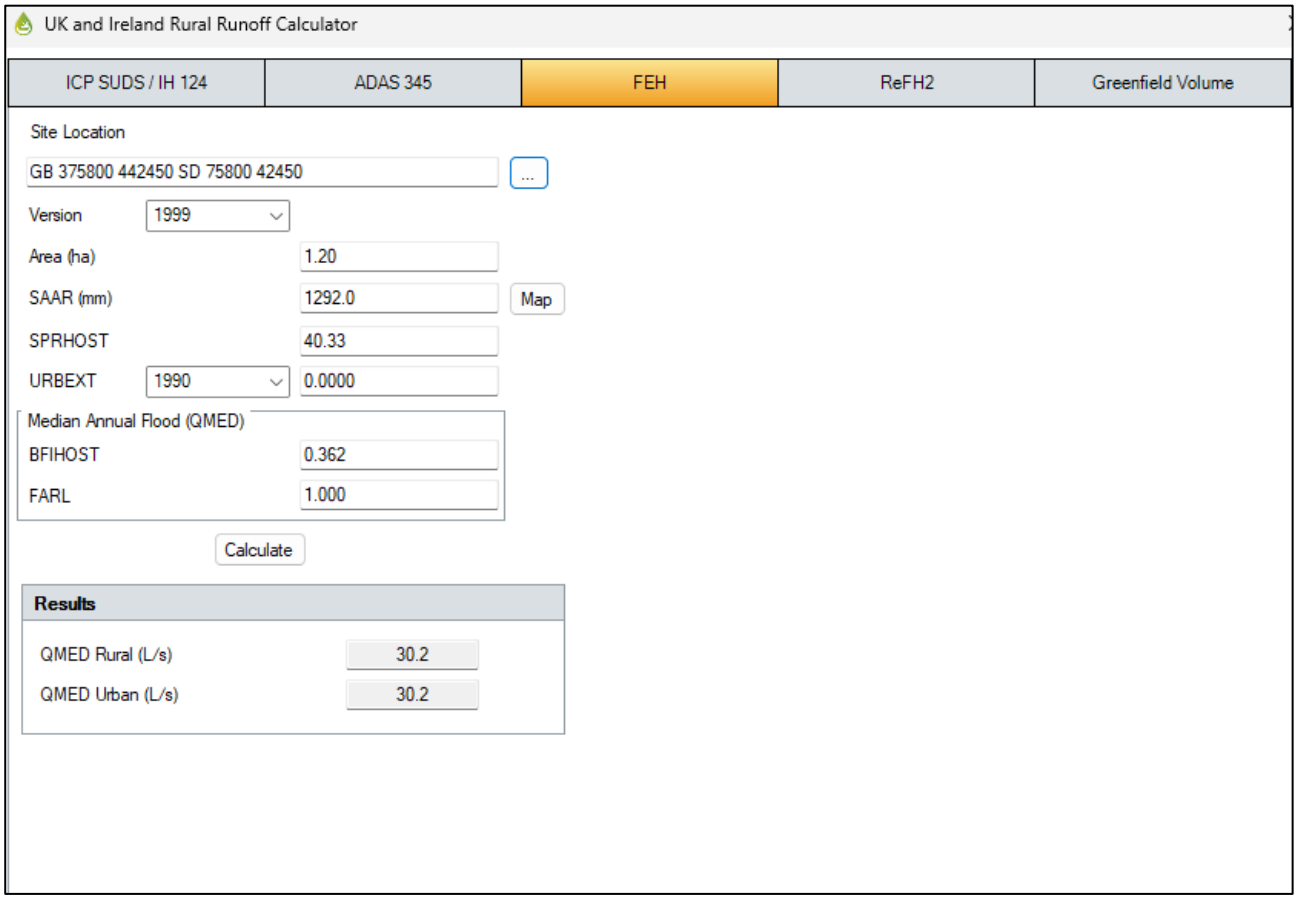
Proposed Site Impermeable Area (ha)	Proposed Attenuation1%AEP +25% 360minute (m^3)	Proposed Restricted Discharge Rate (l/s)
1.2	970	2.4

22) Mitigation to limit the potential effects of site drainage during construction is detailed within Appendix A.2 Construction Code of Practice (Volume 4) of the Environmental Statement and includes, but is not limited to:

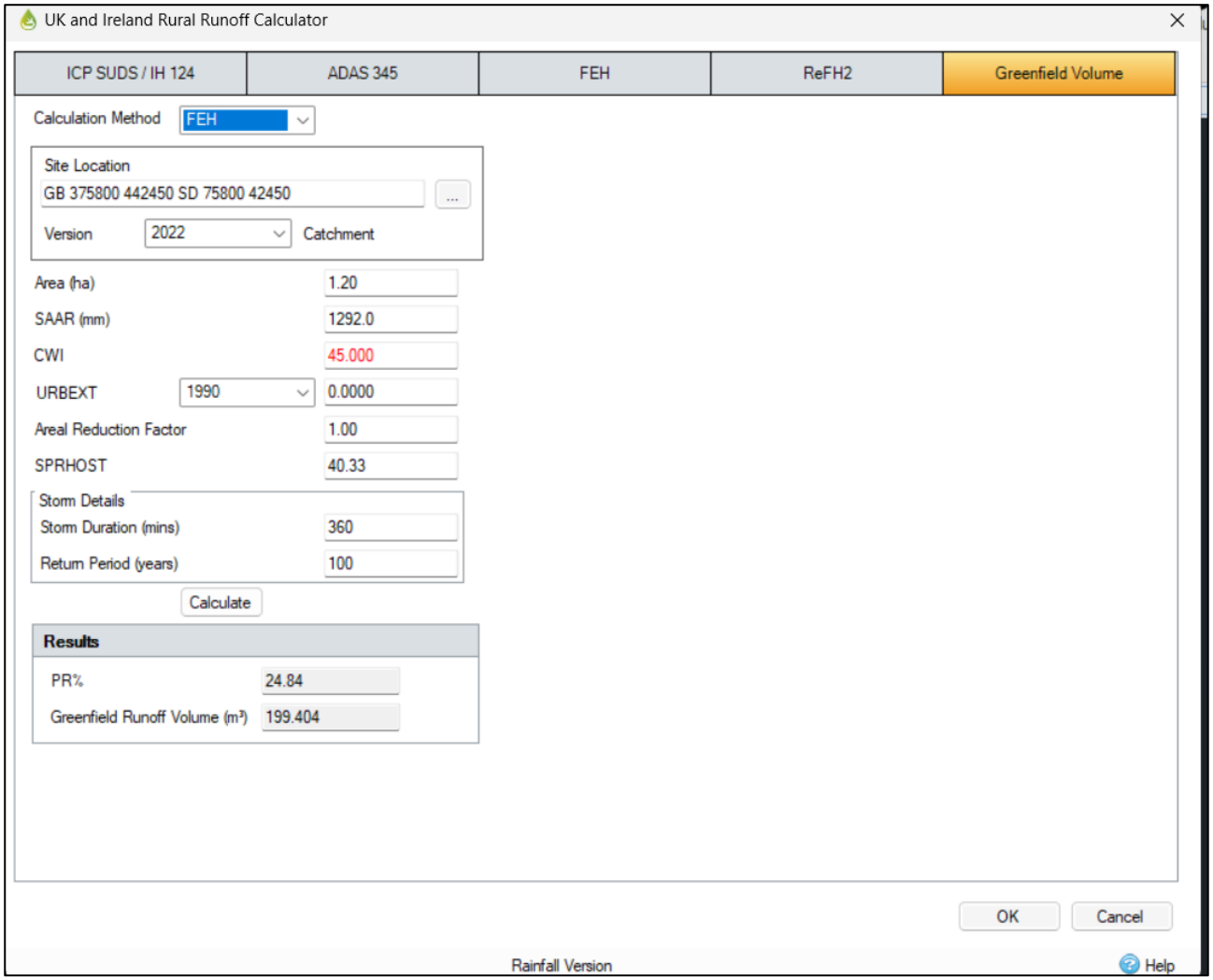
- The Contractor assessing requirements for management of surface water runoff from working areas. Sediment traps, settlement ponds, filter drains, buffer strips and proprietary methods would be incorporated into the drainage system as necessary and would serve the dual purpose of attenuating flows, by slowing the flow of runoff through the drainage system and allowing sediment to settle before being discharged
- Drainage receiving runoff, which is expected to contain sediment, would be directed towards a suitably sized attenuation area or other facility that provides sufficient treatment before being discharged to Worston Brook
- Construction SuDS would be appropriately designed for the volume of drainage and the level of treatment required prior to discharge. To reduce the impact on the natural hydrological regime, the site drainage would mimic the greenfield runoff of 2.4 l/s response through the adoption of sustainable drainage principles.

Appendix A. Supporting Evidence of Calculations

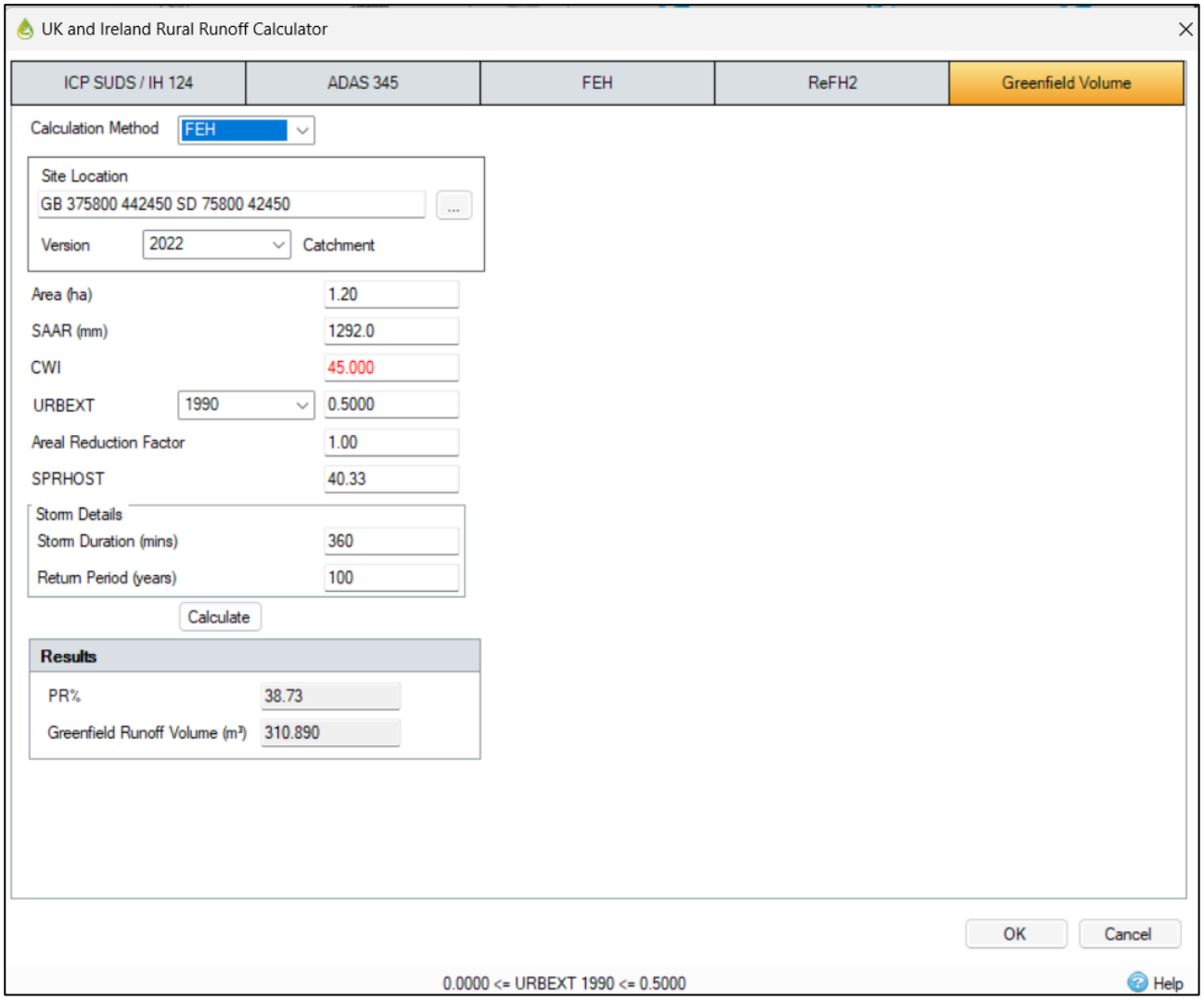
Greenfield Runoff (QMED)



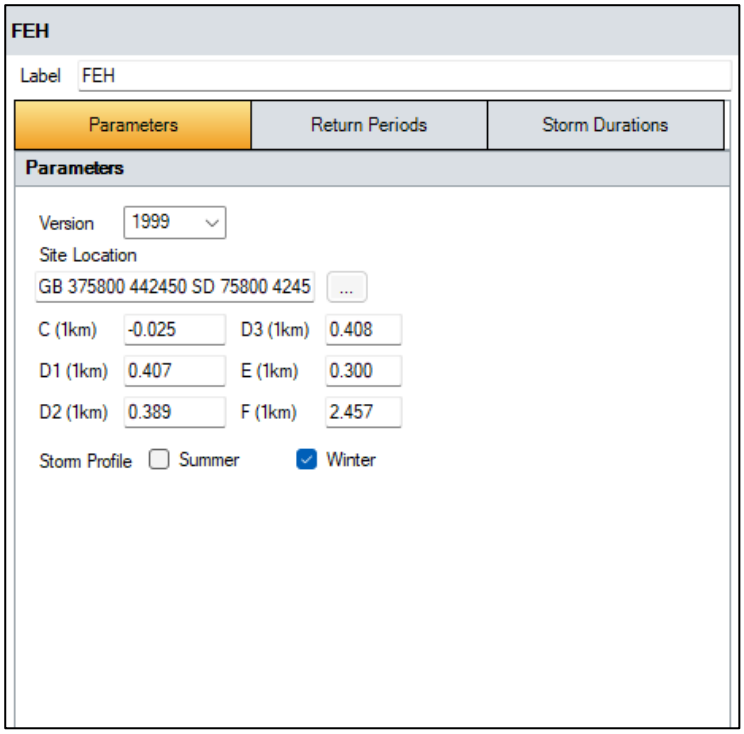
Greenfield Runoff Volumes (1% AEP)

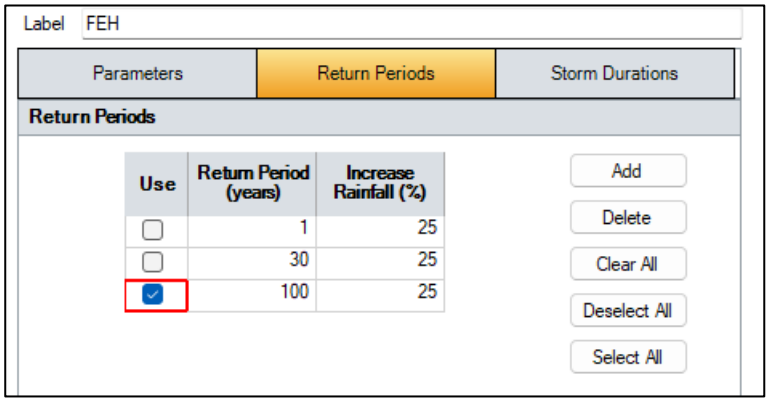


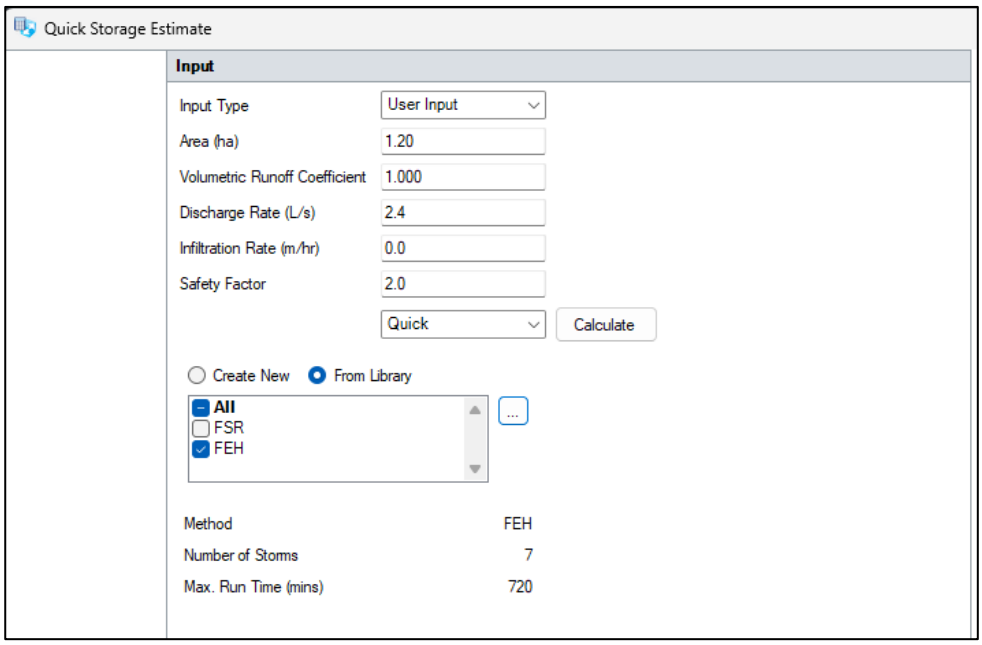
Alternative Facility Runoff Volumes (1% AEP)

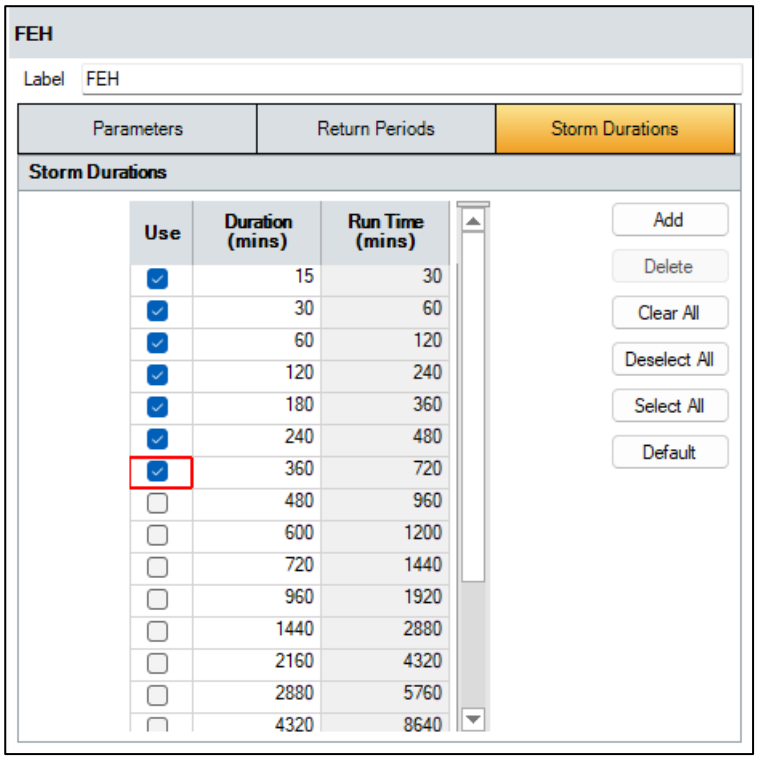


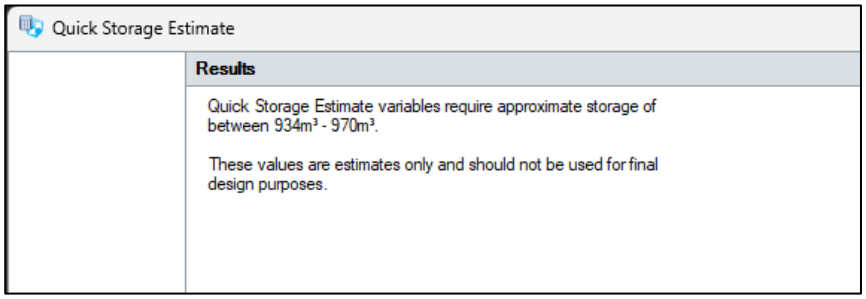
Alternative Facility Attenuation (1% AEP+25% Climate Change)






Quick Storage Estimate
Input
Input Type
User Input
Area (ha)
1.20
Volumetric Runoff Coefficient
1.000
Discharge Rate (L/s)
2.4
Infiltration Rate (m/hr)
0.0
Safety Factor
2.0
Quick
Calculate
Create New
From Library
All
FSR
FEH
Method
FEH
Number of Storms
7
Max. Run Time (mins)
720


FEH
Label
FEH
Parameters
Return Periods
Storm Durations
Storm Durations
Use
Duration (mins)
Run Time (mins)
15 30
30 60
60 120
120 240
180 360
240 480
360 720
480 960
600 1200
720 1440
960 1920
1440 2880
2160 4320
2880 5760
4320 8640
Add
Delete
Clear All
Deselect All
Select All
Default


Quick Storage Estimate
Results
Quick Storage Estimate variables require approximate storage of between 934m³ - 970m³.
These values are estimates only and should not be used for final design purposes.