

**To:** Olivia Tresise  
**From:** Andrew Dannatt  
**Company:** Wiltshire Council  
**Company:** SLR Consulting Limited  
**cc:** Barney Taylor, Atkins  
**Date:** 1 August 2023  
**Application No.** PL/2023/03359  
**Subject:** **RE: Land West of Ashton Road, Ashton Keynes, Wilts, SN6 6QT**  
**Construction and operation of anaerobic digestion facility, ancillary infrastructure and construction of new access from Ashton Road**

## INTRODUCTION

Thank you for your letter in response to the Flood Risk Assessment (FRA) & Surface Water Drainage Strategy (SWDS) (SLR Ref.: 404.11923.00004.0019 Version No. 02 dated December 2022) prepared on behalf of Acorn Bioenergy Ltd. for the proposed Anaerobic Digestion Plant (the 'proposed development') at Land West of Ashton Road, Ashton Keynes, (the 'Site'). This Technical Memorandum aims to address the objection to the proposed development at the Site. The objection is set out in the letter dated 31 May 2023, is addressed below.

## Objection - Discharge Control

### Greenfield Runoff and Betterment

Objection:

*"The applicant should resubmit calculations to demonstrate a significant reduction in discharge rates. We acknowledge the applicant intends to restrict discharge rates to the greenfield rate, however Wiltshire Council requires 20% betterment to be achieved on greenfield rates for all storm events between the 1 in 1 year and the 1 in 100 year return period storm events. To demonstrate this, the applicant must provide detailed drainage calculations for each of the 1 in 1, 1 in 30, and 1 in 100 year storm events."*

Response:

With reference to Section 3.3.1b) of The SuDS Manual<sup>1</sup>, for extreme rainfall events, a drainage system should be designed such that 'the volume of runoff from the Site (or development) area [does] not exceed the volume of runoff from the equivalent area in its natural undeveloped or "greenfield" state'.

Therefore 'all the runoff from the site for the 1:100 year [1% AEP] event [to] be discharged at either a rate of  $2\text{ls}^{-1}\text{ha}^{-1}$  or the average annual peak flow rate (i.e. the mean annual flood, QBAR), whichever is greater.'

In line with the Wiltshire Council's Adoptable Highway Drainage Guidance, a 20% betterment to greenfield runoff rates is to be provided. The maximum allowable discharge for each Annual Exceedance Percentage (AEP) events have therefore been recalculated and provided in **Table 1**.

<sup>1</sup> CIRIA Report C624, Development and flood risk: guidance for the construction industry

**Table 1**  
**Maximum Allowable Discharge**

| AEP (%) | Estimated Greenfield Runoff Rate | 20% Betterment | Maximum Allowable Discharge        |
|---------|----------------------------------|----------------|------------------------------------|
|         | $\text{ls}^{-1}\text{ha}^{-1}$   |                | $\text{ls}^{-1}4.52\text{ha}^{-1}$ |
| 100     | 0.89                             | 0.71           | 3.23                               |
| 50      | 1.02                             | 0.82           | 3.69                               |
| 3.3     | 2.54                             | 2.03           | 9.20                               |
| 1       | 3.66                             | 2.92           | 13.23                              |

The ReFH2 greenfield runoff report for the specified return periods is provided in **Appendix 01**.

The below ground proprietary 'crate' system as outlined in the Surface Water Drainage Strategy has remained unchanged, providing 1,529m<sup>3</sup> of attenuation storage volume. A drawing of the arrangement is shown in **Appendix 02**. The pump has been resized to achieve the discharge rates including betterment against a range of design storm events.

A revised version of the discharge analysis using MicroDrainage 'Source Control' module has been completed and is provided in **Appendix 03**. A summary of the results is provided in **Table 2**.

**Table 2**  
**Revised Drainage Performance and Sizing**

| AEP (%) | Maximum Allowable Discharge ( $\text{ls}^{-1}$ ) <sup>1</sup> | Maximum Proposed Discharge ( $\text{ls}^{-1}$ ) | Maximum Water Depth (m) | Maximum Attenuation Storage Required (m <sup>3</sup> ) | Half Drain Time (minutes) |
|---------|---------------------------------------------------------------|-------------------------------------------------|-------------------------|--------------------------------------------------------|---------------------------|
| 50      | 3.2 <sup>1</sup>                                              | 3.2                                             | 0.302                   | 439.9                                                  | 1159                      |
| 3.3     | 9.2                                                           | 9.2                                             | 0.578                   | 840.8                                                  | 1149                      |
| 1       | 13.2                                                          | 12.6                                            | 0.770                   | 1120.8                                                 | 1170                      |
| 1 +20%  | 16.5 <sup>2</sup>                                             | 14.3                                            | 0.934                   | 1360.0                                                 | 1073                      |

<sup>1</sup>Due to limitation with MicroDrainage modelling software being unable to model the 100% AEP event, the 50% AEP simulation has restricted flow to the calculated greenfield runoff rate with betterment for the 100% AEP event.

<sup>2</sup>Maximum allowable discharge has been assumed to fit the 1% AEP without betterment.

Based on the results above, the revised discharge arrangement is deemed compliant with Wiltshire Council's betterment policy for discharging to adoptable highways drainage.

## Closure

We would look forward to hearing confirmation that the revised discharge rates will be acceptable to Wiltshire Council's betterment requirements. As such, we would appreciate the withdrawal of your objection to the planning application.

Regards,

**SLR Consulting Limited**

**Andrew Dannatt**  
Technical Director  
adannatt@slrconsulting.com



## **APPENDIX 01**

### **Details of ReFH2 Analysis**



# UK Design Flood Estimation

Generated on 07 July 2023 12:58:00 by gfrisby  
Printed from the ReFH2 Flood Modelling software package, version 4.0.8560.23190

## Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

### Site details

Checksum: 8674-039E

Site name: FEH\_Point\_Descriptors\_403977\_196102\_v4\_0\_0

Easting: 403977

Northing: 196102

Country: England, Wales or Northern Ireland

Catchment Area (km<sup>2</sup>): 0.01

Using plot scale calculations: Yes

Model: 2.3

Site description: None

## Model run: 1 year

### Summary of results

|                        |       |                                |      |
|------------------------|-------|--------------------------------|------|
| Rainfall - FEH13 (mm): | 21.92 | Total runoff (ML):             | 0.01 |
| Total Rainfall (mm):   | 15.56 | Total flow (ML):               | 0.03 |
| Peak Rainfall (mm):    | 2.66  | Peak flow (m <sup>3</sup> /s): | 0.00 |

### Parameters

*Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.*

*\* Indicates that the user locked the duration/timestep*

#### Rainfall parameters (Rainfall - FEH13)

| Name                             | Value               | User-defined? |
|----------------------------------|---------------------|---------------|
| Duration (hh:mm:ss)              | 06:00:00 [01:42:00] | Yes           |
| Timestep (hh:mm:ss)              | 00:24:00 [00:06:00] | Yes           |
| SCF (Seasonal correction factor) | 0.71                | No            |
| ARF (Areal reduction factor)     | 1                   | No            |
| Seasonality                      | Winter              | No            |

#### Loss model parameters

| Name                        | Value  | User-defined? |
|-----------------------------|--------|---------------|
| Cini (mm)                   | 55.23  | No            |
| Cmax (mm)                   | 1040.6 | No            |
| Use alpha correction factor | No     | No            |
| Alpha correction factor     | n/a    | No            |

#### Routing model parameters

| Name    | Value | User-defined? |
|---------|-------|---------------|
| Tp (hr) | 1     | No            |
| Up      | 0.65  | No            |
| Uk      | 0.8   | No            |

#### Baseflow model parameters

| Name                    | Value | User-defined? |
|-------------------------|-------|---------------|
| BF0 (m <sup>3</sup> /s) | 0     | No            |
| BL (hr)                 | 41.19 | No            |
| BR                      | 3.48  | No            |

#### Urbanisation parameters

| Name                                      | Value | User-defined? |
|-------------------------------------------|-------|---------------|
| Sewer capacity (m <sup>3</sup> /s)        | 0     | No            |
| Exporting drained area (km <sup>2</sup> ) | 0     | No            |
| Urban area (km <sup>2</sup> )             | 0     | No            |
| Urbext 2000                               | 0     | No            |
| Impervious runoff factor                  | 0.7   | No            |
| Imperviousness factor                     | 0.4   | No            |
| Tp scaling factor                         | 0.75  | No            |
| Depression storage depth (mm)             | 0.5   | No            |

# Time series data

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 00:00:00           | 0.2326       | 0.0000                            | 0.0124           | 0.0000                        | 0                               | 0                                 |
| 00:24:00           | 0.3400       | 0.0000                            | 0.0182           | 0.0000                        | 7.53E-08                        | 4.54E-06                          |
| 00:48:00           | 0.4956       | 0.0000                            | 0.0267           | 0.0000                        | 4.86E-07                        | 2.05E-05                          |
| 01:12:00           | 0.7202       | 0.0000                            | 0.0392           | 0.0000                        | 1.66E-06                        | 5.16E-05                          |
| 01:36:00           | 1.0422       | 0.0000                            | 0.0576           | 0.0001                        | 4E-06                           | 9.44E-05                          |
| 02:00:00           | 1.4983       | 0.0000                            | 0.0847           | 0.0001                        | 7.92E-06                        | 0.000153                          |
| 02:24:00           | 2.1245       | 0.0000                            | 0.1238           | 0.0002                        | 1.4E-05                         | 0.000235                          |
| 02:48:00           | 2.6552       | 0.0000                            | 0.1608           | 0.0003                        | 2.31E-05                        | 0.000353                          |
| 03:12:00           | 2.1245       | 0.0000                            | 0.1335           | 0.0005                        | 3.65E-05                        | 0.000516                          |
| 03:36:00           | 1.4983       | 0.0000                            | 0.0968           | 0.0006                        | 5.51E-05                        | 0.0007                            |
| 04:00:00           | 1.0422       | 0.0000                            | 0.0686           | 0.0008                        | 7.83E-05                        | 0.000843                          |
| 04:24:00           | 0.7202       | 0.0000                            | 0.0480           | 0.0008                        | 0.000104                        | 0.000892                          |
| 04:48:00           | 0.4956       | 0.0000                            | 0.0333           | 0.0007                        | 0.000128                        | 0.00086                           |
| 05:12:00           | 0.3400       | 0.0000                            | 0.0230           | 0.0006                        | 0.00015                         | 0.000782                          |
| 05:36:00           | 0.2326       | 0.0000                            | 0.0158           | 0.0005                        | 0.000168                        | 0.000685                          |
| 06:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0004                        | 0.000182                        | 0.000582                          |
| 06:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0003                        | 0.000192                        | 0.000481                          |
| 06:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0002                        | 0.000198                        | 0.000391                          |
| 07:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0001                        | 0.000201                        | 0.000317                          |
| 07:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0001                        | 0.000202                        | 0.000268                          |
| 08:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000202                        | 0.000237                          |
| 08:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000201                        | 0.000218                          |
| 08:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000199                        | 0.000206                          |
| 09:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000198                        | 0.000199                          |
| 09:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000196                        | 0.000196                          |
| 10:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000194                        | 0.000194                          |
| 10:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000192                        | 0.000192                          |
| 10:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00019                         | 0.00019                           |
| 11:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000188                        | 0.000188                          |
| 11:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000186                        | 0.000186                          |
| 12:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000185                        | 0.000185                          |
| 12:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000183                        | 0.000183                          |
| 12:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000181                        | 0.000181                          |
| 13:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000179                        | 0.000179                          |
| 13:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000178                        | 0.000178                          |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 14:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000176                        | 0.000176                          |
| 14:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000174                        | 0.000174                          |
| 14:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000172                        | 0.000172                          |
| 15:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000171                        | 0.000171                          |
| 15:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000169                        | 0.000169                          |
| 16:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000167                        | 0.000167                          |
| 16:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000166                        | 0.000166                          |
| 16:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000164                        | 0.000164                          |
| 17:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000163                        | 0.000163                          |
| 17:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000161                        | 0.000161                          |
| 18:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00016                         | 0.00016                           |
| 18:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000158                        | 0.000158                          |
| 18:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000156                        | 0.000156                          |
| 19:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000155                        | 0.000155                          |
| 19:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000153                        | 0.000153                          |
| 20:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000152                        | 0.000152                          |
| 20:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000151                        | 0.000151                          |
| 20:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000149                        | 0.000149                          |
| 21:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000148                        | 0.000148                          |
| 21:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000146                        | 0.000146                          |
| 22:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000145                        | 0.000145                          |
| 22:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000143                        | 0.000143                          |
| 22:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000142                        | 0.000142                          |
| 23:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000141                        | 0.000141                          |
| 23:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000139                        | 0.000139                          |
| 24:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000138                        | 0.000138                          |
| 24:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000137                        | 0.000137                          |
| 24:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000135                        | 0.000135                          |
| 25:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000134                        | 0.000134                          |
| 25:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000133                        | 0.000133                          |
| 26:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000131                        | 0.000131                          |
| 26:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00013                         | 0.00013                           |
| 26:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000129                        | 0.000129                          |
| 27:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000128                        | 0.000128                          |
| 27:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000126                        | 0.000126                          |
| 28:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000125                        | 0.000125                          |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 28:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000124                        | 0.000124                          |
| 28:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000123                        | 0.000123                          |
| 29:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000122                        | 0.000122                          |
| 29:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00012                         | 0.00012                           |
| 30:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000119                        | 0.000119                          |
| 30:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000118                        | 0.000118                          |
| 30:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000117                        | 0.000117                          |
| 31:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000116                        | 0.000116                          |
| 31:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000115                        | 0.000115                          |
| 32:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000114                        | 0.000114                          |
| 32:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000112                        | 0.000112                          |
| 32:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000111                        | 0.000111                          |
| 33:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00011                         | 0.00011                           |
| 33:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000109                        | 0.000109                          |
| 34:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000108                        | 0.000108                          |
| 34:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000107                        | 0.000107                          |
| 34:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000106                        | 0.000106                          |
| 35:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000105                        | 0.000105                          |
| 35:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000104                        | 0.000104                          |
| 36:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000103                        | 0.000103                          |
| 36:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000102                        | 0.000102                          |
| 36:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000101                        | 0.000101                          |
| 37:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.0001                          | 0.0001                            |
| 37:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.91E-05                        | 9.91E-05                          |
| 38:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.82E-05                        | 9.82E-05                          |
| 38:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.72E-05                        | 9.72E-05                          |
| 38:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.63E-05                        | 9.63E-05                          |
| 39:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.53E-05                        | 9.53E-05                          |
| 39:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.44E-05                        | 9.44E-05                          |
| 40:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.35E-05                        | 9.35E-05                          |
| 40:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.26E-05                        | 9.26E-05                          |
| 40:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.17E-05                        | 9.17E-05                          |
| 41:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.08E-05                        | 9.08E-05                          |
| 41:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9E-05                           | 9E-05                             |
| 42:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.91E-05                        | 8.91E-05                          |
| 42:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.82E-05                        | 8.82E-05                          |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 42:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.74E-05                        | 8.74E-05                          |
| 43:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.65E-05                        | 8.65E-05                          |
| 43:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.57E-05                        | 8.57E-05                          |
| 44:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.49E-05                        | 8.49E-05                          |
| 44:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.4E-05                         | 8.4E-05                           |
| 44:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.32E-05                        | 8.32E-05                          |
| 45:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.24E-05                        | 8.24E-05                          |
| 45:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.16E-05                        | 8.16E-05                          |
| 46:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.08E-05                        | 8.08E-05                          |
| 46:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.01E-05                        | 8.01E-05                          |
| 46:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.93E-05                        | 7.93E-05                          |
| 47:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.85E-05                        | 7.85E-05                          |
| 47:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.78E-05                        | 7.78E-05                          |
| 48:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.7E-05                         | 7.7E-05                           |
| 48:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.63E-05                        | 7.63E-05                          |
| 48:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.55E-05                        | 7.55E-05                          |
| 49:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.48E-05                        | 7.48E-05                          |
| 49:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.41E-05                        | 7.41E-05                          |
| 50:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.34E-05                        | 7.34E-05                          |
| 50:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.26E-05                        | 7.26E-05                          |
| 50:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.19E-05                        | 7.19E-05                          |
| 51:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.13E-05                        | 7.13E-05                          |
| 51:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.06E-05                        | 7.06E-05                          |
| 52:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 6.99E-05                        | 6.99E-05                          |
| 52:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 6.92E-05                        | 6.92E-05                          |
| 52:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 6.85E-05                        | 6.85E-05                          |
| 53:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 6.79E-05                        | 6.79E-05                          |
| 53:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 6.72E-05                        | 6.72E-05                          |
| 54:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 6.66E-05                        | 6.66E-05                          |
| 54:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 5.56E-05                        | 5.56E-05                          |
| 54:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 5.51E-05                        | 5.51E-05                          |
| 55:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 5.45E-05                        | 5.45E-05                          |
| 55:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 5.4E-05                         | 5.4E-05                           |
| 56:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 5.35E-05                        | 5.35E-05                          |
| 56:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 1.31E-05                        | 1.31E-05                          |
| 56:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 1.3E-05                         | 1.3E-05                           |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 57:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 1.28E-05                        | 1.28E-05                          |
| 57:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 1.27E-05                        | 1.27E-05                          |
| 58:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 1.26E-05                        | 1.26E-05                          |

## Appendix

### Catchment descriptors

| Name      | Value | User-defined value used? |
|-----------|-------|--------------------------|
| BFIHOST   | 0.8   | No                       |
| BFIHOST19 | 0.86  | No                       |
| PROPWET   | 0.34  | No                       |
| SAAR (mm) | 736   | No                       |

# UK Design Flood Estimation

Generated on 07 July 2023 13:01:06 by gfrisby  
Printed from the ReFH2 Flood Modelling software package, version 4.0.8560.23190

## Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

### Site details

Checksum: 8674-039E

Site name: FEH\_Point\_Descriptors\_403977\_196102\_v4\_0\_0

Easting: 403977

Northing: 196102

Country: England, Wales or Northern Ireland

Catchment Area (km<sup>2</sup>): 0.01

Using plot scale calculations: Yes

Model: 2.3

Site description: None

## Model run: 2 year

### Summary of results

|                        |       |                                |      |
|------------------------|-------|--------------------------------|------|
| Rainfall - FEH13 (mm): | 24.71 | Total runoff (ML):             | 0.01 |
| Total Rainfall (mm):   | 17.54 | Total flow (ML):               | 0.04 |
| Peak Rainfall (mm):    | 2.99  | Peak flow (m <sup>3</sup> /s): | 0.00 |

### Parameters

*Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.*

*\* Indicates that the user locked the duration/timestep*

#### Rainfall parameters (Rainfall - FEH13)

| Name                             | Value               | User-defined? |
|----------------------------------|---------------------|---------------|
| Duration (hh:mm:ss)              | 06:00:00 [01:42:00] | Yes           |
| Timestep (hh:mm:ss)              | 00:24:00 [00:06:00] | Yes           |
| SCF (Seasonal correction factor) | 0.71                | No            |
| ARF (Areal reduction factor)     | 1                   | No            |
| Seasonality                      | Winter              | No            |

#### Loss model parameters

| Name                        | Value  | User-defined? |
|-----------------------------|--------|---------------|
| Cini (mm)                   | 55.23  | No            |
| Cmax (mm)                   | 1040.6 | No            |
| Use alpha correction factor | No     | No            |
| Alpha correction factor     | n/a    | No            |

#### Routing model parameters

| Name    | Value | User-defined? |
|---------|-------|---------------|
| Tp (hr) | 1     | No            |
| Up      | 0.65  | No            |
| Uk      | 0.8   | No            |

#### Baseflow model parameters

| Name                    | Value | User-defined? |
|-------------------------|-------|---------------|
| BF0 (m <sup>3</sup> /s) | 0     | No            |
| BL (hr)                 | 41.19 | No            |
| BR                      | 3.48  | No            |

#### Urbanisation parameters

| Name                                      | Value | User-defined? |
|-------------------------------------------|-------|---------------|
| Sewer capacity (m <sup>3</sup> /s)        | 0     | No            |
| Exporting drained area (km <sup>2</sup> ) | 0     | No            |
| Urban area (km <sup>2</sup> )             | 0     | No            |
| Urbext 2000                               | 0     | No            |
| Impervious runoff factor                  | 0.7   | No            |
| Imperviousness factor                     | 0.4   | No            |
| Tp scaling factor                         | 0.75  | No            |
| Depression storage depth (mm)             | 0.5   | No            |

# Time series data

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 00:00:00           | 0.2622       | 0.0000                            | 0.0139           | 0.0000                        | 0                               | 0                                 |
| 00:24:00           | 0.3831       | 0.0000                            | 0.0205           | 0.0000                        | 8.49E-08                        | 5.12E-06                          |
| 00:48:00           | 0.5585       | 0.0000                            | 0.0301           | 0.0000                        | 5.48E-07                        | 2.31E-05                          |
| 01:12:00           | 0.8117       | 0.0000                            | 0.0443           | 0.0001                        | 1.87E-06                        | 5.82E-05                          |
| 01:36:00           | 1.1746       | 0.0000                            | 0.0653           | 0.0001                        | 4.52E-06                        | 0.000107                          |
| 02:00:00           | 1.6886       | 0.0000                            | 0.0962           | 0.0002                        | 8.94E-06                        | 0.000172                          |
| 02:24:00           | 2.3942       | 0.0000                            | 0.1410           | 0.0002                        | 1.58E-05                        | 0.000265                          |
| 02:48:00           | 2.9923       | 0.0000                            | 0.1840           | 0.0004                        | 2.62E-05                        | 0.0004                            |
| 03:12:00           | 2.3942       | 0.0000                            | 0.1534           | 0.0005                        | 4.14E-05                        | 0.000587                          |
| 03:36:00           | 1.6886       | 0.0000                            | 0.1115           | 0.0007                        | 6.25E-05                        | 0.000798                          |
| 04:00:00           | 1.1746       | 0.0000                            | 0.0792           | 0.0009                        | 8.9E-05                         | 0.000963                          |
| 04:24:00           | 0.8117       | 0.0000                            | 0.0555           | 0.0009                        | 0.000118                        | 0.00102                           |
| 04:48:00           | 0.5585       | 0.0000                            | 0.0385           | 0.0008                        | 0.000146                        | 0.000986                          |
| 05:12:00           | 0.3831       | 0.0000                            | 0.0266           | 0.0007                        | 0.000171                        | 0.000898                          |
| 05:36:00           | 0.2622       | 0.0000                            | 0.0183           | 0.0006                        | 0.000192                        | 0.000787                          |
| 06:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0005                        | 0.000208                        | 0.000669                          |
| 06:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0003                        | 0.000219                        | 0.000554                          |
| 06:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0002                        | 0.000226                        | 0.000449                          |
| 07:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0001                        | 0.00023                         | 0.000365                          |
| 07:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0001                        | 0.000231                        | 0.000307                          |
| 08:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000231                        | 0.000271                          |
| 08:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00023                         | 0.000249                          |
| 08:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000228                        | 0.000236                          |
| 09:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000226                        | 0.000228                          |
| 09:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000224                        | 0.000224                          |
| 10:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000222                        | 0.000222                          |
| 10:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00022                         | 0.00022                           |
| 10:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000218                        | 0.000218                          |
| 11:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000215                        | 0.000215                          |
| 11:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000213                        | 0.000213                          |
| 12:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000211                        | 0.000211                          |
| 12:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000209                        | 0.000209                          |
| 12:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000207                        | 0.000207                          |
| 13:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000205                        | 0.000205                          |
| 13:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000203                        | 0.000203                          |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 14:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000201                        | 0.000201                          |
| 14:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000199                        | 0.000199                          |
| 14:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000197                        | 0.000197                          |
| 15:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000195                        | 0.000195                          |
| 15:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000194                        | 0.000194                          |
| 16:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000192                        | 0.000192                          |
| 16:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00019                         | 0.00019                           |
| 16:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000188                        | 0.000188                          |
| 17:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000186                        | 0.000186                          |
| 17:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000184                        | 0.000184                          |
| 18:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000183                        | 0.000183                          |
| 18:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000181                        | 0.000181                          |
| 18:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000179                        | 0.000179                          |
| 19:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000177                        | 0.000177                          |
| 19:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000176                        | 0.000176                          |
| 20:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000174                        | 0.000174                          |
| 20:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000172                        | 0.000172                          |
| 20:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000171                        | 0.000171                          |
| 21:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000169                        | 0.000169                          |
| 21:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000167                        | 0.000167                          |
| 22:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000166                        | 0.000166                          |
| 22:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000164                        | 0.000164                          |
| 22:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000163                        | 0.000163                          |
| 23:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000161                        | 0.000161                          |
| 23:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000159                        | 0.000159                          |
| 24:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000158                        | 0.000158                          |
| 24:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000156                        | 0.000156                          |
| 24:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000155                        | 0.000155                          |
| 25:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000153                        | 0.000153                          |
| 25:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000152                        | 0.000152                          |
| 26:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00015                         | 0.00015                           |
| 26:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000149                        | 0.000149                          |
| 26:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000148                        | 0.000148                          |
| 27:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000146                        | 0.000146                          |
| 27:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000145                        | 0.000145                          |
| 28:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000143                        | 0.000143                          |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 28:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000142                        | 0.000142                          |
| 28:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000141                        | 0.000141                          |
| 29:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000139                        | 0.000139                          |
| 29:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000138                        | 0.000138                          |
| 30:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000136                        | 0.000136                          |
| 30:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000135                        | 0.000135                          |
| 30:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000134                        | 0.000134                          |
| 31:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000133                        | 0.000133                          |
| 31:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000131                        | 0.000131                          |
| 32:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00013                         | 0.00013                           |
| 32:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000129                        | 0.000129                          |
| 32:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000128                        | 0.000128                          |
| 33:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000126                        | 0.000126                          |
| 33:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000125                        | 0.000125                          |
| 34:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000124                        | 0.000124                          |
| 34:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000123                        | 0.000123                          |
| 34:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000121                        | 0.000121                          |
| 35:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00012                         | 0.00012                           |
| 35:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000119                        | 0.000119                          |
| 36:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000118                        | 0.000118                          |
| 36:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000117                        | 0.000117                          |
| 36:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000116                        | 0.000116                          |
| 37:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000115                        | 0.000115                          |
| 37:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000113                        | 0.000113                          |
| 38:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000112                        | 0.000112                          |
| 38:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000111                        | 0.000111                          |
| 38:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00011                         | 0.00011                           |
| 39:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000109                        | 0.000109                          |
| 39:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000108                        | 0.000108                          |
| 40:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000107                        | 0.000107                          |
| 40:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000106                        | 0.000106                          |
| 40:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000105                        | 0.000105                          |
| 41:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000104                        | 0.000104                          |
| 41:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000103                        | 0.000103                          |
| 42:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000102                        | 0.000102                          |
| 42:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000101                        | 0.000101                          |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 42:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.0001                          | 0.0001                            |
| 43:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.91E-05                        | 9.91E-05                          |
| 43:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.81E-05                        | 9.81E-05                          |
| 44:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.72E-05                        | 9.72E-05                          |
| 44:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.62E-05                        | 9.62E-05                          |
| 44:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.53E-05                        | 9.53E-05                          |
| 45:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.44E-05                        | 9.44E-05                          |
| 45:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.35E-05                        | 9.35E-05                          |
| 46:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.26E-05                        | 9.26E-05                          |
| 46:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.17E-05                        | 9.17E-05                          |
| 46:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 9.08E-05                        | 9.08E-05                          |
| 47:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.99E-05                        | 8.99E-05                          |
| 47:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.9E-05                         | 8.9E-05                           |
| 48:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.82E-05                        | 8.82E-05                          |
| 48:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.73E-05                        | 8.73E-05                          |
| 48:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.65E-05                        | 8.65E-05                          |
| 49:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.56E-05                        | 8.56E-05                          |
| 49:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.48E-05                        | 8.48E-05                          |
| 50:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.4E-05                         | 8.4E-05                           |
| 50:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.32E-05                        | 8.32E-05                          |
| 50:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.24E-05                        | 8.24E-05                          |
| 51:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.16E-05                        | 8.16E-05                          |
| 51:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.08E-05                        | 8.08E-05                          |
| 52:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8E-05                           | 8E-05                             |
| 52:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.92E-05                        | 7.92E-05                          |
| 52:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.85E-05                        | 7.85E-05                          |
| 53:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.77E-05                        | 7.77E-05                          |
| 53:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.7E-05                         | 7.7E-05                           |
| 54:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.62E-05                        | 7.62E-05                          |
| 54:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 6.38E-05                        | 6.38E-05                          |
| 54:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 6.32E-05                        | 6.32E-05                          |
| 55:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 6.26E-05                        | 6.26E-05                          |
| 55:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 6.2E-05                         | 6.2E-05                           |
| 56:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 6.14E-05                        | 6.14E-05                          |
| 56:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 1.51E-05                        | 1.51E-05                          |
| 56:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 1.5E-05                         | 1.5E-05                           |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 57:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 1.48E-05                        | 1.48E-05                          |
| 57:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 1.47E-05                        | 1.47E-05                          |
| 58:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 1.45E-05                        | 1.45E-05                          |

## Appendix

### Catchment descriptors

| Name      | Value | User-defined value used? |
|-----------|-------|--------------------------|
| BFIHOST   | 0.8   | No                       |
| BFIHOST19 | 0.86  | No                       |
| PROPWET   | 0.34  | No                       |
| SAAR (mm) | 736   | No                       |

# UK Design Flood Estimation

Generated on 07 July 2023 12:59:38 by gfrisby  
Printed from the ReFH2 Flood Modelling software package, version 4.0.8560.23190

## Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

### Site details

Checksum: 8674-039E

Site name: FEH\_Point\_Descriptors\_403977\_196102\_v4\_0\_0

Easting: 403977

Northing: 196102

Country: England, Wales or Northern Ireland

Catchment Area (km<sup>2</sup>): 0.01

Using plot scale calculations: Yes

Model: 2.3

Site description: None

## Model run: 30 year

### Summary of results

|                        |       |                                |      |
|------------------------|-------|--------------------------------|------|
| Rainfall - FEH13 (mm): | 53.19 | Total runoff (ML):             | 0.03 |
| Total Rainfall (mm):   | 37.75 | Total flow (ML):               | 0.09 |
| Peak Rainfall (mm):    | 6.44  | Peak flow (m <sup>3</sup> /s): | 0.00 |

### Parameters

*Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.*

*\* Indicates that the user locked the duration/timestep*

#### Rainfall parameters (Rainfall - FEH13)

| Name                             | Value               | User-defined? |
|----------------------------------|---------------------|---------------|
| Duration (hh:mm:ss)              | 06:00:00 [01:42:00] | Yes           |
| Timestep (hh:mm:ss)              | 00:24:00 [00:06:00] | Yes           |
| SCF (Seasonal correction factor) | 0.71                | No            |
| ARF (Areal reduction factor)     | 1                   | No            |
| Seasonality                      | Winter              | No            |

#### Loss model parameters

| Name                        | Value  | User-defined? |
|-----------------------------|--------|---------------|
| Cini (mm)                   | 55.23  | No            |
| Cmax (mm)                   | 1040.6 | No            |
| Use alpha correction factor | No     | No            |
| Alpha correction factor     | n/a    | No            |

#### Routing model parameters

| Name    | Value | User-defined? |
|---------|-------|---------------|
| Tp (hr) | 1     | No            |
| Up      | 0.65  | No            |
| Uk      | 0.8   | No            |

#### Baseflow model parameters

| Name                    | Value | User-defined? |
|-------------------------|-------|---------------|
| BF0 (m <sup>3</sup> /s) | 0     | No            |
| BL (hr)                 | 41.19 | No            |
| BR                      | 3.48  | No            |

#### Urbanisation parameters

| Name                                      | Value | User-defined? |
|-------------------------------------------|-------|---------------|
| Sewer capacity (m <sup>3</sup> /s)        | 0     | No            |
| Exporting drained area (km <sup>2</sup> ) | 0     | No            |
| Urban area (km <sup>2</sup> )             | 0     | No            |
| Urbext 2000                               | 0     | No            |
| Impervious runoff factor                  | 0.7   | No            |
| Imperviousness factor                     | 0.4   | No            |
| Tp scaling factor                         | 0.75  | No            |
| Depression storage depth (mm)             | 0.5   | No            |

# Time series data

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m³/s) | Net Rain<br>(mm) | Runoff<br>(m³/s) | Baseflow<br>(m³/s) | Total Flow<br>(m³/s) |
|--------------------|--------------|----------------------|------------------|------------------|--------------------|----------------------|
| 00:00:00           | 0.5644       | 0.0000               | 0.0301           | 0.0000           | 0                  | 0                    |
| 00:24:00           | 0.8247       | 0.0000               | 0.0445           | 0.0000           | 1.83E-07           | 1.11E-05             |
| 00:48:00           | 1.2022       | 0.0000               | 0.0661           | 0.0000           | 1.18E-06           | 4.99E-05             |
| 01:12:00           | 1.7472       | 0.0000               | 0.0985           | 0.0001           | 4.05E-06           | 0.000126             |
| 01:36:00           | 2.5284       | 0.0000               | 0.1478           | 0.0002           | 9.82E-06           | 0.000233             |
| 02:00:00           | 3.6347       | 0.0000               | 0.2232           | 0.0004           | 1.95E-05           | 0.00038              |
| 02:24:00           | 5.1537       | 0.0000               | 0.3383           | 0.0006           | 3.48E-05           | 0.000593             |
| 02:48:00           | 6.4412       | 0.0000               | 0.4587           | 0.0009           | 5.83E-05           | 0.000911             |
| 03:12:00           | 5.1537       | 0.0000               | 0.3957           | 0.0013           | 9.35E-05           | 0.00137              |
| 03:36:00           | 3.6347       | 0.0000               | 0.2944           | 0.0018           | 0.000144           | 0.00191              |
| 04:00:00           | 2.5284       | 0.0000               | 0.2122           | 0.0021           | 0.000208           | 0.00235              |
| 04:24:00           | 1.7472       | 0.0000               | 0.1502           | 0.0023           | 0.00028            | 0.00254              |
| 04:48:00           | 1.2022       | 0.0000               | 0.1051           | 0.0021           | 0.000352           | 0.00249              |
| 05:12:00           | 0.8247       | 0.0000               | 0.0729           | 0.0019           | 0.000416           | 0.00229              |
| 05:36:00           | 0.5644       | 0.0000               | 0.0502           | 0.0016           | 0.000469           | 0.00202              |
| 06:00:00           | 0.0000       | 0.0000               | 0.0000           | 0.0012           | 0.000512           | 0.00173              |
| 06:24:00           | 0.0000       | 0.0000               | 0.0000           | 0.0009           | 0.000542           | 0.00144              |
| 06:48:00           | 0.0000       | 0.0000               | 0.0000           | 0.0006           | 0.000562           | 0.00116              |
| 07:12:00           | 0.0000       | 0.0000               | 0.0000           | 0.0004           | 0.000573           | 0.000938             |
| 07:36:00           | 0.0000       | 0.0000               | 0.0000           | 0.0002           | 0.000577           | 0.000784             |
| 08:00:00           | 0.0000       | 0.0000               | 0.0000           | 0.0001           | 0.000577           | 0.000687             |
| 08:24:00           | 0.0000       | 0.0000               | 0.0000           | 0.0001           | 0.000574           | 0.000628             |
| 08:48:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.00057            | 0.00059              |
| 09:12:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000565           | 0.000569             |
| 09:36:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000559           | 0.000559             |
| 10:00:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000554           | 0.000554             |
| 10:24:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000548           | 0.000548             |
| 10:48:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000543           | 0.000543             |
| 11:12:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000538           | 0.000538             |
| 11:36:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000533           | 0.000533             |
| 12:00:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000528           | 0.000528             |
| 12:24:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000522           | 0.000522             |
| 12:48:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000517           | 0.000517             |
| 13:12:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000512           | 0.000512             |
| 13:36:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000507           | 0.000507             |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 14:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000503                        | 0.000503                          |
| 14:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000498                        | 0.000498                          |
| 14:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000493                        | 0.000493                          |
| 15:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000488                        | 0.000488                          |
| 15:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000483                        | 0.000483                          |
| 16:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000479                        | 0.000479                          |
| 16:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000474                        | 0.000474                          |
| 16:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00047                         | 0.00047                           |
| 17:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000465                        | 0.000465                          |
| 17:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000461                        | 0.000461                          |
| 18:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000456                        | 0.000456                          |
| 18:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000452                        | 0.000452                          |
| 18:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000447                        | 0.000447                          |
| 19:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000443                        | 0.000443                          |
| 19:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000439                        | 0.000439                          |
| 20:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000434                        | 0.000434                          |
| 20:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00043                         | 0.00043                           |
| 20:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000426                        | 0.000426                          |
| 21:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000422                        | 0.000422                          |
| 21:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000418                        | 0.000418                          |
| 22:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000414                        | 0.000414                          |
| 22:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00041                         | 0.00041                           |
| 22:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000406                        | 0.000406                          |
| 23:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000402                        | 0.000402                          |
| 23:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000398                        | 0.000398                          |
| 24:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000394                        | 0.000394                          |
| 24:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00039                         | 0.00039                           |
| 24:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000387                        | 0.000387                          |
| 25:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000383                        | 0.000383                          |
| 25:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000379                        | 0.000379                          |
| 26:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000376                        | 0.000376                          |
| 26:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000372                        | 0.000372                          |
| 26:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000368                        | 0.000368                          |
| 27:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000365                        | 0.000365                          |
| 27:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000361                        | 0.000361                          |
| 28:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000358                        | 0.000358                          |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 28:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000354                        | 0.000354                          |
| 28:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000351                        | 0.000351                          |
| 29:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000347                        | 0.000347                          |
| 29:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000344                        | 0.000344                          |
| 30:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000341                        | 0.000341                          |
| 30:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000338                        | 0.000338                          |
| 30:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000334                        | 0.000334                          |
| 31:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000331                        | 0.000331                          |
| 31:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000328                        | 0.000328                          |
| 32:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000325                        | 0.000325                          |
| 32:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000322                        | 0.000322                          |
| 32:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000318                        | 0.000318                          |
| 33:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000315                        | 0.000315                          |
| 33:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000312                        | 0.000312                          |
| 34:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000309                        | 0.000309                          |
| 34:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000306                        | 0.000306                          |
| 34:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000303                        | 0.000303                          |
| 35:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.0003                          | 0.0003                            |
| 35:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000297                        | 0.000297                          |
| 36:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000295                        | 0.000295                          |
| 36:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000292                        | 0.000292                          |
| 36:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000289                        | 0.000289                          |
| 37:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000286                        | 0.000286                          |
| 37:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000283                        | 0.000283                          |
| 38:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000281                        | 0.000281                          |
| 38:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000278                        | 0.000278                          |
| 38:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000275                        | 0.000275                          |
| 39:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000273                        | 0.000273                          |
| 39:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00027                         | 0.00027                           |
| 40:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000267                        | 0.000267                          |
| 40:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000265                        | 0.000265                          |
| 40:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000262                        | 0.000262                          |
| 41:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00026                         | 0.00026                           |
| 41:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000257                        | 0.000257                          |
| 42:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000255                        | 0.000255                          |
| 42:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000252                        | 0.000252                          |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 42:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00025                         | 0.00025                           |
| 43:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000247                        | 0.000247                          |
| 43:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000245                        | 0.000245                          |
| 44:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000243                        | 0.000243                          |
| 44:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00024                         | 0.00024                           |
| 44:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000238                        | 0.000238                          |
| 45:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000236                        | 0.000236                          |
| 45:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000233                        | 0.000233                          |
| 46:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000231                        | 0.000231                          |
| 46:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000229                        | 0.000229                          |
| 46:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000227                        | 0.000227                          |
| 47:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000224                        | 0.000224                          |
| 47:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000222                        | 0.000222                          |
| 48:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00022                         | 0.00022                           |
| 48:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000218                        | 0.000218                          |
| 48:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000216                        | 0.000216                          |
| 49:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000214                        | 0.000214                          |
| 49:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000212                        | 0.000212                          |
| 50:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00021                         | 0.00021                           |
| 50:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000208                        | 0.000208                          |
| 50:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000206                        | 0.000206                          |
| 51:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000204                        | 0.000204                          |
| 51:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000202                        | 0.000202                          |
| 52:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.0002                          | 0.0002                            |
| 52:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000198                        | 0.000198                          |
| 52:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000196                        | 0.000196                          |
| 53:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000194                        | 0.000194                          |
| 53:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000192                        | 0.000192                          |
| 54:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00019                         | 0.00019                           |
| 54:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000163                        | 0.000163                          |
| 54:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000161                        | 0.000161                          |
| 55:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000159                        | 0.000159                          |
| 55:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000158                        | 0.000158                          |
| 56:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000156                        | 0.000156                          |
| 56:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 4.1E-05                         | 4.1E-05                           |
| 56:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 4.06E-05                        | 4.06E-05                          |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 57:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 4.02E-05                        | 4.02E-05                          |
| 57:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 3.98E-05                        | 3.98E-05                          |
| 58:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 3.94E-05                        | 3.94E-05                          |

## Appendix

### Catchment descriptors

| Name      | Value | User-defined value used? |
|-----------|-------|--------------------------|
| BFIHOST   | 0.8   | No                       |
| BFIHOST19 | 0.86  | No                       |
| PROPWET   | 0.34  | No                       |
| SAAR (mm) | 736   | No                       |

# UK Design Flood Estimation

Generated on 07 July 2023 12:59:48 by gfrisby  
Printed from the ReFH2 Flood Modelling software package, version 4.0.8560.23190

## Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

### Site details

Checksum: 8674-039E

Site name: FEH\_Point\_Descriptors\_403977\_196102\_v4\_0\_0

Easting: 403977

Northing: 196102

Country: England, Wales or Northern Ireland

Catchment Area (km<sup>2</sup>): 0.01

Using plot scale calculations: Yes

Model: 2.3

Site description: None

## Model run: 100 year

### Summary of results

|                        |       |                                |      |
|------------------------|-------|--------------------------------|------|
| Rainfall - FEH13 (mm): | 70.63 | Total runoff (ML):             | 0.04 |
| Total Rainfall (mm):   | 50.13 | Total flow (ML):               | 0.14 |
| Peak Rainfall (mm):    | 8.55  | Peak flow (m <sup>3</sup> /s): | 0.00 |

### Parameters

*Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.*

*\* Indicates that the user locked the duration/timestep*

#### Rainfall parameters (Rainfall - FEH13)

| Name                             | Value               | User-defined? |
|----------------------------------|---------------------|---------------|
| Duration (hh:mm:ss)              | 06:00:00 [01:42:00] | Yes           |
| Timestep (hh:mm:ss)              | 00:24:00 [00:06:00] | Yes           |
| SCF (Seasonal correction factor) | 0.71                | No            |
| ARF (Areal reduction factor)     | 1                   | No            |
| Seasonality                      | Winter              | No            |

#### Loss model parameters

| Name                        | Value  | User-defined? |
|-----------------------------|--------|---------------|
| Cini (mm)                   | 55.23  | No            |
| Cmax (mm)                   | 1040.6 | No            |
| Use alpha correction factor | No     | No            |
| Alpha correction factor     | n/a    | No            |

#### Routing model parameters

| Name    | Value | User-defined? |
|---------|-------|---------------|
| Tp (hr) | 1     | No            |
| Up      | 0.65  | No            |
| Uk      | 0.8   | No            |

#### Baseflow model parameters

| Name                    | Value | User-defined? |
|-------------------------|-------|---------------|
| BF0 (m <sup>3</sup> /s) | 0     | No            |
| BL (hr)                 | 41.19 | No            |
| BR                      | 3.48  | No            |

#### Urbanisation parameters

| Name                                      | Value | User-defined? |
|-------------------------------------------|-------|---------------|
| Sewer capacity (m <sup>3</sup> /s)        | 0     | No            |
| Exporting drained area (km <sup>2</sup> ) | 0     | No            |
| Urban area (km <sup>2</sup> )             | 0     | No            |
| Urbext 2000                               | 0     | No            |
| Impervious runoff factor                  | 0.7   | No            |
| Imperviousness factor                     | 0.4   | No            |
| Tp scaling factor                         | 0.75  | No            |
| Depression storage depth (mm)             | 0.5   | No            |

# Time series data

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m³/s) | Net Rain<br>(mm) | Runoff<br>(m³/s) | Baseflow<br>(m³/s) | Total Flow<br>(m³/s) |
|--------------------|--------------|----------------------|------------------|------------------|--------------------|----------------------|
| 00:00:00           | 0.7494       | 0.0000               | 0.0400           | 0.0000           | 0                  | 0                    |
| 00:24:00           | 1.0952       | 0.0000               | 0.0595           | 0.0000           | 2.44E-07           | 1.47E-05             |
| 00:48:00           | 1.5965       | 0.0000               | 0.0888           | 0.0001           | 1.58E-06           | 6.64E-05             |
| 01:12:00           | 2.3202       | 0.0000               | 0.1334           | 0.0002           | 5.4E-06            | 0.000168             |
| 01:36:00           | 3.3576       | 0.0000               | 0.2022           | 0.0003           | 1.31E-05           | 0.000312             |
| 02:00:00           | 4.8268       | 0.0000               | 0.3097           | 0.0005           | 2.62E-05           | 0.000512             |
| 02:24:00           | 6.8439       | 0.0000               | 0.4774           | 0.0008           | 4.69E-05           | 0.000806             |
| 02:48:00           | 8.5537       | 0.0000               | 0.6600           | 0.0012           | 7.89E-05           | 0.00125              |
| 03:12:00           | 6.8439       | 0.0000               | 0.5787           | 0.0018           | 0.000128           | 0.0019               |
| 03:36:00           | 4.8268       | 0.0000               | 0.4352           | 0.0025           | 0.000198           | 0.00269              |
| 04:00:00           | 3.3576       | 0.0000               | 0.3157           | 0.0031           | 0.00029            | 0.00335              |
| 04:24:00           | 2.3202       | 0.0000               | 0.2245           | 0.0033           | 0.000394           | 0.00366              |
| 04:48:00           | 1.5965       | 0.0000               | 0.1575           | 0.0031           | 0.000497           | 0.0036               |
| 05:12:00           | 1.0952       | 0.0000               | 0.1094           | 0.0027           | 0.000591           | 0.00333              |
| 05:36:00           | 0.7494       | 0.0000               | 0.0756           | 0.0023           | 0.000669           | 0.00296              |
| 06:00:00           | 0.0000       | 0.0000               | 0.0000           | 0.0018           | 0.000732           | 0.00254              |
| 06:24:00           | 0.0000       | 0.0000               | 0.0000           | 0.0013           | 0.000778           | 0.00211              |
| 06:48:00           | 0.0000       | 0.0000               | 0.0000           | 0.0009           | 0.000808           | 0.00171              |
| 07:12:00           | 0.0000       | 0.0000               | 0.0000           | 0.0005           | 0.000824           | 0.00137              |
| 07:36:00           | 0.0000       | 0.0000               | 0.0000           | 0.0003           | 0.00083            | 0.00114              |
| 08:00:00           | 0.0000       | 0.0000               | 0.0000           | 0.0002           | 0.00083            | 0.000996             |
| 08:24:00           | 0.0000       | 0.0000               | 0.0000           | 0.0001           | 0.000827           | 0.000907             |
| 08:48:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.00082            | 0.000852             |
| 09:12:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000813           | 0.00082              |
| 09:36:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000805           | 0.000805             |
| 10:00:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000798           | 0.000798             |
| 10:24:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.00079            | 0.00079              |
| 10:48:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000782           | 0.000782             |
| 11:12:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000775           | 0.000775             |
| 11:36:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000767           | 0.000767             |
| 12:00:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.00076            | 0.00076              |
| 12:24:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000752           | 0.000752             |
| 12:48:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000745           | 0.000745             |
| 13:12:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000738           | 0.000738             |
| 13:36:00           | 0.0000       | 0.0000               | 0.0000           | 0.0000           | 0.000731           | 0.000731             |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 14:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000724                        | 0.000724                          |
| 14:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000717                        | 0.000717                          |
| 14:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00071                         | 0.00071                           |
| 15:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000703                        | 0.000703                          |
| 15:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000696                        | 0.000696                          |
| 16:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000689                        | 0.000689                          |
| 16:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000683                        | 0.000683                          |
| 16:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000676                        | 0.000676                          |
| 17:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00067                         | 0.00067                           |
| 17:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000663                        | 0.000663                          |
| 18:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000657                        | 0.000657                          |
| 18:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00065                         | 0.00065                           |
| 18:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000644                        | 0.000644                          |
| 19:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000638                        | 0.000638                          |
| 19:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000632                        | 0.000632                          |
| 20:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000626                        | 0.000626                          |
| 20:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00062                         | 0.00062                           |
| 20:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000614                        | 0.000614                          |
| 21:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000608                        | 0.000608                          |
| 21:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000602                        | 0.000602                          |
| 22:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000596                        | 0.000596                          |
| 22:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00059                         | 0.00059                           |
| 22:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000585                        | 0.000585                          |
| 23:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000579                        | 0.000579                          |
| 23:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000573                        | 0.000573                          |
| 24:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000568                        | 0.000568                          |
| 24:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000562                        | 0.000562                          |
| 24:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000557                        | 0.000557                          |
| 25:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000551                        | 0.000551                          |
| 25:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000546                        | 0.000546                          |
| 26:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000541                        | 0.000541                          |
| 26:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000536                        | 0.000536                          |
| 26:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00053                         | 0.00053                           |
| 27:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000525                        | 0.000525                          |
| 27:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00052                         | 0.00052                           |
| 28:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000515                        | 0.000515                          |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 28:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00051                         | 0.00051                           |
| 28:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000505                        | 0.000505                          |
| 29:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.0005                          | 0.0005                            |
| 29:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000496                        | 0.000496                          |
| 30:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000491                        | 0.000491                          |
| 30:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000486                        | 0.000486                          |
| 30:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000481                        | 0.000481                          |
| 31:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000477                        | 0.000477                          |
| 31:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000472                        | 0.000472                          |
| 32:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000468                        | 0.000468                          |
| 32:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000463                        | 0.000463                          |
| 32:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000459                        | 0.000459                          |
| 33:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000454                        | 0.000454                          |
| 33:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00045                         | 0.00045                           |
| 34:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000445                        | 0.000445                          |
| 34:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000441                        | 0.000441                          |
| 34:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000437                        | 0.000437                          |
| 35:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000433                        | 0.000433                          |
| 35:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000428                        | 0.000428                          |
| 36:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000424                        | 0.000424                          |
| 36:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00042                         | 0.00042                           |
| 36:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000416                        | 0.000416                          |
| 37:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000412                        | 0.000412                          |
| 37:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000408                        | 0.000408                          |
| 38:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000404                        | 0.000404                          |
| 38:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.0004                          | 0.0004                            |
| 38:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000396                        | 0.000396                          |
| 39:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000393                        | 0.000393                          |
| 39:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000389                        | 0.000389                          |
| 40:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000385                        | 0.000385                          |
| 40:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000381                        | 0.000381                          |
| 40:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000378                        | 0.000378                          |
| 41:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000374                        | 0.000374                          |
| 41:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00037                         | 0.00037                           |
| 42:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000367                        | 0.000367                          |
| 42:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000363                        | 0.000363                          |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 42:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00036                         | 0.00036                           |
| 43:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000356                        | 0.000356                          |
| 43:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000353                        | 0.000353                          |
| 44:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000349                        | 0.000349                          |
| 44:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000346                        | 0.000346                          |
| 44:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000343                        | 0.000343                          |
| 45:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000339                        | 0.000339                          |
| 45:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000336                        | 0.000336                          |
| 46:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000333                        | 0.000333                          |
| 46:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00033                         | 0.00033                           |
| 46:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000326                        | 0.000326                          |
| 47:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000323                        | 0.000323                          |
| 47:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00032                         | 0.00032                           |
| 48:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000317                        | 0.000317                          |
| 48:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000314                        | 0.000314                          |
| 48:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000311                        | 0.000311                          |
| 49:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000308                        | 0.000308                          |
| 49:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000305                        | 0.000305                          |
| 50:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000302                        | 0.000302                          |
| 50:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000299                        | 0.000299                          |
| 50:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000296                        | 0.000296                          |
| 51:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000293                        | 0.000293                          |
| 51:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00029                         | 0.00029                           |
| 52:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000288                        | 0.000288                          |
| 52:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000285                        | 0.000285                          |
| 52:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000282                        | 0.000282                          |
| 53:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000279                        | 0.000279                          |
| 53:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000277                        | 0.000277                          |
| 54:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000274                        | 0.000274                          |
| 54:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000236                        | 0.000236                          |
| 54:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000234                        | 0.000234                          |
| 55:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000232                        | 0.000232                          |
| 55:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00023                         | 0.00023                           |
| 56:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000227                        | 0.000227                          |
| 56:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 6.12E-05                        | 6.12E-05                          |
| 56:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 6.06E-05                        | 6.06E-05                          |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 57:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 6E-05                           | 6E-05                             |
| 57:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 5.95E-05                        | 5.95E-05                          |
| 58:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 5.89E-05                        | 5.89E-05                          |

## Appendix

### Catchment descriptors

| Name      | Value | User-defined value used? |
|-----------|-------|--------------------------|
| BFIHOST   | 0.8   | No                       |
| BFIHOST19 | 0.86  | No                       |
| PROPWET   | 0.34  | No                       |
| SAAR (mm) | 736   | No                       |

# UK Design Flood Estimation

Generated on 07 July 2023 12:59:58 by gfrisby  
Printed from the ReFH2 Flood Modelling software package, version 4.0.8560.23190

## Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

### Site details

Checksum: 8674-039E

Site name: FEH\_Point\_Descriptors\_403977\_196102\_v4\_0\_0

Easting: 403977

Northing: 196102

Country: England, Wales or Northern Ireland

Catchment Area (km<sup>2</sup>): 0.01

Using plot scale calculations: Yes

Model: 2.3

Site description: None

## Model run: 100 year 1.2 CC

### Summary of results

|                        |       |                                |      |
|------------------------|-------|--------------------------------|------|
| Rainfall - FEH13 (mm): | 84.76 | Total runoff (ML):             | 0.05 |
| Total Rainfall (mm):   | 60.16 | Total flow (ML):               | 0.17 |
| Peak Rainfall (mm):    | 10.26 | Peak flow (m <sup>3</sup> /s): | 0.00 |

### Parameters

*Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.*

*\* Indicates that the user locked the duration/timestep*

#### Rainfall parameters (Rainfall - FEH13)

| Name                             | Value               | User-defined? |
|----------------------------------|---------------------|---------------|
| Duration (hh:mm:ss)              | 06:00:00 [01:42:00] | Yes           |
| Timestep (hh:mm:ss)              | 00:24:00 [00:06:00] | Yes           |
| SCF (Seasonal correction factor) | 0.71                | No            |
| ARF (Areal reduction factor)     | 1                   | No            |
| Seasonality                      | Winter              | No            |
| Climate change factor            | 1.20                | Yes           |

#### Loss model parameters

| Name                        | Value  | User-defined? |
|-----------------------------|--------|---------------|
| Cini (mm)                   | 55.23  | No            |
| Cmax (mm)                   | 1040.6 | No            |
| Use alpha correction factor | No     | No            |
| Alpha correction factor     | n/a    | No            |

#### Routing model parameters

| Name    | Value | User-defined? |
|---------|-------|---------------|
| Tp (hr) | 1     | No            |
| Up      | 0.65  | No            |
| Uk      | 0.8   | No            |

#### Baseflow model parameters

| Name                    | Value | User-defined? |
|-------------------------|-------|---------------|
| BF0 (m <sup>3</sup> /s) | 0     | No            |
| BL (hr)                 | 41.19 | No            |
| BR                      | 3.48  | No            |

#### Urbanisation parameters

| Name                                      | Value | User-defined? |
|-------------------------------------------|-------|---------------|
| Sewer capacity (m <sup>3</sup> /s)        | 0     | No            |
| Exporting drained area (km <sup>2</sup> ) | 0     | No            |
| Urban area (km <sup>2</sup> )             | 0     | No            |
| Urbext 2000                               | 0     | No            |
| Impervious runoff factor                  | 0.7   | No            |
| Imperviousness factor                     | 0.4   | No            |
| Tp scaling factor                         | 0.75  | No            |
| Depression storage depth (mm)             | 0.5   | No            |

# Time series data

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 00:00:00           | 0.8993       | 0.0000                            | 0.0481           | 0.0000                        | 0                               | 0                                 |
| 00:24:00           | 1.3142       | 0.0000                            | 0.0717           | 0.0000                        | 2.93E-07                        | 1.77E-05                          |
| 00:48:00           | 1.9158       | 0.0000                            | 0.1075           | 0.0001                        | 1.9E-06                         | 7.99E-05                          |
| 01:12:00           | 2.7843       | 0.0000                            | 0.1625           | 0.0002                        | 6.5E-06                         | 0.000203                          |
| 01:36:00           | 4.0291       | 0.0000                            | 0.2484           | 0.0004                        | 1.58E-05                        | 0.000377                          |
| 02:00:00           | 5.7921       | 0.0000                            | 0.3844           | 0.0006                        | 3.17E-05                        | 0.000622                          |
| 02:24:00           | 8.2127       | 0.0000                            | 0.6003           | 0.0009                        | 5.69E-05                        | 0.000984                          |
| 02:48:00           | 10.2644      | 0.0000                            | 0.8414           | 0.0014                        | 9.63E-05                        | 0.00154                           |
| 03:12:00           | 8.2127       | 0.0000                            | 0.7462           | 0.0022                        | 0.000157                        | 0.00237                           |
| 03:36:00           | 5.7921       | 0.0000                            | 0.5652           | 0.0031                        | 0.000245                        | 0.00338                           |
| 04:00:00           | 4.0291       | 0.0000                            | 0.4118           | 0.0039                        | 0.000361                        | 0.00425                           |
| 04:24:00           | 2.7843       | 0.0000                            | 0.2937           | 0.0042                        | 0.000493                        | 0.00466                           |
| 04:48:00           | 1.9158       | 0.0000                            | 0.2064           | 0.0040                        | 0.000625                        | 0.00461                           |
| 05:12:00           | 1.3142       | 0.0000                            | 0.1436           | 0.0035                        | 0.000746                        | 0.00428                           |
| 05:36:00           | 0.8993       | 0.0000                            | 0.0993           | 0.0030                        | 0.000848                        | 0.00381                           |
| 06:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0023                        | 0.000929                        | 0.00328                           |
| 06:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0017                        | 0.000989                        | 0.00272                           |
| 06:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0012                        | 0.00103                         | 0.0022                            |
| 07:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0007                        | 0.00105                         | 0.00177                           |
| 07:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0004                        | 0.00106                         | 0.00146                           |
| 08:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0002                        | 0.00106                         | 0.00128                           |
| 08:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0001                        | 0.00105                         | 0.00116                           |
| 08:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00105                         | 0.00109                           |
| 09:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00104                         | 0.00105                           |
| 09:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00103                         | 0.00103                           |
| 10:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00102                         | 0.00102                           |
| 10:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00101                         | 0.00101                           |
| 10:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000998                        | 0.000998                          |
| 11:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000988                        | 0.000988                          |
| 11:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000979                        | 0.000979                          |
| 12:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000969                        | 0.000969                          |
| 12:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00096                         | 0.00096                           |
| 12:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000951                        | 0.000951                          |
| 13:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000941                        | 0.000941                          |
| 13:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000932                        | 0.000932                          |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 14:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000923                        | 0.000923                          |
| 14:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000914                        | 0.000914                          |
| 14:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000906                        | 0.000906                          |
| 15:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000897                        | 0.000897                          |
| 15:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000888                        | 0.000888                          |
| 16:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00088                         | 0.00088                           |
| 16:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000871                        | 0.000871                          |
| 16:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000863                        | 0.000863                          |
| 17:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000854                        | 0.000854                          |
| 17:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000846                        | 0.000846                          |
| 18:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000838                        | 0.000838                          |
| 18:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00083                         | 0.00083                           |
| 18:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000822                        | 0.000822                          |
| 19:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000814                        | 0.000814                          |
| 19:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000806                        | 0.000806                          |
| 20:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000798                        | 0.000798                          |
| 20:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00079                         | 0.00079                           |
| 20:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000783                        | 0.000783                          |
| 21:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000775                        | 0.000775                          |
| 21:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000768                        | 0.000768                          |
| 22:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00076                         | 0.00076                           |
| 22:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000753                        | 0.000753                          |
| 22:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000746                        | 0.000746                          |
| 23:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000738                        | 0.000738                          |
| 23:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000731                        | 0.000731                          |
| 24:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000724                        | 0.000724                          |
| 24:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000717                        | 0.000717                          |
| 24:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00071                         | 0.00071                           |
| 25:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000703                        | 0.000703                          |
| 25:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000697                        | 0.000697                          |
| 26:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00069                         | 0.00069                           |
| 26:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000683                        | 0.000683                          |
| 26:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000677                        | 0.000677                          |
| 27:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00067                         | 0.00067                           |
| 27:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000664                        | 0.000664                          |
| 28:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000657                        | 0.000657                          |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 28:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000651                        | 0.000651                          |
| 28:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000645                        | 0.000645                          |
| 29:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000638                        | 0.000638                          |
| 29:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000632                        | 0.000632                          |
| 30:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000626                        | 0.000626                          |
| 30:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00062                         | 0.00062                           |
| 30:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000614                        | 0.000614                          |
| 31:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000608                        | 0.000608                          |
| 31:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000602                        | 0.000602                          |
| 32:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000596                        | 0.000596                          |
| 32:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000591                        | 0.000591                          |
| 32:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000585                        | 0.000585                          |
| 33:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000579                        | 0.000579                          |
| 33:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000574                        | 0.000574                          |
| 34:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000568                        | 0.000568                          |
| 34:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000563                        | 0.000563                          |
| 34:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000557                        | 0.000557                          |
| 35:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000552                        | 0.000552                          |
| 35:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000546                        | 0.000546                          |
| 36:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000541                        | 0.000541                          |
| 36:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000536                        | 0.000536                          |
| 36:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000531                        | 0.000531                          |
| 37:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000526                        | 0.000526                          |
| 37:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000521                        | 0.000521                          |
| 38:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000516                        | 0.000516                          |
| 38:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000511                        | 0.000511                          |
| 38:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000506                        | 0.000506                          |
| 39:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000501                        | 0.000501                          |
| 39:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000496                        | 0.000496                          |
| 40:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000491                        | 0.000491                          |
| 40:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000486                        | 0.000486                          |
| 40:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000482                        | 0.000482                          |
| 41:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000477                        | 0.000477                          |
| 41:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000472                        | 0.000472                          |
| 42:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000468                        | 0.000468                          |
| 42:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000463                        | 0.000463                          |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 42:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000459                        | 0.000459                          |
| 43:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000454                        | 0.000454                          |
| 43:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00045                         | 0.00045                           |
| 44:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000446                        | 0.000446                          |
| 44:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000441                        | 0.000441                          |
| 44:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000437                        | 0.000437                          |
| 45:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000433                        | 0.000433                          |
| 45:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000429                        | 0.000429                          |
| 46:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000425                        | 0.000425                          |
| 46:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00042                         | 0.00042                           |
| 46:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000416                        | 0.000416                          |
| 47:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000412                        | 0.000412                          |
| 47:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000408                        | 0.000408                          |
| 48:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000404                        | 0.000404                          |
| 48:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000401                        | 0.000401                          |
| 48:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000397                        | 0.000397                          |
| 49:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000393                        | 0.000393                          |
| 49:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000389                        | 0.000389                          |
| 50:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000385                        | 0.000385                          |
| 50:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000382                        | 0.000382                          |
| 50:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000378                        | 0.000378                          |
| 51:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000374                        | 0.000374                          |
| 51:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000371                        | 0.000371                          |
| 52:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000367                        | 0.000367                          |
| 52:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000363                        | 0.000363                          |
| 52:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00036                         | 0.00036                           |
| 53:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000356                        | 0.000356                          |
| 53:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000353                        | 0.000353                          |
| 54:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.00035                         | 0.00035                           |
| 54:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000303                        | 0.000303                          |
| 54:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000301                        | 0.000301                          |
| 55:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000298                        | 0.000298                          |
| 55:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000295                        | 0.000295                          |
| 56:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 0.000292                        | 0.000292                          |
| 56:24:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 8.01E-05                        | 8.01E-05                          |
| 56:48:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.93E-05                        | 7.93E-05                          |

| Time<br>(hh:mm:ss) | Rain<br>(mm) | Sewer Loss<br>(m <sup>3</sup> /s) | Net Rain<br>(mm) | Runoff<br>(m <sup>3</sup> /s) | Baseflow<br>(m <sup>3</sup> /s) | Total Flow<br>(m <sup>3</sup> /s) |
|--------------------|--------------|-----------------------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| 57:12:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.86E-05                        | 7.86E-05                          |
| 57:36:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.78E-05                        | 7.78E-05                          |
| 58:00:00           | 0.0000       | 0.0000                            | 0.0000           | 0.0000                        | 7.7E-05                         | 7.7E-05                           |

## Appendix

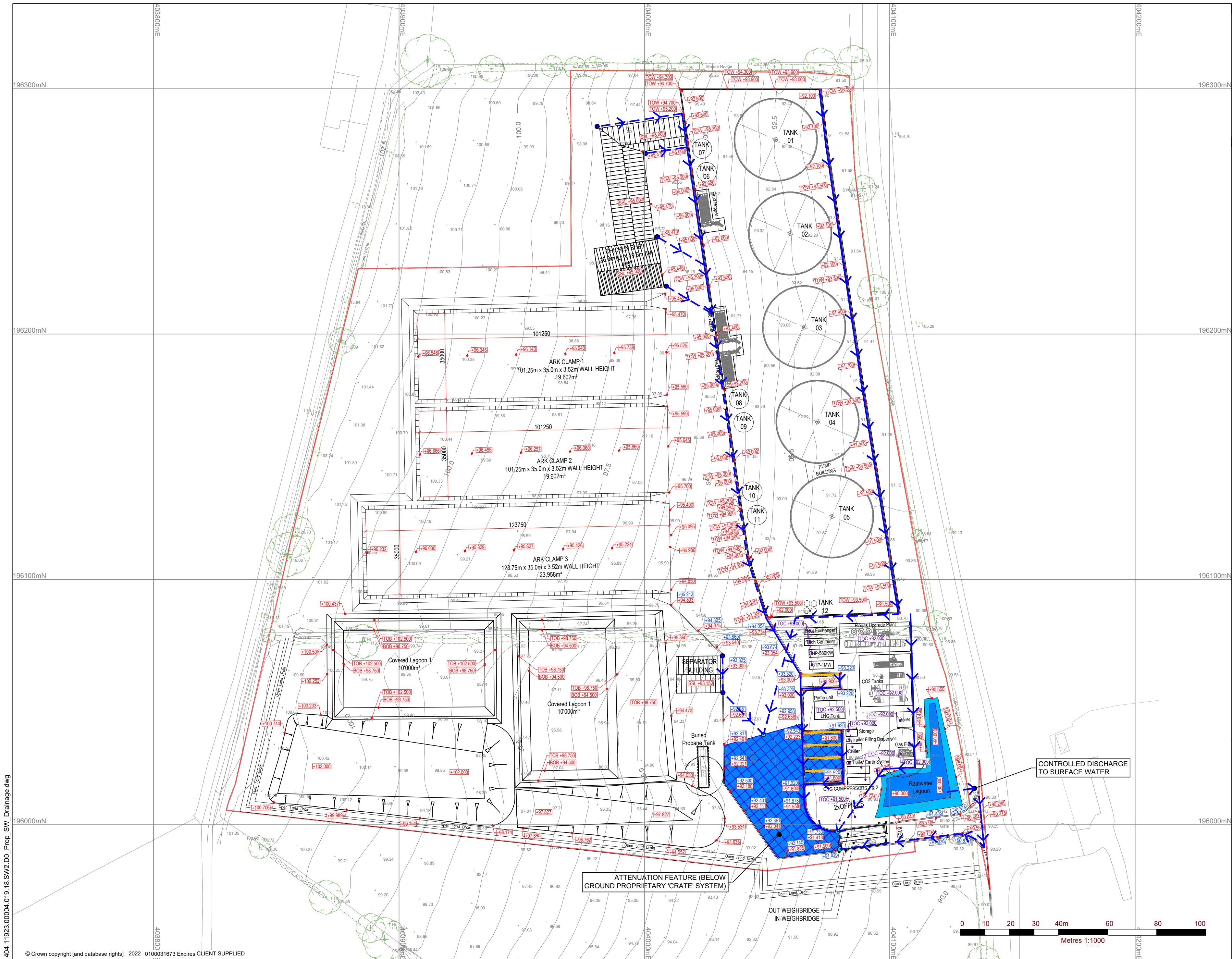
### Catchment descriptors

| Name      | Value | User-defined value used? |
|-----------|-------|--------------------------|
| BFIHOST   | 0.8   | No                       |
| BFIHOST19 | 0.86  | No                       |
| PROPWET   | 0.34  | No                       |
| SAAR (mm) | 736   | No                       |

## **APPENDIX 02**

### **PROPOSED SURFACE WATER DRAINAGE STRATEGY PLAN**





NOTES

1. DRAWING GENERATED FROM INFORMATION SUPPLIED BY THE CLIENT.  
REF: GGP-29419-P-101-E-Ashton  
Keynes-Site Layout (1).DWG, DATED: OCTOBER 2022.

LEGEND

- SITE BOUNDARY (69,900m<sup>2</sup>)
- TOP OF KERB LEVEL
- FINISHED GROUND LEVEL
- TOP OF CONCRETE LEVEL
- ANTICIPATED RAINWATER DOWN PIPE LOCATION
- INTERCEPTION / CONVEYANCE FEATURES (ACO DRAINS)
- PIPED FEATURES
- ATTENUATION FEATURE (BELOW GROUND PROPRIETARY 'CRATE' SYSTEM)
- BELOW GROUND PROPRIETARY 'CRATE' SYSTEM TERMINAL

acorn BIOENERGY

SLR

ASHTON KEYNES  
SURFACE WATER DRAINAGE STRATEGY  
PROPOSED SURFACE WATER DRAINAGE STRATEGY PLAN  
SW2

Scale 1:1000 @ A2 Date FEBRUARY 2023

404.11923.00004.019.18.SW2.D0\_Prop\_SW\_Drainage.dwg

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## **APPENDIX 03**

### **Revised MicroDrainage Model**



|                                                            |                                      |                                                                                     |
|------------------------------------------------------------|--------------------------------------|-------------------------------------------------------------------------------------|
| SLR Consulting Ltd                                         |                                      | Page 1                                                                              |
| 4/5 Lockside View<br>Edinburgh Park<br>Edinburgh, EH12 9DH |                                      |  |
| Date 07/07/2023 15:32<br>File CELLULAR STORAGE ARRANG...   | Designed by cmiddleton<br>Checked by |                                                                                     |
| Innovyze Source Control 2020.1.3                           |                                      |                                                                                     |

| Summary of Results for 100 year Return Period (+20%) |                     |                     |                              |                         |                           |                       |        |
|------------------------------------------------------|---------------------|---------------------|------------------------------|-------------------------|---------------------------|-----------------------|--------|
| Half Drain Time : 1073 minutes.                      |                     |                     |                              |                         |                           |                       |        |
| Storm<br>Event                                       | Max<br>Level<br>(m) | Max<br>Depth<br>(m) | Max<br>Infiltration<br>(l/s) | Max<br>Control<br>(l/s) | Max<br>Σ Outflow<br>(l/s) | Max<br>Volume<br>(m³) | Status |
| 15 min Summer                                        | 88.818              | 0.328               | 0.0                          | 3.3                     | 3.3                       | 477.5                 | O K    |
| 30 min Summer                                        | 88.917              | 0.427               | 0.0                          | 5.2                     | 5.2                       | 621.3                 | O K    |
| 60 min Summer                                        | 89.009              | 0.519               | 0.0                          | 9.2                     | 9.2                       | 755.4                 | O K    |
| 120 min Summer                                       | 89.121              | 0.631               | 0.0                          | 9.8                     | 9.8                       | 918.4                 | O K    |
| 180 min Summer                                       | 89.190              | 0.700               | 0.0                          | 11.2                    | 11.2                      | 1019.0                | O K    |
| 240 min Summer                                       | 89.235              | 0.745               | 0.0                          | 12.1                    | 12.1                      | 1084.6                | O K    |
| 360 min Summer                                       | 89.284              | 0.794               | 0.0                          | 13.1                    | 13.1                      | 1155.9                | O K    |
| 480 min Summer                                       | 89.303              | 0.813               | 0.0                          | 13.2                    | 13.2                      | 1183.9                | O K    |
| 600 min Summer                                       | 89.307              | 0.817               | 0.0                          | 13.2                    | 13.2                      | 1188.9                | O K    |
| 720 min Summer                                       | 89.303              | 0.813               | 0.0                          | 13.2                    | 13.2                      | 1183.2                | O K    |
| 960 min Summer                                       | 89.290              | 0.800               | 0.0                          | 13.2                    | 13.2                      | 1164.8                | O K    |
| 1440 min Summer                                      | 89.258              | 0.768               | 0.0                          | 12.6                    | 12.6                      | 1118.7                | O K    |
| 2160 min Summer                                      | 89.209              | 0.719               | 0.0                          | 11.6                    | 11.6                      | 1046.1                | O K    |
| 2880 min Summer                                      | 89.164              | 0.674               | 0.0                          | 10.7                    | 10.7                      | 981.9                 | O K    |
| 4320 min Summer                                      | 89.103              | 0.613               | 0.0                          | 9.5                     | 9.5                       | 892.0                 | O K    |
| 5760 min Summer                                      | 89.062              | 0.572               | 0.0                          | 9.2                     | 9.2                       | 832.9                 | O K    |
| 7200 min Summer                                      | 89.040              | 0.550               | 0.0                          | 9.2                     | 9.2                       | 801.1                 | O K    |
| 8640 min Summer                                      | 89.028              | 0.538               | 0.0                          | 9.2                     | 9.2                       | 783.5                 | O K    |
| 10080 min Summer                                     | 89.023              | 0.533               | 0.0                          | 9.2                     | 9.2                       | 775.6                 | O K    |
| 15 min Winter                                        | 88.858              | 0.368               | 0.0                          | 3.5                     | 3.5                       | 535.5                 | O K    |

| Storm<br>Event   | Rain<br>(mm/hr) | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins) |
|------------------|-----------------|---------------------------|-----------------------------|---------------------|
| 15 min Summer    | 124.281         | 0.0                       | 277.2                       | 35                  |
| 30 min Summer    | 81.100          | 0.0                       | 298.4                       | 49                  |
| 60 min Summer    | 50.030          | 0.0                       | 658.6                       | 78                  |
| 120 min Summer   | 31.020          | 0.0                       | 778.2                       | 136                 |
| 180 min Summer   | 23.410          | 0.0                       | 863.8                       | 194                 |
| 240 min Summer   | 19.080          | 0.0                       | 929.3                       | 252                 |
| 360 min Summer   | 14.126          | 0.0                       | 1020.0                      | 366                 |
| 480 min Summer   | 11.297          | 0.0                       | 1078.0                      | 484                 |
| 600 min Summer   | 9.442           | 0.0                       | 1117.0                      | 600                 |
| 720 min Summer   | 8.125           | 0.0                       | 1144.5                      | 650                 |
| 960 min Summer   | 6.367           | 0.0                       | 1177.6                      | 762                 |
| 1440 min Summer  | 4.470           | 0.0                       | 1198.6                      | 1022                |
| 2160 min Summer  | 3.121           | 0.0                       | 1743.8                      | 1440                |
| 2880 min Summer  | 2.428           | 0.0                       | 1725.4                      | 1860                |
| 4320 min Summer  | 1.737           | 0.0                       | 1656.6                      | 2696                |
| 5760 min Summer  | 1.393           | 0.0                       | 2083.0                      | 3480                |
| 7200 min Summer  | 1.197           | 0.0                       | 2235.8                      | 4256                |
| 8640 min Summer  | 1.071           | 0.0                       | 2401.4                      | 5024                |
| 10080 min Summer | 0.986           | 0.0                       | 2539.3                      | 5760                |
| 15 min Winter    | 124.281         | 0.0                       | 281.3                       | 35                  |

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|                                                            |                        |                                                                                     |
|------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|
| SLR Consulting Ltd                                         |                        | Page 3                                                                              |
| 4/5 Lockside View<br>Edinburgh Park<br>Edinburgh, EH12 9DH |                        |  |
| Date 07/07/2023 15:32                                      | Designed by cmiddleton |                                                                                     |
| File CELLULAR STORAGE ARRANG...                            | Checked by             |                                                                                     |
| Innovyze                                                   |                        | Source Control 2020.1.3                                                             |

Rainfall Details

|                       |                                 |
|-----------------------|---------------------------------|
| Rainfall Model        | FEH                             |
| Return Period (years) | 100                             |
| FEH Rainfall Version  | 2013                            |
| Site Location         | GB 403977 196102 SU 03977 96102 |
| Data Type             | Point                           |
| Summer Storms         | Yes                             |
| Winter Storms         | Yes                             |
| Cv (Summer)           | 0.750                           |
| Cv (Winter)           | 0.840                           |
| Shortest Storm (mins) | 15                              |
| Longest Storm (mins)  | 10080                           |
| Climate Change %      | +20                             |

Time Area Diagram

Total Area (ha) 2.077

| Time (mins) | Area  | Time (mins) | Area  | Time (mins) | Area  |
|-------------|-------|-------------|-------|-------------|-------|
| From: To:   | (ha)  | From: To:   | (ha)  | From: To:   | (ha)  |
| 0 4         | 0.415 | 8 12        | 0.415 | 16 20       | 0.416 |
| 4 8         | 0.415 | 12 16       | 0.416 |             |       |

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| SLR Consulting Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         | Page 4                                                                              |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------|------------|-----------|----------------|-----------|------------|----------------|-------|--------|--------|-------|-----|--------|-------|--------|--------|--|--|--|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-------|--------|-------|---------|-------|--------|-------|--------|-------|--------|-------|---------|-------|--------|-------|--------|-------|--------|-------|---------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|--|--|-------|---------|-------|--------|-------|--------|--|--|
| 4/5 Lockside View<br>Edinburgh Park<br>Edinburgh, EH12 9DH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                         |  |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| Date 07/07/2023 15:32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Designed by cmiddleton  |                                                                                     |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| File CELLULAR STORAGE ARRANG...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Checked by              |                                                                                     |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Source Control 2020.1.3 |                                                                                     |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| <div>Model Details</div> <div>Storage is Online Cover Level (m) 91.413</div> <div>Cellular Storage Structure</div> <div>Invert Level (m) 88.490 Safety Factor 2.0<br/>Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95<br/>Infiltration Coefficient Side (m/hr) 0.00000</div> <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>0.000</td><td>1532.4</td><td>1532.4</td><td>1.051</td><td>0.0</td><td>1532.4</td></tr><tr><td>1.050</td><td>1532.4</td><td>1532.4</td><td></td><td></td><td></td></tr></table> <div>Pump Outflow Control</div> <div>Invert Level (m) 88.490</div> <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.001</td><td>3.2000</td><td>0.900</td><td>13.2000</td><td>1.700</td><td>0.0000</td><td>2.500</td><td>0.0000</td></tr><tr><td>0.100</td><td>3.2000</td><td>1.000</td><td>16.5000</td><td>1.800</td><td>0.0000</td><td>2.600</td><td>0.0000</td></tr><tr><td>0.200</td><td>3.2000</td><td>1.050</td><td>16.5000</td><td>1.900</td><td>0.0000</td><td>2.700</td><td>0.0000</td></tr><tr><td>0.300</td><td>3.2000</td><td>1.200</td><td>0.0000</td><td>2.000</td><td>0.0000</td><td>2.800</td><td>0.0000</td></tr><tr><td>0.400</td><td>3.7000</td><td>1.300</td><td>0.0000</td><td>2.100</td><td>0.0000</td><td>2.900</td><td>0.0000</td></tr><tr><td>0.500</td><td>9.2000</td><td>1.400</td><td>0.0000</td><td>2.200</td><td>0.0000</td><td>3.000</td><td>0.0000</td></tr><tr><td>0.600</td><td>9.2000</td><td>1.500</td><td>0.0000</td><td>2.300</td><td>0.0000</td><td></td><td></td></tr><tr><td>0.800</td><td>13.2000</td><td>1.600</td><td>0.0000</td><td>2.400</td><td>0.0000</td><td></td><td></td></tr></table> |                         |                                                                                     | Depth (m)  | Area (m²) | Inf. Area (m²) | Depth (m) | Area (m²)  | Inf. Area (m²) | 0.000 | 1532.4 | 1532.4 | 1.051 | 0.0 | 1532.4 | 1.050 | 1532.4 | 1532.4 |  |  |  | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | 0.001 | 3.2000 | 0.900 | 13.2000 | 1.700 | 0.0000 | 2.500 | 0.0000 | 0.100 | 3.2000 | 1.000 | 16.5000 | 1.800 | 0.0000 | 2.600 | 0.0000 | 0.200 | 3.2000 | 1.050 | 16.5000 | 1.900 | 0.0000 | 2.700 | 0.0000 | 0.300 | 3.2000 | 1.200 | 0.0000 | 2.000 | 0.0000 | 2.800 | 0.0000 | 0.400 | 3.7000 | 1.300 | 0.0000 | 2.100 | 0.0000 | 2.900 | 0.0000 | 0.500 | 9.2000 | 1.400 | 0.0000 | 2.200 | 0.0000 | 3.000 | 0.0000 | 0.600 | 9.2000 | 1.500 | 0.0000 | 2.300 | 0.0000 |  |  | 0.800 | 13.2000 | 1.600 | 0.0000 | 2.400 | 0.0000 |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Area (m²)               | Inf. Area (m²)                                                                      | Depth (m)  | Area (m²) | Inf. Area (m²) |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1532.4                  | 1532.4                                                                              | 1.051      | 0.0       | 1532.4         |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 1.050                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1532.4                  | 1532.4                                                                              |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Flow (l/s)              | Depth (m)                                                                           | Flow (l/s) | Depth (m) | Flow (l/s)     | Depth (m) | Flow (l/s) |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.2000                  | 0.900                                                                               | 13.2000    | 1.700     | 0.0000         | 2.500     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.2000                  | 1.000                                                                               | 16.5000    | 1.800     | 0.0000         | 2.600     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.2000                  | 1.050                                                                               | 16.5000    | 1.900     | 0.0000         | 2.700     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.2000                  | 1.200                                                                               | 0.0000     | 2.000     | 0.0000         | 2.800     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.400                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.7000                  | 1.300                                                                               | 0.0000     | 2.100     | 0.0000         | 2.900     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.2000                  | 1.400                                                                               | 0.0000     | 2.200     | 0.0000         | 3.000     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.2000                  | 1.500                                                                               | 0.0000     | 2.300     | 0.0000         |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 13.2000                 | 1.600                                                                               | 0.0000     | 2.400     | 0.0000         |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
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|                                                            |                                      |                                                                                     |
|------------------------------------------------------------|--------------------------------------|-------------------------------------------------------------------------------------|
| SLR Consulting Ltd                                         |                                      | Page 1                                                                              |
| 4/5 Lockside View<br>Edinburgh Park<br>Edinburgh, EH12 9DH |                                      |  |
| Date 07/07/2023 15:32<br>File CELLULAR STORAGE ARRANG...   | Designed by cmiddleton<br>Checked by |                                                                                     |
| Innovyze Source Control 2020.1.3                           |                                      |                                                                                     |

| Summary of Results for 100 year Return Period |                     |                     |                              |                         |                           |                       |        |
|-----------------------------------------------|---------------------|---------------------|------------------------------|-------------------------|---------------------------|-----------------------|--------|
| Half Drain Time : 1170 minutes.               |                     |                     |                              |                         |                           |                       |        |
| Storm<br>Event                                | Max<br>Level<br>(m) | Max<br>Depth<br>(m) | Max<br>Infiltration<br>(1/s) | Max<br>Control<br>(1/s) | Max<br>Σ Outflow<br>(1/s) | Max<br>Volume<br>(m³) | Status |
| 15 min Summer                                 | 88.763              | 0.273               | 0.0                          | 3.2                     | 3.2                       | 396.9                 | O K    |
| 30 min Summer                                 | 88.845              | 0.355               | 0.0                          | 3.5                     | 3.5                       | 517.1                 | O K    |
| 60 min Summer                                 | 88.924              | 0.434               | 0.0                          | 5.6                     | 5.6                       | 632.3                 | O K    |
| 120 min Summer                                | 89.014              | 0.524               | 0.0                          | 9.2                     | 9.2                       | 762.7                 | O K    |
| 180 min Summer                                | 89.071              | 0.581               | 0.0                          | 9.2                     | 9.2                       | 845.7                 | O K    |
| 240 min Summer                                | 89.109              | 0.619               | 0.0                          | 9.6                     | 9.6                       | 901.8                 | O K    |
| 360 min Summer                                | 89.151              | 0.661               | 0.0                          | 10.4                    | 10.4                      | 962.4                 | O K    |
| 480 min Summer                                | 89.167              | 0.677               | 0.0                          | 10.7                    | 10.7                      | 985.6                 | O K    |
| 600 min Summer                                | 89.169              | 0.679               | 0.0                          | 10.8                    | 10.8                      | 989.2                 | O K    |
| 720 min Summer                                | 89.166              | 0.676               | 0.0                          | 10.7                    | 10.7                      | 983.4                 | O K    |
| 960 min Summer                                | 89.154              | 0.664               | 0.0                          | 10.5                    | 10.5                      | 966.2                 | O K    |
| 1440 min Summer                               | 89.123              | 0.633               | 0.0                          | 9.9                     | 9.9                       | 922.2                 | O K    |
| 2160 min Summer                               | 89.074              | 0.584               | 0.0                          | 9.2                     | 9.2                       | 850.3                 | O K    |
| 2880 min Summer                               | 89.030              | 0.540               | 0.0                          | 9.2                     | 9.2                       | 786.8                 | O K    |
| 4320 min Summer                               | 88.987              | 0.497               | 0.0                          | 9.0                     | 9.0                       | 723.1                 | O K    |
| 5760 min Summer                               | 88.968              | 0.478               | 0.0                          | 8.0                     | 8.0                       | 696.4                 | O K    |
| 7200 min Summer                               | 88.959              | 0.469               | 0.0                          | 7.5                     | 7.5                       | 682.8                 | O K    |
| 8640 min Summer                               | 88.954              | 0.464               | 0.0                          | 7.2                     | 7.2                       | 675.9                 | O K    |
| 10080 min Summer                              | 88.953              | 0.463               | 0.0                          | 7.2                     | 7.2                       | 674.0                 | O K    |
| 15 min Winter                                 | 88.796              | 0.306               | 0.0                          | 3.2                     | 3.2                       | 445.3                 | O K    |

| Storm<br>Event   | Rain<br>(mm/hr) | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins) |
|------------------|-----------------|---------------------------|-----------------------------|---------------------|
| 15 min Summer    | 103.567         | 0.0                       | 276.3                       | 35                  |
| 30 min Summer    | 67.584          | 0.0                       | 279.6                       | 49                  |
| 60 min Summer    | 41.692          | 0.0                       | 580.5                       | 78                  |
| 120 min Summer   | 25.850          | 0.0                       | 670.8                       | 136                 |
| 180 min Summer   | 19.508          | 0.0                       | 736.9                       | 194                 |
| 240 min Summer   | 15.900          | 0.0                       | 785.3                       | 252                 |
| 360 min Summer   | 11.772          | 0.0                       | 852.8                       | 368                 |
| 480 min Summer   | 9.414           | 0.0                       | 896.0                       | 484                 |
| 600 min Summer   | 7.868           | 0.0                       | 924.7                       | 600                 |
| 720 min Summer   | 6.771           | 0.0                       | 944.2                       | 664                 |
| 960 min Summer   | 5.306           | 0.0                       | 965.6                       | 778                 |
| 1440 min Summer  | 3.725           | 0.0                       | 974.2                       | 1038                |
| 2160 min Summer  | 2.601           | 0.0                       | 1457.8                      | 1456                |
| 2880 min Summer  | 2.024           | 0.0                       | 1476.7                      | 1852                |
| 4320 min Summer  | 1.448           | 0.0                       | 1369.8                      | 2644                |
| 5760 min Summer  | 1.161           | 0.0                       | 1735.9                      | 3464                |
| 7200 min Summer  | 0.997           | 0.0                       | 1863.1                      | 4264                |
| 8640 min Summer  | 0.892           | 0.0                       | 2001.3                      | 5096                |
| 10080 min Summer | 0.822           | 0.0                       | 2149.3                      | 5856                |
| 15 min Winter    | 103.567         | 0.0                       | 276.3                       | 34                  |

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|                                                            |                        |                                                                                     |
|------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|
| SLR Consulting Ltd                                         |                        | Page 3                                                                              |
| 4/5 Lockside View<br>Edinburgh Park<br>Edinburgh, EH12 9DH |                        |  |
| Date 07/07/2023 15:32                                      | Designed by cmiddleton |                                                                                     |
| File CELLULAR STORAGE ARRANG...                            | Checked by             |                                                                                     |
| Innovyze                                                   |                        | Source Control 2020.1.3                                                             |

Rainfall Details

|                       |                                 |
|-----------------------|---------------------------------|
| Rainfall Model        | FEH                             |
| Return Period (years) | 100                             |
| FEH Rainfall Version  | 2013                            |
| Site Location         | GB 403977 196102 SU 03977 96102 |
| Data Type             | Point                           |
| Summer Storms         | Yes                             |
| Winter Storms         | Yes                             |
| Cv (Summer)           | 0.750                           |
| Cv (Winter)           | 0.840                           |
| Shortest Storm (mins) | 15                              |
| Longest Storm (mins)  | 10080                           |
| Climate Change %      | +0                              |

Time Area Diagram

Total Area (ha) 2.077

| Time (mins) | Area  | Time (mins) | Area  | Time (mins) | Area  |
|-------------|-------|-------------|-------|-------------|-------|
| From: To:   | (ha)  | From: To:   | (ha)  | From: To:   | (ha)  |
| 0 4         | 0.415 | 8 12        | 0.415 | 16 20       | 0.416 |
| 4 8         | 0.415 | 12 16       | 0.416 |             |       |

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| SLR Consulting Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         | Page 4                                                                              |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------|------------|-----------|----------------|-----------|------------|----------------|-------|--------|--------|-------|-----|--------|-------|--------|--------|--|--|--|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-------|--------|-------|---------|-------|--------|-------|--------|-------|--------|-------|---------|-------|--------|-------|--------|-------|--------|-------|---------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|--|--|-------|---------|-------|--------|-------|--------|--|--|
| 4/5 Lockside View<br>Edinburgh Park<br>Edinburgh, EH12 9DH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                         |  |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| Date 07/07/2023 15:32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Designed by cmiddleton  |                                                                                     |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| File CELLULAR STORAGE ARRANG...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Checked by              |                                                                                     |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Source Control 2020.1.3 |                                                                                     |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| <div>Model Details</div> <div>Storage is Online Cover Level (m) 91.413</div> <div>Cellular Storage Structure</div> <div>Invert Level (m) 88.490 Safety Factor 2.0<br/>Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95<br/>Infiltration Coefficient Side (m/hr) 0.00000</div> <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>0.000</td><td>1532.4</td><td>1532.4</td><td>1.051</td><td>0.0</td><td>1532.4</td></tr><tr><td>1.050</td><td>1532.4</td><td>1532.4</td><td></td><td></td><td></td></tr></table> <div>Pump Outflow Control</div> <div>Invert Level (m) 88.490</div> <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.001</td><td>3.2000</td><td>0.900</td><td>13.2000</td><td>1.700</td><td>0.0000</td><td>2.500</td><td>0.0000</td></tr><tr><td>0.100</td><td>3.2000</td><td>1.000</td><td>16.5000</td><td>1.800</td><td>0.0000</td><td>2.600</td><td>0.0000</td></tr><tr><td>0.200</td><td>3.2000</td><td>1.050</td><td>16.5000</td><td>1.900</td><td>0.0000</td><td>2.700</td><td>0.0000</td></tr><tr><td>0.300</td><td>3.2000</td><td>1.200</td><td>0.0000</td><td>2.000</td><td>0.0000</td><td>2.800</td><td>0.0000</td></tr><tr><td>0.400</td><td>3.7000</td><td>1.300</td><td>0.0000</td><td>2.100</td><td>0.0000</td><td>2.900</td><td>0.0000</td></tr><tr><td>0.500</td><td>9.2000</td><td>1.400</td><td>0.0000</td><td>2.200</td><td>0.0000</td><td>3.000</td><td>0.0000</td></tr><tr><td>0.600</td><td>9.2000</td><td>1.500</td><td>0.0000</td><td>2.300</td><td>0.0000</td><td></td><td></td></tr><tr><td>0.800</td><td>13.2000</td><td>1.600</td><td>0.0000</td><td>2.400</td><td>0.0000</td><td></td><td></td></tr></table> |                         |                                                                                     | Depth (m)  | Area (m²) | Inf. Area (m²) | Depth (m) | Area (m²)  | Inf. Area (m²) | 0.000 | 1532.4 | 1532.4 | 1.051 | 0.0 | 1532.4 | 1.050 | 1532.4 | 1532.4 |  |  |  | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | 0.001 | 3.2000 | 0.900 | 13.2000 | 1.700 | 0.0000 | 2.500 | 0.0000 | 0.100 | 3.2000 | 1.000 | 16.5000 | 1.800 | 0.0000 | 2.600 | 0.0000 | 0.200 | 3.2000 | 1.050 | 16.5000 | 1.900 | 0.0000 | 2.700 | 0.0000 | 0.300 | 3.2000 | 1.200 | 0.0000 | 2.000 | 0.0000 | 2.800 | 0.0000 | 0.400 | 3.7000 | 1.300 | 0.0000 | 2.100 | 0.0000 | 2.900 | 0.0000 | 0.500 | 9.2000 | 1.400 | 0.0000 | 2.200 | 0.0000 | 3.000 | 0.0000 | 0.600 | 9.2000 | 1.500 | 0.0000 | 2.300 | 0.0000 |  |  | 0.800 | 13.2000 | 1.600 | 0.0000 | 2.400 | 0.0000 |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Area (m²)               | Inf. Area (m²)                                                                      | Depth (m)  | Area (m²) | Inf. Area (m²) |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1532.4                  | 1532.4                                                                              | 1.051      | 0.0       | 1532.4         |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 1.050                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1532.4                  | 1532.4                                                                              |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Flow (l/s)              | Depth (m)                                                                           | Flow (l/s) | Depth (m) | Flow (l/s)     | Depth (m) | Flow (l/s) |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.2000                  | 0.900                                                                               | 13.2000    | 1.700     | 0.0000         | 2.500     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.2000                  | 1.000                                                                               | 16.5000    | 1.800     | 0.0000         | 2.600     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.2000                  | 1.050                                                                               | 16.5000    | 1.900     | 0.0000         | 2.700     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.2000                  | 1.200                                                                               | 0.0000     | 2.000     | 0.0000         | 2.800     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.400                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.7000                  | 1.300                                                                               | 0.0000     | 2.100     | 0.0000         | 2.900     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.2000                  | 1.400                                                                               | 0.0000     | 2.200     | 0.0000         | 3.000     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.2000                  | 1.500                                                                               | 0.0000     | 2.300     | 0.0000         |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 13.2000                 | 1.600                                                                               | 0.0000     | 2.400     | 0.0000         |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
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|                                                            |                                      |                                                                                     |
|------------------------------------------------------------|--------------------------------------|-------------------------------------------------------------------------------------|
| SLR Consulting Ltd                                         |                                      | Page 1                                                                              |
| 4/5 Lockside View<br>Edinburgh Park<br>Edinburgh, EH12 9DH |                                      |  |
| Date 07/07/2023 15:35<br>File CELLULAR STORAGE ARRANG...   | Designed by cmiddleton<br>Checked by |                                                                                     |
| Innovyze Source Control 2020.1.3                           |                                      |                                                                                     |

| Summary of Results for 30 year Return Period |               |               |                        |                   |                     |                 |        |
|----------------------------------------------|---------------|---------------|------------------------|-------------------|---------------------|-----------------|--------|
| Half Drain Time : 1149 minutes.              |               |               |                        |                   |                     |                 |        |
| Storm Event                                  | Max Level (m) | Max Depth (m) | Max Infiltration (1/s) | Max Control (1/s) | Max Σ Outflow (1/s) | Max Volume (m³) | Status |
| 15 min Summer                                | 88.697        | 0.207         | 0.0                    | 3.2               | 3.2                 | 301.3           | O K    |
| 30 min Summer                                | 88.756        | 0.266         | 0.0                    | 3.2               | 3.2                 | 386.7           | O K    |
| 60 min Summer                                | 88.815        | 0.325         | 0.0                    | 3.3               | 3.3                 | 473.6           | O K    |
| 120 min Summer                               | 88.889        | 0.399         | 0.0                    | 3.7               | 3.7                 | 580.3           | O K    |
| 180 min Summer                               | 88.931        | 0.441         | 0.0                    | 6.0               | 6.0                 | 642.2           | O K    |
| 240 min Summer                               | 88.957        | 0.467         | 0.0                    | 7.4               | 7.4                 | 680.3           | O K    |
| 360 min Summer                               | 88.984        | 0.494         | 0.0                    | 8.9               | 8.9                 | 719.0           | O K    |
| 480 min Summer                               | 88.992        | 0.502         | 0.0                    | 9.2               | 9.2                 | 730.9           | O K    |
| 600 min Summer                               | 88.992        | 0.502         | 0.0                    | 9.2               | 9.2                 | 731.3           | O K    |
| 720 min Summer                               | 88.991        | 0.501         | 0.0                    | 9.2               | 9.2                 | 729.5           | O K    |
| 960 min Summer                               | 88.987        | 0.497         | 0.0                    | 9.0               | 9.0                 | 722.8           | O K    |
| 1440 min Summer                              | 88.972        | 0.482         | 0.0                    | 8.2               | 8.2                 | 701.8           | O K    |
| 2160 min Summer                              | 88.950        | 0.460         | 0.0                    | 7.0               | 7.0                 | 669.3           | O K    |
| 2880 min Summer                              | 88.935        | 0.445         | 0.0                    | 6.2               | 6.2                 | 647.5           | O K    |
| 4320 min Summer                              | 88.919        | 0.429         | 0.0                    | 5.3               | 5.3                 | 624.3           | O K    |
| 5760 min Summer                              | 88.910        | 0.420         | 0.0                    | 4.8               | 4.8                 | 611.8           | O K    |
| 7200 min Summer                              | 88.907        | 0.417         | 0.0                    | 4.6               | 4.6                 | 606.4           | O K    |
| 8640 min Summer                              | 88.906        | 0.416         | 0.0                    | 4.6               | 4.6                 | 605.1           | O K    |
| 10080 min Summer                             | 88.907        | 0.417         | 0.0                    | 4.6               | 4.6                 | 606.7           | O K    |
| 15 min Winter                                | 88.722        | 0.232         | 0.0                    | 3.2               | 3.2                 | 338.2           | O K    |

| Storm Event      | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|------------------|--------------|---------------------|-----------------------|------------------|
| 15 min Summer    | 78.977       | 0.0                 | 276.1                 | 34               |
| 30 min Summer    | 50.812       | 0.0                 | 276.1                 | 49               |
| 60 min Summer    | 31.351       | 0.0                 | 487.5                 | 78               |
| 120 min Summer   | 19.492       | 0.0                 | 563.5                 | 138              |
| 180 min Summer   | 14.684       | 0.0                 | 589.1                 | 194              |
| 240 min Summer   | 11.957       | 0.0                 | 618.3                 | 252              |
| 360 min Summer   | 8.864        | 0.0                 | 664.1                 | 366              |
| 480 min Summer   | 7.101        | 0.0                 | 693.6                 | 482              |
| 600 min Summer   | 5.953        | 0.0                 | 713.4                 | 564              |
| 720 min Summer   | 5.141        | 0.0                 | 727.0                 | 616              |
| 960 min Summer   | 4.065        | 0.0                 | 741.6                 | 740              |
| 1440 min Summer  | 2.896        | 0.0                 | 740.9                 | 1020             |
| 2160 min Summer  | 2.066        | 0.0                 | 1158.3                | 1468             |
| 2880 min Summer  | 1.636        | 0.0                 | 1217.0                | 1912             |
| 4320 min Summer  | 1.201        | 0.0                 | 1129.1                | 2780             |
| 5760 min Summer  | 0.980        | 0.0                 | 1464.9                | 3648             |
| 7200 min Summer  | 0.851        | 0.0                 | 1589.9                | 4480             |
| 8640 min Summer  | 0.767        | 0.0                 | 1718.8                | 5288             |
| 10080 min Summer | 0.708        | 0.0                 | 1852.6                | 6144             |
| 15 min Winter    | 78.977       | 0.0                 | 276.2                 | 34               |

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|                                                            |                     |                           |                              |                                      |                           |                       |                                                                                     |
|------------------------------------------------------------|---------------------|---------------------------|------------------------------|--------------------------------------|---------------------------|-----------------------|-------------------------------------------------------------------------------------|
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| 4/5 Lockside View<br>Edinburgh Park<br>Edinburgh, EH12 9DH |                     |                           |                              | Designed by cmiddleton<br>Checked by |                           |                       |  |
| Date 07/07/2023 15:35<br>File CELLULAR STORAGE ARRANG...   |                     |                           |                              |                                      |                           |                       |                                                                                     |
| Innovyze                                                   |                     |                           |                              | Source Control 2020.1.3              |                           |                       |                                                                                     |
| Summary of Results for 30 year Return Period               |                     |                           |                              |                                      |                           |                       |                                                                                     |
| Storm<br>Event                                             | Max<br>Level<br>(m) | Max<br>Depth<br>(m)       | Max<br>Infiltration<br>(l/s) | Max<br>Control<br>(l/s)              | Max<br>Σ Outflow<br>(l/s) | Max<br>Volume<br>(m³) | Status                                                                              |
| 30 min Winter                                              | 88.788              | 0.298                     | 0.0                          | 3.2                                  | 3.2                       | 434.4                 | O K                                                                                 |
| 60 min Winter                                              | 88.856              | 0.366                     | 0.0                          | 3.5                                  | 3.5                       | 532.3                 | O K                                                                                 |
| 120 min Winter                                             | 88.936              | 0.446                     | 0.0                          | 6.2                                  | 6.2                       | 649.9                 | O K                                                                                 |
| 180 min Winter                                             | 88.982              | 0.492                     | 0.0                          | 8.8                                  | 8.8                       | 716.3                 | O K                                                                                 |
| 240 min Winter                                             | 89.012              | 0.522                     | 0.0                          | 9.2                                  | 9.2                       | 759.3                 | O K                                                                                 |
| 360 min Winter                                             | 89.047              | 0.557                     | 0.0                          | 9.2                                  | 9.2                       | 810.8                 | O K                                                                                 |
| 480 min Winter                                             | 89.062              | 0.572                     | 0.0                          | 9.2                                  | 9.2                       | 833.4                 | O K                                                                                 |
| 600 min Winter                                             | 89.068              | 0.578                     | 0.0                          | 9.2                                  | 9.2                       | 840.8                 | O K                                                                                 |
| 720 min Winter                                             | 89.067              | 0.577                     | 0.0                          | 9.2                                  | 9.2                       | 839.4                 | O K                                                                                 |
| 960 min Winter                                             | 89.057              | 0.567                     | 0.0                          | 9.2                                  | 9.2                       | 825.4                 | O K                                                                                 |
| 1440 min Winter                                            | 89.035              | 0.545                     | 0.0                          | 9.2                                  | 9.2                       | 793.5                 | O K                                                                                 |
| 2160 min Winter                                            | 89.000              | 0.510                     | 0.0                          | 9.2                                  | 9.2                       | 743.1                 | O K                                                                                 |
| 2880 min Winter                                            | 88.977              | 0.487                     | 0.0                          | 8.5                                  | 8.5                       | 709.0                 | O K                                                                                 |
| 4320 min Winter                                            | 88.951              | 0.461                     | 0.0                          | 7.1                                  | 7.1                       | 671.3                 | O K                                                                                 |
| 5760 min Winter                                            | 88.936              | 0.446                     | 0.0                          | 6.2                                  | 6.2                       | 649.6                 | O K                                                                                 |
| 7200 min Winter                                            | 88.927              | 0.437                     | 0.0                          | 5.7                                  | 5.7                       | 636.4                 | O K                                                                                 |
| 8640 min Winter                                            | 88.922              | 0.432                     | 0.0                          | 5.4                                  | 5.4                       | 628.3                 | O K                                                                                 |
| 10080 min Winter                                           | 88.918              | 0.428                     | 0.0                          | 5.3                                  | 5.3                       | 623.7                 | O K                                                                                 |
| Storm<br>Event                                             | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³)  | Time-Peak<br>(mins)                  |                           |                       |                                                                                     |
| 30 min Winter                                              | 50.812              | 0.0                       | 276.0                        | 49                                   |                           |                       |                                                                                     |
| 60 min Winter                                              | 31.351              | 0.0                       | 546.3                        | 78                                   |                           |                       |                                                                                     |
| 120 min Winter                                             | 19.492              | 0.0                       | 590.8                        | 134                                  |                           |                       |                                                                                     |
| 180 min Winter                                             | 14.684              | 0.0                       | 639.6                        | 190                                  |                           |                       |                                                                                     |
| 240 min Winter                                             | 11.957              | 0.0                       | 679.3                        | 246                                  |                           |                       |                                                                                     |
| 360 min Winter                                             | 8.864               | 0.0                       | 732.6                        | 360                                  |                           |                       |                                                                                     |
| 480 min Winter                                             | 7.101               | 0.0                       | 765.7                        | 472                                  |                           |                       |                                                                                     |
| 600 min Winter                                             | 5.953               | 0.0                       | 788.4                        | 582                                  |                           |                       |                                                                                     |
| 720 min Winter                                             | 5.141               | 0.0                       | 804.7                        | 688                                  |                           |                       |                                                                                     |
| 960 min Winter                                             | 4.065               | 0.0                       | 825.9                        | 786                                  |                           |                       |                                                                                     |
| 1440 min Winter                                            | 2.896               | 0.0                       | 841.7                        | 1082                                 |                           |                       |                                                                                     |
| 2160 min Winter                                            | 2.066               | 0.0                       | 1297.0                       | 1520                                 |                           |                       |                                                                                     |
| 2880 min Winter                                            | 1.636               | 0.0                       | 1348.1                       | 1968                                 |                           |                       |                                                                                     |
| 4320 min Winter                                            | 1.201               | 0.0                       | 1261.2                       | 2868                                 |                           |                       |                                                                                     |
| 5760 min Winter                                            | 0.980               | 0.0                       | 1641.6                       | 3760                                 |                           |                       |                                                                                     |
| 7200 min Winter                                            | 0.851               | 0.0                       | 1780.8                       | 4632                                 |                           |                       |                                                                                     |
| 8640 min Winter                                            | 0.767               | 0.0                       | 1925.0                       | 5536                                 |                           |                       |                                                                                     |
| 10080 min Winter                                           | 0.708               | 0.0                       | 2075.6                       | 6360                                 |                           |                       |                                                                                     |
| ©1982-2020 Innovyze                                        |                     |                           |                              |                                      |                           |                       |                                                                                     |

|                                                            |                        |                                                                                     |
|------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|
| SLR Consulting Ltd                                         |                        | Page 3                                                                              |
| 4/5 Lockside View<br>Edinburgh Park<br>Edinburgh, EH12 9DH |                        |  |
| Date 07/07/2023 15:35                                      | Designed by cmiddleton |                                                                                     |
| File CELLULAR STORAGE ARRANG...                            | Checked by             |                                                                                     |
| Innovyze                                                   |                        | Source Control 2020.1.3                                                             |

Rainfall Details

|                       |                                 |
|-----------------------|---------------------------------|
| Rainfall Model        | FEH                             |
| Return Period (years) | 30                              |
| FEH Rainfall Version  | 2013                            |
| Site Location         | GB 403977 196102 SU 03977 96102 |
| Data Type             | Point                           |
| Summer Storms         | Yes                             |
| Winter Storms         | Yes                             |
| Cv (Summer)           | 0.750                           |
| Cv (Winter)           | 0.840                           |
| Shortest Storm (mins) | 15                              |
| Longest Storm (mins)  | 10080                           |
| Climate Change %      | +0                              |

Time Area Diagram

Total Area (ha) 2.077

| Time (mins) | Area  | Time (mins) | Area  | Time (mins) | Area  |
|-------------|-------|-------------|-------|-------------|-------|
| From: To:   | (ha)  | From: To:   | (ha)  | From: To:   | (ha)  |
| 0 4         | 0.415 | 8 12        | 0.415 | 16 20       | 0.416 |
| 4 8         | 0.415 | 12 16       | 0.416 |             |       |

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| SLR Consulting Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         | Page 4                                                                              |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------|------------|-----------|----------------|-----------|------------|----------------|-------|--------|--------|-------|-----|--------|-------|--------|--------|--|--|--|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-------|--------|-------|---------|-------|--------|-------|--------|-------|--------|-------|---------|-------|--------|-------|--------|-------|--------|-------|---------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|--|--|-------|---------|-------|--------|-------|--------|--|--|
| 4/5 Lockside View<br>Edinburgh Park<br>Edinburgh, EH12 9DH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                         |  |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| Date 07/07/2023 15:35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Designed by cmiddleton  |                                                                                     |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| File CELLULAR STORAGE ARRANG...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Checked by              |                                                                                     |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Source Control 2020.1.3 |                                                                                     |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| <div>Model Details</div> <div>Storage is Online Cover Level (m) 91.413</div> <div>Cellular Storage Structure</div> <div>Invert Level (m) 88.490 Safety Factor 2.0<br/>Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95<br/>Infiltration Coefficient Side (m/hr) 0.00000</div> <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>0.000</td><td>1532.4</td><td>1532.4</td><td>1.051</td><td>0.0</td><td>1532.4</td></tr><tr><td>1.050</td><td>1532.4</td><td>1532.4</td><td></td><td></td><td></td></tr></table> <div>Pump Outflow Control</div> <div>Invert Level (m) 88.490</div> <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.001</td><td>3.2000</td><td>0.900</td><td>13.2000</td><td>1.700</td><td>0.0000</td><td>2.500</td><td>0.0000</td></tr><tr><td>0.100</td><td>3.2000</td><td>1.000</td><td>16.5000</td><td>1.800</td><td>0.0000</td><td>2.600</td><td>0.0000</td></tr><tr><td>0.200</td><td>3.2000</td><td>1.050</td><td>16.5000</td><td>1.900</td><td>0.0000</td><td>2.700</td><td>0.0000</td></tr><tr><td>0.300</td><td>3.2000</td><td>1.200</td><td>0.0000</td><td>2.000</td><td>0.0000</td><td>2.800</td><td>0.0000</td></tr><tr><td>0.400</td><td>3.7000</td><td>1.300</td><td>0.0000</td><td>2.100</td><td>0.0000</td><td>2.900</td><td>0.0000</td></tr><tr><td>0.500</td><td>9.2000</td><td>1.400</td><td>0.0000</td><td>2.200</td><td>0.0000</td><td>3.000</td><td>0.0000</td></tr><tr><td>0.600</td><td>9.2000</td><td>1.500</td><td>0.0000</td><td>2.300</td><td>0.0000</td><td></td><td></td></tr><tr><td>0.800</td><td>13.2000</td><td>1.600</td><td>0.0000</td><td>2.400</td><td>0.0000</td><td></td><td></td></tr></table> |                         |                                                                                     | Depth (m)  | Area (m²) | Inf. Area (m²) | Depth (m) | Area (m²)  | Inf. Area (m²) | 0.000 | 1532.4 | 1532.4 | 1.051 | 0.0 | 1532.4 | 1.050 | 1532.4 | 1532.4 |  |  |  | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | 0.001 | 3.2000 | 0.900 | 13.2000 | 1.700 | 0.0000 | 2.500 | 0.0000 | 0.100 | 3.2000 | 1.000 | 16.5000 | 1.800 | 0.0000 | 2.600 | 0.0000 | 0.200 | 3.2000 | 1.050 | 16.5000 | 1.900 | 0.0000 | 2.700 | 0.0000 | 0.300 | 3.2000 | 1.200 | 0.0000 | 2.000 | 0.0000 | 2.800 | 0.0000 | 0.400 | 3.7000 | 1.300 | 0.0000 | 2.100 | 0.0000 | 2.900 | 0.0000 | 0.500 | 9.2000 | 1.400 | 0.0000 | 2.200 | 0.0000 | 3.000 | 0.0000 | 0.600 | 9.2000 | 1.500 | 0.0000 | 2.300 | 0.0000 |  |  | 0.800 | 13.2000 | 1.600 | 0.0000 | 2.400 | 0.0000 |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Area (m²)               | Inf. Area (m²)                                                                      | Depth (m)  | Area (m²) | Inf. Area (m²) |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1532.4                  | 1532.4                                                                              | 1.051      | 0.0       | 1532.4         |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 1.050                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1532.4                  | 1532.4                                                                              |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Flow (l/s)              | Depth (m)                                                                           | Flow (l/s) | Depth (m) | Flow (l/s)     | Depth (m) | Flow (l/s) |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.2000                  | 0.900                                                                               | 13.2000    | 1.700     | 0.0000         | 2.500     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.2000                  | 1.000                                                                               | 16.5000    | 1.800     | 0.0000         | 2.600     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.2000                  | 1.050                                                                               | 16.5000    | 1.900     | 0.0000         | 2.700     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.2000                  | 1.200                                                                               | 0.0000     | 2.000     | 0.0000         | 2.800     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.400                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.7000                  | 1.300                                                                               | 0.0000     | 2.100     | 0.0000         | 2.900     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.2000                  | 1.400                                                                               | 0.0000     | 2.200     | 0.0000         | 3.000     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.2000                  | 1.500                                                                               | 0.0000     | 2.300     | 0.0000         |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 13.2000                 | 1.600                                                                               | 0.0000     | 2.400     | 0.0000         |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| ©1982-2020 Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                         |                                                                                     |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |

|                                                            |                                      |                                                                                     |
|------------------------------------------------------------|--------------------------------------|-------------------------------------------------------------------------------------|
| SLR Consulting Ltd                                         |                                      | Page 1                                                                              |
| 4/5 Lockside View<br>Edinburgh Park<br>Edinburgh, EH12 9DH |                                      |  |
| Date 07/07/2023 15:36<br>File CELLULAR STORAGE ARRANG...   | Designed by cmiddleton<br>Checked by |                                                                                     |
| Innovyze Source Control 2020.1.3                           |                                      |                                                                                     |

| Summary of Results for 2 year Return Period |                     |                     |                              |                         |                           |                       |        |
|---------------------------------------------|---------------------|---------------------|------------------------------|-------------------------|---------------------------|-----------------------|--------|
| Half Drain Time : 1159 minutes.             |                     |                     |                              |                         |                           |                       |        |
| Storm<br>Event                              | Max<br>Level<br>(m) | Max<br>Depth<br>(m) | Max<br>Infiltration<br>(l/s) | Max<br>Control<br>(l/s) | Max<br>Σ Outflow<br>(l/s) | Max<br>Volume<br>(m³) | Status |
| 15 min Summer                               | 88.578              | 0.088               | 0.0                          | 3.2                     | 3.2                       | 128.7                 | O K    |
| 30 min Summer                               | 88.602              | 0.112               | 0.0                          | 3.2                     | 3.2                       | 162.7                 | O K    |
| 60 min Summer                               | 88.625              | 0.135               | 0.0                          | 3.2                     | 3.2                       | 196.4                 | O K    |
| 120 min Summer                              | 88.670              | 0.180               | 0.0                          | 3.2                     | 3.2                       | 261.6                 | O K    |
| 180 min Summer                              | 88.696              | 0.206               | 0.0                          | 3.2                     | 3.2                       | 300.2                 | O K    |
| 240 min Summer                              | 88.714              | 0.224               | 0.0                          | 3.2                     | 3.2                       | 325.6                 | O K    |
| 360 min Summer                              | 88.734              | 0.244               | 0.0                          | 3.2                     | 3.2                       | 355.0                 | O K    |
| 480 min Summer                              | 88.743              | 0.253               | 0.0                          | 3.2                     | 3.2                       | 368.5                 | O K    |
| 600 min Summer                              | 88.747              | 0.257               | 0.0                          | 3.2                     | 3.2                       | 373.8                 | O K    |
| 720 min Summer                              | 88.747              | 0.257               | 0.0                          | 3.2                     | 3.2                       | 374.1                 | O K    |
| 960 min Summer                              | 88.741              | 0.251               | 0.0                          | 3.2                     | 3.2                       | 365.3                 | O K    |
| 1440 min Summer                             | 88.729              | 0.239               | 0.0                          | 3.2                     | 3.2                       | 347.3                 | O K    |
| 2160 min Summer                             | 88.715              | 0.225               | 0.0                          | 3.2                     | 3.2                       | 328.3                 | O K    |
| 2880 min Summer                             | 88.706              | 0.216               | 0.0                          | 3.2                     | 3.2                       | 313.9                 | O K    |
| 4320 min Summer                             | 88.691              | 0.201               | 0.0                          | 3.2                     | 3.2                       | 293.1                 | O K    |
| 5760 min Summer                             | 88.680              | 0.190               | 0.0                          | 3.2                     | 3.2                       | 277.1                 | O K    |
| 7200 min Summer                             | 88.673              | 0.183               | 0.0                          | 3.2                     | 3.2                       | 265.8                 | O K    |
| 8640 min Summer                             | 88.667              | 0.177               | 0.0                          | 3.2                     | 3.2                       | 257.1                 | O K    |
| 10080 min Summer                            | 88.663              | 0.173               | 0.0                          | 3.2                     | 3.2                       | 251.7                 | O K    |
| 15 min Winter                               | 88.590              | 0.100               | 0.0                          | 3.2                     | 3.2                       | 144.9                 | O K    |

| Storm<br>Event   | Rain<br>(mm/hr) | Flooded<br>Volume<br>(m³) | Discharge<br>Volume<br>(m³) | Time-Peak<br>(mins) |
|------------------|-----------------|---------------------------|-----------------------------|---------------------|
| 15 min Summer    | 34.592          | 0.0                       | 134.1                       | 34                  |
| 30 min Summer    | 22.002          | 0.0                       | 170.7                       | 48                  |
| 60 min Summer    | 13.516          | 0.0                       | 209.9                       | 76                  |
| 120 min Summer   | 9.205           | 0.0                       | 286.0                       | 136                 |
| 180 min Summer   | 7.200           | 0.0                       | 335.9                       | 194                 |
| 240 min Summer   | 5.989           | 0.0                       | 372.4                       | 252                 |
| 360 min Summer   | 4.548           | 0.0                       | 424.3                       | 370                 |
| 480 min Summer   | 3.700           | 0.0                       | 461.1                       | 488                 |
| 600 min Summer   | 3.139           | 0.0                       | 489.0                       | 606                 |
| 720 min Summer   | 2.737           | 0.0                       | 511.7                       | 724                 |
| 960 min Summer   | 2.198           | 0.0                       | 547.7                       | 938                 |
| 1440 min Summer  | 1.611           | 0.0                       | 539.8                       | 1156                |
| 2160 min Summer  | 1.184           | 0.0                       | 663.0                       | 1544                |
| 2880 min Summer  | 0.958           | 0.0                       | 715.6                       | 1960                |
| 4320 min Summer  | 0.726           | 0.0                       | 813.4                       | 2780                |
| 5760 min Summer  | 0.606           | 0.0                       | 905.6                       | 3624                |
| 7200 min Summer  | 0.534           | 0.0                       | 997.4                       | 4408                |
| 8640 min Summer  | 0.485           | 0.0                       | 1088.3                      | 5208                |
| 10080 min Summer | 0.452           | 0.0                       | 1181.4                      | 6056                |
| 15 min Winter    | 34.592          | 0.0                       | 150.2                       | 34                  |

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|                                                            |                        |                                                                                     |
|------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|
| SLR Consulting Ltd                                         |                        | Page 3                                                                              |
| 4/5 Lockside View<br>Edinburgh Park<br>Edinburgh, EH12 9DH |                        |  |
| Date 07/07/2023 15:36                                      | Designed by cmiddleton |                                                                                     |
| File CELLULAR STORAGE ARRANG...                            | Checked by             |                                                                                     |
| Innovyze                                                   |                        | Source Control 2020.1.3                                                             |

Rainfall Details

|                       |                                 |
|-----------------------|---------------------------------|
| Rainfall Model        | FEH                             |
| Return Period (years) | 2                               |
| FEH Rainfall Version  | 2013                            |
| Site Location         | GB 403977 196102 SU 03977 96102 |
| Data Type             | Point                           |
| Summer Storms         | Yes                             |
| Winter Storms         | Yes                             |
| Cv (Summer)           | 0.750                           |
| Cv (Winter)           | 0.840                           |
| Shortest Storm (mins) | 15                              |
| Longest Storm (mins)  | 10080                           |
| Climate Change %      | +0                              |

Time Area Diagram

Total Area (ha) 2.077

| Time (mins) | Area  | Time (mins) | Area  | Time (mins) | Area  |
|-------------|-------|-------------|-------|-------------|-------|
| From: To:   | (ha)  | From: To:   | (ha)  | From: To:   | (ha)  |
| 0 4         | 0.415 | 8 12        | 0.415 | 16 20       | 0.416 |
| 4 8         | 0.415 | 12 16       | 0.416 |             |       |

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| SLR Consulting Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         | Page 4                                                                              |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------|------------|-----------|----------------|-----------|------------|----------------|-------|--------|--------|-------|-----|--------|-------|--------|--------|--|--|--|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-------|--------|-------|---------|-------|--------|-------|--------|-------|--------|-------|---------|-------|--------|-------|--------|-------|--------|-------|---------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|--|--|-------|---------|-------|--------|-------|--------|--|--|
| 4/5 Lockside View<br>Edinburgh Park<br>Edinburgh, EH12 9DH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                         |  |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| Date 07/07/2023 15:36                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Designed by cmiddleton  |                                                                                     |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| File CELLULAR STORAGE ARRANG...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Checked by              |                                                                                     |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Source Control 2020.1.3 |                                                                                     |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| <div>Model Details</div> <div>Storage is Online Cover Level (m) 91.413</div> <div>Cellular Storage Structure</div> <div>Invert Level (m) 88.490 Safety Factor 2.0<br/>Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95<br/>Infiltration Coefficient Side (m/hr) 0.00000</div> <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>0.000</td><td>1532.4</td><td>1532.4</td><td>1.051</td><td>0.0</td><td>1532.4</td></tr><tr><td>1.050</td><td>1532.4</td><td>1532.4</td><td></td><td></td><td></td></tr></table> <div>Pump Outflow Control</div> <div>Invert Level (m) 88.490</div> <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.001</td><td>3.2000</td><td>0.900</td><td>13.2000</td><td>1.700</td><td>0.0000</td><td>2.500</td><td>0.0000</td></tr><tr><td>0.100</td><td>3.2000</td><td>1.000</td><td>16.5000</td><td>1.800</td><td>0.0000</td><td>2.600</td><td>0.0000</td></tr><tr><td>0.200</td><td>3.2000</td><td>1.050</td><td>16.5000</td><td>1.900</td><td>0.0000</td><td>2.700</td><td>0.0000</td></tr><tr><td>0.300</td><td>3.2000</td><td>1.200</td><td>0.0000</td><td>2.000</td><td>0.0000</td><td>2.800</td><td>0.0000</td></tr><tr><td>0.400</td><td>3.7000</td><td>1.300</td><td>0.0000</td><td>2.100</td><td>0.0000</td><td>2.900</td><td>0.0000</td></tr><tr><td>0.500</td><td>9.2000</td><td>1.400</td><td>0.0000</td><td>2.200</td><td>0.0000</td><td>3.000</td><td>0.0000</td></tr><tr><td>0.600</td><td>9.2000</td><td>1.500</td><td>0.0000</td><td>2.300</td><td>0.0000</td><td></td><td></td></tr><tr><td>0.800</td><td>13.2000</td><td>1.600</td><td>0.0000</td><td>2.400</td><td>0.0000</td><td></td><td></td></tr></table> |                         |                                                                                     | Depth (m)  | Area (m²) | Inf. Area (m²) | Depth (m) | Area (m²)  | Inf. Area (m²) | 0.000 | 1532.4 | 1532.4 | 1.051 | 0.0 | 1532.4 | 1.050 | 1532.4 | 1532.4 |  |  |  | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | 0.001 | 3.2000 | 0.900 | 13.2000 | 1.700 | 0.0000 | 2.500 | 0.0000 | 0.100 | 3.2000 | 1.000 | 16.5000 | 1.800 | 0.0000 | 2.600 | 0.0000 | 0.200 | 3.2000 | 1.050 | 16.5000 | 1.900 | 0.0000 | 2.700 | 0.0000 | 0.300 | 3.2000 | 1.200 | 0.0000 | 2.000 | 0.0000 | 2.800 | 0.0000 | 0.400 | 3.7000 | 1.300 | 0.0000 | 2.100 | 0.0000 | 2.900 | 0.0000 | 0.500 | 9.2000 | 1.400 | 0.0000 | 2.200 | 0.0000 | 3.000 | 0.0000 | 0.600 | 9.2000 | 1.500 | 0.0000 | 2.300 | 0.0000 |  |  | 0.800 | 13.2000 | 1.600 | 0.0000 | 2.400 | 0.0000 |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Area (m²)               | Inf. Area (m²)                                                                      | Depth (m)  | Area (m²) | Inf. Area (m²) |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1532.4                  | 1532.4                                                                              | 1.051      | 0.0       | 1532.4         |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 1.050                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1532.4                  | 1532.4                                                                              |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Flow (l/s)              | Depth (m)                                                                           | Flow (l/s) | Depth (m) | Flow (l/s)     | Depth (m) | Flow (l/s) |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.2000                  | 0.900                                                                               | 13.2000    | 1.700     | 0.0000         | 2.500     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.2000                  | 1.000                                                                               | 16.5000    | 1.800     | 0.0000         | 2.600     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.2000                  | 1.050                                                                               | 16.5000    | 1.900     | 0.0000         | 2.700     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.2000                  | 1.200                                                                               | 0.0000     | 2.000     | 0.0000         | 2.800     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.400                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.7000                  | 1.300                                                                               | 0.0000     | 2.100     | 0.0000         | 2.900     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.2000                  | 1.400                                                                               | 0.0000     | 2.200     | 0.0000         | 3.000     | 0.0000     |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.2000                  | 1.500                                                                               | 0.0000     | 2.300     | 0.0000         |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| 0.800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 13.2000                 | 1.600                                                                               | 0.0000     | 2.400     | 0.0000         |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |
| ©1982-2020 Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                         |                                                                                     |            |           |                |           |            |                |       |        |        |       |     |        |       |        |        |  |  |  |           |            |           |            |           |            |           |            |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |         |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |       |        |  |  |       |         |       |        |       |        |  |  |