

Hob Lane Solar Farm: Flood Risk Assessment & Surface Water Management Strategy

Hob Lane Solar Farm Ltd

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1 INTRODUCTION

1.1 Background

Envireau Water has been commissioned by Stephenson Halliday to prepare a Flood Risk Assessment (FRA) and Surface Water Management Strategy for the construction and operation of a 30MWac solar photovoltaic ("PV") farm with associated infrastructure and landscape and ecological enhancements, for a temporary operational period of 40 years ('the proposed development') on land to the north and south of Rake Lane, Dunham-on-the-Hill, Chester ('the site'). This report has been prepared for Belltown Power UK Ltd (Belltown Power) on behalf of Hob Lane Solar Farm Ltd.

This FRA and Surface Water Management Strategy is intended to support a full planning application and as such the level of detail included is commensurate with and subject to the nature of the proposals.

1.2 Pre-Application Advice

This FRA and Surface Water Management Strategy takes account of pre-application advice (ref. 23/03713/PREAPP) received from Cheshire West and Chester Council in a letter dated 11 October 2024.

1.3 Scope of Work

The scope of work undertaken for this report includes the following:

- Description of the local physical and hydrological setting of the site (Section 2);
- Description and details of the proposed development (Section 3);
- Flood Risk Assessment for the proposed development (Section 4);
- Surface Water Management Strategy for the proposed development (Section 5);
- SuDS Maintenance and Management Plan (Section 6); and
- Conclusions of this report (Section 7).

1.4 Sources of Information

The following main sources of information have been used to support this report:

- Proposed development plans and drawings;
- Ordnance Survey 1:25,000 scale mapping;
- British Geological Survey 1:50,000 scale geological mapping;
- Soilscapes 1:250,000 scale soil type mapping;
- United Utilities sewerage asset records for the site;
- Environment Agency LiDAR Digital Terrain Model data;
- Environment Agency Flood Map for Planning (Rivers and Sea);
- Environment Agency Long-Term Flood Risk Information (Surface Water, Rivers and Reservoirs);
- Cheshire West and Chester Level 1 Strategic Flood Risk Assessment (JBA consulting, 2016); and
- British Geological Survey Susceptibility to Groundwater Flooding mapping.



2 SITE DESCRIPTION

The site is described in the sections below and is based on available desk-based information and observations from a walkover survey conducted by Envireau Water in February 2025.

2.1 Location and Setting

The site is situated c. 530 m to the south-east of Elton and 890 m to the north-west of Dunham-on-the-Hill, Chester (see Figure 1). The National Grid Reference for the site is SJ 46360 73852. The site area (red line boundary) covers 77 hectares (ha) and consists of ten fields, herein referred to as Fields A-K (see Figure 2). Field A is situated in the very north of the site and Field K in the very south.

The site is bounded by the M56 Motorway in the north, the A5117 road to the north-east and to the south by Hob Lane. Access into the site is via Common Lane from the A5117. Rake Lane intersects the approximate centre of site to the north of Hob Lane.

2.2 Existing Development and Land Use

The site currently consists of mixed arable and pastoral fields bound by mature trees and hedgerows (see Figure 2). A number of brick storage buildings associated with the former Royal Ordnance Factory (ROF) Dunham-on-the-Hill, a non-designated heritage asset, are dispersed across the site. An existing caravan park is located off Common Lane.

2.3 Topography

The topography of the site has been established using LiDAR Digital Terrain Model (DTM) data (Environment Agency, 2025). The LiDAR data and ground contours derived from that dataset are shown on Figure 3.

The site is very gently sloping with maximum and minimum elevations ranging from 14.0 m AOD in the north of the site to 9.0 m AOD in the south of the site.

The gradient of the land across the site is very low, averaging approximately 0.6 degrees or 1% slope (1 in 100).

2.4 Watercourses

Watercourses in the vicinity of the site have been identified using 1:25,000 scale Ordnance Survey (OS) mapping and are shown on Figure 1.

An unnamed Main River flows adjacent to the western boundary of the site in a north-westerly direction towards Elton (see Figure 1). The watercourse issues approximately 900 m south of the site and flows in an open channel until it reaches the A5117 road, 1.2 km north-west of the site, where it becomes culverted at Ellesmere Port Wastewater Treatment Plant.





	Application Site Boundary
_	Main River
+	Flow Direction



8.528 - 9.768
9.769 - 10.432
10.433 - 11.038
11.039 - 11.643
11.644 - 12.192
12.193 - 12.826
12.827 - 13.75
13.751 - 15.885



2.5 Artificial Waterbodies

There are no canals, lakes or reservoirs within the site boundary (see Figure 1). The nearest artificial waterbody is the Manchester Ship Canal, situated approximately 3 km to the north of the site.

Several small, shallow ponds are situated within the site boundary. Observations from the site walkover, suggest that they have been formed artificially at some point in the past due to their uniform shape.

2.6 Soils

The natural soil type at the site has been identified from Landis Soilscapes (Cranfield Soil and Agrifood Institute, 2025).

The soils across the entirety of the site are described as 'slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils'. The soils series information indicates that the soils have impeded drainage often resulting in seasonally wet pastures. The soil type description reflects observations taken on-site of localised, shallow water pooling on the ground surface in low areas.

2.7 Geology

The geology at the site has been established from British Geological Survey (BGS) England and Wales 1:50,000 scale mapping on the Onshore GeoIndex (British Geological Survey, 2025).

Superficial deposits of Till (clay, sand, gravel and boulders) overlay the entirety of the site with the bedrock geology beneath consisting of the Kinnerton Sandstone Formation. The superficial deposit at the site suggests there would be impeded drainage due the clay content of the deposits.

The site is not located within or nearby to a Source Protection Zone (SPZ) for groundwater (Natural England, 2025).

2.8 Sewers

United Utilities records indicate that there are no public sewers within the site boundary (see Appendix A).

2.9 Existing Drainage

An extensive network of deep, low gradient drainage channels is present within the site boundary. Due to the low gradient nature of the site topography, it is considered that the drainage channels act as groundwater collection drains, supressing groundwater beneath the ground surface to reduce ground saturation. Water level in the drainage channels varied across the site, but there was distinctly no observable flow, owed to the low bed gradient of the channels.

Surface water runoff from Common Lane sheds off into an adjacent drainage ditch. The section of ditch east of the caravan park drains north-eastwards towards the A5117 road and connects into the wider land drainage network to the north of the road. Ditches run either side of Common Lane to the west of the caravan park. These ditches connect into the wider drainage network which ultimately drains west into the Main River.



3 PROPOSED DEVELOPMENT

3.1 Description

The proposed development is for the construction and operation of a 30MWac solar photovoltaic farm with associated infrastructure and landscape and ecological enhancements, for a temporary operational period of 40 years. The site would be accessed from the A5117 road via Common Lane. The proposed development layout and elevation drawings are presented in Appendix B.

3.2 Infrastructure

3.2.1 Solar Farm

The solar panel arrays would comprise of rows of fixed array solar panels mounted on aluminium rack frames with legs secured into the ground. The arrays would be sited at least 3.5 m apart to avoid shadowing and allow access for maintenance. The maximum panel height would be up to 3.2 m with the lowest edge of the panels set at a nominal minimum of 0.8 m above ground level (except locally in areas at risk of flooding, see Section 4.8.3). The panels would be tilted at a 20-degree angle from horizontal and orientated due-south.

The solar panels do not create an impermeable surface at ground level as rainwater can still fall to natural ground, pass beneath the panels and infiltrate into the ground under the solar arrays. The land beneath and around the solar panels would be converted to a full meadow grassland, with some fields also used for sheep grazing.

During operation, the solar farm would remain unstaffed – site attendees are infrequent and only needed on occasions (only monthly maintenance visits by operatives and singular annual visits for some activities such as landscape maintenance).

The perimeter of the solar farm would be enclosed by 2.5 m high deer fencing (with CCTV cameras).

3.2.2 Inverter Substations

Inverter substation units would be installed at strategic locations across the site. Each station would cover a footprint of 14 m x 5 m (70 m²). In total, there would be 14 stations within the site boundary (roughly 1 per field) and therefore the total footprint of the stations would be 980 m² (equivalent to 0.1% of the site area). The overall footprint is therefore very small within the context of the overall site area.

3.2.3 Site Substation Compound

The proposed substation compound would measure 40 m x 25 m (1,000 m²) and would contain electrical control equipment to connect the solar farm transformer to the Distributed Network Operator (DNO).

The compound would comprise a porous stone platform with a min. 300 mm sub-base thickness of MOT Type 3 sub-base formation with fence enclosure and would require a degree of earthworks to provide a level surface.

The Customer and Distributed Network Operator (DNO) Substation Metering Rooms and all other structures within the compound would be constructed from prefabricated units with duo-pitch roofs sat on the surface of the compound platform.

3.2.4 Site Internal Access Tracks

4 m wide permeable access tracks would be constructed within each solar array area to provide vehicular (LGV) to the solar panels and inverter stations for inspection and maintenance purposes.

The access tracks would be formed of a 300 mm thickness of MOT Type 3 sub-base overlain by a 100 mm stone chip capping layer to ground level. The formation would be wrapped in a highly permeable Terram 1000 non-woven fabric geotextile (or similar).

3.2.5 Access Track Crossings

Several of the proposed site access tracks need to pass over existing drainage channels (groundwater drains) for vehicles to access the various parts of the solar farm. It is proposed to install clear/open span bridge crossings, wherever practicably possible, avoiding the use of culvert as far as reasonably possible. Ordinary Watercourse Land Drainage Consents would be obtained from Cheshire West and Chester Council to install the access track crossings.

3.2.6 Site Entrance Road Widening

Minor road widening works would be required on the north-eastern section of Common Lane from the A5117 road and at the main site entrance to the west of the caravan park, to create a consistent 6 m road width for sufficient vehicular access into and out of the site. The proposed widening plans are presented in Appendix C.

The widening proposed on the north-eastern section of Common Lane amount to a very minor additional road footprint (concrete) of 176 m² (0.02% of the site area). The widening proposed on a small section to the west of the caravan park amounts again to a very minor additional road footprint of 152 m² (0.02% of the site area). Both sections of road are drained by adjacent drainage ditches.

3.2.7 Temporary Construction Compounds

The construction period for the proposed development is anticipated to last approximately 6 to 12 months and would take place over sequential phases.

Temporary construction compound (3 No.) would be formed in Fields A, E and G. The compounds would be used to store construction materials and equipment and would be formed of porous, freely draining MOT Type 3 subbase or similar. After construction, the compounds would be removed and solar panels installed over the areas.

3.2.8 Landscape Enhancement

Currently the site is used for agriculture (mixed arable/pasture). It is proposed to create a shade and high nutrient tolerant meadow grassland covering the extent of the solar panel array.

These changes to the landscape would improve the natural retention capacity of the field and promote infiltration, thereby promoting the reduction in runoff rate from the site.



4 FLOOD RISK ASSESSMENT

4.1 Introduction

This FRA identifies and assesses the risks of all forms of flooding to and from the proposed development and demonstrates how these flood risks would be managed so that the development remains safe throughout its lifetime, taking account of climate change.

In line with the requirements of NPPF, all potential sources of flooding have been considered, these are: fluvial (river) flooding, tidal (coastal) flooding, groundwater flooding, surface water (pluvial) flooding, sewer flooding and flooding from artificial waterbodies (reservoirs, canals and lakes).

4.2 National Policy Context

This FRA has been prepared in accordance with the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government, 2012 (Updated December 2024)) and Planning Practice Guidance (PPG): Flood Risk and Coastal Change (Ministry of Housing, Communities & Local Government, 2014 (Updated 2022)) and all relevant local policies and guidance as indicated in this report.

4.3 Local Policy Context

This FRA has been prepared in line with the policies of the adopted Cheshire West and Chester Local Plan (Cheshire West and Chester, 2015). The local policy relevant to flood risk and the water environment is Policy ENV 1 (Flood Risk and Water Management).

The wording of Policy ENV1 and signposting as to where the relevant information is contained in this report is presented in Table 1.

Table 1 Policy ENV 1 and Compliance

Policy Wording	Compliance / Signpost	
All development must follow the sequential approach to	A sequentially designed development layout has been	
determining the suitability of land for development,	prepared. The Sequential Test report is contained within	
directing new development to areas at the lowest risk of	the Planning Statement.	
flooding and where necessary apply the exception test, as outlined in national planning policy.	Critical and vulnerable parts of the proposed development have been directed to areas at lowest risk of flooding (see Section 4.8 of this report).	
Developers will be required to demonstrate, where	The proposed development will not increase the risk of	
necessary, through an appropriate Flood Risk	flooding at the site or elsewhere. Appropriate flood risk	
Assessment (FRA) at the planning application stage, that	mitigation has been employed where required to ensure	
development proposals will not increase flood risk on site	the development is safe for its lifetime. See Section 4	
or elsewhere, and should seek to reduce the risk of	and Section 7 of this report.	
flooding. New development will be required to include or		
contribute to flood mitigation, compensation and/or		

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Policy Wording	Compliance / Signpost
protection measures, where necessary, to manage flood	
risk associated with or caused by the development.	
Development proposals should comply with the Water	The objective of both River Management Plans is to
Framework Directive by contributing to the North West	achieve Good Ecological Status (GES) or potential by
River Basin Management Plan and Dee River Basin	2027. Reasons for not achieving GES are principally due
Management Plan objectives, unless it can be	to diffuse or point source pollution from agriculture. A
demonstrated that this would not be technically feasible.	sustainable surface water management strategy for the
	proposed development has been prepared. Only clean
	surface water runoff would be discharged from the site.
	Land cover/use beneath the solar panels would change
	from agriculture to grassland thereby providing
	betterment over the development lifetime (40 years).
	See Section 5 of this report.
The drainage of new development shall be designed to	A sustainable surface water management strategy for
reduce surface water run-off rates to include the	the proposed development has been prepared. See
implementation of Sustainable Drainage Systems (SUDS)	Section 5 of this report.
unless it can be demonstrated that it is not technically	
feasible or viable.	
Proposals within areas of infrastructure capacity and/or	The proposed development is not located within an area
water supply constraint should demonstrate that there is	of infrastructure capacity and/or water supply
adequate wastewater infrastructure and water supply	constraint. Wastewater would not be generated and a
capacity to serve the development or adequate provision	water supply is not required.
can be made available.	

4.4 Strategic Flood Risk Assessment

A Strategic Flood Risk Assessment (SFRA) provides a district wide assessment of the risk of flooding. The Cheshire West and Chester Level 1 SFRA (JBA consulting, 2016) has been consulted to ascertain flood risk information for the site and its vicinity.

The SFRA contains records of flooding occurring along the River Gowy and Thornton Brook situated approximately 2 km east of the site. Tidal Flooding from the River Dee and the River Mersey is shown to affect the low-lying floodplain of Ellesmere Port, 2 km north of the site. However, the SFRA does not contain any records of fluvial, surface water, groundwater, reservoir or sewer flooding at the site or in the vicinity.

4.5 Historic Flooding

The Environment Agency Historic Flood Map (Environment Agency, 2025), shows that there has been no historic flooding at the Site.

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4.6 Flood Risk Zones

The Environment Agency recently released the new national flood risk assessment (NaFRA2) (Environment Agency, 2025). NaFRA2 provides a single picture of current and future flood risk from rivers and the sea, and from surface water.

The flood zones shown on the Flood Map for Planning (Environment Agency, 2025) are classified by the Environment Agency as follows:

- Flood Zone 3 land with a 1% (1 in 100 year) or greater annual probability of flooding from rivers or sea (i.e. High risk of flooding).
- Flood Zone 2 land with between a 0.1% (1 in 1000 year) and 1% (1 in 100 year) annual probability of flooding from rivers or between 0.5% (1 in 200 year) and 0.1% (1 in 1,000 year) annual probability of flooding from the sea (i.e. a Medium risk of flooding).
- Flood Zone 1 land with a less than 0.1% (< 1 in 1000 year) annual probability of flooding from rivers and the sea (i.e. a Low risk of flooding).

An extract of the Environment Agency Flood Map for Planning is shown in Figure 4. 99.6% of the site is situated within Flood Zone 1 and is therefore presently at **Low Risk** of flooding from rivers and the sea. The remaining 0.4% of the site (isolated to Fields E and J) is situated within Flood Zone 2 and this area is therefore presently at **Medium Risk** of flooding from rivers and the sea. A very small number of solar panels are proposed within Flood Zone 2.

4.7 Flood Risk Vulnerability Classification

Annex 3 of the NPPF refers to vulnerability classifications, which are based on the sensitivity of different forms of development. In accordance with Annex 3, solar farms and associated infrastructure are classed as 'Essential Infrastructure' development. Essential Infrastructure development is appropriate within Flood Zone 1 and Flood Zone 2 as highlighted in the flood risk vulnerability classification matrix presented in Table 2.

	Flood Risk Vulnerability Classification				
Flood Zones	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	\checkmark	√	\checkmark	~
Zone 2	✓	Exception Test required	\checkmark	\checkmark	~
Zone 3a	Exception Test required	х	Exception Test required	\checkmark	~
Zone 3b	Exception Test required	х	x	x	~

Table 2 Development Flood Risk Vulnerability Classification

Key:

✓ Development is appropriate

x Development should not be permitted.



	Application Site Boundary			
	Fenceline			
	Proposed Access Tracks			
	Proposed Substation Compound			
	Proposed Solar Panels			
	Proposed Inverter Locations			
	Proposed Temporary Construction Compounds			
_	Main River			
→	Flow Direction			
nvironment Agency Flood Zone				
	Flood Zone 2			



4.8 Consideration of Flood Risk

4.8.1 Flooding from the Sea

The site is located inland and local watercourses are not tidally influenced. The Flood Map for Planning indicates that there is **No Risk** to the site from tidal flooding.

4.8.2 Flooding from Rivers

Present Day Risk

The Flood Map for Planning indicates that nearly all the site (99.6%) is presently at Low Risk from fluvial flooding (see Figure 4). 0.4% of the site is at Medium Risk from fluvial flooding. Overall, the site is at **Low Risk** from fluvial flooding.

Future Risk

The Rivers and Sea Defended and Undefended – Climate Change mapping contained within the Flood Map for Planning shows the risk of flooding under future climate change (Environment Agency, 2025). The mapping uses the 'Central' allowance for the 2080s epoch (2070-2125)). The development lifetime is 40 years (2065) and therefore the mapping is considered a conservative prediction of the future flood risk with respect to the proposed development. The mapping shows that the same proportions of the site would remain at Low and Medium Risk of fluvial flooding.

4.8.3 Flooding from Surface Water

The Environment Agency classifies the Risk of Flooding from Surface Water (RoFSW) using the following categories:

- **High** Greater than a 3.3% (1 in 30) chance in any given year;
- Medium Less than 3.3% (1 in 30) but greater than or equal to 1% (1 in 100) chance in any given year; and
- Low Less than 1% (1 in 100) chance in any given year.

The RoFSW map (Environment Agency, 2025) presents the risk, taking into account the 'Central' allowance for the 2050s epoch (2040-2060) for risk of flooding from surface water, based on the Representative Concentration Pathway (RCP) 8.5 in the latest UK Climate Projections (UKCP18) from the Met Office. This allowance covers anticipated changes to peak rainfall intensity which are appropriate to the lifetime of the development (40 years).

An extract of the RoFSW map covering the site is presented in Figure 6.



	Application Site Boundary
	1 in 100 and 1 in 1,000 (the 'Central' allowance for the 2080s epoch) Fluvial Flood Risk
	Fenceline
	Proposed Access Tracks
	Proposed Substation Compound
	Proposed Solar Panels
	Proposed Inverter Locations
	Proposed Temporary Construction Compounds
	Main River
\rightarrow	Flow Direction

Site Wide Risk

The RoFSW map shows that a large proportion of the site is at Very Low Risk from surface water flooding. However, given the very gentle topography of the site, there are predicted to be small areas at higher risk of flooding from surface water flooding, particularly in the topographically lowest areas of the site (Fields J and K) or in field depressions.

A review of LiDAR DTM data and the RoFSW map (accounting for climate change), indicates that the maximum flood level during a 1 in 100 year plus climate change allowance event is 9.7 m AOD.

Correspondingly for this flood level, flood depths are predicted to range between 0.13 to 0.9 m during a 1 in 100 year plus climate change event (see Figure 7). The deepest flooding (of up to 0.9 m) is predicted in proximity to the Main River, in Fields J and K, being topographically lowest area of the site.

Elsewhere within the site, the depth of surface water flooding during a 1 in 100 year plus climate change event is predicted to be very shallow at equal to or less than 0.15 m.

Solar Panels

In the topographically lowest parts of Fields J and K (within the 1 in 100 year plus climate change flood extent), the lowest edge of the solar panels would be raised to a minimum height of 1.2 m above ground level (0.9 m + 0.3 m freeboard) and the metal posts supporting the panels would be secured into the ground. Elsewhere, the lowest edge of the solar panels would be raised to a minimum height of 0.8 m above ground level.

Therefore, the panels would not impede overland flow and there would be no change to the risk of surface water flooding within these areas of the Site. The ground surface beneath and around the solar panels would be converted to grassland meadow providing betterment over the existing land use.

Inverter Substations

The proposed inverters have all been sited on land at Very Low risk from surface water flooding, based on the RoFSW and accounting for climate change.



	Application Site Boundary
	Proposed Access Tracks
	Proposed Substation Compound
	Proposed Solar Panels
	Proposed Inverter Locations
	Proposed Temporary Construction Compounds
lood	Likelihood Category
	High
	Medium
	Low
	Main River





Substation Compound

The proposed substation compound has been sited on land at Very Low risk from surface water flooding.

The proposed surface water drainage system (see Section 5) for the compound would ensure that the risk of surface water flooding is not increased at the site or elsewhere.

Access Tracks

The proposed access tracks have been sited outside of areas at risk from surface water flooding, as far as reasonably practicable and existing tracks and roads have been utilised where possible to limit the extent of new tracks. However, avoiding all areas at Low to High risk from flooding is not practicably possible. Track routes have been designed to provide the most efficient and safe (taking account of other factors such as visibility and arboriculture) means of accessing all areas of the site.

The new access track sections are designed to be porous/freely draining through the use of a MOT Type 3 stone sub-base layer. The surface of the tracks would be approximately level with the ground surface and this would prevent any impedance or modification of existing overland flow pathways.

The site would be unmanned and operated remotely. Only occasional access is required (typically monthly maintenance visits by operatives and singular annual visits for some activities such as landscape maintenance).

Summary

Overall, the risk of surface water flooding to the proposed development is **Very Low** and the proposed development would not increase the risk of surface water flooding at the site or elsewhere.



4.8.4 Flooding from Groundwater

The BGS 'Susceptibility of Groundwater Flooding Map' has been used to assess the susceptibility to groundwater flooding across the site. The mapping identifies areas where geological conditions could enable groundwater flooding to occur and where groundwater may come close to the ground surface (British Geological Survey, 2025).

The mapping indicates that there is 'Limited potential for groundwater flooding to occur' across the entirety of the site. Existing drains across the site would continue to mitigate groundwater flooding from occurring and reduce ground saturation.

The solar panels would be elevated at least 0.8 m above ground level and therefore the risk of groundwater flooding, impacting on the solar panel arrays, is **None**. Critical infrastructure such as inverter substations and transformer within the substation compound would be raised above ground level.

Based on the above, it is considered that the overall risk of groundwater flooding to the proposed development is **Very Low** and the proposed development would not increase the risk of groundwater flooding elsewhere.

4.8.5 Flooding from Artificial Waterbodies

According to the Reservoir Flood Map (Environment Agency, 2025), the site is not located within the maximum extent of flooding from reservoirs (i.e. in the event of breach/failure). There are no canals, lakes or reservoirs at the site or within the vicinity.

Therefore, there is **No Risk** of flooding from artificial waterbodies and the proposed development would not increase the risk of flooding to any artificial waterbodies downstream of the site.

4.8.6 Flooding from Sewers

Sewerage asset plans obtained from United Utilities indicate that there are no public sewer assets within the site boundary.

Therefore, there is **No Risk** of flooding from sewers to the proposed development and the proposed development would not increase the risk of flooding to sewers.



4.9 Flood Risk Summary

Table 3 provides a summary of the risk of flooding to and from the proposed development.

Table 3 Overall Flood Risk to and From the Proposed Development

Flood Source	Overall Risk of Flooding (Including Mitigation)					
	No Risk	Very Low	Low	Medium	High	
Sea (Coastal/Tidal)	✓					
Rivers (Fluvial)		✓				
Surface Water (Pluvial)		✓				
Groundwater		✓				
Artificial Waterbodies and Reservoirs (infrastructure failure)	~					
Sewers	√					



5 SURFACE WATER MANAGEMENT STRATEGY

5.1 Introduction

A surface water management strategy, based upon rural Sustainable Drainage Systems (SuDS) and land management principles, has been developed to provide 'source control' of runoff from the engineered elements of the solar farm development such as the substation compound and inverter substations and 'site control' associated with runoff from solar panels and all other aspects of the proposed development.

5.2 Local Policy Context

This Surface Water Management Strategy has been prepared in line with the policies of the adopted Cheshire West and Chester Local Plan (Cheshire West and Chester, 2015). The local policy relevant to flood risk and the water environment is Policy ENV 1 (Flood Risk and Water Management).

In relation to drainage, Policy ENV 1 states:

• The drainage of new development shall be designed to reduce surface water run-off rates to include the implementation of Sustainable Drainage Systems (SUDS) unless it can be demonstrated that it is not technically feasible or viable.

5.3 Greenfield Runoff Rates

Site-specific greenfield runoff rates have been calculated based on the Institute of Hydrology (IoH) 124 methodology using the Greenfield Runoff Rate Estimation Tool (HR Wallingford, 2024). The calculations have been based on a nominal area of 1 ha.

The calculated runoff rates are provided in Table 4 and the output from the tool is contained in Appendix D.

Table 4 Greenfield Runoff Rates

Storm Return Period (yrs)	Runoff Rate (l/s/ha)
1	4.3
2.3 (Q _{bar})	4.9
30	8.4
100	10.2



5.4 SuDS Discharge Hierarchy

Planning Practice Guidance of the NPPF states that the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

- 1. into the ground (infiltration);
- 2. to a surface water body;
- 3. to a surface water sewer, highway drain, or another drainage system;
- 4. to a combined sewer.

An assessment of the suitability of each tier of the hierarchy has been made in turn and is presented in Table 5.

Table 5 SuDS Discharge Hierarchy Assessment

Priority	Hierarchy	Suitability	Comment
1	Infiltration to ground	X	The soils across the entirety of the site are expected to be clayey and seasonally wet in low-lying areas and therefore of a low permeability (see Section 2.6). The superficial geology (Till) reflects this description (see Section 2.7). Groundwater is expected to be shallow (however, groundwater drains are present which act to reduce ground saturation). On this basis, formal infiltration into the ground using soakaways or similar methods is not considered viable.
2	Discharge to surface waterbody	~	The unnamed Main River and its tributaries are considered suitable receiving watercourse for discharging attenuated surface water runoff at the greenfield runoff rate (based on desk top study and observations during the site walkover survey).
3	Discharge to a surface water sewer, highway drain or another drainage system	Х	There are no surface water sewers, highway drains or other known positive drainage systems located within the site boundary.
4	Discharge to a combined sewer	х	There are no combined sewers within the site boundary.



5.5 **Proposed Surface Water Management**

The overarching principle for the proposed surface water management strategy is to provide SuDS (where appropriate) at source, ensuring that surface water run-off routes remain unchanged and providing betterment where practicably possible.

5.5.1 Solar Panel Arrays

As described in Section 3, the land on which the solar panels are to be installed would be converted to meadow grassland and there would be a full grass cover beneath the panels (see Plate 1 below). The land on which the arrays are to be located has been in use for mixed-use and pastoral farming. A full coverage of grassland meadow would provide a 'betterment' in terms of rainfall runoff flows by removing the time periods of bare earth which is significantly more prone to erosion than permanent grassland.

It is important to note that the land at the site has a very low gradient and in parts, essentially flat. The natural topography of the land beneath the solar panels would therefore, by its very nature, prevent or significantly reduce the risk of any overland flow being generated from water dripping from the panel edges. This would be further intercepted by the meadow grassland beneath the panels and between the panel rows.



Plate 1: Example of full grass/vegetated cover maintained beneath and around solar panels (Image: TPRC/Gamcap)

The first image in Plate 2 (see below) is an extract from an elevation plan for a typical (fixed) solar panel array and highlights the drip gaps between the panels. A 20 mm 'gap' (shown by red arrows) between modules, both 'upslope' and along the array length, allows rainfall runoff to fall from individual modules onto the ground below to closely mimic normal rainfall on the ground, rather than allowing 'sheet flow' from the larger area of arrays. The shallow pitch (slope) of the modules slows the velocity of the rainwater such that the runoff cannot 'jump' the 'gaps' between modules. A minimum gap of 3.5 m between panel rows ensures that all runoff from the panels dissipate within the grass sward before combining with the runoff from the next row, and thus concentrated runoff and rilling are prevented.

Hob Lane Solar Farm: Flood Risk Assessment & Surface Water Management Strategy



Overall, there would be no decrease in the permeable area and no increase in runoff from the solar panel array areas, thus mimicking the existing hydrological characteristics of the land. The arrays are designed to avoid sheeting, pooling and erosion. Water drips off the panels at multiple points onto the vegetated ground below, and the wide spaces between the panel rows would act as natural filter strips with vegetated ground that slows the movement of surface water. In effect, the grass sward beneath the panels is a SuDS system, which dissipates overland flow, provides interception storage and ensures overall runoff is maintained at greenfield runoff rates.



Plate 2: Photograph of rainwater 'drip gaps' between modules.

5.5.2 Access Tracks

The proposed access tracks within the site have been designed to be permeable and porous with a 300 mm thickness of MOT Type 3 sub-base or similar, which provides a void ratio of approximately 30%. The use of the permeable sub-base attenuation storage would reduce the overall site runoff and provide betterment over the natural capacity of the soil to store water.

As the proposed access tracks would be permeable, no additional SuDS measures are required as the access tracks would not increase the impermeable area across the site.

5.5.3 Substation Compound

The substation compound has been designed as a SuDS attenuation system with a min. 300 mm thickness of MOT Type 3 or similar sub-base layer, perimeter filter drains and vortex flow control to throttle flows to the 1 in 2 year (Qbar) greenfield runoff rate.

The sub-base layer has been designed to store up to and including the critical 1 in 100 year plus climate change allowance storm event. Given the lifetime of the development, the 'Central' allowance for peak rainfall intensity (+30%) has been applied in line with the latest climate change guidance (Environment Agency, 2022).

The proposed drainage system and sub-base attenuation storage has been modelled using Causeway Flow drainage design software. The proposed drainage layout is presented in Appendix E and hydraulic calculations are provided in Appendix F.

The discharge from the compound would be controlled by a vortex flow control (Hydro-Brake or similar) housed within a flow control chamber. Discharge of attenuated surface water runoff from the compound would be to the adjacent field drain (tributary of the unnamed Main River). A pre-cast concrete headwall would be installed on the watercourse to facilitate the discharge from the platform surface water drainage system (see Appendix E). A Land Drainage Consent would be obtained to construct the headwall.

The discharge rate would be throttled to a maximum rate of 0.8 l/s for all events up to and including the 1 in 100 year plus climate change storm. The discharge rate is based on the site-specific 1 in 2 year (Qbar) greenfield runoff rate (see Table 3) and compound footprint (i.e. 4.9 l/s x 0.1 ha = 0.5 l/s). However, that rate is insufficient to achieve a half drain down time within 24 hours and therefore the discharge rate has been increased very marginally to 0.8 l/s to provide sufficient drain down time. Flow control devices are prone to blockage at very low flow rates and as such this should provide a margin of safety in the design to reduce the risk of blockage occurring.



5.5.4 Common Lane Road Widening

Runoff from the proposed widening to an area of the western section of Common Lane (between the site and caravan park) would shed off into existing drainage ditches adjacent to the road. These ditches drain westwards and ultimately to the unnamed Main River. The proposed widening amounts to a very minor increase in impermeable area of 152 m². There is no available land adjacent to the road to balance runoff from the additional road area. Given that the section of the road lies within the catchment of the Main River, the increase in impermeable area has been factored into the attenuation storage of the substation compound (see Appendix F).

Runoff from proposed widening to the eastern section of Common Lane, (between the caravan park and the A5117 road), would shed off to the existing drainage ditches adjacent to the road (draining eastwards). Given that the widening footprint is very minor (176 m²) and distributed along the length of the road, it is considered that there would be no appreciable change in runoff or runoff rate to the drainage ditch. The use of flow restrictions within the ditch (to balance the increase in impermeable area) has been discounted on the basis that it could increase the risk of flooding upstream.

5.5.5 Inverters Substations

The inverters and transformers would be scattered across the site (roughly 1 per field). Given the small footprint of each station (70 m²) and potential impact on runoff and flood risk, it would not be reasonable to provide a positive drainage system for each station.

A "source control" SuDS in the form a 1 m wide x 0.4 m deep trench of MOT Type 3 stone or similar would be provided around the perimeter of each concrete mounting pad to capture rainwater dripping down from the units at source, preventing overland flow and any potential localised ground erosion.

The trench at each station would cover an area of approximately 42 m². Assuming a porosity of 30%, each trench can store approximately 5 m³ of water. This is equivalent to storing 119 mm of rainfall from a 42 m² surface. For comparison, the FEH22 rainfall depth at the site for a 24 hour, 1 in 100 year storm plus 30% climate change allowance is 116 mm (UK Centre for Ecology & Hydrology, 2025). Therefore, the use Type 3 stone or similar would provide betterment over the natural capacity of the soil to store water and prevent any increase in flood risk due to the inverter substations.



6 SUDS MAINTENANCE AND MANAGEMENT PLAN

6.1 Maintenance responsibility

The proposed substation compound surface water drainage system would be inspected and maintained by Belltown Power.

6.2 Maintenance schedules

This section outlines the maintenance and management schedules for the proposed drainage system. The schedules have been formulated in line with guidelines contained within the CIRIA SuDS Manual (Woods Ballard, et al., 2015). There are three categories of maintenance activities (including inspections and monitoring) referred to in this report:

- **Regular maintenance** tasks which are required to be undertaken on a weekly or monthly basis, or as required.
- Occasional maintenance tasks which are required to be undertaken periodically.
- **Remedial maintenance** tasks which are not required on a regular basis but are done when necessary.

This section is intended to give an overview of the operation and maintenance for the range of drainage features included within the surface water drainage scheme and in relation to typical/standard details only. These schedules are not exhaustive and should be reassessed at regular intervals to determine if any additional maintenance requirements are required to preserve the performance and condition of the drainage system.

6.2.1 Filter Drain

A typical schedule of maintenance activities for a filter drain is provided in Table 6.

Table 6 Filter Drain Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter (including leaf litter) and debris from filter drain surfaces and access chambers	Monthly (or as required)
	Inspect filter drain surface, inlet/outlet pipework, clogging standing water and structural damage	Monthly
	Inspect inlets and perforated pipework for silt accumulation and establish appropriate silt removal frequencies	Six monthly
Occasional maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain using recommended methods (e.g. NJUG, 2007 or BS 3998:2010)	As required
	Clear perforated pipework of blockages	As required
Remedial	Replace damaged perforated pipework	As required
actions	Remove surface geotextile and replace, and wash or replace overlying filter medium	As required



6.2.2 Drainage Pipes and Manholes

A typical maintenance schedule for drainage pipes and manholes is provided in Table 7.

Table 7 Drainage Pipes and Manholes Maintenance Schedule

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove any accumulation of silt, sediment, leaves and debris etc	Monthly, or as required
	Inspect for evidence of poor operation	Monthly (during the first year), then half yearly
Occasional maintenance	High pressure water jet removal of silt build-up and avoid blockages, particularly at bends or changes in direction	Six monthly, or as required
Remedial actions	Clear pipework of blockages	As required
hemedia actions	Replace any damaged or failed pipes or manholes	As required

6.2.3 Flow Controls

A typical schedule of maintenance activities for flow controls is included in Table 8.

Table 8 Flow Controls Maintenance Schedule

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect/check pipework to ensure that the flow control is in good condition and operating as designed	Monthly
	Inspect for evidence of poor operation	Monthly, or as required
Occasional maintenance	High pressure water jet removal of silt build-up	Six monthly, or as required
Remedial actions	Replace the flow control if it becomes damaged	As required
	Clear pipework of blockages	As required



7 CONCLUSIONS

This Flood Risk Assessment and Surface Water Management Strategy demonstrates that:

- 99.6% of the site is situated within Environment Agency Flood Zone 1 (Low Risk) and 0.4% in Flood Zone 2 (Medium Risk). The Flood Map for Planning shows that the same proportions of the site would remain within the same flood zones under future climate change, in excess of the development lifetime.
- The risk of surface water flooding at the site, accounting for climate change, is for the most part Very Low. However, the topographically lowest parts of the southern-most fields (Fields J and K) within the site are at Medium to High risk of surface water flooding. Flood depths during a 1 in 100 year plus climate change event are predicted to be up to a maximum of 0.9 m. To mitigate this risk over the development lifetime, the lowest edge of the solar panels within the flood extent would be raised at least 1.2 m above ground level (0.9 m + 0.3 m freeboard), thereby preventing any impedance of flow or modification of existing flow pathways. Elsewhere, solar panels would be a minimum of 0.8 m above ground level. The metal posts supporting the panels would be secured into the ground.
- The risk of groundwater flooding impacting on the proposed development is Very Low and there is No Risk of flooding from artificial waterbodies or public sewers.
- The proposed development ('Essential Infrastructure') is a suitable development type within Flood Zone 1 and Flood Zone 2 and therefore the Exception Test is not required, in accordance with NPPF and NPPG.
- Critical infrastructure such the inverter stations and substation compound have been sited on land at Very Low Risk from surface water flooding. The proposed SuDS controls would provide betterment and reduce the risk of surface water flooding occurring.
- The site is of a very low gradient and essentially level in places, inherently reducing the risk of overland flow occurring. There would be no decrease in permeable area and no increase in runoff from the solar panel arrays, thus mimicking the existing hydrological characteristics of the land. The arrays are designed to avoid sheeting, pooling and erosion. Water drips off the panels at multiple points onto vegetated ground below, and there is adequate space between panel rows which would act as natural filter strips with vegetated ground that slows the movement of surface water. In effect, the grass sward beneath the panels is a SuDS system, which dissipates overland flow, provides interception storage and ensures overall runoff is maintained at greenfield runoff rates.
- Source control SuDS for the engineered elements of the solar farm (i.e. inverters substations) have been designed to prevent the increase in runoff from the Site. Access tracks would be constructed of permeable/porous MOT Type 3 stone or similar.
- A positive SuDS based drainage system for the substation compound has been designed to attenuate up to and including the critical 1 in 100 year plus climate change storm event with a discharge to the adjacent field drain (tributary of the unnamed Main River along the western boundary of the site), throttled using a vortex flow control to equivalent of the 1 in 2 year greenfield runoff rate.
- Overall, the proposed development would not increase the risk of flooding at the site or elsewhere and would not increase the rate of runoff leaving the site.
- The proposed development meets the requirements of Local Plan Policy ENV 1 (Flood Risk and Water Management).



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APPENDICES


Appendix A United Utilities Sewer Asset Plans

Drainage & Water Search (Commercial Extra)



Search Details

Prepared for: TLT LLP Matter: 117993/000004/RES1 Client address: 1 Redcliff Street, Bristol, BS1 6TP

Property:

Land At Grid Ref, 345751 374134 Common Lane, Hapsford, Chester

Water Company: United Utilities Water Plc Grasmere House, Lingley Mere Business Park, Warrington, WA5 3LP

Date Returned: 02/08/2024

Property type: Commercial

This search was compiled by the Water Company above and provided by InfoTrack Ltd - t: 0207 186 8090, e: helpdesk@infotrack.co.uk. This search is subject to terms and conditions issued by InfoTrack which can be viewed at www.infotrack.co.uk or supplied on request. This search is also subject to terms and conditions issued by the Water Company, available on request. InfoTrack are registered with the Property Codes Compliance Board (PCCB) as subscribers to the Search Code. The PCCB independently monitors how registered firms maintain compliance with the Code. Visit www.propertycodes.org.uk for more information.



InfoTrack UK Limited, Level 11, 91 Waterloo Road, London, SE1 8RT T: 0207 186 8090 E: helpdesk@infotrack.co.uk





CON29DW Commercial Search

Responses to a drainage and water enquiry for commercial premises or development sites.

Client:

InfoTrack Limited

91 Wa

Waterloo Road, London, SE1 8RT

FAO:

The following records were searched in compiling this report:

The map of public sewers The map of waterworks Water and sewerage billing records Adoption of public sewers records Building over public sewer records Adoption of public water mains records Water supply clarification

Property address: Land at, Hob Lane, Cheshire, WA6 0LR

Please Note - We must make you aware that due to the introduction of the open market with effect from 1st April 2017 for commercial customers, Property Searches will no longer be able to resolve issues regarding some discrepancies within the report. Due to the change in the structure of the market the retailer is now responsible for taking ownership of certain issues, particularly relating to billing/tariff charges as well as, but not limited to change of usage of a property.

Enquiries and Responses

The records were searched by Katy Lowry for United Utilities who does not have, nor is likely to have, any personal or business relationship with any person involved in the sale of the property.

This search report was prepared by Katy Lowry for United Utilities who does not have, nor is likely to have, any personal or business relationship with any person involved in the sale of the property.

How to contact us:

United Utilities Water Limited Property Searches Haweswater House Lingley Mere Business Park Great Sankey Warrington WA5 3LP What is included:

- 1. Summary of findings and key
- 2. Detailed findings of the CON29DW
- 3. Guidance for interpretation
- 4. Terms and conditions
- 5. Complaints policy

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

If you are planning works anywhere in the North West, please read our access statement before you start work to check how it will affect our network. <u>http://www.unitedutilities.com/work-near-asset.aspx</u>.







Client ref: 58483160

Order number: UUPS-ORD-578747 Received date: 01/07/2024 Response date: 22/08/2024





To help understand the implications of the drainage and water enquiries report a summary guide to the content of the full report is provided below.

- ✓ This response represents the typical situation for a property.
- ₱ The attention of the purchaser is drawn to this response. The purchaser may wish to make further investigations into this situation.
- This response represents an uncommon situation for a property and the purchaser should carefully consider its implications.

Question	Report Schedule	Answer	
1.1	Where relevant, please include a copy of an extract from the public sewer map.	Yes & in vicinity	✓
1.2	Where relevant, please include a copy of an extract from the map of waterworks.	Yes & in vicinity	✓
2.1	Does foul water from the property drain to a public sewer?	Plot of land	ъ
2.2	Does surface water from the property drain to a public sewer?	Plot of land	×
2.3	Is a surface water drainage charge payable?	No	×
2.4	Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?	Public	×
2.4.1	Does the public sewer map indicate any public pumping station or ancillary apparatus within the boundaries of the property?	None	✓
2.5	Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?	None	Ю
2.5.1	Does the public sewer map indicate any public pumping station or any other ancillary apparatus within 50 metres (164.04 feet) of any buildings within the property?	Yes	Ю
2.6	Are any sewers or lateral drains serving or which are proposed to serve the property the subject of an existing adoption agreement or an application for such an agreement?	F - No	✓
		SW - No	✓
2.7	Has a sewerage undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?	None	✓
2.8	Is any building which is or forms part of the property at risk of internal flooding due to overloaded public sewers?	No	~
2.9	Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.	Yes	~
3.1	Is the property connected to mains water supply?	Plot of land	Ю
3.2	Are there any water mains, resource mains or discharge pipes within the boundaries of the property?	No	~
3.3	Is any water main or service pipe serving or which is proposed to serve the property the subject of an existing adoption agreement or an application for such an agreement?	No	~





Question 3.4	Report Schedule Is this property at risk of receiving low water pressure or flow?	Answer No	~
3.5	What is the clarification of the water supply for the property?	Very hard	✓
3.6	Is there a meter installed at the property?	No	✓
3.7	Please include details of the location of any water meter serving the property.	No meter	✓
4.1.1	Who is responsible for providing the sewerage services for the property?	United Utilities	✓
4.1.2	Who is responsible for providing the water services for the property?	Severn Trent Water	✓
4.2	Who bills the property for sewerage services?	Retailer Sewer	✓
4.3	Who bills the property for water services ?	Retailer Water	✓
5.1	Is there Consent to discharge Trade Effluent under S118 of the Water Industry Act (1991) into the public sewerage system?	No	~
6.1	Is there a wayleave/easement agreement giving the Water and/or Sewerage Undertaker the right to lay or maintain assets or right of access to pass through private land in order to reach the Company's assets?	No	~
6.2	On the copy extract from the public sewer map, please show manhole cover, depth and invert levels where the information is available.	Included	✓



Water for the North West



Question 1.1	Where relevant, please include a copy of an extract from the public sewer map.
Answer	A copy of an extract of the public sewer map within the vicinity of the property is included.
Guidance	1. The Water Industry Act 1991 defines Public Sewers as those which (United Utilities) have responsibility for. Other assets and rivers, water courses, ponds, culverts or highway drains may be shown for information purposes only.
	2. Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.
	3. The Sewerage Undertaker has a statutory right of access to carry out work on its assets, subject to notice. This may result in employees of the Sewerage Undertaker or its contractors needing to enter the property to carry out work.
Question 1.2	Where relevant, please include a copy of an extract from the map of waterworks.
Answer	A copy of an extract of the map of waterworks is included, showing water mains, resource mains or discharge pipes in the vicinity of the property.
Guidance	The "water mains" in this context are those which are vested in and maintainable by the Water Undertaker under statute.
	Assets other than public water mains may be shown on the plan, for information only. Water Undertakers are not responsible for private supply pipes connecting the property to the public water main and do not hold details of these. These may pass through land outside of the control of the seller, or may be shared with adjacent properties. The buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.
	If an extract of the public water main record is enclosed, it will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.
	The presence of a public water main running within the boundary of the property may restrict further development within it. Water Undertakers have a statutory right of access to carry out work on their assets, subject to notice. This may result in employees of the Water Undertaker or its contractors needing to enter the property to carry out work.
Question 2.1	Does foul water from the property drain to a public sewer?
Answer	This enquiry appears to relate to a plot of land or a recently built property. It is recommended that drainage proposals are checked with the developer.
Guidance	Sewerage Undertakers are not responsible for any private drains or sewers that connect the property to the public sewerage system, and do not hold details of these.
	The property owner will normally have sole responsibility for private drains serving the property and may have shared responsibility, with other users, if the property is served by a private sewer which also serves other properties. These may pass through land outside of the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.
	If foul water does not drain to the public sewerage system the property may have private facilities in the form of a cesspit, septic tank or other type of treatment plant.
	If an extract from the public sewer map is enclosed, this will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.



Water for the North West



Question 2.2	Does surface water from the property drain to a public sewer?
Answer	This enquiry appears to relate to a plot of land or a recently built property. It is recommended that drainage proposals are checked with the developer. If the property was constructed after the 6th April 2015 the surface water drainage may be served by a sustainable drainage system.
Guidance	Sewerage Undertakers are not responsible for any private drains or sewers that connect the property to the public sewerage system and do not hold details of these.
	The property owner will normally have sole responsibility for private drains serving the property and may have shared responsibility with other users, if the property is served by a private sewer which also serves other properties. These may pass through land outside of the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.
	In some cases, Sewerage Undertakers' records do not distinguish between foul and surface water connections to the public sewerage system. If on inspection the buyer finds that the property is not connected for surface water drainage, the property may be eligible for a rebate of the surface water drainage charge. Details can be obtained from the Sewerage Undertaker.
	If surface water does not drain to the public sewerage system the property may have private facilities in the form of a soakaway or private connection to a watercourse. If an extract from the public sewer map is enclosed, this will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.
Question 2.3	Is a surface water drainage charge payable?
Answer	Records indicate that a surface water drainage charge is not applicable for the property.
Guidance	Since 1st April 2017 commercial customers can choose their retailer for clean, waste or both services. For more information on any applicable surface water charges you will need to contact the current owner of the property to find out who the current retailer is. Details of the retailer for a property can be found on the current occupiers bill. For a list of all potential retailers of water and waste water services for the property please visit www.open-water.org.uk.
	Please note if the property was constructed after 6th April 2015 the Surface Water drainage may be served by a Sustainable Drainage System. Further information may be available from the Developer.
Question 2.4	Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?
Answer	The public sewer map included indicates that there are public sewers, disposal mains or lateral drains within the boundary of the property. However from the 1st October 2011 there may be additional public sewers, disposal mains or lateral drains which are not recorded on the public sewer map which may further prevent or restrict development of the property. If you are considering any future development at this property which may require build over consent, please complete the enquiry form by accessing the following link http://www.unitedutilities.com/planning-wastewater-guidance.aspx
Guidance	The approximate boundary of the property has been determined by reference to the Ordnance Survey record. A property of this type will normally be served by a shared sewer passing through the boundaries of several properties. It is therefore likely that a public sewer or lateral drain is present within the property boundary.
	Please note that from 1st October 2011 the majority of private sewers and lateral drains connected to the public network as of 1st July 2011 transferred into public ownership and therefore it is possible there may be additional public assets which may not be shown on the public sewer plan.
	The presence of public assets running within the boundary of the property may restrict further development. If there are any plans to develop the property further enquiries should be made to United Utilities Build Over department.





United Utilities Water has a legal right of access to carry out work on its assets, subject to notice. This may result in employees of the Company or its contractors needing to enter the property to carry out work.

Question 2.4.1	Does the public sewer map indicate any public pumping station or ancillary apparatus within the boundaries of the property?
Answer	The public sewer map included indicates that there is no public pumping station or other ancillary apparatus within the boundaries of the property. However, from the 1st October 2016 private pumping stations which serve more than one property will be transferred into public ownership but may not be recorded on the public sewer map until that time
Guidance	From 1 October 2016 United Utilities will be responsible for private pumping stations (though we may take ownership of some stations before this date) that either:
	* serve a single property, and are outside the property boundary or
	* serves two or more properties
	Only private pumping stations installed before 1st July 2011 will be transferred into our ownership. United Utilities will be responsible for all associated costs, maintenance, repairs and any necessary upgrade work.
	Where the property is part of a very recent or ongoing development and the sewers/pumping station are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains, sewers and pumping stations for which they will hold maintenance and renewal liabilities.
	Other ancillary apparatus may include in-sewer monitors. These devices help Untied Utilities proactively monitor performance of the sewerage network. United Utilities will be responsible for maintaining these devices. If an in-sewer monitor is installed in the sewerage network within the boundary of the property then please be aware that maintenance work may be needed on the device.
Question 2.5	Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?
Answer	The public sewer map included indicates that there are no public sewers within 30.48 metres (100 feet) of a building within the boundary of the property. However from the 1st October 2011 private sewers will be transferred into public ownership and may not be recorded on the public sewer map and it is our professional opinion that there will be a public sewer within 30.48 (100 feet) of a building within the boundary of the property.
Guidance	From 1st October 2011 there may be additional lateral drains and/or public sewers which are not recorded on the public sewer map but are also within 30.48 metres (100 feet) of a building within the property.
	The presence of a public sewer within 30.48 metres (100 feet) of the building(s) within the property can result in the Local Authority requiring a property to be connected to the public sewer.
	The measure is estimated from the Ordnance Survey record, between the building(s) within the boundary of the property and the nearest public sewer.
	Sewers indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended that these details are checked with the developer, if any.
	Assets other than public sewers may be shown on the copy extract for information only.
Question 2.5.1	Does the public sewer map indicate any public pumping station or any other ancillary apparatus within 50 metres (164.04 feet) of any buildings within the property?



Water for the North West



Answer	The public sewer map included indicates that there is a public pumping station within 50 metres of any building within the property. Any other ancillary apparatus is shown on the public sewer map and referenced on the legend.					
Guidance	From 1 October 2016 United Utilities will be responsible for private pumping stations (though we may take ownership of some stations before this date) that either:					
	* serve a single property, and are outside the property boundary or					
	* serves two or more properties.					
	Only private pumping stations installed before 1st July 2011 will be transferred into our ownership. United Utilities will be responsible for all associated costs, maintenance, repairs and any necessary upgrade work.					
	If you think there might be a private pumping station on your land or near your business property, please let us know by completing this questionnaire with as much information as possible, please visit our website http://www.unitedutilities.com/ppstransfer.aspx.					
	Where the property is part of a very recent or ongoing development and the sewers/pumping station are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains, sewers and pumping stations for which they will hold maintenance and renewal liabilities.					
Question 2.6	Are any sewers or lateral drains serving or which are proposed to serve the property the subject of an existing adoption agreement or an application for such an agreement?					
Answer	Foul - Records confirm that foul sewers and/or lateral drains serving the development, of which the property forms part are not the subject of an existing adoption agreement or an application for such an agreement.					
	Surface Water - Records confirm that the surface water sewer(s) and/or surface water lateral drain(s) are not the subject of an adoption agreement and it is recommended that responsibility for maintenance of these is checked with the developer as this may be due to a Sustainable Drainage Scheme (SUDS)					
Guidance	This enquiry is of interest to purchasers of new property who will want to know whether or not the property will be linked to a public sewer.					
	Where the property is part of a very recent or ongoing development and the sewers are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains and sewers for which they will hold maintenance and renewal liabilities.					
	Final adoption is subject to the developer complying with the terms of the adoption agreement under Section 104 of the Water Industry Act 1991.					
Question 2.7	Has a sewerage undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?					
Answer	There are no records in relation to any approval or consultation about plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain. However, the sewerage undertaker might not be aware of a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain.					
Guidance	From the 1st October 2011 private sewers, disposal mains and lateral drains were transferred into public ownership and the sewerage undertaker may not have granted approval or been consulted about any plans to erect a building or extension on the property over or in the vicinity of these assets.					
	Prior to 2003 United Utilities Water Limited had sewerage agency agreements with the local authorities therefore details of any agreements/consents or rejections may not have been forwarded on to our offices before this date.					





Buildings or extensions erected over a sewer in contravention of building controls may have to be removed or altered.

Question 2.8	Is any building which is or forms part of the property at risk of internal flooding due to overloaded public sewers?
Answer	The building is not recorded as being at risk of internal flooding due to overloaded public sewers. From the 1st October 2011 private sewers, disposal mains and lateral drains were transfered into public ownership it is therefore possible that a property may be at risk of internal flooding due to an overloaded public sewer which the sewerage undertaker is not aware of. For further information it is recommended that enquiries are made of the vendor.
Guidance	1. A sewer is "overloaded" when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
	2. "Internal flooding" from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
	3. These are defined as properties that have suffered or are likely to suffer internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Sewerage Undertaker's reporting procedure.
	4. Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included.
	5. Properties may be at risk of flooding but not included where flooding incidents have not been reported to the Sewerage Undertaker.
	6. Public sewers are defined as those for which the Sewerage Undertaker holds statutory responsibility under the Water Industry Act 1991.
	7. It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Sewerage Undertaker.
	8. This report excludes flooding from private sewers and drains and the Sewerage Undertaker makes no comment upon this matter. For reporting purposes buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
Question 2.9	Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.
Answer	The nearest Sewage Treatment Works is 1.14 miles (1.83 km), North East of the property. The name of the Sewage treatment works is Helsby WwTW. The owner is United Utilities
Guidance	The nearest sewage treatment works will not always be the sewage treatment works serving the catchment within which the property is situated i.e. the property may not necessarily drain to this works.
	The Sewerage Undertaker's records were inspected to determine the nearest sewage treatment works.
	It should be noted therefore that there may be a private sewage treatment works closer than the one detailed above that has not been identified. As a responsible utility operator, United Utilities Water Limited seeks to manage the impact of odour from operational sewage works on the surrounding area.
	This is done in accordance with the "Code of Practice on Odour Nuisance from Sewage Treatment Works" issued via the Department of Environment, Food and Rural Affairs (DEFRA).
	This Code recognises that odour from sewage treatment works can have a detrimental impact on the quality of the local environment for those living close to works.





However DEFRA also recognises that sewage treatment works provide important services to communities and are essential for maintaining standards in water quality and protecting aquatic based environments. For more information visit www.unitedutilities.com.

Question 3.1	Is the property connected to mains water supply?
Answer	This enquiry relates to a plot of land or a recently built property. It is recommended that the water supply proposals are checked with the developer.
Guidance	If the property is suplied by private water mains please note that details of private supplies are not kept by the Water Undertaker. The situation should be checked with the current owner of the property.
Question 3.2	Are there any water mains, resource mains or discharge pipes within the boundaries of the property?
Answer	The map of waterworks does not indicate any water mains, resource mains or discharge pipes within the boundaries of the property.
Guidance	The boundary of the property has been determined by reference to the Ordnance Survey record.
	The presence of a public water main within the boundary of the property may restrict further development within it. Water Undertakers have a statutory right of access to carry out work on their assets, subject to notice.
	This may result in employees of the Water Undertaker or its contractors needing to enter the property to carry out work.
Question 3.3	Is any water main or service pipe serving or which is proposed to serve the property the subject of an existing adoption agreement or an application for such an agreement?
Answer	Records confirm that water mains or service pipes serving the property are not the subject of an existing adoption agreement or an application for such an agreement.
Guidance	This enquiry is of interest to purchasers of new premises who will want to know whether or not the property will be linked to the mains water supply.
Question 3.4	Is this property at risk of receiving low water pressure or flow?
Answer	Records confirm that the building is not recorded by the water undertaker as being at risk of receiving low water pressure or flow.
Guidance	The boundary of the property has been determined by reference to the Ordnance Survey record. "Low water pressure" means water pressure below the regulatory reference level which is the minimum pressure when demand on the system is not abnormal. Water undertakers report properties receiving pressure below the reference level, provided that allowable exclusions do not apply (i.e. events which can cause pressure to temporarily fall below the reference level). Reference level: The reference level of service is a flow of 9l/min at a pressure of 10m head on the customer's side of the main stop tap (mst). The reference level applies to a single property. The reference level of service must be applied on the customer's side of a meter or any other company fittings that are on the customer's side of the main stop tap. Where a common service pipe serves more than one property, the flow assumed in the reference level. Because of the difficulty in measuring pressure and flow at the mst, companies may measure against a surrogate reference level. Companies should use a surrogate of 15m head in the adjacent distribution main unless a different level can be shown to be suitable. In some circumstances companies may need to use a surrogate pressure greater than 15m to ensure that the reference level is supplied at the customer's side of the mst (for example in areas with small diameter or shared communication pipes).





There are a number of circumstances under which properties identified as receiving low pressure should be excluded from the reported figure. The aim of these exclusions is to exclude properties which receive a low pressure as a result of a one-off event and which, under normal circumstances (including normal peaks in demand), will not receive pressure or flow below the reference level. Companies must maintain verifiable, auditable records of all the exclusions that they apply in order to confirm the accuracy and validity of their information. Allowable exclusions includes Abnormal demand, Planned maintenance, One off incidents, Low pressure incidents of short duration and common supply.

Abnormal demand:

This exclusion is intended to cover abnormal peaks in demand and not the daily, weekly or monthly peaks in demand, which are normally expected. Water undertakers exclude figures from properties which are affected by low pressure only on those days with the highest peak demands. During the yearly report water undertakers may exclude, for each property, up to five days of low pressure caused by peak demand.

Planned maintenance:

Water undertakers will not report low pressures caused by planned maintenance. It is not intended that water undertakers identify the number of properties affected in each instance. However, water undertakers must maintain sufficiently accurate records to verify that low-pressure incidents that are excluded because of planned maintenance. are actually caused by maintenance.

One-off incidents:

This exclusion covers a number of causes of low pressure; mains bursts; failures of company equipment (such as pressure reducing valves or booster pumps); fire fighting and action by a third party. However, if problems of this type affect a property frequently, they cannot be classed as one-off events and further investigation will be required before they can be excluded.

Low pressure incidents of short duration:

Properties affected by low pressures that only occur for a short period, and for which there is evidence that incidents of a longer duration would not occur during the course of the year, may be excluded.

A company must maintain a minimum pressure in the communication pipe of seven metres static head (0.7 bar). If pressure falls below this on two occasions, each occasion lasting more than one hour, within a 28-day period, the company must automatically make a GSS payment to the customer. There are exceptions to the requirement to make a GSS payment if the pressure standard is not met. These are: a payment has already been made to the same customer in respect of the same financial year; it is impractical for the company to have identified the particular customer as being affected, and the customer has not made a claim within three months of the date of the latter occasion; industrial action by the company's employees makes it not feasible to maintain the pressure standard; the act or default of a person other than the company's representative make it not feasible to maintain the pressure standard; or the pressure falls below the minimum standard due to necessary works taking place or due to a drought.

It should be noted that low water pressure can occur from private water mains, private supply pipes (the pipework from the external stop cock to the property) or internal plumbing which are not the responsibility of the Water Undertaker. This report excludes low water pressure from private water mains, supply pipes and internal plumbing and the Water Undertaker makes no comment upon this matter. For reporting purposes buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.

Question 3.5 What is the clarification of the water supply for the property?

Answer

The water supplied to the property has an average water hardness of 322mg/l calcium carbonate, which is defined as very hard by Severn Trent Water

Guidance

The hardness of water is due to the presence of calcium and magnesium minerals that are naturally present in the water. The usual signs of a hard water supply are scaling inside kettles, poor lathering of soaps and scum.

What is water hardness?





Hard water is formed when water passes through or over limestone or chalk areas and calcium and magnesium ions dissolve into the water. The hardness is made up of two parts: temporary (carbonate) and permanent (non-carbonate) hardness. When water is boiled, calcium carbonate scale can form, which can deposit on things like kettle elements. The scale will not stick to kettles that have a plastic polypropylene lining but will float on the surface. The permanent hardness that comprises calcium and magnesium sulphate does not go on to form scale when heated or boiled.

How is water hardness measured?

Hardness is usually expressed in terms of the equivalent quantity of calcium carbonate (CaCO3) in milligrams per litre or parts per million. You may also see hardness expressed as degrees of hardness in Clark (English) degrees, French or German degrees. Interconversion between the different measurements can be made by using the appropriate conversion factors below. There are no standard levels as to what constitutes a hard or a soft water. Table 1 gives an indication of the equivalents of calcium and calcium carbonate and the relative degree of hardness.

Water quality standards

There are no regulatory standards for water hardness in drinking water.

Water hardness in the North West

The majority of raw water in the United Utilities region comes from upland surface water reservoirs. The water in the reservoirs has little chance of passing through rocks and to dissolve the minerals that make water hard. Therefore, the majority of water in this region is soft or very soft. We supply water from a number of boreholes in the south of the region that are reasonably hard, but these tend to be blended with softer sources to meet demand. No water supply in the North West is artificially softened.

Can hard water be softened?

Yes, water can be softened artificially by the installation of a water softener or the use of 'jug type' filters. Medical experts recommend that a non-softened supply is maintained for drinking purposes because softened water may contain high levels of sodium. Softeners should be fitted after the drinking water tap and comply with the requirements of the Water Supply (Water Fittings) Regulations 1999. They should be maintained in accordance with manufacturers' instructions.

If you're interested in finding out more about the quality of your drinking water, please visit www.unitedutilities.com/waterquality and enter your postcode.

The Drinking Water Inspectorate is responsible for ensuring the quality of public water supplies. Visit their website at: www.dwi.defra.gov.uk.

Question 3.6	Is there a meter installed at the property?
Answer	Records indicate that the property is not served by a water meter
Guidance	Not applicable
Question 3.7	Please include details of the location of any water meter serving the property.
Answer	Records indicate that the property is not served by a water meter.
Guidance	Where the property is not served by a meter the current occupier can contact the retailer directly to advise on the current charging method, details of the retailer can also be found on the current occupiers bill.
Question 4.1.1	Who is responsible for providing the sewerage services for the property?
Answer	United Utilities Water Limited, Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP





Guidance	United Utilities is the sewerage undertaker and will be responsible for providing the sewerage services for the property. If the property is not connected then United Utilities is still the sewerage undertaker responsible for providing sewerage services in this area.					
Question 4.1.2	Who is responsible for providing the water services for the property?					
Answer	Severn Trent Water Limited, Sherbourne House, St Martins Road, Coventry, CV3 6SD. Within this report the sections for water billing, water mapping and water hardness have been completed by Corinne Radford					
Guidance	Not Applicable					
Question 4.2	Who bills the property for sewerage services?					
Answer	Since 1st April 2017 commercial customers can choose their retailer. If you wish to know who currently bills the property for sewerage services you will need to contact the current owner of the property to find out who the current retailer is.					
Guidance	Details of the retailer for a property can be found on the current occupiers bill. For a list of all potential retailers of waste water services for the property please visit www.open-water.org.uk					
Question 4.3	Who bills the property for water services ?					
Answer	Since 1st April 2017 commercial customers can choose their retailer. If you wish to know who currently bills the property for water services you will need to contact the owner of the property to find out who the retailer is.					
Guidance	Details of the retailer for a property can be found on the current occupiers bill. For a list of all potential retailers of water services for the property please visit www.open-water.org.uk					
Question 5.1	Is there Consent to discharge Trade Effluent under S118 of the Water Industry Act (1991) into the public sewerage system?					
Answer	There is no record of a Trade Effluent consent at this property. Applications for Trade Effluent consents should be submitted via your retailer for info please visit https://www.unitedutilities.com/Business-services/trade-effluent/					
Guidance	The owner/occupiers of Trade Premises do not have the right to discharge Trade Effluent to the public wastewater network. Any Trade Effluent Discharge Consent will be issued under Section 118 of the Water Industry Act 1991 and will be subject to conditions set by the Sewerage Undertaker.					
	Generally these conditions are to ensure:					
	a) The Health and Safety of staff working within the wastewater network and at wastewater treatment plants.					
	b) The apparatus of the wastewater network is not damaged.					
	c) The flow of the contents of the wastewater network is not restricted.					
	d) Equipment, plant, and processes at treatment works are not disrupted or damaged.					
	e) Treatment of sewage sludge is not impeded and sludges are disposed of in an environmentally friendly manner.					
	f) Final effluent discharge from wastewater treatment plants has no impact on the environment or prevents the receiving waters from complying with EU Directives.					





g) Potential damage to the environment via storm water overflows is minimised.

Disputes between an occupier of a Trade Premise and the Sewerage Undertaker can be referred to the Director General of Water Services (OFWAT).

Protecting Public Sewers - Discharges Section 111 of the Water Industry Act 1991, places prohibition on the discharge of the following into a public sewer, drain or a sewer that communicates with a public sewer.

i) Any matter likely to injure the sewer or drain, to interfere with the free flow of its contents or to affect prejudicially the treatment or disposal of its contents.

ii) Any chemical refuse or waste steam or any liquid of temperature higher than 43.3 degrees Celsius (110 degrees Fahrenheit).

iii) Any petroleum spirit or carbide of calcium. On summary conviction offences under this Section carry a fine not exceeding the statutory maximum or a term of imprisonment not exceeding two years, or both.

Please note any existing consent is dependant on the business being carried out at the property and will not transfer automatically upon change of ownership.

Question 6.1 Is there a wayleave/easement agreement giving the Water and/or Sewerage Undertaker the right to lay or maintain assets or right of access to pass through private land in order to reach the Company's assets?

There is no record of a formal easement affecting this property.

Guidance Not Applicable.

Answer

Question 6.2 On the copy extract from the public sewer map, please show manhole cover, depth and invert levels where the information is available.

Answer A copy of an extract from the public sewer map, showing manhole cover, depth and invert levels where the information is available, is included.

Guidance Not applicable





Water for the North West

Appendix 1- General interpretation

1. (1) In this Schedule-

"the 1991 Act" means the Water Industry Act 1991(a);

"the 2000 Regulations" means the Water Supply (Water Quality) Regulations 2000(b);

"the 2001 Regulations" means the Water Supply (Water Quality) Regulations 2001(c);

"adoption agreement" means an agreement made or to be made under Section 51A(1) or 104(1) of the 1991 Act (d);

"bond" means a surety granted by a developer who is a party to an adoption agreement;

"bond waiver" means an agreement with a developer for the provision of a form of financial security as a substitute for a bond;

"calendar year" means the twelve months ending with 31st December;

"discharge pipe" means a pipe from which discharges are made or are to be made under Section 165(1) of the 1991 Act:

"disposal main" means (subject to Section 219(2) of the 1991 Act) any outfall pipe or other pipe whicha) is a pipe for the conveyance of effluent to or from any sewage disposal works, whether of a sewerage undertaker or of any other person; and (b) is not a public sewer;

"drain" means (subject to Section 219(2) of the 1991 Act) a drain used for the drainage of one building or any buildings or yards appurtenant to buildings within the same curtilage;

"effluent" means any liquid, including particles of matter and other substances in suspension in the liquid; "financial year" means the twelve months ending with 31st March;

"lateral drain" means-

(a) that part of a drain which runs from the curtilage of a building (or buildings or yards within the same curtilage) to the sewer with which the drain communicates or is to communicate; or

b) (if different and the context so requires) the part of a drain identified in a declaration of vesting made under Section 102 of the 1991 Act or in an agreement made under Section 104 of that Act (e);

"licensed water supplier" means a company which is the holder for the time being of a water supply licence under Section 17A(1) of the 1991 Act(f);

"maintenance period" means the period so specified in an adoption agreement as a period of time-(a) from the date of issue of a certificate by a Sewerage Undertaker to the effect that a developer has built (or substantially built) a private sewer or lateral drain to that undertaker's satisfaction; and

(b) until the date that private sewer or lateral drain is vested in the Sewerage Undertaker;

"map of waterworks" means the map made available under Section 198(3) of the 1991 Act (q) in relation to the information specified in subsection (1A);

"private sewer" means a pipe or pipes which drain foul or surface water, or both, from premises, and are not vested in a Sewerage Undertaker;

"public sewer" means, subject to Section 106(1A) of the 1991 Act(h), a sewer for the time being vested in a Sewerage Undertaker in its capacity as such, whether vested in that undertaker-

(a) by virtue of a scheme under Schedule 2 to the Water Act 1989(i);

(b) by virtue of a scheme under Schedule 2 to the 1991 Act (i);

(c) under Section 179 of the 1991 Act (k); or (d) otherwise;

"public sewer map" means the map made available under Section 199(5) of the 1991 Act (I);

"resource main" means (subject to Section 219(2) of the 1991 Act) any pipe, not being a trunk main, which is or is to be used for the purpose of-(a) conveying water from one source of supply to another, from a source of supply to a regulating reservoir or from a regulating reservoir to a source of supply; or

(b) giving or taking a supply of water in bulk;







"sewerage services" includes the collection and disposal of foul and surface water and any other services which are required to be provided by a Sewerage Undertaker for the purpose of carrying out its functions;

"Sewerage Undertaker" means the company appointed to be the Sewerage Undertaker under Section 6(1) of the 1991 Act for the area in which the property is or will be situated;

"surface water" includes water from roofs and other impermeable surfaces within the curtilage of the property;

"water main" means (subject to Section 219(2) of the 1991 Act) any pipe, not being a pipe for the time being vested in a person other than the water Undertaker, which is used or to be used by a Water Undertaker or licensed water supplier for the purpose of making a general supply of water available to customers or potential customers of the undertaker or supplier, as distinct from for the purpose of providing a supply to particular customers;

"water meter" means any apparatus for measuring or showing the volume of water supplied to, or of effluent discharged from any premises; "water supplier" means the company supplying water in the water supply zone, whether a water undertaker or licensed water supplier;

"water supply zone" means the names and areas designated by a Water Undertaker within its area of supply that are to be its water supply zones for that year; and

"Water Undertaker" means the company appointed to be the Water Undertaker under Section 6(1) of the 1991 Act for the area in which the property is or will be situated.

(2) In this Schedule, references to a pipe, including references to a main, a drain or a sewer, shall include references to a tunnel or conduit which serves or is to serve as the pipe in question and to any accessories for the pipe.

- (a) 1991 c. 56
- (b) S.I. 2000/3184. These Regulations apply in relation to England.
- (c) S.I. 2001/3911. These Regulations apply in relation to Wales.
- (d) Section 51A was inserted by Section 92(2) of the Water Act 2003 (c. 37). Section 104(1) was amended by Section 96(4) of that Act.
- (e) Various amendments have been made to Sections 102 and 104 by Section 96 of the Water Act 2003.
- (f) Inserted by Section 56 of and Schedule 4 to the Water Act 2003.
- (g) Subsection (1A) was inserted by Section 92(5) of the Water Act 2003.
- (h) Section 106(1A) was inserted by Section 99 of the Water Act 2003.
- (i) 1989 c. 15.
- (j) To which there are various amendments made by Section 101(1) of and Schedule 8 to the Water Act 2003.
- (k) To which there are various amendments made by Section 101(1) of and Schedule 8 to the Water Act 2003.
- (I) Section 199 was amended by Section 97(1) and (8) of the Water Act 2003.





Appendix 2 - DRAINAGE AND WATER ENQUIRY (COMMERCIAL) AGREEMENT

The Customer and the Client are asked to note the provisions of this Agreement, which govern the basis on which this drainage and water report is supplied.

Definitions

'Client' means the person, company or body who is the intended recipient of the Report with an actual or potential interest in the Property (including, where relevant, their mortgage lender).

'Company' means United Utilities Water Limited who produce the Report; its registered office being at Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Great Sankey, Warrington WA5 3LP, company number 2366678.

'Customer' means the person, company, firm or other legal body placing the Order, either on their own behalf as Client, or, as an agent for a Client. 'Order' means any request completed by the Customer requesting the Report.

'Property' means the address or location supplied by the Customer in the Order.

'Report' means the drainage and water report prepared by the Company in respect of the Property.

Agreement

1.1 The Company agrees to supply the Report to the Customer and the Client subject to this Agreement. The scope and limitations of the Report are described in clauses 2 and 3 of this Agreement. Where the Customer is acting as an agent for the Client, the Customer shall be responsible for bringing this Agreement (including, without limitation, any limitations and exclusions contained in it) to the attention of the Client and ensuring their acceptance of it pursuant to clause 1.2.

1.2 The Customer and the Client agree that the placing of an Order for a Report and the subsequent provision of a copy of the Report to the Customer and/or the Client indicates their acceptance of this Agreement and the Company shall be entitled to rely on this notwithstanding the Customer's failure to comply with clause 1.1.

1.3 The Company's cancellation policy in relation to an Order shall form part of this Agreement and is detailed at https://propertysearches.unitedutilities.com/cancellation/

Report

2.1 Whilst the Company will use reasonable care and skill in producing the Report, it is provided to the Customer and the Client on the basis that they acknowledge and agree to the following:-

2.2 The information contained in the Report can change on a regular basis so the Company cannot be responsible to the Customer and/or the Client for any change in the information contained in the Report after the date on which the Report was produced.

2.3 The Report does not give details about the actual state or condition of the Property nor should it be used or taken to indicate or exclude actual suitability or unsuitability of the Property for any particular purpose, or relied upon for determining saleability or value, or used as a substitute for any physical investigation or inspection. Further advice and information from appropriate experts and professionals should always be obtained.

2.4 The information contained in the Report is based upon the accuracy, completeness and legibility of the address, drawn boundaries and/or plans supplied by the Customer in the Order.

2.5 The Report provides information as to the indicative location and connection status of existing services and other information in relation to drainage and water enquiries and should not be used or relied on for any other purpose. The Report may contain opinions or general advice to the Customer and the Client. The Company, subject to clauses 3.4 and 3.7 and without prejudice to the other provisions of this Agreement, accepts no liability in relation to any such opinion or general advice or any other information contained in the Report (including, without limitation, any inaccuracies, errors or omissions) unless and only to the extent that such liability arises as a direct result of the Company's negligence (if relevant).



Water for the North West



2.6 The position and depth of apparatus shown on any maps attached to the Report are approximate, and are furnished as a general guide only, and no warranty as to its correctness is given or implied. The exact positions and depths should be obtained by excavation trial holes and the maps must not be relied on in the event of excavation or other works made at the Property and/or in the vicinity of the Company's apparatus and, subject to clause 3.7, the Company accepts no liability in relation to any such reliance.

2.7 In providing the Report the Company will comply with the Drainage & Water Searches Network (DWSN) Standards, <u>https://www.con29dw.co.uk/about-dwsn/#standards</u>

Liability

3.1 The Company shall not be liable to the Customer and/or the Client for any failure defect or non-performance of its obligations arising from any failure to provide or delay in providing the Report to the extent that such failure or delay is due to an event or circumstance beyond the reasonable control of the Company including but not limited to any delay, failure of or defect in any machine, processing system or transmission link or any failure or delay is directly caused by the negligence of the Company.

3.2 Where a Report is requested for an address falling within a geographical area where two different entities separately provide Water and Sewerage Services, then any liability imposed on the Company pursuant to this Agreement for information contained in the Report which has been provided by the other entity shall be subject to the provisions of this Agreement and shall, without prejudice to the other provisions of this Agreement (including without limitation clauses 3.3 to 3.7), not exceed the liability that would have been imposed on the other entity had it supplied that information directly to the Customer.

3.3 The Report is produced only for use in relation to individual commercial property transactions (i.e. single commercial units, mixed sales of a building or area of land used for non-residential purposes, dual use of a dwelling house, farms sold with agricultural land and/or buildings, a group of holiday homes or an entire new development or a plot of land/additional area with a single or no building) and which requires the provision of drainage and water information and cannot be used for residential properties (i.e. a single dwelling house together with any associated land). Subject to clauses 3.4 to 3.7, the Company's entire liability to the Client howsoever arising under or in connection with the Report and/or this Agreement and whether in contract, negligence or any other tort or for breach of statutory duty or otherwise shall not exceed £10,000,000 (ten million pounds). The Company shall not in any circumstances (whether for breach of contract, negligence or any other tort, under statute or statutory duty, restitution or otherwise at all) be liable to the Client for any indirect or consequential loss or damage whatsoever caused and howsoever arising under or in connection with the Report and/or this Agreement

3.4. The plans attached to the Report are provided pursuant to the Company's statutory duty to make such plans available for inspection (notwithstanding the provisions of this clause) and your attention is drawn to the notice on the plan(s) attached to the Report which applies to the plan(s) and its/their contents. For the avoidance of doubt, nothing in this Agreement shall be interpreted as, or deemed to be, in any way an acknowledgement or acceptance by the Company that a common law duty of care exists between the Company, the Customer and/or the Client in relation to those plans (including, without limitation, the provision of such plans and the information contained within them) and/or any other information contained in the Report.

3.5 Subject to clause 3.7, the Company's entire liability to the Customer howsoever arising under or in connection with this Agreement and whether in contract, negligence or any other tort or for breach of statutory duty or otherwise shall not exceed £5,000 (five thousand pounds) and the Company shall not in any circumstances (whether for breach of contract, negligence or any other tort, under statute or statutory duty, restitution or otherwise at all) be liable to the Customer for any indirect or consequential loss or damage whatsoever caused and howsoever arising under or in connection with this Agreement .

3.6 The Customer and the Client shall ensure that the Report is not accessed by, made available to, used by and/or relied on (in whole or in part) in any way by any other third party, and, subject to clause 3.7, the Company shall not in any circumstances (whether for breach of contract, negligence or any other tort, under statute or statutory duty, restitution or otherwise at all) be liable to any third party for any loss (whether direct, indirect or consequential loss (all three of which terms include without limitation, pure economic loss, loss of profit, loss of business depletion of goodwill and like loss)) or damage whatsoever caused and howsoever arising under or in connection with this Agreement and/or the Report and/or any use of or reliance placed upon the Report. The Customer and the Client agree to indemnify the Company against any losses, costs, claims and damage suffered by the Company as a result of any breach by either of them of the provisions of this clause 3.6.

3.7 Nothing in this Agreement shall exclude the Company's liability for death or personal injury arising from its negligence or for fraud or any other matter to the extent that such liability cannot be excluded or limited by law.



Copyright and Confidentiality

CON29DW COMMERCIAL DRAINAGE & WATER SEARCH

4.1 The Customer and the Client acknowledge that the Report is confidential and is intended for the personal use of the Client only and shall not be used (in whole or in part) for any commercial gain in any circumstances. The Customer and the Client shall ensure that the Report is not accessed by, made available to, used by and/or relied on (in whole or in part) in any way by any other third party. The copyright and any other intellectual property rights in the Report shall remain the property of the Company and its licensors. No intellectual or other property rights are transferred or licensed to the Customer or the Client except to the extent expressly provided herein.

4.2 The Customer or the Client is entitled to make copies of the Report but may only copy Ordnance Survey mapping or data contained in or attached to the Report, if they have an appropriate licence from the originating source of that mapping or data

4.3 The Customer and, the Client agree (in respect of both the original and any copies made) to respect and not to alter any part of the Report including but not limited to altering, removing or obscuring the trademark, logo, copyright notice or other property marking which appears on the Report.

4.4 The maps contained in the Report are protected by Crown Copyright and must not be used for any purpose outside the context of the Report.

4.5 The enquiries contained in the Report are protected by copyright by the Law Society of 113 Chancery Lane, London, WC2A 1PL and must not be used for any purpose outside the context of the Report

4.6 The Customer and the Client agree to indemnify the Company against any losses, costs, claims and damage suffered by the Company as a result of any breach by either of them of the provisions of clauses 4.1 to 4.5 inclusive.

Payment

5.1 Unless otherwise stated all prices are inclusive of VAT. The Customer shall pay the price of the Report specified by the Company, without any set off, deduction or counterclaim.

5.2 Payment must be received in advance unless an account has been set up with the Company. In these cases, payment terms will be as agreed with the Company, but in any event any invoice must be paid within 30 days of the date of its issue.

5.3 The Company reserves the right to increase fees on reasonable prior written notice at any time.

Data Protection

6.1 We will process any personal data you provide to us in accordance with applicable data protection laws and our Data Protection and Privacy Notice (https://www.unitedutilities.com/privacy/. In addition we will use your personal data to manage and administer the provision of the Report under this Agreement and to develop and improve the business and services we provide to our customers. We may also disclose it to other companies in the United Utilities group (being United Utilities Water Limited, its holding companies (and their subsidiary companies) and its subsidiary companies) and their sub-contractors in connection with those purposes, but it will not be processed for other purposes or disclosed to other third parties without your express permission or without lawful purpose under data protection law.

General

7.1 If any provision of this Agreement is or becomes invalid or unenforceable, it will be taken to be removed from the rest of this Agreement to the extent that it is invalid or unenforceable. No other provision of this Agreement shall be affected.

7.2 This Agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts.

7.3 Nothing in this Agreement and conditions shall in any way restrict the Company's or the Customer's or the Client's statutory or any other rights in relation to the provision of and/or access to the information contained in the Report.

7.4 This Agreement and conditions may be enforced by the Customer and the Client but not by any other third party.

7.5 Before you agree to this Agreement, please note that where you are the Customer it is your responsibility to ensure your client/customer is aware of them and that any objections are raised accordingly.



Property Searches complaints procedure

CON29DW COMMERCIAL DRAINAGE & WATER SEARCH

In the event of any queries relating to this Report please e-mail, write or phone our customer team quoting the United Utilities reference detailed on the Report, We will endeavor to resolve any telephone contact or complaint at the time of the call.

Whilst we always try to resolve all complaints straight away, if this is not possible and you are not happy with the course of action taken by us you can ask us to escalate the issues internally via the complaints process detailed below.

We will listen to your complaint and do our best to deal with it immediately.

If we fail to give you a written substantive response within 5 working days the Company will compensate the Customer or the Client (as applicable) the amount of the original fee paid to the Company for the Report, regardless of the outcome of your complaint.

If it is a complex issue requiring more time, we will still get back to you within 5 working days and notify you of progress and update you with the new timescales.

If we consider your complaint to be justified or we have made any errors that substantially change the outcome of the search we will:

- Refund your Report fee
- Provide you with a revised Report (if requested)

- Take the necessary action within our power to put things right which may (where appropriate) include, at our complete discretion, financial compensation or the relocation/removal/installation of our affected water or sewerage assets.

- Keep you informed of any action required

If your complaint has gone through our full internal complaints procedure and you are not satisfied with the response or you believe that we have failed to comply with our internal complaints procedure you may be able to refer your complaint for consideration under The Property Ombudsman Scheme (TPOs). The maximum award available to TPO through their redress scheme is £25k. In addition to TPO's redress scheme covering consumers, TPO will also provide redress for small businesses (including charities and trusts) that meet the following criteria:

- a small business (or group of companies) with an annual turnover of less than £3 million;
- a charity with an annual income of less than £3 million; or
- a trust with a net asset value of less than £3 million.

You can obtain further information by visiting www.tpos.co.uk or email admin@tpos.co.uk

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Size x	Size y	Shape	Matl	Length	Grad	LEGEND
						Abandoned Foul Surface Water Combined
						Public Sewer
						Section 104
						Sludge Main
						→ Water Course Highway Drain
						All point assets follow the standard colour convention: red - combined blue - surface water brown - foul purple - overflow
						 Manhole Side Entry Manhole
						Head of System Coutfall
						Rodding Eye
						Inlet Discharge Point Discharge Point
						Vortex T Junction / Saddle
						Washout Chamber Solution
						Valve Vent Column
						Non Return Valve
						Gully
						Cascade Ww Treatment Works
						Hatch Box
						Oil Interceptor Oil Summit Oil Summit
						Drop Shaft
						• Orifice Plate
						MANHOLE FUNCTION
						FO Foul
						SW Surface Water
						CO Combined OV Overflow
						SEWER SHAPE
						CI Circular TR Trapezoidal
						EG Egg AR Arch
						OV Oval BA Barrel FT Flat Top HO HorseShoe
						RE Rectangular UN Unspecified
						SQ Square
						AC Ashestos Cement
						BR Brick
						PE Polyethylene RP Reinforced Plastic Matrix
						CO Concrete
						CSB Concrete Segment Bolted
						CC Concrete Box Culverted
						PSC Plastic / Steel Composite GRC Glass Reinforect Plastic
						D) Ductile Iron
						PVC Polyvinyl Chloride
						SI Spun Iron
						ST Steel
						PP Polypropylene
						PF Pitch Fibre
						MAR Masonry, Random
						U Unspecified
						Address or Site Reference:
						Land at, Hob Lane,
						WA6 0LR
						OS sheet SJ4573SF
						Number:
						Scale: 1:1250 Date: 22/08/2024
						Sheet: 1 of 9
						Printed by: Property Searches
						Finited by. Froperty Searches
						SEWER RECORDS
						Water for the North West



Size x	Size y	Shape	Matl	Length	Grad	LEGEND
						Abandoned Foul Surface Water Combined
						Private Sewer
						Overflow Water Course
						→ Highway Drain
						All point assets follow the standard colour convention: red - combined blue - surface water brown - foul purple - overflow
						Manhole Side Entry Manhole
						Head of System Outfall Extent of Survey Screen Chamber
						 Rodding Eye Inspection Chamber Bifurcation Chamber
						Discharge Point Lamp Hole Vortex T Junction / Saddle
						Penstock Catchpit Valve Chamber
						Valve Valve
						Air Valve O Vortex Chamber Non Return Valve O Penstock Chamber
						Soakaway
						Cascade Ww Treatment Works
						Flow Meter Septic Tank
						Oil Interceptor
						● Summit ■ Drop Shaft ▼ Change of Characteristic
						• Orifice Plate
						FO. Foul
						SW Surface Water
						CO Combined OV Overflow
						SEWER SHAPE
						CI Circular TR Trapezoidal
						EG Egg AR Arch OV Oval BA Barrel
						FT Flat Top HO HorseShoe
						SQ Square
						SEWER MATERIAL
						AC Asbestos Cement
						BR Brick PE Polyethylene
						RP Reinforced Plastic Matrix
						CO Concrete CSB Concrete Segment Bolted
						CSU Concrete Segment Unbolted
						CC Concrete Box Culverted PSC Plastic / Steel Composite
						GRC Glass Reinforecd Plastic
						PVC Polyvinyl Chloride
						CI Cast Iron
						ST Steel
						VC Vitrified Clay PP Polypropylene
						PF Pitch Fibre
						MAC Masonry, Coursed MAR Masonry, Random
						U Unspecified
						Address or Site Reference:
						Land at, Hob Lane, Cheshire, WAG OLR
						OS sheet SJ4573NE Number:
						Scale: 1:1250 Date: 22/08/2024
						Nodes: 8 Sheet: 2 of 9
						Printed by: Property Searches
						SEWER
						RECORDS <i>Utilities</i>
						Water for the North West

Size x	Size y	Shape	Matl	Length	Grad	LEGEND
						Abandoned Foul Surface Water Combined
						Public Sewer
						Section 104
						Sludge Main
						₩ater Course Highway Drain
						All point assets follow the standard colour convention: red - combined blue - surface water brown - foul purple - overflow
						 Manhole Side Entry Manhole
						Head of System Coutfall
						Rodding Eye
						Inlet O Bifurcation Chamber Discharge Point Lamp Hole
						Vortex I Junction / Saddle
						Washout Chamber Solution
						Valve Vent Column
						Non Return Valve
						Gully
						Cascade Ww Treatment Works
						Hatch Box
						Oil Interceptor Summit Oil Summit
						Drop Shaft ✓ Change of Characteristic
						• Orifice Plate
						MANHOLE FUNCTION
						FO. Foul
						SW Surface Water
						CO Combined OV Overflow
						SEWER SHAPE
						CI Circular TR Trapezoidal
						EG Egg AR Arch
						FT Flat Top HO HorseShoe
						RE Rectangular UN Unspecified
						SQ Square
						SEWER MATERIAL
						AC Asbestos Cement
						BR Brick
						PE Polyethylene RP Reinforced Plastic Matrix
						CO Concrete
						CSB Concrete Segment Bolted CSU Concrete Segment Unbolted
						CC Concrete Box Culverted
						PSC Plastic / Steel Composite GRC Glass Reinforecd Plastic
						DI Ductile Iron
						PVC Polyvinyl Chloride CI Cast Iron
						SI Spun Iron
						ST Steel VC Vitrified Clay
						PP Polypropylene
						PF Pitch Fibre MAC Masonry. Coursed
						MAR Masonry, Random
						UUnspecified
						Address or Site Reference:
						Land at, Hob Lane,
						WA6 0LR
						OS sheet SJ4574SF
						Number:
						Scale: 1:1250 Date: 22/08/2024
						Nodes: 8 Sheet: 3 of 9
						Printed by: Property Searches
						SEWER United
						Water for the North West

Size x Size y Shape Matl Lei	ngth Grad	LEGEND
		Abandoned Foul Surface Water Combined Public Sewer Private Sewer Section 104 Section 104 Rising Main Sludge Main Overflow Water Course Highway Drain
		All point assets follow the standard colour convention: red - combined blue - surface water brown - foul purple - overflow • Manhole • Side Entry Manhole • Mathole • Side Entry Manhole • Mathole • Outfall • Mathole • Side Entry Manhole • Mathole • Outfall • Non Return Valve • Hatch Box • Soakaway • Valve • Non Return Valve • Vent Column • Soakaway • Vent Column • Non Return Valve • Vent Column • Soakaway • Ww Pumping Station • Matho Box • Ww Pumping Station • Summit • Onthole Kiesk • Drop Shaft • Din Network Monitoring Point • Orifice Plate • Onthole Kiesk
		MANHULE FUNCTIONFOFoulSWSurface WaterCOCombinedOVOverflowSEVER SHAPECICircularTRTapezoidalEGEggARArchOVOvalBABarrelFTFlat TopHOFGRectangularUNUnspecifiedSQSquare
		SEWER MATERIALACAsbestos CementBRBrickPEPolyethyleneRPReinforced Plastic MatrixCOConcreteCBBConcrete Segment BoltedCSUConcrete Segment UnboltedCCConcrete Segment UnboltedCCPastic / Steel CompositeGRCGlass Reinforecd PlasticDJDuctile IronPVCPolyvinyl ChlorideCICast IronSISpun IronSTSteelVCVitrified ClayPPPolypropylenePFPitch Fibre
		PF Pitch Fibre MAC Masonry, Coursed MAR Masonry, Random U Unspecified Address or Site Reference: Land at, Hob Lane, Cheshire, WA6 0LR Mage 12/08/2024 Nodes: 8 Sheet: 4 of 9
		Printed by:Property SearchesSEWER RECORDSImage: Constant of the searchesWater for the North West

Refno Cover Func Invert Size x Size y Shape Matl Length Grad Refno Cover Func Invert ill not accept liability for any loss or damage caused by the actual position being different from those shown. will infringe these copyrights.

Size x	Size y	Shape	Matl	Length	Grad	LEGEND
						Abandoned Foul Surface Water Combined
						Public Sewer
						Section 104
						Sludge Main
						→ Water Course →
						All point assets follow the standard colour convention: red - combined blue - surface water brown - foul purple - overflow
						Manhole Side Entry Manhole
						Head of System Coutfall
						Rodding Eye
						Inlet Or Bifurcation Chamber Discharge Point Image Point
						Vortex I Junction / Saddle Penstock Scatchpit
						Washout Chamber Valve Chamber
						Valve Vortex Chamber Air Valve Depeteel
						Non Return Valve Penstock Chamber Notwork Storage Tank
						Gully
						Cascade Ww Pumping Station Flow Meter Sontio Tank
						Hatch Box Oil Interceptor
						^{5™} Summit ^{DS} D Change of Characteristic
						Drop Shaft Orifice Plate
						MANHOLE FUNCTION
						FO. Foul
						SW Surface Water CO Combined
						OV Overflow
						SEWER SHAPE
						CI Circular TR Trapezoidal
						OV Oval BA Barrel
						FT Flat Top HO HorseShoe RE Rectangular LIN Uppercified
						SQ Square
						AC Asbestos Cement
						BR Brick
						PE Polyethylene RP Reinforced Plastic Matrix
						CO Concrete
						CSB Concrete Segment Bolted CSU Concrete Segment Unbolted
						CC Concrete Box Culverted
						PSC Plastic / Steel Composite GRC Glass Reinforecd Plastic
						DI Ductile Iron
						CI Cast Iron
						SI Spun Iron
						VC Vitrified Clay
						PP Polypropylene PF Pitch Fibre
						MAC Masonry, Coursed
						MAR Masonry, Random U Unspecified
						Address or Site Reference:
						Land at, Hob Lane,
						Cheshire, WA6 0LR
						OS sheet SJ4673SW
						Scale: 1:1250 Date: 22/08/2024
						Nodes: 8
						Sneet: 5 of 9
						Printed by: Property Searches
						SEWER RECORDS
						Water for the North West

Size x	Size y	Shape	Matl	Length	Grad	LEGEND
						Abandoned Foul Surface Water Combined
						Public Sewer
						Section 104
						Sludge Main
						→ Water Course → Highway Drain
						All point assets follow the standard colour convention: red - combined blue - surface water brown - foul purple - overflow
						Manhole Side Entry Manhole
						Head of System Coutfall
						Rodding Eye Subscription Chamber
						Inlet Discharge Point Lamp Hole
						Vortex I Junction / Saddle Penstock Scatchpit
						Washout Chamber Solution Valve Chamber
						Valve Vortex Chamber Air Valve Air Valve
						Image: Non Return Valve Openstock Chamber Soakaway Image: Network Storage Tank
						Gully
						Cascade Ww Pumping Station Flow Meter Sentic Tank
						Hatch Box Oil Interceptor
						SM Summit ^{DS} Deven Oberta
						Drop Shaft Orifice Plate
						MANHOLE FUNCTION
						FO. Foul
						SW Surface Water CO Combined
						OV Overflow
						SEWER SHAPE
						CI Circular TR Trapezoidal EG Egg AR Arch
						OV Oval BA Barrel
						RE Rectangular UN Unspecified
						SQ Square
						SEWER MATERIAL
						AC Asbestos Cement
						BR Brick PE Polyethylene
						RP Reinforced Plastic Matrix
						CO Concrete CSB Concrete Segment Bolted
						CSU Concrete Segment Unbolted
						PSC Plastic / Steel Composite
						GRC Glass Reinforecd Plastic
						PVC Polyvinyl Chloride
						CI Cast Iron SI Spun Iron
						ST Steel
						VC Vitrified Clay PP Polypropylene
						PF Pitch Fibre
						MAC Masonry, Coursed MAR Masonry, Random
						U Unspecified
						Address or Site Reference:
						Land at, Hob Lane, Cheshire,
						WA6 0LR
						OS sheet SJ4672NW
						Number:
						Scale: 1:1250 Date: 22/08/2024 Nodes: 8
						Sheet: 6 of 9
						Printed by: Property Searches
						SEWER
						vvater for the North West

Size x	Size y	Shape	Matl	Length	Grad	LEGEND
						Abandoned Foul Surface Water Combined
						Public Sewer
						Section 104
						Sludge Main
						Water Course Highway Drain
						All point assets follow the standard colour convention: red - combined blue - surface water
						Manholo
						Head of System
						Extent of Survey Extent of Survey Extent of Survey
						Inlet
						Discharge Point Lamp Hole T Junction / Saddle
						Penstock Catchpit
						Washout Chamber Valve Chamber
						Air Valve O Vortex Chamber O D D
						Non Return Valve
						Gully
						Cascade Ww Treatment Works
						Hatch Box
						Oil Interceptor
						● Summit → Change of Characteristic → Drop Shaft
						• Orifice Plate
						SW Surface Water
						CO Combined
						OV Overflow
						SEWER SHAPE
						CI Circular TR Trapezoidal
						EG Egg AR Arch OV Oval BA Barrel
						FT Flat Top HO HorseShoe
						RE Rectangular UN Unspecified
						AC Ashestos Cement
						BR Brick
						PE Polyethylene
						CO Concrete
						CSB Concrete Segment Bolted
						CSU Concrete Segment Unbolted CC Concrete Box Culverted
						PSC Plastic / Steel Composite
						GRC Glass Reinforecd Plastic
						PVC Polyvinyl Chloride
						CI Cast Iron
						SI Spun Iron ST Steel
						VC Vitrified Clay
						PP Polypropylene
						MAC Masonry, Coursed
						MAR Masonry, Random
						o onspecilieu
						Address or Site Reference:
						Land at, Hob Lane,
						Cheshire, WAG OLR
						OS sheet SJ4672NE
						Number: Scale: 1:1250 Date: 22/08/2024
						Nodes: 8
						Sheet: 7 of 9
						Printed by: Property Searches
						SEWER RECORDS
						Water for the North West

Slurry Bed The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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Size x	Size y	Shape	Matl	Length	Grad	LEGEND
						Abandoned Foul Surface Water Combined Public Sewer Private Sewer Section 104 Rising Main Sludge Main Overflow Water Course Highway Drain
						All point assets follow the standard colour convention: red - combined blue - surface water brown - foul purple - overflow Manhole Side Entry Manhole Head of System Coutfall Extent of Survey Screen Chamber Rodding Eye Coutfall Screen Chamber Rodding Eye Coutfall Screen Chamber Ninlet Sifurcation Chamber Vortex Chamber Vortex Catchpit Vortex Valve Valve Chamber Non Return Valve Soakaway Cascade Valve Devertiow Manhole Side Entry Manhole Valve Voutfall Screen Chamber Valve Vortex Chamber Valve Penstock Chamber Valve Penstock Chamber Valve Storage Tank Sewer Overflow Varta Sewer Overflow
						 Flow Meter Flow Meter Septic Tank Oil Interceptor Oil Interceptor Summit Drop Shaft Orifice Plate
						MANHOLE FUNCTIONFOFoulSWSurface WaterCOCombinedOVOverflow
						SEWER SHAPECICircularTRTrapezoidalEGEggARArchOVOvalBABarrelFTFlat TopHOHorseShoeRERectangularUNUnspecifiedSQSquareSquareSquare
						SEWER MATERIALACAsbestos CementBRBrickPEPolyethyleneRPReinforced Plastic MatrixCOConcreteCSBConcrete Segment BoltedCSUConcrete Segment UnboltedCCConcrete Box CulvertedPSCPlastic / Steel CompositeGRCGlass Reinforecd PlasticDIDuctile IronPVCPolyvinyl ChlorideCICast IronSISpun IronSTSteelVCVitrified ClayPPPolypropylenePFPitch FibreMACMasonry, CoursedMARMasonry, RandomUUnspecified
						Address or Site Reference: Land at, Hob Lane, Cheshire, WA6 0LR
						OS sheet Number: Scale: 1:1250 Date: 22/08/2024 Nodes: 8 Sheet: 8 of 9 Printed by: Property Searches
						SEWER RECORDS Up United Utilities Water for the North West

Size x	Size y	Shape	Matl	Length	Grad	LEGEND
						Abandoned Foul Surface Water Combined Public Sewer Private Sewer Section 104 Section 104 Rising Main Sludge Main Overflow Water Course Water Course
						All point assets follow the standard colour convention: red - combined blue - surface water brown - foul purple - overflow Manhole Side Entry Manhole Head of System C Outfall Head of System C Outfall Screen Chamber Rodding Eye C Inspection Chamber N Inlet Discharge Point H Lamp Hole Vortex T Junction / Saddle Penstock C Catchpit
						 Washout Chamber Valve Valve Vent Column Vortex Chamber Vortex Chamber Vortex Chamber Penstock Chamber Non Return Valve Soakaway Soakaway Sewer Overflow Gully Gully Ww Treatment Works Cascade Flow Meter Septic Tank Control Kiosk Oil Interceptor Mumit Control Kiosk Drop Shaft Orifice Plate
						FO Foul SW Surface Water CO Combined OV Overflow
						CICircularTRTrapezoidalEGEggARArchOVOvalBABarrelFTFlat TopHOHorseShoeRERectangularUNUnspecifiedSQSquareSEWER MATERIAL
						SEWER MATERIALACAsbestos CementBRBrickPEPolyethyleneRPReinforced Plastic MatrixCOConcreteCBBConcrete Segment BoltedCSUConcrete Segment UnboltedCCConcrete Box CulvertedPSCPlastic / Steel CompositeGRCGlass Reinforecd PlasticDJDuctile IronPVCPolyvinyl ChlorideCICast IronSISpun IronSTSteelVCVitrified ClayPPPolypropylenePFPitch FibreMACMasonry, CoursedMARMasonry, Random
						U Unspecified Address or Site Reference: Land at, Hob Lane, Cheshire, WA6 0LR
						OS sheet Number:SJ4673NEScale:1:1250Date:Nodes:8Sheet:9 of 9Printed by:Property Searches
						SEWER RECORDS Up United Water for the North West

Clean Water Symbology

19	Proposed	Abandoned	Live		
-		-A		Distri	bution Main
		-A		Trunk	Main
		AAA		Comr	ns Pipe
	10.0	-AA		Priva	te Pipe
		-AA		Conc	essionary Service
-				Raw	Water
		A		LDTM	Raw Water
		<u> </u>		LDTM	1 Treated Water
	Air Valve			BH	Bore Hole
1	AC Valve, op	en		lines	Inlet Point
0	AC Valve, clo	sed		A	Bulk Supply Point
T	CC Valve, op	en		F	End Can
T	CC Valve, clo	esed		-	Site Termination
	Non Return V	/alve		7	Change of Characteristic
	Pressure Mar	nagement Valve		-	Condition Report
I	OMS Valve				
*	Stop Tap				Property Types
-	Flow Meter				
M	Domestic Me	ter			Water Tower
	Commercial	Meter			
3	Pump			VH	Valve House
	Hydrant			A	Booster Pumping Station
FH O	Fire Hydrant			<u></u>	
P	Anode			IPS	Intake Pumping Station
1	Chlorination	Point		m	and the second second second
Q	De-chlorinati	on Point			Water Treatment Works
SP.	Strainer Poin	it i		(FLE)	Supply Reservoir
A.P.	Access Point	ÊG		8	
HB	Hatch Box			(SR)	Service Reservoir
IP	IP Point			TR	Impounding Reservoir
SPT	Sampling Sta	ation		9	a de an anna de la la ser a
LB	Logger Box			ñ.	Pipe Bridge

Symbology for proposed assets is the same as above, but shown in green Symbology for abandoned assets is the same as above, but shown in black

OS Sheet No: SJ4672NE

Scale: 1: 1250 Date: 22/08/2024

Legend

OS Sheet No: SJ4672NW

Printed By: Property Searches

Scale: 1: 1250 Date: 22/08/2024

	PIPE WO	ORK	
	Live	Proposed	
			Trunk Main - I
			Raw Water A
			LDTM Raw Wa
			LDTM Raw W
			LDTM Treated
			LDTM Treated
			Distribution
			Comms Pipe
			Concessionar
	NODES/	FURNITU	IRE
	Live	Proposed	
	E	E	End Cap
	- î -	- F-	CC Valve
	- H -3	1	ACValve
	÷.	÷.	Air Valve
	X	X	Sluice Valve
	-		Non Return
	~	~	Chapter of (
	•	•	Chlorinatio
	Q	Q	De Chlorina
	•		Bore Hole
	o Inlet	O	Inlet Point
	\oplus	\oplus	Bulk Supply
	FH •	FH	Fire Hydran
	н ●	H	Hydrant
	PEH	PFH	Private Fire
	-0-	-0-	Pump
	•	0	Site Termin
		•	Service Star
	•	· ·	Service End
T I2 -		:	
Ine	posit	ion of	underg
oniy	and	IS GIVE	en in ac
Ine	actua	al pos	itions m
priva	ate pi	pes, s	ewers o
PLC	WIII r	not ac	cept an
bein	g diffe	erent	from the
ΟU	nited	Utiliti	es Wate
Surv	vev M	lap wi	th the s
Cro	wn cc	pvria	ht 1000
rese	erved	Unai	uthorise
			00
			05
Sc	cale	: 1: ′	250

Legend

ABANDONED PIPE

ground apparatus shown on this plan is approximate ccordance with the best information currently available. nay be different from those shown on the plan and or drains may not be recorded. United Utilities Water ny liability for any damage caused by the actual positions nose shown.

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Sheet No: SJ4672NW

OS Sheet No: SJ4673SE

Scale: 1: 1250 Date: 22/08/2024

Legend PIPE WORK Live Proposed Trunk Main - PressurisedMain Raw Water Aqueduct - Pressurised Main 💳 💳 Raw Water Aqueduct - GravityMain 💻 💻 LDTM Raw Water Distribution - GravityMain LDTM Treated Water Distribution - PressurisedMain LDTM Treated Water Distribution - GravityMain ----- Private Pipe - LateralLine Distribution Main - PressurisedMain Comms Pipe - LateralLine ----- Concessionary Service - LateralLine NODES/ FURNITURE Proposed Live ✡ End Cap -1-CC Valve AC Valve Δ Air Valve • Ħ Sluice Valve Non Return Valve VH Pressure Management Valve ∇ E Change of Char ____ 1-1 Anode Chlorination Point Inlet AP 0 De Chlorination Point 0 Μ Bore Hole C CM O Inlet Point \oplus Bulk Supply Point 112 FH Fire Hydrant Hydrant PFH Private Fire Hydrant -0--@-Pump CU COPPER Site Termination \circ \circ Service Start Service End DRILLING The position of underground apparatus shown on this plan is approximate The actual positions may be different from those shown on the plan and being different from those shown. © United Utilities Water PLC 2024. The plan is based upon the Ordnance Survey Map with the sanction of the Controller of H.M.Stationery Office, reserved. Unauthorised reproduction will infringe these copyrights. OS Sheet No: SJ4673SE Scale: 1: 1250

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Date: 22/08/2024

OS Sheet No: SJ4673SW

Scale: 1: 1250 Date: 22/08/2024

PIPE	WORK

	Live	Proposed	Trunk Main -	
			Raw Water A Raw Water A LDTM Raw W	
			LDTM Raw W LDTM Treate LDTM Treate Private Pine	
			Distribution Comms Pipe Concessiona	
NODES/ FURNITURE				
		↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	CC Valve AC Valve Air Valve Sluice Valv Non Return Pressure M Change of Anode Chlorinatic De Chlorin Bore Hole Inlet Point	
			Bulk Suppl Fire Hydrar Hydrant Private Fire Pump Site Termir Service Sta Service End	
The only The priva PLC bein	posit and actua ate pi will r g diffe	ion of is give al posi pes, s not ac erent	underg en in ac itions m ewers cept an from th	
© U Surv Crov rese	nited vey N wn co erved	Utilitie Iap wi opyrigl . Unat	es Wate th the s ht 1000 uthorise	
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ABANDONED PIPE

ground apparatus shown on this plan is approximate ccordance with the best information currently available. may be different from those shown on the plan and or drains may not be recorded. United Utilities Water ny liability for any damage caused by the actual positions hose shown.

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Sheet No: SJ4673SW

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Scale: 1: 1250 Date: 22/08/2024

PIPE	WORK

Live	Proposed			
		Trunk Main - Raw Water 4		
		Raw Water A		
		LDTM Raw W		
		LDTM Raw W		
		LDTM Treate		
		Private Pipe		
		Distribution		
	·	Comms Pipe		
		Concessiona		
NODES/ FURNITURE				
Live	Proposed			
	-	End Cap		
	-	AC Valve		
•	•	Air Valve		
X	X	Sluice Valv		
×		Non Retur		
•	M	Pressure N		
	∇	Change of		
	-	Anode		
	0	Chlorinatic		
Ť	Ť	Bore Hole		
Inlet O	Inlet	Inlet Point		
\oplus	\oplus	Bulk Suppl		
FH	FH	Fire Hydrai		
H	H •	Hydrant		
•	• •	Private Fire		
-0-	-0-	Pump Site Termin		
•	0	Service Sta		
•	0	Service En		
The posit	tion of	under		
only and	is aive	en in ac		
The actua	al posi	itions n		
private pi	pes, s	ewers		
PLC will	not ac	cept ar		
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@ United	1 1411141			
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## ABANDONED PIPE

![](_page_71_Figure_7.jpeg)

rground apparatus shown on this plan is approximate accordance with the best information currently available. may be different from those shown on the plan and s or drains may not be recorded. United Utilities Water any liability for any damage caused by the actual positions hose shown.

ter PLC 2024.The plan is based upon the Ordnance sanction of the Controller of H.M.Stationery Office, 022432 and United Utilities Water PLC copyrights are sed reproduction will infringe these copyrights.

Sheet No: SJ4573SE

![](_page_71_Picture_11.jpeg)

![](_page_71_Picture_12.jpeg)
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Scale: 1: 1250 Date: 22/08/2024



Scale: 1: 1250 Date: 22/08/2024

Legend
PIPE WORK
Live Proposed
Trunk Main - PressurisedM
Raw Water Aqueduct - Pre
LDTM Raw Water Distribut
🚥 🖛 🚥 🚥 LDTM Raw Water Distribut
LDTM Treated Water Distri
LDTM Treated Water Distri
Private Pipe - LateralLine
Distribution Main - Pressu
Concessionary Service - La
live Proposed
End Cap
Air Valve
T Sluice Valve
Non Return Valve
🕞 📄 🕨 Pressure Management
V Change of Char
Anode
Chlorination Point
O De Chlorination Point
😑 🛛 😑 Bore Hole
👸 🚺 Inlet Point
🕀 🛛 🕀 Bulk Supply Point
🍧 🧧 🖥 Fire Hydrant
👗 🍐 Hydrant
🍯 🧧 Private Fire Hydrant
<b>-⊗-</b> - <mark>⊙</mark> - Pump
<ul> <li>Site Termination</li> </ul>
<ul> <li>Service Start</li> </ul>
<ul> <li>Service End</li> </ul>
The position of underground a only and is given in accordance The actual positions may be of private pipes, sewers or drain PLC will not accept any liability being different from those sho © United Utilities Water PLC Survey Map with the sanction Crown copyright 100022432 reserved. Unauthorised repro-
OS Shee
Scale: 1: 1250

### ABANDONED PIPE



apparatus shown on this plan is approximate nce with the best information currently available. different from those shown on the plan and ns may not be recorded. United Utilities Water lity for any damage caused by the actual positions lown.

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# et No: SJ4673NW





	OS Sheet No	o: SJ4573NE

# Scale: 1: 1250 Date: 22/08/2024

Legend	1	
PIPE WO	ORK	
Live	Proposed	Taran la Mariana d
		Raw Water A
		Raw Water Ad
		LDTM Raw Wa
		LDTM Raw Wa
		LDTM Treated
		Private Pipe -
		Distribution N
		Comms Pipe
		Concessionar
NODES/	FURNITU	JRE
Live	Proposed	
E	E	End Cap
<del></del>	-	CC Valve
	100	AC Valve
	÷.	Air Vaive
A	A	Non Return
S 🖌 S	W	Pressure Ma
$\nabla$	$\nabla$	Change of C
<u> </u>		Anode
<u> </u>		Chlorinatio
<u> </u>	<u> </u>	De Chlorina
•	٠	Bore Hole
Inlet O	O	Inlet Point
<b>•</b>	<b>•</b>	Bulk Supply
• •	• •	Fire Hydran
РЕН	Ö PEH	Hydrant
	•	Private Fire
-0-	-9-	Fump Site Termin
	ŏ	Service Star
•	•	Service End
The posit	ion of	undera
only and	ion or is aive	n in ac
The actua	al nos	itions m
nrivato ni	nos s	
	pes, s not ac	cont an
being diff	oront	from the
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© United	Utiliti	es Wate
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Crown co	pyrig	ht 1000
reserved	. Unai	uthorise
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Carla		
Scale		1200



### ABANDONED PIPE



ground apparatus shown on this plan is approximate cordance with the best information currently available. nay be different from those shown on the plan and or drains may not be recorded. United Utilities Water ny liability for any damage caused by the actual positions nose shown.

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# Sheet No: SJ4573NE

Date: 22/08/2024





# OS Sheet No: SJ4574SE

Scale: 1: 1250 Date: 22/08/2024

# Legend PIPE WORK Live Proposed ---- Private Pipe - LateralLine Comms Pipe - LateralLine ----- Concessionary Service - LateralLine NODES/ FURNITURE Proposed Live End Cap CC Valve ACValve Air Valve ٠ Sluice Valve Non Return Valve $\nabla$ Change of Char Anode Chlorination Point 0 De Chlorination Point Bore Hole 0 Inlet Point $\oplus$ Bulk Supply Point Fire Hydrant Hydrant Private Fire Hydrant Pump -0-Site Termination $\circ$ $\circ$ Service Start $\circ$ Service End being different from those shown. Scale: 1: 1250

### ABANDONED PIPE



The position of underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private pipes, sewers or drains may not be recorded. United Utilities Water PLC will not accept any liability for any damage caused by the actual positions

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OS Sheet No: SJ4574SE







### Appendix B Proposed Development Drawings















# 40m









# 





# Appendix C Proposed Widening Works to Common Lane



I	1		1
с	Revised widening & amended signs	SJE	05/03/25
B	Revised widening & omit temp signals Revised widening	SJE SJE	27/02/25
rev.	amendment	by	date
		by	dute
			~~~
B	eacon Transport P	lanı	ning
Beac 1a Ce info@	eacon Transport Planning LLP dar Avenue, Malvern, Worcestershire WR14 25G beacontransportplanning.co.uk www.beacontran	lanı	ning
Beac 1a Ce info(eacon Transport Planning LLP dar Avenue, Malvern, Worcestershire WR14 25G 2beacontransportplanning.co.uk www.beacontran	lanı	ning ning.co.uk
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Beac 1a Cc info@ client Bee project Hc drawn by	eacon Transport P on Transport Planning LLP dar Avenue, Malvern, Worcestershire WR14 25G 2beacontransportplanning.co.uk www.beacontran elltown Power UK Limited bb Lane Solar Farm SJE	rsportplan	ning.co.uk
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Appendix D Greenfield Runoff Rates



Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Mar 17 2025 12:23

Calculated by:	Michael Underwood	Site Deta	ils
Site name:	Hob Lane	Latitude:	53.26085° N
Site location:	Elton, Cheshire	Longitude:	2.81332° W
This is an estimatio	n of the greenfield runoff rates that a	are used to meet normal best practice Baference	2296870954

This is an estimation of the greenfield runoff rates that are used to meet normal best practice Reference: criteria in line with $\ensuremath{\mathsf{Environment}}$ Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis

Date: for setting consents for the drainage of surface water runoff from sites.

		IH124		
RUNOTT estimation	approach			
Site characteristi	CS		Notes	
Total site area (ha): ¹			(1) Is Q _{BAR} < 2.0 l/s/ha?	
Methodology				
Q _{BAR} estimation method:	Calculate from S	PR and SAAR	When Q _{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.	
SPR estimation method:	Calculate from S	OIL type		
Soil characteristic	CS _{Default}	Edited	(2) Are flow rates < 5.0 l/s?	
SOIL type:	4	4	Where flow rates are less than 5.0 l/s consent	
HOST class:	N/A	N/A	for discharge is usually set at 5.0 l/s if blockage	
SPR/SPRHOST:	0.47	0.47	from vegetation and other materials is possible.	
Hydrological characteristics	Default	Edited	blockage risk is addressed by using appropriate drainage elements.	
SAAR (mm):	711	711		
Hydrological region:	10	10	(3) Is SPR/SPRHOST ≤ 0.3?	
Growth curve factor 1 year	0.87	0.87	Where groundwater levels are low enough the	
Growth curve factor 30 years:	1.7	1.7	use of soakaways to avoid discharge offsite	
Growth curve factor 100 years:	2.08	2.08	surface water runoff.	
Growth curve factor 200 years:	2.37	2.37		

Q _{BAR} (I/s):	4.92	4.92
1 in 1 year (l/s):	4.28	4.28
1 in 30 years (l/s):	8.36	8.36
1 in 100 year (l/s):	10.23	10.23
1 in 200 years (l/s):	11.65	11.65

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.



Appendix E Substation Compound Drainage Scheme



Node Easting (m) Northing (m) CL (m) Depth (m) Sump (m) Node (m) MH Connections Link IL Dia Link SW1 345863.295 374094.886 10.300 0.825 900 Manhole Adoptable • 0 2.000 9.475 225 Circular SW2 345879.661 374114.139 10.300 0.825 900 Manhole Adoptable • 0 2.000 9.475 225 Circular SW2 345848.204 374141.000 10.300 1.69 900 Manhole Adoptable • 0 1.000 9.475 225 Circular SW3 345848.204 374141.000 10.300 1.69 900 Manhole Adoptable 1 1.000 9.231 225 Circular SW4 345832.129 374121.687 10.300 1.517 1200 0.300 Manhole Adoptable 1 1 0.002 9.003 225	Node Easting (m) Northing (m) CL (m) Opp (m) Name (m) Sump (m) Name (m)	Node Easting (m) Northing (m) CL (m) Depth (m) Dia (mm) Sump (m) Node (mm) MH Type Connections Link (m) III. Dia (mm) Link Type SW1 345863.295 374094.886 10.300 0.825 900 Manhole Adoptable 0 2.000 9.475 225 Circular SW2 345879.661 374114.139 10.300 0.825 900 Manhole Adoptable 0 1.000 9.475 225 Circular SW2 345879.661 374114.139 10.300 1.069 900 Manhole Adoptable 0 1.000 9.475 225 Circular SW3 345848.204 374141.000 10.300 1.069 900 Manhole Adoptable 0 1.000 9.231 225 Circular SW4 345832.129 374121.687 10.300 1.517 1200 0.300 Manhole Adoptable 0 1.001 9.231 225 Circular SW4 345832.129 374121.687 10.300 1.517 1200
Node (m) Easting (m) Northing (m) CL (m) Depth (m) Dia (mm) Sump (m) Node Type MH Type Connections Link (m) IL Dia (mm) Link Type SW1 345863.295 374094.886 10.300 0.825 900 Manhole Adoptable	Node (m)Easting (m)Northing (m)CL (m)Depth (m)Dia (m)Sump (m)Node (m)MH TypeConnectionsLink (m)Link (m)Link TypeSW1345863.295374094.88610.3000.825900ManholeAdoptable 9 000 </th <th>Node (m) Easting (m) Northing (m) CL (m) Depth (m) Dia (mm) Sump (m) Node (m) MH Type Connections Link IL (m) Dia (m) Link Type SW1 345863.295 374094.886 10.300 0.825 900 Manhole Adoptable 0 2.000 9.475 225 Circular SW2 345879.661 374114.139 10.300 0.825 900 Manhole Adoptable 0 2.000 9.475 225 Circular SW2 345879.661 374114.100 10.300 1.069 900 Manhole Adoptable 0 1.000 9.475 225 Circular SW3 345848.204 374141.000 10.300 1.069 900 Manhole Adoptable 1 1.000 9.231 225 Circular SW4 345832.129 374121.687 10.300 1.517 1200 0.300 Manhole Adoptable 1 1.001 9.100 225 Circular <</th>	Node (m) Easting (m) Northing (m) CL (m) Depth (m) Dia (mm) Sump (m) Node (m) MH Type Connections Link IL (m) Dia (m) Link Type SW1 345863.295 374094.886 10.300 0.825 900 Manhole Adoptable 0 2.000 9.475 225 Circular SW2 345879.661 374114.139 10.300 0.825 900 Manhole Adoptable 0 2.000 9.475 225 Circular SW2 345879.661 374114.100 10.300 1.069 900 Manhole Adoptable 0 1.000 9.475 225 Circular SW3 345848.204 374141.000 10.300 1.069 900 Manhole Adoptable 1 1.000 9.231 225 Circular SW4 345832.129 374121.687 10.300 1.517 1200 0.300 Manhole Adoptable 1 1.001 9.100 225 Circular <
SW1 345863.295 374094.886 10.300 0.825 900 Manhole Adoptable 0 2.000 9.475 225 Circular SW2 345879.661 374114.139 10.300 0.825 900 Manhole Adoptable 0 2.000 9.475 225 Circular SW2 345879.661 374114.139 10.300 0.825 900 Manhole Adoptable 0 1.000 9.475 225 Circular SW3 345848.204 374141.000 10.300 1.069 900 Manhole Adoptable 1 1.000 9.231 225 Circular SW4 345832.129 374121.687 10.300 1.517 1200 0.300 Manhole Adoptable 1 2.000 9.100 225 Circular SW4 345848.375 374072.807 10.000 1.100 900 Manhole Adoptable 1 1.002 8.900 225 Circular SW5 345804.375 374072.807 10.000 1.100 900 Manhole Adoptable	SW1 345863.295 374094.886 10.300 0.825 900 Manhole Adoptable 0 2.000 9.475 225 Circular SW2 345879.661 374114.139 10.300 0.825 900 Manhole Adoptable 0 2.000 9.475 225 Circular SW2 345879.661 374114.139 10.300 1.069 900 Manhole Adoptable 0 1.000 9.475 225 Circular SW3 345848.204 374141.000 10.300 1.069 900 Manhole Adoptable 1 1.000 9.231 225 Circular SW4 345832.129 374121.687 10.300 1.517 1200 0.300 Manhole Adoptable 1 2.000 9.100 225 Circular SW4 345848.375 374072.807 10.000 1.100 900 Manhole Adoptable 1 1.002 9.900 225 Circular SW5 345804.375 374072.807 10.000 1.100 900 Manhole Adoptable	SW1 345863.295 374094.886 10.300 0.825 900 Manhole Adoptable 0 2.000 9.475 225 Circula SW2 345879.661 374114.139 10.300 0.825 900 Manhole Adoptable 0 2.000 9.475 225 Circula SW2 345879.661 374114.139 10.300 0.825 900 Manhole Adoptable 0 1.000 9.475 225 Circula SW3 345848.204 374141.000 10.300 1.069 900 Manhole Adoptable 1 1.000 9.231 225 Circula SW4 345832.129 374121.687 10.300 1.517 1200 0.300 Manhole Adoptable 1 2.000 9.100 225 Circula SW4 345832.129 374121.687 10.300 1.517 1200 0.300 Manhole Adoptable 1 2.000 9.100 225 Circula
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	d d	Image: W6 345792.032 374033.617 9.700 0.950 Junction 1 1.003 8.900 225 Circulation



michaelunderwood@envireauwater.co.uk

Technical Specification				
Control Point	Head (m)	Flow (I/s)		
Primary Design	1.500	0.800		
Flush-Flo™	0.168	0.496		
Kick-Flo®	0.337	0.418		
Mean Flow		0.587		





hydro-int.com/patents

Site

Ref



Head (m)	Flow (l/s)
0.000	0.000
0.052	0.373
0.103	0.478
0.155	0.495
0.207	0.493
0.259	0.481
0.310	0.450
0.362	0.431
0.414	0.456
0.466	0.479
0.517	0.502
0.569	0.523
0.621	0.543
0.672	0.562
0.724	0.580
0.776	0.598
0.828	0.615
0.879	0.632
0.931	0.648
0.983	0.663
1.034	0.678
1.086	0.693
1.138	0.707
1.190	0.721
1.241	0.735
1.293	0.749
1.345	0.762
1.397	0.775
1.448	0.787
1.500	0.799



SHE-0038-8000-1500-8000

Hydro-Brake® Optimum

© 2024 Hydro International, Rivernead Court, Kenn Business Park, Windmill Road, Kenn, Clevedon, BS21 6FT. Tel 01275 878371 Fax 01275 874979 Web www.hydro-int.com Email designtcols@hydro-int.com



CE

NOTES:

All dimensions in mm All measurements ± 1mm

- Specification Information

 Opening in back wall cast to suit outside diameter of the pipework

 Invert level of pipe can be set to your specification

Headwall Installation Units should be bedded on minimum 150mm of semi-dry concrete. Sit the headwall level or with a slight fall 1:50 from pipe to spill mouth.

landling

- Weight of concrete is based on 2.4 tonne/m³+5% is recommended for sizing lifting equipment. All lifting points shall be used as specified below Anchor points & loops Total
- Qty: 3
- Unit to be lifted as per lifting diagram

- Concrete

 A.
 Mix ref: Self-compacting DC4/DS4 Mix

 B.
 Lifting strength based on 2 cubes = 20N/mm²

 C.
 Characteristic 28 day cube strength = 50N/mm²

 D.
 Concrete provides Design Chemical Class 4 (DC4) to special Digest 1, Table F2.

Reinforcement

- Reinforcement to BS EN 13369
- Scheduling, dimensioning, bending & cutting to BS8666 Cage to be machine tied with steel wire

- Manufacture

 A.
 Manufacture to BS EN 15258:2008 precast concrete products Retaining wall elements, Factory Production Control certificate number: 0086-CPR-650448 & BS EN 40260
- Tolerances to BS EN 13369 clause 4.3.1.1
- Top
 Sides
 Base
 Rear of back wall

 Class
 A
 A
 A
 Self Levelled
- Marking: Units shall be indelibly marked to show: Mould reference code De-mould date

- Job reference number & unique product number Unit weight (kg)
-)esigr
- Concrete design to EC2
- Althon have designed the concrete units only, the site conditions should be assessed for suitability by the scheme designer Units are designed to withstand a vertical live load surcharge of 10kN/M² Weight of soil = 18kN/M²

- Angle of internal friction = 30 Deg. Design Life: >50 years
- Min Cover
 Cover Block
 Min Cover
 Max Cover

 Size (mm)
 Size (mm)
 Size (mm)
 Size (mm)

 All Faces
 33
 28
 38

 Exposure
 Exposure induced
 Corrosion induced
 Freeze/thaw
 Chemical attack

 Classification
 by Carbonation
 by Chloride
 attack
 attack

 All Faces
 XC3/4
 XD2
 XF3
 XA2

Fabrication Specification

- Manufacture IAW EN 1090-2 EXC CLASS 1
- Material grade is to be: BS EN 10025 S275 Welding carried out IAW EN 1090-2 PARA 7.5.4 7.5.18
- All fillet and butt welds to have a minimum throat thickness of 6mm & joints to be
- fully welded where possible. Ensure vertical flats are fully welded both sides where possible.
- All sharp edges and burrs are to be removed. Remove all weld splatter.

- Holes by punching are permitted with reaming. Galvanising is carried out after fabrication to BS EN:ISO 1461

Handrail Specification

- Kee Klamp® Galvanised Size 8 Fittings Size 8 48.3mm OD 3.2mm Wall Thickness Galvanised Medium Duty Tube to BS EN 10255
- EN 10255 360N/m Design Load at stated in BS 8118, BS 6180, BS 6399 & BS 7818, Civil Engineering Specification for thw Water Industry (CESWI) 7th Edition Clause 2.60 Handrails & Balusters & The Engineering Equipment and Materials Users' Association (EEMUA) Publication 105 7th Edition Factory Stairways, Ladders and Hondraile Handrails
- Other design loads available on request GRP/FRP Handrails also available

REV NO	DATE	DESCRIPTION								
		Al	thon							
ADDRESS: ALTHON LIMITED TEL: 01603 488700 VULCAN ROAD SOUTH FAX: 01603 488598 NORWICH EMALL: sales@althon.co.uk NR6 6AF WEBSITE: www.althon.co.uk										
	PR	OPRIETARY &	CONFIDENTIAL							
The inform in part	ation contained in this of or as a whole without t	drawing is the se he written perm	ole property of Althor ission of Althon Limte	Limited. Any reproduction ed is strictly prohibited.						
DRAWING TITLE	E / PROJECT:									
H3C Headwall Cranked Grating 3 Sided Kee Klamp										
LIENT:										
SCALE: NTS	PAPER: A3	SHEET NC	01 OF 02	DATE: 12 - 10 - 21						
EADWALL WEI	знт: 54	l0kg	TOE WEIGHT:	N/A						
PRODUCT NAME	E	H3	С							

Appendix F Substation Compound Stormwater Hydraulic Calculations

envireau water





Causeway	Belltown Power Hob Lane Solar Farm Substation Compoun	d	File: Substation Com Network: Storm Net Envireau Water 20/03/2025	npound.pfd :work	Page 1
		Desig	n Settings		
Rainfall Methodolog Return Period (years Additional Flow (% C Time of Entry (mins	xy FEH-22 Maxin s) 100 6) 0 V 1.000 s) 5.00	num Time of Concentrati Maximum Rainfal Minimum Velo Connec Minimum Backdrop H	on (mins) 30.00 I (mm/hr) 50.0 city (m/s) 1.00 tion Type Level Soffit leight (m) 0.200	Preferred Cov Include Interme Enforce best practice s	rer Depth (m) 0.600 diate Ground √ e design rules x
		<u>N</u>	lodes		
Name /	Area T of E Cove (ha) (mins) Leve (m)	r Node Manhol Type Type	e Diameter Sump (mm) (m)	Easting Northing (m) (m)	; Depth (m)
SW1 0 SW2 0	0.025 5.00 10.30 0.025 5.00 10.30	0 Manhole Adoptab 0 Manhole Adoptab	e 900 e 900	345863.295 374094.88 345879.661 374114.13	6 0.825 9 0.825
SW3 (0.025 5.00 10.30	0 Manhole Adoptab	e 900	345848.204 374141.00	0 1.069
SW4 0 SW5 SW6	0.040 5.00 10.30 10.00 9.70	0 Manhole Adoptab 0 Manhole Adoptab 0 Junction	le 1200 0.300 le 900	345832.129374121.68345804.375374072.80345792.032374033.61	7 1.517 17 1.100 7 0.950
		Manho	le Schedule		
Node Easting N (m)	lorthing CL D (m) (m)	epth Dia Sump (m) (mm) (m)	Node MH Type Type	Connections Link	IL Dia Link (m) (mm) Type
SW1 345863.295 374	4094.886 10.300 ().825 900	Manhole Adoptable	• ~ ~ ~	
SW2 345879.661 374	4114.139 10.300 (0.825 900	Manhole Adoptable	0 2.000	9.475 225 Circular
				0 1.000	9.475 225 Circular
SW3 345848.204 374	4141.000 10.300 2	1.069 900	Manhole Adoptable		9.231 225 Circular
SW3 345848.204 374	4141.000 10.300 1	1.069 900	Manhole Adoptable		9.231 225 Circular

File: Substation Compound.pfd

Page 1

Belltown Power

Cause	Nay Belltown F Hob Lane Substation	Power Solar Farm I Compound		File: Substation C Network: Storm Envireau Water 20/03/2025	Compound.pfd Network	Page 2							
Manhole Schedule													
Node Ea: (sting Northing m) (m)	CL Depth (m) (m)	Dia Sump (mm) (m)	Node MH Type Type	Connections Link	IL Dia Link (m) (mm) Type							
SW4 3458	32.129 374121.687	10.300 1.517	1200 0.300	Manhole Adoptab	de 2 1 2.000 2 2 1.001	9.100 225 Circular 9.083 225 Circular							
SW5 3458	04.375 374072.807	10.000 1.100	900	Manhole Adoptab	$\begin{array}{c cccc} & & & & 0 & 1.002 \\ \hline & & & 1 & 1.002 \\ \hline & & & & 1 \end{array}$	9.100 225 Circular 8.900 225 Circular							
SW6 3457	92.032 374033.617	9.700 0.950		lunction	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	8.900 225 Circular 8.750 225 Circular							
			Simulati	on Settings									
Rainfall R	Methodology FEH-22 ainfall Events Singular Summer CV 1.000	Winte Analysis Sp Skip Steady S	r CV 1.000 beed Detailed tate x	Drain Down Ti Additional Stora Starting	me (mins) 1440 Check ge (m³/ha) 0.0 Check ; Level (m)	Discharge Rate(s) x Discharge Volume x							
	15 6 30 1	50 180 3 20 240 4	Storm 660 600 80 720	Durations960216014402880	4320 7200 10080 5760 8640								
Return Peri (years)	od Climate Change / (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change Additiona (CC %) (A %	al Area Additional Flow 6) (Q %)							
	1 0 30 0	0 0	0 0	100 100	0 30	0 0 0 0							



File: Substation Compound.pfd Network: Storm Network Envirozu Wator

u ay	Substation Compour	iu	20/03/2025	ei								
		Nod- C	1 20, 00, 2020			I						
		<u>Node S</u>	W4 Online Hydro-Brake® Co	ontrol								
Re	Flap Va places Downstream L	lve x ink x	Objective Sump Available	e (HE) M e √	linimise upstream st	orage						
	Invert Level (m) 9.100 Product Number CTL-SHE-0038-8000-1500-8000											
	Design Depth (m) 1.500 Min Outlet Diameter (m) 0.075											
	Design Flow (/s) 0.8	Min Node Diameter (mm) 1200								
		<u>Node S</u>	W4 Depth/Area Storage Stru	<u>ucture</u>								
Bas	e Inf Coefficient (m/h	r) 0.00000	Safety Factor 2.0		Invert Level (m)	10.000						
Sid	le Inf Coefficient (m/h	r) 0.00000	Porosity 0.30	Time to	half empty (mins)	720						
	De (I 0.	pth Area m) (m²) 000 1000.0	Inf Area Depth Ar (m²) (m) (n 0.0 0.300 100	r ea Inf / n²) (n 00.0	Area n²) 0.0							
		<u>Node SV</u>	/3 Link Surround Storage St	<u>ructure</u>								
Base I	nf Coefficient (m/hr)	0.00000	Porosity	0.30	Link	1.000						
Side I	nf Coefficient (m/hr)	0.00000	Invert Level (m)	9.231	Surround Shape	(Trench)						
	Safety Factor	2.0	Time to half empty (mins)		Diameter (mm)	500						
		<u>Node SV</u>	/4 Link Surround Storage St	<u>ructure</u>								
Base I	nf Coefficient (m/hr)	0.00000	Porosity	0.30	Link	2.000						
Side I	nf Coefficient (m/hr)	0.00000	Invert Level (m)	9.100	Surround Shape	(Trench)						
	Safety Factor	2.0	Time to half empty (mins)		Diameter (mm)	500						
		Node SV	/4 Link Surround Storage St	<u>ructure</u>								
Base I	nf Coefficient (m/hr)	0.00000	Porosity	0.30	Link	1.001						
Side I	nf Coefficient (m/hr)	0.00000	Invert Level (m)	9.083	Surround Shape	(Trench)						
	Safety Factor	2.0	Time to half empty (mins)		Diameter (mm)	500						



Belltown Power Hob Lane Solar Farm Substation Compound File: Substation Compound.pfd Network: Storm Network Envireau Water 20/03/2025

Results for 1 year Critical Storm Duration. Lowest mass balance: 98.37%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (I/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	SW1	264	9.658	0.183	0.8	0.1164	0.0000	ОК
360 minute summer	SW2	264	9.658	0.183	0.8	0.1162	0.0000	ОК
360 minute summer	SW3	256	9.658	0.427	1.6	1.7021	0.0000	SURCHARGED
360 minute summer	SW4	256	9.658	0.575	2.4	4.0641	0.0000	SURCHARGED
360 minute summer	SW5	264	8.921	0.021	0.5	0.0132	0.0000	ОК
360 minute summer	SW6	264	8.768	0.018	0.5	0.0000	0.0000	ОК
Link Event	US	Link	DS	Outflow	Velocity	Flow/Ca	ap Lin	k Discharge
(Upstream Depth)	Node		Node	(I/s)	(m/s)		Vol (m³) Vol (m³)
360 minute summer	SW1	2.000	SW4	0.8	0.120	0.0	16 1.5	283
360 minute summer	SW2	1.000	SW3	0.8	0.226	0.02	20 1.5	370
360 minute summer	SW3	1.001	SW4	0.5	0.088	0.0	11 0.9	994
360 minute summer	SW4	1.002	SW5	0.5	0.289	0.0	17 0.0	999
360 minute summer	SW5	1.003	SW6	0.5	0.316	0.0	16 0.0	669 20.1



Belltown Power Hob Lane Solar Farm Substation Compound

600 minute winter SW3

600 minute winter SW4

600 minute winter SW5 1.003 SW6

File: Substation Compound.pfd Network: Storm Network Envireau Water 20/03/2025

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.37%

Node Event	US Node	Peak (mins)	Leve (m)	l Depth (m)	Inflow (I/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	SW1	540	10.06	6 0.591	0.9	0.3758	0.0000	FLOOD RISK
600 minute winter	SW2	540	10.06	6 0.591	0.9	0.3758	0.0000	FLOOD RISK
600 minute winter	SW3	540	10.06	6 0.835	1.8	4.4619	0.0000	FLOOD RISK
600 minute winter	SW4	540	10.06	6 0.983	4.0	28.4478	0.0000	FLOOD RISK
600 minute winter	SW5	555	8.92	3 0.023	0.7	0.0147	0.0000	ОК
600 minute winter	SW6	555	8.77	0 0.020	0.7	0.0000	0.0000	ОК
Link Event	US	Link	DS	Outflow	Velocity	Flow/Cap	Link	Discharge
(Upstream Depth)	Node		Node	(I/s)	(m/s)		Vol (m	³) Vol (m ³)
600 minute winter	SW1	2.000	SW4	1.0	0.064	0.019	1.634	8
600 minute winter	SW2	1.000	SW3	0.9	0.203	0.022	1.645	1

1.7

0.7

0.7

0.056

0.312

0.336

0.9994

0.1181

0.0802

58.2

0.043

0.021

0.021

1.001 SW4

1.002 SW5



Results for 100 year Critical Storm Duration. Lowest mass balance: 98.37%

Node Event	US Nodo	Peak	Level	Depth	Inflow	Node	Flood	Status
	Noue	(IIIIIIS)	(111)	(111)	(1/5)	voi (iii)	(111)	
720 minute winter	SW1	690	10.114	0.639	1.0	0.4061	0.0000	FLOOD RISK
720 minute winter	SW2	690	10.114	0.639	1.0	0.4061	0.0000	FLOOD RISK
720 minute winter	SW3	690	10.114	0.883	2.0	4.7862	0.0000	FLOOD RISK
720 minute winter	SW4	690	10.114	1.031	4.4	43.2898	0.0000	FLOOD RISK
720 minute winter	SW5	690	8.923	0.023	0.7	0.0149	0.0000	ОК
720 minute winter	SW6	690	8.771	0.021	0.7	0.0000	0.0000	ОК

US	Link	DS	Outflow	Velocity	Flow/Cap	Link	Discharge
Node		Node	(I/s)	(m/s)		Vol (m³)	Vol (m³)
SW1	2.000	SW4	1.0	0.064	0.020	1.6348	
SW2	1.000	SW3	1.0	0.203	0.025	1.6451	
SW3	1.001	SW4	1.9	0.056	0.048	0.9994	
SW4	1.002	SW5	0.7	0.314	0.022	0.1199	
SW5	1.003	SW6	0.7	0.338	0.021	0.0814	75.9
	US Node SW1 SW2 SW3 SW4 SW5	US Link Node SW1 2.000 SW2 1.000 SW3 1.001 SW4 1.002 SW5 1.003	US Link DS Node Node SW1 2.000 SW4 SW2 1.000 SW3 SW3 1.001 SW4 SW4 SW4 SW4 SW3 1.001 SW4 SW4 SW4 SW4	US Link DS Outflow Node Node (l/s) SW1 2.000 SW4 1.0 SW2 1.000 SW3 1.0 SW3 1.001 SW4 1.9 SW4 1.002 SW5 0.7 SW5 1.003 SW6 0.7	US Link DS Outflow Velocity Node Node (l/s) (m/s) SW1 2.000 SW4 1.00 0.064 SW2 1.000 SW3 1.0 0.203 SW3 1.001 SW4 1.9 0.056 SW4 1.002 SW5 0.7 0.314 SW5 1.003 SW6 0.7 0.338	US Link DS Outflow Velocity Flow/Cap Node Node (l/s) (m/s) SW1 2.000 SW4 1.0 0.064 0.020 SW2 1.000 SW3 1.0 0.203 0.025 SW3 1.001 SW4 1.9 0.056 0.048 SW4 1.002 SW5 0.7 0.314 0.022 SW5 1.003 SW6 0.7 0.338 0.021	US Link DS Outflow Velocity Flow/Cap Link Node Node (l/s) (m/s) Vol (m³) SW1 2.000 SW4 1.0 0.064 0.020 1.6348 SW2 1.000 SW3 1.0 0.203 0.025 1.6451 SW3 1.001 SW4 1.9 0.056 0.048 0.9994 SW4 1.002 SW5 0.7 0.314 0.022 0.1199 SW5 1.003 SW6 0.7 0.338 0.021 0.0814



Belltown Power Hob Lane Solar Farm Substation Compound

720 minute summer SW2 1.000 SW3

720 minute summer SW3 1.001 SW4

720 minute summer SW4 1.002 SW5

720 minute summer SW5 1.003 SW6

File: Substation Compound.pfd Network: Storm Network Envireau Water 20/03/2025

0.203

0.090

0.316

0.341

0.047 1.6451

0.022 0.0829

0.9994

0.1223

82.0

0.090

0.022

Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 98.37%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (I/s)	Node Vol (m³)	Flood (m³)	Status
720 minute summer	SW1	720	10.180	0.705	1.9	0.4482	0.0000	FLOOD RISK
720 minute summer	SW2	720	10.180	0.705	1.9	0.4482	0.0000	FLOOD RISK
720 minute summer	SW3	720	10.180	0.949	3.8	5.2392	0.0000	FLOOD RISK
720 minute summer	SW4	720	10.180	1.097	8.5	63.8623	0.0000	FLOOD RISK
720 minute summer	SW5	720	8.924	0.024	0.7	0.0151	0.0000	ОК
720 minute summer	SW6	720	8.771	0.021	0.7	0.0000	0.0000	ОК
Link Event	US	Link	DS C	Dutflow	Velocity	Flow/Cap	Link	Discharge
(Upstream Depth)	Node		Node	(I/s)	(m/s)		Vol (m	³) Vol (m ³)
720 minute summer	SW1	2.000	SW4	1.9	0.047	0.038	1.634	8

1.9

3.6

0.7

0.7