Bold Forest Garden Village

Flood Risk Screening

St Helen's Council

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Basis of Report

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Acronyms and Abbreviations

aOD	Above Ordnance Datum
BFGV	Bold Forest Garden Village
BGS	British Geological Society
DEFRA	Department of Environment, Food and Rural Affairs
EA	Environment Agency
LiDAR	Light Detection and Ranging
LLFA	Lead local Flood Authority
NGR	National Grid Reference
NPPF	National Planning Policy Framework
PPG	Planning Practice Guidance
SPZ	Source Protection Zone

1.0 Introduction

St Helens Borough Council's Local Planning Authority (the Council) has appointed SLR Consulting Limited (SLR) to deliver a Masterplan Framework for Bold Forest Garden Village (BFGV).

This report is a flood screening assessment which is intended to describe baseline hydrological conditions on the site and identify any major flood risk considerations that need to be reflected in masterplanning. The report has been prepared under the direction of a Technical Director who specialises in flood risk and associated planning matters. Reporting has been completed in accordance with guidance presented within the National Planning Policy Framework[1] (NPPF) and its associated Planning Practice Guidance[2] (PPG), taking due account of current best practice documents relating to the assessment of flood risk published by the British Standards Institution BS8533[3] and local planning policies.

1.1 Site Location

The BFGV site is located on the southeastern edge of St Helens, Merseyside. Centred on the National Grid Reference (NGR) SJ 53738 92310. The site is south of the B5204, north of Gorsey Lane and encompasses 132.86 ha.

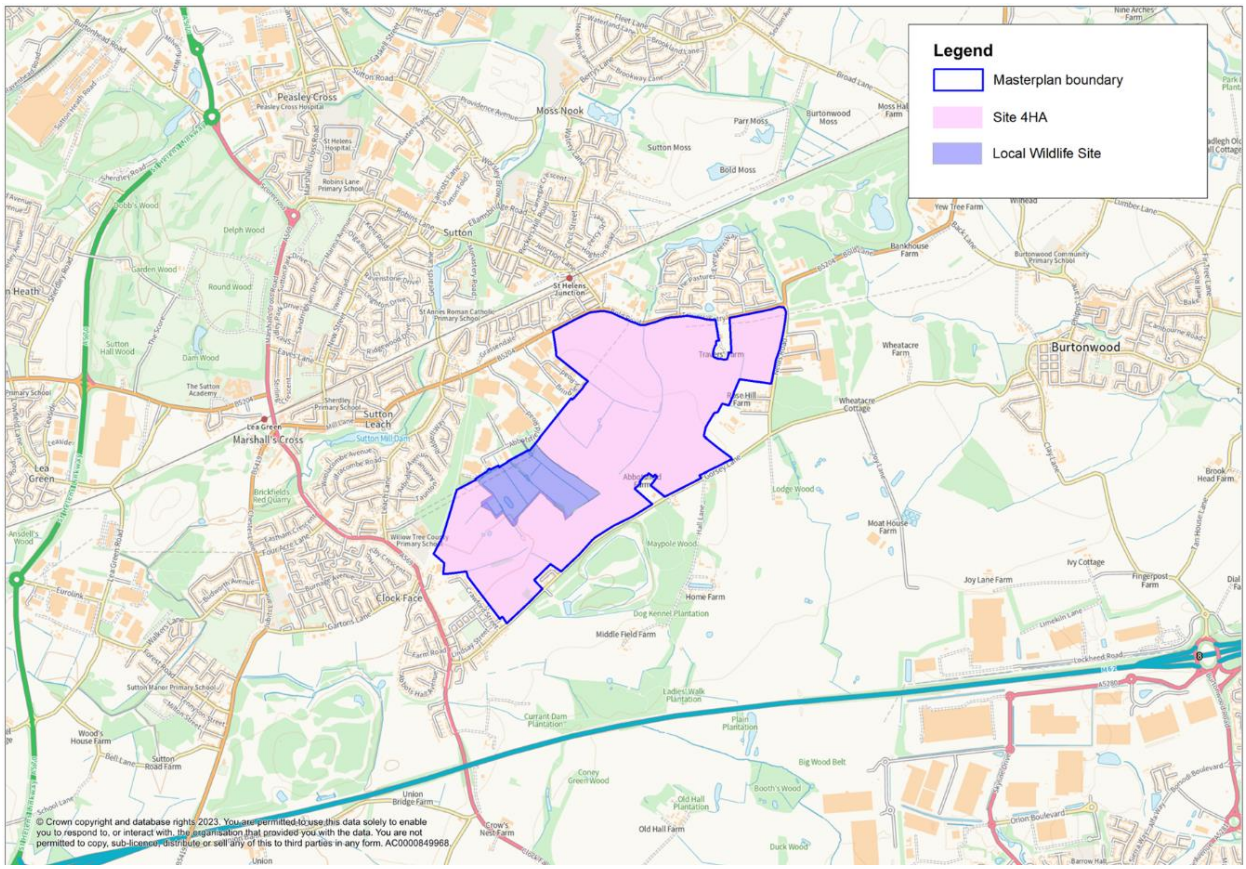
This location and extent of the land is illustrated in Figure 1.

1 Revised National Planning Policy Framework: Communities and Local Government (Updated February 2025)

2 Planning Practice Guidance for flood risk and coastal change: Communities and Local Government (Updated August 2022)

3 BS8533:2017, Assessing and managing flood risk in development: Code of Practice (December 2017)

Figure 1: Site Location Plan



1.2 Administrative Context

The site falls within the planning jurisdiction of St Helens Borough Council who act as the Lead Local Flood Authority (LLFA).

1.3 Development Proposal

The BFGV site was released from the Green Belt for the purposes of allocating it for residential development in the Local Plan[4]. Initial work undertaken by the Council indicates there to be a potential development capacity of approximately 3,000 dwellings.

This work is intended to inform the masterplanning of the site, which will likely encompass ancillary development, community facilities and open space.

4 St Helen's Local Plan , https://www.sthelens.gov.uk/media/4315/St-Helens-Borough-Local-Plan-up-to-2037/pdf/Local_Plan_Written_Statement_-_FINAL_adoption_version.pdf

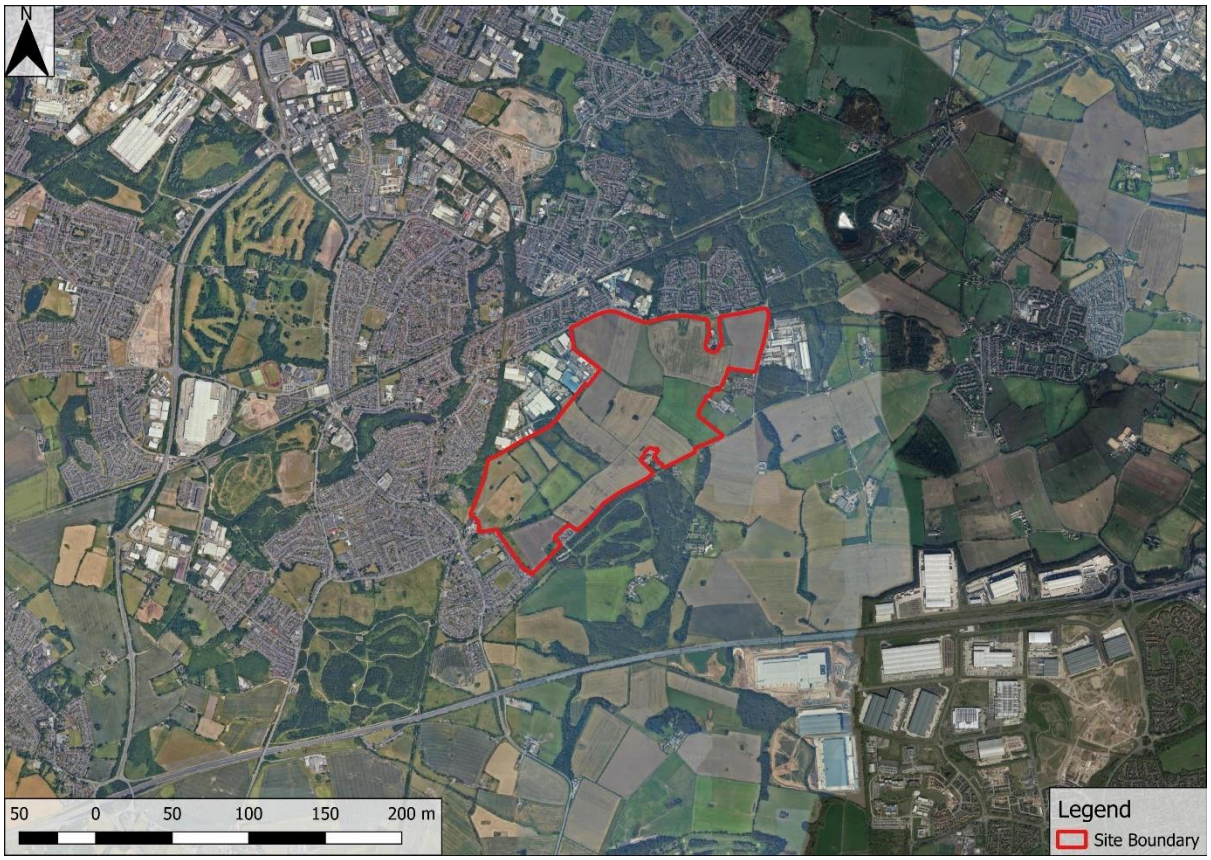
2.0 Baseline Context

The site is comprised of 15 land parcels under 12 different land ownership. Aside from a local nature reserve to the northwest of the site, all land is comprised of arable farmland.

Residential areas border the site to the north and west with Clock Face Country Park and agricultural fields to the south. Reginald Road Industrial Estate and Bold Industrial Park respectively lie on the west and east boundaries, alongside multiple private farms in proximity to the site.

Satellite imagery showing the land use across the site and surrounding area is provided in Figure 2.

Figure 2: Satellite Imagery

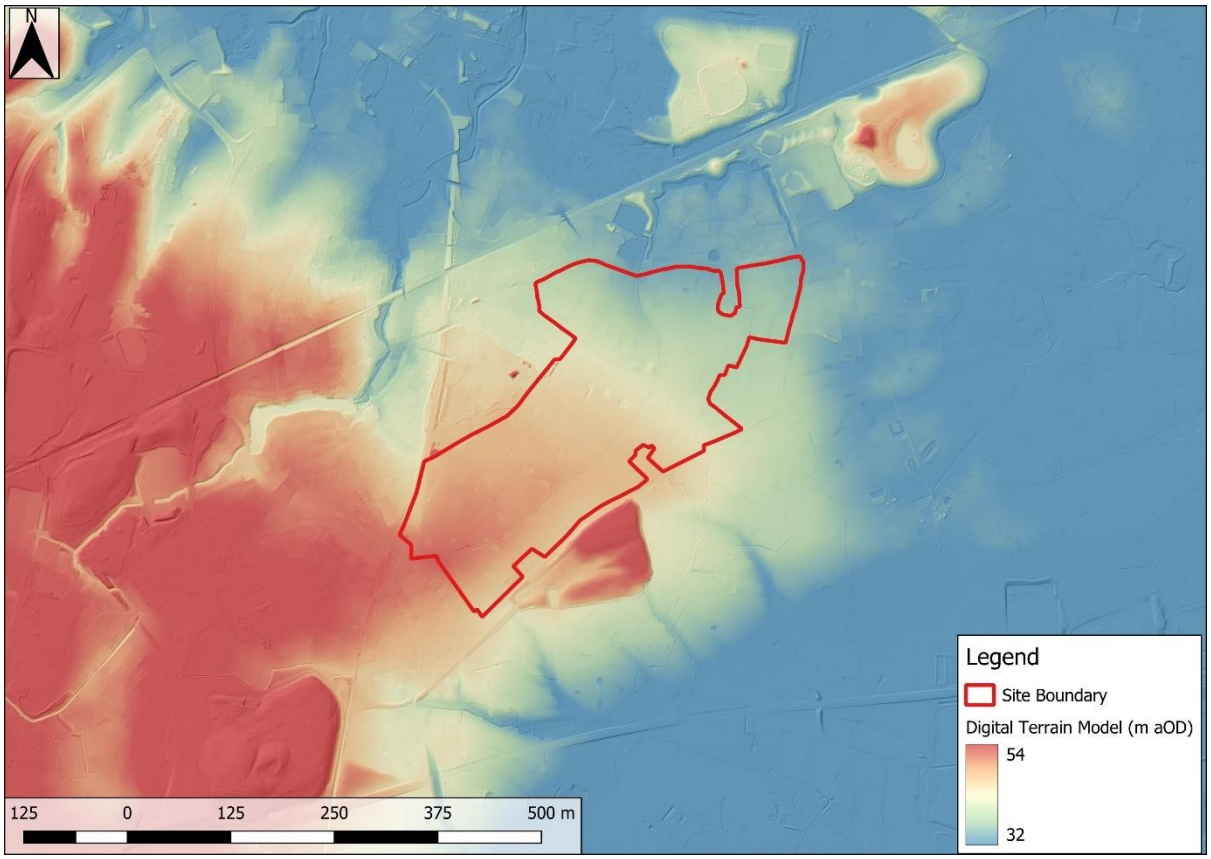


2.1 Topography

1 m resolution Light Detection and Ranging (LiDAR) elevation data has been obtained from the Department of Environment, Food and Rural Affairs (DEFRA) Survey Data Download website[5]. A plot of this data is provided in Figure 3. The elevation plot presented uses a Digital Terrain Model (DTM), which maps the surface elevations and therefore does not include features such as built developments and vegetation.

5 Defra Survey Data Download https://environment.data.gov.uk/survey (Accessed October 2024)

Figure 3: Local Topography



The highest elevation point of the site is to the west, where ground levels reach a maximum of 53 m above Ordnance Datum (aOD). Ground levels then slope away from this raised area towards the site boundary to the north, south and east. A large portion of the site slopes in a northeasterly direction towards the lowest point in the northeast corner, sitting at 33 m aOD.

On the opposite side of Gorsey Lane, to the south of the site, lies Clock Face Country Park. This is a former colliery and areas within this are artificially raised with ground elevations up to 58 m aOD.

Outside the site elevations fall to the north, east and southeast (excluding Clock Face Country Park) and rise to the west.

2.2 Geology and Hydrogeology

2.2.1 Superficial Geology

The National Soils Resources Institute, Soilscapes website[6], indicates that the soils on the Site are *"slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils"* with *"impeded drainage".*

British Geological Survey (BGS) mapping[7] of the area indicates that the site is wholly underlain by superficial deposits of Till – Diamicton. This superficial Till is designated as a

6 Soilscapes https://www.landis.org.uk/soilscapes/ (Accessed October 2024)

7 BGS Geology Viewer https://geologyviewer.bgs.ac.uk/ (Accessed October 2024)

Secondary (undifferentiated) aquifer which is defined as "*aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only a minor value.*"

Based on available borehole records, the superficial cover is typically between 10 m and 20 m in thickness and is described as clay.

2.2.2 Solid Geology

The BGS mapping indicates that beneath the superficial deposits, the site is mostly underlain by the Sherwood Sandstone Group (Kinnerton Sandstone Formation and Chester Formation). Fracturing has however brought the deeper Pennine Coal Measures (Etruria Formation) to the surface in the central area of the site.

The Environment Agency have designated[8] the Sherwood Sandstone Group, which underlies the majority of the site as a Principal Aquifer. These are defined as *"strategically important rock formations that have high permeability and water storage capacity, likely supporting water supplies on a strategic scale."*.

The Pennine Coal Measures are however designated as a Secondary A aquifer. These are defined as *"permeable layers that can support local water supplies and may form an important source of base flow to rivers.".*

2.2.3 Source Protection Zones

Environment Agency (EA) mapping highlights that parts of the site sit within a Zone 3 Source Protection Zone (SPZ). This is defined by the EA as *"the area around a supply source within which all the groundwater ends up at the abstraction point. This is the point from where the water is taken. This could extend some distance from the source point.".*

This SPZ relates to abstractions to the east of the site from the Sherwood Sandstone aquifer.

While some consideration of pollutants entering the groundwater in these areas might be required, this is unlikely to constrain development on the site.

2.3 Local Hydrology

As the site consists of undeveloped fields, rainfall falling on the site will mostly infiltrate into the shallow soils to either be stored or evaporated during drier periods.

The low permeability shallow geology at the site means that infiltration to the deeper aquifer will be limited. Water logging during extended wet periods is therefore likely, along with lateral flows within the soils and surface runoff towards the local ditch network.

Whilst infiltration is a potential discharge route, it is likely that, due to the clay superficial geology, infiltration testing would fail on the site. This will need to be confirmed for each plot as plans are developed.

In advance of this, it is assumed that surface discharge will be required and any potential drainage solutions onsite should mirror the existing drainage directions. This will ensure that the current drainage network onsite is maintained.

8 MAGIC Mapping Magic Map Application (defra.gov.uk) (Accessed October 2024)

In areas where the land is farmed (or has been farmed previously) field drainage networks is likely to have been installed to manage shallow water logging. These surface networks will route water towards adjacent ditches and ponds.

2.3.1 Ponds

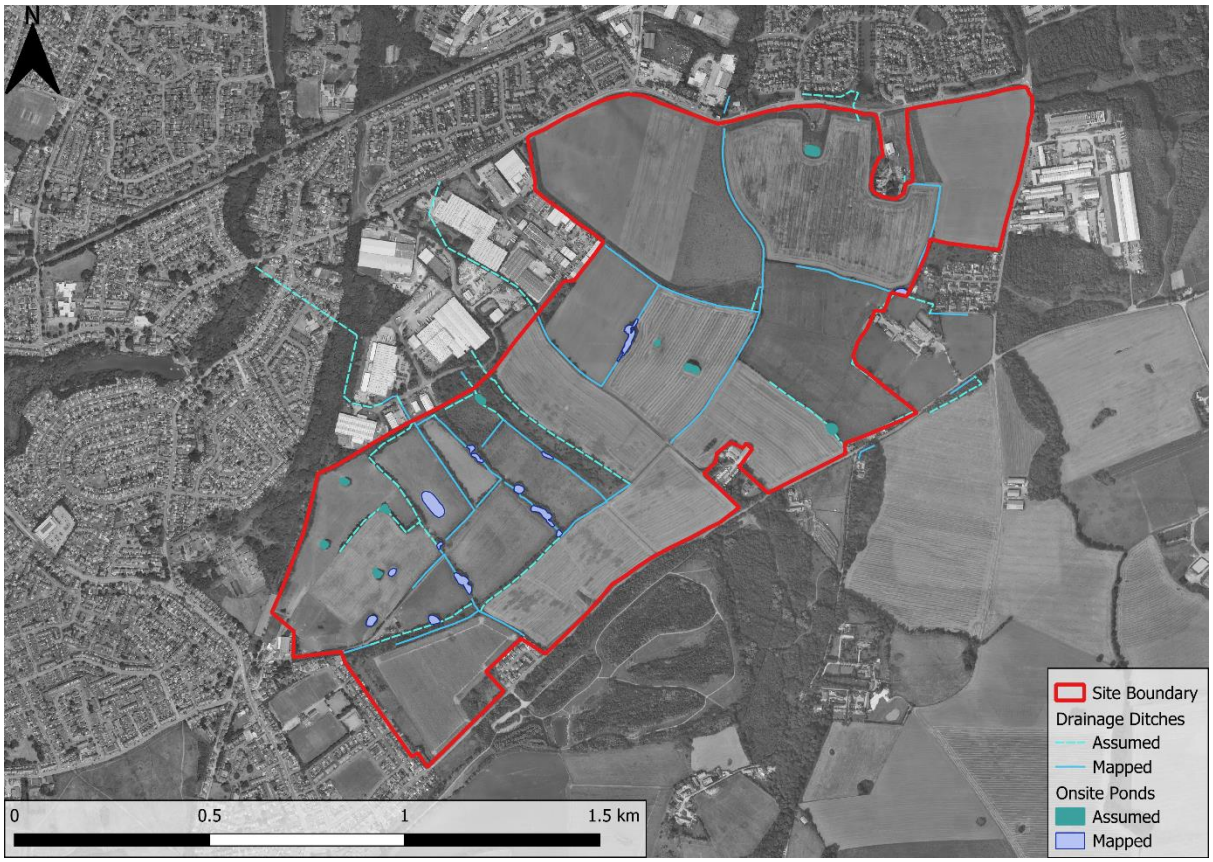
A series of ponds and depression are present on the site, some of which can be seen on the LiDAR elevation plot in Figure 3. Some of these ponds are incorporated into a wider ditch network (see below in Figure 4); however, others are isolated offline ponds within fields.

The surface network of ditches and ponds was observed on the site visit, which took place on the 3rd of December 2024. However, due to limitations in access, not all ditches could be surveyed.

2.3.2 Site Drainage

Figure 4 demonstrates the system of manmade drainage ditches present on the site that typically delineate the fields. A larger A3 version of the figure can be found within Appendix A.

Figure 4: The System of Drainage Ditches



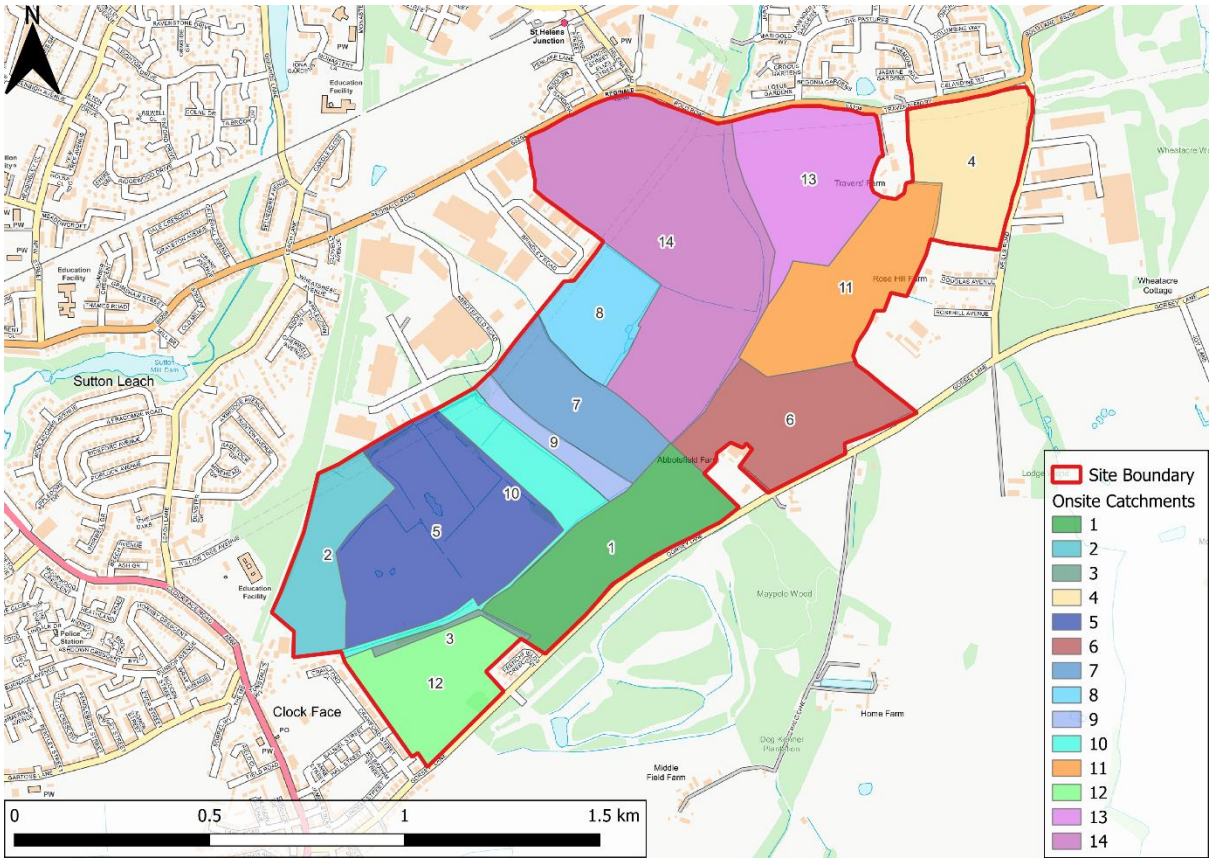
As discussed in Section 2.1 the land on the site slopes away from higher ground in southwest to the north, south and east. The drainage network reflects this topography, collecting and conveying flows away from the central high land.

Based upon current available data, it is likely that surface water currently discharges from the site in a total of eleven locations with fourteen contributing catchments. These

catchments and discharge points have been mapped and illustrated in Figure 5 below and within Appendix A.

It should also be noted that United Utilities infrastructure mapping of the site and surrounding area has not yet been made available and as such may change the findings surrounding the known drainage regime of the site when procured.

Figure 5: Catchments and Drainage Ditch System on site



2.3.3 Wider Hydrology

Sutton Brook lies around 600m to the northwest of the site and flows in a northerly direction through the area of Sutton to the west of the site and then drains to the River Mersey via Sankey Brook.

- Catchments 13 and 14 drain northwards to meet the Sutton Brook at the northern site boundary (NGR SJ 54006 92996).
- Catchments 5, 7, 8, 9, 10 all drain westwards off the site towards the Sutton Brook. Onward routing for these ditches is currently unclear; however, they likely discharge into the Sutton Brook, which flows through the area of Sutton through culverts under Reginald Road Industrial Park.

Whittle Brook is present around 500m to the south of the site and flows in an easterly direction towards Warrington also discharging ultimately into the River Mersey.

- Catchments 1, 3, 12 drain southwards away from the site to meet the Whittle Brook (NGR SJ 53693 90821). A culvert is located at the southern end of Catchment 3, drains towards Clock Face County Park. The flows are believed to head toward the

far side of the County Park flowing towards the motorway. However, further work will be required to investigate the flow direction and where the connection through the Clock Face County Park goes.

- Catchment 6 appears to initially drain to the east then immediately south to meet the Whittle Brook below the Lingley Mere Business Park to the south of the site (NGR SJ 55430 89812).

Surface water which falls within catchment 2 is currently thought to drain to the lowest elevation area of the parcel, comprising an assumed pond (or potentially an area of frequent water logging) in the treeline of the western site boundary (NGR SJ 52940 91979). Here, surface water likely infiltrates into the shallow soil or evaporates during drier periods.

Currently, the onwards routing of surface water in catchments 4 and 11 after leaving the site is unknown. During the site visit it was noted that surface water which fell on catchment 11 ran with the gradient into the drainage ditch segregating catchments 11 and 4, where it flowed off the site into the neighbouring residential land. After which the drainage ditch is presumed to be culverted underneath Travers' Entry to later drain to the Sutton Brook.

After both the site visit and desktop review it was also noted that catchment 4 had no clear outfall away from the site. Surface water appears to run to the most northeasterly corner of the field, where in a storm event it likely flows over the junction of Travers' Entry and Bold Lane as overland flow to either a field drainage ditch on the east side or west side of the junction. Further investigation is required to determine the exact route of this surface water away from the site.

3.0 Planning Policy and Guidance

3.1 Proposal Summary

In relation to the flood risk vulnerability, as outlined in Annex 3 of the NPPF8, the proposed residential scheme is classified as 'Dwelling Houses' which is classified as a 'More Vulnerable' development type.

In line with guidance for residential development, this assessment considers the risk posed to the scheme with an anticipated lifetime of 100 years.

3.2 National Planning Policy

This FRA report has been completed in accordance with the guidance presented in the NPPF[1] and with reference to PPG[2].

3.3 Local Planning Policy

Local development is currently guided by the St Helens Borough Local Plan up to 2037[9] which was adopted in July 2022.

From the St Helens Borough Local Plan up to 2037 are policies of specific relevance to this baseline report, including Policy LPC12: Flood Risk and Water Management.

Policy LPC12: Flood Risk and Water Management

1. The Impact of development proposals on flood risk and water management assets will be considered in accordance with case law, legislation, and the Nation Planning Policy Framework.

2. Measures to manage or mitigate flood risk associated with or caused by new development much (as appropriate having regard to its scale and nature):

- *a) be designed to contribute to the biodiversity of the Borough unless it has been demonstrated that this would not be technically feasible;*
- *b) protect heritage assets (such as buried archaeology);*
- *c) be fully described in the development proposal; and*
- *d) be funded by the developer, including long-term maintenance.*

3. Any proposal for major development on a site that would abut, run along, or straddle any watercourse* in the Borough, must include measurements to temporarily attenuate and filter flood water in order to: improve water quality; reduce peak flows during flooding; and reduce downstream flood risk, unless it has been demonstrated that this is not feasible or viable. In cases where measures are not currently feasible or viable, the development must not compromise the ability to implement such measures in the future.*

4. The Flood Water Storage Safeguarding Areas as defined on the Policies Map shall be safeguarded for the provision of flood storage. Development within or adjacent to these areas that would have a negative impact on their function as a flood storage area or on their potential to be developed for flood storage infrastructure will not be permitted.

9 St Helens Borough Local Plan up to 2037, St Helens Borough Council, 2022,
- Local Plan Written Statement - FINAL adoption version 16.06.2022 (sthelens.gov.uk)

Water Quality

5. Development that would adversely affect the quality or quantity of water in any watercourse or of groundwater or cause detoriration in water body or element classification levels defined in the Water Framework Directive (WFD) (or in any national regulations covering this matter) will not be permitted. Any planning application for development that could (without effective mitigation) cause such harm must be supported by a Construction Management Plan sets out how the water environment will be protected during the construction process.

Sustainable Drainage Systems

6. inclusion of sustainable drainage systems within proposed major development sites will be assessed in accordance with national policy. Surface water should be managed in accordance with the following hierarchy (with a) being the preferred option and d) being the least favourable option):

a) an adequate soakaway or other form of infiltration system;

b) an attenuated discharge to watercourse

c) an attenuated discharge to public surface water sewer;

d) an attenuated discharge to public combined sewer.

7. Surface water management infrastructure within new developments should, where feasible, include above ground features deigned to deliver benefits to biodiversity and/or landscape.

8. Discharge of surface water to a public sewer will not be permitted unless clear evidence has been submitted demonstrating why no suitable alternative option(s) exist. Development proposals should identify how any necessary surface water drainage infrastructure will be appropriately maintained. The drainage proposals on all sites should be designed to address the drainage needs of the whole site. Where development would proceed in different phases or with multiple developers involved, the drainage proposals should cover all phases and the full construction period. Any development proposal should demonstrate unfettered rights to discharge between various phases.

9. If a development on a greenfield site would discharge to a public sewer, the rates of proposed discharge (peak flow and overall volume) from the development should not exceed the existing greenfield run-off rates. If a development on a previously developed site would discharge to a public sewer, the discharge rates (peak flow and overall volume) must be as close as reasonably practicable to those that would apply if the site were a greenfield site. As a guideline, a reduction of at least 30% may be sought, rising to at least 50% in Critical Drainage Areas or in areas identified as having an intermediate or high risk of surface water flooding. Storm water storage capacity should normally include an allowance of 40% to address the likely future effects of climate change.

10. Proposals for the soft or hard landscaping of any development site should, where practicable, demonstrably reduce the expected rate of surface water discharge from the site.

11. Applications for planning permission should have regard to the St Helens Borough Council Sustainable Drainage Systems Guidance.

Protection of water and wastewater assets

12. Development that would compromise the physical integrity or the effective maintenance of any water or wastewater infrastructure asset will not be permitted.

Any drainage submitted as part of the application should be submitted alongside the LLFA SuDS Assessment Checklist[10].

3.4 Flood Risk and Planning

3.4.1 Flood Zone Classification

The definition of Flood Zones is provided in PPG Table 1: Flood Zones:

- Zone 1 - Low Probability (Flood Zone 1) is defined as land which could be at risk of flooding from fluvial or tidal flood events with less than 0.1% annual probability of occurrence (1:1,000 year) i.e. considered to be at 'low probability' of flooding.
- Zone 2 - Medium Probability (Flood Zone 2) is defined as land which could be at risk of flooding with an annual probability of occurrence between 1% (1:100 year) and 0.1% (1:1,000 year) from fluvial sources and between 0.5% (1:200 year) and 0.1% (1:1,000 year) from tidal sources i.e. considered to be at 'medium probability' of flooding.
- Zone 3a - High Probability (Flood Zone 3a) is defined as land which could be at risk of flooding with an annual probability of occurrence greater than 1% (1:100 year) from fluvial sources and greater than 0.5% (1:200 year) from tidal sources i.e. considered to be at 'high probability' of flooding.
- Zone 3b - the Functional Floodplain (Flood Zone 3b) This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of a functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise:
    - land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or
    - land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding).

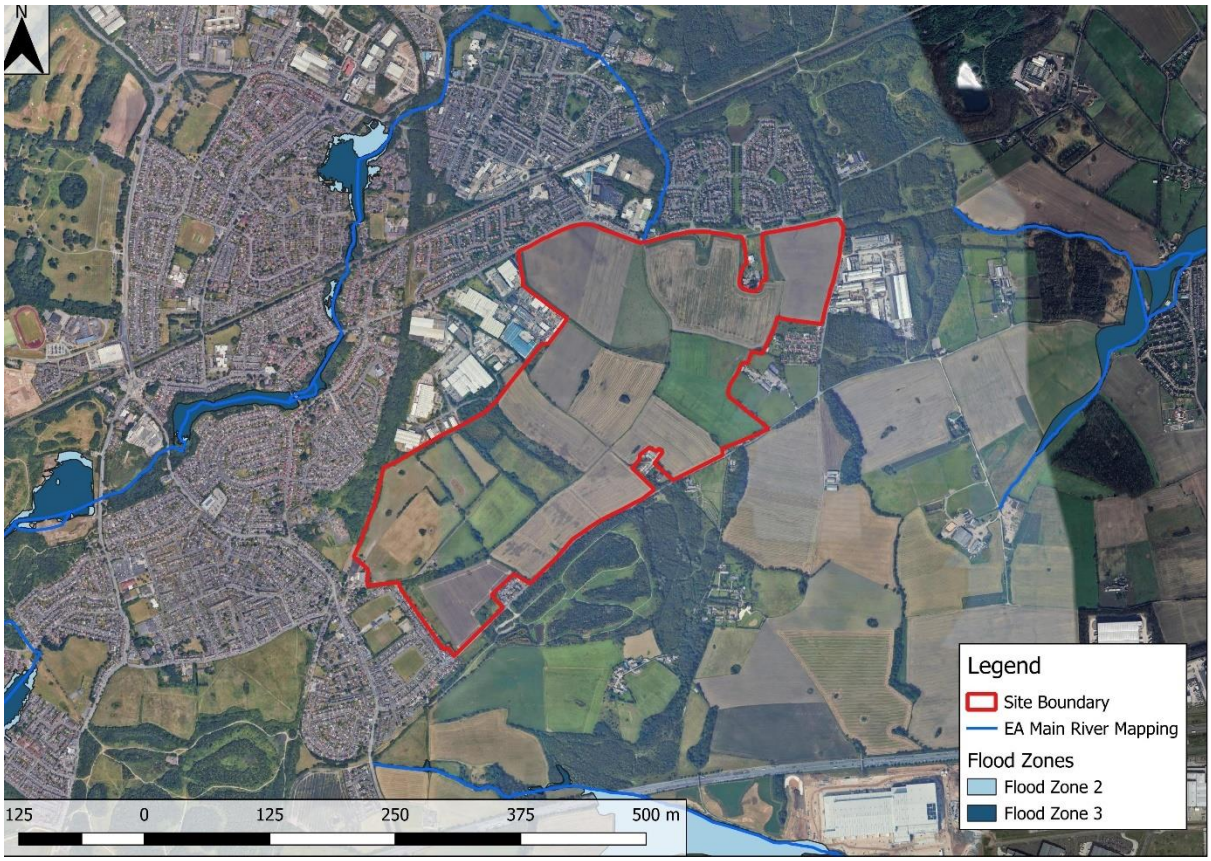
  Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency.

Based on the Flood Map for Planning[11], the Site is located wholly within Flood Zone 1. An extract illustrating this is provided in Figure 6.

10 St. Helens Council SuDS Submission Application and Approval Checklist, Accessed from: https://www.sthelens.gov.uk/article/7555/Sustainable-drainage

11 Flood Map for Planning, get flood risk information for planning in England, Environment Agency, Accessed at https://flood-map-for-planning.service.gov.uk/

Figure 6: Flood Zone Designation Mapping



3.4.2 Flood Risk Compatibility

As discussed in Section 3.4.1, the site is located in Flood Zones 1 and, as detailed in Section 3.1, the proposed scheme is classified within the Annex 3 of NPPF[1] as a *'More Vulnerable'* development type.

PPG Table 3: Flood risk vulnerability and flood zone 'incompatibility' (reproduced as Table 3-1) confirms that, with respect to flood risk, *'More Vulnerable'* development types are considered appropriate in Flood Zones 1 and that the Exception Test is not required.

Table 3-1: Flood Risk Vulnerability and Flood Zone 'Incompatibility'

Flood Risk Vulnerability Classification (PPG Table 2)		Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone (PPG Table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	Exception Test Required	✓	✓	✓
	Zone 3a†	Exception Test Required	x	Exception Test Required	✓	✓
	Zone 3b* (functional floodplain)	Exception Test Required	x	x	x	✓

Key:

✓ Exception test is not required

x Development should not be permitted

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

* In Flood Zone 3b (functional floodplain) essential infrastructure that has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

3.4.3 Sequential Test

With reference to the NPPF, the Sequential Test gives preference to locating new development in areas that are at lowest risk of flooding.

In paragraph 170 NPPF sets out that:

> "*Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future).*"

Paragraph 172 confirms that this process should take into account:

> *"all sources of flood risk and the current and future impacts of climate change".*

As the site has been allocated, the Sequential Test can be assumed to be passed and no further consideration of this is required.

3.5 Climate Change

In February 2016, the Environment Agency issued updated guidance[12] on the impacts of climate change on flood risk in the UK to support NPPF. This was most recently updated in December 2023 and advice sets out that peak rainfall intensity, sea level, peak river flow, offshore wind speed and extreme wave height are all expected to increase in the future as a

12 Environment Agency, Flood Risk Assessments: Climate change allowances. February 2016, Updated May 2022, Accessed at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

result of climate change. Consideration of the changes to these parameters should use the allowances outlined below based on the anticipate lifetime of the development.

Allowances in relation to offshore wind speed and extreme wave height are only relevant to sites situated on the open coast. The Site is located within Flood Zone 1 and away tidal and larger fluvial water bodies. As such only changes to peak rainfall intensity (and the impact of this on groundwater, and flows in ditches) will need to be considered further.

The guidance acknowledges that there is uncertainty with respect to the absolute levels of change that is likely to occur. As such, the document provides estimates of possible changes that reflect a range of different emission scenarios.

3.5.1 Peak Rainfall Intensity

For peak rainfall intensity the PPG guidance states that flood risk assessments for developments with a lifetime beyond 2100 (i.e. residential development), the upper end allowances for the 2070s epoch for both the 1% and 3.3% Annual Exceedance probability (AEP) storm event must be used.

Table 2: Peak Rainfall Intensity Allowances

Management Catchment	Annual Exceedance Probability (%)	Allowance Category	Total potential change anticipated for the 2050s	Total potential change anticipated for the 2070s
Lower Mersey	3.3	Upper End	35%	40%
	1	Upper End	40%	45%

In line with guidance the 3.3% AEP + 40% and 1% AEP + 45% climate change allowances should be considered during development.

4.0 Screening Study

Potential sources of flooding include:

• Flooding from the sea or tidal flooding;

• Flooding from rivers or fluvial flooding;

• Flooding from surface water and overland flow;

• Flooding from groundwater;

• Flooding from sewers;

• Flooding from reservoirs, canals, and other artificial sources; and

• Flooding from infrastructure failure.

The flood risk from each of these potential sources is discussed below and summarised in Section 4.8.

4.1 Flooding from Sea or Tidal Flooding

The Site is located approximately 20 km away the coast and is raised 50 m above sea level.

Therefore, the Site is not considered at risk of flooding from the sea or tidal flooding and is not considered further.

4.2 Flooding from Rivers or Fluvial Flooding

As seen in Figure 6 the Site lies wholly in Flood Zone 1, which is defined as land with less than 0.1% (1 in 1,000) annual chance of flooding from fluvial sources. The site is also remote from land that is designated as Flood Zone 2 or 3.

Therefore, flooding from rivers or fluvial sources does not pose a signficiant risk to the Site and is not considered further.

We note that the potential for flooding from the ditch networks on and around the site is considered to be surface water flood risk. This is considered in Section 4.3.

4.3 Flooding from Surface Water and Overland Flow

Ground levels slope away from the site to the north, south and east and surface water will not drain into the site from these directions. There is also no significant upgradient catchment draining onto the site from the high ground to the west. As such any surface water flood risk issue on the site will relate to site derived runoff

An extract from the Environment Agency Risk of Flooding from Surface Water (RoFSW)[13] is provided in Figure 7. This indicates that the risk of surface water flooding on the site is predominantly very low. Where higher risk areas are mapped, these mostly align to the existing ponds and ditch networks or are very shallow (less than 200mm).

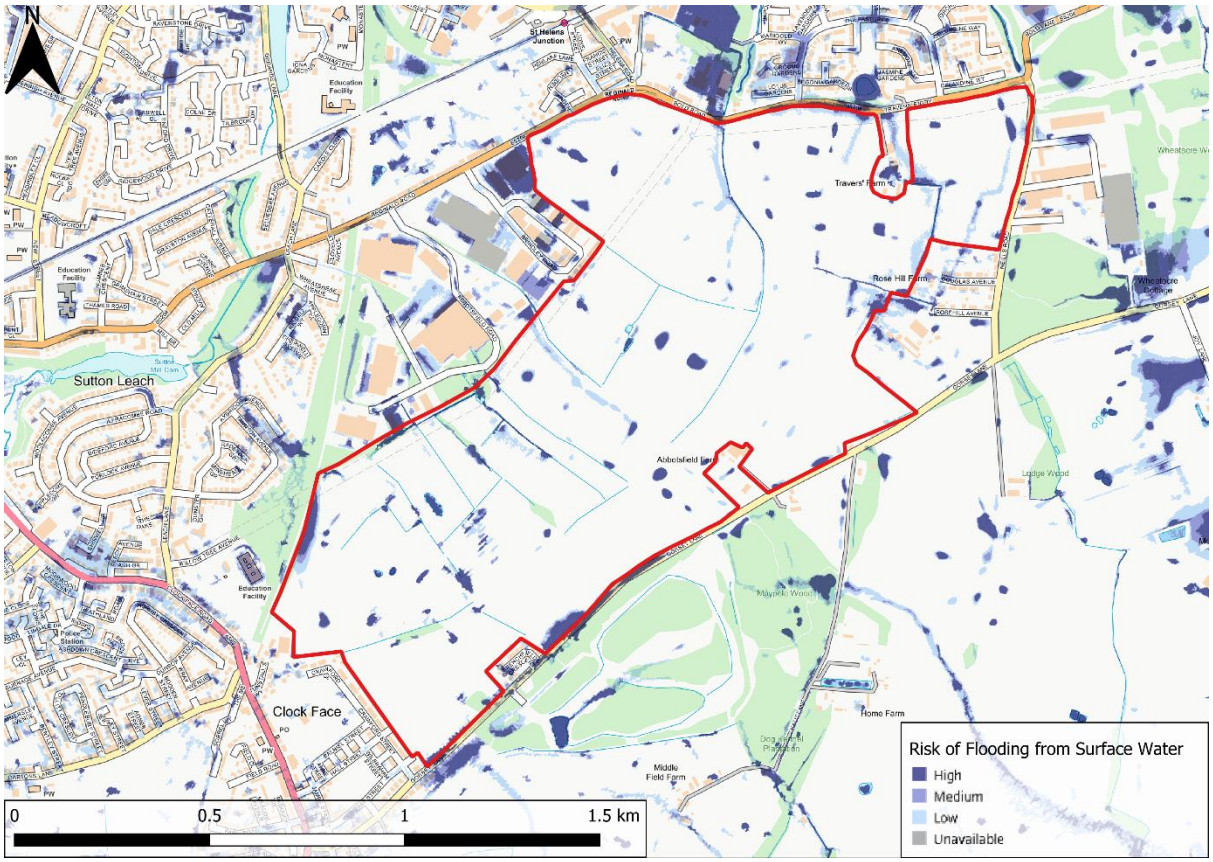
Some areas of low risk surface water flooding are mapped within the lower fields to the east of the site. In these areas some consideration of surface water flooding may be required

13 Risk of flooding from surface water – understanding and using the map, Environment Agency, January 2025. Accessed at: https://www.gov.uk/government/publications/flood-risk-maps-for-surface-water-how-to-use-the-map/risk-of-flooding-from-surface-water-understanding-and-using-the-map

within the scheme design in terms of retaining conveyance routes and ensuring that finished floor levels are raised above surround ground.

Elsewhere on site surface water flood risk is unlikely to significantly influence layout provided that suitable accommodation is made for existing drainage features and storm water management.

Figure 7: Surface Water Flood Extent Mapping



Initial discussion with the LLFA have highlighted existing surface water drainage issues local to the site along Gorsey Lane (to south) and also along the B5204 (to north). Other concerns flagged include drainage that routes north from the site passing through culverts beneath buildings on the Reginald Road Industrial Estate and possible issues to the west of the site along the former railway line. Possible opportunities to help alleviate some of these issues could potentially be realised if the site is developed.

4.4 Flooding from Groundwater

Due to the low permeability superficial deposits significant groundwater flow in the shallow geology across the site is highly unlikely. Government Long Term Flood Risk data[14], confirms this understanding.

Therefore, groundwater flooding is highly unlikely to pose a risk in any areas of the site and is not considered further.

14 GOV.UK Check Your Long-Term Flood Risk Website Your long term flood risk assessment - Check your long term flood risk - GOV.UK (Accessed November 2024)

We note that while groundwater flooding is unlikely, the low permeability ground conditions means that below ground field drainage will likely be widespread to manage shallow water logging of the ground. Blockage, collapse or failure of such field drainage can lead to localised surcharge which is often be interpreted as groundwater / a spring.

4.5 Flooding from Sewers and Main Water Systems

At this stage we are not aware of any major sewer or mains water system traversing the site. Asset plans from statutory undertakers are however awaited.

Flooding from sewers and main water systems is considered unlikely to pose a significant risk at the site. This conclusion will however be subject to further review once asset plans are received.

4.6 Flooding from Reservoirs, Canals and other Artificial Sources

With reference to EA Mapping[15], the site does not lie within the flood extent of a reservoir breach scenario.

No other artificial sources of flooding have been identified at, near or upgradient of the site.

The risk of flooding associated with a failure of reservoirs, canals and other artificial sources is therefore assessed to be very low and is not considered further.

4.7 Flooding from Infrastructure Failure

The only infrastructure capable of failing would be that on the Sutton Mill Dam reservoir which is described in section 4.6.

The likelihood of infrastructure failing is extremely low and is therefore not considered further.

4.8 Summary of Flood Screening

Table 3: Summary of Flood Risk

Potential Source of Flooding	Potential for Significant Flood Risk at Site
Rivers or Fluvial Flooding	No
Sea or Tidal Flooding	No
Surface Water or Pluvial Flooding	No – but minor and localised controls may be required particularly to the east Opportunities may also exist to address localised flood risk issues offsite as the site is developed
Groundwater	No
Sewers	No
Reservoirs, Canals and other Artificial Sources	No
Infrastructure Failure	No

15 Environment Agency Risk of Flooding from Reservoirs - Maximum Extent Flood Map

5.0 Conclusion

SLR Consulting Limited has been appointed by Avison Young to prepare this flood fisk screening for the BFGV site. The aim of the report is to provide a better understanding of the baseline hydrology and identify potential significant flood risks that should be considered during the masterplanning of the site.

Following the completion of this assessment the following conclusions are made:

- The highest point on the site is to the southwest. Ground levels slope away from this raised area towards the site boundary to the north, south and east.
- The shallow geology at the site consists of a low permeability soil and a significant thickness of Till. This will restrict infiltration and, during wet periods, result in flows progressing towards the local ditch network via both surface runoff and shallow sub surface flow pathways.
- The solid geology of the site is comprised of units from the Sherwood Sandstone Group and units from the Pennine Coal Measures. Both groups are considered as aquifers and the presence of the potable abstraction from the Sherwood Sandstone in the east result in parts of the site falling within Source Protection Zone 3 (total catchment).
- Due to the low permeability superficial deposits the risk posed to deeper groundwater from any development is low.
- The site is located in Flood Zone 1. This indicates that the risk of fluvial and tidal flooding is low.
- The flood screening assessment undertaken confirmed this understanding and also indicates that the risk of flooding posed to possible future development on the site from groundwater, sewer, reservoirs, canal and infrastructure failure are all low. These potential sources of flood risk do not require detailed consideration.
- Available mapping indicates that while the majority of the site is at very low risk of surface water flooding small areas, particularly along the ditch network, may be vulnerable. More detailed consideration as to whether this might constrain development in certain areas, or otherwise how this might influence masterplanning and design for development on the site will be required.

Appendix A Site Drainage Diagrams

Bold Forest Garden Village

Flood Risk Screening

St Helen's Council

SLR Project No.: 403.065666.00001

22 April 2025

353000 353500 354000 354500 355000

393000 392500 392000

N

LEGEND

Site Boundary

Drainage Ditches

Assumed

Mapped

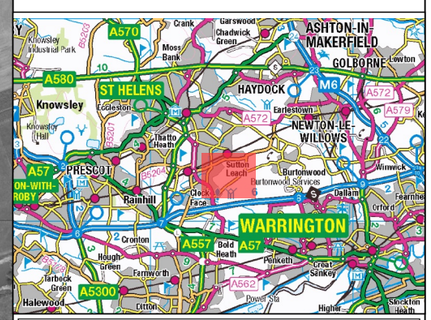
Potential

Onsite Ponds

Assumed

Mapped

Notes



0 200 400 600 m

Bold Forest Garden Village

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BOLD FOREST GARDEN VILLAGE

BASELINE REPORT

ONSITE DRAINAGE

Appendix A

Scale	Date
1:8,000 @ A3	APRIL 2025

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353000 353500 354000 354500 355000

393000 392500 392000

N

LEGEND

Site Boundary

Onsite Catchments

1
2
3
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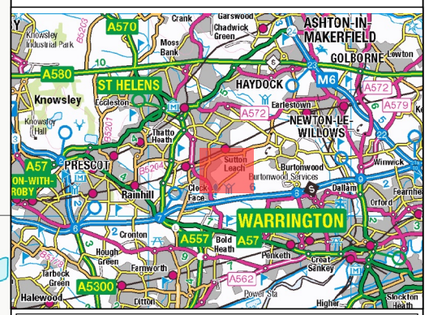
12
13
14

Notes



Bold Forest Garden Village

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BOLD FOREST GARDEN VILLAGE

BASELINE REPORT

ONSITE CATCHMENTS

Appendix A

Scale	Date
1:8,000 @ A3	APRIL 2025

0 200 400 600 m

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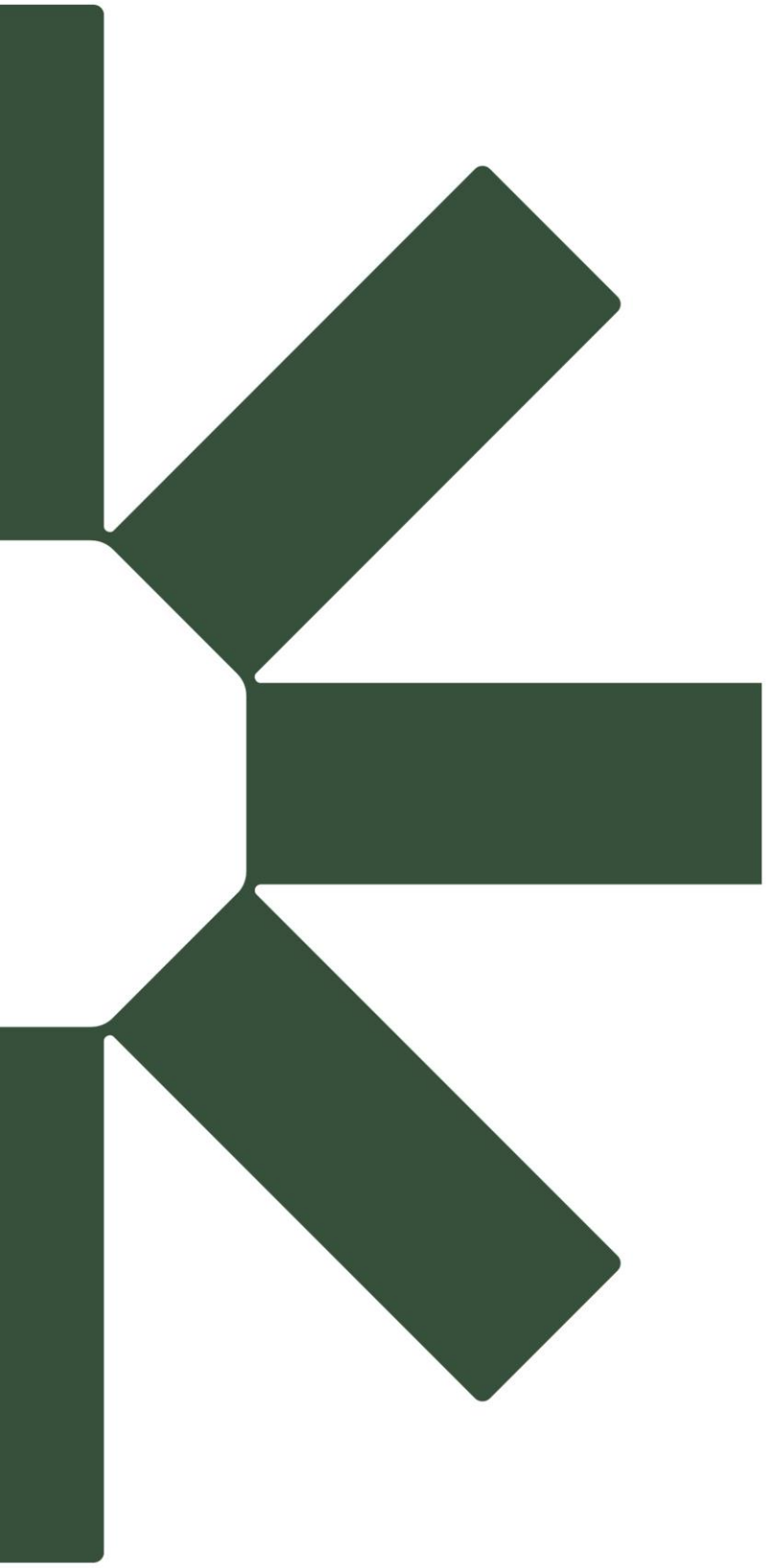

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