

FLOOD RISK ASSESSMENT

EA Product 4 flood data incorporated

Existing upper dwelling: change of use of ground floor from office / retail to residential to create 2 storey dwelling.

- Critical: all site users have access to upper levels in emergency
 - Betterment with safe refuge
 - Not a self-contained ground floor flat

127 High Street, Glossop, SK13 8HJ

28 April 2015

ARK Ltd

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If this report has been released electronically, the appendices referred to herein can be found in the annexed zip folder/s as .pdf or .dwg files. If this report has been released in hard copy the appendices will be bound into the back of this report. Plans may be annexed separately as A1 or A0 copies where a bound-in A3 copy is not appropriate.

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1.0 Scope

This report contains the details of a Flood Risk Assessment carried out by Ark Environmental Consultancy Limited (“ARK Ltd”) for the proposed change of use at 127 High Street, Glossop, SK13 8HJ, henceforth referred to as “the site” in this report.

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Please note this report does not purport to provide definitive legal advice nor can it be used to demonstrate that the site will never flood in the future.

The Executive Summary contains an overview of key findings and conclusions. However, no reliance should be placed on the Executive Summary until the whole of the report has been read.

Other sections of the report may contain information which puts into context the findings noted within the Executive Summary.

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2.0 Executive Summary

This FRA has been carried out in accordance with the 27th March 2012 National Planning Policy Framework (NPPF) which replaced “PPS25: Development and Flood Risk”. It is to be used to assist the Local Planning Authority (LPA) and Environment Agency (EA) when considering the flooding issues of the proposed development as part of a planning application.

The scheme is a change of the use from office / retail ground floor to residential to create a two storey dwelling. Appropriate Flood Resilient measures commensurate with the change of use can be incorporated into the scheme as recommended in this report.

The site is located within Environment Agency Flood Zone 2 & 3. The main source of flooding is fluvial from Glossop Brook and potential surface water flooding.

The proposed use is categorized as a “More Vulnerable” in accordance with the NPPF classifications; the NPPF Exception test will need to be passed.

This FRA also uses detailed consultations with the EA for a scheme in the same area EA letter ref: LT/2013/116074/03-L01, which led to approval of the evacuation procedure.

Raised floor levels are not possible due to re-use of existing structure. All site users have access to upper levels in emergency. Given the extreme event residual risk flood setting, the level, extent and depth of flooding on the site can be managed in terms of resilient measures, the EA Flood warning and easy evacuation to areas in Flood Zone 1, less than 250m to the south of the site. Refuge and evacuation are feasible. A preliminary evacuation procedure has been provided; the tenants will need to understand the appropriate response to the EA flood warning.

Based on the likely flooding risk, good flood warning and response management and the small scale of the proposed development (conversion of existing), it is considered that the proposed development can be constructed and operated safely in flood risk terms, without increasing

flood risk elsewhere; it is therefore considered appropriate development in accordance with the NPPF.

3.0 Introduction

The FRA combined a desktop study, review of available information, consultations and an assessment of all sources of flooding posed to and from the site and proposed development, in accordance with National Planning Policy Framework (NPPF). Appropriate flood mitigation measures were then considered, either as already incorporated within the scheme or recommended for inclusion at detailed design stage. The suitability of the proposed development was also reviewed in the context of the NPPF and the technical guidance accompanying the NPPF.

4.0 Purpose of the Report

This FRA has been carried out in accordance with National Planning Policy Framework (NPPF). It is to be used to assist the Local Planning Authority (LPA) and Environment Agency (EA) when considering the flooding issues of the proposed development as part of a planning application.

The report provides supplementary information to the FRA submitted with a previous planning application in order to update the following key objectives:

- An assessment of the flood risk posed to the site based on flood information and mapping provide by the EA and Strategic Flood Risk Assessment (SFRA);
- An assessment of the proposed development in terms of surface water run-off; and
- Proposals for measures to mitigate the flood risks posed to and from the development where appropriate.

5.0 Report Information Sources

The information source used to undertake this FRA has been collected from the following sources:

- EA Product 4 modelled data
- British Geological Survey Website
- EA Website
- High Peak Borough Level 1 Council Strategic Flood Risk Assessment (2007);
- High Peak Borough Council Website
- Anecdotal evidence from local people; and
- Internet mapping and searches.

7.0 Overview of British Legislation

7.1 National Planning Policy

The National Planning Policy Framework (NPPF) and accompanying Technical Guidance was published on the 27th March 2012. This supercedes all Planning Policy Statements (PPS's)

and remaining Planning Policy Guidance (PPG's). Flood risk is retained as a key development consideration and is incorporated within Section 10: "Meeting the challenge of climate change, flooding and coastal change":

"Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere."

The Sequential and Exception Tests (as per PPS25) are retained as part of the NPPF. The accompanying NPPF Technical Guidance also includes Tables 2 and 3 (similar to Tables D2 & D3 of PPS25) to assist with flood risk vulnerability classifications and development suitability.

7.2 Local Policy

High Peak Borough Council (HPBC) authority considers flood risk through relevant environmental and climate change policies which enforce the requirements of the NPPF.

The Strategic Flood Risk Assessment (SFRA) is a key source of flood risk specific information for the area. The SFRA provides a more detailed review of flood risks and recommendations for ensuring developments can be constructed and operated safely in accordance with the NPPF. Greater detail of the SFRA is provided in the report.

8.0 Site Status and Environmental Setting

8.1 Site Location and Status

The site is c. 0.01 hectares comprising an existing building and located adjacent to the A57 within Glossop. The site location plan can be seen in Appendix A.

8.2 Existing Flood Risk

Fluvial and Tidal

There are no surface water features present on the site.

From an inspection of ordnance survey plans the nearest water feature to the site is Glossop Brook located c. 50m to the east of the site.

The site is mostly in EA Flood Zone 2 / adjacent to FZ3a (High Street), indicating no potential inundation of the actual building except in extreme events (1 in 1000 year event).

The site is within an area that now receives EA Flood Warnings.

The Glossop Brook Flood Alleviation Scheme has also been completed, offering additional protection to the Glossop area. The FAS was essentially designed to increase channel capacity such that the brook could transfer flood waters more easily through and away from the populated areas.

The EA website Flood Map can be seen in Figure 1.

The site is not directly protected by flood defences; it is considered that a breach in the defences would not have an impact on the site.

Although Glossop Brook is a flashy river in terms of speed of flooding, the main access / egress, the A57 is not a main flood flow path.

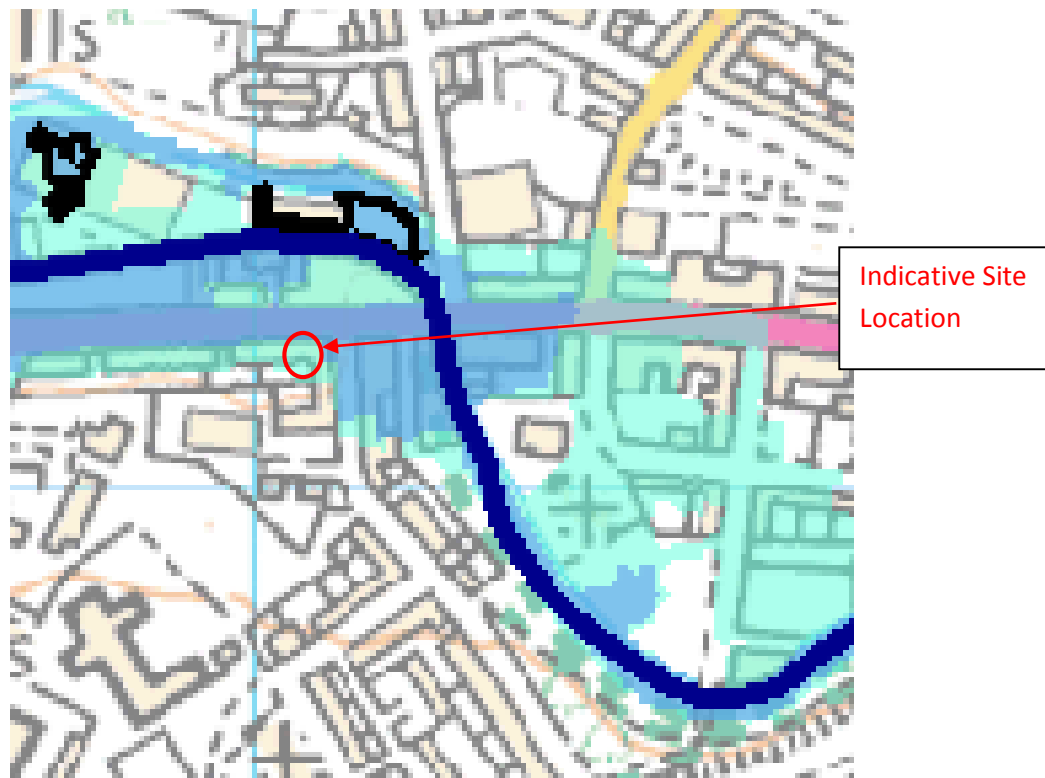


Figure 1: EA flood map (environment-agency.gov.uk, accessed June 2013)

Strategic Flood Risk Assessment

The 2007 Level 1 SFRS notes:

“Glossop Brook is a major tributary of the River Etherow. Both the brook and its tributaries pose fluvial flood risk in Glossop, even though the Flood Zones are relatively narrow. There are issues with Flood Zone misalignments (i.e. the Flood Zone maps do not follow the path of the associated watercourse) and culverted sections which show Flood Zones (tabulated in Section 4.6). At the downstream end of Glossop Brook where the Flood Zones are slightly wider, flood risk affects an industrial estate and the A57.”

Importantly since the 2007 SFRA it is understood that the EA flood zones have been updated and do include accommodation for climate change.

The SFRA does not indicate any other specific sources of flooding posed to the area or site.

The Level 2 SFRA was not available at the time of writing.

8.3 EA Product 4 Flood data

The EA’s data in AppA indicate:

-
- 1in100year level: 141.38mAOD to 138.06mAOD
 - Node 2 is upstream and just at culverted section hence potential surcharging level
 - Node 3 downstream also likely representative of flooding at the site
 - Hence likely 1in100year of between 139.45mAOD to 141.38mAOD
 - 1in1000year of max 142.53mAOD
 - A57 was inundated in EA's historic flood extent mapping but not property itself

8.4 Flood Levels and Design Response: Refuge & Evacuation

The scheme is a conversion which will create a two storey dwelling from a single upper storey dwelling.

It is not possible or necessary to raise ground floor levels.

The scheme offers a betterment in that the ground floor living areas will have access to upper levels for sleeping quarters.

Refuge is appropriate given short duration of flooding likely and hence no reliance on EA flood warning.

Nevertheless, in discussion with the EA, updated flood levels indicate that the site would be potentially subject to depths of flood waters in the extreme event, which would be forewarned as part of the EA Flood Warning scheme; hence the assessment has considered in detail the Flood Evacuation Response and Management Plan specific to the site.

The velocities provided by the EA also confirm the flashy nature of the Glossop Brook.

Groundwater

There is always the potential for localized flooding from superficial geological perched groundwater.

There is no ground investigation data available for the site to confirm the geology and groundwater levels on the site.

However, there are no records from the existing site users of the site being flooded as result of groundwater.

The proposed development does not include any works which could increase the risk of flooding to or from the development from groundwater sources.

Artificial Sources of Flooding

There are sections of Glossop Brook which are culverted in the surrounding area; these have been accommodated in the flood modelling.

There are no known reservoirs, lakes, canals or lost rivers on or close to the site.

Other Sources of Flooding (Infrastructure)

United Utilities is responsible for storm water and foul water sewer systems in the area of the site. Sewer asset plans have been purchased; there is a public sewer passing through the site, an appropriate construction management plan will ensure there is no unacceptable impact on this sewer. The exact condition, depth and exact location of sewers within the A57 is not known at this stage. It is assumed the existing connection to surface and foul sewers will be reused as part of the scheme.

At the time of writing a Surface Water Management Plan (SWMP) was not available.

Flood History

The area has been subject to historic flooding, hence the Glossop Brook FAS.

Key Flooding Sources

A summary of the key flooding sources (sources discounted above are not included) relative to the site that have been identified from available sources is provided in Table 2:

Table 2: Summary of Flooding Sources and Pathway / Risk

Flooding Source	Potential			Comments on Pathway Likelihood
	High	Medium	Low	
Fluvial / Tidal			x	Site is Located in Flood Zone 2 & 3a. Safe refuge is feasible – no reliance on EA flood warning and likely short duration of flooding. However, given the EA flood warning, evacuation is also appropriate and safe passage to Flood Zone 1 is feasible. See evacuation procedure.
Other sources of flooding (e.g. infrastructure)		x		No history of sewer flooding for the immediate area though it is understood there are general capacity issues in parts of the district. Residual risk to be managed as part of design.

9.0 Assessment of Proposed Development

9.1 Proposed Development

The proposed development can be seen in Appendix B.

The proposed development is to change the use of the ground floor to residential to act as the living area for the upper existing dwelling. It will remain one dwelling on the site. There are to be no new structures on the site; flood compensation is therefore not considered necessary.

There will be no changes to the existing ground finished floor levels.

Raised floor levels are not possible due to re-use of existing structure, regardless, due to safe refuge and short duration of flooding, raised floor levels are not considered necessary.

Additional Mitigation:

- Betterment: Floodgates on entrance points to minimize potential for floodwaters to enter the building
- Flood resilience – see below

9.2 Flood Resilience

Given change of use, the opportunities for flood resilience are limited. However, the proposed development will utilize the flood resilient techniques recommended in the NPPF Technical Guidance where appropriate and also the recommendations that have previously been issued by various London Borough Councils.

These include:

- Plasterboards will be installed in horizontal sheets rather than conventional vertical installation methods to minimise the amount of plasterboard that could be damaged in a flood event
- The ground floor slab will be concrete (existing groundfloor slab to be reused) in order to minimise damage and reduce the turnaround time for returning the property to full operation after a flood event
- Wall sockets will be raised to as high as is feasible and practicable in order to minimise damage if flood waters inundate the property
- Any wood fixings on ground floor will be robust and/or protected by suitable coatings in order to minimise damage during a flood event
- Airbricks will be raised to as high as is feasible and practicable
- Where necessary to install new, any waterproofing will be installed above the main floor slab and tied in to the walls where appropriate, to reduce the turnaround time for returning the property to full operation after a flood event.

9.3 Safe Flood Response Management

The site is not directly protected by flood defences; floodwaters are therefore not likely to inundate the site in a short period of time from a breach.

Based on the likely flood risk and associated warning time that is feasible it is considered likely that there would be sufficient time to seek refuge & evacuate to an area of Flood Zone 1 **within 50m**.

9.4 Evacuation and Refuge

A precautionary approach has been taken.

Based on the likely flood risk (EA data) and associated warning time that is feasible (EA Flood Warning / residual risk of flooding) it is considered likely that there would be sufficient time to evacuate / seek refuge as appropriate.

- In the event of a flood warning, evacuation should be the preferred response for the full range of flood events given well advanced flood warning (meteorological tidal warning).

Range of Flood Events

Following the precautionary approach, it is considered that:

- a) Evacuation is always the preferred response and is feasible at this site with the EA flood warning – well in advance
- b) All site users would have access to upper levels as appropriate refuge areas above the extreme event in emergency

Early Flood Warning – Evacuation

Upon an EA Flood Warning the preferred evacuation route should be:

- Immediately east on High Street for 20m
- South on St Mary's Road for 30m – into unrestricted FZ1

This evacuation route:

-
- remains in similar lower flood hazard areas (FZ2)
 - takes occupants away from the principle flood source

Evacuation is always the preferred approach.

Community Safety Planning and Local Authority to advise and confirm.

Antecedent Rain Conditions / Emergency Warning / Overnight

If there is a warning before occupants were to sleep, upon an EA Emergency / Community Flood Warning

- It is recommended that all occupants should evacuate as a preferred precautionary approach if it is safe to do so.

If surrounding area is dry:

- Follow Evacuation Route above

If surrounding area is inundated:

- There is no need for any occupant to walk in floodwaters
- All site users /occupants to seek refuge at upper levels above the extreme flood level

Clear communication in Flood Warning Event

The future tenants will need to understand and sign up to the EA Flood Warning scheme.

9.5 Surface Water Runoff – Flood Risk from the Development

In accordance with the NPPF, this FRA also considers the risks posed from the development to surrounding areas.

Due to the small size of the proposal (conversion), the proposed development will likely reutilize existing connections to the existing sewers in adjacent roads.

The proposed development is a change of use of an existing building. The proposals, if new white units are required, will incorporate new low-water demand devices such that the increase in peak flow and volume of flow is likely to be negligible.

Given the small scale of the proposed development it is considered likely that the development will have no effect on surrounding infrastructure. There will not be any significant increase in overland flow from the site and, given the site setting, no other sensitive assets would likely be affected.

9.6 Climate Change

The impact of climate change in accordance with the NPPF is likely to be an increase in the rainfall intensity in the future, which will increase peak storm flows to sewer. The proposed development will incorporate low flush and reduced water demand showers and toilets, such that the combined flows to sewer are likely to have a negligible impact. It is considered

therefore that flows in the future are not likely to have a significant impact, even with an allowance for climate change.

There is unlikely to be an impact on the receiving sewers owing to the small scale of the development.

Importantly the EA flood zones have been updated since the previous application, regardless both versions of the modelling include an accommodation for climate change.

9.7 Sequential Test

The sequential test is a guidance designed to ensure that areas at little or no risk of flooding are developed in preference to areas at higher risk.

The proposal is for a ground floor conversion to residential and does not increase the intensity use of the site (remains one dwelling), such that the sequential test does not actually apply.

9.8 Flood Risk Vulnerability

The site and surroundings is already in residential use.

According to the NPPF retained Flood Risk Vulnerability Classification as per the former Table D2 in PPS25, the proposed retention of residential land use would be classified as “More Vulnerable.”

The NPPF also retained Flood Risk Vulnerability and Flood Zone “Compatibility” Classification as per the former Table D3 of PPS25; this states that a “More Vulnerable” development in Flood Zone 2 does not require the Exception test but in 3a does require the Exception Test (retained by NPPF) to be passed.

Based on the data reviewed to date, the flood risk assessment recommends the property could be operated safely in flood risk terms, but the evacuation safe management needs to be followed:

9.9 Exception Test

Table 3 provides the likely response to the 2 key criteria of the Exception Test, which should be confirmed by the planning department. This FRA provides the second element required of NPPF to satisfy the Exception Test.

In support to the council for the first part of the test:

- The scheme establishes a safe development by ensuring a second storey which is a safe refuge above the extreme event for the lifetime of the development
- The ground floor protection level can also be raised above the 1in200year event
- Additional flood exclusion measures can be incorporated

Table 3: Exception Test Summary

Exception Test Criteria	Proposed Development
It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a SFRA where one has been prepared.	Planners to confirm.
A FRA must demonstrate that the development will be safe, without increasing flood risk elsewhere, and, where possible will reduce flood risk overall.	Pass. Safe refuge area on upper levels on site. Suitable evacuation timing and route. As long as the flood resilient measures are incorporated and the future occupiers understand the flood response required, understand and sign up to the EA Flood Warning service, it is considered likely that the proposed development can be constructed and operated safely in flood risk terms and is therefore appropriate development in accordance with the NPPF.

Based on the data reviewed to date, the flood risk assessment recommends the property could be constructed and operated safely in flood risk terms without increasing flood risk elsewhere.

10.0 Conclusion

The site is considered to be generally at a low risk from all sources of flooding except fluvial; the EA website map and SFRA indicate the site is in Flood Zone 2 / adjacent to 3a (Medium & High probability).

The proposed development is categorised as “More Vulnerable” in accordance with the NPPF; it is therefore an appropriate type of development within Flood Zone 3a if the Exception Test can be passed.

A preliminary refuge and evacuation procedure has been provided; the proposed scheme can incorporate suitable flood resilient measures.

All future tenants would have:

- access to upper levels above extreme event for lifetime of the development
- access Flood Zone 1 within 50m
- suitable warning time

Based on the likely flooding risk, it is considered that the proposed development can be constructed and operated safely in flood risk terms, without increasing flood risk elsewhere and is therefore appropriate development in accordance with the NPPF.

It is recommended that the property signs up to the EA Flood Warning scheme.

10.1 Recommendations for Further Work

1. If additional site specific flood levels become available, the residual flood risk should be re-evaluated
2. Produce a Flood Evacuation Plan with tenants
3. Sign up property to EA Flood Warning scheme

11.0 Appendices

A. Site Location

Appendix A