

Pendle Level 2 Strategic Flood Risk Assessment - Site P081

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1 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for Pendle Borough Council Site P081. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Pendle Level 1 SFRA' (2021) and read the 'Pendle Level 2 SFRA Main Report' (2024) and is therefore familiar with the terminology used in this report.

1.1 Site P081

- Location: New Road Garage Site, New Road
- Existing site use: Brownfield; industrial
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 0.6 hectares
- Proposed development impermeable area: 0.5 hectares (assumed 85% of total site area)
- EA model: Earby Beck 2018 / Earby Beck Phase 2 2021
- Watercourse: New Cut
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Site subject to the Exception Test
 - Assess modelled fluvial depths and hazards
 - Assess surface water depths and hazards
 - Climate change proxy assessment



Figure 1-1: existing site location boundary

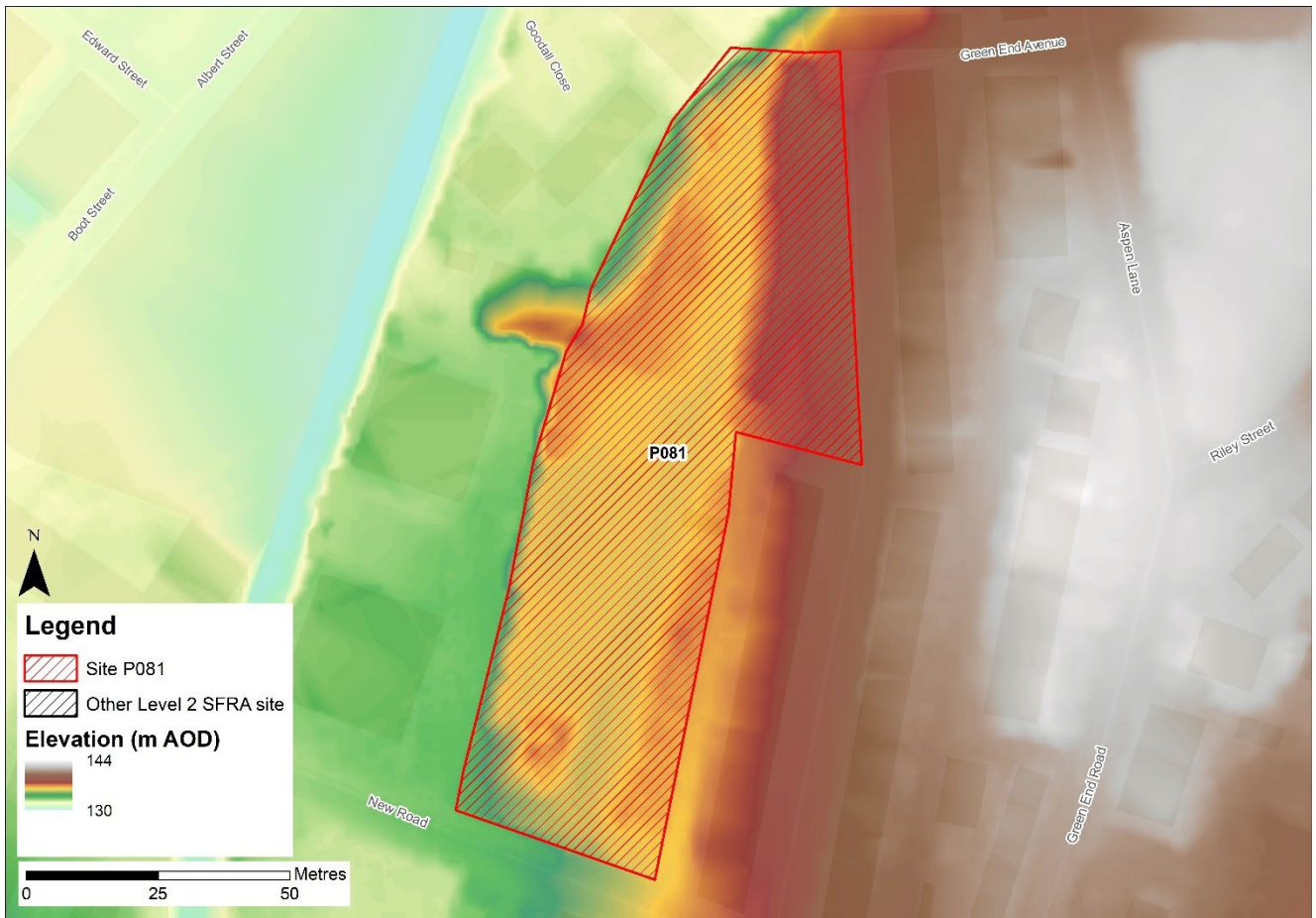


Figure 1-2: topography

2 Flood risk from rivers

2.1 Existing risk

2.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Pendle Level 2 SFRA (2024), the percentage areas of the site within each flood zone are stated in Table 2-1 and can be viewed on Figure 2-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 2.3) or the impacts of climate change (Section 2.2).

The majority of the site is located within Flood Zone 1.

Table 2-1: existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
99	1	0	0

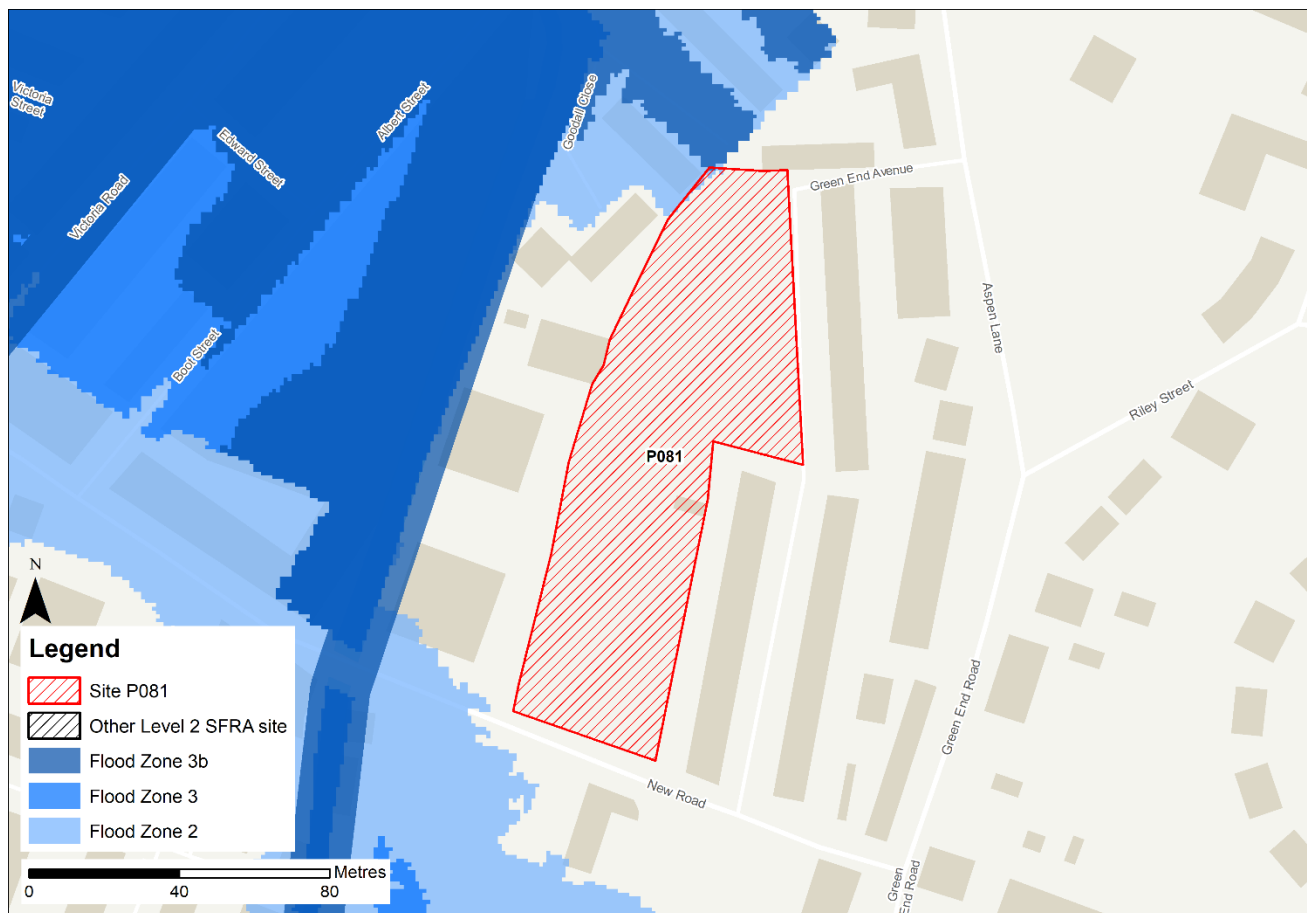


Figure 2-1: existing risk from rivers to the site

2.1.2 Earby Beck Phase 2 2021 model outputs

Figure 2-2 shows the modelled flood depths for the 0.1% AEP undefended event which is the event Flood Zone 2 of the Flood Map for Planning is based on. Modelled risk to the site is similar to Flood Zone 2 in the vicinity of the site, with the small area along the northwestern boundary of the site modelled to be at risk. There is no modelled flood risk to the rest of the site in the 0.1% AEP undefended event, reflecting Flood Zone 2.

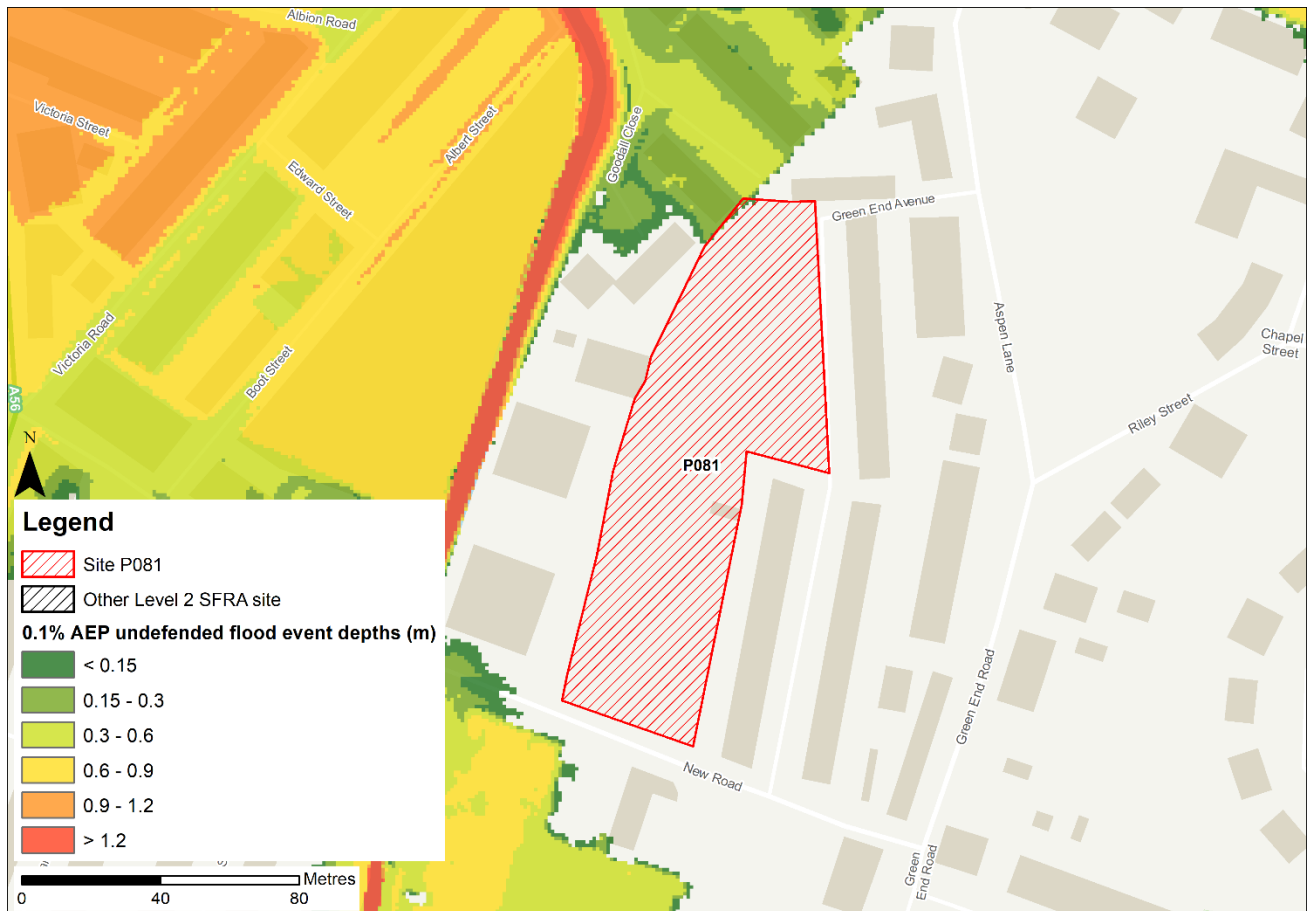


Figure 2-2: flood depths for 0.1% AEP undefended flood event

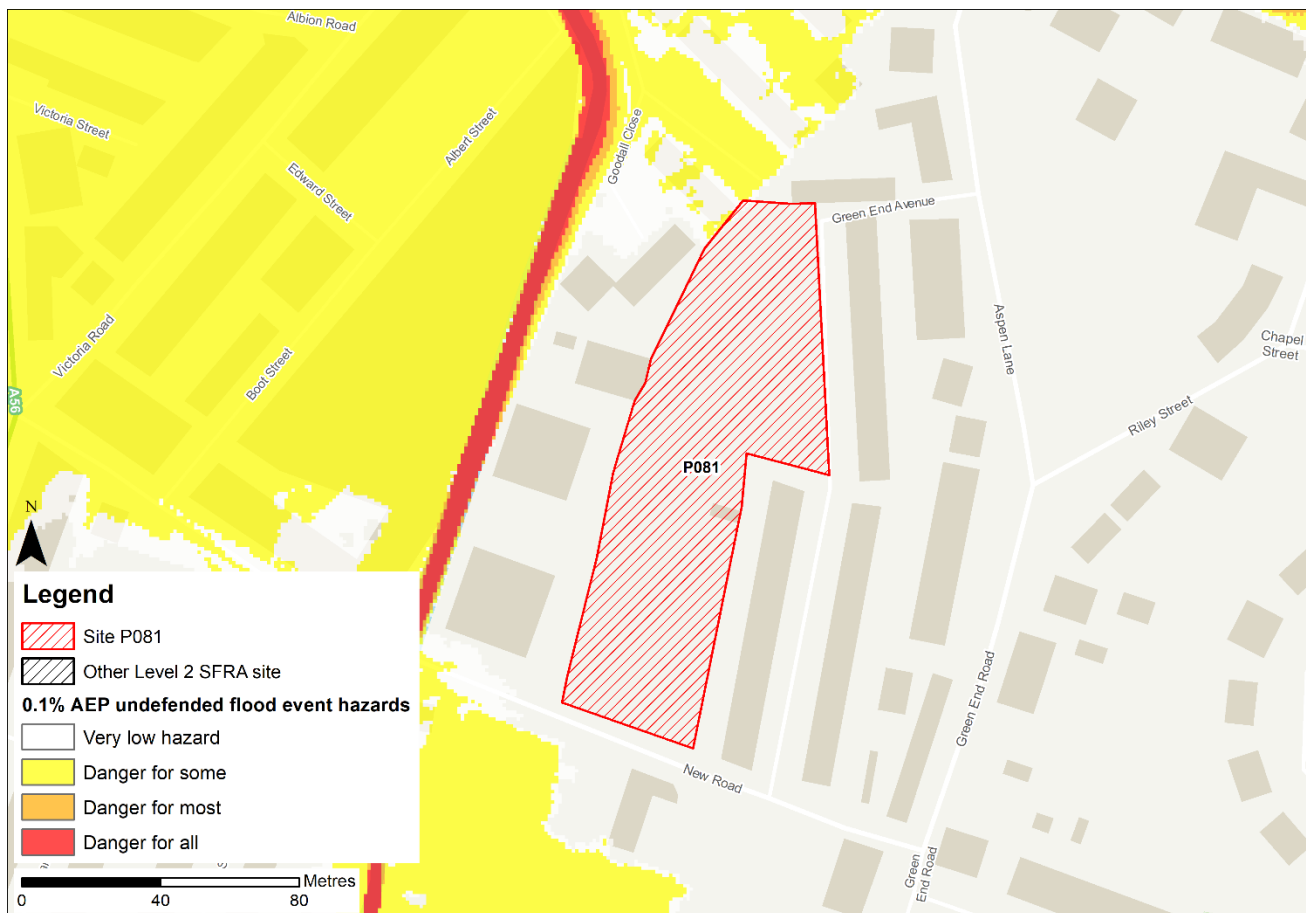


Figure 2-3: flood hazard¹ for 0.1% AEP undefended flood event

2.2 Impacts from climate change

The impacts of climate change on flood risk from New Cut has not been modelled for this SFRA, as the timescales for the Local Plan would not allow for it. Therefore, in the absence of modelled climate change information, the modelled 0.1% AEP undefended event has been used as a conservative proxy for Flood Zone 3 plus climate change. The 0.1% AEP undefended event is discussed in Section 2.1.2.

The impacts of climate change must be modelled using the EA's latest allowances for peak river flows to inform on whether the site can remain safe for its lifetime. Therefore, any updates to this Level 2 SFRA and/or any FRA should include for the most up to date climate change allowances based on a fully up to date flood model.

¹ Fluvial hazard ratings based on Table 4 of the SUPPLEMENTARY NOTE ON FLOOD HAZARD RATINGS AND THRESHOLDS FOR DEVELOPMENT PLANNING AND CONTROL PURPOSE – Clarification of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1. May 2008.

2.3 Flood risk management

There are no engineered flood defences within the vicinity of the site that are likely to impact fluvial flood risk. There are however areas of natural high ground along the banks of New Cut to the west of the site boundary.

2.3.1 Working with Natural Processes

The EA's Working with Natural Processes (WwNP) dataset has been interrogated to identify opportunities for Natural Flood Management (NFM) to reduce flood risk to the site and surrounding areas. There are not any applicable areas that could benefit this site.

2.4 Residual risk

2.4.1 Flood risk from reservoirs

The EA's Reservoir Flood Maps (RFM) (2021) show where water may go in the unlikely event of a reservoir or dam failure. Figure 2-4 shows the RFM in a "dry day" and "wet day" scenario. A "dry day" scenario assumes that the water level in the reservoir is the same as the spillway level or the underside of the roof for a service reservoir and the watercourses upstream and downstream of the reservoir are at a normal level. A "wet day" scenario assumes a worst-case scenario where a reservoir releases water held on a "wet day" when local rivers have already overflowed their banks.

This site is potentially at risk from three reservoirs, all of which are located within the Pendle authority area. The Canal & River Trust is the undertaker for all three reservoirs.

The EA's SFRA guidance states that where a proposed development site is at flood risk from a reservoir, then an assessment into whether the reservoir design or maintenance schedule needs improving should be carried out. Expert advice may be required. More details are available in the main report of this Level 2 SFRA.

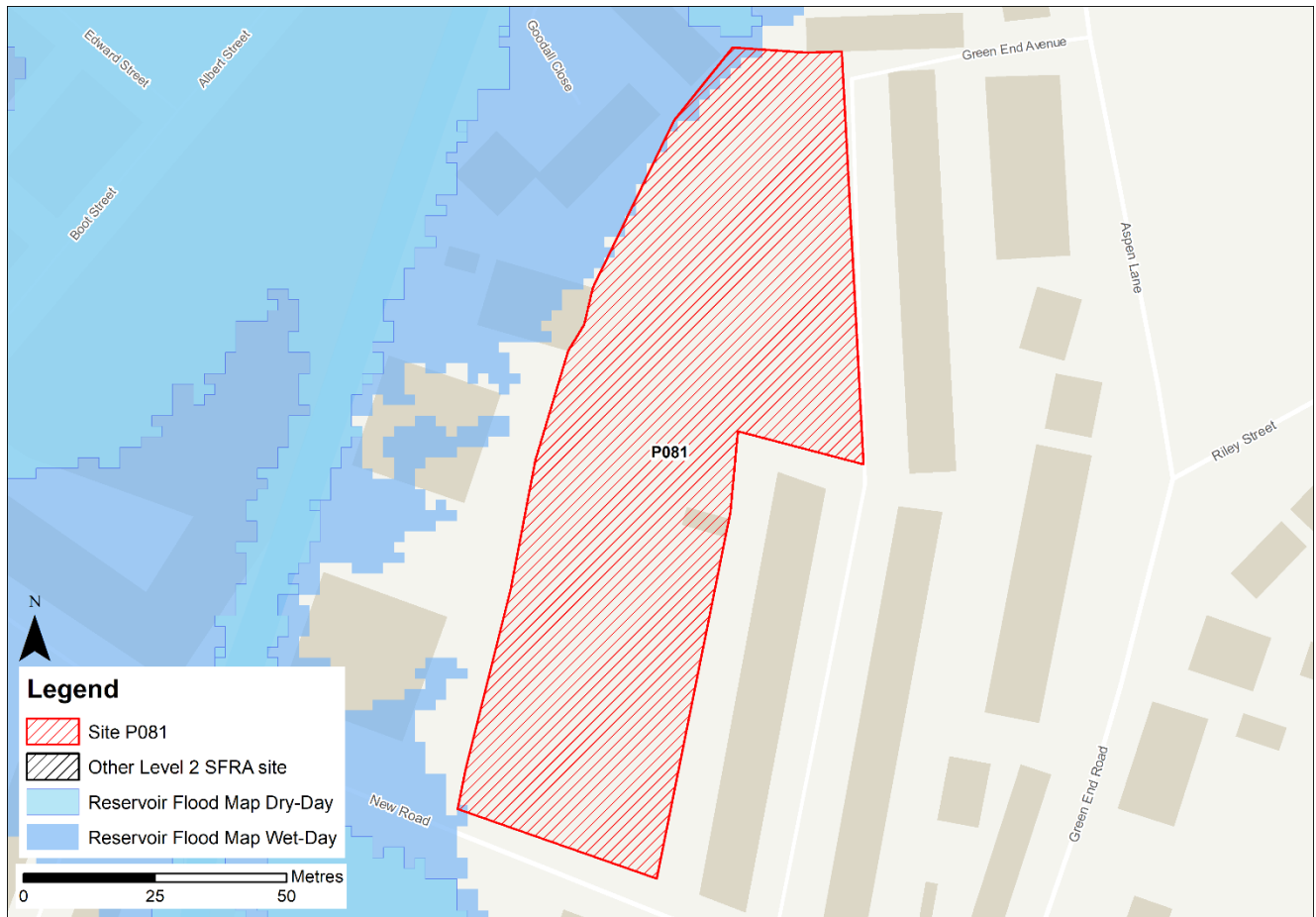


Figure 2-4: Flood risk from reservoirs

2.5 Historic flood incidents

EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood events within the vicinity of the site.

2.6 Flood warning and access and escape routes

The EA operates a Flood Warning Service for properties located within a Flood Warning Area (FWA) for when a flood event is expected to occur. This site is not located within an FWA.

Flood alerts may be issued ahead of a flood warning for properties located within a Flood Alert Area (FAA) to provide advance notice of the possibility of flooding. A flood alert may be issued when there is less confidence that flooding will occur in a FWA. The site is located within a FAA, namely 123WAF957 - Earby Beck Catchment.

Safe access and escape should be possible via New Road to the south of the site.

2.7 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site would see a change in the risk classification from less vulnerable to a more vulnerable housing site, according to the NPPF classification.
- Given the change in use and therefore vulnerability of the site, the site-specific FRA must show that the development can be designed to be safe and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- The site is at nominal risk from Flood Zone 2.
- The 0.1% AEP undefended event outputs have been used as a proxy to provide a conservative estimate of the 1% AEP undefended event plus climate change. Based on this approach, fluvial risk is unlikely to increase risk to the site in the long term. However, climate change must be modelled to inform on safe development for the development's lifetime.
- Safe access and escape routes are available from several locations based on current information.

3 Flood risk from surface water

3.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is very low. Approximately 4% of the site is within the low risk surface water flood zone, as shown in Table 3-1. There is no modelled risk to the site in the high or medium risk events.

The area at risk in the low risk event is mainly confined to a distinct flow path along a hardstanding road through the centre of the site, potentially constrained by the existing building on the site. There is an additional area of risk within the north of the site, however this is confined to a small area along the site boundary.

Greatest flood depths in the low risk event range between 0.6 and 0.9 m, however these depths are located within the small area of risk along the northern boundary. Maximum flood depths along the flow path within the centre of the site range between 0.15 and 0.3 m (Figure 3-1) comprising areas of low hazard (Figure 3-2). Safe access and escape routes should be possible via New Road to the south of the site in the low risk events.

Table 3-1: existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
96	4	0	0

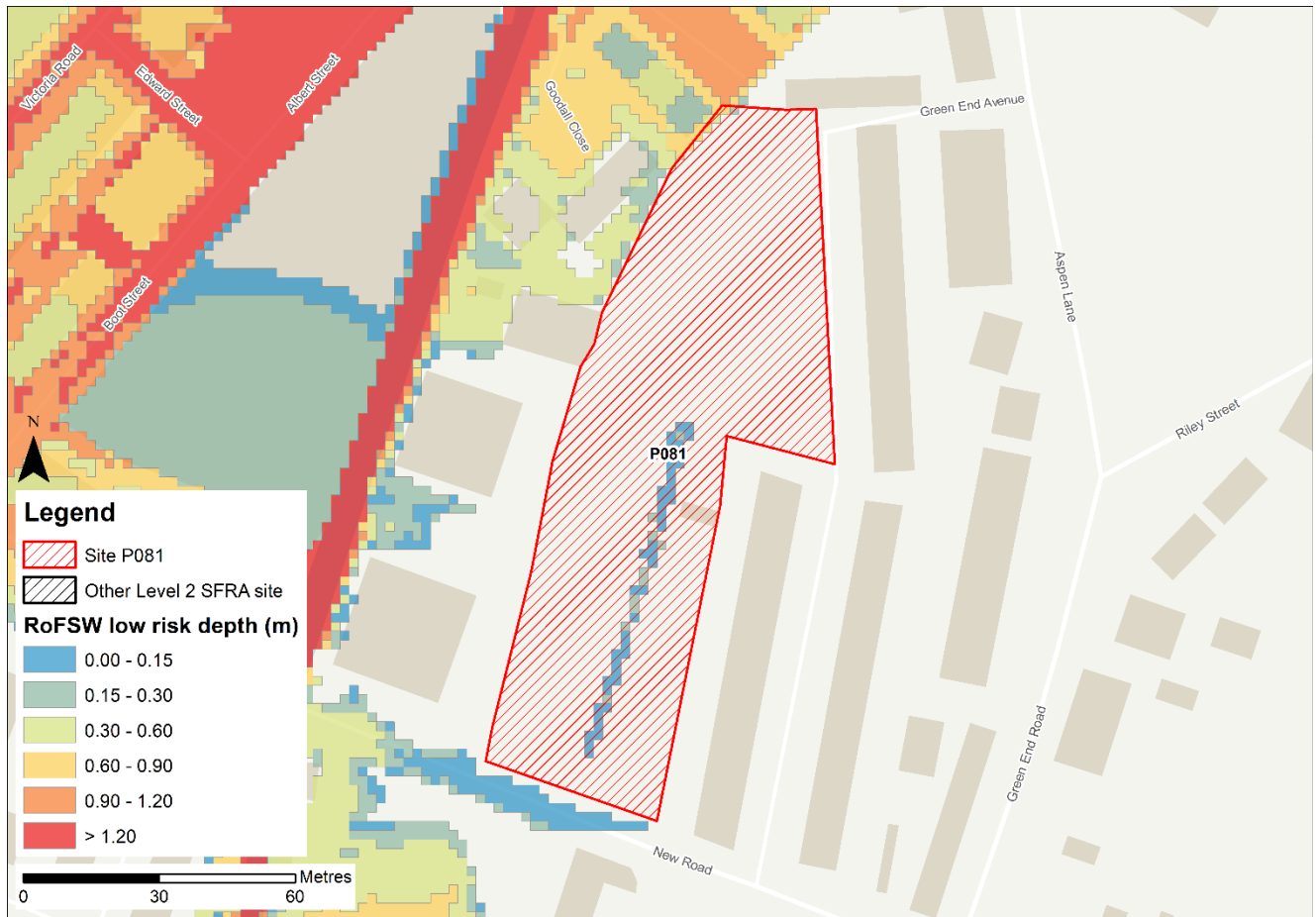


Figure 3-1: low risk event surface water flood depths (Risk of Flooding from Surface Water map)

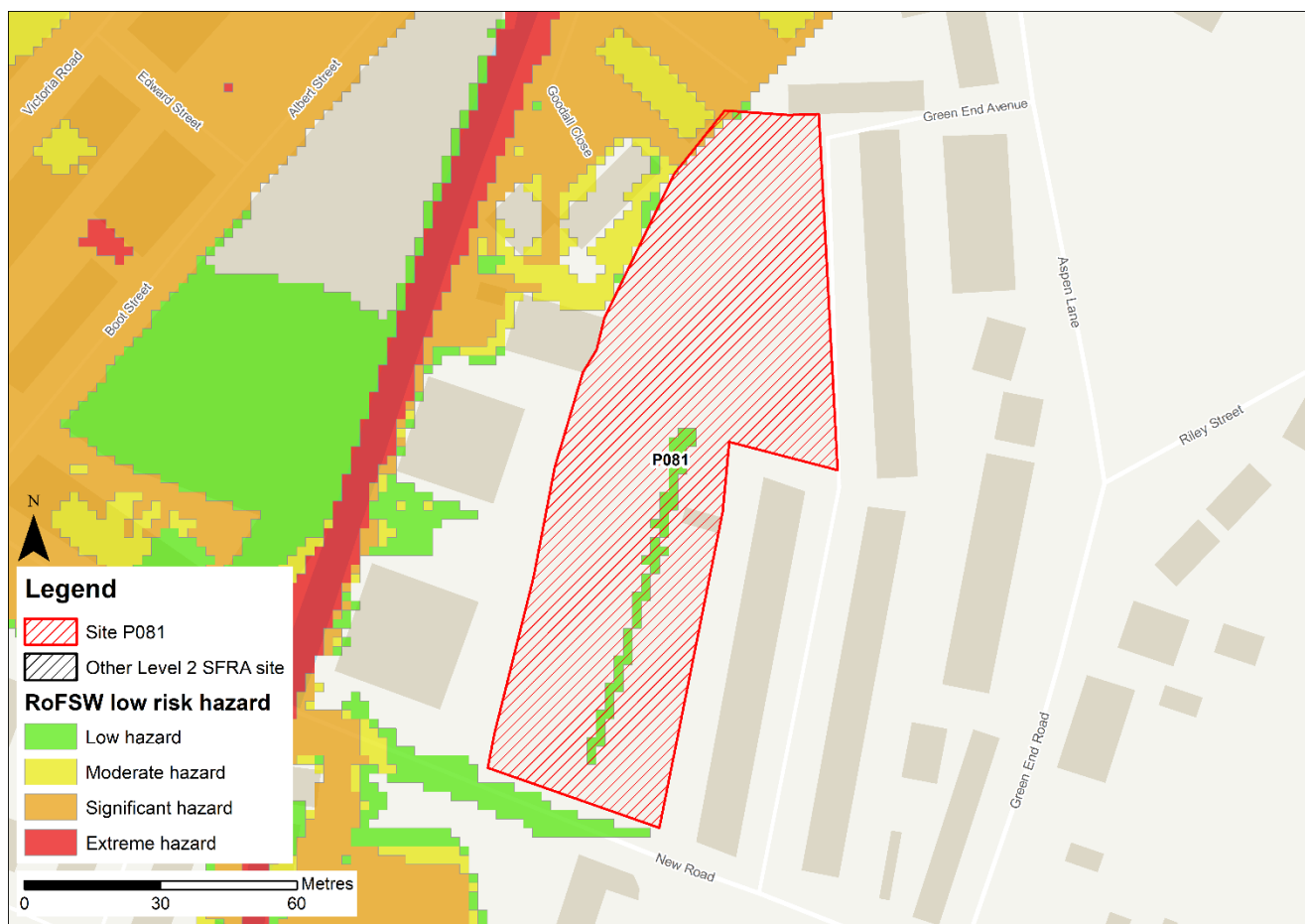


Figure 3-2: low risk event surface water flood hazard² (Risk of Flooding from Surface Water map)

3.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 3-2: modelled climate change allowances for rainfall for the Ribble Management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	40%
1% (medium risk)	35%	50%

Figure 3-3 shows the modelled surface water flood depths for the medium risk event +50% climate change. Risk is modelled to be nominally greater than for present day conditions, with the medium risk plus climate change event being similar in extent to the low risk present day event. There is an additional area of risk located within the northwest of the site

² Based on Section 7.5 Hazard rating. What is the Risk of Flooding from Surface Water map? Report version 2.0. April 2019. Environment Agency

in comparison to the present day low risk event. Greatest flood depths are modelled to be between 0.3 and 0.6 m with areas of low hazard (Figure 3-4).

Safe access and escape should remain achievable via New Road to the south of the site.



Figure 3-3: medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 3-4: medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

3.3 Observations, mitigation options and site suitability - surface water

- The site is predominantly at very low surface water flood risk. There is a surface water flow path located along the hardstanding ground through the site in the low risk event. Safe access and escape routes should be possible via New Road to the south of the site.
- The modelled climate change outputs indicate increased surface water flood risk to the site in the medium risk event, which is similar in extent to the present day low risk event. Safe access and escape should remain achievable to the south of the site.
- It is likely the site will be cleared to make way for new development. A drainage strategy would be required to ensure there is no increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on layout plans and detailed design and consultation with the LLFA.
- The use of appropriate SuDS should be investigated. The groundwater table is likely to be low in this location judging from the Groundwater Flood Map in Figure 4-1 therefore infiltration SuDS should be an option. This will require appropriate ground and infiltration survey.

- Assessment of the current drainage system in place should be carried out to ascertain any current capacity issues and whether the current system could accommodate the proposed residential development or whether further capacity will be required.
- The RoFSW map is not suitable for identifying whether an individual property will flood and is therefore indicative. The RoFSW map is not appropriate to act as the sole evidence for any specific planning or regulatory decision or assessment of risk in relation to flooding at any scale without further supporting studies or evidence.

4 Flood risk from groundwater

Flood risk from groundwater sources is assessed in this SFRA using JBA's 5m Groundwater Flood Map. This dataset is recommended for use by the EA in the SFRA Good Practice Guide³. Figure 4-1 show the map for Site P081 and the surrounding areas and Table 4-1 explains the risk classifications.

The entire site is in an area of no risk of groundwater emergence. Groundwater conditions should therefore be suited to infiltration SuDS.

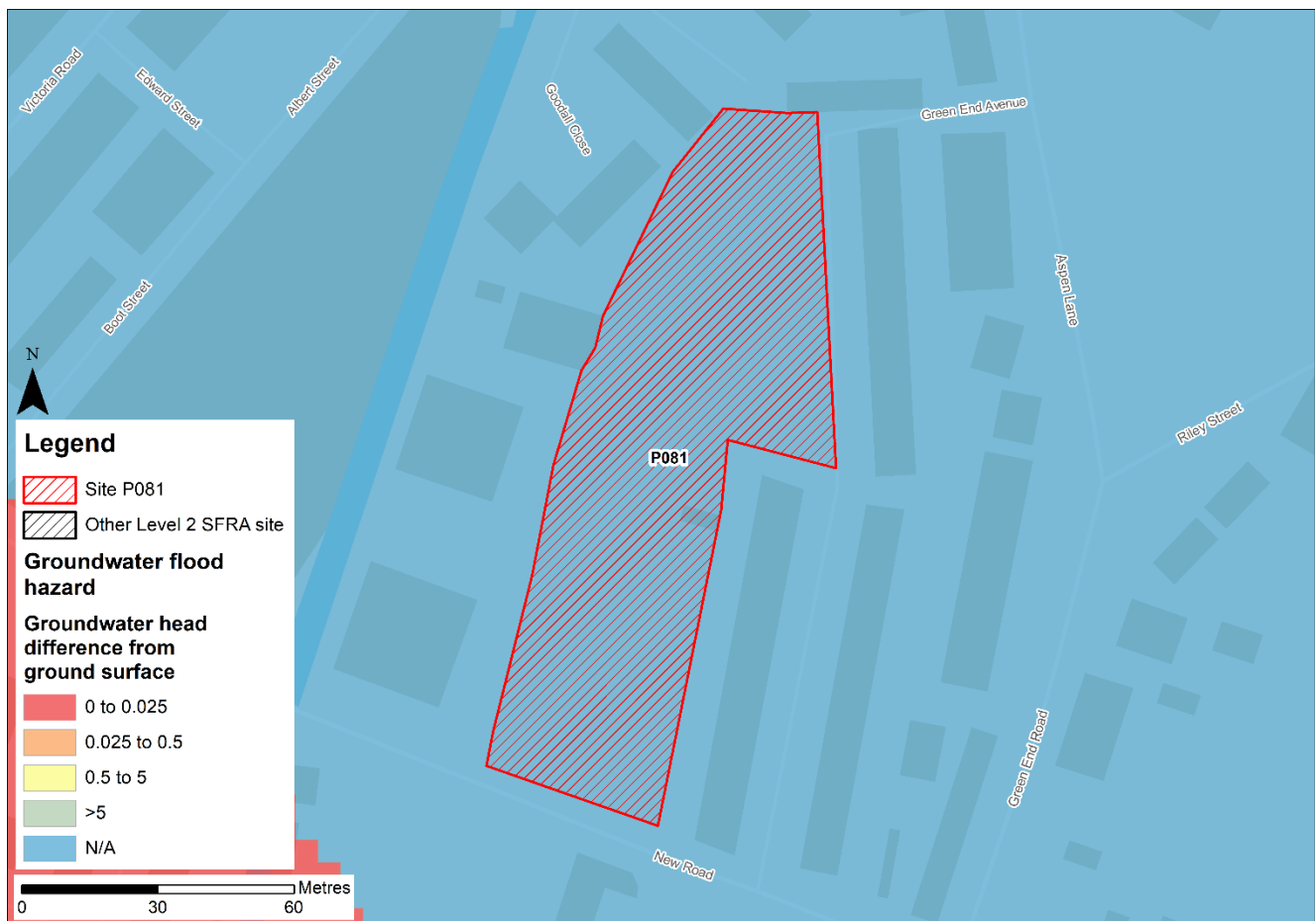


Figure 4-1: JBA 5m Groundwater Flood Map

³ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 4-1: Groundwater Flood Hazard Classification

Groundwater head difference (m)*	Class label
0 to 0.025	Groundwater levels are either at very near (within 0.025m of) the ground surface in the 100-year return period flood event. Within this zone there is a risk of groundwater flooding to both surface and subsurface assets. Groundwater may emerge at significant rates and has the capacity to flow overland and/or pond within any topographic low spots.
0.025 to 0.5	Groundwater levels are between 0.025m and 0.5m below the ground surface in the 100-year return period flood event. Within this zone there is a risk of groundwater flooding to surface and subsurface assets. There is the possibility of groundwater emerging at the surface locally.
0.5 to 5	Groundwater levels are between 0.5m and 5m below the ground surface in the 100-year return period flood event There is a risk of flooding to subsurface assets, but surface manifestation of groundwater is unlikely.
>5	Groundwater levels are at least 5m below the ground surface in the 100-year return period flood event. Flooding from groundwater is not likely.
N/A	No risk. This zone is deemed as having a negligible risk from groundwater flooding due to the nature of the local geological deposits.

5 Overall site assessment

5.1 Can part b) of the exception test be passed?

To pass part b) of the exception test⁴, it must be proven that the development can be safe for its lifetime, which is 100 years for residential development, taking account of the vulnerability of its users, without increasing risk elsewhere, and, where possible, will reduce flood risk overall.

- The site is not required to pass the exception test as it is not within Flood Zone 3a and is virtually wholly located within Flood Zone 1 and is not shown to be at risk from climate change based on the proxies used. Surface water risk should be manageable.

5.2 Recommendation summary

Based on the evidence presented in the Level 1 SFRA (2021) and this Level 2 SFRA:

- It should be appropriate to develop this site for more vulnerable purposes given its location in Flood Zone 1 and at low additional risk in the long term.
- Updated climate change modelling on the New Cut watercourse should be carried out at the FRA stage to provide a robust assessment of flood risk to this site and the surrounding areas.
- Were this site to be allocated based on current information, the LPA must make it clear that this site cannot be developed until the required information detailed in this SFRA on future flood risk from New Cut is fully ascertained.
- A drainage strategy will be required. Use of infiltration SuDS should be possible.

5.3 FRA requirements and further work

- Any FRA must include a drainage strategy which should include ground investigation for infiltration SuDS suitability.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Pendle Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

⁴ Para 164 National Planning Policy Framework 2023

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