Appendix E – Summary of flood risk in High Peak Borough

The table below summarises the areas where there are notable flood risks within High Peak Borough. For this summary the Borough has been delineated into four Character Areas, taking into account Parish boundaries, socioeconomic factors, and the characteristics of the area. Further information on the High Peak Borough character areas can be found in Section 4.10 of the main report.

Character Area	Fluvial flood risk	Existing defences	Surface water flood risk	Susceptibility to groundwater flood risk	Reservoir inundation risks	Historic, recorded flood events
Character Area 1: Hope Valley This area is largely rural and located in the east of the Borough, within the Peak District National Park.	The River Westend and River Ashop flow from west to east, into Howden, and Ladybower reservoirs respectively. Additionally, the River Noe flows east, across the south of the Character Area joining the River Derwent near the Borough boundary. The River Derwent passes through Derwent Reservoir and Ladybower Reservoir, flowing south through the character area. Due to the rural nature of this area, the main sources of fluvial flood risk are the River Noe and Derwent, with Flood Zones 2 and 3 extending into settlements in the south of the area such as Castleton and Shatton. There is far less fluvial flood risk in the north and west region of the Character Area at higher elevation, with the Rivers Ashop, Alport, and Westend flowing through highly rural areas.	The EA AIMS dataset shows natural high ground along both banks of the River Derwent and from Peakshole Water into the River Noe in the South of the Character Area.	Surface water flow paths follow the topography of the Character Area into fluvial watercourses and reservoirs, mostly routing water towards the south-east of the character area. Major flow paths in the area that pose surface water flood risk to residential areas largely exist in the south of the area, directing water to the River Noe where settlements are situated. These flow routes intercept transport links such as the A6187 at numerous locations, with flow pathways present along roads in Hope. Areas of surface water ponding exist in the Hope area, indicating potential for localised surface water flooding issues.	The AStGWF dataset shows areas of greater than 50% susceptibility are located in the south of the character area, along the upper reaches of the River Noe and Peakshole Water. The JBA Groundwater Emergence Map identifies groundwater levels less than 0.5m below the surface along the lower reaches of the River Noe and River Derwent, the entirety of the River Westend, and upper reaches of the River Ashop and River Alport. Based on the RoFfSW dataset, it is likely any groundwater that emerges in the character area will flow towards the south-east of the border, mirroring route of fluvial watercourses.	The following reservoirs impact the character area in the ‘dry day’ scenario. - Ladybower Reservoir: Flood extents follow the River Noe upstream from the south-east corner of the area, into the confluence with Bradwell Brook, impacting locations along Hope Road including Shatton and Brough-on-Noe. - Derwent Reservoir: Flood extents are largely confined to the reservoir, with some flooding in rural locations along the River Ashop. - Howden Reservoir: Flood extents largely confined to the reservoir, with some flooding in rural locations along the River Ashop. - Hope Works Lagoons 1,2,3 and 4: Flood extents largely confined to the channels of the River Noe and River Derwent The following reservoirs impact the character area in the ‘wet day’ scenario. - Ladybower Reservoir: Impact largely similar to that in the ‘dry day’ scenario, with flood extents extending further in to Bamford village and upstream of the River Noe into Peakshole Water. - Derwent Reservoir: Flooding extends further south, mirroring the extents of Ladybower Reservoir. - Howden Reservoir: Flooding extends further south, mirroring the extents of Ladybower Reservoir. - Hope Works Lagoons 1,2,3 and 4: Greater extent of flooding compared to the ‘dry day’ scenario,	Historic flood mapping, EA recorded flood outlines, and LLFA historic flood points suggest the following: • January 1947 – Fluvial flooding due to channel capacity exceedance of the River Derwent and River Noe in the south-east of the character area. • December 1965 – Fluvial flooding due to channel capacity exceedance of the River Derwent in the south-east of the character area. • Canal flooding incidents: Severn Trent Water have identified 10 properties in this character area at risk from internal and external sewer flooding due to hydraulic overload.

Character Area	Fluvial flood risk	Existing defences	Surface water flood risk	Susceptibility to groundwater flood risk	Reservoir inundation risks	Historic, recorded flood events
					extending into Brough-on-Noe, Shatton and Bamford from each lagoon.	
Character Area 2: Glossop dale and Tintwistle This area is located in the north of the Borough. It is rural in most places, with the towns of Glossop and Hadfield to the west of the Character Area.	The River Etherow flows from east to west through a series of reservoirs before flowing south through the Character Area to the Borough boundary. Glossop Brook and its tributaries flow east to west through the Character Area to its confluence with the River Etherow. Both the North and South banks of Glossop Brook at within Flood Zone 3. Additionally, areas along the western boundary of the Character Area in Hadfield and Brookfield are at risk of fluvial flooding from the River Etherow.	The EA AIMS dataset shows natural high ground defences along the course of Glossop Brook and its tributaries, Long Clough Brook, and Hurst Brook. The River Etherow and Glossop Brook Flood Alleviation Scheme is also within this Character Area.	Surface water flow paths follow the topography of the land, flowing north-west through Glossop and Hadfield towns. The RoFfSW map shows a network of roads in both Glossop and Hadfield susceptible to surface water flooding and acting as flow pathways into watercourses such as Glossop Brook and the River Etherow. Additionally, there are isolated areas prone to surface water ponding apparent in locations such as at St Luke's C of E Primary School and Smithy Fold.	The AStGWF dataset shows areas greater than 50% susceptibility to groundwater flooding along the western boundary of the Character Area, following the River Etherow alongside a more isolated area in Old Glossop. The JBA Groundwater Emergence Map mirrors this, with groundwater levels less than 0.5m below the surface along the River Etherow, and in the town of Hadfield. The ROFfSW suggests that groundwater emerging along the course of the River Etherow is likely to flow along the route of the river. Groundwater emergence is also likely in the Black Peak area on the eastern boundary of the Character Area.	The following reservoirs impact the character area in the 'dry day' scenario. - Woodhead Reservoir: flood extents follow the path of the River Etherow, through downstream reservoirs of Torside, Rhodeswood, and Bottoms and inundating areas in Hadfield and along the western boundary of the character area. - Rhodeswood Reservoir: Flood extents similar to that of Woodhead Reservoir, though extend further along Glossop Brook. - Torside Reservoir: Flood extents similar to that of Woodhead Reservoir in this scenario. - Bottoms Reservoir: Flood extents similar to that of Woodhead Reservoir, although do not extend as far into Hadfield. - Valehouse Reservoir: Flood extents inundate less area than that from Bottoms reservoir with flooding largely confined to the River Etherow channel, although flooding some areas in the south of Hadfield. - Lower Swineshaw Reservoir: Flooding extends along the course of Glossop Brook, inundating multiple areas in Glossop Town - Arnfield Reservoir: Flooding extends along the River Etherow down the western boundary of the character area and in Tintwistle village immediately below the reservoir. The following reservoirs impact the character area in the 'wet day' scenario.	Historic flood mapping, EA recorded flood outlines, and LLFA historic flood points suggest the following: • July/August 1973 – flooding of an unknown cause inundating areas in Glossop town, from both banks of Glossop Brook. Some inundation on both banks of the River Etherow additionally. • October 1998- Flooding from River Etherow due to channel capacity exceedance with no raised defences, inundation of Woolley and Brookfield areas. • July 2002- Flooding from Glossop Brook due to channel capacity exceedance with no raised defences causing inundation throughout Glossop. • November 2016- Surface water flooding in multiple locations Glossop town and Tintwistle. United Utilities hydraulic incident data details 10 internal sewer flooding incidents between 2009 and 2020 within the character area. An additional 10 incidences were reported 2020-present. There are 9 recorded instances of external flooding between 2009 and 2020, and an additional 3 since 2020.

Character Area	Fluvial flood risk	Existing defences	Surface water flood risk	Susceptibility to groundwater flood risk	Reservoir inundation risks	Historic, recorded flood events
					- Lower Swineshaw Reservoir: Flood extents are largely similar to that from the reservoir in the 'dry day' scenario. - Arnfield Reservoir: Flood extents are largely similar to that from the reservoir in the 'dry day' scenario.	
Character Area 3: Whaley Bridge, Sett, and New Mills Character Area 3 is largely rural, with towns of New Mills, Chapel-en-le-Frith, and Whaley Bridge.	The River Goyt flows north from the south-west of the Area through Whaley Bridge, with Black Brook joining upstream of New Mills. The River Sett flows from east to west across the north of the Area, joining the River Goyt at New Mills. There is fluvial flood risk along the course of the River Goyt, with areas of Whaley Bridge, Furness Vale, and New Mills in Flood Zones 2 and 3. Additionally, there is fluvial flood risk on both banks of the River Sett. Flood risk along the course of Black Brook is generally lower; however, some villages including Whitehough and Chinley are in Flood Zones 2 and 3. Modelling of both Black Brook and the River Sett mirrors these findings.	The EA AIMS dataset shows natural high ground defences on both banks of the River Sett, River Goyt and Black Brook through this area. The Black Brook Flood Alleviation Scheme is also within this Character Area.	Surface water flow paths follow the topography of the land, flowing from higher elevations in the east to the west of the area. Areas on both banks of the River Sett and River Goyt are at risk from surface water flooding, particularly apparent at Birch Vale Industrial Estate and Thornsett Trading Estate. In town areas of Chapel-en-le-Frith, New Mills and Whaley Bridge, surface water flow routes also exist on road networks. There are also small, isolated, areas of surface water ponding in the more urban areas within this character area.	The AStGWF dataset shows areas with greater than 50% susceptibility along watercourses in the area. These areas are along Black Brook at Chinley and Whitehough, and the River Goyt south of Whaley Bridge. The JBA groundwater emergence map highlights locations where groundwater is within 0.5 m of the surface in the east of the area which is the case for a large proportion of Chapel-en-le-Frith and the rural, high elevation region to the east. The ROFSW map shows that groundwater emerging from the east of the character area is likely to follow water courses such as Black Brook and the River Sett flowing to the west. Groundwater emerging in the south of the area is likely to follow the course of the River Goyt flowing north through the area.	The following reservoirs impact the character area in the 'dry day' scenario. - Errwood Reservoir: Flooding extends along the course of the river Goyt, running from the south to the north of the Character Area, inundating locations in Whaley Bridge, Horwich End, Furness Vale and New Mills. - Fernilee Reservoir: Flood extents largely the same as that of the Errwood Reservoir in this scenario. - Combs Reservoir: Flooding of Randall Carr Brook and the canal feeder in addition to flooding along the course of the River Goyt downstream. - Toddbrook Reservoir: Flooding of both banks of the River Goyt in Whaley Bridge, Furness Vale and into New Mills. - Birch Vale Lodge Reservoir: Flood extents indicate inundation down the course of the River Sett and into New Mills at the confluence with the River Goyt. The following reservoirs impact the character area in the 'wet day' scenario. - Errwood Reservoir: Flood extents are largely similar to those in the 'dry day' scenario for this reservoir. - Fernilee Reservoir: Flood extents are largely similar to those in the 'dry day' scenario for this reservoir. - Combs Reservoir: Flood extents are largely similar to those in the 'dry day' scenario for this reservoir.	Historic flood mapping, EA recorded flood outlines, and LLFA historic flood points suggest the following: • January 1995- Localised flooding in Chapel Milton due to an obstruction/channel blockage. • October 1998- Flooding of the River Goyt at Whaley Bridge Waste Treatment Works due to channel capacity exceedance. • October 1999- Localised flooding of an unknown cause at Black Brook near chapel Milton. • October 2000- Localised flooding of Black Brook near Chapel Milton due to an obstruction/blockage. • November 2016- Localised surface water flooding next to Randall Carr Brook, Horwich End and surface water flooding in Low Leighton, New Mills. Also flooding due to an obstruction/blocked culvert off the east bank of the River Sett, New Mills. • July 2019- Flooding of the River Goyt at Whaley Bridge due to channel capacity exceedance. United Utilities Hydraulic incident data highlights 9 internal sewer flooding incidents since 2020 in the Character Area, with 4 incidents between 2009 and 2020. There have been 11 external sewer

Character Area	Fluvial flood risk	Existing defences	Surface water flood risk	Susceptibility to groundwater flood risk	Reservoir inundation risks	Historic, recorded flood events
					- Birch Vale Lodge Reservoir: Flooding extends downstream of the River Goyt's confluence with the River Sett, while a greater area is also flooded in the areas impacted by the 'dry day' scenario. - Kinder Reservoir: Flooding along the course of the River Sett, through Hayfield and into New Mills, with flood extents extending upstream of the River Goyt's confluence with the River Sett.	flooding incidents since 2020 and 16 on record between 2009 and 2020. The Canal and Rivers Trust have identified one historic canal breach in this Character Area, a breach of the Combs Feeder at Horwich End in 2009. Additionally, 5 overtopping instances of the Combs Feeder Canal have been reported.
Character Area 4: Buxton Aside from the town of Buxton, Character Area 4 is also largely rural.	The River Wye flows from west to east across the area, with main tributaries Hogshaw Brook and Nun Brook joining in Buxton. The River Wye is a source of fluvial flood risk in Buxton, with much of the town centre in Flood Zones 2 and 3. Additionally there fluvial flood risk from Nun Brook, before its confluence with the River Wye in Buxton.	The EA AIMS dataset shows natural high ground along the banks of the River Wye from Buxton to the eastern boundary of the Character Area. Additionally, there is engineered high ground on the banks of Hogshaw Brook and Nun Brook in Buxton, before their confluences with the River Wye.	Surface water flow paths follow the topography of the land, with large flow paths along the course of the River Wye. In Buxton, roads such as Spring Gardens and Dale Road have been identified as flow paths to the River Wye. In addition, isolated areas of surface water ponding in urban areas such as Buxton town centre and quarries to the east of the Character Area. Surface water flow paths flowing north to the south of the also indicate risk from surface water flooding in Peak Forest.	The AStGWF suggests the entire Character Area is less than 50% susceptible to groundwater flooding. The JBA Groundwater Emergence Map shows that groundwater levels are within 0.5 m of the surface throughout much of the Character Area. This is particularly apparent from Dove Holes through to Tunstead Works. In Buxton, groundwater emergence levels are also within 0.5 m of the surface.	In both the 'dry day' and 'wet day' reservoir flooding scenarios there is no apparent flood risk from reservoir flooding to this Character Area.	Historic flood mapping, EA recorded flood outlines, and LLFA historic flood points suggest the following: • February 1984- Flooding of the River Wye at numerous locations in Buxton and downstream to the eastern edge of the character area due to channel capacity exceedance. • November 2000- flooding of the River Wye at multiple locations downstream of Buxton due to channel capacity exceedance. Severn Trent Water have identified 26 properties in this character area at risk from internal and external sewer flooding due to hydraulic overload. The majority of these properties are located in Buxton town, with one in Peak Forest.