Exeter City Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	015
Address	Water Lane
Area	36.2 hectares
Current land use	Brownfield – including commercial and industrial land use
Proposed land use	Regeneration for mixed Use including around 2,200 homes
Flood Risk Vulnerability	More Vulnerable
Sources of flood risk	
Location of site	The site is located south of Exeter city centre, east of the Great Western Main Line railway. The site currently comprises Water Lane Solar Farm, Gasworks, a Bio Gas facility, an electricity distribution station, a former playing field, public car parks and industrial and commercial premises. Exeter Ship Canal flows southwards along the east of the site. Surrounding features include Riverside Valley Park and the River Exe to the east; residential, industrial and commercial areas to the north and west; and greenfield land to the south.
Topography	Mapping (presented at the end of this document): Water Lane_Topography The Environment Agency's 1m resolution 2022 Composite LiDAR shows that the topography is relatively flat with a gentle slope from northwest to southeast. The lowest points are situated in the southern area of the site, at approximately 4.3m Above Ordnance Datum (AOD) and the highest point is situated within Exeter City Council Solar Farm, reaching 11.5m AOD. The channel in the southeast drops to elevations of 3.5mAOD but this is not representative of the rest of the site. The maximum elevation across the site, excluding the solar farm, is approximately 6.0m AOD.
Existing drainage features	Mapping (presented at the end of this document): Water Lane_Watercourses The Exeter Ship Canal flows along the northeastern boundary of the site. An outfall to the River Exe exists adjacent to the north of the site, near Haven Road, indicating the presence of sewer networks beneath the site. The Alphin Brook flows in a southeasterly direction to the south of the site, flowing for approximately 1.8km until it joins the River Exe. A drainage ditch exists south of Clapper Brook Lane, which runs parallel to the canal, on the east of the field. A small drainage channel exists on the east of the site, north of Clapper Brook Lane, which extends beneath the railway line in 2 places.
Flood Zones	Available data: Environment Agency Flood Map for Planning for Rivers and Sea. Mapping (presented at the end of this document): Water Lane_FMfP Data analysis: Proportion of site in each Flood Zone. Flood Zone 1 – 1.5% Flood Zone 2 – 1.5% Flood Zone 3a – 97.00%

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	Flood Zone 3b – 0% Flood characteristics: The site is partially located in Flood Zone 1 and Flood Zone 2 to the northwest of the site. The remainder (majority) of the site is located within Flood Zone 3a. Flood Zone 1 represents areas which have less than 1 in 1000 (0.1% Annual Exceedance Probability (AEP)) chance of river flooding in a given year. Flood Zone 2 represents areas which have less than 1 in 100 (1% AEP) but greater than 1 in 1000 (0.1% AEP) chance of river flooding in a given year. Flood Zone 3 representing an area greater than 1 in 100 (1% AEP) chance of river flooding in a given year. The Sequential Test must be satisfied before the Exception Test is applied. The Exception Test must be satisfied for any 'More Vulnerable' development in Flood Zone 3a. 'Highly vulnerable' development is not permitted in Flood Zone 3a.
Fluvial	Available data: Environment Agency 2024 River Exe Scheme Modelling for 3.3%, 1%, 0.1% Annual Exceedance Probability (AEP) events. The 2024 update to the River Exe modelling includes the recently constructed Exeter Flood Defence Scheme (FDS) – see details of defences in the existing defences section below. Mapping (presented at the end of this document): Water Lane_Fluvial_0030_Depth Water Lane_Fluvial_0030_Hazard Water Lane_Fluvial_0030_Velocity Water Lane_Fluvial_0100_Depth Water Lane_Fluvial_0100_Hazard Water Lane_Fluvial_0100_Velocity Water Lane_Fluvial_1000_Depth Water Lane_Fluvial_1000_Hazard Water Lane_Fluvial_1000_Velocity Data analysis: 3.3% AEP (1 in 30 year) Mapping shows that the site is not impacted by flooding in this event. 1% AEP (1 in 100 year) Proportion – 3.5% Max Depth – 0.81m Max Velocity – 0.59m/s Max Hazard – 2.07 (Danger for All) Mean Depth – 0.1m Mean Velocity – 0.03m/s Mean Hazard – 1.06 (Danger for Some) 0.1% AEP (1 in 1000 year) Proportion – 87.4% Max Depth – 3.88m Mean Depth – 1.36m

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	Max Velocity – 3.81m/s Max Hazard – 16.23 (Danger for All)) Mean Velocity – 0.55m/s Mean Hazard – 2.46 (Danger for All) Flood characteristics: The site is shown to flood in the 1% and 0.1% AEP events. In the 1% AEP event, flood extent is 3.5%. Flooding in the 1% AEP event is mostly confined to the channel of the Exeter Ship Canal where the hazard rating is a 'Danger for Some'. The flood extent in the 0.1% AEP event increases to 87.4%, extending across the site. The greatest depths across the site are along Water Lane, in particular at the junction of Water Lane and Cotfield Street, within the channel of the Canal and across the green space south of Clapperbrook Lane East. Across the north of the site, flood depths are sporadic, varying between 0.1m and >1.5m. Flood depths greater than 1.5m are shown to encroach the north of the site from the northeast, from the Canal, and northwest, along Haven Road and onto Water Lane. In the 0.1% AEP event, the area surrounding the former Gasworks is identified as a dry island, with approximately 1ha of land located outside of the 0.1% AEP extent. Additionally, the car park situated between the railway and the Exeter City Substation is identified as a dry island. The car park is more elevated that the rest of the site, with elevations upwards of 9mAOD, and this portion of land is situated outside of the 0.1% AEP extent. The maximum depth, velocity and hazard in the 0.1% AEP event are 3.88m, 3.81m/s and 16.23 (Danger for All), which are likely located within the canal. Outside the canal, the greatest depths are observed in the land south of Clapperbrook Lane East, reaching 2.4mAOD, and in the 0.1% AEP event, the majority of the site is situated in a 'Danger for all' hazard rating. Depth, velocity and hazard remain high in developable areas across the site as demonstrated in the high mean values 1.36m, 1.55m/s and 1.06. All areas surrounding the site are defined as Flood Zone 3 and therefore indicate significant flood risk. Flood Zone 2 extent in the Flood Map for Planning is greater than the 0.1% AEP flood extent in the River Exe Scheme Modelling. The River Exe Modelling includes the recently constructed Exeter Flood Defence Scheme (FDS). This mapping indicates that the defences reduce the extent of flooding to the site.
Fluvial plus climate change	Available data: Environment Agency River Exe Scheme Modelling for 1% Annual Exceedance Probability (AEP) event plus Central and Higher Central climate change allowances. Management Catchment: East Devon Management Catchment Mapping (presented at the end of this document): Red Cow_Fluvial_0100_46CC_Depth Red Cow_Fluvial_0100_46CC_Hazard Red Cow_Fluvial_0100_46CC_Velocity

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Address	Water Lane

Red Cow_Fluvial_0100_61CC_Depth
Red Cow_Fluvial_0100_61CC_Hazard
Red Cow_Fluvial_0100_61CC_Velocity

Data analysis:

Higher Central 1% AEP (1 in 100 year) plus 61% Climate Change CC3
Proportion – 85%

Max Depth – 3.68m	Mean Depth – 1.22m
Max Velocity – 3.12m/s	Mean Velocity – 0.49m/s
Max Hazard – 11.45 (Danger for All)	Mean Hazard – 2.23 (Danger for All)

Central 1% AEP (1 in 100 year) plus 46% Climate Change CC5
Proportion – 83.5%

Max Depth – 3.54m	Mean Depth – 1.12m
Max Velocity – 2.91m/s	Mean Velocity – 0.45m/s
Max Hazard – 9.8 (Danger for All)	Mean Hazard – 2.09 (Danger for All)

Flood characteristics:

The site is shown to be at high risk of flooding in both the 1% plus 61% CC and 1% plus 46% CC events, with mean depths of between 1.22 and 1.12m, respectively.

In the 1% plus 46% CC event, the depths greater than 1.5m within the site are found along Clapperbrook Lane East and along the west of the site, between Exeter City Council Solar Farm and the railway line. Other notable depths are found along Exeter Ship Canal and sporadically along Water Lane. In the 1% plus 61% CC event, the instances of depths greater than 1.5m extend in the same localised areas. The area south of the junction of Water Lane and River Meadows has significant growth in depths greater than 1.5m. The maximum flood depth in the 1% AEP plus 61% climate change event is shown to be 3.68m, located in the southwest of the site.

In the 1% plus 46% CC event, the 'Danger for All' hazard ratings generally follow the Exeter Canal, Water Lane, the boundary of the Exeter City Council Solar Farm and the land south of Clatterbrook Lane East. In the 1% plus 61% CC event, the extent of 'Danger for All' hazard rating increases in the above areas, with additional areas of this hazard rating at Tenpin Exeter, along Haven Road in the east and along Tan Lane.

During the fluvial design flood event flooding generally flows from north to south across the site, flood waters enter the site along Water Lane (from the north and east) Haven Road and also directly from the Alphin Brook in the south. Flood waters also enter the site from the west, overtopping the Great Western main line railway, to the north and south of Clapperbrook Lane East. Key flow paths exist along Water Lane in a southerly direction, across Clapperbrook Lane East in a southerly direction and across the Great Western main line railway (north and south of Clapperbrook Lane East) in an easterly direction.

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Surface Water	Available data: Environment Agency Risk of Flooding from Surface Water for the 3.33%, 1% and 0.1% Annual Exceedance Probability (AEP) events. Mapping (presented at the end of this document): Water Lane_RoFSW_0030_Depth Water Lane_RoFSW_0030_Hazard Water Lane_RoFSW_0030_Velocity Water Lane_RoFSW_0100_Depth Water Lane_RoFSW_0100_Hazard Water Lane_RoFSW_0100_Velocity Water Lane_RoFSW_1000_Depth Water Lane_RoFSW_1000_Hazard Water Lane_RoFSW_1000_Velocity Data analysis 3.3% AEP (1 in 30 year) event: Proportion – 0.3% Max Depth – 0.76m Max Velocity – 0.33m/s Max Hazard – 1.25 (Danger for Some) Mean Depth – 0.21m Mean Velocity – 0.09m/s Mean Hazard – 0.68 (Caution) 1% AEP (1 in 100 year) event: Proportion – 1.4% Max Depth – 0.74m Max Velocity – 0.44m/s Max Hazard – 1.37 (Danger for Most) Mean Depth – 0.23m Mean Velocity – 0.11m/s Mean Hazard – 0.76 (Danger for Some) 0.1% AEP (1 in 1000 year) event: Proportion – 14.5% Max Depth – 1.76m Max Velocity – 1.88m/s Max Hazard – 2.07 (Danger for All) Mean Depth – 0.33m Mean Velocity – 0.17m/s Mean Hazard – 0.89 (Danger for Some) Flood characteristics: The site is shown to be at low risk of flooding in all three scenarios. In the 3.3% event, the flooding is sporadic but remains within the north of the site, with localised instances of flooding along Water Lane, Haven Road and east of Tan Lane. In the 1% AEP event, flood risk grows, starting to encroach into the south of the site, and flow paths extending further east along Water Lane. In the 0.1% AEP event, surface water extent increases considerably. Flow paths are shown to spread further along Water Lane, across the areas west and south of the Exeter City Council Solar Farm and across the field south of Clapperbrook Lane East. The remainder of the site remains largely low risk of surface water flooding.
Surface water plus climate change	Available data: JBA climate change updates to the Environment Agency Risk of Flooding from Surface Water mapping Management Catchment: East Devon Management Catchment

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The site is situated in the East Devon Management Catchment. The Environment Agency guidance recommends that the Upper End allowance is considered for both the 3.3% and 1% AEP events, for the 2070s epoch. This is appropriate for development with a lifetime beyond 2100. The recommended uplift on peak rainfall intensity for the 1% AEP is 45%. As Risk of Flooding from Surface Water data with a 65% uplift was already available this has been used as the best available data and a conservative estimate for the 3.3%, 1% and 0.1% AEPs.

Mapping (presented at the end of this document):
Water Lane_RoFSW_0030_65CC_Depth
Water Lane_RoFSW_0030_65CC_Hazard
Water Lane_RoFSW_0030_65CC_Velocity
Water Lane_RoFSW_0100_65CC_Depth
Water Lane_RoFSW_0100_65CC_Hazard
Water Lane_RoFSW_0100_65CC_Velocity
Water Lane_RoFSW_1000_65CC_Depth
Water Lane_RoFSW_1000_65CC_Hazard
Water Lane_RoFSW_1000_65CC_Velocity

Data analysis:
3.3% AEP (1 in 30 year) plus 65% climate change event:
Proportion – 2%
Max Depth – 0.79m
Mean Depth – 0.24m
Max Velocity – 0.5m/s
Mean Velocity – 0.1m/s
Max Hazard – 1.4 (Danger for most)
Mean Hazard – 0.78 (Danger for some)

1% AEP (1 in 100 year) plus 65% climate change event:
Proportion – 5.8%
Max Depth – 1.41m
Mean Depth – 0.32m
Max Velocity – 0.9m/s
Mean Velocity – 0.13m/s
Max Hazard – 1.71 (Danger for most)
Mean Hazard – 0.9 (Danger for some)

0.1% AEP (1 in 1000 year) plus 65% climate change event:
Proportion – 31%
Max Depth – 2.08m
Mean Depth – 0.4m
Max Velocity – 2.17m/s
Mean Velocity – 0.19m/s
Max Hazard – 2.86 (Danger for all)
Mean Hazard – 1.08 (Danger for some)

Flood characteristics:
The site is shown to be at risk of flooding in all three surface water climate change scenarios and is shown to be highly sensitive to the impacts of climate change on surface water flooding. Surface water flooding in the 3.3% plus 65% CC event is largely similar to the 1% AEP event without climate change. Flooding is generally localised to Water Lane, with a marginally larger flood extent at the north and south ends of the road. In the 1% AEP plus 65% CC event, the flood extents increases in the same localised areas, growing considerably at the south of Water Lane and east of Tan Lane. In

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	this event, flooding also begins to encroach along the west and south borders of the Exeter City Council Solar Farm. In the 0.1% AEP plus 65% climate change event, there is significant flood water across the field south of Clapperbrook Lane East. Across all scenarios, average flood depths are less than 0.5m. In the 0.1% AEP plus 65% climate change event the flood depths reach a maximum of 2.08m; the greatest flood depths are to the north of Clapperbrook Lane East. Water Lane becomes impacted by flooding of up to 0.9m and the flooding extends westwards into the site of Exeter City Substation. The land west of Tan Lane experiences depths greater than 1.5m in this event. During the surface water design flood event only minor surface water flow paths have been identified, with the most significant being to the north of Clapperbrook Lane East, following the line of a drainage ditch. Flows here enter the site from the west, overtopping the railway line and flowing in an easterly direction towards the canal.
Reservoir	Available data: Environment Agency Reservoir Flood Extents for Dry Day and Wet Day Scenarios Mapping (presented at the end of this document): Water Lane_Reservoir_Flood_Extents Flood characteristics: In the rare event of a reservoir breach, almost the entirety of the site is at risk from flooding from Wimbleball Lake in both the dry and wet day scenario. An area towards the south of the site, at the Exter City Council Solar Farm and in the west of the site, adjacent to the Exeter City Substation, are not included in the reservoir flood risk mapping. These areas are topographic high points within the site. Impact of reservoir breach has not been assessed within this Level 2 SFRA.
Groundwater	Available data: The JBA Groundwater Flood Data Map (GW5) is provided as a 5m resolution grid. This is a groundwater flood emergence dataset which shows the risk based on the proximity of groundwater to the surface during a 1% AEP groundwater flood event. Mapping (presented at the end of this document): Water Lane_Groundwater5m Flood characteristics: JBA's Groundwater mapping shows varying groundwater levels across the site. In the northeast groundwater levels are between 0.5m and 5m below ground surface level. In the southeast groundwater levels are between 0.025m and 0.5m below ground surface level and in the northwest groundwater levels are within 0.025m of the ground surface. In these instances, where groundwater levels are close to the ground surface, there is a significant risk of groundwater emergence. Subsurface development or development requiring deep foundations run the risk of interfering with groundwater levels by displacing water. There is a requirement for site-specific flood risk investigations to determine the groundwater risk at the site through ground investigations and to demonstrate that proposed development will not impact the risk posed within or surrounding the site.

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	Site-specific FRAs should assess the suitability of SuDS within the areas at potential risk of groundwater emergence.
Sewers	Available data and mapping: South West Water Drainage and Wastewater Management Plan Flood characteristics: The site is situated within the catchment of the Countess Wear WwTW. South West Water's DWMP indicates an immediate moderate risk of sewer flooding in a 1 in 10 year event and in a 1 in 50 year event. Internal sewer flooding within the catchment is not a risk and the system is considered resilient. The DWMP shows that, across the Exe River Catchment in 2023 there were 17 external flood incidents caused by 'Hydraulic Overload', 199 external flood incidents caused by 'Other' sources, three internal flood incidents caused by 'Hydraulic Overload' and 10 internal flood incidents caused 'Other' sources.
Flood history	Available data: Environment Agency Historic Flood Map and Recorded Flood Outlines map Mapping (presented at the end of this document): Water Lane_Historic_Flood_Map Flood characteristics: The site is shown to be located within the Environment Agency's Historic Flood Map and Recorded Flood Outlines. The Recorded Flood Outlines map indicates that the historic flooding occurred in December 1960 on the River Exe as a result of channel capacity exceedance (prior to the building of flood defences along the River Exe). The map also indicates flooding from the Alphin Brook due to channel capacity exceedance, but no date is provided for this event. Flooding events between December 2013 and February 2014 impacted 34 properties internally, caused by surface water runoff and a large tidal surge event which overwhelmed drainage systems. In October 2021, nine properties in Exeter experienced surface water flooding. On 17th September 2023, Exeter experienced flooding caused by localised surface water runoff, exacerbated by the local drainage systems lack of capacity. Exeter City Council operate the Exeter Canal. There are no significant records of breach or overtopping event documented. The canal was reported to have maintenance carried out in December 2021 to clear the waterway of potential obstructions which could impact flood risk.
Policy zones	
Critical drainage areas	The site has not been identified to be located within an area with critical drainage problems.

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Flood risk management infrastructure	
Existing defences	Available data: Environment Agency AIMS spatial flood defences dataset Mapping (presented at the end of this document): Water Lane_AIMS_Spatial_Flood_Defences The Environment Agency's AIMS dataset shows there are no formal defences located within the site. In the vicinity of the site, the Environment Agency AIMS mapping identifies an embankment defence along the east bank of the Exeter Ship Canal, part of the Exeter Flood Defence Scheme and the Haven Bank Wall defence, situated north of the site. The Haven Bank Wall, to the north of the site, and embankment, to the east of the site, form part of the Exeter FDS. The overall scheme has a Standard of Protection between 1.33% AEP to 1% AEP (1 in 75year to 1 in 100 year). The Exeter flood defence scheme was completed in 2022 and reduced flood risk to more than 3,000 homes and businesses in Exeter. The works were split into two phases. During phase 1 the Trews flood relief channel and the side spill weir at the top of the channel were lowered, increasing the flow capacity of the flood relief channel, which will help reduce flood risk to the quay area during high river flows. During phase 2 new embankments were constructed between Cowley Bridge and Bridge Road, Countess Wear along with new flood walls, flood gates, control structures and bespoke demountable defences at Exeter Quay.
Residual risk	The majority of the site is located in the 'Reduction in Risk of Flooding from Rivers and Sea due to Defences' map. The site is at risk from defence breach or overtopping due to the Haven Banks Wall defences situated near to the site, which could be compromised during extreme flood event. There is an embankment defence situated east of the site, between the Canal and the River Exe flood relief channel. Capacity exceedance in the flood relief channel could lead to breach of the embankment in periods of intense rainfall, which could increase the flood risk to the site. Fluvial breach modelling was undertaken as part of the Exe Scheme Hydraulic Model update. The breach scenario 'EXE_DEF_112_AP_BR5_Q100' represents the 1% AEP breach scenario. Initial encroaching on the site occurs in the southeast, east of the canal. More significant encroaching then occurs at the north of the site, with water travelling in a southerly direction along Haven Road and Water Lane and via the canal channel. Sporadic flooding moves southwards through the site, particularly impacting the land south of Cotfield Street and Water Lane's junction. In this event, flooding is predicted to reach a maximum of 1.9mAOD in the southwest of the site, with average flood depths across the site between 0 to 1.0mAOD. Developers must ensure safe access and egress takes into account the residual risk scenario and that flood mitigation options are in place for a residual event. Flooding in the 1% AEP fluvial event, flooding is shown to enter the site initially from the south and remaining within the field in the south of the site.

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	Further flooding encroaches the site along the channel of the canal in the east. This observed flood depth remains confined to the channel. The site is at risk from reservoir failure in the dry and wet day scenarios.
Emergency planning	
Flood warning	The site is located in the Lower Exe flood alert area (113WABTW10) and the River Exe at Exeter flood warning area (113FWFEXE11). Mapping (presented at the end of this document): Water Lane_Flood_Alert_Warning_Areas
Access and egress	The main access routes to the site are Clapperbrook Lane, towards the south of the site; Water Lane, through the centre and north of the site; and Haven Road along the northwest reach of the site. Clapperbrook Lane bridge over the railway is shown to remain unaffected by flood risk in the 1% AEP plus 61% climate change event. However, the west extent of the road reaches flood depths greater than 1.5m and a hazard rating of 'Danger for all' and the east of the road, in places, reaches depths greater than 1.5m, with parts of the road categorised with a hazard rating of 'Danger for all' During the surface water 1% AEP plus 65% climate change event, the road remains clear from flooding. During the design flood event, initial out of bank flooding occurs to the northeast of Water Lane from Haven Bank Basin and also to the northwest of the site from Shooting Marsh Stile. On-site flooding occurs within 1 hour. Within a further hour, flooding is entering the site from Water Lane, Haven Road, Marsh Barton Road, south of River Meadows and from the Alphin Brook in the south. Within a further 3.5 hours the majority of the site is affected by flooding. The River Exe hydraulic modelling indicates a flood duration on the site of approximately 36 hours during the design flood event. Water Lane experiences flood depths of up to 0.6mAOD and a maximum hazard rating of 'Danger for most' in the surface water 1% AEP plus 65% climate change event. In the 1% plus 61% climate change fluvial event, Water Lane is subject to flood depths in exceedance of 1.5m and a hazard rating of 'danger for all'. The greatest flood depths are found at the junction of Water Lane and River Meadows and at the north of the site where Water Lane enters the site. Haven Road is subject to flooding in the north, nearest the existing Tenpin site, where flood depths reach 0.6m. Haven Road is generally flooded to a depth of between 0.6m and 1.5m. The greatest depths are found adjacent to Terracina Court, at the closest point to the Exeter Ship Canal. A safe access and egress options appraisal has been completed for Water Lane. Option 7 via Trews Weir has been identified to be the preferred option. This route would start at the embankment adjacent to the eastern side of the railway line, south of Tan Lane. From here the route would head east via an elevated cycle path, a bridge would provide a crossing over Water Lane, leading to the dry ground within the Old Gas Works site. A path would lead around the southern edge of the Old Gas Works site where it would join a bridge of the Exeter Ship Canal, before linking to further bridges (connected

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	by elevated cycle paths) over the Flood Relief Channel and River Exe. Finally an elevated cycle path would connect the River Exe bridge to dry ground on Glenwood Rise. Further consideration is required to ensure that safe access and egress from individual parts of the site can be achieved during the design flood events (1% AEP plus 46% CC fluvial event and the 1% AEP plus 45% climate change surface water events) taking into account all potential flood risk and the topography of the site. Given that the site is at high risk of flooding in the present day and is shown to be sensitive to the effects of climate change in the future, a flood warning and evacuation plan would be required to demonstrate the safety of site users.
Requirements for drainage control and impact mitigation	
Broad-scale assessment of possible SuDS	Geology BGS data indicates that the underlying bedrock geology is Alphington Breccia Formation, and a small region of Whipton Formation Sandstone in the northeast of the site. The bedrock is overlain by 'Alluvium – clay, silt, sand and gravel' throughout. This underlying geology is likely to have highly variable permeability. The soils in the north are freely draining, but the soils in the south of the site are loamy and clayey with a naturally high groundwater. This should be confirmed through infiltration testing. Off-site discharge in accordance with the SuDS hierarchy may be required to discharge surface water runoff from the site. SuDS The site is not located within a Groundwater Source Protection Zone and there are no restrictions over the use of infiltration techniques with regard to groundwater quality. The site is partially located within a historic landfill site, according to EA designations. A thorough ground investigation will be required as part of a detailed site-specific FRA; to determine potential mitigation for contamination and the impact this may have on SuDS. As such, proposed SuDS should be discussed with the relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints. The site is almost entirely situated in Flood Zone 3 and subsequently, attenuation features such as basins, ponds and tanks may not be feasible, given the lack of capacity to situate them outside of Flood Zone 3. Surface water outfalls that discharge into the River Exe may be susceptible to surcharging due to water levels in the river. The impacts of flood flows will need to be considered in terms of the attenuation storage requirements of the site and placement of the outfalls. Groundwater levels are indicated to be less than 1m below ground level during a 1% AEP groundwater flood event. Detention and attenuation features (if possible) should be designed to prevent groundwater ingress from impacting hydraulic capacity and structural integrity. Additional site investigation work may be required to support the detailed design of the drainage system. This may include groundwater monitoring to demonstrate that a sufficient unsaturated zone has been

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	provided above the highest occurring groundwater level. Below ground development such as basements are not appropriate at this site. SuDS should be designed in line with Devon County Councils SuDS Guidance. https://www.devon.gov.uk/floodriskmanagement/document/sustainable-drainage-system-guidance-for-devon-2023/#dcc-documents-cpt-contents Given the significant levels of flood risk to the site, consideration should be given the reducing runoff from the site as much as possible through source control measures such as rainwater harvesting systems and green roofs. Given this is a brownfield site and surface water runoff is likely to discharge to the River Exe, the cumulative impacts of this development are unlikely to be significant.
Opportunities for wider sustainability benefits and integrated flood risk management	Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. They could also provide wider sustainability benefits to the site and surrounding area. Proposals to use SuDS techniques should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development. Opportunities to incorporate source control techniques such as green roofs, permeable surfaces and rainwater harvesting must be considered in the design of the site. SuDS are to be designed so that they are easy to maintain, and it should be set out who will maintain the system, how the maintenance will be funded and should be supported by an appropriately detailed maintenance and operation manual. SuDS should be designed with a holistic approach, combining ecology, landscape and drainage requirements specific to the site, and incorporating Biodiversity Net Gain requirements. Opportunities to incorporate filtration techniques such as filter strips, filter drains and bioretention areas must be considered. Consideration should be made to the existing condition of receiving waterbodies and their Water Framework Directive objectives for water quality. The use of multistage SuDS treatment will improve water quality or surface water runoff discharged from the site and reduce the impact on receiving water bodies. The potential to utilise conveyance features such as swales to intercept and convey surface water runoff should be considered where this can be provided outside of the design flood event extent. Conveyance features should be located on common land or public open space to facilitate ease of access.
NPPF and planning implications	
Exception Test requirements	The Local Authority has confirmed that the Sequential Test has been carried out in line with national guidelines and that it has been passed (see SFRA level 1).

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Address	Water Lane
(Local Authority considerations)	The majority of the site is located in Flood Zone 3, with the remainder being situated in Flood Zone 1 and 2. The NPPF classifies that site usage as 'More Vulnerable' development, which requires the passing of the Exception Test in Flood Zone 3. The Exeter Plan -Publication (Reg 19) outlines the requirements for the Water Lane allocation in relation to flood risk as follows: A layout and design informed by a detailed flood risk assessment which addresses flood risk from all sources and make provision for emergency access and egress within the site; Sustainable Urban Drainage to mitigate against flood risk; and Delivery of, or contributions to, an emergency access and egress route. In order to pass the Exception Test, development must be able to made safe for its lifetime, without increasing flood risk elsewhere. In order to achieve this, and prevent increase in flooding outside the site, the following must be addressed: Site-specific hydraulic modelling: Conduct hydraulic modelling to assess the impact of the proposed site layout on flood risk. This should also consider the impact of safe access and egress routes on flood risk as well. Flood Mitigation: Implement mitigation measures that control flow without obstructing existing fluvial conveyance routes through the site. Finished Floor Levels (FFL): Ensure FFLS are set at least 300mm above the River Exe flood levels, 600mm above the average ground level of the site, or 600mm above the adjacent road level to the buildings, whichever is higher. Floodwater Compensation: Where floodwater displacement is unavoidable, provide on-site flood storage and conveyance measures to maintain pre-development flow rates and conveyance capacity or provide betterment.
Requirements and guidance for site-specific Flood Risk Assessment (Developer considerations)	Flood Risk Assessment: A site-specific Flood Risk Assessment is required given the following: The site is at significant risk from multiple sources of flooding (e.g. fluvial, surface water and groundwater). The Level 1 SFRA has more guidance on the requirements for site specific Flood Risk Assessments and relevant policies and information applicable to development within Exeter City. Consultation with Exeter City Council, and Devon County Council and the Environment Agency should be undertaken at an early stage. Developers should consult with South West Water to ensure that the development aims to help achieve the targets of the Drainage and Wastewater Management Plan. Development plans should promote an integrated approach to water management.

Exeter City Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	015
Address	Water Lane

Guidance for site design and making development safe:

The developer will need to show, through an FRA, that future users of development will not be placed in danger from flood hazards throughout its lifetime. It is for the applicant to show that the development meets the objectives of the NPPF's policy on flood risk. For example, how the operation of any mitigation measures can be safeguarded and maintained effectively through the lifetime of the development. (Para 048 Flood Risk and Coastal Change PPG).

Given the high risk of groundwater flooding at the site, the developer will need to confirm through additional ground investigations, the risk of groundwater emergence. Through the FRA, the develop should demonstrate that development will not increase risk either within the site or elsewhere.

The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, so runoff magnitudes from the development are not increased by development across any surface water flow routes. A drainage strategy should help inform the site layout and design to ensure runoff rates do not exceed greenfield rates.

The risk of breach and failure of defence should be modelled as part of a site-specific FRA, to determine the residual risk posed to the site development. In particular, consideration of reservoir breach would be required within a site specific flood risk assessment and emergency response plan for any development at the site.

Further consideration will be needed to identify and demonstrate routes of safe access and egress within a site-specific FRA, for the design surface water and fluvial events, with an appropriate allowance for climate change, using the depth, hazard and velocity outputs. Due to the significant flood risk across the site, a flood warning and evacuation plan is likely to be needed.

As outlined in the PPG, the Finished Floor Levels of the development should be raised to a minimum of whichever is highest of the following:

- 600mm above the average ground level of the site
- 600mm above the adjacent road level to the building
- 300mm above the estimated river or sea flood level (River Exe Model design flood event)

It is suggested that flood resilient design is adopted in the construction of development. The PPG sets out that flood resistant material that have low permeability should be used to at least 600mm above the estimated flood level; flood resilient materials to at least 600mm above the estimated flood level and raising of electrical equipment at least 600mm above the estimated flood level.

Exeter City Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	015
Address	Water Lane

Key messages

The site is identified as being at high risk of flooding. The site is situated 97% in Flood Zone 3, 83.5% in the design fluvial event, 5.8% in the design surface water event and at is at high risk of groundwater flooding.

The key access routes to the site are via Clapper Brook Lane East in the south, Water Lane in the northwest and Haven Road in the northeast of the site. During the design fluvial event (central climate change allowance), all three access routes are obstructed in part by flood depths of greater than 1.2m. During the surface water design event, the surface water path along Water Lane reaches depths of 0.9m. Along Haven Road, flooding is sporadic, pooling slightly near Tenpin. Significant flooding occurs west along Clapperbrook Lane, with depths greater than 1.5m in places.

Given the high flood risk posed to the site, development will only be able to progress if:

Consideration is given to the safe access and egress to the site, taking into account the Egress and Access Route Plan work being carried out alongside the SFRA. An Emergency Response Plan should be prepared in line with ADEPT guidance: https://www.adeptnet.org.uk/system/files/documents/ADEPT%20%26%20EA%20Flood%20risk%20emergency%20plans%20for%20new%20development%20September%202019....pdf

A site-specific Flood Risk Assessment in undertaken to assess the risk of fluvial, surface water and groundwater flooding in relation to the proposed development, and the access and egress arrangements, as outlined above.

Detailed modelling is undertaken as part of the site-specific flood risk assessment.

The Exception Test is satisfied.

Infiltration rates are assessed on site as part of a drainage strategy.

The site-specific Flood Risk Assessment assesses the risk of reservoir breach and incorporate this risk into an emergency response plan for the site development.

The risk of defence breach and failure are considered in the context of development and the safety of users.

Finished floor levels are raised to a minimum of whichever is higher of 300mm above the estimated river or sea flood level or 600mm above the average ground level of the site or 600mm above the adjacent road level to the building.

The site-specific Flood Risk Assessment should consider flood mitigation options in the context of the site, and beyond the site, ensuring that the measures will not increase the risk of flooding elsewhere.

Exeter City Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	015
Address	Water Lane

Design Flood Event	Maximum Hazard	Average Hazard
Fluvial – River Exe 1% Annual Exceedance Probability (AEP) plus 46%CC	9.8 (Danger for All)	2.09 (Danger for All)
Surface Water 1% Annual Exceedance Probability (AEP) plus 65% CC	1.71 (Danger for most)	0.9 (Danger for some)

Sources of information

National Planning Policy Framework - https://assets.publishing.service.gov.uk/media/669a25e9a3c2a28abb50d2b4/NPPF_December_2023.pdf

Planning Practice Guidance, Flood Risk and Coastal Change - https://www.gov.uk/guidance/flood-risk-and-coastal-change

Section 19 Flood Investigation, Devon Winter Flood December 2013 to February 2014 - https://devoncc.sharepoint.com/sites/PublicDocs/Planning/FloodRisk/Forms/AllItems.aspx?id=%2Fsites%2FPublicDocs%2FPlanning%2FFloodRisk%2FInvestigations%20and%20Incidents%2FDevon%20December%202013%20January%202014%20Floods%20Report%20Final%2Epdf&parent=%2Fsites%2FPublicDocs%2FPlanning%2FFloodRisk%2FInvestigations%20and%20Incidents&p=true&ga=1

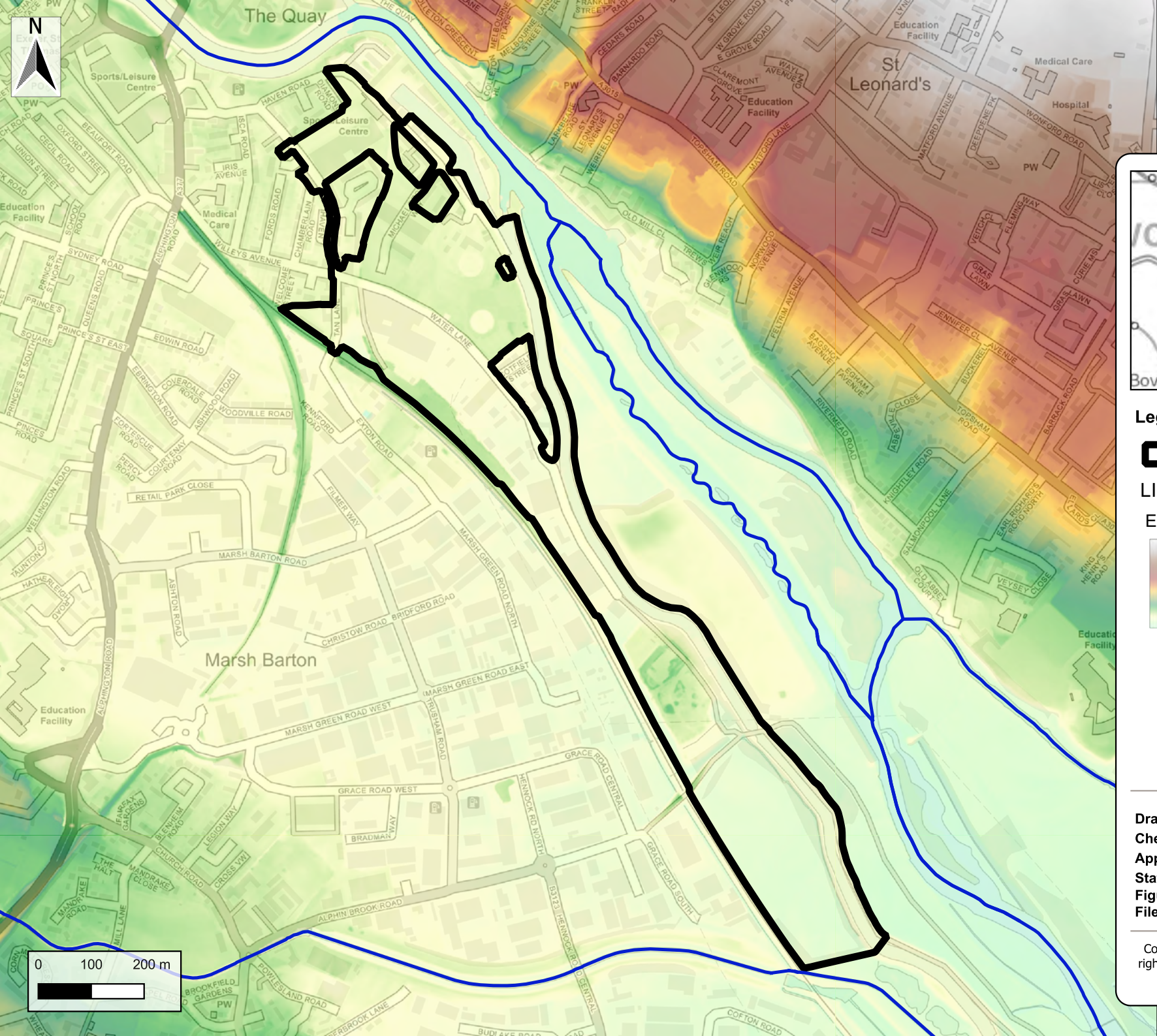
Section 19 Investigation, Exeter and Devon-Wide Flood 4th-5th October 2021 - https://www.devon.gov.uk/floodriskmanagement/document/exeter-and-devon-wide-floods-4th-5th-october-2021/

Section 19 Investigation, 17th September 2023 - https://www.devon.gov.uk/floodriskmanagement/document/flood-investigation-report/#5-exeter-flood-incident-extent-and-impact

British Geological Survey, GeoIndex - https://mapapps2.bgs.ac.uk/geoindex/home.html

LandIS Soilscapes - https://www.landis.org.uk/soilscapes/

South West Water's Drainage and Wastewater Management Plan - https://www.southwestwater.co.uk/siteassets/documents/about-us/dwmp/strategic-catchments/exe_l2_dwmp_plan.pdf



Exeter City Council

JBA consulting

Legend

Site Location

LIDAR 1m DTM 2022

Elevation (mAOD)

50.77

1.04

Drawn By:	BG	**Date:**	08/08/2024
Checked By:	EH	**Date:**	08/08/2024
Approved By:	EH	**Date:**	08/08/2024
Status:	S3	**Revision:**	P01
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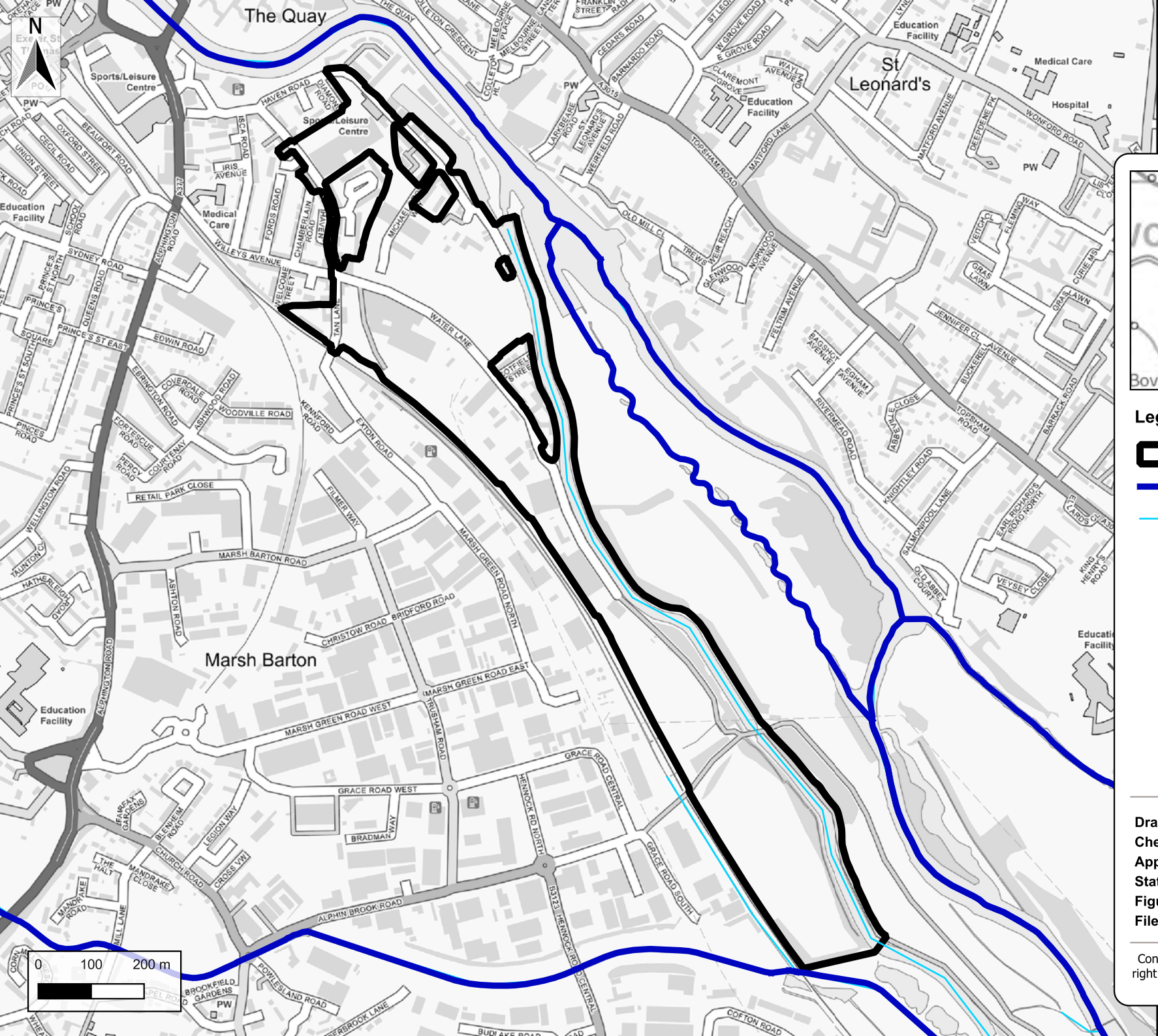
File Name:	Exeter SFRA L2		



Legend

- Site Location
- Statutory Main River
- Ordinary Watercourse

Drawn By:	BG	**Date:**	12/08/2024
Checked By:	EH	**Date:**	12/08/2024
Approved By:	EH	**Date:**	12/08/2024
Status:	S3	**Revision:**	P01
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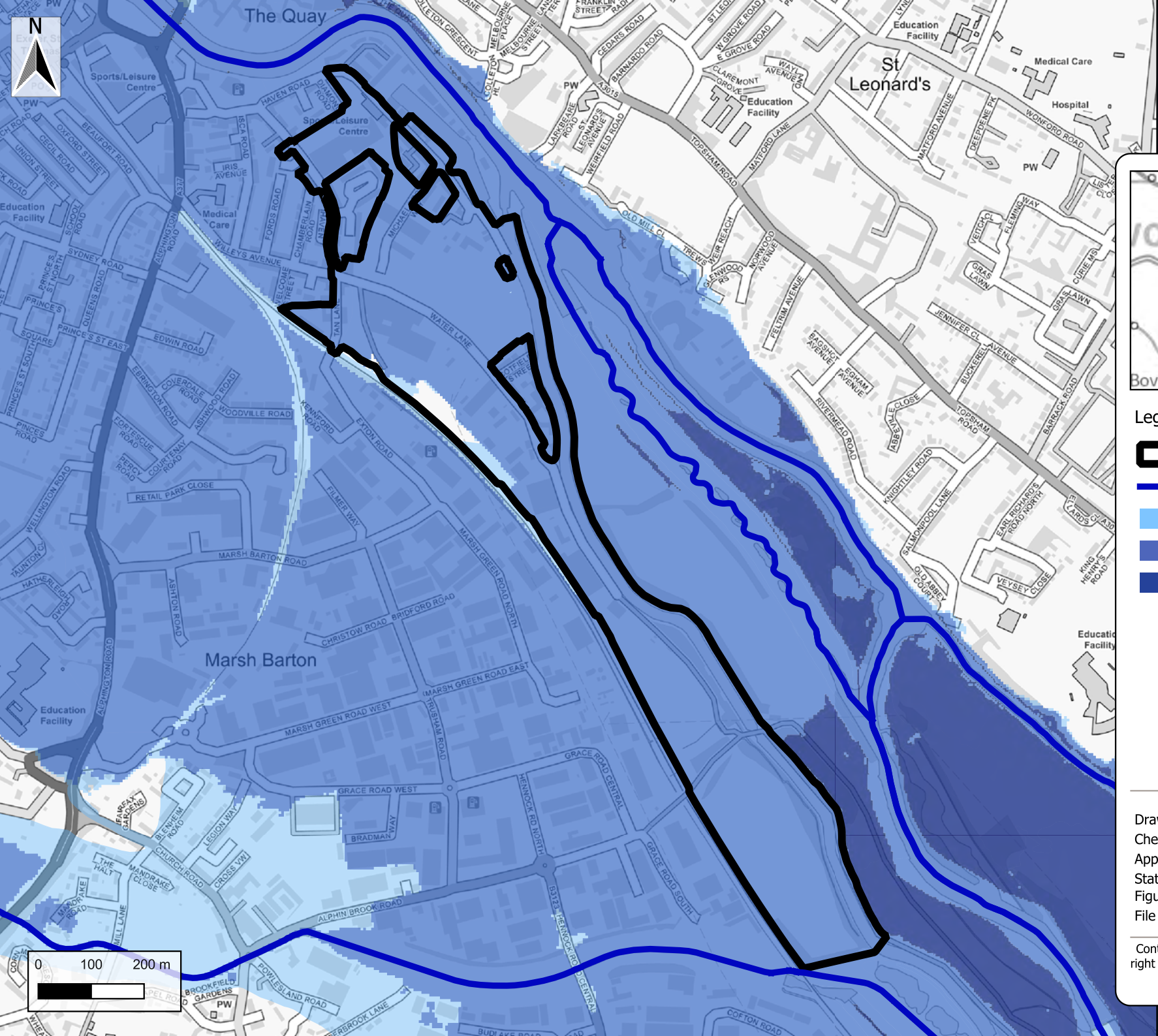
File Name:	Exeter SFRA L2		



Legend

- Site Location
- Statutory Main River
- Flood Zone 2
- Flood Zone 3a
- Flood Zone 3b

Drawn By:	BG	Date:	23/10/2024
Checked By:	EH	Date:	23/10/2024
Approved By:	EH	Date:	23/10/2024
Status:	S3	Revision:	P01
Figure Title:	Flood Zones		
File Name:	Exeter SFRA L2		

Exeter City Council

JBA consulting

Legend

Site Location

Fluvial 3.3% AEP event

Depth (m)

- < 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- 1.20 - 1.50
- > 1.50

Drawn By:	BG	Date:	30/10/2024
Checked By:	EH	Date:	30/10/2024
Approved By:	EH	Date:	30/10/2024
Status:	S3	Revision:	P02
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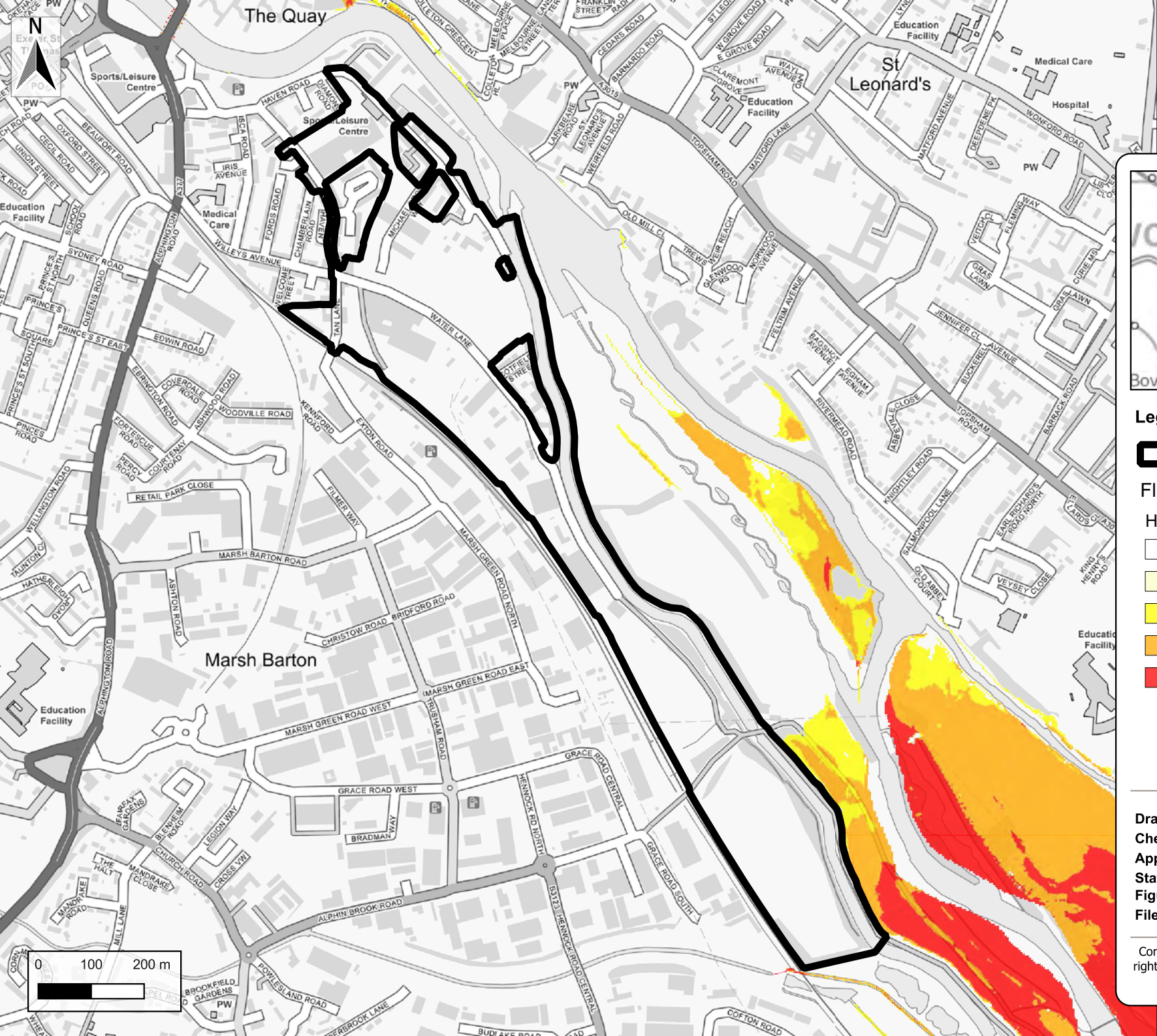
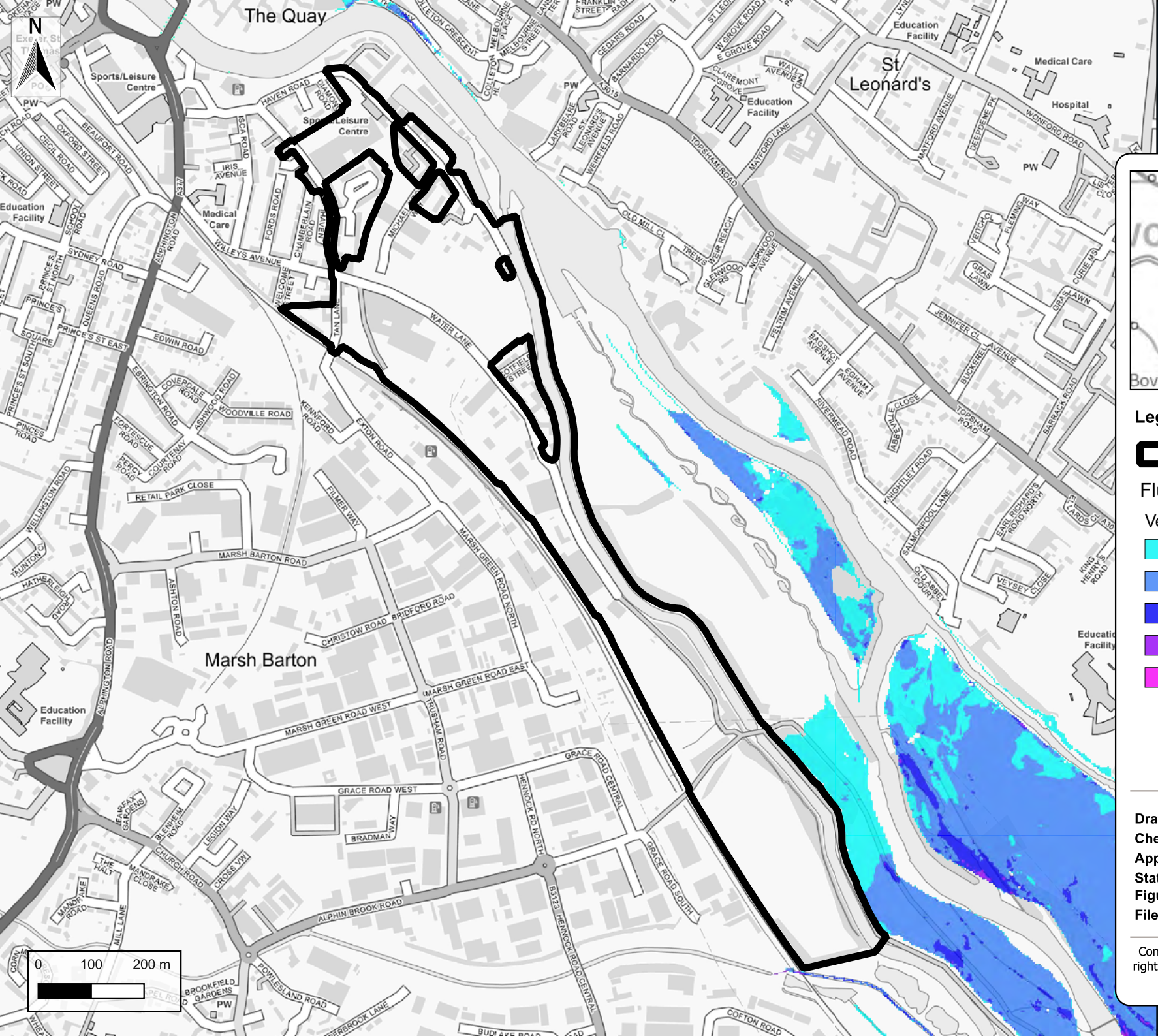
File Name:	Exeter SFRA L2		



Legend

- Site Location
- Fluvial 3.3% AEP
- Hazard Rating
  - No hazard
  - Very low hazard - Caution
  - Danger for some
  - Danger for most
  - Danger for all

Drawn By:	BG	**Date:**	05/08/2024
Checked By:	EH	**Date:**	05/08/2024
Approved By:	EH	**Date:**	05/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	Fluvial 3.3% AEP Hazard		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

Site Location

Fluvial 3.3% AEP

Velocity (m/s)

- 0.0 to 0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- > 2.0

Drawn By:	BG	**Date:**	05/08/2024
Checked By:	EH	**Date:**	05/08/2024
Approved By:	EH	**Date:**	05/08/2024
Status:	S3	**Revision:**	P01
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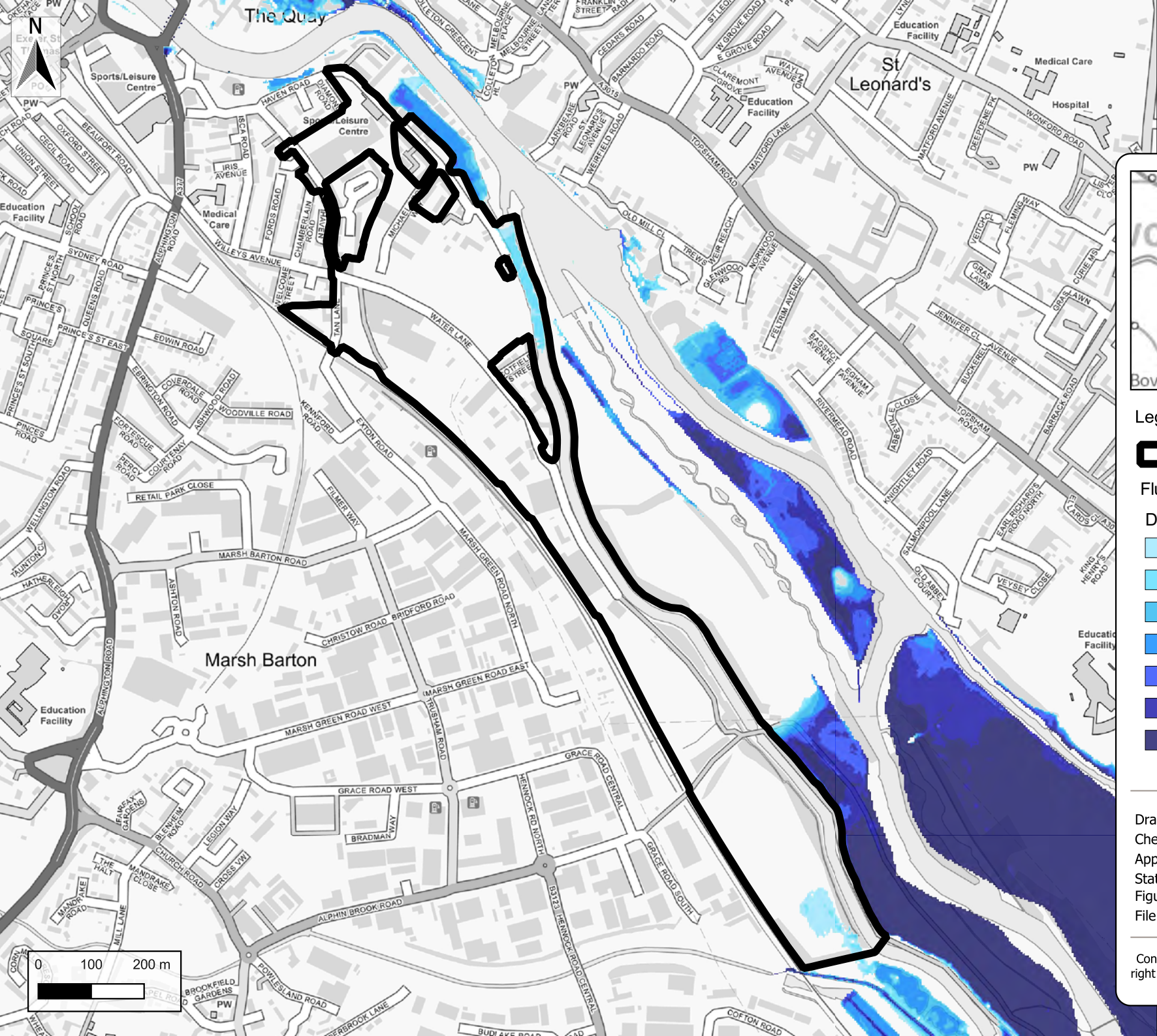
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

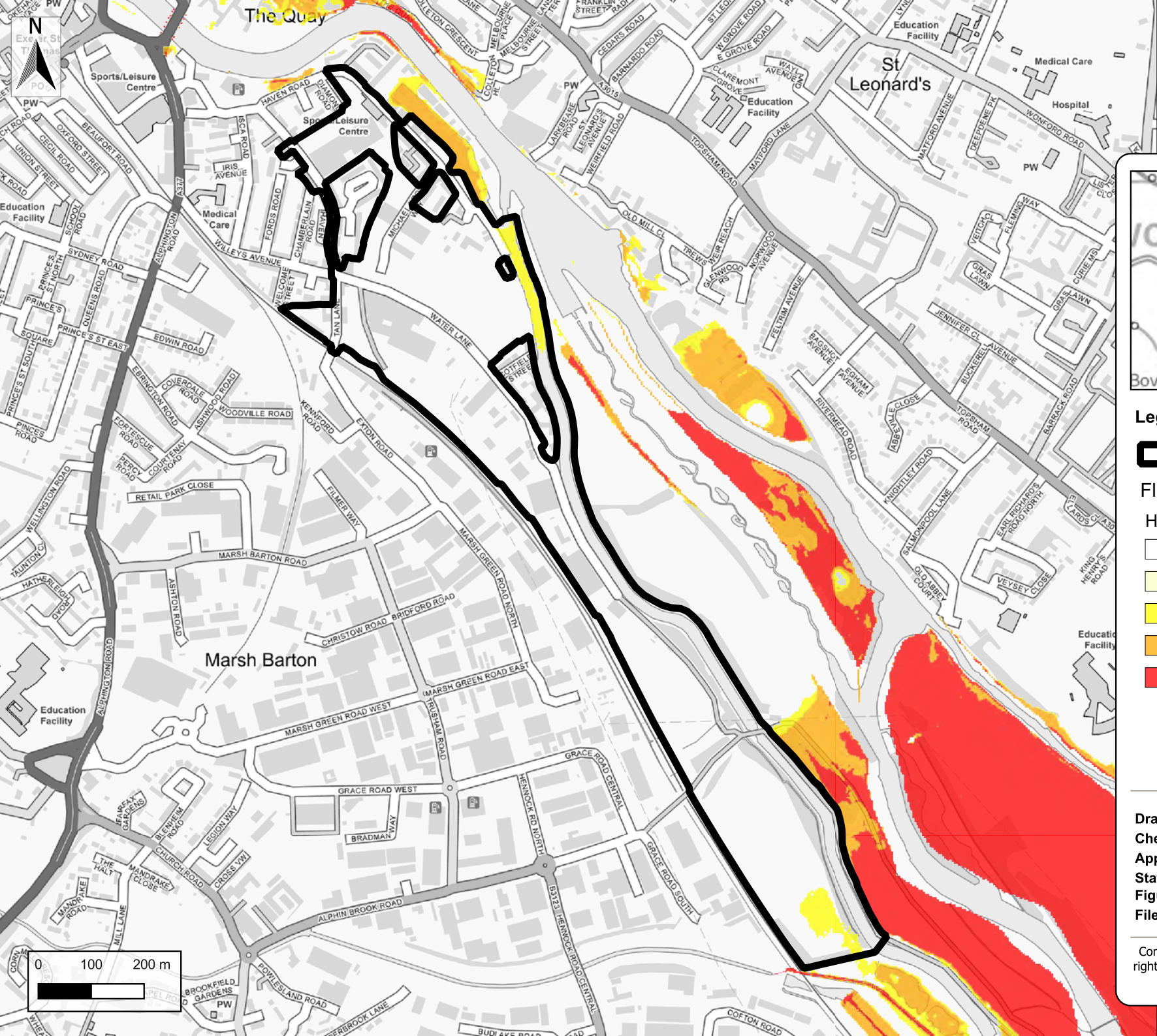
Site Location

Fluvial 1% AEP event

Depth (m)

- < 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- 1.20 - 1.50
- > 1.50

Drawn By:	BG	Date:	30/10/2024
Checked By:	EH	Date:	30/10/2024
Approved By:	EH	Date:	30/10/2024
Status:	S3	Revision:	P02
Figure Title:	Fluvial 1% depth		
File Name:	Exeter SFRA L2		



Exeter City Council

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Legend

- Site Location

Fluvial 1% AEP

Hazard Rating

- No hazard
- Very low hazard - Caution
- Danger for some
- Danger for most
- Danger for all

Drawn By:	BG	**Date:**	05/08/2024
Checked By:	EH	**Date:**	05/08/2024
Approved By:	EH	**Date:**	05/08/2024
Status:	S3	**Revision:**	P01
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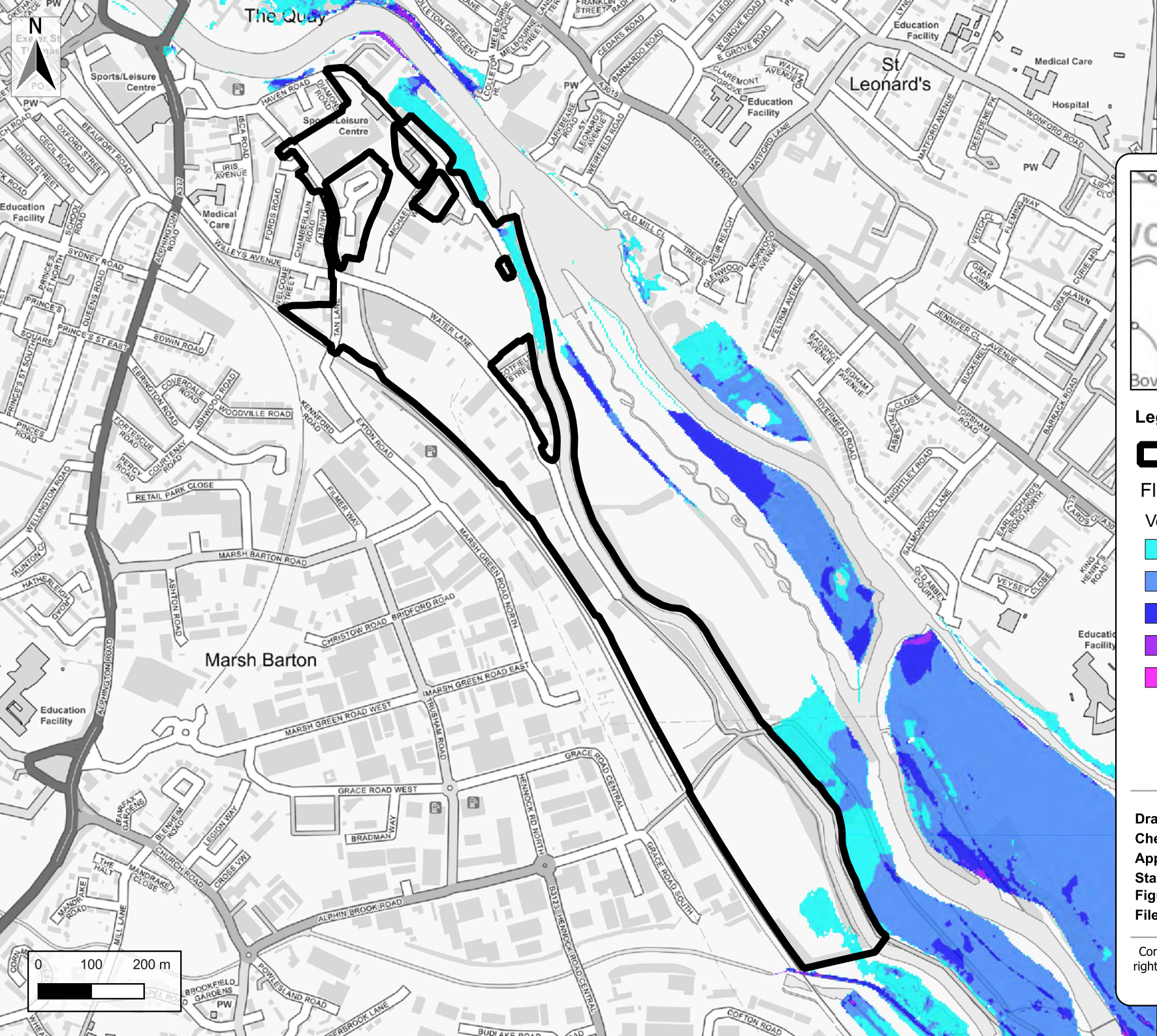
File Name:	Exeter SFRA L2		



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Legend

- Site Location

Fluvial 1% AEP

Velocity (m/s)

- 0.0 to 0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- > 2.0

Drawn By:	BG	**Date:**	05/08/2024
Checked By:	EH	**Date:**	05/08/2024
Approved By:	EH	**Date:**	05/08/2024
Status:	S3	**Revision:**	P01
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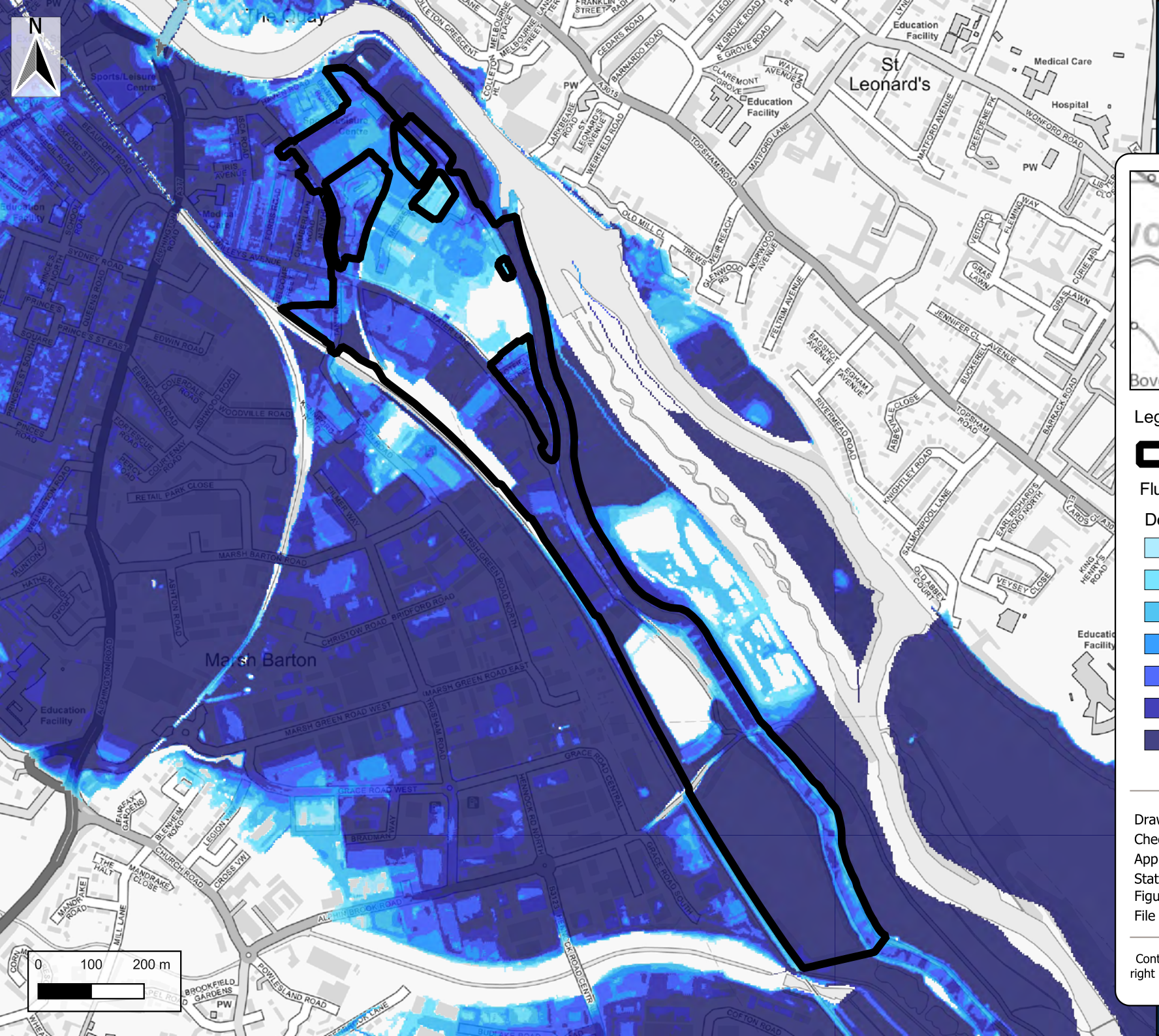
File Name:	Exeter SFRA L2		



Exeter City Council

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Legend

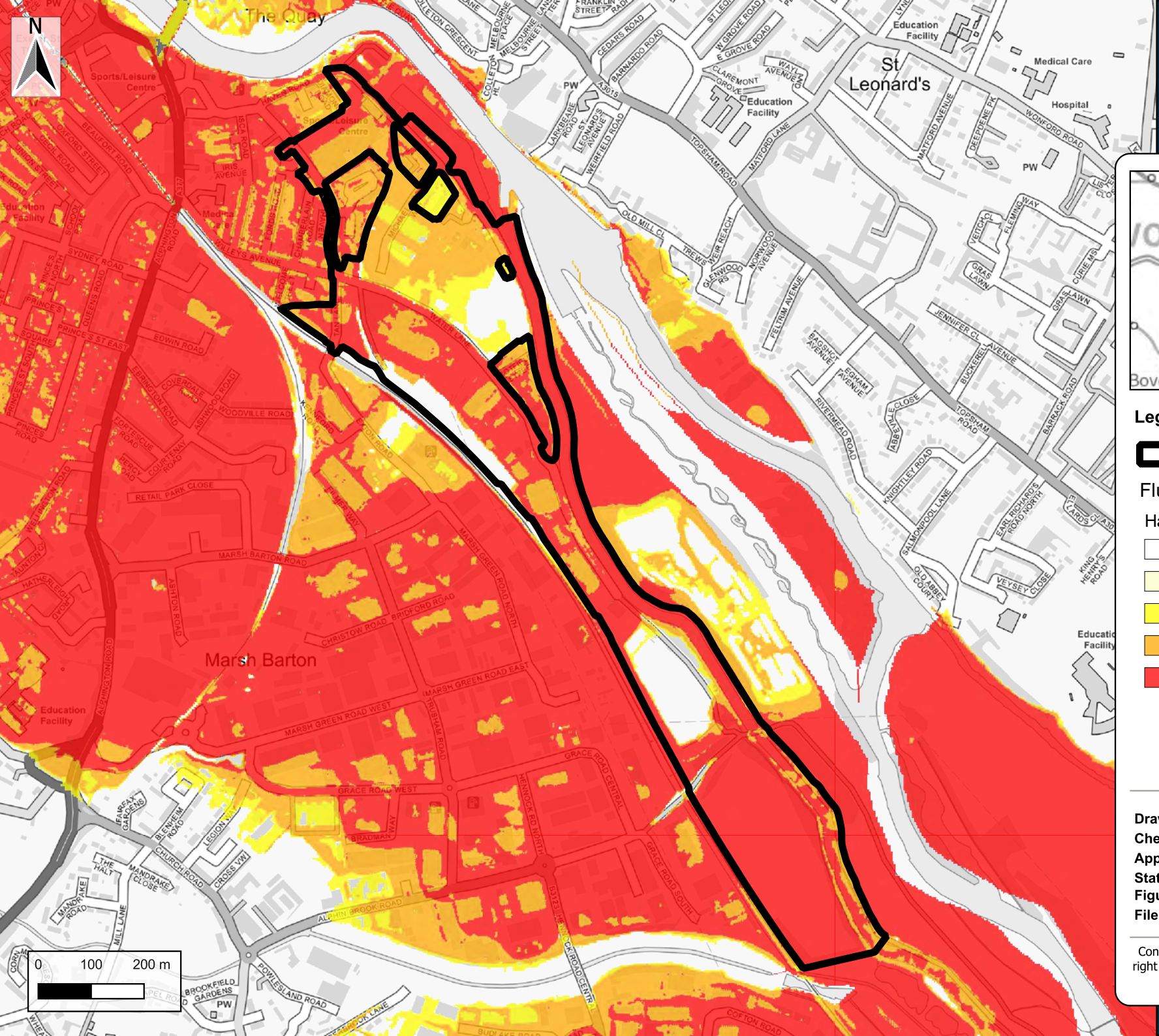
Site Location

Fluvial 0.1% AEP event

Depth (m)

- < 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- 1.20 - 1.50
- > 1.50

Drawn By:	BG	Date:	30/10/2024
Checked By:	EH	Date:	30/10/2024
Approved By:	EH	Date:	30/10/2024
Status:	S3	Revision:	P02
Figure Title:	Fluvial 0.1% depth		
File Name:	Exeter SFRA L2		



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Legend

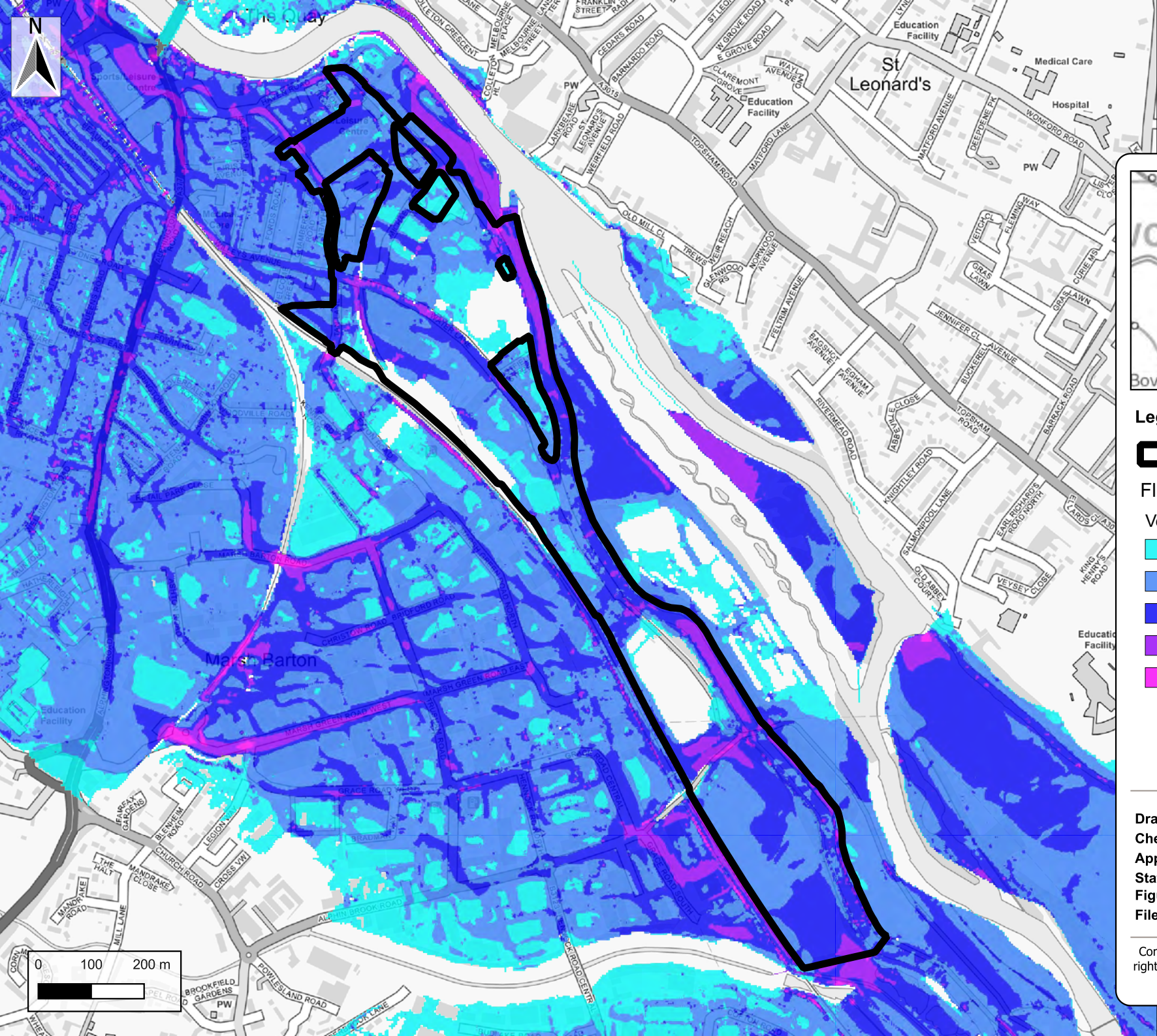
- Site Location

Fluvial 0.1% AEP

Hazard Rating

- No hazard
- Very low hazard - Caution
- Danger for some
- Danger for most
- Danger for all

Drawn By:	BG	**Date:**	05/08/2024
Checked By:	EH	**Date:**	05/08/2024
Approved By:	EH	**Date:**	05/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	Fluvial 0.1% AEP Hazard		
File Name:	Exeter SFRA L2		



Exeter City Council

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Legend

- Site Location

Fluvial 0.1% AEP

Velocity (m/s)

- 0.0 to 0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- > 2.0

Drawn By:	BG	**Date:**	05/08/2024
Checked By:	EH	**Date:**	05/08/2024
Approved By:	EH	**Date:**	05/08/2024
Status:	S3	**Revision:**	P01
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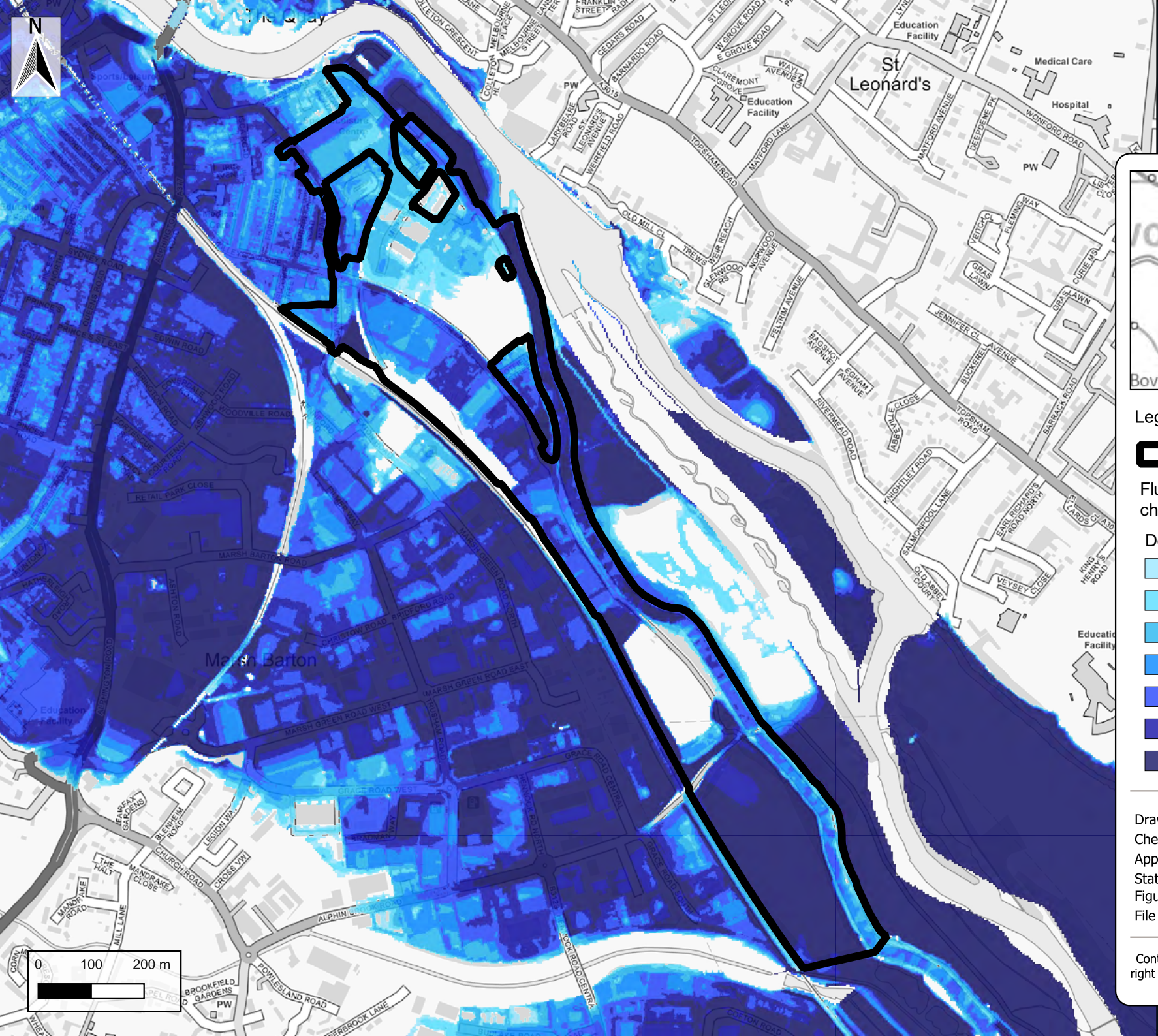
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

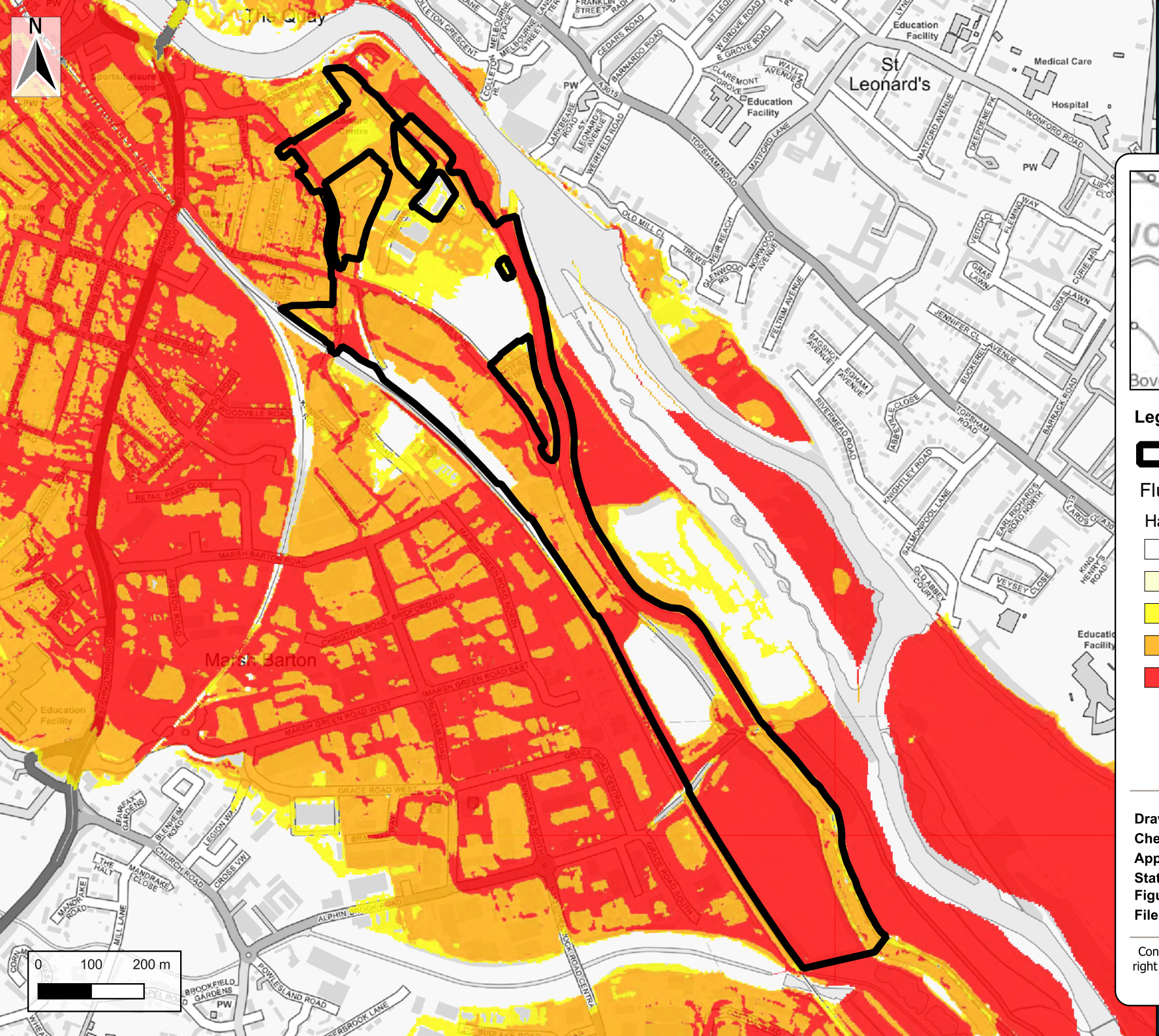
Site Location

Fluvial 1% AEP plus 46% climate change

Depth (m)

- < 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- 1.20 - 1.50
- > 1.50

Drawn By:	BG	Date:	30/10/2024
Checked By:	EH	Date:	30/10/2024
Approved By:	EH	Date:	30/10/2024
Status:	S3	Revision:	P02
Figure Title:	Fluvial 1% + CC depth		
File Name:	Exeter SFRA L2		



Legend

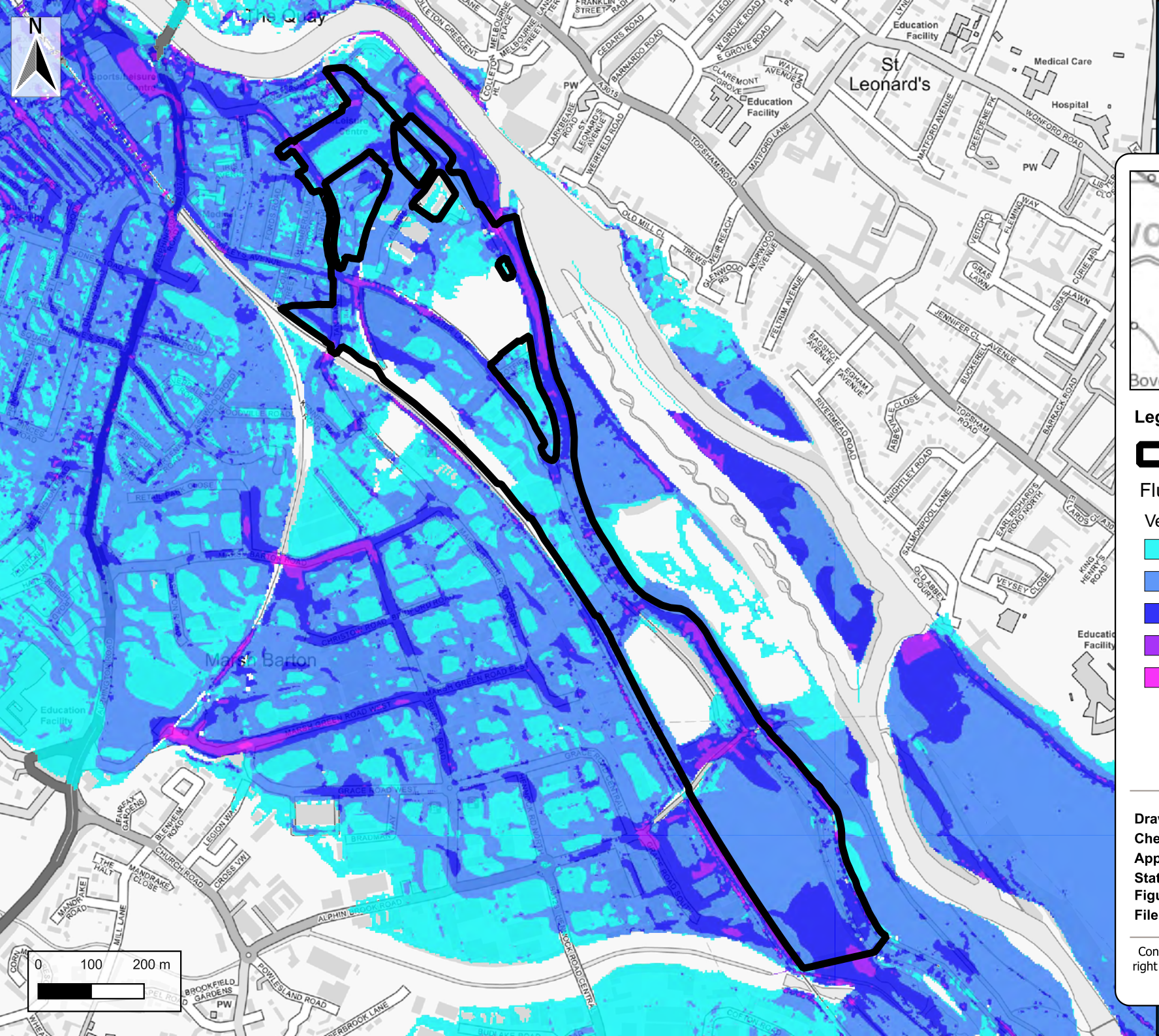
Site Location

Fluvial 1% AEP plus 46% CC

Hazard Rating

- No hazard
- Very low hazard - Caution
- Danger for some
- Danger for most
- Danger for all

Drawn By:	BG	**Date:**	06/08/2024
Checked By:	EH	**Date:**	06/08/2024
Approved By:	EH	**Date:**	06/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	Fluvial 1% AEP + 46% CC		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

Site Location

Fluvial 1% AEP plus 46% CC

Velocity (m/s)

- 0.0 to 0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- > 2.0

Drawn By:	BG	**Date:**	05/08/2024
Checked By:	EH	**Date:**	05/08/2024
Approved By:	EH	**Date:**	05/08/2024
Status:	S3	**Revision:**	P01
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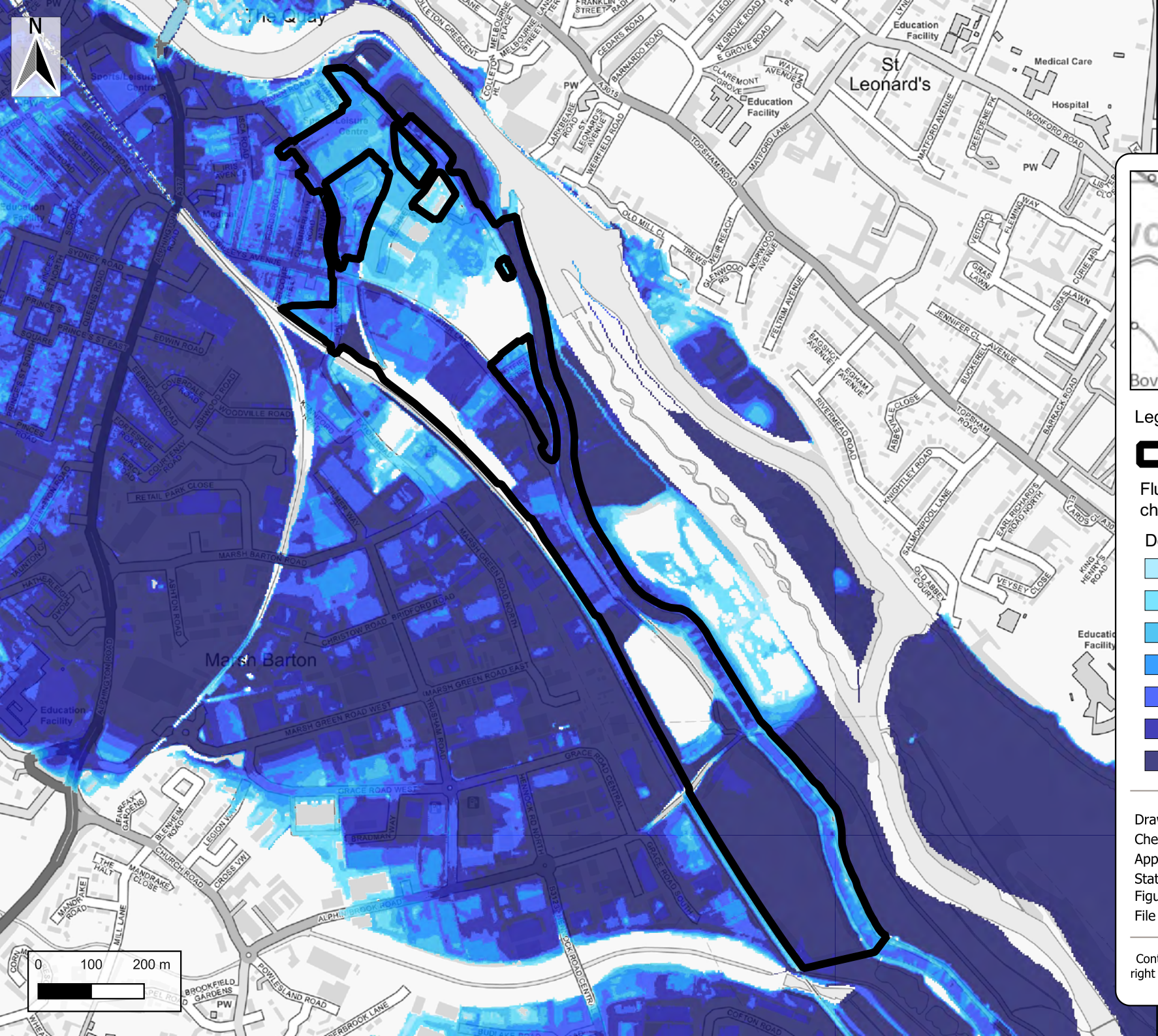
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

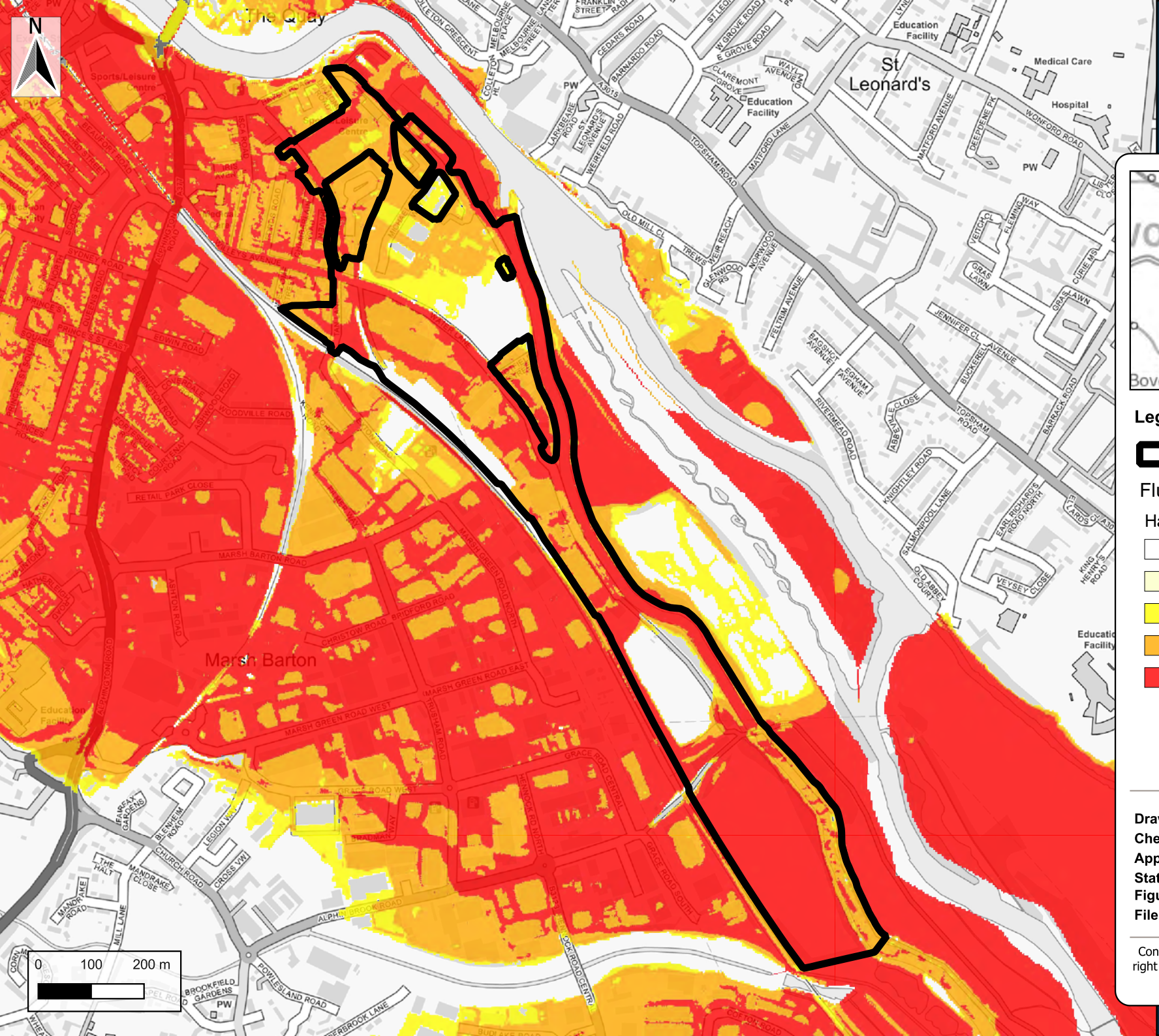
Site Location

Fluvial 1% AEP plus 61% climate change

Depth (m)

- < 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- 1.20 - 1.50
- > 1.50

Drawn By:	BG	Date:	30/10/2024
Checked By:	EH	Date:	30/10/2024
Approved By:	EH	Date:	30/10/2024
Status:	S3	Revision:	P02
Figure Title:	Fluvial 1% + CC depth		
File Name:	Exeter SFRA L2		



Legend

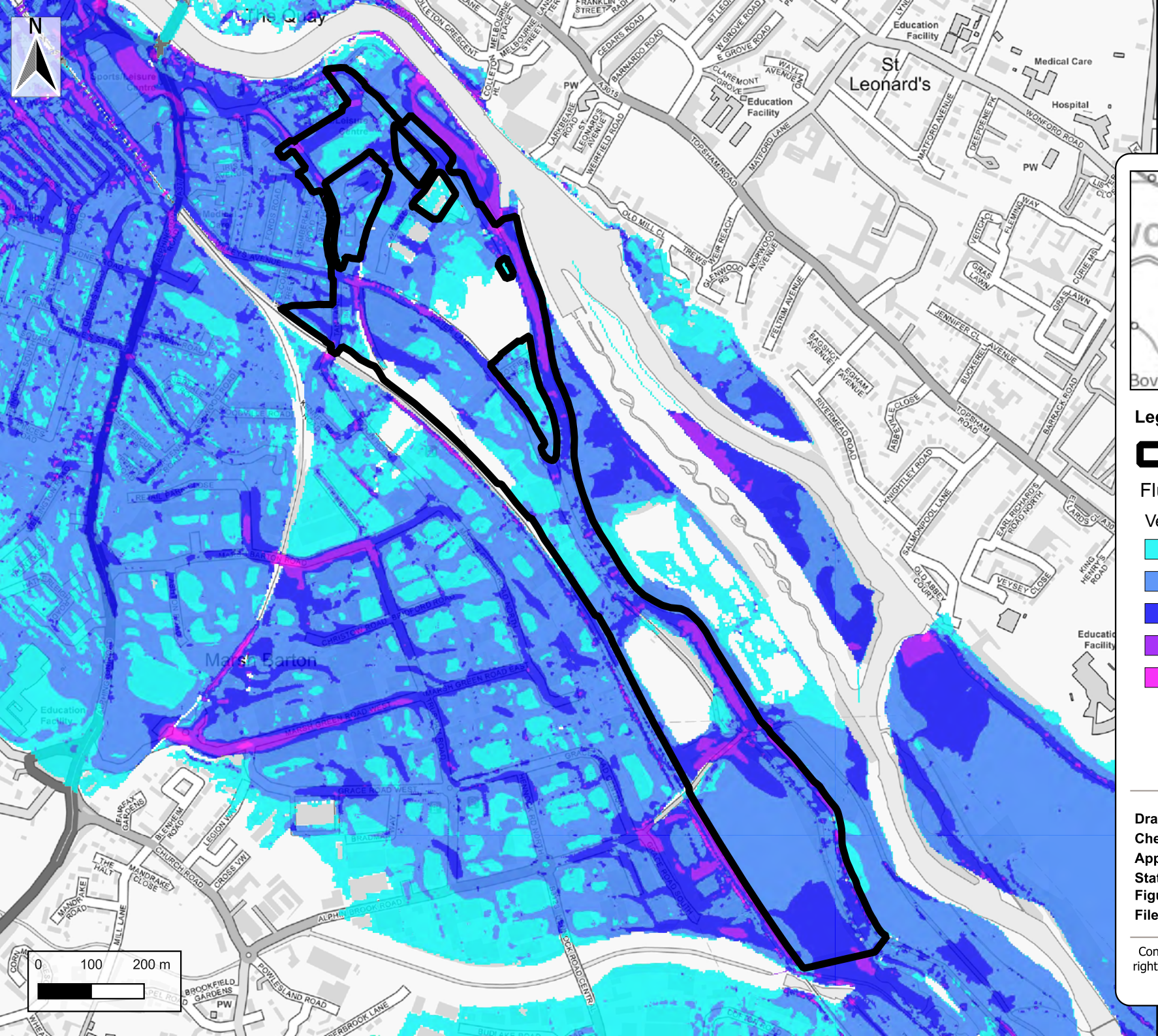
- Site Location

Fluvial 1% AEP plus 61% CC

Hazard Rating

- No hazard
- Very low hazard - Caution
- Danger for some
- Danger for most
- Danger for all

Drawn By:	BG	**Date:**	06/08/2024
Checked By:	EH	**Date:**	06/08/2024
Approved By:	EH	**Date:**	06/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	Fluvial 1% AEP + 61% CC		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

Site Location

Fluvial 1% AEP plus 61% CC

Velocity (m/s)

- 0.0 to 0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- > 2.0

Drawn By:	BG	**Date:**	05/08/2024
Checked By:	EH	**Date:**	05/08/2024
Approved By:	EH	**Date:**	05/08/2024
Status:	S3	**Revision:**	P01
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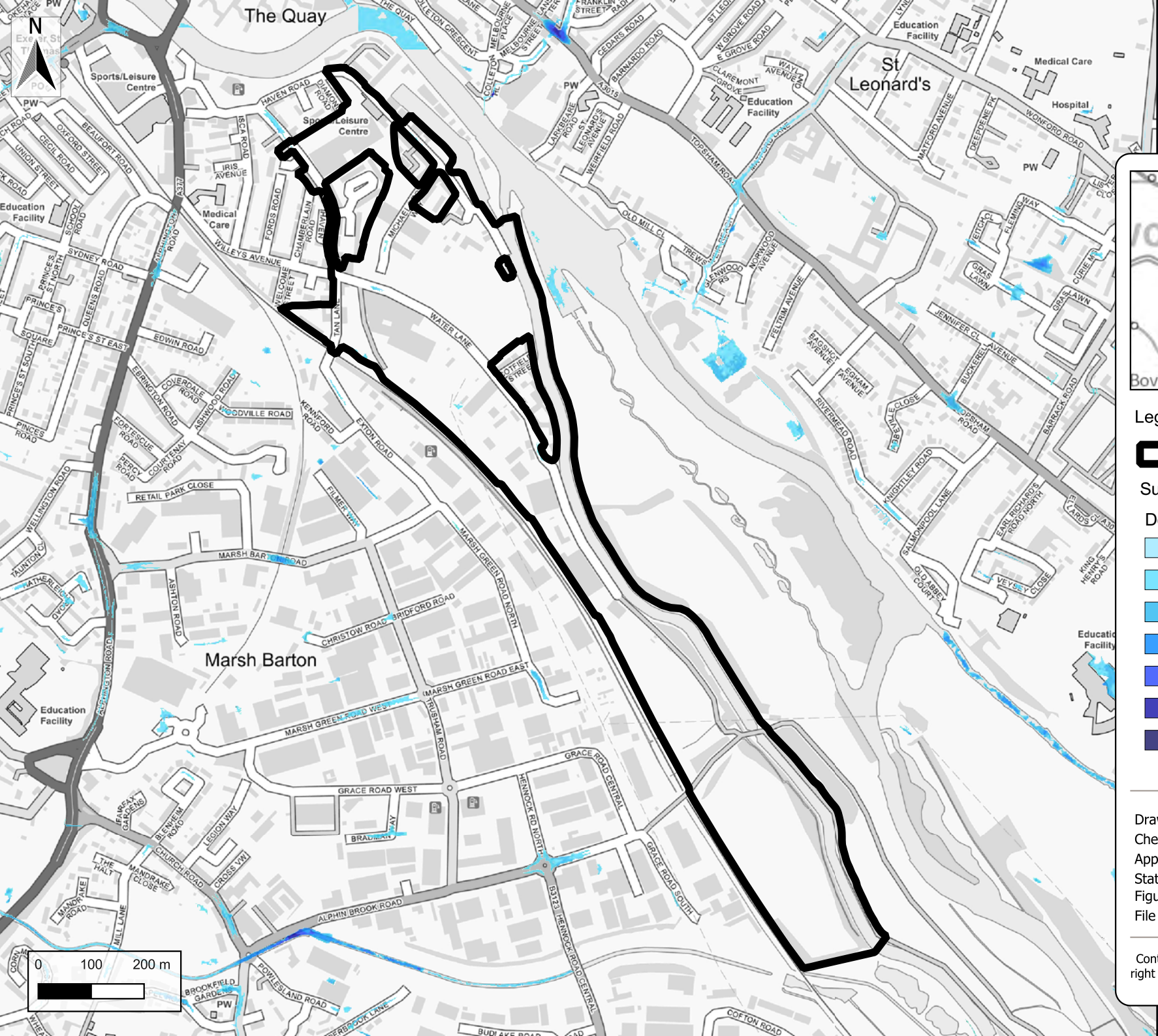

Legend

Site Location

Surface Water 3.3% AEP event

Depth (m)

- < 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- 1.20 - 1.50
- > 1.50

Drawn By:	BG	Date:	30/10/2024
Checked By:	EH	Date:	30/10/2024
Approved By:	EH	Date:	30/10/2024
Status:	S3	Revision:	P02
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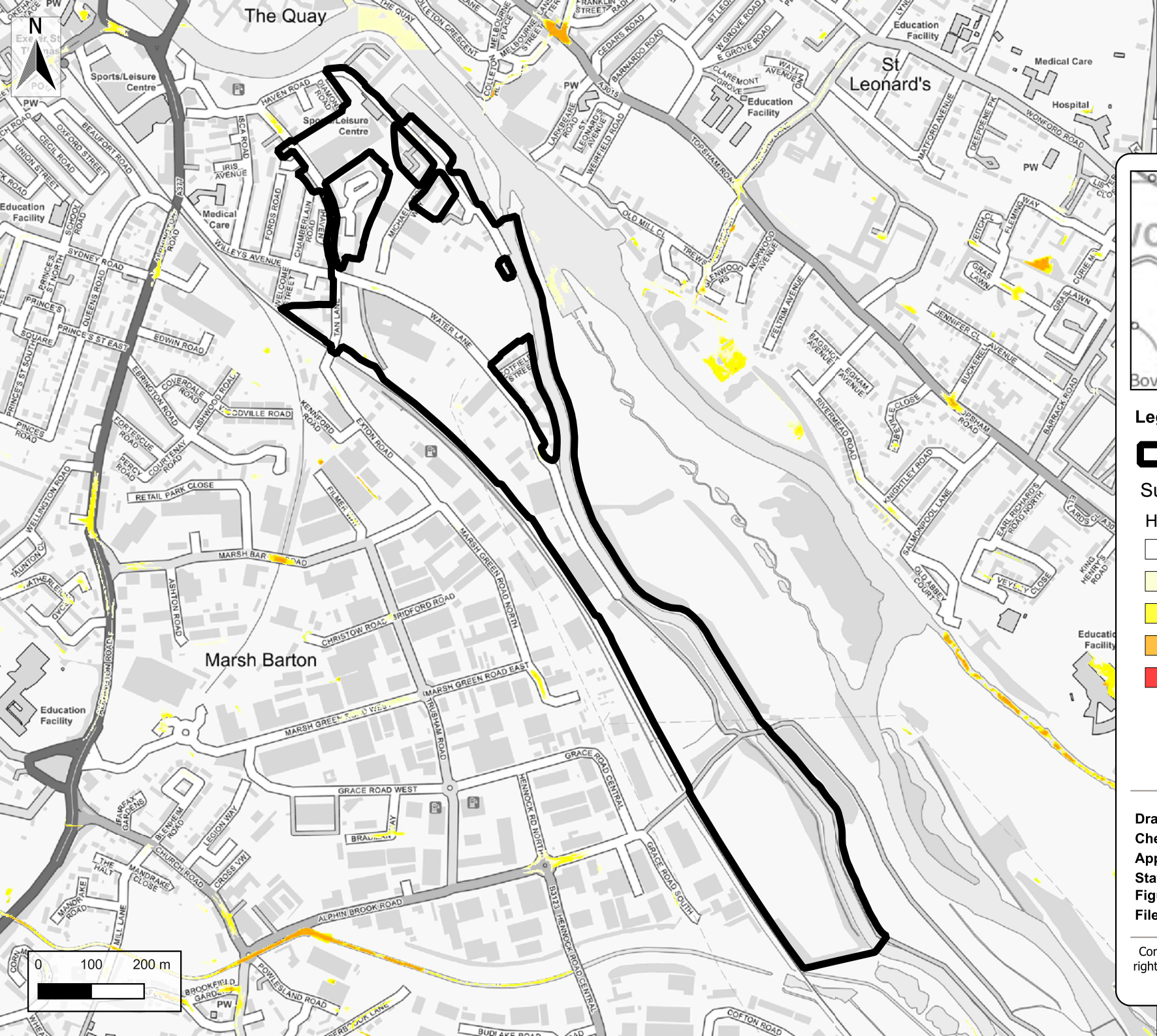
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

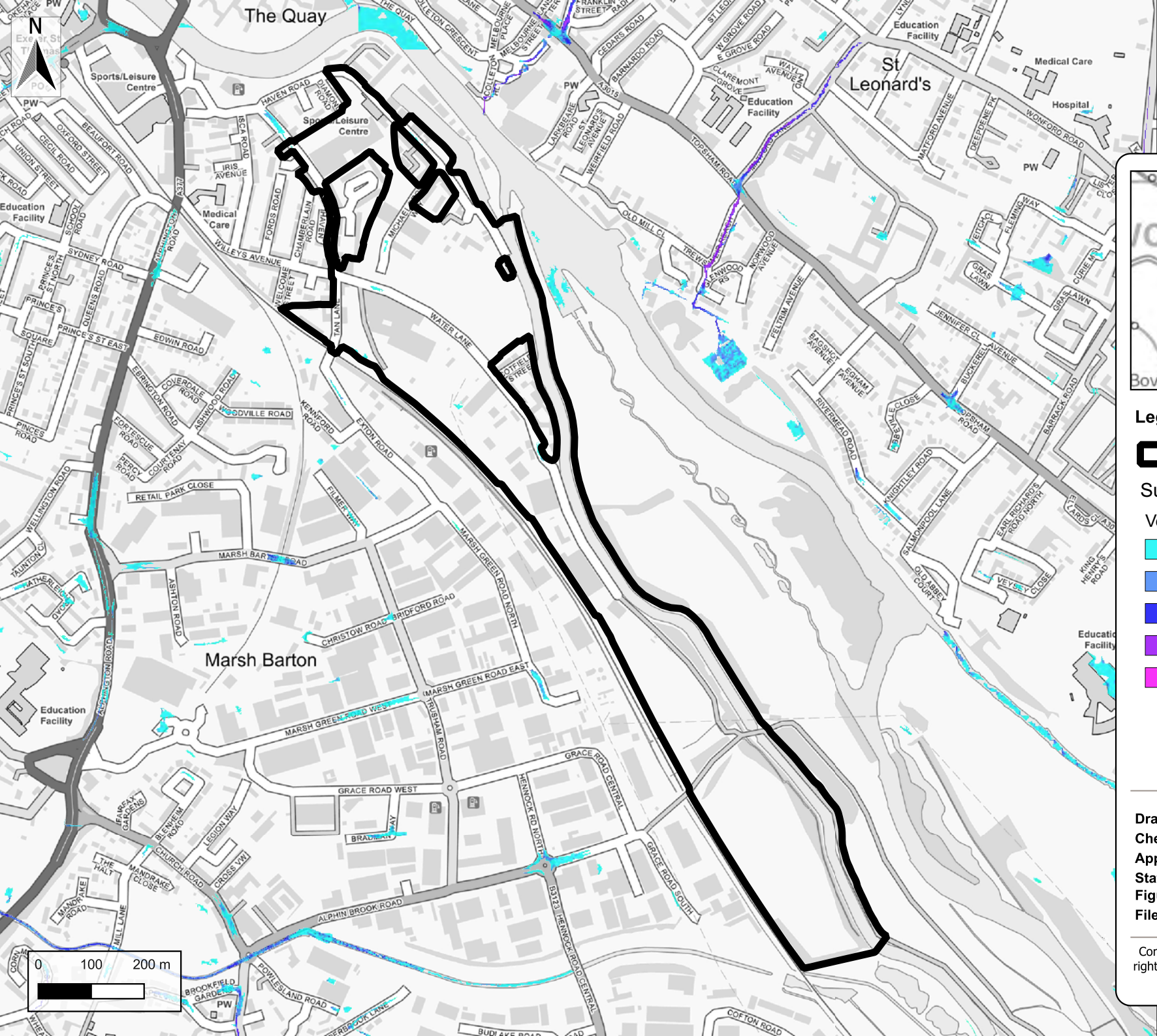
- Site Location

Surface Water 3.3% AEP

Hazard Rating

- No hazard
- Very low hazard - Caution
- Danger for some
- Danger for most
- Danger for all

Drawn By:	BG	**Date:**	08/08/2024
Checked By:	EH	**Date:**	08/08/2024
Approved By:	EH	**Date:**	08/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	RoFSW 3.3% AEP Hazard		
File Name:	Exeter SFRA L2		



Legend

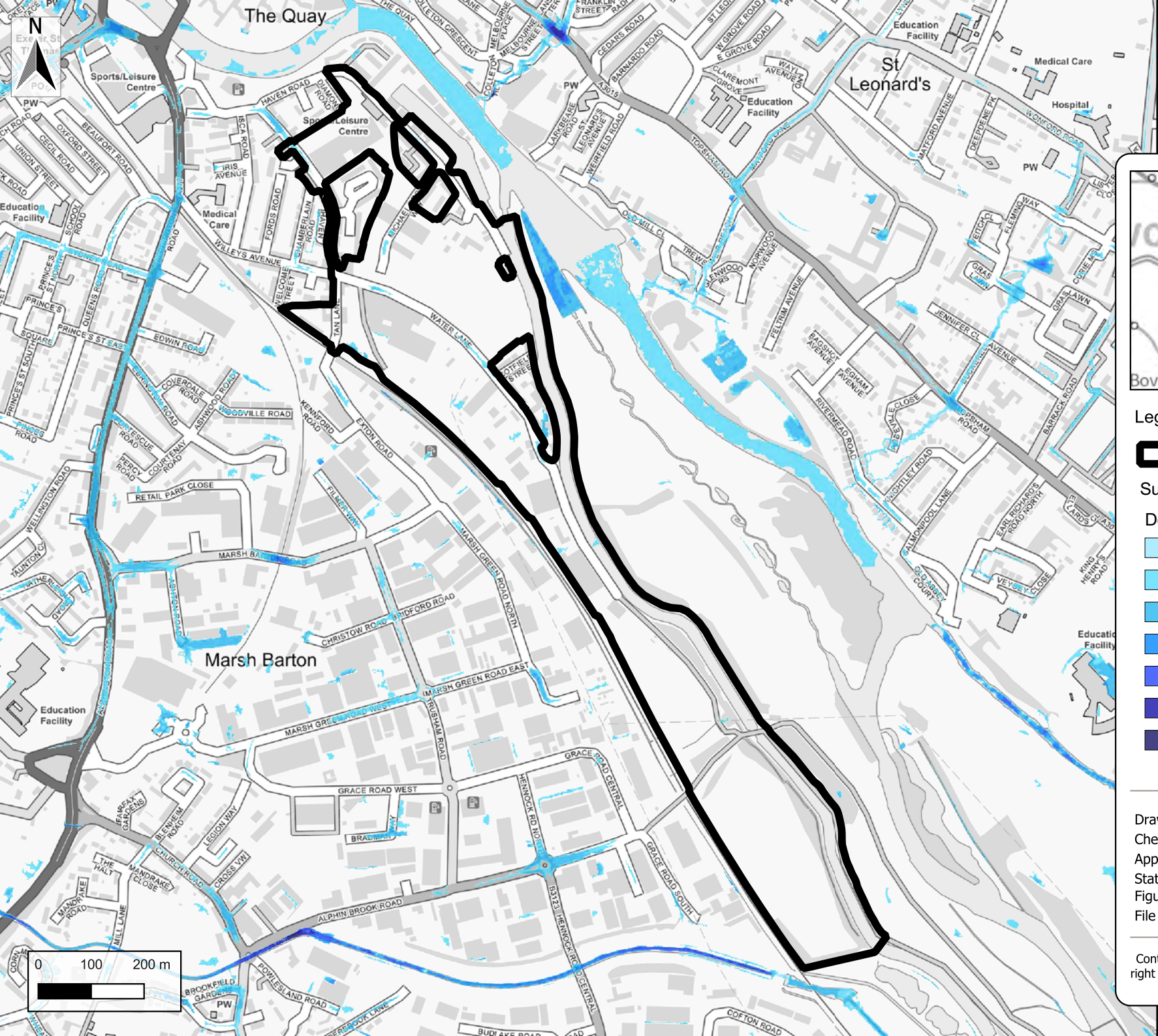
Site Location

Surface Water 3.3% AEP

Velocity (m/s)

- 0.0 to 0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- > 2.0

Drawn By:	BG	**Date:**	08/08/2024
Checked By:	EH	**Date:**	08/08/2024
Approved By:	EH	**Date:**	08/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	RoFSW 3.3% AEP Velocity		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

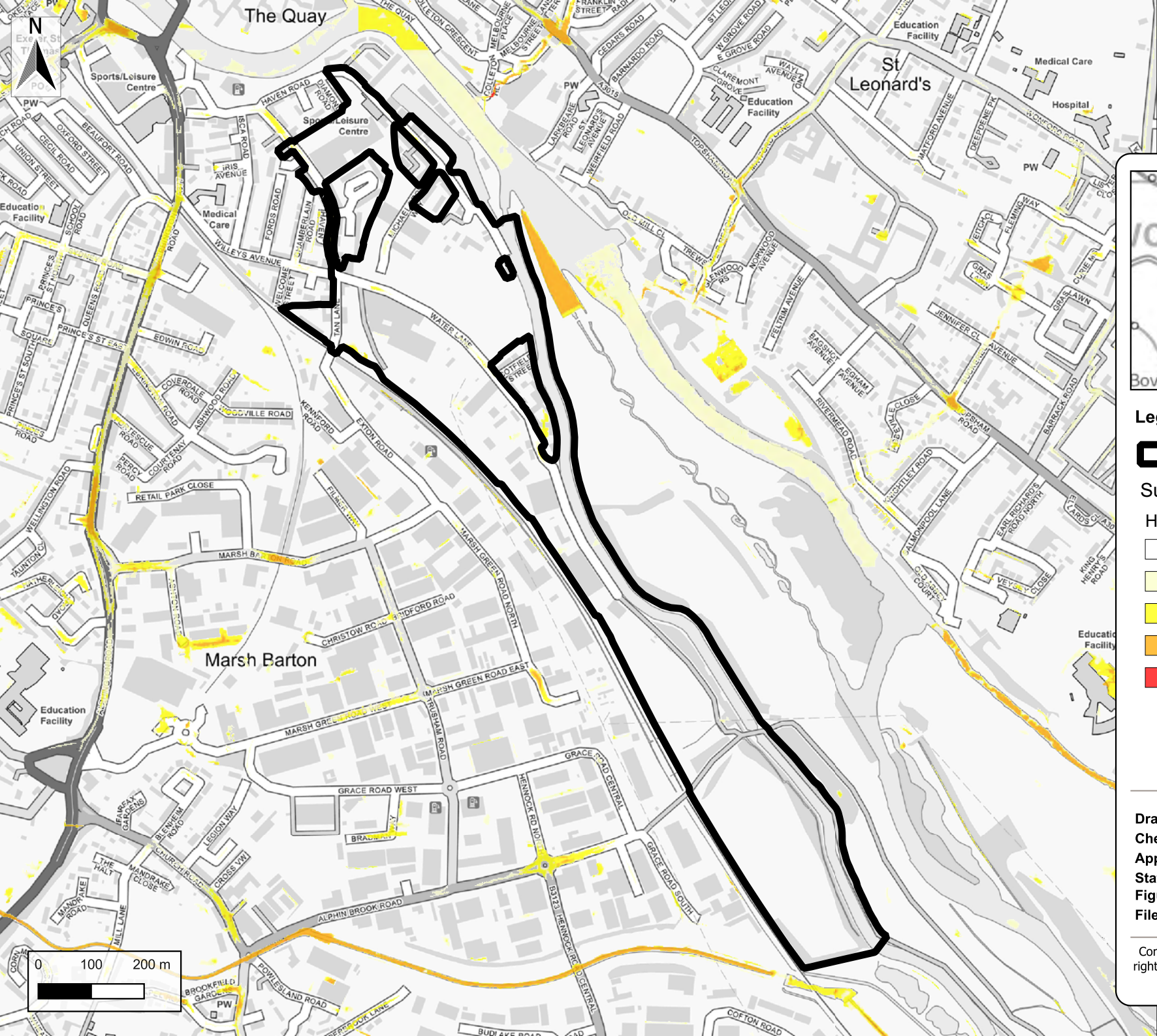
Site Location

Surface Water 1% AEP event

Depth (m)

- < 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- 1.20 - 1.50
- > 1.50

Drawn By:	BG	Date:	30/10/2024
Checked By:	EH	Date:	30/10/2024
Approved By:	EH	Date:	30/10/2024
Status:	S3	Revision:	P02
Figure Title:	RoFSW 1% AEP depth		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

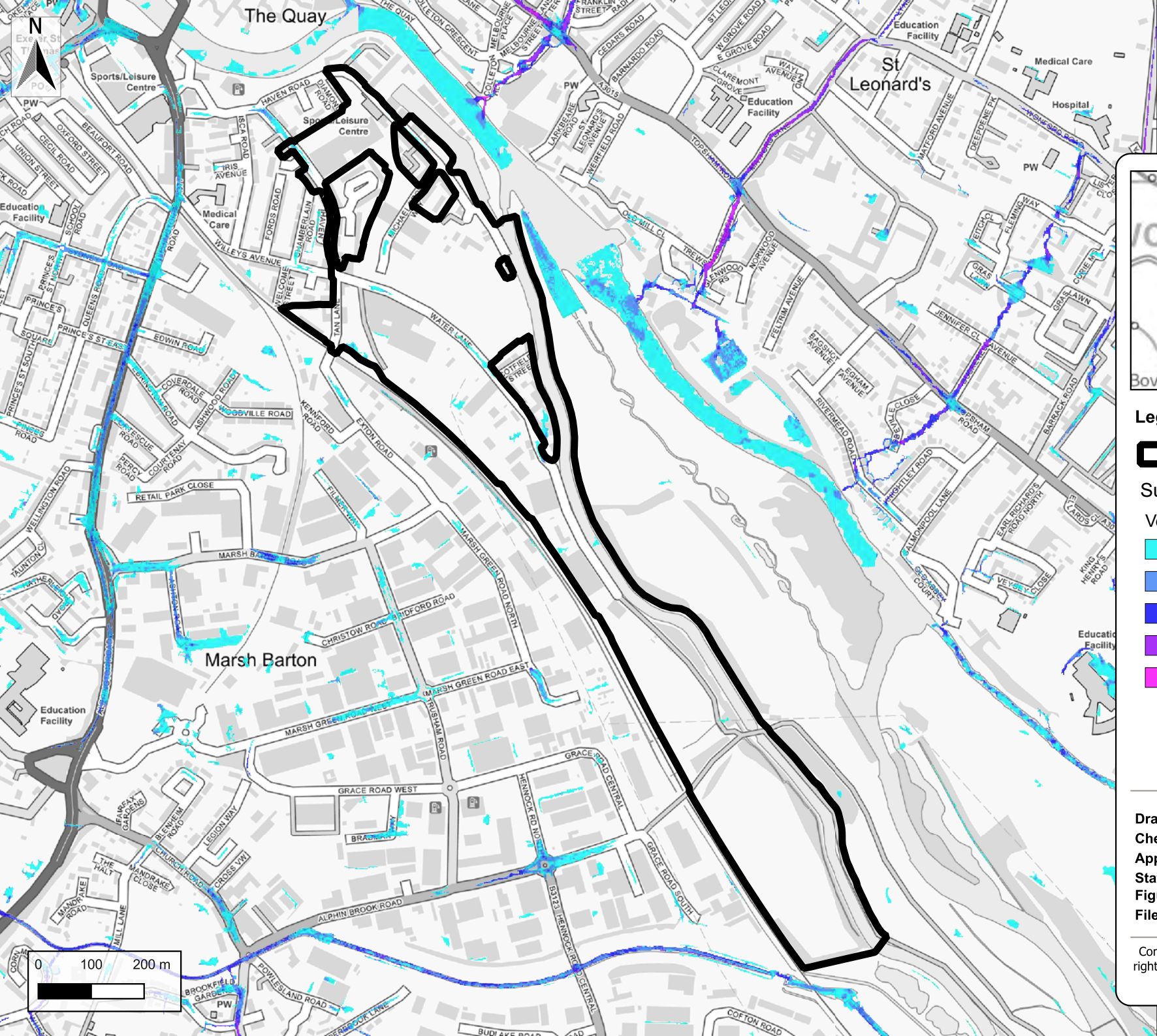
- Site Location

Surface Water 1% AEP

Hazard Rating

- No hazard
- Very low hazard - Caution
- Danger for some
- Danger for most
- Danger for all

Drawn By:	BG	**Date:**	08/08/2024
Checked By:	EH	**Date:**	08/08/2024
Approved By:	EH	**Date:**	08/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	RoFSW 1% AEP Hazard		
File Name:	Exeter SFRA L2		



Legend

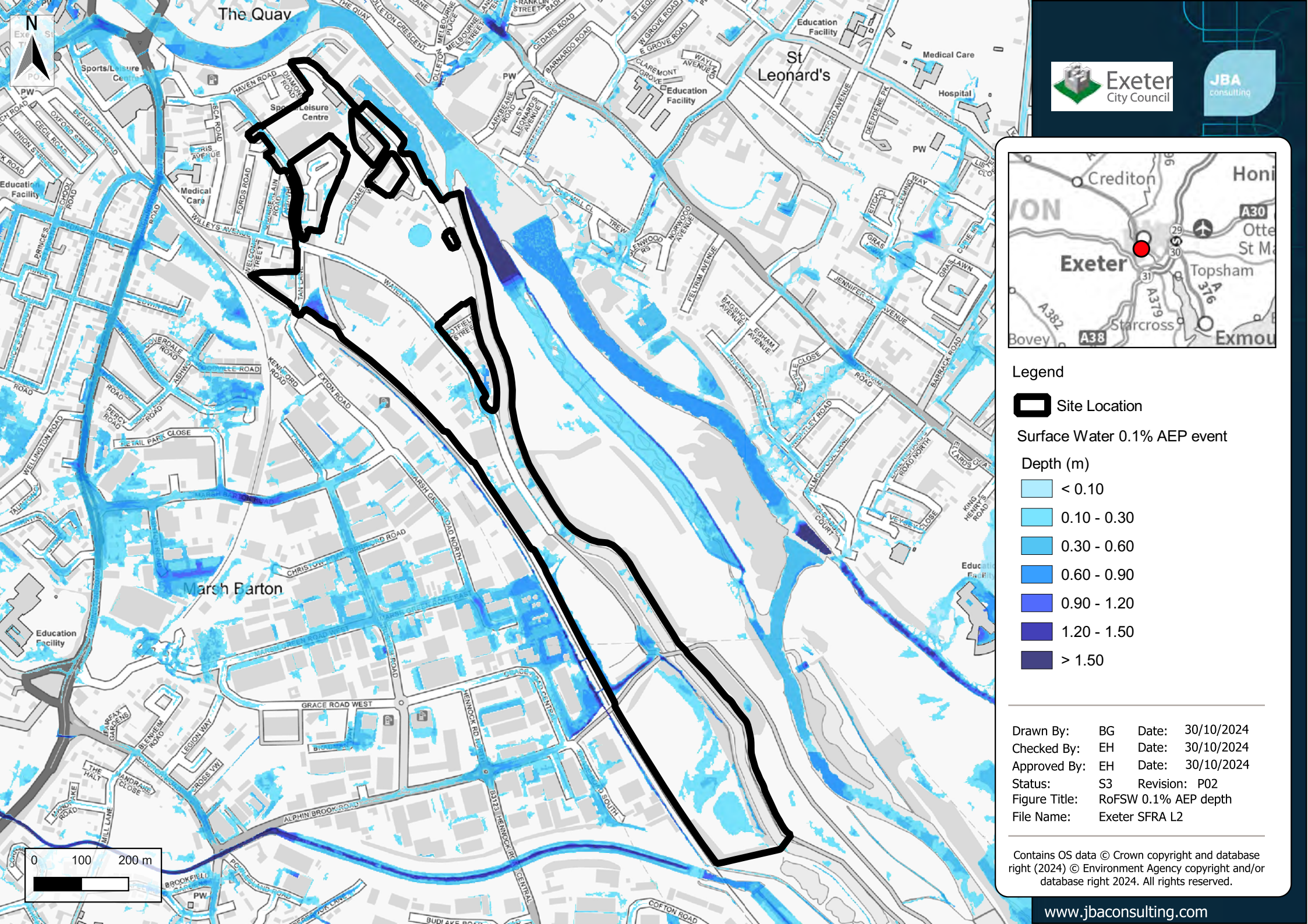
Site Location

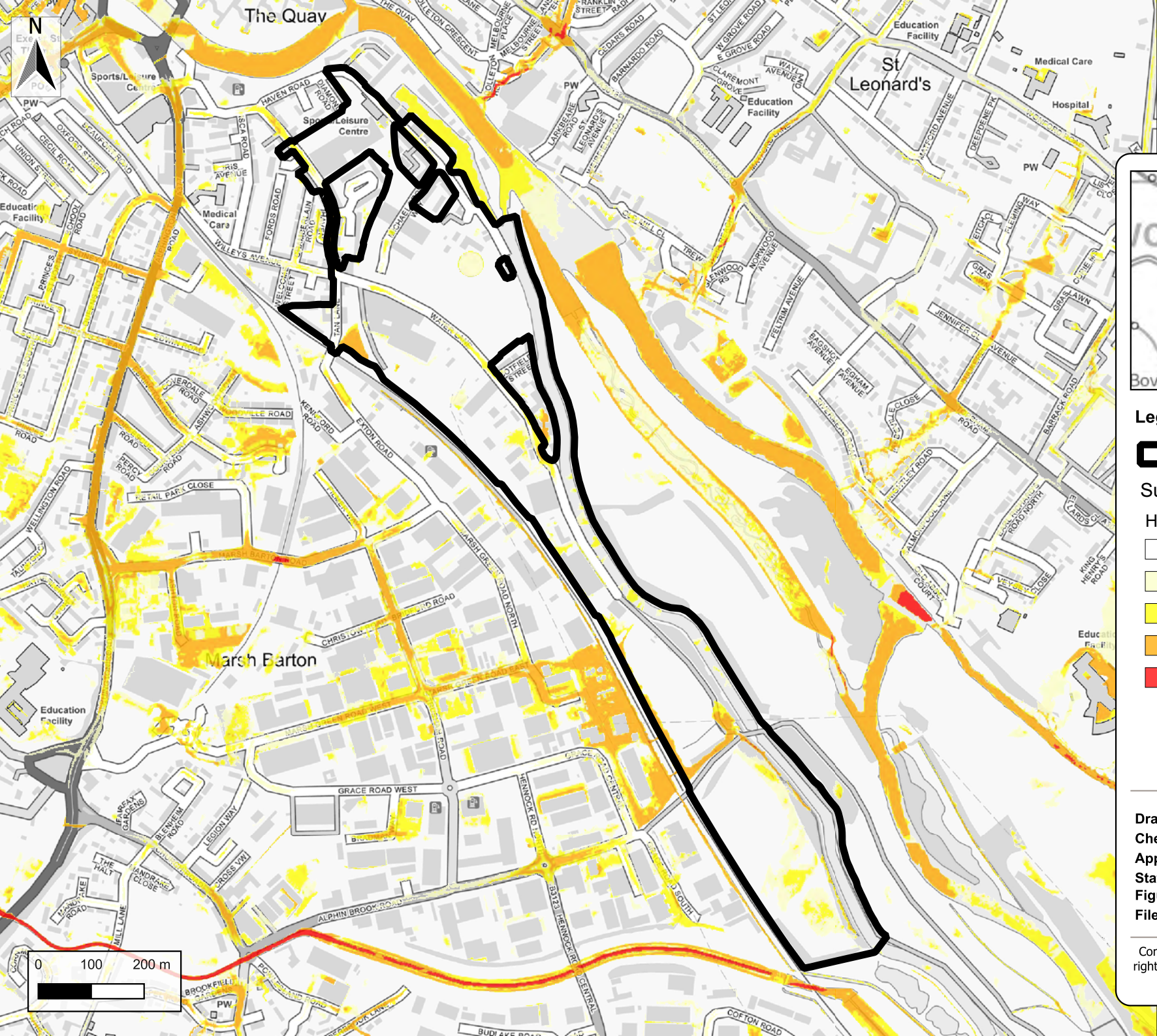
Surface Water 1% AEP

Velocity (m/s)

- 0.0 to 0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- > 2.0

Drawn By:	BG	**Date:**	08/08/2024
Checked By:	EH	**Date:**	08/08/2024
Approved By:	EH	**Date:**	08/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	RoFSW 1% AEP Velocity		
File Name:	Exeter SFRA L2		





Legend

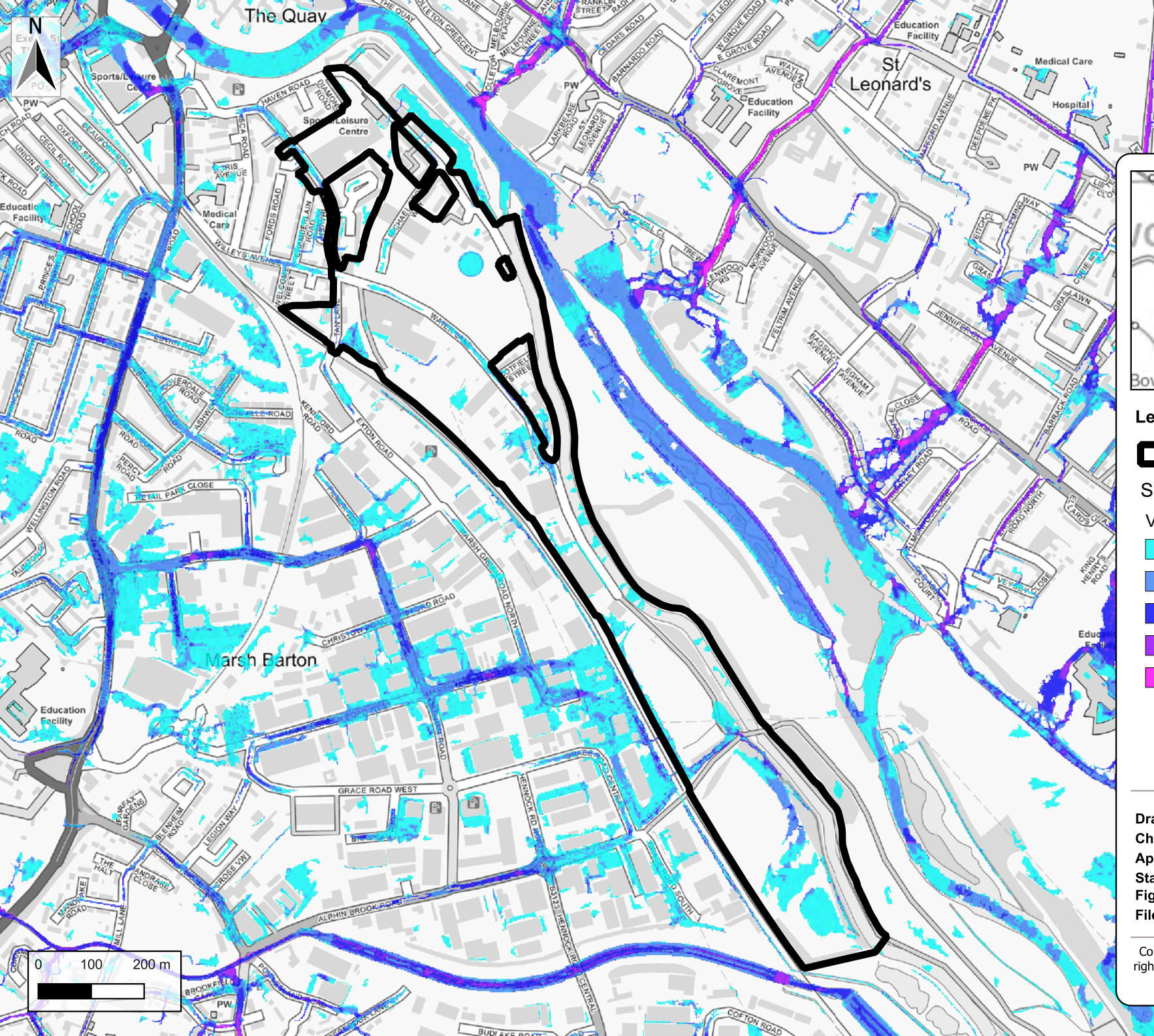
Site Location

Surface Water 0.1% AEP

Hazard Rating

- No hazard
- Very low hazard - Caution
- Danger for some
- Danger for most
- Danger for all

Drawn By:	BG	**Date:**	08/08/2024
Checked By:	EH	**Date:**	08/08/2024
Approved By:	EH	**Date:**	08/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	RoFSW 0.1% AEP Hazard		
File Name:	Exeter SFRA L2		



Legend

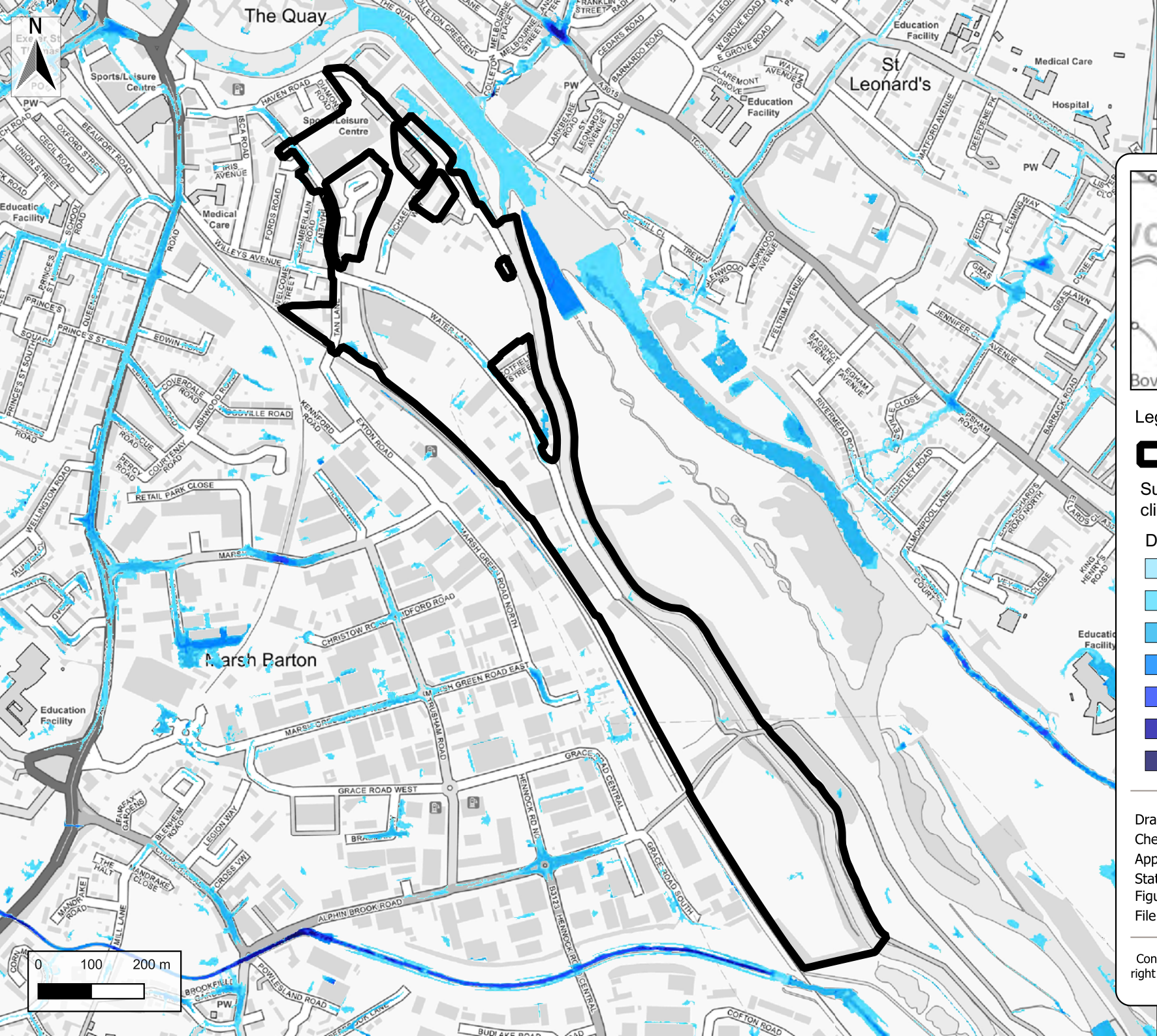
Site Location

Surface Water 0.1% AEP

Velocity (m/s)

- 0.0 to 0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- > 2.0

Drawn By:	BG	**Date:**	08/08/2024
Checked By:	EH	**Date:**	08/08/2024
Approved By:	EH	**Date:**	08/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	RoFSW 0.1% AEP Velocity		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

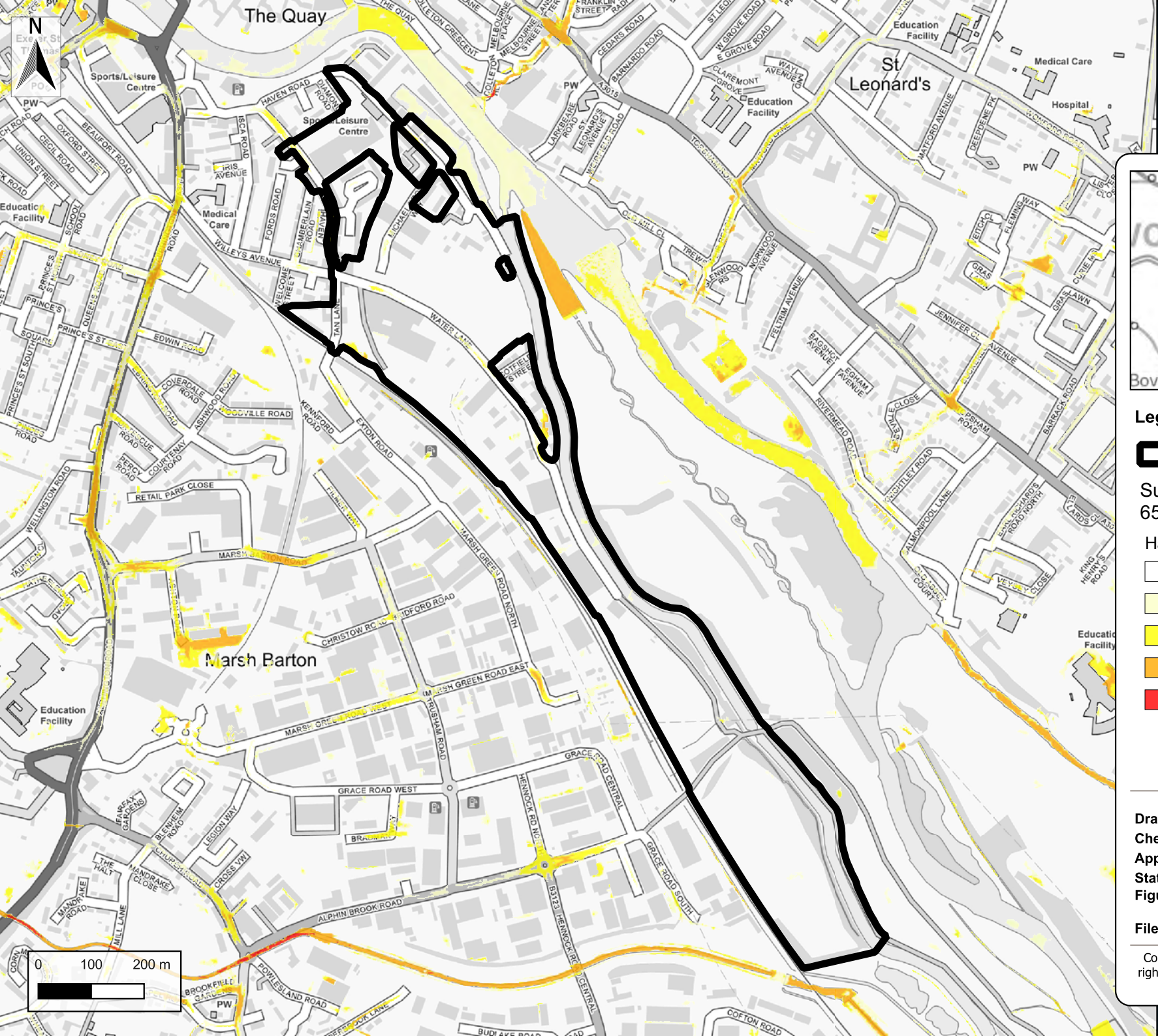
Site Location

Surface Water 3.3% AEP plus 65% climate change

Depth (m)

- < 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- 1.20 - 1.50
- > 1.50

Drawn By:	BG	Date:	30/10/2024
Checked By:	EH	Date:	30/10/2024
Approved By:	EH	Date:	30/10/2024
Status:	S3	Revision:	P02
Figure Title:	RoFSW 3.3% plus CC depth		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

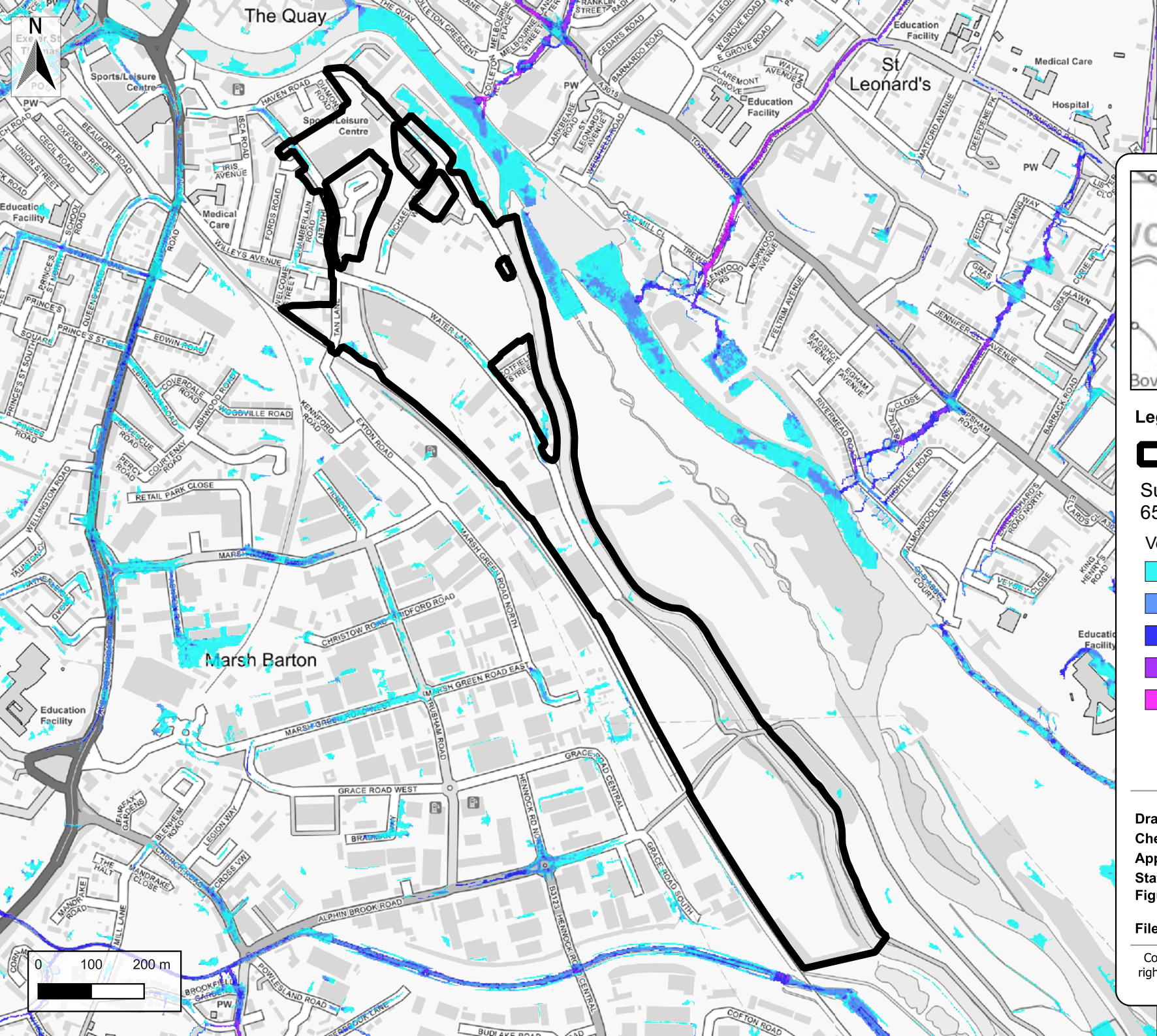
Site Location

Surface Water 3.3% AEP plus 65% climate change

Hazard Rating

- No hazard
- Very low hazard - Caution
- Danger for some
- Danger for most
- Danger for all

Drawn By:	BG	**Date:**	08/08/2024
Checked By:	EH	**Date:**	08/08/2024
Approved By:	EH	**Date:**	08/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	RoFSW 3.3% AEP + 65% CC Hazard		
File Name:	Exeter SFRA L2		



Legend

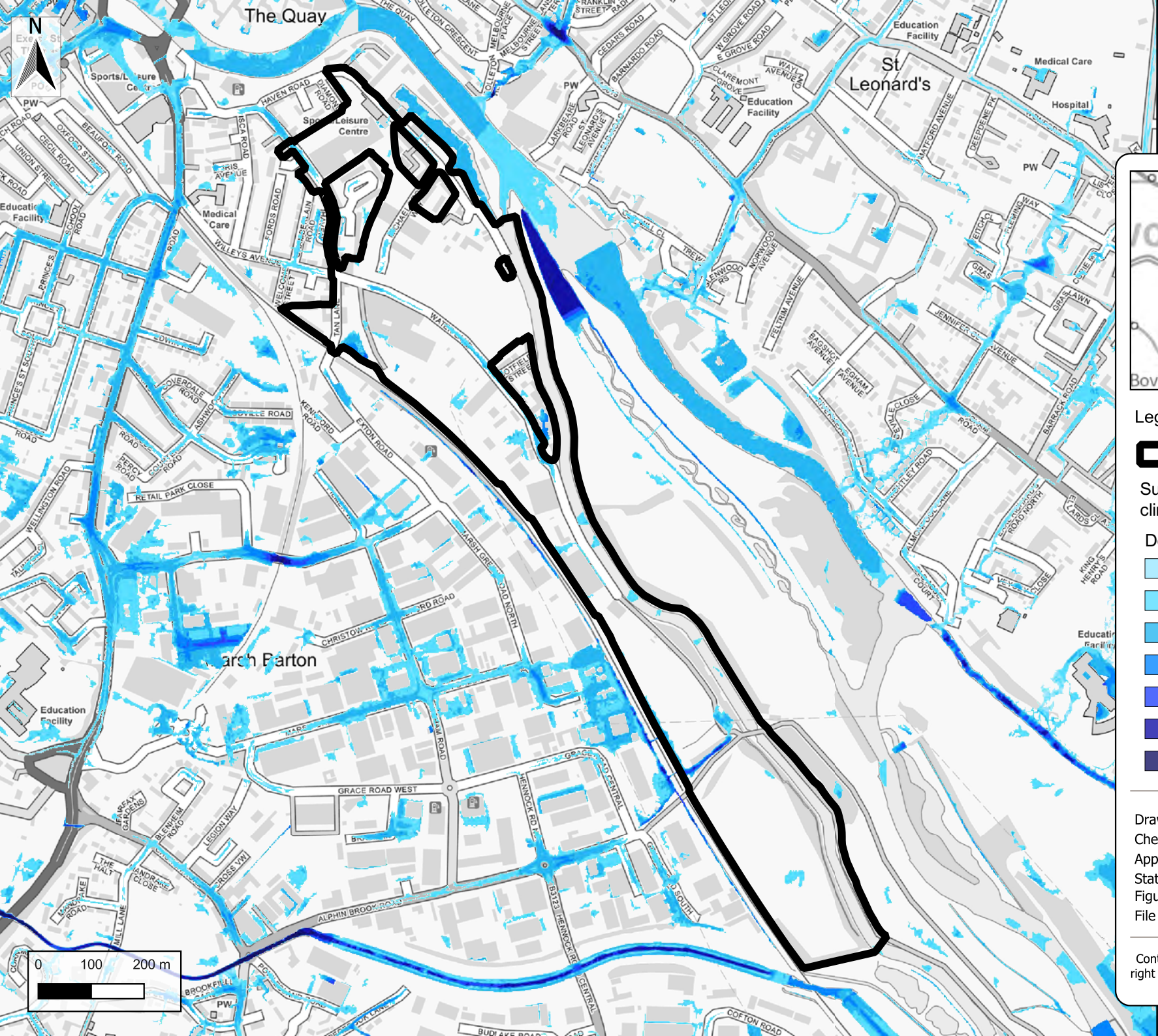
Site Location

Surface Water 3.3% AEP plus 65% climate change

Velocity (m/s)

- 0.0 to 0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- > 2.0

Drawn By:	BG	**Date:**	08/08/2024
Checked By:	EH	**Date:**	08/08/2024
Approved By:	EH	**Date:**	08/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	RoFSW 3.3% AEP + 65% CC Velocity		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

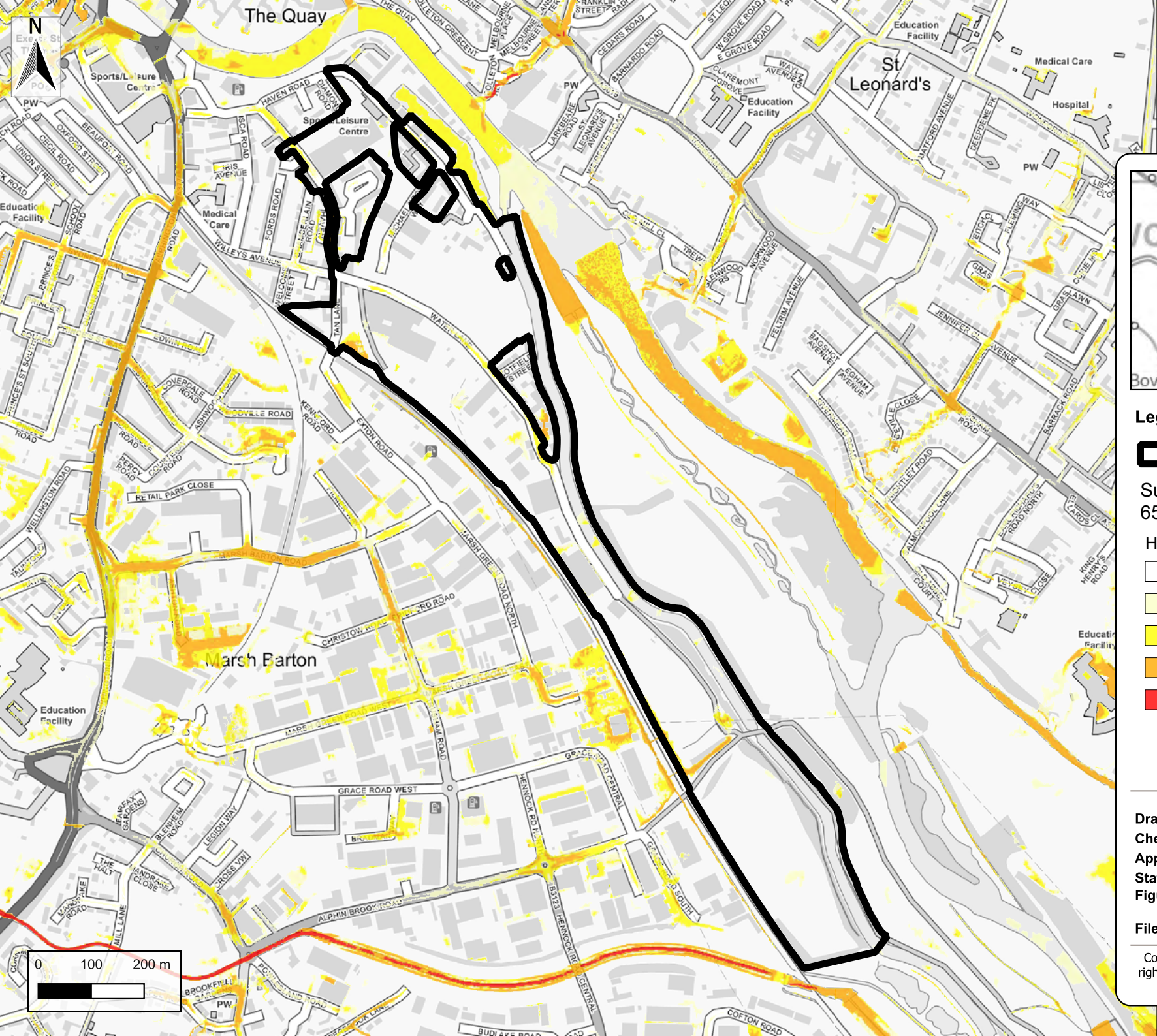
Site Location

Surface Water 1% AEP plus 65% climate change

Depth (m)

- < 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- 1.20 - 1.50
- > 1.50

Drawn By:	BG	Date:	30/10/2024
Checked By:	EH	Date:	30/10/2024
Approved By:	EH	Date:	30/10/2024
Status:	S3	Revision:	P02
Figure Title:	RoFSW 1% plus CC depth		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

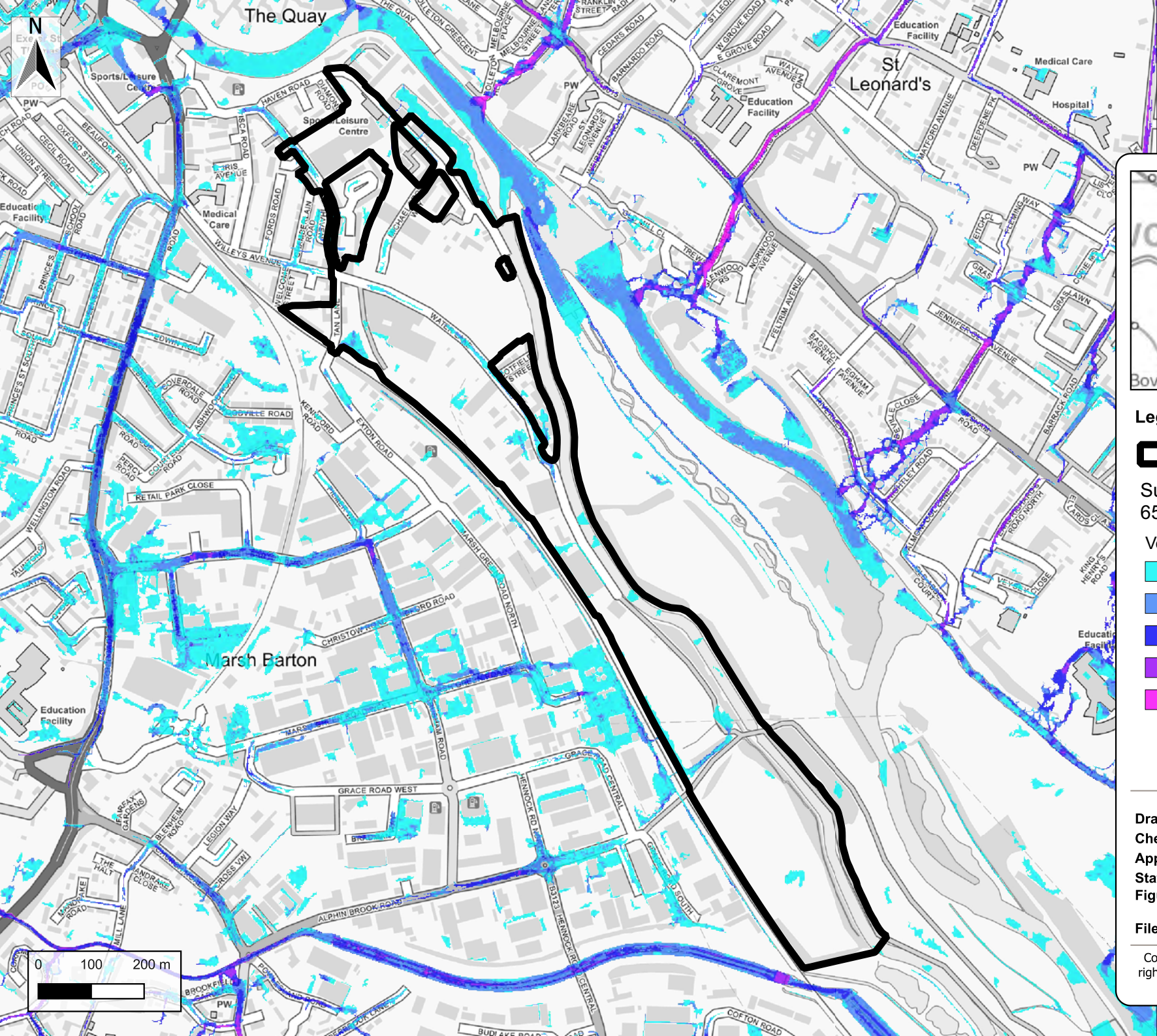
Site Location

Surface Water 1% AEP plus 65% climate change

Hazard Rating

- No hazard
- Very low hazard - Caution
- Danger for some
- Danger for most
- Danger for all

Drawn By:	BG	**Date:**	08/08/2024
Checked By:	EH	**Date:**	08/08/2024
Approved By:	EH	**Date:**	08/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	RoFSW 1% AEP + 65% CC Hazard		
File Name:	Exeter SFRA L2		



Exeter City Council

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Legend

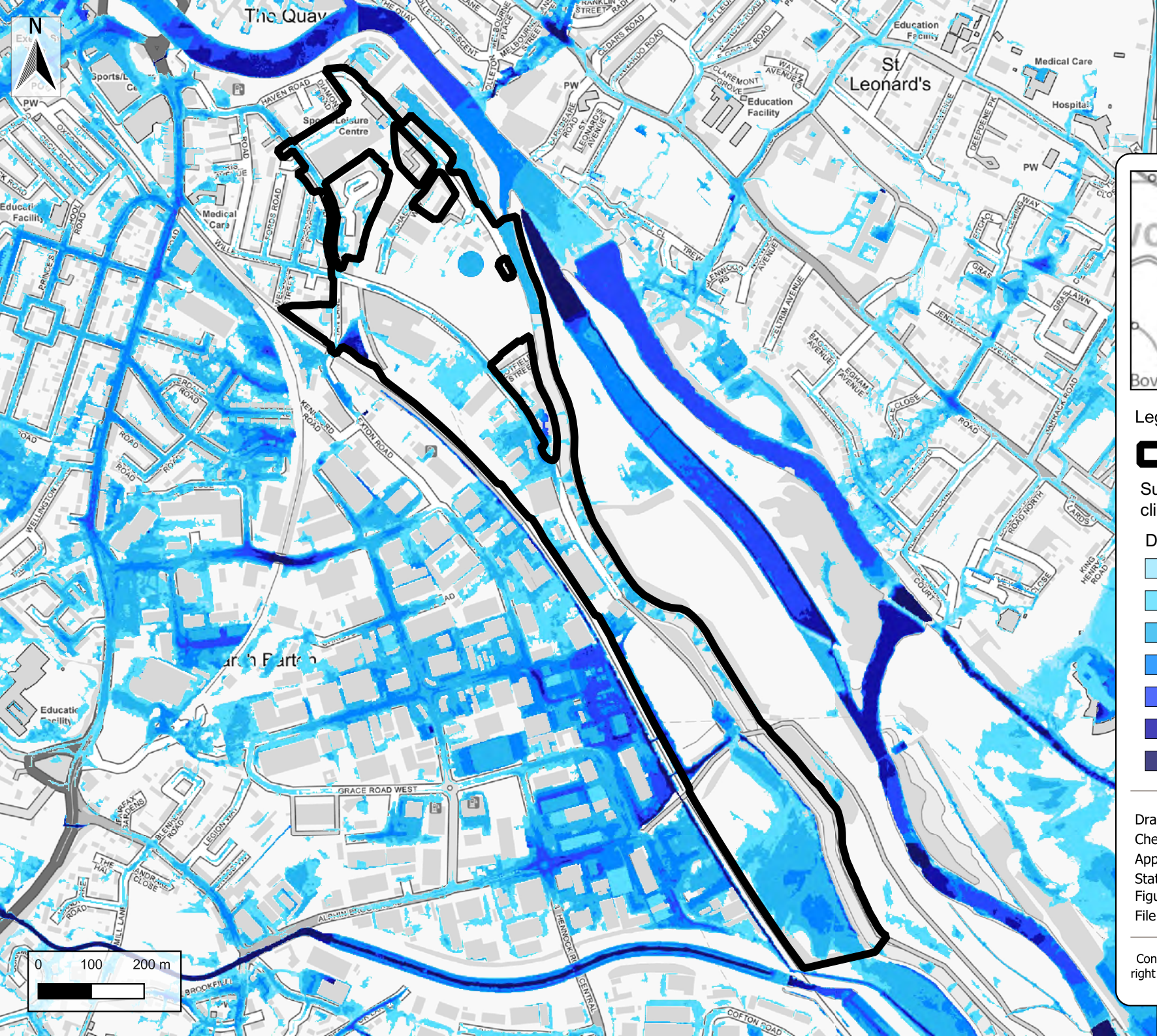
Site Location

Surface Water 1% AEP plus 65% climate change

Velocity (m/s)

- 0.0 to 0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- > 2.0

Drawn By:	BG	**Date:**	08/08/2024
Checked By:	EH	**Date:**	08/08/2024
Approved By:	EH	**Date:**	08/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	RoFSW 1% AEP + 65% CC Velocity		
File Name:	Exeter SFRA L2		



Exeter City Council

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Legend

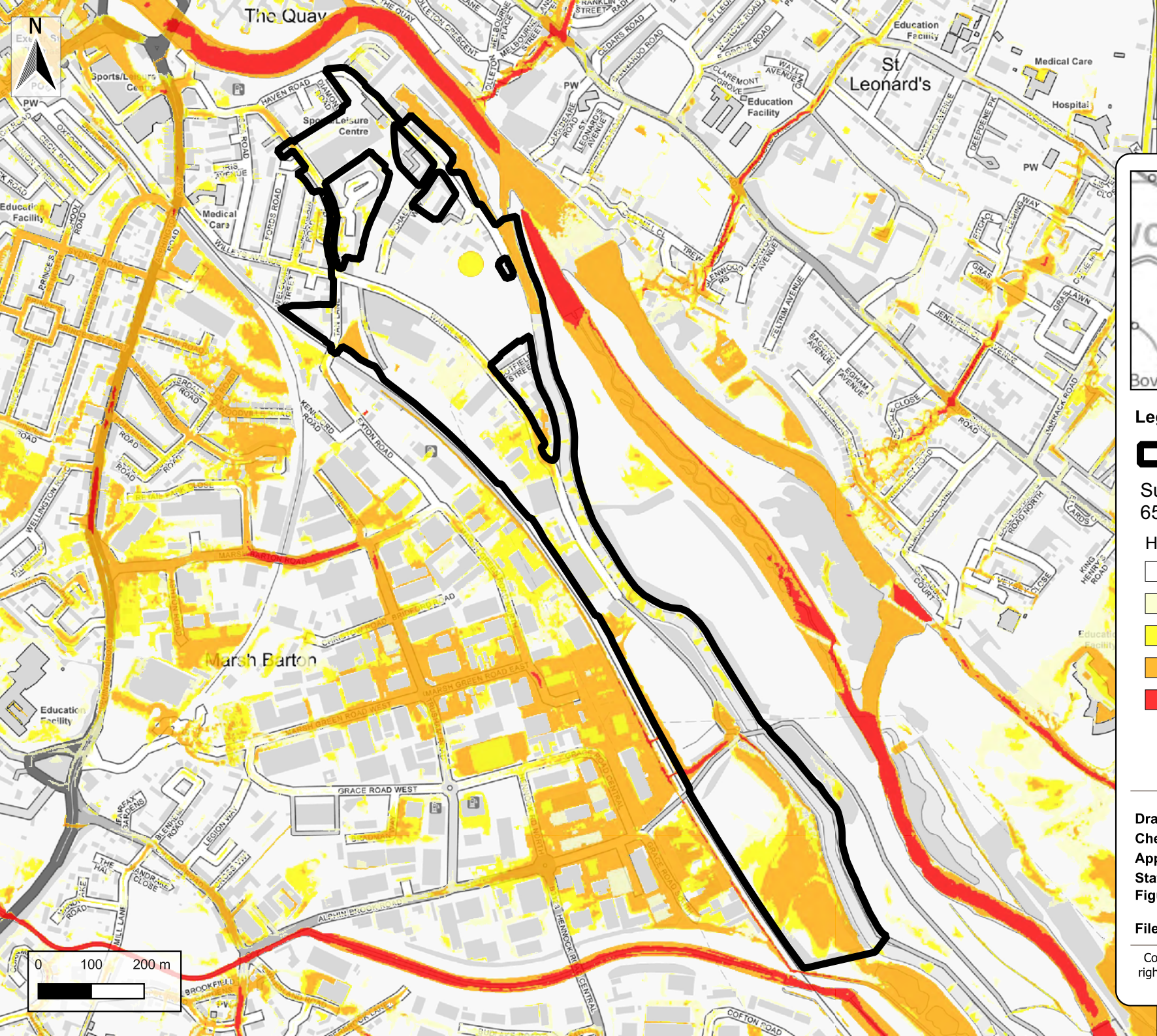
Site Location

Surface Water 0.1% AEP plus 65% climate change

Depth (m)

- < 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- 1.20 - 1.50
- > 1.50

Drawn By:	BG	Date:	30/10/2024
Checked By:	EH	Date:	30/10/2024
Approved By:	EH	Date:	30/10/2024
Status:	S3	Revision:	P02
Figure Title:	RoFSW 0.1% plus CC depth		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

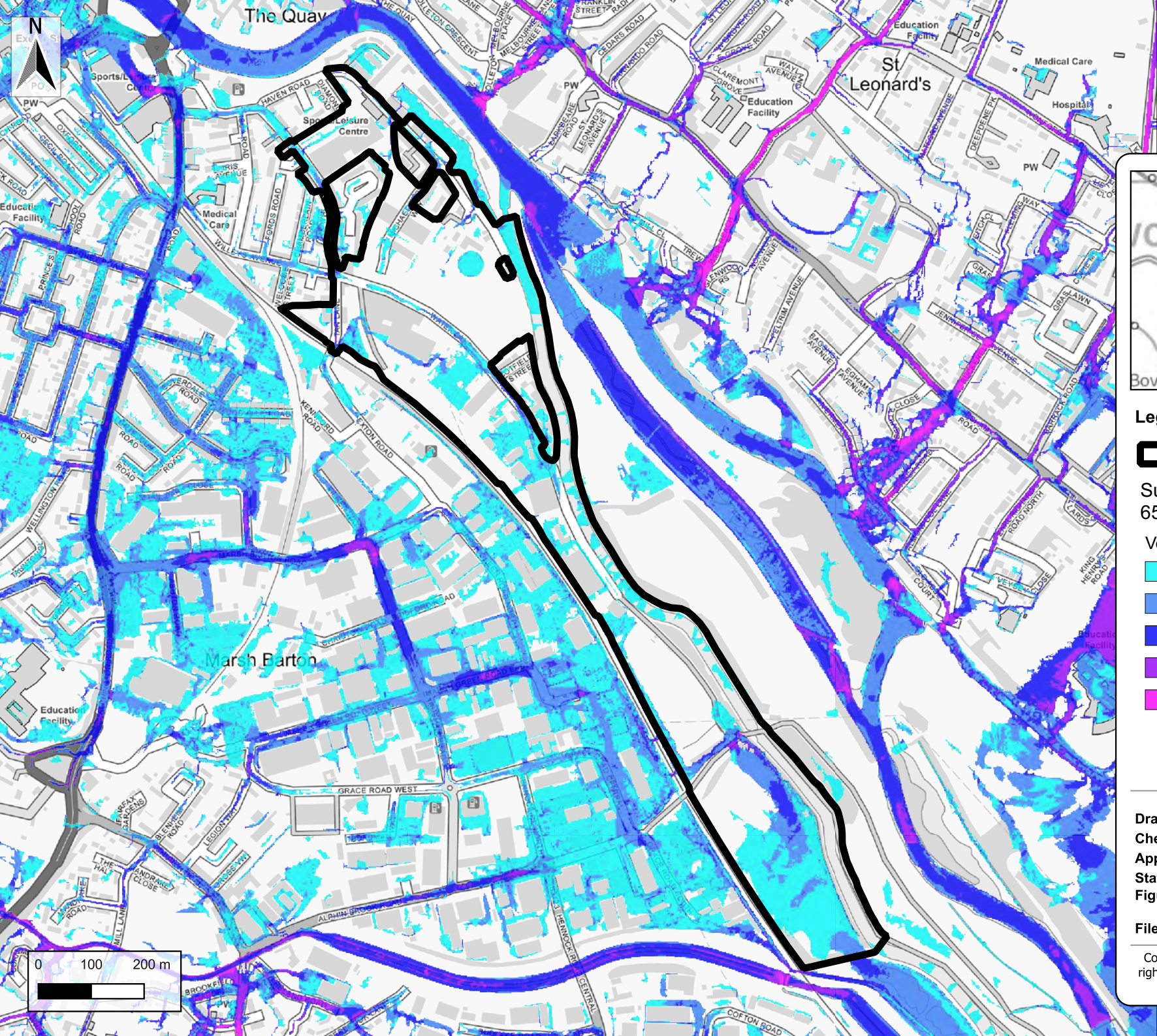
Site Location

Surface Water 0.1% AEP plus 65% climate change

Hazard Rating

- No hazard
- Very low hazard - Caution
- Danger for some
- Danger for most
- Danger for all

Drawn By:	BG	**Date:**	08/08/2024
Checked By:	EH	**Date:**	08/08/2024
Approved By:	EH	**Date:**	08/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	RoFSW 0.1% AEP + 65% CC Hazard		
File Name:	Exeter SFRA L2		



Exeter City Council

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Legend

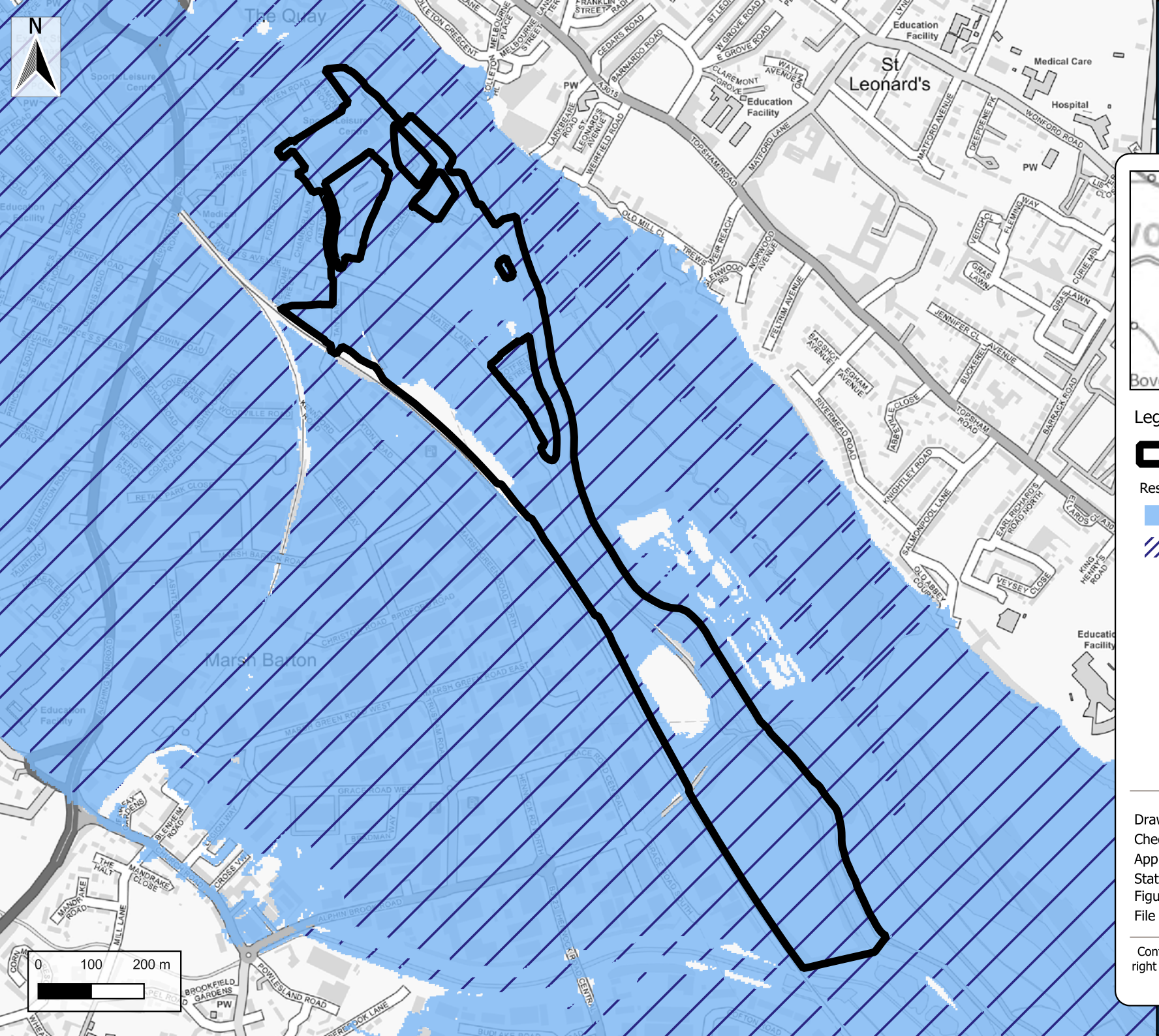
Site Location

Surface Water 0.1% AEP plus 65% climate change

Velocity (m/s)

- 0.0 to 0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- > 2.0

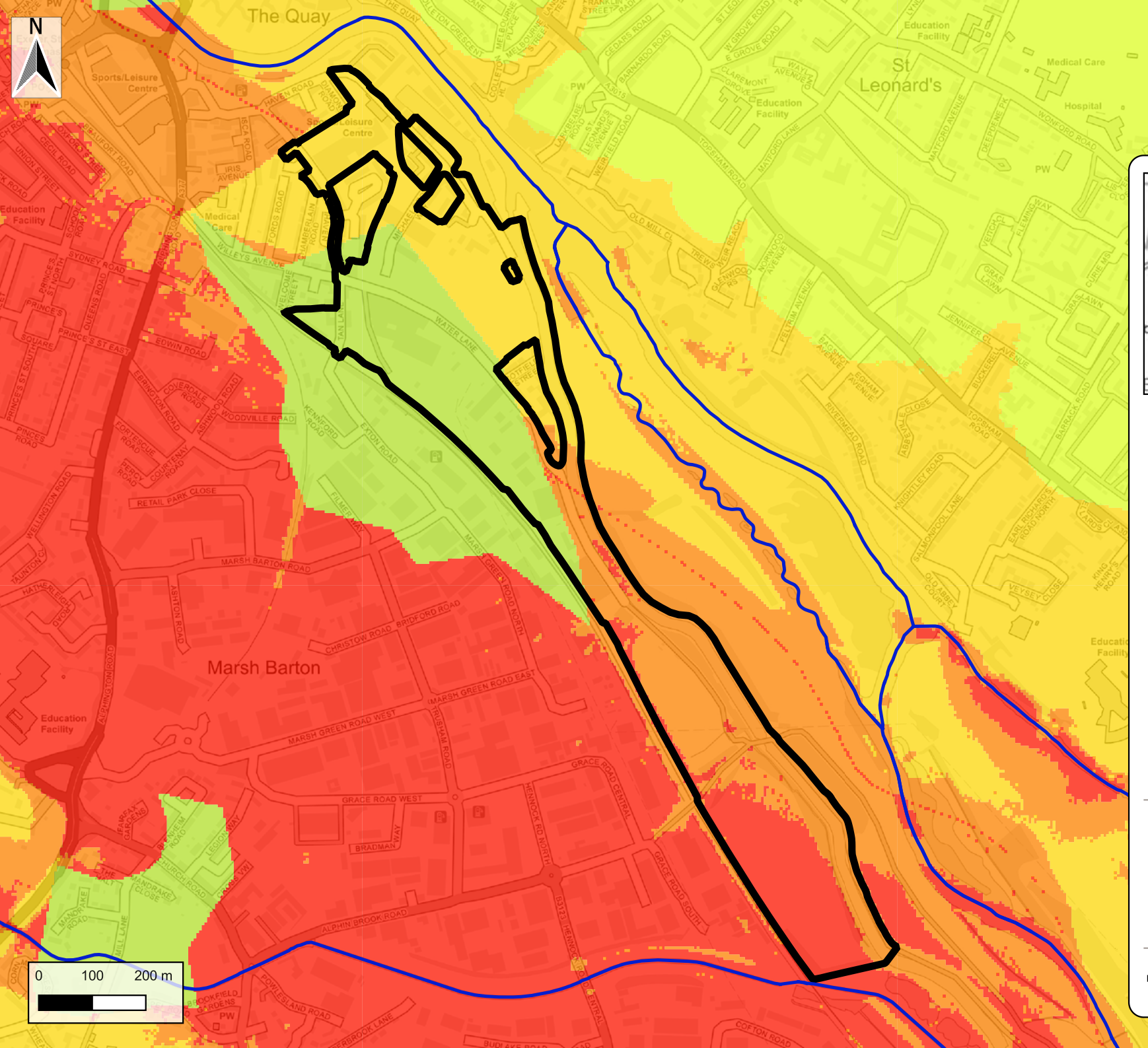
Drawn By:	BG	**Date:**	08/08/2024
Checked By:	EH	**Date:**	08/08/2024
Approved By:	EH	**Date:**	08/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	RoFSW 0.1% AEP + 65% CC Velocity		
File Name:	Exeter SFRA L2		



Legend

- Site Location
- Reservoir Flood Extents
  - Wet Day
  - Dry Day

Drawn By:	BG	Date:	25/10/2024
Checked By:	EH	Date:	25/10/2024
Approved By:	EH	Date:	25/10/2024
Status:	S3	Revision:	P02
Figure Title:	Reservoir Flood Risk		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

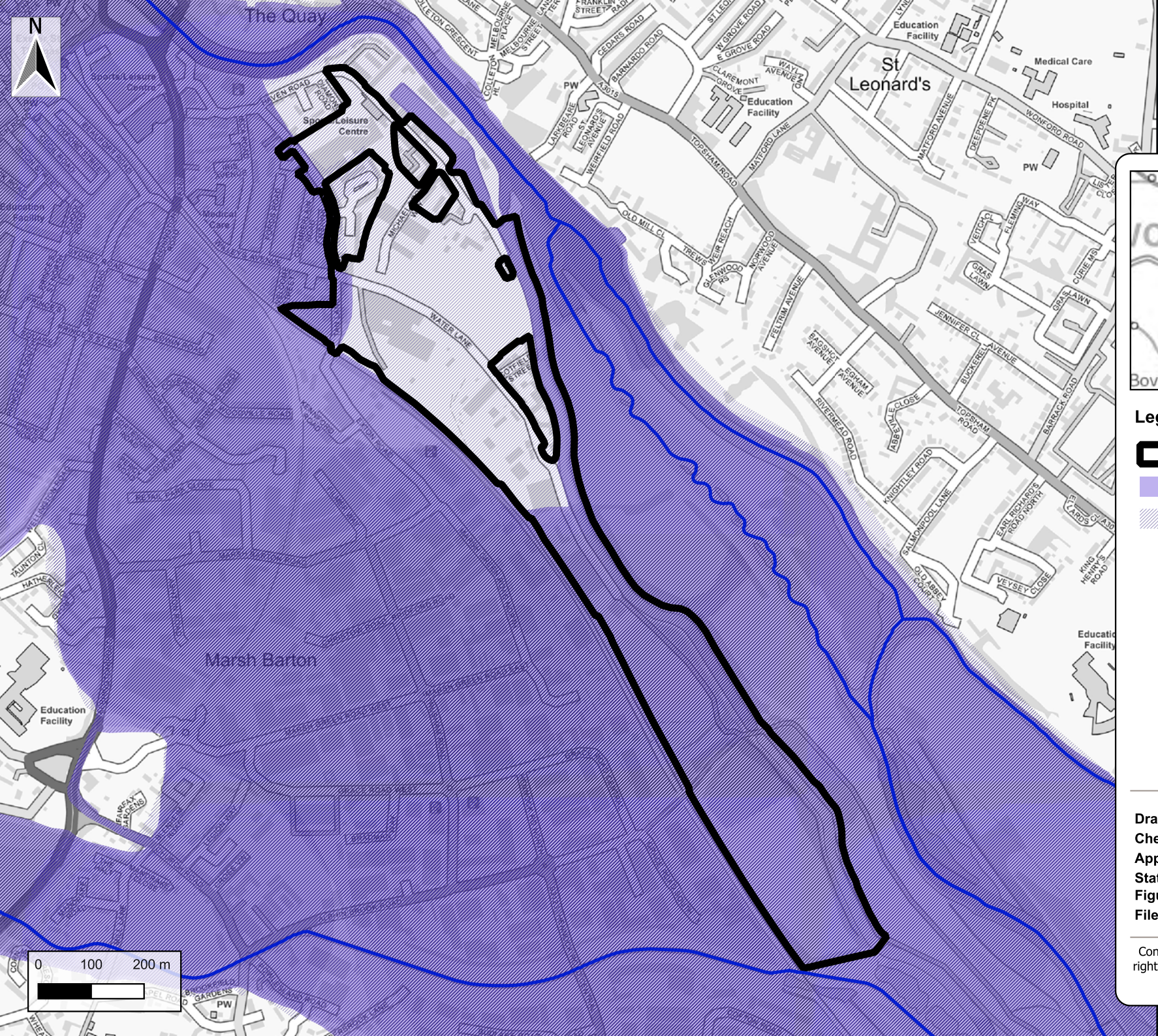
Legend

Site Location

Groundwater Levels Risk Map

- Groundwater levels ar either at or very near (within 0.025m of) the ground surface.
- Groundwater levels are between 0.025m and 0.5m below the ground surface.
- Groundwater levels are between 0.5m and 5m below the ground surface.
- Groundwater levels are at least 5m below the ground surface.
- No risk.

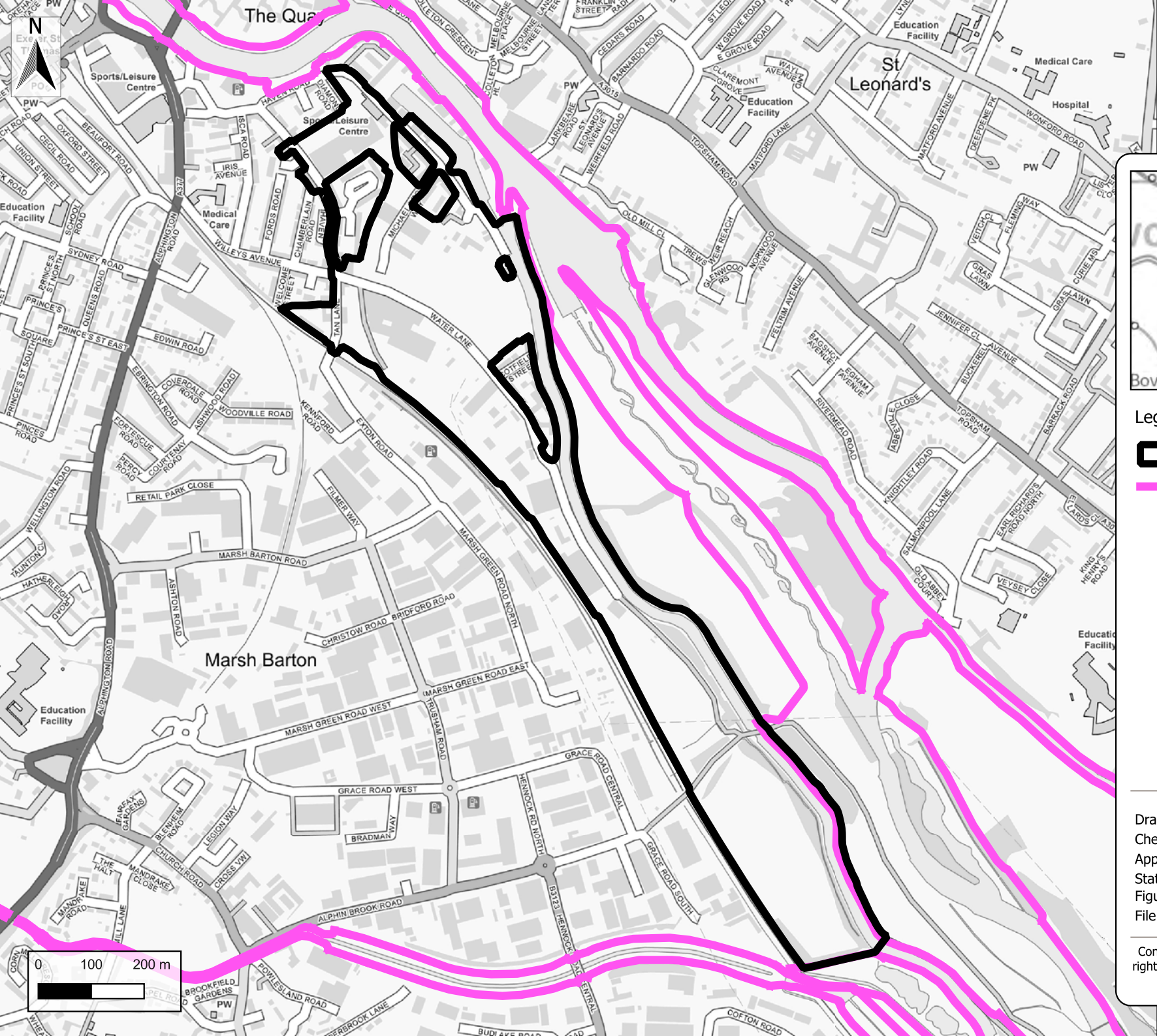
Drawn By:	BG	**Date:**	06/08/2024
Checked By:	EH	**Date:**	06/08/2024
Approved By:	EH	**Date:**	06/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	Groundwater		
File Name:	Exeter SFRA L2		



Legend

- Site Location
- Historic Flood Map
- Recorded Flood Outlines

Drawn By:	BG	**Date:**	06/08/2024
Checked By:	EH	**Date:**	06/08/2024
Approved By:	EH	**Date:**	06/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	Historic Flood Map		
File Name:	Exeter SFRA L2		



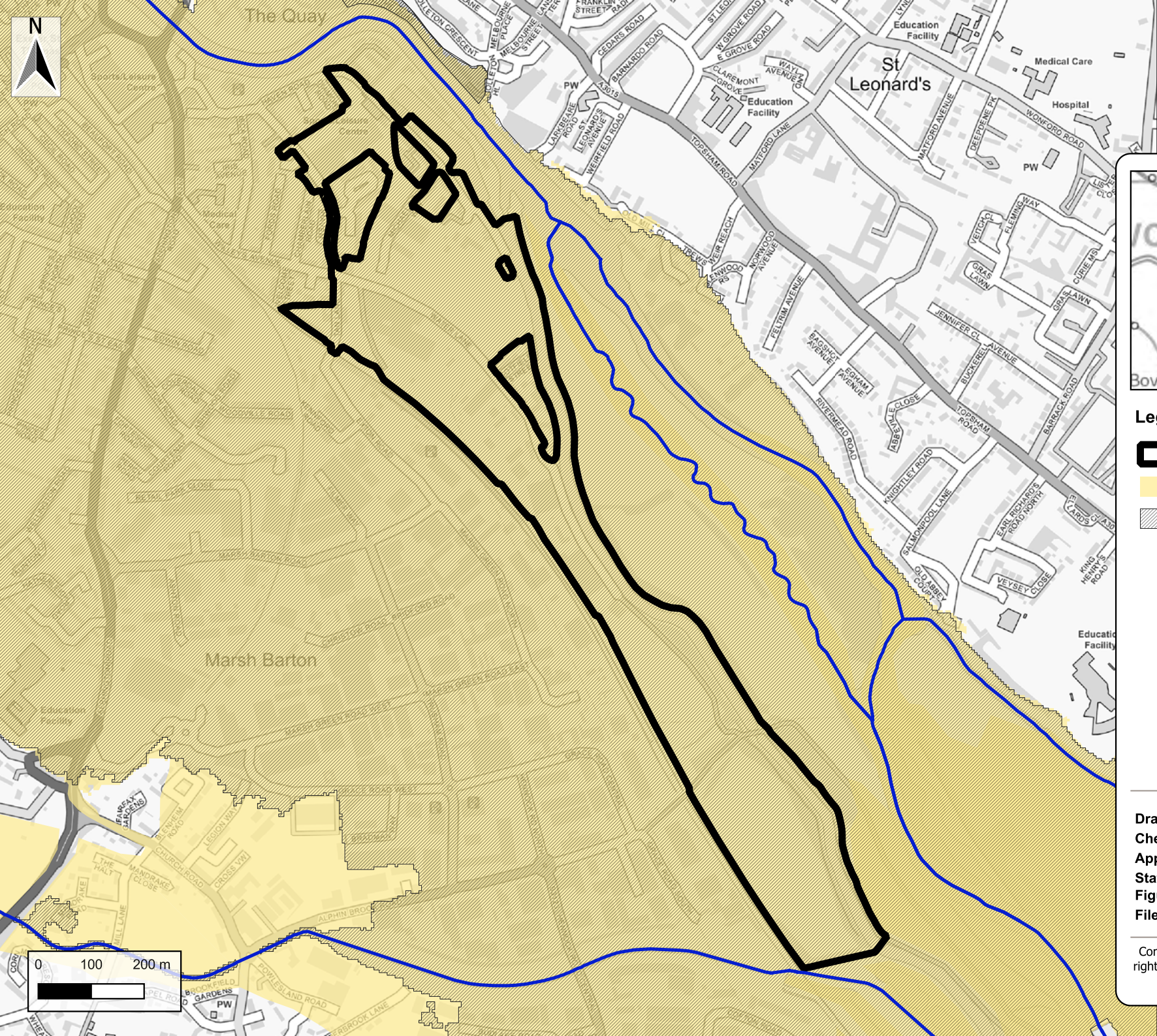
Exeter City Council

JBA consulting

Legend

- Site Location
- AIMS Spatial Flood Defences including standardised atrributes

Drawn By:	BG	Date:	22/10/2024
Checked By:	EH	Date:	22/10/2024
Approved By:	EH	Date:	22/10/2024
Status:	S3	Revision:	P01
Figure Title:	Flood Alert and Warning Areas		
File Name:	Exeter SFRA L2		



Exeter City Council

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Legend

- Site Location
- Flood Alert Areas
- Flood Warning Areas

Drawn By:	BG	**Date:**	06/08/2024
Checked By:	EH	**Date:**	06/08/2024
Approved By:	EH	**Date:**	06/08/2024
Status:	S3	**Revision:**	P01
Figure Title:	Flood Alert and Warning Areas		
File Name:	Exeter SFRA L2		