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ENVIRONMENT

Ethical Partnership
Land off North Road, West Boldon
South Tyneside
Flood Risk Assessment

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EXECUTIVE SUMMARY

This Flood Risk Assessment (FRA) has been prepared in accordance with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance. It has been produced on behalf of Ethical Partnership in respect of a planning application for a proposed residential development located on greenfield land, adjacent to North Road, West Boldon, (approximate grid reference: NZ348612).

This report demonstrates that the proposed built development is at an acceptable level of flood risk, subject to the recommended flood mitigation strategies being implemented.

On the northern boundary of the site is the River Don, classified by the Environment Agency as 'Main River' and flowing from south west to north east. Associated with the River Don are areas of Flood Zones 2 and 3, which have been confirmed through consultation with the Environment Agency to be based upon national generalised modelling. No modelled flood levels are therefore available for the watercourse. There are no records of there having been any flooding within the site. A small area downstream of the culvert that passes beneath the adjacent Highway (North Road) is shown to have previously been affected by flooding.

A conservative approach for setting a minimum finished floor level for the development has been taken, thus incorporating a freeboard allowance to account for climate change. It is proposed that a minimum floor level of 30.5m AOD is adopted for the development. Such a level would make the development approximately 2.5m above the flood level as inferred from the Flood Zone 2 extent and site levels. All of the proposed development is located within Flood Zone 1 (Low Probability) including highways and gardens.

Areas shown to have a low to high susceptibility to surface water flooding are located adjacent to the River Don and are commensurate with the Flood Zones. The majority of the site is shown to have a very low susceptibility of surface water flooding. There are no records within the SFRA of flooding from the pluvial source.

Correspondence with Northumbrian Water has identified a number of combined public sewers in the area. In the event of any exceedance of the sewers, flows are expected to be directed away from the development and be managed within the highway. There are no recorded incidents of sewer flooding in the West Boldon area.

A review of groundwater flooding has also been undertaken, with the underlying geology being such that groundwater emergence is unlikely. The SFRA mapping identifies the site and surrounding area to have a less than 25% probability of groundwater flooding and there are no recorded events in the area, therefore the overall risk from the source is considered to be low.

In compliance with the requirements of the NPPF, and subject to the mitigation measures proposed, the development could proceed without being subject to significant flood risk. Moreover, the development will not increase flood risk to the wider catchment area as a result of suitable management of surface water runoff discharging from the site.

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1. INTRODUCTION

1.1 This Flood Risk Assessment (FRA) has been prepared in accordance with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance. The FRA has been produced on behalf of Ethical Partnership in respect of a planning application for the proposed residential development off North Road, West Boldon.

1.2 This FRA is intended to support an outline planning application and as such the level of detail included is commensurate and subject to the nature of the proposals. Summary information is included as **Table 1.1**.

Table 1.1: Site Summary

Site Name	Land off North Road
Location	West Boldon, South Tyneside
NGR (approx.)	NZ348612
Application Site Area (ha)	2.4 (approximately)
Development Type	Residential
Flood Zone Classification	Flood Zones 1, 2 and 3
NPPF Vulnerability	More Vulnerable
Environment Agency Office	North East (Tyneside-Newcastle)
Lead Local Flood Authority	South Tyneside Council
Local Planning Authority	South Tyneside Council

Sources of Data

i. Topographical Survey by BWB Consulting, reference NRB-BWB-00-ZZ-DR-G-0001.
ii. Environment Agency LiDAR data.
iii. OS Explorer Series mapping.
iv. Environment Agency consultation and model information.
v. South Tyneside Level 1 Strategic Flood Risk Assessment.
vi. South Tyneside Joint Level 1 and 2 SFRA.
vii. South Tyneside Preliminary Flood Risk Assessment.
viii. Northumbrian Water Sewer Records.
ix. British Geological Survey Drift & Geology Maps.

Existing Site

1.3 The site is located off North Road, West Boldon. The site is bound to the north and west by the River Don, to the east by North Road and to the south by a residential area. The existing site is considered to be greenfield, comprising open agricultural fields with a building located within the east of the site.

1.4 A topographical survey of the existing site has been undertaken and is included as **Appendix 1**. The existing site is shown to generally fall in a north westerly direction towards the River Don. Existing site levels are shown to range from approximately 26.54m Above Ordnance Datum (AOD) in the south west to 39.23m AOD in the south east. The site's location is illustrated within **Figure 1.1**.

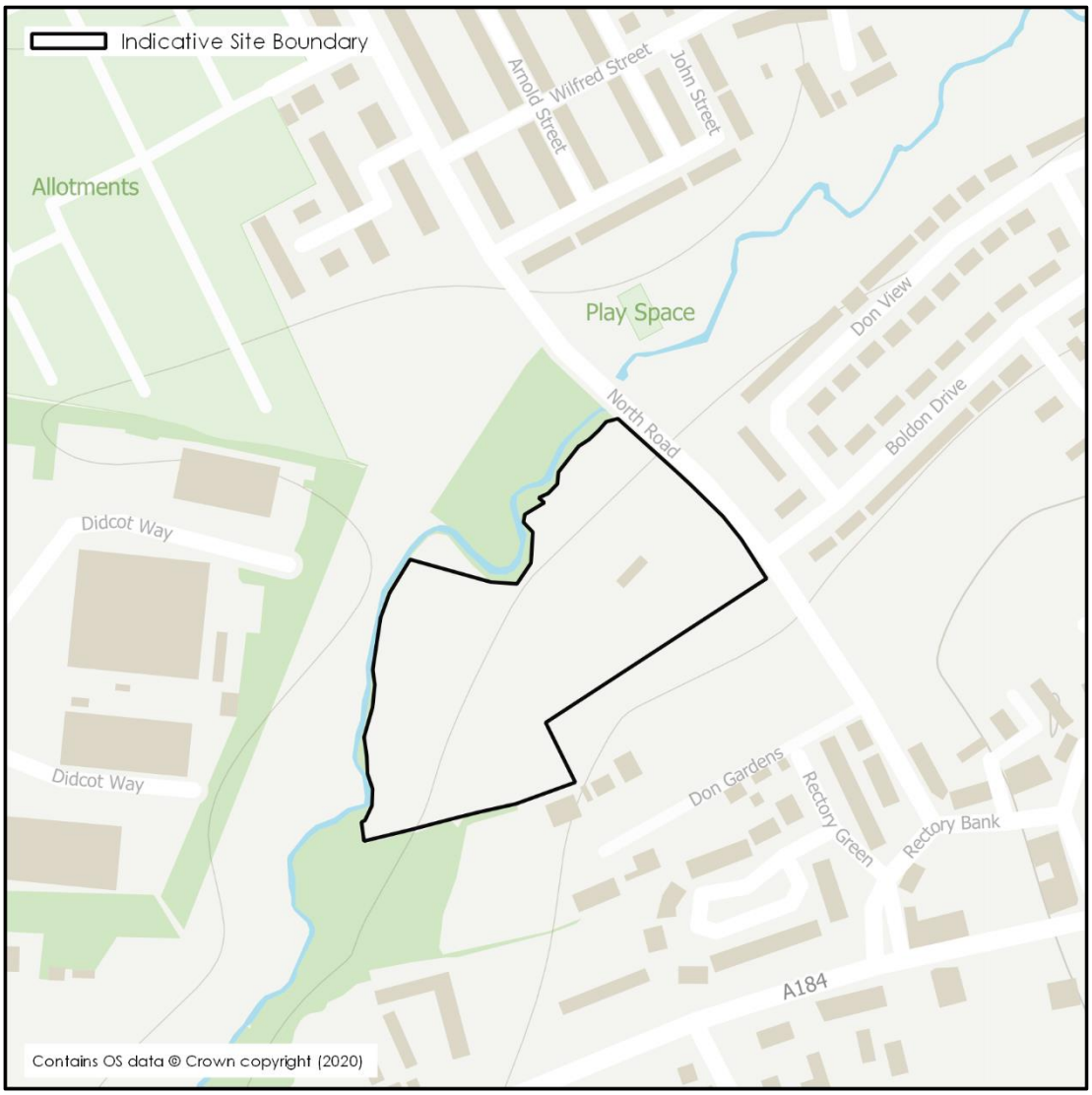

Figure 1.1: Site Location

Proposed Development

1.5 It is proposed that the site is developed to accommodate circa 50 dwellings comprising of individual houses and a single apartment block containing 9 flats. The existing building will be removed. The proposed site access and egress route is via North Road, to the north of the site.

1.6 A proposed development plan is included for reference as **Appendix 2**.

2. FLOOD RISK PLANNING POLICY

National Planning Policy Framework

2.1 The NPPF[1] sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. Planning Practice Guidance is also available online[2].

2.2 The Planning Practice Guidance sets out the vulnerability to flooding of different land uses. It encourages development to be located in areas of lower flood risk where possible and stresses the importance of preventing increases in flood risk off site to the wider catchment area.

2.3 The Planning Practice Guidance also states that alternative sources of flooding, other than fluvial (river flooding), should be considered when preparing an FRA.

2.4 The Planning Practice Guidance includes a series of tables that define Flood Zones (Table 1), the flood risk vulnerability classification of development land uses (Table 2) and 'compatibility' of development within the defined Flood Zones (Table 3).

2.5 This FRA is written in accordance with the NPPF and the Planning Practice Guidance.

Flood Map for Planning

2.6 With particular reference to planning and development, the Flood Map for Planning produced by the Environment Agency identifies Flood Zones in accordance with Table 1 of the Planning Practice Guidance.

2.7 Flood Zone 1 (Low Probability) is defined as land having less than a 1 in 1000 annual probability of river or sea flooding (<0.1% Annual Exceedance Probability).

2.8 Flood Zone 2 (Medium Probability) is defined as land having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1% AEP); or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1% AEP).

2.9 Flood Zone 3a (High Probability) is defined as land having a 1 in 100 or greater annual probability of river flooding (>1% AEP); or land having a 1 in 200 or greater annual probability of flooding from the sea (>0.5% AEP). This is represented by "Flood Zone 3" on the Flood Map for Planning.

2.10 Flood Zone 3b (The Functional Floodplain) is defined as land where water has to flow or be stored in times of flood. This is not identified or separately distinguished from Zone 3a on the Flood Map for Planning.

2.11 The majority of the site is shown to be located within Flood Zone 1, with a small area alongside the River Don comprising of Flood Zones 2 and 3, as shown in **Figure 2.1**.

[1] Revised National Planning Policy Framework, Ministry of Housing, Communities & Local Government, February 2019
[2] Planning Practice Guidance: https://www.gov.uk/government/collections/planning-practice-guidance

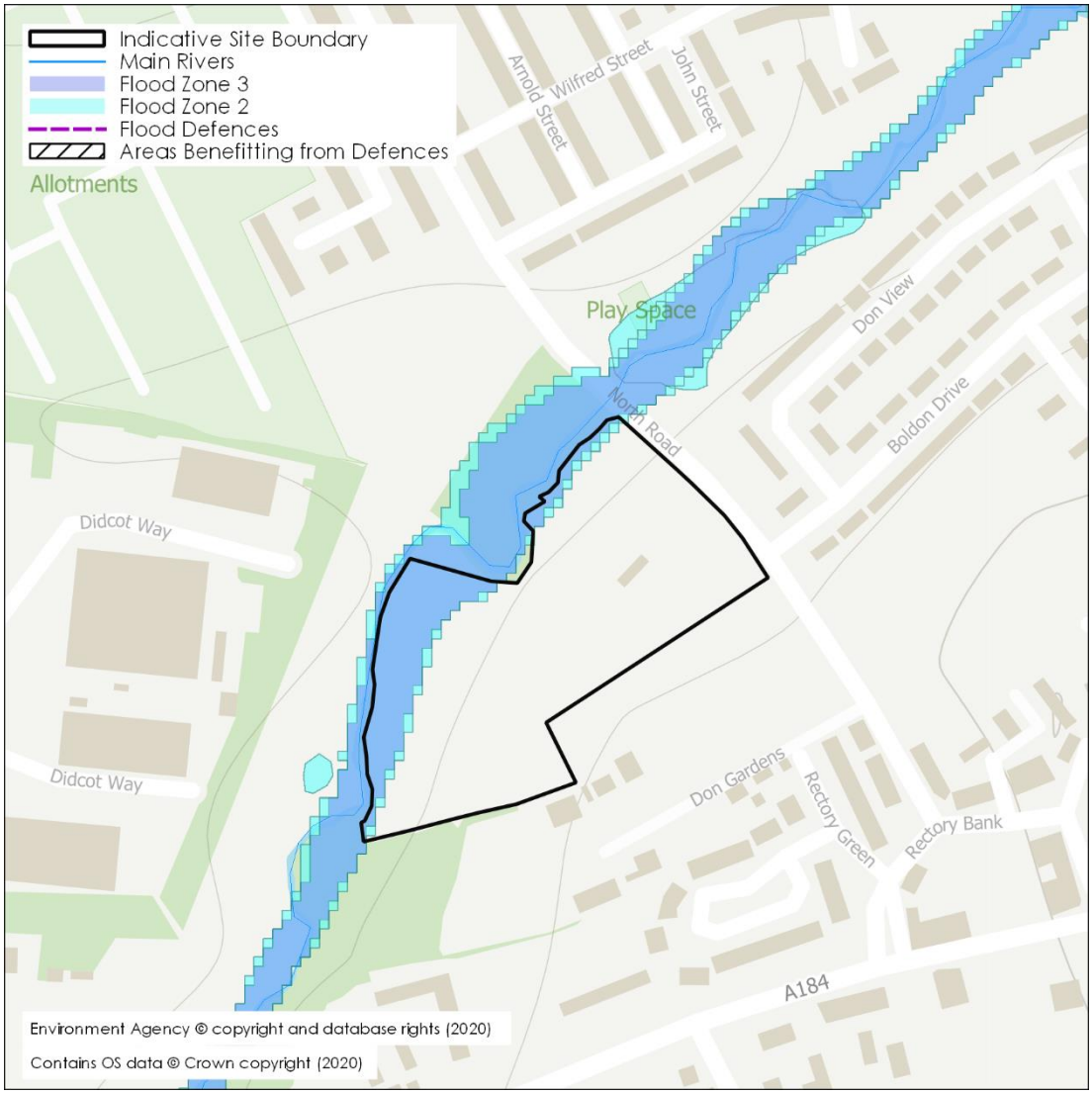

Figure 2.1: Flood Map for Planning

The Design Flood

2.12 The Planning Practice Guidance identifies that new developments should be designed to provide adequate flood risk management, mitigation, and resilience against the 'design flood' for their lifetime.

2.13 This is a flood event of a given annual flood probability, which is generally taken as fluvial (river) flooding likely to occur with a 1% annual probability (a 1 in 100 chance each year), or tidal flooding with a 0.5% annual probability (1 in 200 chance each year), against which the suitability of a proposed development is assessed and mitigation measures, if any, are designed.

Climate Change

2.14 Predicted future change in peak river flows caused by climate change are provided by the Environment Agency within their online guidance[3], with a range of projections applied to regionalised 'River Basin Districts'.

2.15 The River Don catchment falls within the Northumbria River Basin District. **Table 2.1** identifies the relevant peak river flow allowances from this river basin district.

Table 2.1: Peak River Flow Allowance for the Northumbria River Basin District

Allowance Category	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
H++	20%	35%	65%
Upper End	20%	30%	50%
Higher Central	15%	20%	25%
Central	10%	15%	20%

2.16 When determining the appropriate allowance for use in an FRA the Flood Zone classification, flood risk vulnerability and the anticipated lifespan of the development should be considered. **Table 2.2** provides a matrix summarising the Environment Agency's guidance on determining the appropriate allowances.

Table 2.2: Application of the Appropriate Climate Change Allowance

Flood Zone	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
1	Use the central allowance				Use none of the allowances
2 or 3a	Use the upper end allowance	Use the higher central and upper end to assess a range of allowances	Use the higher central and upper end to assess a range of allowances	Use the central and higher central to assess a range of allowances	Use the central allowance
3b	Use the upper end allowance	Development should not be permitted	Development should not be permitted	Development should not be permitted	Use the central allowance
*If development is considered appropriate when not in accordance with Flood Zone vulnerability categories, then it would be appropriate to use the upper end allowance.					

[3] Environment Agency, Flood risk assessments: climate change allowances: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#table-1

2.17 The site is located partially within Flood Zones 2 and 3, the proposed development is classified as 'More Vulnerable' and it has an anticipated lifespan of over 60 years. Therefore, the Central and Upper End allowances for the '2080s' epoch will be considered.

2.18 Therefore, to ensure the development is designed adequately for its lifetime an allowance of 25% will be applied to the design flood to identify minimum development levels, and an allowance of 50% will be applied to the design flood to check the resilience of the development levels.

2.19 The extreme climate change scenarios (H++) allowances are reserved for Nationally Significant Infrastructure Projects (NSIPs), new settlements and urban extensions, where an additional 'sensitive test' is required. Therefore, this does not need to be considered for this development.

Strategic Flood Risk Assessment

2.20 A Strategic Flood Risk Assessment (SFRA) is a study carried out by one or more local planning authorities to assess the risk to an area from flooding from all sources, now and in the future.

2.21 The South Tyneside Level 1 SFRA[4] has been reviewed in the production of this FRA. The level 1 element of the SFRA does not provide specific reference to the site but does provide an overview of flood risk to the general area. Information from the Level 1 SFRA will be referenced within **Section 3** where applicable.

2.22 A Level 2[5] has been produced to facilitate the application of Sequential and Exception Tests to screen allocated development sites. The proposed application site is referenced within the Level 2 SFRA. Information from the Level 2 SFRA will be referenced within **Section 3** where applicable.

Preliminary Flood Risk Assessment

2.23 A Preliminary Flood Risk Assessment (PFRA) is an assessment of floods that have taken place in the past and floods that could take place in the future. It generally considers flooding from surface water runoff, groundwater and ordinary watercourses, and is prepared by the Lead Local Flood Authorities.

2.24 The South Tyneside PFRA[6] considers flooding from surface water runoff, groundwater, ordinary watercourses and canals. There are no historical instances of flooding at the site included within the main text of the PFRA or as part of the accompanying mapping. The mapping however does identify an area to the north of North Road that has previously experienced flooding. Details on the magnitude, exact area affected, and source of flooding are unknown. Information from the PFRA will be referenced within this report where applicable.

[4] South Tyneside Council Level 1 Strategic Flood Risk Assessment (JBA Consulting, October 2018)
[5] South Tyneside Level 1 and 2 Strategic Flood Risk Assessment (South Tyneside Council, February 2011)
[6] South Tyneside Preliminary Flood Risk Assessment (South Tyneside Council, June 2011)

Local Flood Risk Management Strategy

2.25 A Local Flood Risk Management Strategy (LFRMS) is prepared by a Lead Local Flood Authority to help understand and manage flood risk at a local level.

2.26 The LFRMS aims to ensure that the knowledge of local flood risk issues is communicated effectively so that they can be better managed. The LFRMS also aims to promote sustainable development and environmental protection.

2.27 The South Tyneside LFRMS[7] has been reviewed and will be referenced within this report where applicable.

[7] South Tyneside Flood Risk and Coastal Management Strategy (South Tyneside Council, 2017)

3. POTENTIAL SOURCES OF FLOOD RISK

3.1 Flooding can occur from a variety of sources, or combination of sources, which may be natural or artificial. **Table 3.1** below identifies the potential sources of flood risk to the site in its current condition, and the impacts which the development could have in the wider catchment, prior to mitigation. These are discussed in greater detail in the forthcoming section. The mitigation measures proposed to address flood risk issues and ensure the development is appropriate for its location are discussed within **Section 4**.

Table 3.1: Pre-Mitigation Sources of Flood Risk

Flood Source	Potential Risk				Description
	High	Medium	Low	None	
Fluvial	X				Parts of the site are located in Flood Zones 2 and 3 associated with the River Don.
			X		There are no ordinary watercourses within the site or immediate surrounding area of the site.
Coastal				X	The site is not affected by the Coastal source.
Canals				X	There are no canals in the vicinity of the site.
Groundwater			X		The site is shown to fall within an area predicted to be at a low susceptibility to groundwater flooding.
Reservoirs and waterbodies			X		The site is shown to fall outside of the area at risk of reservoir failure.
Pluvial runoff			X		The site shown to have a low susceptibility to surface water flooding.
Sewers			X		Any exceedance flows from the surrounding public sewers are expected to flow away from the site.
Effect of Development on Wider Catchment			X		Development will not result in impedance or loss of the fluvial floodplain.
		X			The development will increase the area of impermeable surfaces leading to a potential increase in runoff.

Fluvial Flood Risk

3.2 Flooding from watercourses occurs when flows exceed the capacity of the channel, or where a restrictive structure is encountered, which leads to water overtopping the banks into the floodplain. This process can be exacerbated when debris is mobilised by high flows and accumulates at structures.

3.3 Located on the northern boundary of the site the River Don, which is classified as an Environment Agency 'Main River' and has areas of Flood Zone 2 (Medium Probability) and Flood Zone 3 (High Probability) associated with it. The watercourse flows from south west to north east. Both Flood Zones are similar in extent, with the Flood Zone 2 extent as expected being slightly greater.

3.4 The watercourse is shown to pass beneath North Road via a brick arch culvert which based upon the topographical survey is considered to have an opening diameter of approximately 1.5m. Although there are no levels shown on the topographical survey on the right bank directly adjacent to the watercourse, due to vegetation coverage levels in the area are thought to be at around 26m AOD.

3.5 Consultation with the Environment Agency, **Appendix 3,** has identified that the Flood Zone designation is based upon "nationalised generalised modelling". Therefore, there are no modelled flood levels that can be released as part of the site specific assessment.

3.6 There are no records held by the Environment Agency of the site having previously been affected by flooding, however it is noted that a small area to the west of the site, on the left bank, along with an area to the east of North Road have been affected by flooding, as shown in **Figure 3.1.**

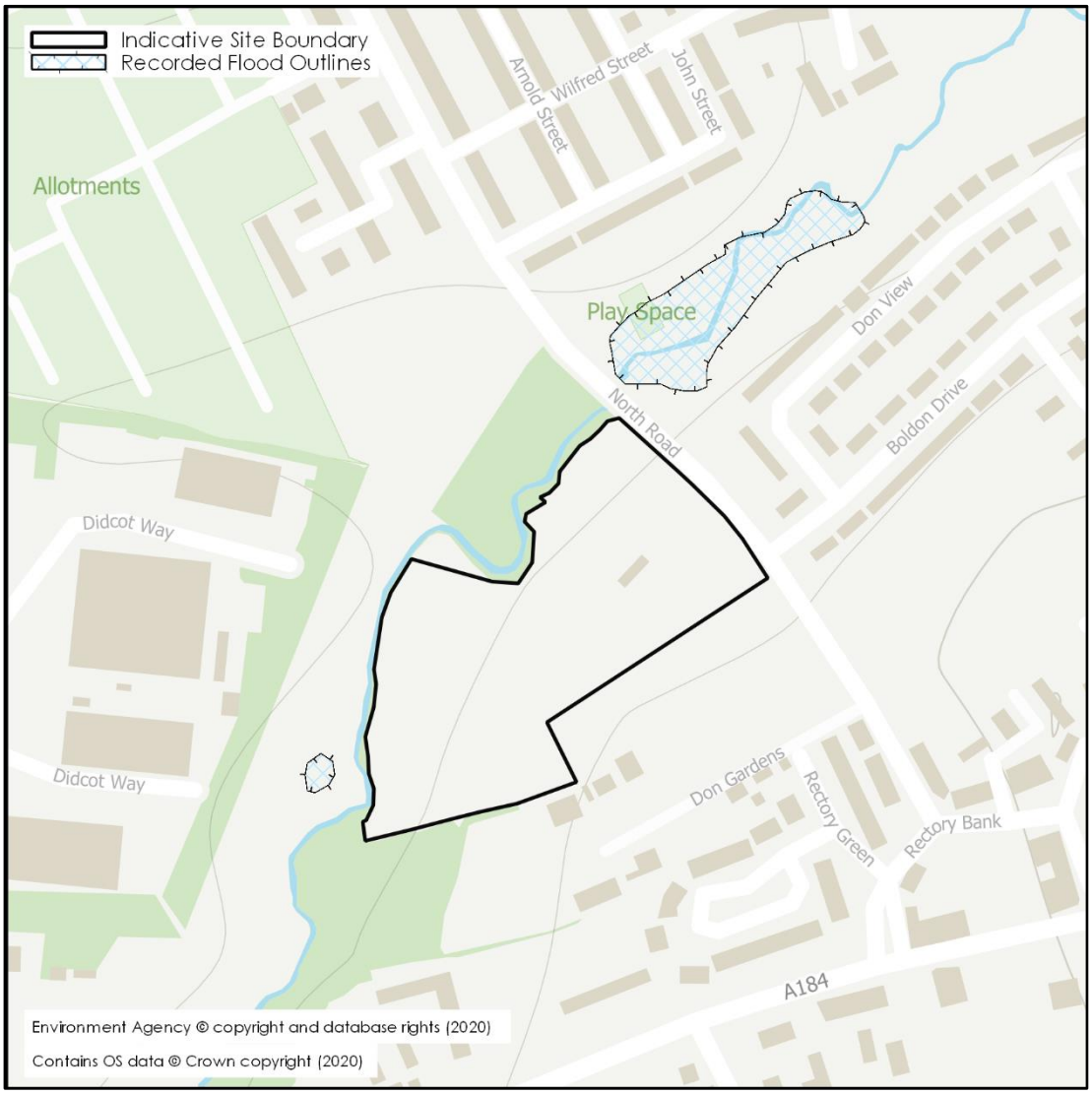

Figure 3.1: Recorded Flood Events

3.7 Environment Agency data identifies the source of the flooding was due to exceedance of the river channel, further details on the magnitude and duration of the flooding is unknown. Due to the direction in which the River Don flows it is not considered that a blockage of the culvert was a factor in the flooding, as the affected area is shown downstream of the culvert.

3.8 A residual risk is however considered to be present from the culvert.

3.9 Reviewing the Flood Zone 2 extents against the site levels identifies that at the greatest extent the Flood Zone sits approximately on the 28.0m AOD contour. Within the southern portion of the site southern portion of the site the extent is shown around the 27.5m AOD contour.

3.10 A series of cross sections through the site, **Figure 3.2** and **Figure 3.3**, extracted from 1m spatial resolution LiDAR data, along with the location of the sections, **Figure 3.4** is shown below.

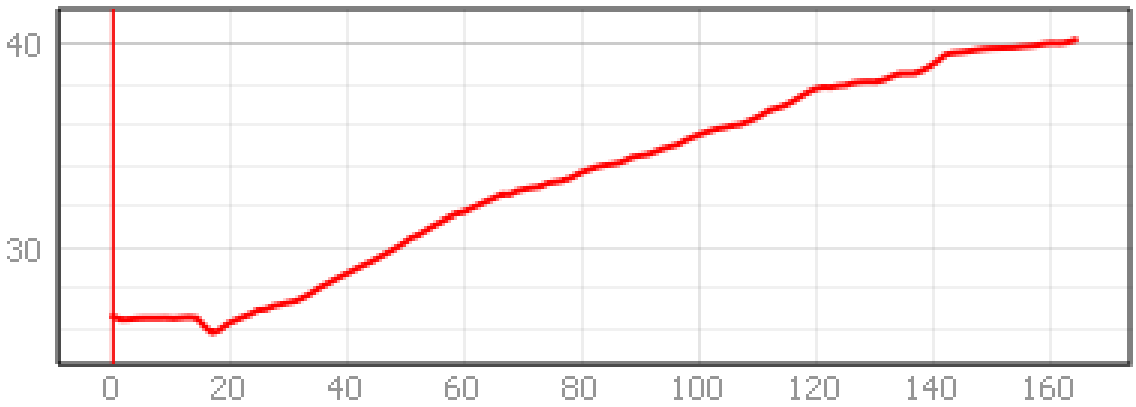

Figure 3.2: Cross Section Through Northern Portion of the Site as Extracted from LiDAR data

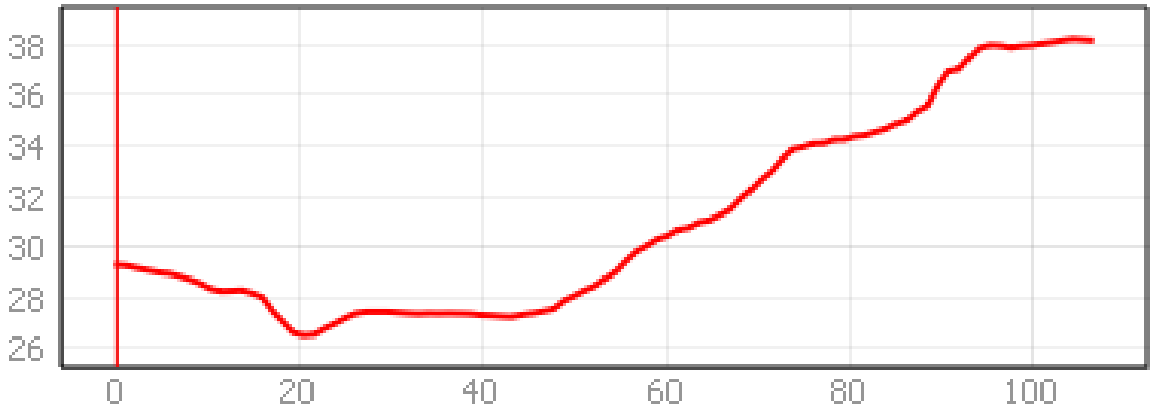

Figure 3.3: Cross Section Through Northern Portion of the Site as Extracted from LiDAR data.

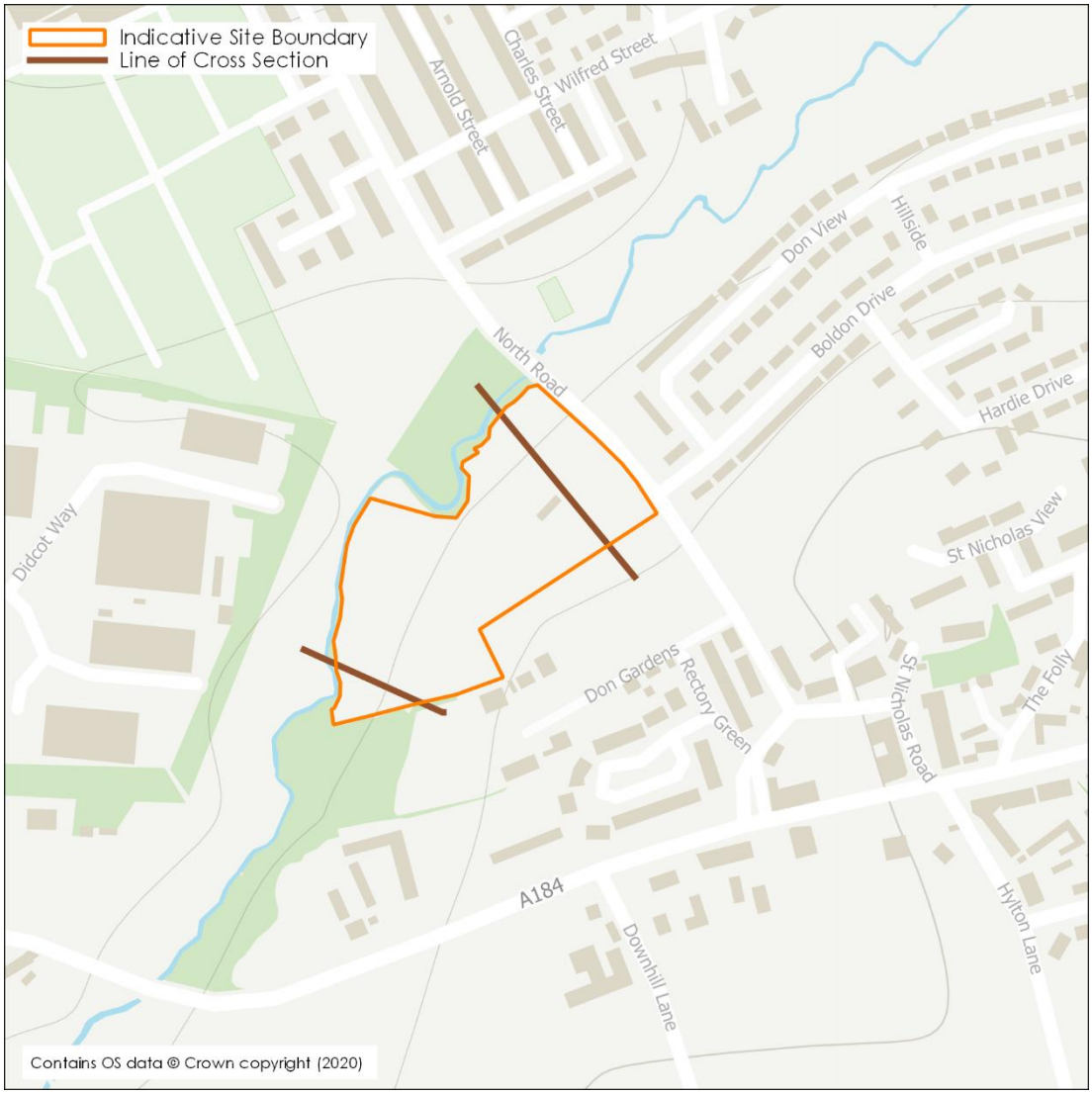

Figure 3.4: Location of Cross Sections through the site.

3.11 The cross sections confirm the site slopes steeply upwards from the watercourse, with levels ~~s~~on the left bank being considerably flatter. Therefore, in the event of any exceedance of the watercourse capacity flows are expected to be directed to the land on the left bank, to the north of the site. This is reflected by the Flood Zone 2 and 3 extents which are shown to be greater to the north.

3.12 The site access and egress via North Road is shown to be located entirely in Flood Zone 1.

3.13 The overall risk posed to a portion of the site from the fluvial source is considered to be high, further details on measures to mitigate the potential risk to the development, from the fluvial source are outlined further in **Section 4**.

Groundwater Flood Risk

3.14 Groundwater flooding occurs when the water table rises above ground elevations. It is most likely to happen in low lying areas underlain by permeable geology. This may be regional scale chalk or sandstone aquifers, or localised deposits of sands and gravels underlain by less permeable strata such as that in a river valley.

3.15 British Geological Survey (BGS) mapping identifies the underlying geology to be comprised of Pennine Upper Coal Measures - Sandstone, with superficial deposits of Till, Devensian – Diamicton and Alluvium – Clay, Silt, Sand and Gravel, along with some area shown to have superficial deposits of Pelaw Clay Member.

3.16 The underlying bedrock aquifer is identified as 'Principal' aquifer. These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

3.17 The site is shown to be on the edge of a superficial deposits aquifer classified as 'Secondary (undifferentiated)'. This is usually assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

3.18 Borehole logs from previous excavations held by the BGS identify the closest exaction on record being approximately 150m to the north of the site. A series of excavations were undertaken to a depth of up to 3.5m. No groundwater or any form of seepage was encountered during the excavations which identified a similar geology to that understood to be present within the site.

3.19 Groundwater susceptibility mapping with a spatial resolution of 1km^2, included within the PFRA identifies the site and surrounding area to have less than 25% probability of groundwater flooding.

3.20 The SFRA considers groundwater flooding not to be a major risk to the South Tyneside area, with no records of their being flooding from the source within the study area.

3.21 The overall risk from the groundwater source is considered to be low.

Flood Risk from Reservoirs & Large Waterbodies

3.22 Flooding can occur from large waterbodies or reservoirs if they are impounded above the surrounding ground levels or are used to retain water in times of flood. Although unlikely, reservoirs and large waterbodies could overtop or breach leading to rapid inundation of the downstream floodplain.

3.23 To help identify this risk, reservoir failure flood risk mapping has been prepared, this shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. The map displays a worst case scenario and is only intended as a guide.

3.24 The site is shown to be significantly removed from the area considered to be affected in the unlikely event of breaches on surrounding reservoirs.

3.25 There are no waterbodies within the site or immediate surrounding area.

3.26 The overall risk posed from the source is therefore considered to be low.

Pluvial Flood Risk

3.27 Pluvial flooding can occur during prolonged or intense storm events when the infiltration potential of soils, or the capacity of drainage infrastructure is overwhelmed leading to the accumulation of surface water and the generation of overland flow routes.

3.28 Risk of flooding from surface water mapping has been prepared, this shows the potential flooding which could occur when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead. An extract from the mapping is included as **Figure 3.5.**

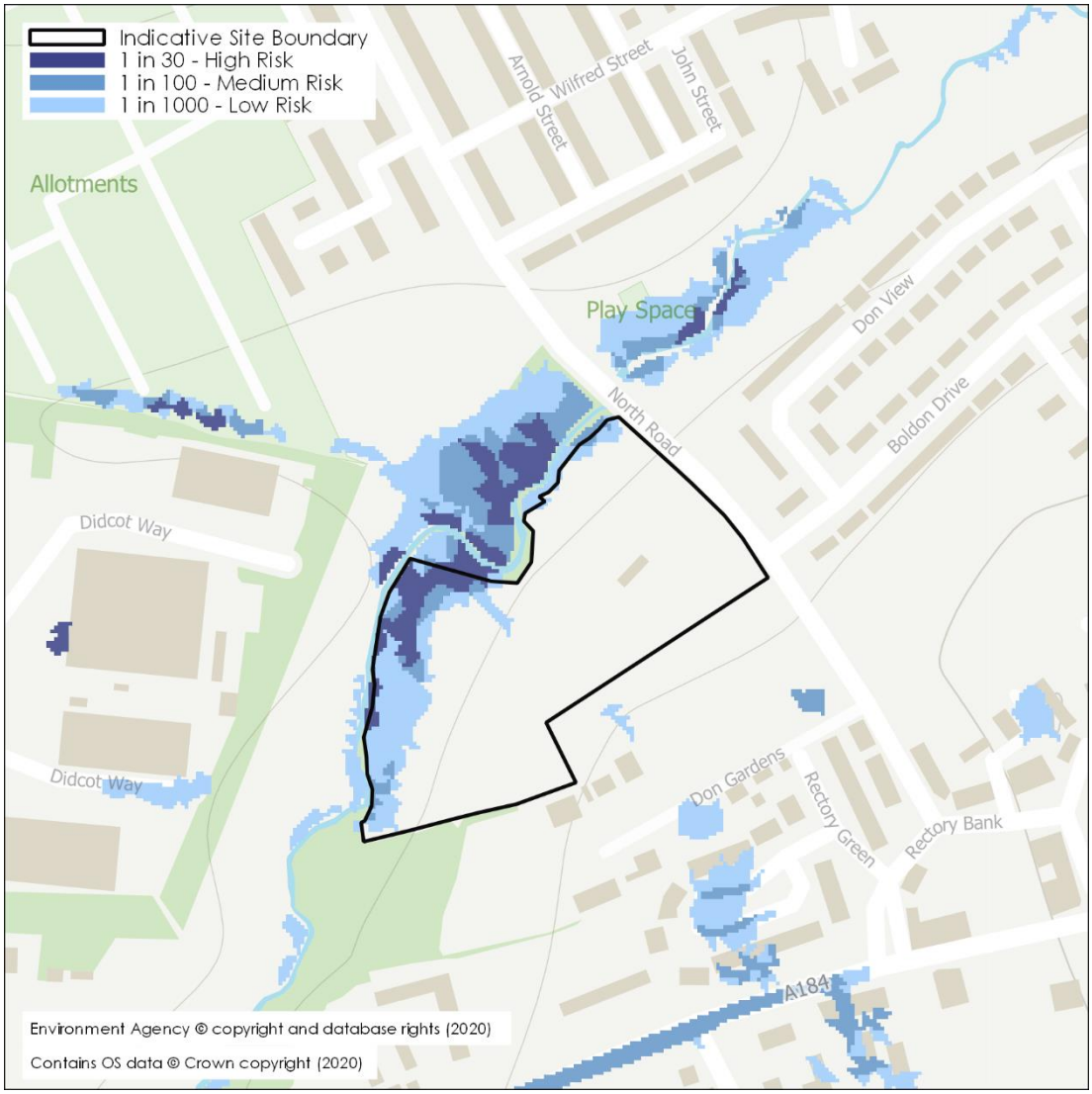

Figure 3.5: Flood Map for Planning

3.29 The majority of the site is shown to have a very low susceptibility to surface water flooding with the areas at low to high risk alongside the watercourse, commensurate with the Flood Zones. The site access and egress via North Road is shown to have a very low susceptibility to surface water flooding.

3.30 Depths are shown in places to be up to 900mm during the high risk 1 in 30 year event, with depths shown at 300mm during the low risk, 1 in 1000 year event.

3.31 There are no recorded events of flooding in West Boldon from the pluvial source within the SFRA.

3.32 The overall risk posed by the source is considered to be low.

Flood Risk from Sewers

3.33 Sewer flooding can occur when the capacity of the infrastructure is exceeded by excessive flows, or as a result of a reduction in capacity due to collapse or blockage, or if the downstream system becomes surcharged. This can lead to the sewers flooding onto the surrounding ground via manholes and gullies, which can generate overland flows.

3.34 The Northumbrian Water sewer records, **Appendix 4,** identify a number of public sewers in the area.

3.35 Located approximately 50m south of the southern boundary of the site is a 300mm combined sewer that flows in a north easterly direction, before joining into a 450mm combined sewer located to the north of North Road.

3.36 The depth to invert of the 300mm diameter sewer is shown to be on average approximately 1.5m, as it runs adjacent to the site. The 450mm diameter sewer has an average depth to invert of approximately 3.0m.

3.37 Located on the left bank of the River Don is a surface water outfall with a 900mm diameter connection into it, thought to receive surface water runoff from the area to the north of the site.

3.38 In the event of the sewers located to the south and east of the site exceeding their capacity it is expected that flows would be managed by the highway and directed in a northerly direction, away from the site.

3.39 In the event that the outfall to the River Don became surcharged, it is expected the flows will back up before exceedance flows reaching the surface via the manholes upstream of the outfall. Flows are then likely to be directed east, towards the low-lying land on the opposite bank to the site.

3.40 There are no recorded incidents within the SFRA of flooding from the sewer source within West Boldon.

3.41 The overall risk posed to the site is considered to be low.

Effect of Development on Wider Catchment

Impedance of Flood Flows

3.42 The positioning of the development, including gardens outside of the floodplain is such that flood flows will not be impeded by the development.

Development Land Use/Drainage Considerations

3.43 The proposed development will lead to an increase in impermeable surfacing which in turn will lead to greater surface water runoff. An appropriate surface water drainage strategy will be implemented to manage this, as summarised in **Section 4**.

4. FLOOD RISK MITIGATION

4.1 **Section 3** has identified the sources of flooding which could potentially pose a risk to the site and the proposed development. This section of the FRA sets out the mitigation measures which are to be incorporated within the proposed development to address and reduce the risk of flooding to within acceptable levels.

Sequential Arrangement

4.2 The development has been sequentially arranged such that all built development, including the highways and gardens are located entirely within Flood Zone 1.

Development Levels

4.3 The nature of the hydraulic modelling associated with the River Don is such that a minimum finished floor level for the development cannot be proposed based directly on the data. However, the topography of the site is such that a minimum finished floor level of 30.5m AOD would be considered appropriate, as this would ensure development is located approximately 2.5m above the inferred 1 in 1000-year flood level.

4.4 With the proposed minimum finished floor level above the 1 in 1000 year inferred level discussed in **Section 3**, it is also thought to be an appropriate finished floor level when considering future climate change.

4.5 Ground levels should be profiled to encourage pluvial runoff and overland flows away from the built development and towards the nearest drainage point.

Safe Access and Egress

4.6 The site is accessed off North Road with access/egress routes to and from the site along with individual dwellings/apartment blocks being within Flood Zone 1 and at very low risk of flooding from pluvial sources. Therefore, safe access and egress is considered to be afforded.

Flood Resilient/Resistant Construction

4.7 The proposed conservative minimum finished floor level is such that flood resilient/resistant construction is not considered necessary. Furthermore, the layout of the site is such that gardens back onto the watercourse, thus providing a further buffer and level of protection.

Flood Contingency Plan and Evacuation Procedures

Flood Warning and Evacuation

4.8 The site is located in the Environment Agency Flood Alert area of 'Rivers Derwent, Team, Don and Estuarine tributaries'.

4.9 It is recommended that residents sign up to the Environment Agency Flood Alert service in order to get updates on potential flooding in the surrounding area.

Surface Water Drainage

4.10 To mitigate the development's impact on the current runoff regime it is proposed to incorporate surface water attenuation and storage as part of the development proposals.

4.11 Further information on the drainage approach is provided within the accompanying Sustainable Drainage Statement, reference NRB-BWB-ZZ-XX-RP-CD-0001_SDS.

4.12 In brief, the development will continue to discharge surface water to the local watercourse at the equivalent greenfield QBAR rate. Attenuated surface water storage will be provided in the form of below ground attenuation, with capacity for the 1 in 100-year storm with an additional 40% allowance for climate change.

Foul Water Drainage

4.13 It is proposed to drain used water from the development separately to surface water, with foul water expected to be pumped to the combined sewer adjacent to North Road.

4.14 Further information on the drainage approach is provided within the accompanying Sustainable Drainage Statement, reference NRB-BWB-ZZ-XX-RP-CD-0001_SDS.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 This FRA has been prepared in accordance with requirements set out in the NPPF and the associated Planning Practice Guidance. The FRA has been produced on behalf of Ethical Partnership in respect of a planning application for the proposed residential development off North Road, West Boldon.

5.2 This FRA is intended to support an outline planning application and as such the level of detail included is commensurate and subject to the nature of the proposals.

5.3 This report demonstrates that the proposed built development is at an acceptable level of flood risk, subject to the recommended flood mitigation strategies being implemented. The identified risks and mitigation measures are summarised within **Table 5.1**:

Table 5.1: Summary of Flood Risk Assessment

Flood Source	Risk & Proposed Mitigation Measures
Fluvial	A proportion of the site has been identified to fall within Flood Zones 3 and 2 of the River Don. The generalised nature of the hydraulic model for the area is such that a conservative approach for defining minimum finished floor levels has been taken. It is proposed that a minimum finished floor level of 30.5m AOD is adopted for the development. Such a level is also thought to be suitable for ensuring climate change is considered too as it is more than 2.5m above the inferred 1 in 1000-year flood level.
Residual Risks	External levels should be profiled to direct runoff away from built development and towards positively drained areas.
Impact of the Development	The built development has been located so as to not encroach or displace any floodplain. There will be no topographical changes within Flood Zones 2 and 3. Surface water runoff from the development will be controlled appropriately and discharged to the local watercourse at the equivalent greenfield QBAR rate. The foul water from the development will be discharged to the public sewer, most likely via a pumped solution.
This summary should be read in conjunction with BWB's full report. It reflects an assessment of the Site based on information received by BWB at the time of production.	

5.4 In compliance with the requirements of the NPPF, and subject to the mitigation measures proposed, the development could proceed without being subject to significant flood risk. Moreover, the development will not increase flood risk to the wider catchment area subject to suitable management of surface water runoff discharging from the site.

APPENDICES

Appendix 1: Topographical Survey

Station Coordinates			
Station Name	Eastings (m)	Northings (m)	Height (m)
BWB01	434863.347	561268.637	31.977
BWB02	434909.354	561215.659	37.188
BWB03	434834.031	561296.559	29.807



Notes

1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.
5. No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey station information below for on site control establishment.
6. All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via OS smart net.
7. All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space entry.
8. OS license number: 100022432

Legend

OS Buildings
Surveyed Buildings
Building
Wall
Kerb Channel Line
Top of Kerb
Edge of Surface
Top of Bank
Bottom of Bank
Canopy / Overhang
Line Marking
Centre Line
Watercourse Centre Line
Barrier
Fence
Gate
Overhead Powerline
Overhead Utilities
Contour Lines
Inspection Chamber
0.25 Flow direction and pipe diameter
1 Station and Name
BH 1 Monitoring Borehole
Tree / Bush / Sapling
Area of Vegetation/ Extent of Tree Canopy
Hedge
Body of Water
Body of Water from OS
+50.00 Spot Level
Assumed Surface Water Drainage Line
Surface Water Drainage Line

AP	Anchor Point	FBW	Fence Barbed Wire	LB	Litter Bin
BG	Back Gully	FCB	Fence Closed Board	LP	Lamp Post
BO	Bollard	FCL	Fence Chain Link	MH	Manhole
BS	Bus Stop	FEL	Fence Electric	Mkr	Service Marker
BT	British Telecom	FMP	Fence Metal Panel	PB	Post Box
C	Crest	FMR	Fence Metal Railing	PT	Post
CL	Cover Level	FOB	Fence Open Board	RE	Rodding Eye
CMP	Cable Marker Post	FPW	Fence Post & Wire	SP	Sign Post
		FSP	Fence Steel Palisade	ST	Stop Tap
CCTV	Security Camera	FWM	Fence Wire Mesh	SV	Stop Valve
CTV	Cable TV	FFL	Finished Floor Level	TCB	Telephone Call Box
DC	Drainage Channel	FP	Flagpole	THL	Threshold Level
		Gas	Gas		
DK	Drop Kerb	GV	Gas Valve	TL	Traffic Light
DP	Down Pipe	GY	Gully	TP	Telegraph Post
Elec	Electric	Ht	Height	TS	Traffic Signal
EP	Electricity Post	IC	Inspection Chamber	UTS	Unable to Survey
ER	Earth Rod	IFL	Internal Floor Level	WL	Water Level
FH	Fire Hydrant	IL	Invert Level (as a reduced level)	WM	Water Meter
FL	Floodlight			WO	Wash Out

Rev	Date	Details of issue / revision	Drw	Rev
P2	17.09.20	Trees added	SDS	DS
P1	07.08.20	First Issue	SDS	DS

Issues & Revisions

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- ☐ Nottingham | 0115 924 1100

www.bwbconsulting.com

Client
Ethical Planning (North East) Ltd

Project Title
Land off North Road, West Boldon

Drawing Title
Existing Site 2D Plan

Drawn:	S D Shreeves	Reviewed:	D. Smith
BWB Ref:	MCW2139	Date:	07.08.20
Scale@A1:	1:500		

Drawing Status
INFORMATION

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
NRB-BWB-00-ZZ-DR-G-001	S2	P2

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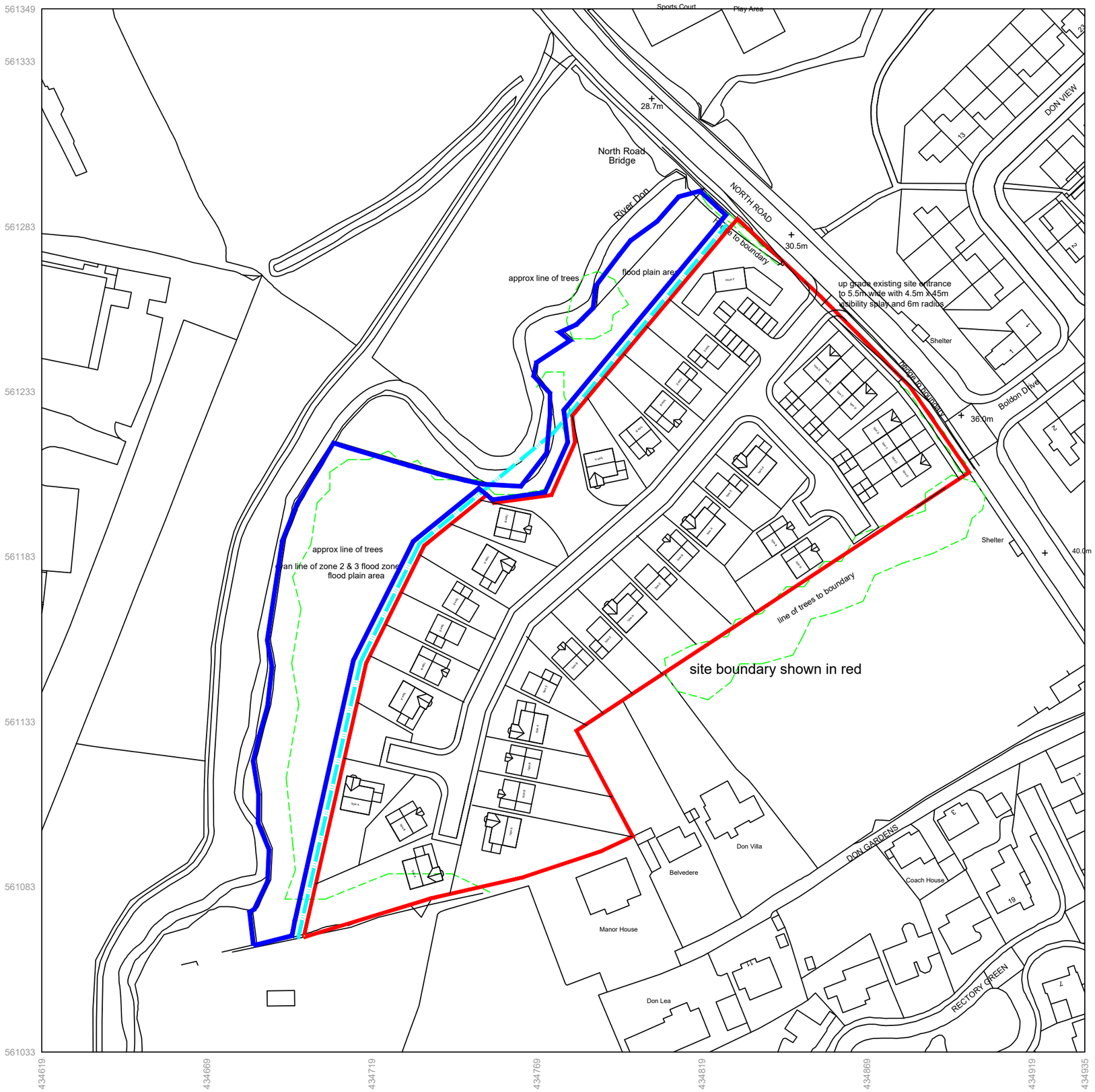
C:\Users\Daniel.smith\Desktop\Ongoing Work Dan\MCW2139 - West Boldon\NRB-BWB-00-ZZ-M2-G-001-Existing-Site-2D-Model.dwg

Appendix 2: Proposed Layout Plan



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Architects Limited
17 Killingworth Drive • Sunderland • SR4 8QQ• Tel: 07985442755
e-mail: info@cummingsarchitects.co.uk

PROJECT
Land North Road, West Boldon

DRAWING TITLE
proposed plan

DATE	SCALE	JOB NO.	DRAWING NO.	REV.
04.12.19	1250@ A3	19085	02	*

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A Member of the Royal Institute of British Architects

Appendix 3: Environment Agency Correspondence

Keith Alger

From: Northeast Newcastle, Customer Contact <northeast-newcastle@environment-agency.gov.uk>
Sent: 07 August 2020 09:45
To: Keith Alger
Subject: 178396: Product 4 Request_West Boldon_NE36 0PZ
Attachments: Flood Risk from Surface Water.pdf; Flood Map for Planning.pdf

Our Ref: 178396

Dear Keith

Enquiry regarding Product 4, NE36 0PZ

Thank you for your enquiry which was received on 16 July 2020.

Please find attached flood risk maps. Please see the following link for details of permitted use - http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

The Agency do not have any detailed models at this location. The flood zones are based on national, generalised modelling.

Following examination of our records of historic flooding, we have no record of flooding in the area. This does not necessarily mean that the area of the property / site has never flooded, only that we do not currently have records of flooding in this area.

The Environment Agency is the relevant risk management authority for flood risk on 'main rivers'. Local Authorities now take the lead for local flood risk, including 'ordinary watercourses', surface water and ground water flooding. We recommend that you contact the Lead Local Flood Authority for further information. Regarding flood risk from sewers please contact Northumbrian Water Group.

There are no Environment Agency owned or maintained flood defences protecting the property/ site. Ultimately the responsibility for maintenance of the river bed, banks, structures and vegetation or obstructions lies with the relevant land owners. For further information, we suggest contacting either the Local Authority or the site's owner.

For general advice about assessing flood risk when completing planning applications, and in particular how to complete a flood risk assessment (FRA) as part of a planning application go to https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications

Our Sustainable Places Team can give more detailed advice although there is a charge for this. Here is the link to the standard terms and conditions that apply to our charged planning advice service https://www.gov.uk/government/publications/planning-advice-environment-agency-standard-terms-and-conditions. The standard charge is £100 per hour.

Any works near a main river may require approval from the Environment Agency. You may need to apply for a Flood Risk Activity Permit if:

- the works are within 8 metres(m) from a non-tidal Main river and from any flood defence structure or culvert.

- the works are within 16m from the a tidal Main river and from any flood defence structure or culvert.

- the works are within 16m from a sea defence structure.

To determine whether you actually need a permit please visit https://www.gov.uk/guidance/flood-risk-activities-environmental-permits Or you can send a brief explanation of what works you plan to do (and where) so we can confirm.

We respond to requests for recorded information that we hold under the Freedom of Information Act 2000 (FOIA) and the associated Environmental Information Regulations 2004 (EIR).

If you are not satisfied with our response to your request for information you can contact us within 2 calendar months to ask for our decision to be reviewed.

We now have over 100 datasets available as Open Data. Open Data allows access to our data free of charge and free of restriction, even for commercial use under an Open Government Licence. You can find out about the data we have available our new page on Gov.uk https://www.gov.uk/environmental-data

Please don't hesitate to contact me if you have any further queries.

Kind regards,

Anna

Anna Chadwick
Operations & FCRM Secretary, Customers and Engagement Team **(Working days Monday)**
Customers and Engagement Officer **(Working days Tuesday - Friday)**
Environment Agency | Tyneside House, Skinnerburn Road, Newcastle, NE4 7AR
Ext. 020 7714 2952 Mob. 07775035479

For all Freedom of Information related enquiries please contact: northeast-newcastle@environment-agency.gov.uk
For all business related enquiries please contact ne_amt_support@environment-agency.gov.uk



Please note that all Environment Agency staff are working from home due to the Coronavirus (COVID-19) pandemic. All staff can be contacted via e-mail or telephone as usual. Please accept our apologies in advance for any delays in our service during this time.

From: Keith Alger [mailto:Keith.Alger@bwbconsulting.com]
Sent: 16 July 2020 14:05
To: Northeast Newcastle, Customer Contact <northeast-newcastle@environment-agency.gov.uk>
Subject: Product 4 Request_West Boldon_NE36 0PZ

Afternoon,

Please could I request a Product 4 associated with the attached site which is adjacent to the River Don and North Road ?

Please let me know if you have any questions.

Thanks

Keith

Keith Alger
Senior Engineer | BWB Consulting Limited

11 Portland Street, Manchester, M1 3HU
T 0161 233 4260 **M** 07464 548 203 **D** 0161 413 3881 **W** www.bwbconsulting.com



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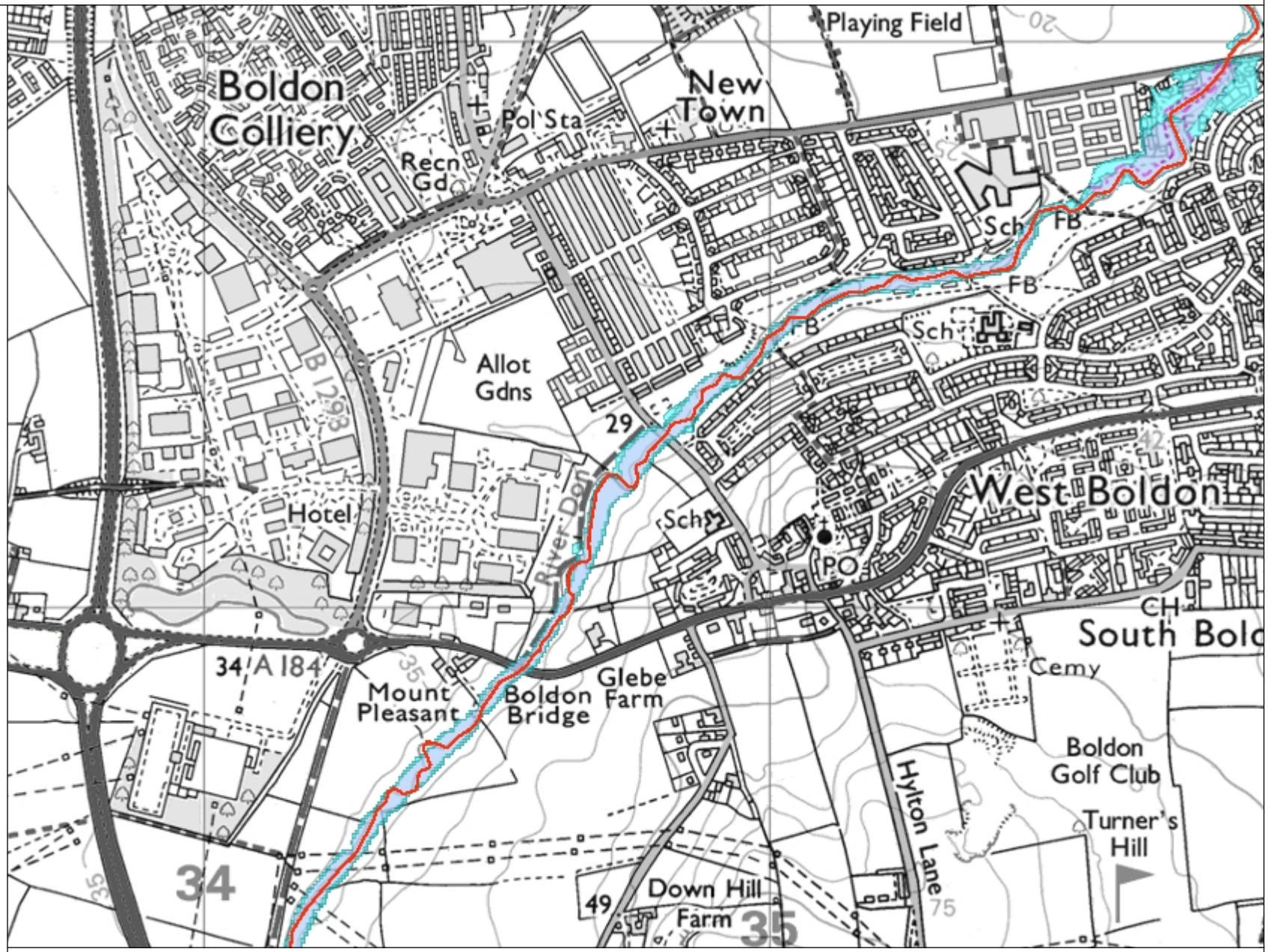
Flood Map for Planning

Environment Agency

Legend

- Statutory Main Rivers
- Defences
- Flood Storage Areas
- Areas benefiting from flood defence
- Flood Zone 3
- Flood Zone 2



1: 10,000

0 250

Metres

N W E S

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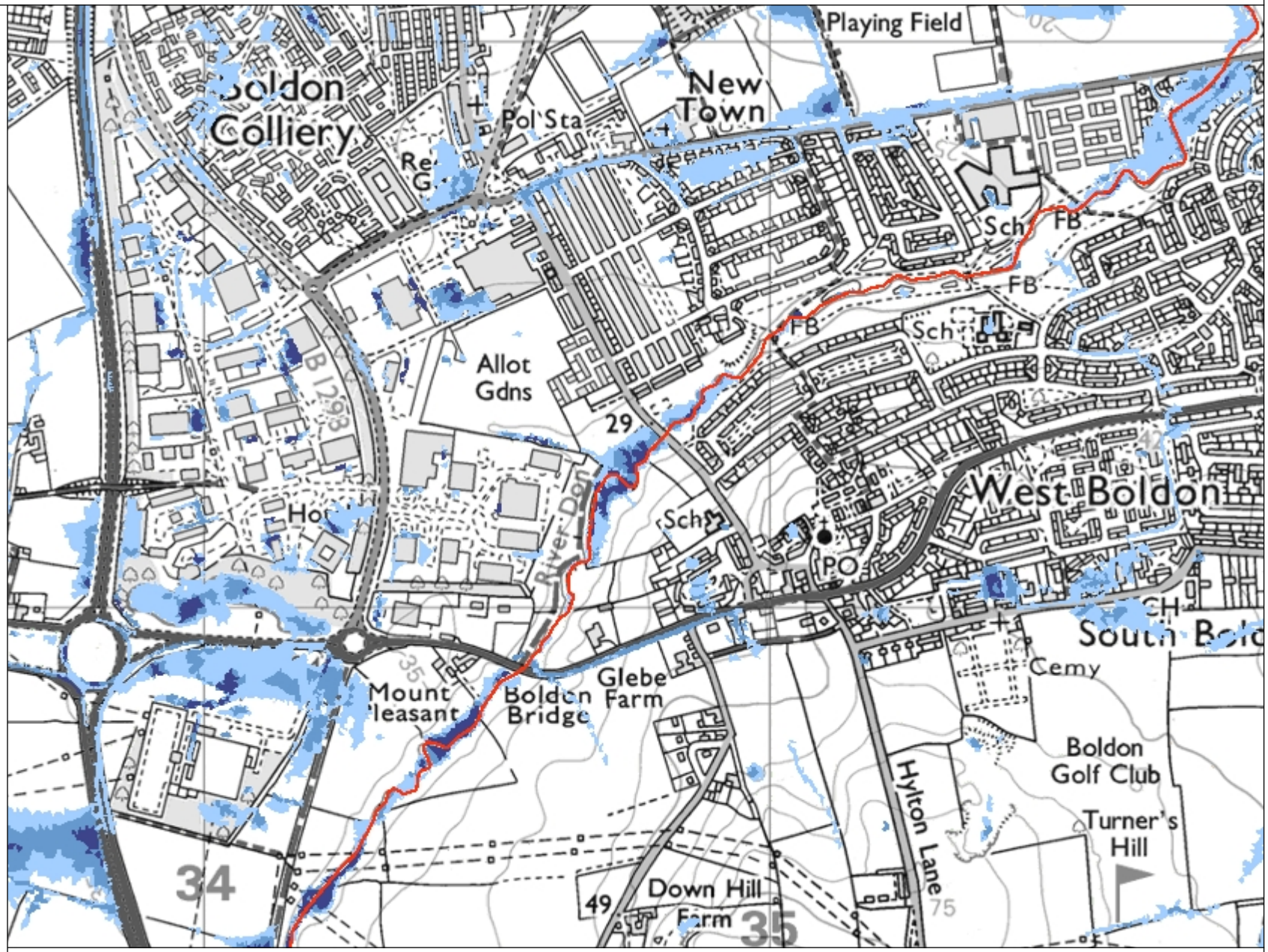
Surface Water Flood Risk

Environment Agency

Legend

- Statutory Main Rivers
- High (>= 3.3%)
- Medium (3.3% - 1%)
- Low (1% - 0.1%)



1: 10,000

0 250

Metres

N W E S

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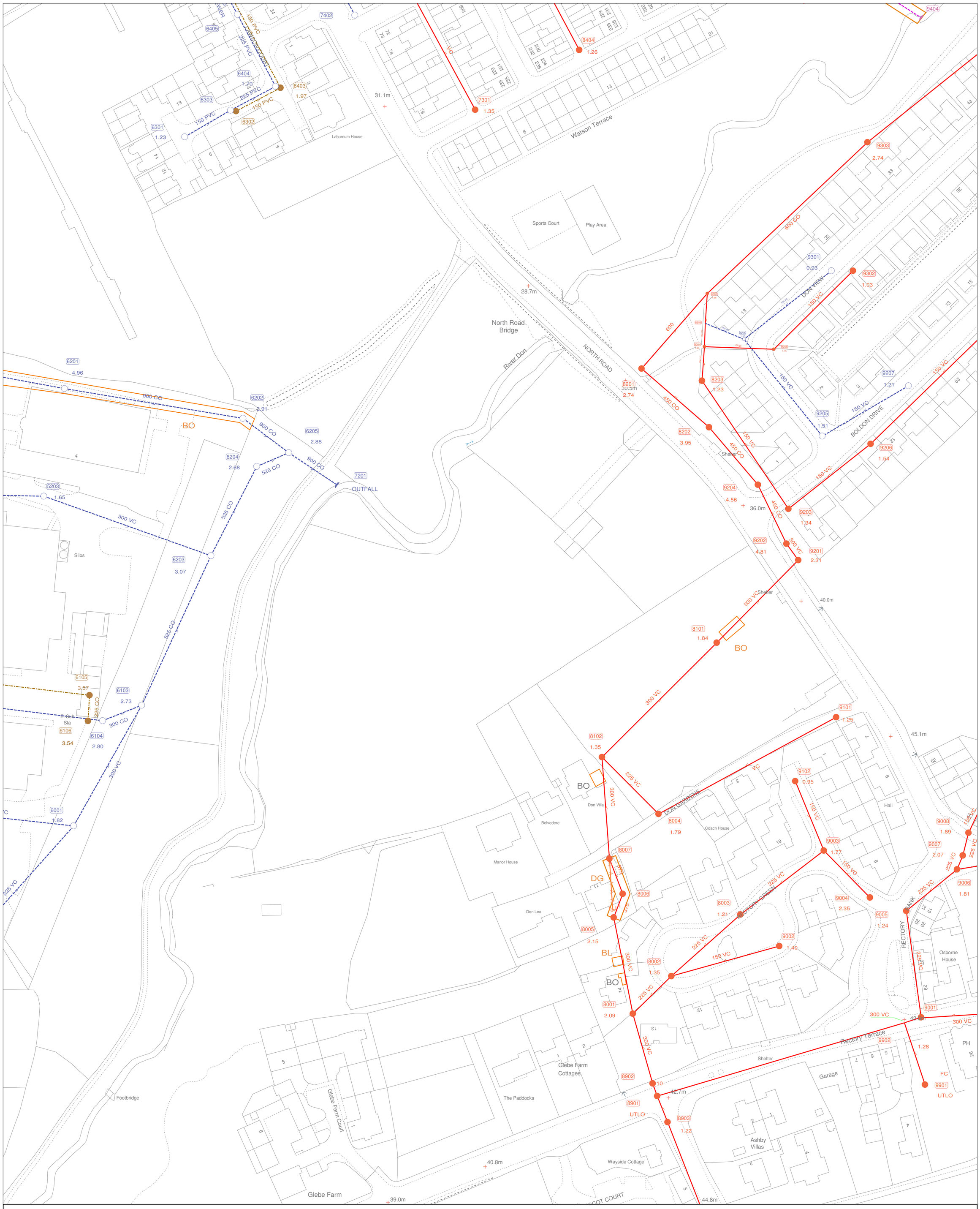
Appendix 4: Northumbrian Water Sewer Records



NWL Responsibility

Combined	
Foul	
Surface	
Treated Eff	
Untreated Eff	
Overflow	

Private/Non NWL

Combined	
Foul	
Surface	
Treated Eff	
Trade Eff	
Watercourse	

Proposed

Combined	
Foul	
Surface	

Annotations

- Direction of flow
- Backdrop
- Abandoned
- Rising Main

Symbols

- Chambers
- Inlet/Outlet
- Treatment Works
- Pumping Station
- Capped End
- Balancing Pond
- Termination Node
- Rodding Eye
- Unknown End
- Attribute Change
- Air Valve
- Property Connection
- Lamp Hole
- Hatchbox
- Dual Usage Chamber

User : DAWSJ1
Date : 05/08/2020
Map Sheet : NZ3461SE
Title : 0000
Centre Point : 434787,561183

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