Sutcliffe

Flood Risk Assessment

At: Well Lane, Cheadle
ST10 1EY

Client: Ascent

Date: Oct 2013
Job No: 26921LRD

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Date: Oct 2013
Ref: LRD26921 Issue 01

SUTCLIFFE

SITE SPECIFIC FLOOD RISK ASSESSMENT

DOCUMENT VERIFICATION

Report Reference: LRD26921 Issue: 01 Date: Oct 2013

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Revision History:

Rev	Date	Description	Prepared	Checked	Approved

Introduction

It is proposed to redevelop a site at Well Street, Cheadle ST10 1EY with social housing.

The site is currently occupied with a nursing home and associated parking, which is to be demolished as part of the development

The proposed development consists of 20 Units, made up of 16 houses and 4 flats. A new road is proposed to provide access to the development.

The site area is approximately 4700m^2 and is located within an established residential area.

This flood risk assessment has been prepared for submission with the Planning Application.

The purpose of this flood risk assessment is to assess existing flood risk to the site by reviewing the strategic flood risk assessment (SFRA), produced for Staffordshire Moorlands District Council, and to assess the proposed flood risk for the propose development and apply recommendations given in the SFRA and recommend how any outstanding flood risk issues could be managed throughout the lifetime of the proposed development.

Sources of Flooding

There are many sources of flooding that need to be considered within a flood risk assessment, which are:

- Rivers / Streams
- Sea
- Reservoirs
- Canals
- Ground Water
- Sewers
- Over Land Flows

It is unlikely, or very rare, that any one site will be affected by all sources of flooding. Therefore, we must assess which forms of flooding are required to be assessed within this flood risk assessment.

Having reviewed the Environment Agency flood maps, sewer records, land topography and OS Maps we can assess the subject site as being potentially affected by the following sources of flooding, which will be individually assessed within this flood risk assessment.

- Rivers / Streams
- Reservoirs
- Ground Water
- Sewers
- Over Land Flows

Flooding Assessment

Rivers / Streams

An inspection of the Environment Agency Flood Maps indicates that the site is not affected by flooding caused from Rivers or Sea. The site is located in a Zone 1 flood area, low risk.

In addition to the above, an inspection of the Strategic Flood Risk Assessment, 2008, for Staffordshire Moorlands District Council was made and no specific mention of the site or the area surrounding was made in relation to potential flooding from rivers or streams.

Therefore, there is a low risk of flooding from rivers / streams for this site.

Reservoirs

An inspection of the Environment Agency Flood Maps was made and the map for reservoir flooding indicates that the site is not potentially affected by reservoir flooding.

Approximately 0.7km to the northeast of the site is Hails Hall Pool. Anticipated flooding for the reservoir is identified on the Environment Agency map but the extent of the anticipated flooding, in the event of a dam failure, is located some 80 – 100m to the east of the site.

The site is located at a higher elevation in relation to the flooding route.

An inspection of the strategic flood risk assessment was made. No mention of reservoir flooding in relation to the development site is made within the SFRA.

Therefore, there is a low risk of flooding from reservoirs.

Ground Water

An inspection of the Environment Agency Flood Maps was made and the map for ground water indicates that the site is not within a potential flood area.

An inspection of the strategic flood risk assessment was made. No mention of ground water flooding in relation to the development site is made within the SFRA.

Therefore, there is a low risk of ground water flooding.

Sewers

Sewers, including site drainage, can flood for several reasons. The reasons are.

- Blockages
- Surcharged
- Undersized pipes

Should sewers flood, for whatever reason, then the site is potentially affected as it is located within a developed area that is fully services by sewers and drains.

The site falls gently downwards from north to south, with a slight fall down from west to east.

To the north and east of the site is a 225mm Ø surface water sewer changing into a 300mm Ø sewer to the east. The sewer discharges to a water course to the south east of the site.

As the site, and general topography of the surrounding area slope from north to south with a gentle slope from west to east it is not anticipated that surcharging sewers will affect the proposed site development and that any surcharging surface water will follow the existing roads around the site. As the sewers are small diameter shallow depths of surcharged flood water would be expected

As anticipated flow depths are anticipated to be shallow, as the volumes of water from 225mm and 300mm Ø sewers are small and we would not expect that the velocity of the flows would cause danger to human life or property. As the sewers are located within the width of the road we would anticipate that any flood water created would be retained within the road width.

An inspection of the strategic flood risk assessment was made. No information regarding sewer flooding in relation to the development site is made within the SFRA.

Therefore, there is a low risk to human life and properties from flooding of sewers.

Overland Flow

Overland flow will occur when rainfall cannot be collected by the designed drainage system or/and the ground becomes waterlogged, or when sewers become full and cannot accept additional water.

Should overland flooding occur on this site then overland flow will pass generally in north west to south east direction, following the general topography of the land. There is a slight fall in a west to east direction so some flow across the site in that direction could be expected.

Due to the topography of the preceding and adjacent land we would expect flow depths to be shallow. Also, the road to the north of the site would act as a cut-off to

overland flow as it is likely flood flows would run within the road being held by the kerbs.

As flows are anticipated as being shallow we would not expect the flows to be a risk to life or property.

An inspection of the strategic flood risk assessment was made. No information regarding overland flow in relation to the development site is made within the SFRA.

Therefore, there is a low risk of overland flooding.

Development Drainage

The National Planning Policy Framework (NPPF) directs us to ensure that the rate of discharge leaving a development site is no more than its previous use, and, where possible, to reduce that discharge.

An inspection of historical maps, google maps google earth shows us that the site has been previously developed with a nursing home and associated car parking. The total impermeable area of those developments has been calculated as being 1995m^2.

It is proposed to develop the site with 20 dwellings and associated infrastructure. The total impermeable area of the development has been calculated as being approximately 2800m^2.

In accordance with NPPF it is, therefore, necessary to reduce the drained impermeable areas to less than the previous impermeable areas. However, it is the intention of the NPPF and SFRA to reduce offsite surface water discharge as much as possible, and where possible to greenfield runoff rates. This can be achieved by employing sustainable urban drainage systems (SUDS). These techniques may typically include infiltration. Other simple ways of reducing surface water discharge off site is to free drain private drives, paths and patios to landscaped areas, such as grass and planted areas where natural surface infiltration and evaporation can occur. Careful detailing will be required to ensure that surface water runoff will flow to appropriate areas.

To date there has been no intrusive ground investigation to determine the suitability of the ground for infiltration.

However, by draining paths and patios to grasses / landscaped areas it is possible to reduce the positively drained areas by approximately 490m^2.

Having viewed Severn Trent Water sewer record plans it can be seen that there is a 225mm Ø surface water sewer to the north and a 300mm Ø surface water sewer to the east of the site. A connection is likely to be made to the north of the site so that the highway drainage can be adopted by the Local Highway Authority.

The SFRA directs that sustainable urban drainage systems (SUDS) should be employed to ensure that no worsening of existing flooding problems elsewhere within the area.

Section 10.0 of the SFRA lists the type of SUDS systems that could be employed on site developments. It also states that the Environment Agency require that a reduction of 20% to discharge rates to account for Climate Change and its effect on future runoff volumes that climate change will have.

From the proposed layout it has been found that there is an approximate increase in drained area, from the predevelopment site condition, is in the order of 43%. Therefore, a further reduction of surface water discharge from the site will be required if possible. To achieve the required policy within the SFRA it will be necessary to attenuate flows to provide a 20% reduction of the existing runoff discharge rate.

In addition to the above the site will also need to be considered for Category 4 of the Code for Sustainable Homes.

From the assessment we can, therefore, deduce that it will be likely that surface water will be required to be discharged to the surface water sewer to the east of the site.

Whilst the peak flow rate off site will be reduced it will still be necessary to:-

- Agree a location for and maximum discharge rate with Severn Trent Water.
- Reduce the surface water discharge rate from the proposed development to reduce discharge rates from site by 20% of the pre development site conditions. It is not currently known how this will be achieved and will be further assessed once a ground investigation has been carried out.

Conclusion & Recommendations

From the above we can conclude that there is an overall low risk of flooding to the development site.

It is likely that, due to the requirements of the SFRA that infiltration or attenuation will be required, especially to be able to manage the 100 year rainfall events that will be required to be designed for.

The SFRA states that there is a 20% reduction of existing discharge rates applied to the surface water drainage to reduce runoff rates to account for future runoff volumes expected as a result of climate change.

At this stage of development design detailed calculations have not been carried out and will be required as part of the design development process which will follow on from Planning Approval.

To enable the surface water site drainage to be progressed it will be necessary that the following be carried out. It will then be possible to design a suitable surface water

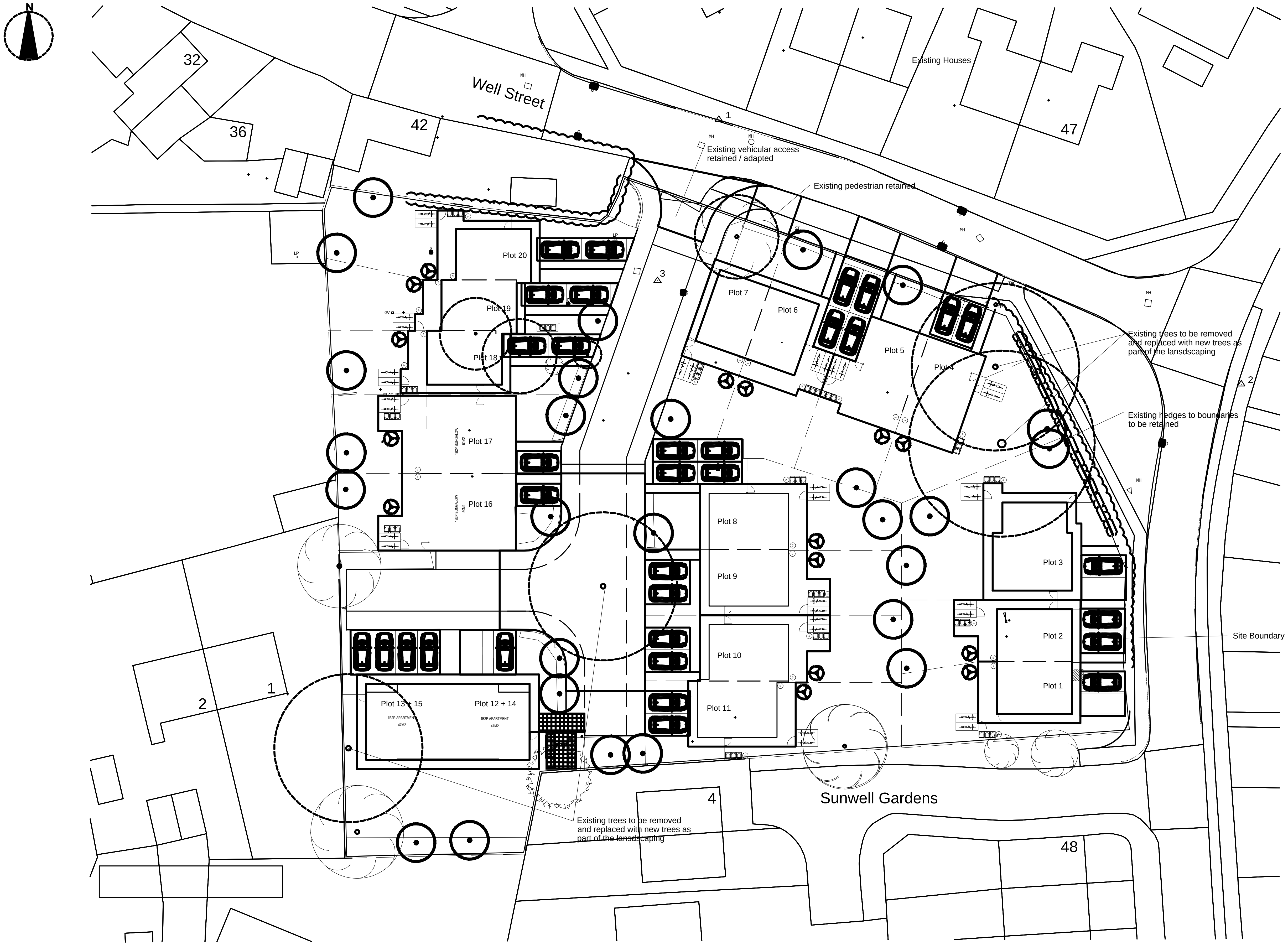
drainage system that satisfies the criteria of the SFRA, LPA and other stake holders, such as the Developer and Severn Trent Water.

- Communication with Severn Trent Water will be required to agree a maximum surface water discharge rate and its connection point with the public sewer.

Appendix A

Proposed Site Plan

Dimensions are to be checked on site. Do not scale from drawings. Report discrepancies to the Architect.



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ACCOMMODATION SCHEDULE

9 x 2b4p Houses @ 75m2
5 x 3b5p Houses @ 86m2 inc 1 with assisted living space
4 x 1b2p Apartments @ 47m2
2 x 1b2p Bungalows @ 50m2

20 Total No. Dwellings

Site Area - 0.47 Hectares

Rev A Layout amended Oct 13

PROJECT	'Lightwood' Well Street (Site 64) Cheadle ST10 1EX
TITLE	Proposed Site Plan ...
SIZE	A1
STATUS	Planning
PROJECT No	1485
DRAWING No	03A
DRAWN by	CG
CHECKED	...
DATE	Sept 13
SCALE (u.n.o)	1:200

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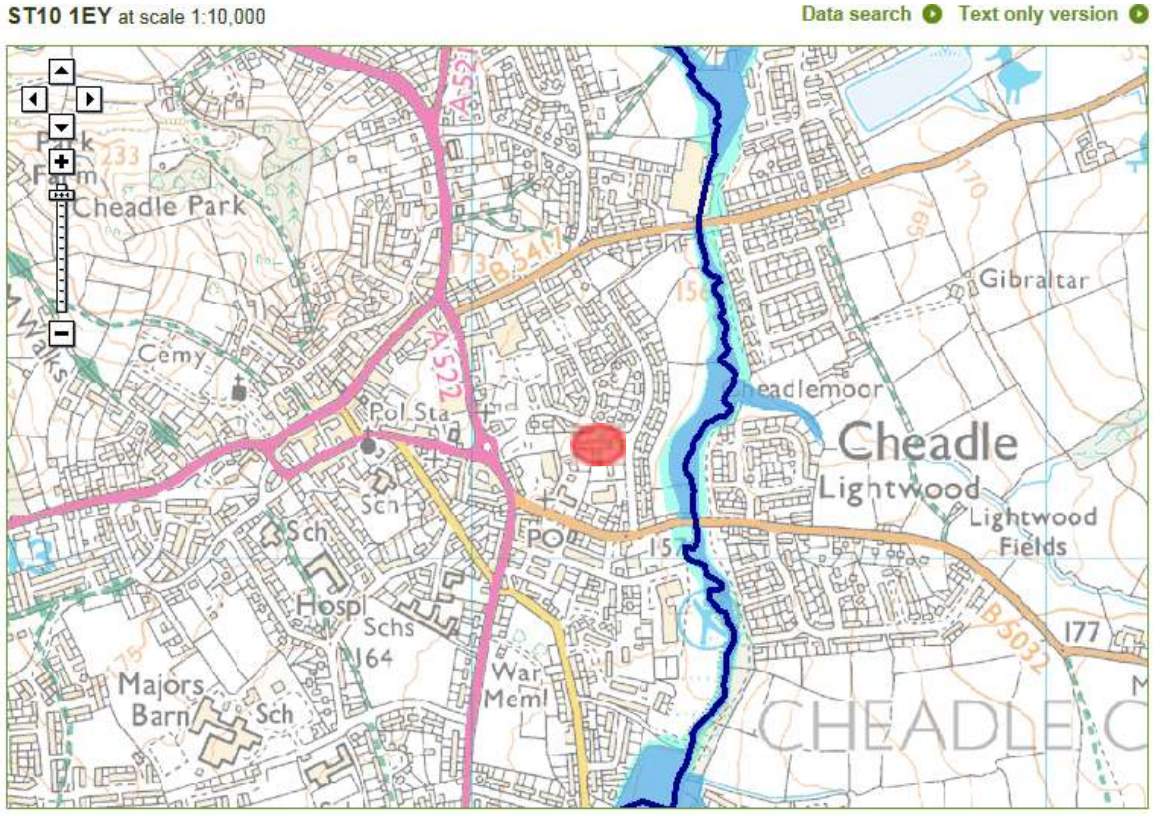
Appendix B

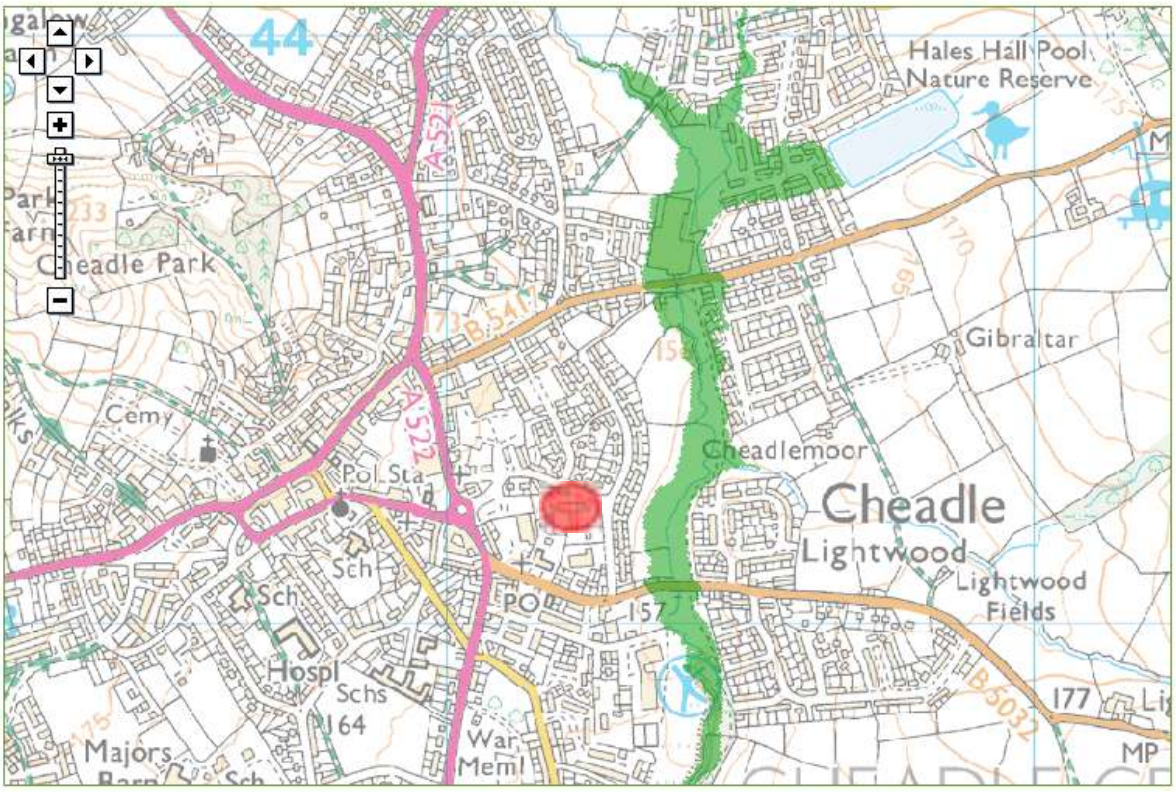
Environment Agency Flood Maps

Rivers & Sea



Reservoirs

X: 401,243;Y: 343,385 at scale 1:10,000 Data search Text only version



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