

# Hemsby – Engineering Judgement Assessment

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## 1. Overview

This document sets out the detailed non-modelling assessment for the settlement of Hemsby in Great Yarmouth. Data collected as part of both the Stage 1 and Stage 2 Surface Water Management Plans (SWMPs) and observations made during site visits in August 2012 and January 2013 have been used to inform the assessment.

The assessment focuses on the historic and predicted flood risk to Hemsby for local sources of flooding (surface water runoff, groundwater and ordinary watercourse) alongside sewer and fluvial flooding. Information available at the time of the study has been used to inform identification of the historic flooding mechanisms, future flood risk and key infrastructure in place to manage surface water flooding both now and in the future. The assessment will be used to inform the options assessment for the Stage 2 SWMP.

The village of Hemsby is located to the north east of Great Yarmouth Borough. It contains several Holiday Villages, Caravan Parks and Chalet Centres, to the east of the settlement, which bring in a large holiday population to the area during the summer months.

## 2. Flood Sources & Mechanisms

### 2.1 Surface Runoff

#### Historic Flooding

Historically, a number of flooding incidents have been reported from surface runoff as outlined in Table 1. The majority of these relate to runoff from fields, typically to the north of the settlement and surface runoff or ponding following heavy rainfall.

**Table 1 – Historic Flooding Locations (Surface Water Runoff)**

Approx. Location	Date	Mechanism	Data Source
Martham Road, Common Road, Waters Lane	Unknown	Flooding from adjacent fields	Great Yarmouth Borough Stage 1 SWMP, Appendix 1.7
Yarmouth Road	Unknown	Flooding from adjacent fields	Great Yarmouth SWMP Stage 2 Stakeholder Workshop, 28 <sup>th</sup> February 2013
Beach Road, Newport Road and near the Post Office	Unknown	Unknown	
Glebe Estate, Beach Road	6 <sup>th</sup> October 2008	Heavy rainfall	GYBC Flooding Locations database
Newport Road, Yarmouth Road, Back Market Lane, Bottom of Newport Road from next to Equestrian Centre down to Yarmouth Road	25 <sup>th</sup> September 2006	Heavy rainfall	Great Yarmouth SWMP Stage 2 Stakeholder Workshop, 28 <sup>th</sup> February 2013
Haycroft Road, Barleycroft Road and Beach Road	Unknown	Unknown	Great Yarmouth Borough SWMP – Stage 1 Report
Waters Lane	17 <sup>th</sup> July 2009	Water pumped out by Fire & Rescue Service	Fire & Rescue Service Records (2009 – 2012)
Newport Road in vicinity of Bermuda Holiday Park	17 <sup>th</sup> July 2009	Water pumped out by Fire & Rescue Service	Fire & Rescue Service Records (2009 – 2012)

### Flood Risk

The Environment Agency's Flood Map for Surface Water (FMfSW) predicts that a total of 302 properties, both residential (no. 136) and non-residential (no. 166) are at risk of flooding to a depth of >0.3m for a rainfall event with a 1 in 200 chance of occurring in any given year (0.5% AEP).

The settlement is fourth in terms of risk faced across the borough, behind Great Yarmouth, Gorleston and Bradwell.

The figures in Appendix D illustrate the flood risk to Hemsby, based on the FMfSW modelling outputs:

- Flood depth for rainfall event with a 1 in 30 chance of occurring in any given year (3.33% AEP).
- Flood depth for rainfall event with a 1 in 200 chance of occurring in any given year (0.5% AEP).

Areas of deeper surface water ponding (based on 0.5% AEP rainfall event) are predicted to occur in the northwest, east and south of the settlement, including in the vicinity of:

- Waters Lane, Common Road and Martham Road;
- Newport Road;
- Beach Road and Hemsby Beach Chalet Centre; and
- Yarmouth Road and Hall Road.

There is an additional area of deep surface water flooding in the vicinity of Fakes Road. However, after discussion with stakeholders it was agreed that this did not reflect historic or local knowledge of flood risk and therefore the modelling was considered to be over predicting risk at this location.

### Receptors

Table 2 provides a summary of the receptors at risk of flooding from the 0.5% AEP rainfall event, based on the FMfSW modelling outputs.

<b>Table 2 – No. receptors at risk of Surface Water Flooding to a depth &gt;0.3m for 1 in 200 year probability event (FMfSW) in Hemsby</b>	
Residential	136
Non-Residential (exc. Critical Services)	166
Schools	0
Police	0
Electricity	0
Sewerage	0
<b>Total</b>	<b>302</b>

Hemsby has a number of holiday camps, chalet parks and caravan sites, located to the east of the settlement. Several of these are identified as being potentially susceptible to surface water flooding. These areas contain caravans, tents and non-permanent buildings and are heavily populated by tourists during the summer months which typically receive more flash flooding events. As such a good warning system and evacuation plan may required to be put in place for all sites to the east of the settlement.

Additionally, the holiday parks offer significant business to the area, and as such any damages incurred will be costly both in terms of loss of assets and income.

### Infrastructure

The surface water runoff from highways is managed by Norfolk County Council (NCC). Since the flooding experienced in September 2006, NCC has installed, upgraded and maintained the highways drainage assets in Hemsby including:

- Installation of soakaways (in Seadell Holiday Park Car Park in 2009/10);
- Cleansing of the drainage system;
- Repairing of dislodged pipes (in the vicinity of Yarmouth Road);
- Maintenance and checking of ditches, grips and pipe inverts (adjacent to Yarmouth Road);
- Implementation of schemes to improve drainage (in Common Road); and,
- Regular tree root clearance to pipes (in Lexington Close).

## *2.2 Groundwater*

### Historic Flooding

There are no recorded groundwater flooding incidents in any datasets received as part of the SWMP. However, there have been several inferences of groundwater flooding from stakeholders and Council officers, and in particular the influence groundwater flooding has on other sources of flooding in Hemsby, predominantly to the east of the settlement.

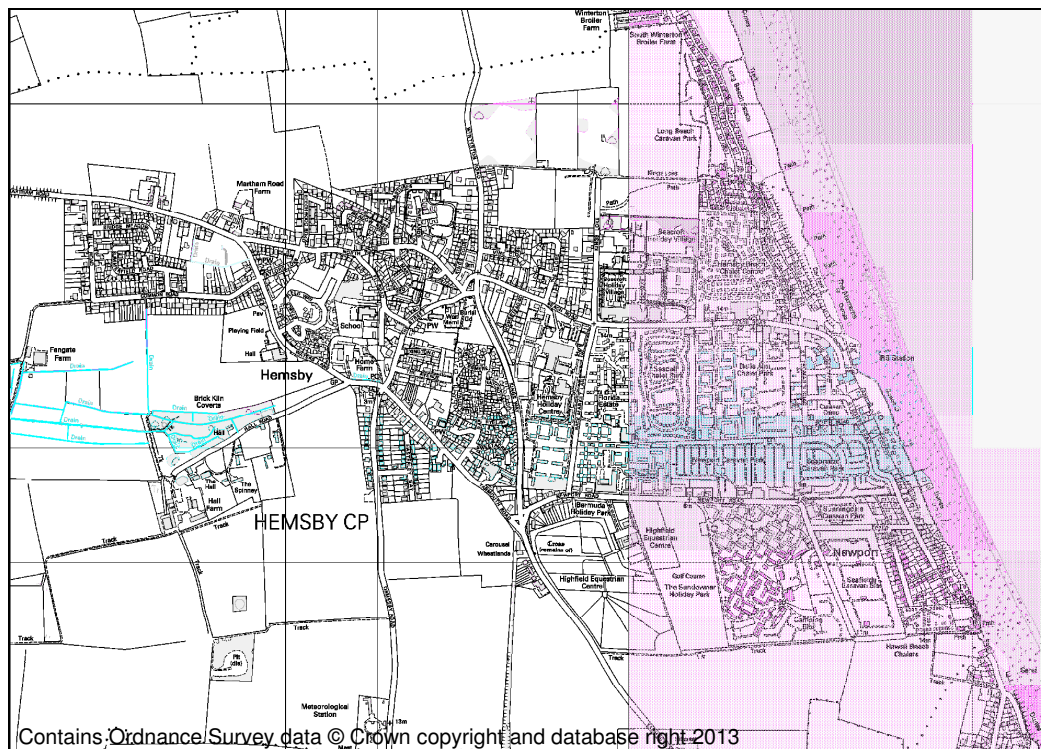
According to the Environment Agency website, and British Geological Survey (BGS) datasets, Hemsby is located in an area identified as Major Aquifer High. It is underlain by:

- Bedrock – Principal Aquifer (All of Hemsby). 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.<sup>1</sup>
- Superficial Deposits. Secondary Aquifer (mainly to the west of Hemsby and along a strip to the east) - These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. As a Secondary Aquifer, permeable layers are capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.<sup>2</sup>

### Flood Risk

The Environment Agency's Areas Susceptible to Groundwater Flooding dataset identifies the east of the settlement as being at risk from groundwater flooding which corresponds to council officer reports of groundwater flooding incidents (Figure F3).

**Figure F3 - Areas Susceptible to Groundwater Flooding (Environment Agency)**



*Note: Areas shown are at <25% risk of flooding from Groundwater.*

### Receptors

Those receptors located in areas of greater risk of groundwater flooding are mainly Holiday Camps, Chalet Parks and Caravan Sites. As previously discussed in Section 2.1 this has potential economic consequences.

### Infrastructure

There is no known infrastructure associated with groundwater sources in Hemsby.

<sup>1</sup> Environment Agency website ([www.environment-agency.gov.uk](http://www.environment-agency.gov.uk))

<sup>2</sup> Environment Agency website ([www.environment-agency.gov.uk](http://www.environment-agency.gov.uk))

## 2.3 Ordinary Watercourses

### Historic Flooding

There are no recorded flooding incidents from ordinary watercourses in Hemsby.

### Flood Risk

There are several ordinary watercourses located to the west of Hemsby. These are principally:

- Ordinary watercourses to the West of Waters Lane, north of Hall Road and South of Common Road (Town Drain) – these watercourses flow west from Hemsby, draining into the Broads Authority Internal Drainage Board Muck Fleet Catchment, and discharging into the Muck Fleet (Main River) to the west of Hemsby.
- Small drainage ditches to the North of Common Road and South of Martham Road – the offline storage features in this location are smaller drainage ditches which bisect the previously undeveloped land to the east of Summerfield Road. These watercourses / ditches do not connect or discharge into any other watercourses but are local drainage assets to manage surface water runoff. There are two smaller ditches to the immediate north of Common Road which are believed to connect to the NCC surface water sewer in Common Road.
- Land Drains to the north of Martham Road (Figure F4) – though these watercourses are not identified on the Environment Agency Detailed River Network map, these exist to the north of Martham Road and their primary purpose is to drain and store water from field drainage runoff. These particular drains were enlarged and in some cases built after the September 2006 flooding event. Some of these drains connect to the NCC pipes and/or offline drainage ditches to the south of Martham Road (east of Summerfield Road).
- Small Ditches – there are several of these across the settlement including to the south of Newport Road and west of Yarmouth Road. Some of these have been piped (north of Newport Road) or infilled / covered (north of Yarmouth Road and Post Office) and some function as highway drainage ditches.

The FMfSW modelling outputs show that the majority of the watercourses lie within areas identified as being at risk of flooding for the 0.5% AEP rainfall event. The FMfSW modelling does not explicitly model ordinary watercourses, therefore the capacity and potential upstream and downstream flow impacts of heavy rainfall events have not modelled.

**Figure F4 – Land Drains located to the North of Martham Road**



Source: Site Visit, January 2013

### Receptors

If any of the Ordinary Watercourses were to flood residential properties in close proximity to the watercourses, namely near Hall Road, Common Road and Martham Road could be at risk of flooding.

## Infrastructure

There are several culverts associated with the ordinary watercourses and drainage ditches identified in Hemsby. For example, the land drains to the north of Martham Road are culverted under paths or access routes to the fields. There is currently no complete record of these assets, though as a Lead Local Flood Authority, NCC will be compiling an Asset Register of significant flood risk assets in Norfolk. The criteria for assets included on the register will be decided by NCC across the whole of Norfolk, but a more detailed register of assets in Hemsby may be useful for future management of watercourses in this vicinity, particularly given the role of surface runoff from fields in the north of the settlement and presence of drainage ditches to help manage this.

Given the role of ordinary watercourses, drainage ditches and land drains in managing surface runoff in the northwest of Hemsby, and coupled with the fact that these areas have historically flooded and are susceptible to surface water flooding during heavy rainfall events, it is recommended that a maintenance regime is put in place to ensure that these assets are maintained to a good condition to provide maximum capacity for surface water storage and discharge during heavy rainfall.

## *2.4 Sewer*

### Historic Flooding

Several sewer flooding incidents have been recorded across Hemsby as outlined in Table 3. These are predominantly recorded by AWS for the 25<sup>th</sup> September 2006 flooding event which resulted in both internal and external flooding in the north west, east and south of the settlement. The historic sewer flooding records correspond to the surface water flooding incidents reported at the time, and also match well to the areas predicted to experience deep flooding during larger rainfall events (FMfSW, 0.5% AEP rainfall event). This highlights the susceptibility of certain areas across the settlement to both surface water and sewer flooding, typically associated with topographical low points. Additionally, it is believed that there may be issues associated with the sewerage system and areas affected by groundwater flooding, based on anecdotal evidence provided by Council Officers and residents.

**Table 3 – Historic Flooding Locations (Sewer)**

Approx. Location	Date	Mechanism	Data Source
Waters Lane, Yarmouth Road and The Glebe	Various (2-3 times a year)	Sewerage flooding	Hemsby Parish Council Local Flooding Survey Response 2012
Yarmouth Road, Waters Lane and Common Road	Various	Sewer flooding linked to periods of rainfall	E-mail to NCC from GYBC on 27 <sup>th</sup> February 2012
Common Road / Martham Road / Yarmouth Road and Hemsby Beach Chalet Centre	25 <sup>th</sup> September 2006	Clusters of flooding events following heavy rainfall. 3 properties experienced internal flooding from sewers with a further 7 properties experiencing external flooding	AWS Sewer Flooding Records 25 <sup>th</sup> September 2006
The Glebe	Annually	AWS flushing out annually at junction with Beach Road	Great Yarmouth SWMP Stage 2 Stakeholder Workshop, 28 <sup>th</sup> February 2013

### Flood Risk

There are 3 records identified in AWS's DG5 register for sewer flooding. The DG5 register details the total number of properties at risk of sewer flooding (both externally and internally) at the time of data

provision (July 2012). Due to confidentiality issues information is provided on a four-digit postcode area. It should be noted that AWS focus their efforts on removing properties from the DG5 register, and therefore this dataset may no longer accurately represent those properties which are currently at risk.

There is no AWS sewer network model covering the Hemsby area.

### Receptors

The following are likely to be susceptible to sewer flooding, based on historic flooding issues:

- Residential properties to the northeast of the settlement (at the upstream end of the sewer network); and,
- Non residential properties to the east of the settlement (at the upstream end of the catchment).

### Infrastructure

#### *Sewers*

The majority of Hemsby is served by a foul sewerage system. The majority of the trunk sewers (>300mm) drain to the junction of Waters Lane, Yarmouth Road, Ormesby Road and The Street, adjacent to the Post Office which is the topographical low spot in the village. The sewage then drains along Yarmouth Road to Yarmouth Road Pumping Station, then South to Ormesby St. Margaret and ultimately to Caister Wastewater Treatment Works (WwTW). A further sewer, serving the east of Hemsby drains to Yarmouth Road Pumping Station before being pumped to Caister WwTW.

There is a small section of surface water sewerage system which serves the housing estate around Stable Field Way and Shire Close.

#### *Pumping Stations*

There are 2 pumping stations in Hemsby located in Common Road and Yarmouth Road. These collect foul sewage from upstream in Common Road / Mill Road and north and west Hemsby respectively and then pump this to Yarmouth Road Pumping Station and south of Hemsby to Ormesby St. Margaret and then ultimately to Caister WwTW.

There are no known or historic issues associated with these pumping stations.

#### *Outfalls*

There is 1 outfall discharge point to an ordinary watercourse located in Hall Road. This discharges surface water collected in the upstream catchment which serves the estate around Stable Field Way and Shire Close. Figure 14 in Appendix D shows the AWS Sewer Network serving Hemsby.

## *2.5 Other*

### Fluvial Flooding

#### *Main Rivers (Environment Agency)*

The west and southwest of Hemsby is at risk of fluvial flooding from the Muck Fleet in the Ormesby Broad, west of Hall Road and southwest of Common Road; however, no properties lie within Fluvial Flood Zones 2 or 3 in this vicinity.

There is a Broadland Private Public Partnership Project (AEC503E/003A/001A) planned by the Environment Agency to mitigate and manage fluvial flood in the Broadlands catchment. This received reserved Government funding in FY 12/13. Being at the top of the catchment this scheme is unlikely to have any direct benefits or impact in terms of fluvial flood risk to Hemsby.

### *Broads Area IDB Drains*

The Broads Authority Internal Drainage Board manages watercourses to the southwest of Hemsby. Surface water from the surface water sewer covering Stable Field Way area and the ordinary watercourses south west discharge into the Hemsby Muck Fleet IDB Catchment to the southwest of the settlement, which contains 6,100m of drains.

The Broads Authority IDB drains located in the Hemsby Muck Fleet Catchment to the southwest of Hemsby have two water control structures:

- Hemsby North (WCS035G0122-01)
- Hemsby South (WCS035G0121-01)

There are no known issues associated with these assets.

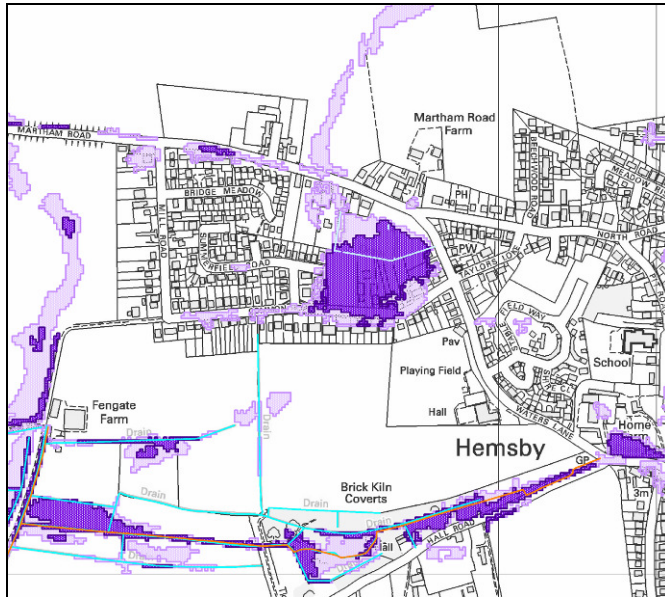
### **3. Flood Risk Assessment by Area**

An assessment of flood risk has been undertaken for areas that were considered through the historic and predicted flood risk data review, stakeholder meetings and site visits to be at a greater risk of flooding in Hemsby.

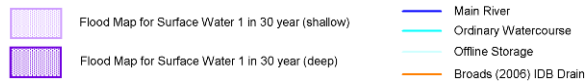


## Area: North West Hemsby

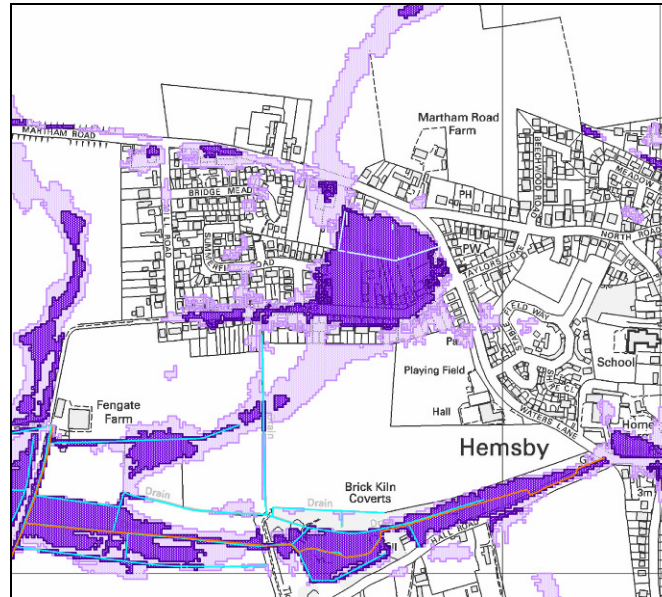
### Predicted Flood Risk - 3.33% AEP Rainfall Event



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### Predicted Flood Risk – 0.5% AEP Rainfall Event



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North West Hemsby is located in an area identified to be at risk from deep (>0.3m) surface water flooding for both the 3.33% and 0.5% AEP rainfall events. It has historically experienced flooding from;

- Surface water runoff from fields to the north of Martham Road;
- Ponding in low spots;
- Areas close to watercourses and drainage ditches;
- Sewers.

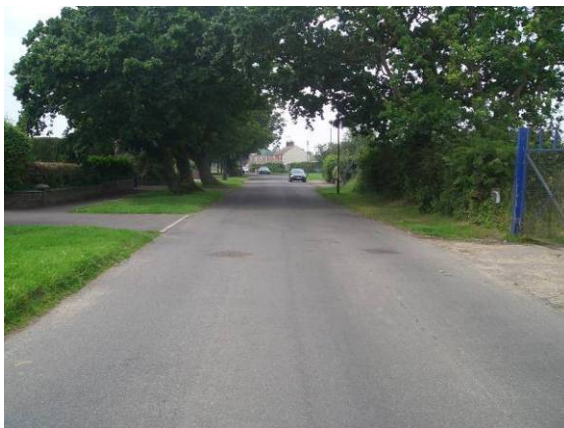
The area experienced flooding during the September 2006 rainfall event.

Following the September 2006 event;

- NCC has implemented a scheme in Common Road to improve drainage in the area. Surface water collected in the catchment upstream of Common Road discharges to the Town Drain.
- Land Drains to the north of Martham Road, designed to collect field runoff from the north, have been built or enlarged.

Standing water has previously been observed to the west of Mill Road, also shown as an area of deep surface water ponding in the FMfSW. This area is the course of the old railway line from Winterton to the Broads and flooding issues started in this location following the removal of the railway bridge to the north (under Martham Road).

New development is planned in the open space to the east of Summerfield Road, which overlaps with the area of deep flooding to the north of Common Road. This development includes a separate surface water drainage system with a 1 in 100 year design for the development that discharges to the Town Drain.



**Common Road looking West**

Source: Site Visit August 2012

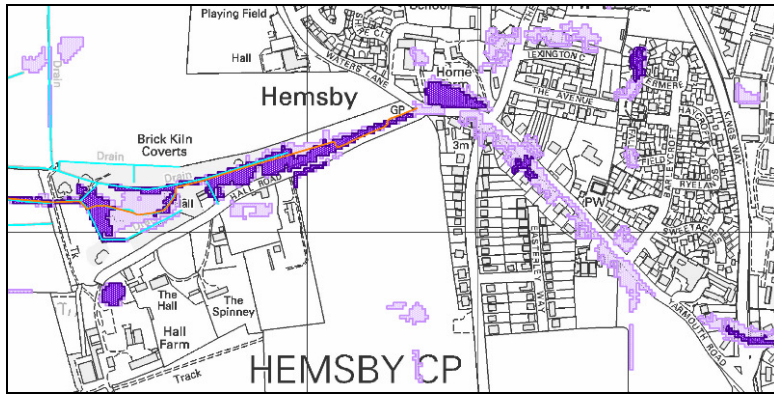


**Surcharged sewer on Waters Lane, Hemsby, October 2008**

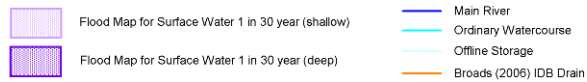
Source: Great Yarmouth Borough Council.

## Area: South West Hemsby

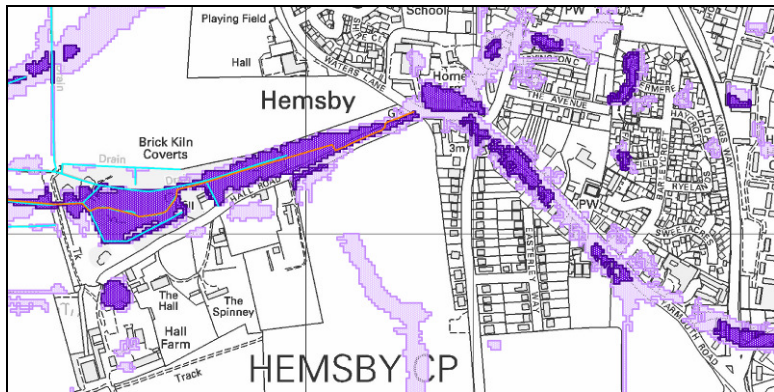
### Predicted Flood Risk - 3.33% AEP Rainfall Event



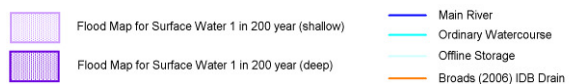
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### Predicted Flood Risk – 0.5% AEP Rainfall Event



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Flooding has occurred multiple times in the vicinity of Waters Lane and Yarmouth Road and resulted in sewage and surface water flooding to properties, including the Post Office;

- There has previously been internal flooding of 2 properties along Yarmouth Road.
- The Post Office marks the low point in the settlement and AWS foul manholes have previously surcharged in this location. Surface runoff is directed here down Waters Lane, The Street and Ormesby Road. There used to be a ditch located to the north of the Post Office but this has been infilled / covered but still within an area of deep flooding, even for 3.33% AEP rainfall event.
- Field runoff from the southwest of Yarmouth Road (at junction with Barleycroft) is believed to have contributed to flooding of a Care Home on Yarmouth Road in September 2006.
- There is a deep ditch to the west of Yarmouth Road (east of the farmland). NCC check grips and the pipe at end of the ditch. However, during prolonged rainfall the ditch fills and can spill onto the road. Under normal conditions there is no water in the ditch.

Measures have been undertaken to address flooding in this area, including AWS fitting three new pumps in Yarmouth Road and non-return valves to several properties in area.

The NCC drainage system drains (gravity fed) north along Yarmouth Road and then west along Hall Road. It should be noted that there is unlikely to be capacity in this system for any drainage from the new development and therefore it is important that a flood risk assessment (incorporating a drainage strategy) is carried out for all developments in this area.



**Junction of Yarmouth Road, Waters lane, Ormesby Road and The Street**

Source: Site Visit January 2013.

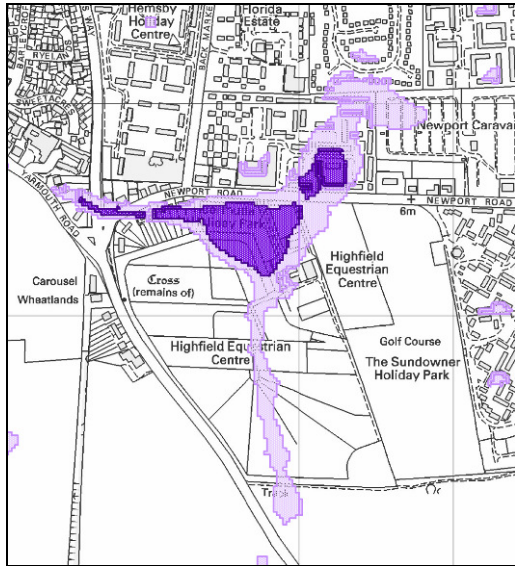


**Field southwest of Yarmouth Road (at junction with Barleycroft)**

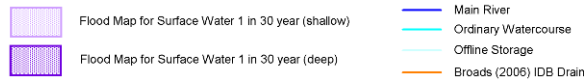
Source: Site Visit January 2013.

## Area: South Central Hemsby

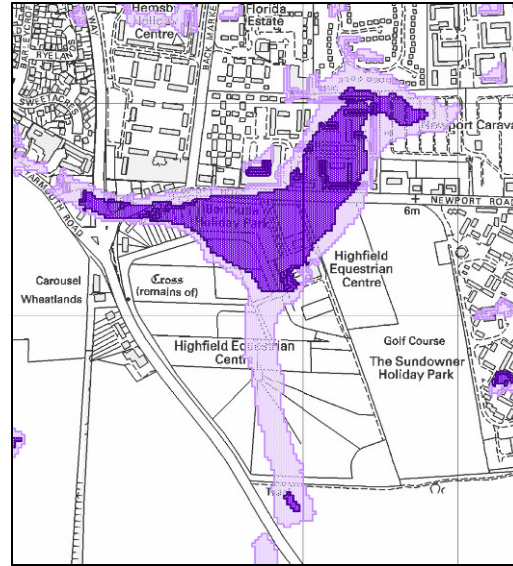
### Predicted Flood Risk - 3.33% AEP Rainfall Event



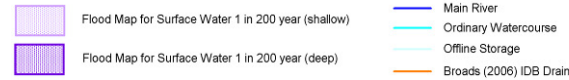
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### Predicted Flood Risk – 0.5% AEP Rainfall Event



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There is a history of surface water flooding in this area;

- Surface water flooding has been reported to Council/ ex-Council houses in Newport Road (dates unknown). It is suspected this is due to a lack of gullies along the south of the road, and the road cambering in this direction. Flooding has been reported to kerb height but has not entered properties.
- Flooding was reported in the area in September 2006.
- The ditch to the south of Newport Road has historically flooded.

Following flooding in September 2006, NCC has installed additional gullies along Newport Road but as illustrated by the FMfSW mapping for the 0,5% AEP rainfall event, it is likely that properties in the area are still at risk of flooding from larger rainfall events..

There is a piped ditch located behind properties to the north of Newport Road (South of the Pontin's Site). Records exist to show that this was cleared in 2006 but current maintenance regimes are unknown.

New development is planned near the Equestrian Centre. Land in this area slopes towards Newport Road properties and has been known to flood road, so surface water management will be important for any new development.



**Newport Road looking East**

Source: Site Visit August 2012.



**Newport Road looking West from Back Market Lane junction**

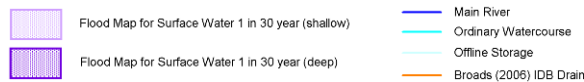
Source: Site Visit January 2013.

## Area: East Hemsby

### Predicted Flood Risk - 3.33% AEP Rainfall Event



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### Predicted Flood Risk – 0.5% AEP Rainfall Event



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Historically there has been surface water flooding reported in East Hemsby in the vicinity of Beach Road, The Glebe and Seadell Chalet Park.

The FMfSW modelling identifies this as an area at risk of deep (>0.3m) surface water flooding during a rainfall event with a 1 in 200 chance of occurring in any given year (0.5% AEP) and an area at risk of shallow flooding during a 1 in 30 year (3.33% AEP) rainfall event.

The area is flat and water is likely to pond in this area, particularly where property thresholds are sited below the adjacent road surface level. The area is also within an area at greater risk of groundwater flooding.

In recent years The Glebe has been resurfaced, and property thresholds to the north of the road are now below the level of the road itself, creating a potential flow path for surface water runoff. The road has not been adopted by the Council, and is under private ownership. The presence of gullies and a drainage system for the road were noted during Site Visits, though it is unknown where these discharge.

NCC has installed 2 new soakaways in Seadell Holiday Park Car Park in 2009/10.



The Glebe looking east

Source: Site Visit January 2013



The Glebe looking north

Source: Site Visit January 2013

#### 4. New Development

Several sites were identified as potentially suitable for development in Hemsby in the Great Yarmouth Borough Strategic Housing Land Availability Assessment (2012). New development sites or redevelopments offer the opportunity to manage surface water runoff both from the site and in the surrounding area.

In particular the following sites offer the potential to manage surface water runoff and/or are constrained in terms of surface water discharge:

- Old Pontins Site, located west of Back Market Lane and north of Newport Road. A planning application was received in December 2011 for 191 dwellings and a 60 bed care home on this site. It has been noted by NCC officers during Stakeholder discussion for the SWMP that there is unlikely to be capacity for any surface water drainage from the new Pontins Site development in the existing drainage system serving the adjacent area (and discharging water along Yarmouth Road). Therefore, on-site surface water management measures will be of importance in any development proposals put forward.
- Waters Lane. 112 units are planned for the site with the majority of these delivered by 31<sup>st</sup> March 2013 and the remainder by 31<sup>st</sup> March 2014. Located in North West Hemsby, this site is in an area identified as being historically and at future risk of surface water and sewer flooding.
- Martham Road (north of Common Road and east of Summerfield Road). 49 units planned to be delivered in the period 2013 – 2016. Surface water drainage plans submitted to support the planning application set out the proposed surface water drainage arrangements which include management of existing drainage ditches on site and discharge of surface water to the Town Drain to the south of Common Road.

#### 5. Environmental & Heritage Considerations

Hemsby contains or borders the following environmental sites:

- Upstream to the northeast of Hall Farm Fen Special Area of Conservation (SAC), Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI) – 100% favourable condition<sup>3</sup>.
- Southeast of Winterton-Horsey Dunes Special Area of Conservation (SAC), Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI) – 83.89% favourable condition.
- Upstream of Broadland Ramsar, Special Area of Conservation (SAC) and Special Protection Area (SPA) site.

In Hemsby, surface water is discharged via Hall Road Anglian Water Outfall to ordinary watercourses IDB Drains to the north of Hall Road. These drain west to Muck Fleet. Muck Fleet and downstream water bodies have a Water Framework Directive (WFD) ecological status of Moderate. The WFD aims to work towards all water bodies achieving an ecological water body status of Good by 2015, or in some cases where this not achievable, by 2027. Any changes to discharges, in terms of volume or quality must not deteriorate the current ecological status of the watercourse or prevent those watercourses achieving Good Status in the future. Where possible, opportunities should be sought to improve the water quality and water environment of these watercourses.

#### 6. Conclusions

Hemsby has historically experienced flooding from a number of sources, including from surface runoff and sewer flooding, and is identified as being at risk of flooding from surface runoff, ordinary

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<sup>3</sup> Great Yarmouth Borough Council Annual Monitoring Report December 2012, Great Yarmouth Borough Council website ([www.great-yarmouth.gov.uk](http://www.great-yarmouth.gov.uk))

watercourses, groundwater and sewer flooding, providing a complex interaction of potential flood sources, pathways and receptors.

Several areas have been identified across Hemsby that are susceptible to flooding or have previously flooded. The predicted flood risk and historic flooding events correspond well, providing confidence in the FMfSW outputs. However, it should be noted that mitigation works have been funded by NCC (cleansing of drainage systems, installation of new pipes) and AWS (new pumps in Yarmouth Road, fitting of non-return valves to properties) meaning that the flood risk predicted is unlikely to be as significant as predicted in the FMfSW outputs, particularly for the more frequent, less intensive rainfall events.

136 residential properties and 166 non-residential receptors are predicted to be at risk of flooding to a depth of greater than 0.3m during a 0.5% AEP rainfall event. The non-residential receptors are predominantly located to the east of Hemsby in holiday parks and caravans parks, which may be of importance in considering evacuation in the case of flooding and the economic impacts of any given flooding event.