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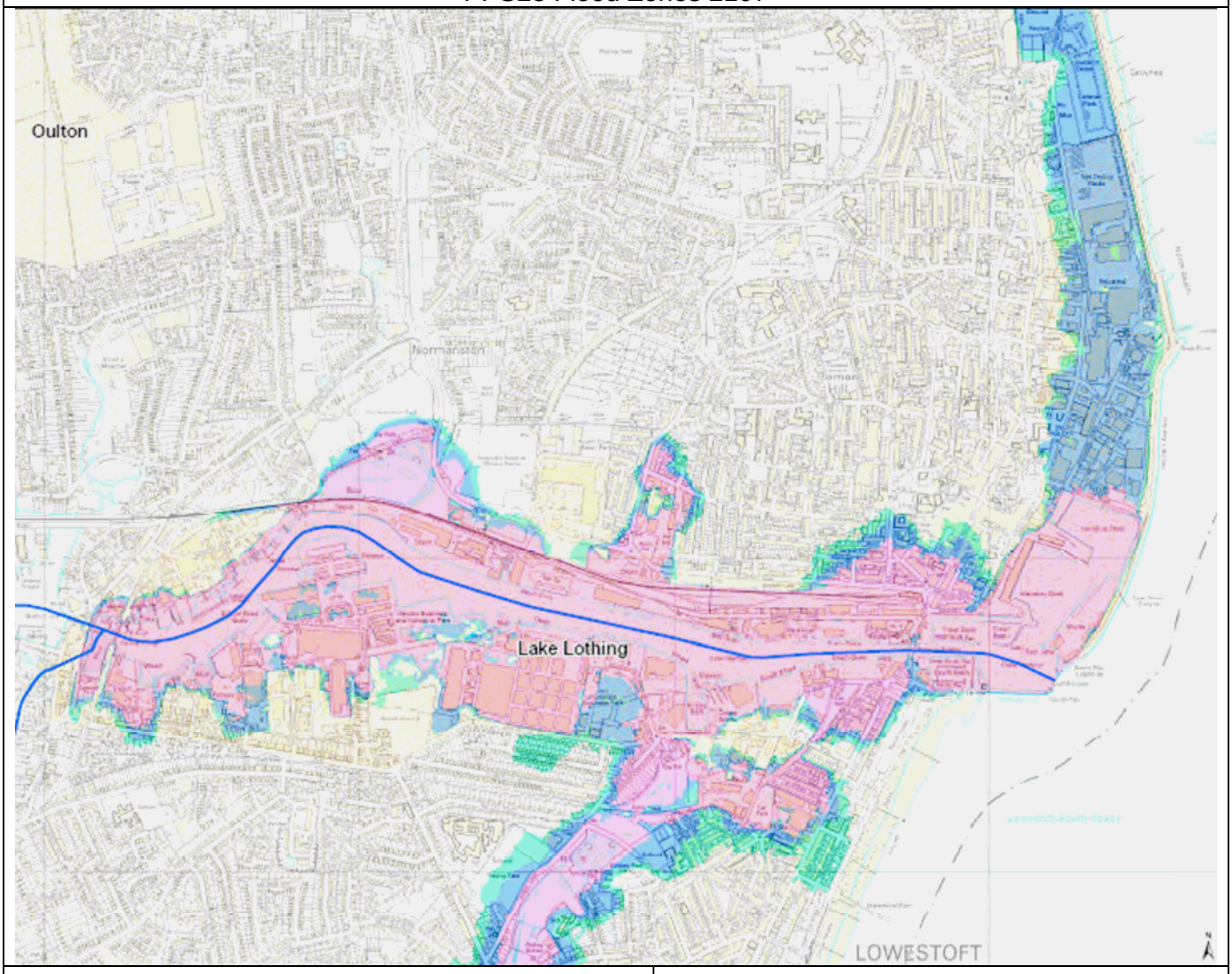
Lowestoft | Figure A20

PPS25 Flood Zones 2107

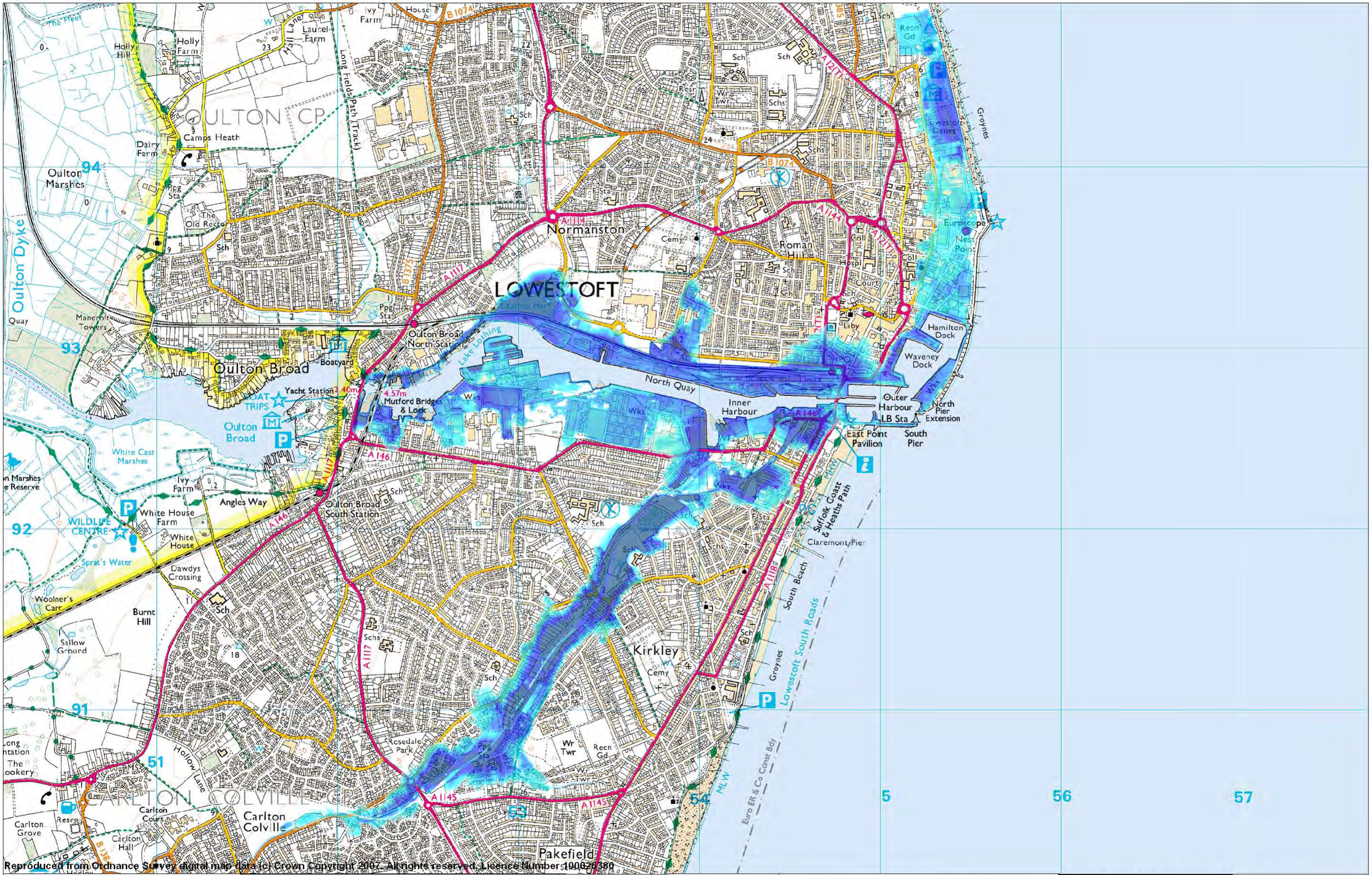


Potential Growth Area
Main River Centreline
Scale @ A3 – 1:11,000

Modelled Flood Zone 2
Modelled Flood Zone 3a
Functional Floodplain
Flood Plain 3b

The delineation of tidal Flood Zones 2 (1 in 1000 years) and 3a (1 in 200 years) with the influence of climate change in Lowestoft has been determined from the modelling undertaken as part of this SFRA. The current scenario where overtopping of the defences occurs, combined with the breach along North Beach has been used to create these outlines.

The functional floodplain in 2107 has been mapped using the 1 in 20 tidal flood extent resulting from the overtopping modelled scenario in Lowestoft. This has been modelled as part of this SFRA. Functional floodplain extents for 2007 and 2107 are available as a result of tidal modelling.



Project: **Suffolk & Waveney SFRA**	Title: **Lowestoft Flood Depth Map Existing Conditions 1 in 200yr + Climate Change (2107)**	Description: Shows the maximum depth at any point during the 1 in 200yr + climate change tidal cycle with existing defence heights	Maximum flood depth [m]: 0.05 · 0.50 · 1.00 · 1.50 · 2.00 · 3.00

FIGURE A21

Scale:	1:20000 @ A3		
Drw:	AA	App:	JR
Chk:	LW	Date:	07/02/08

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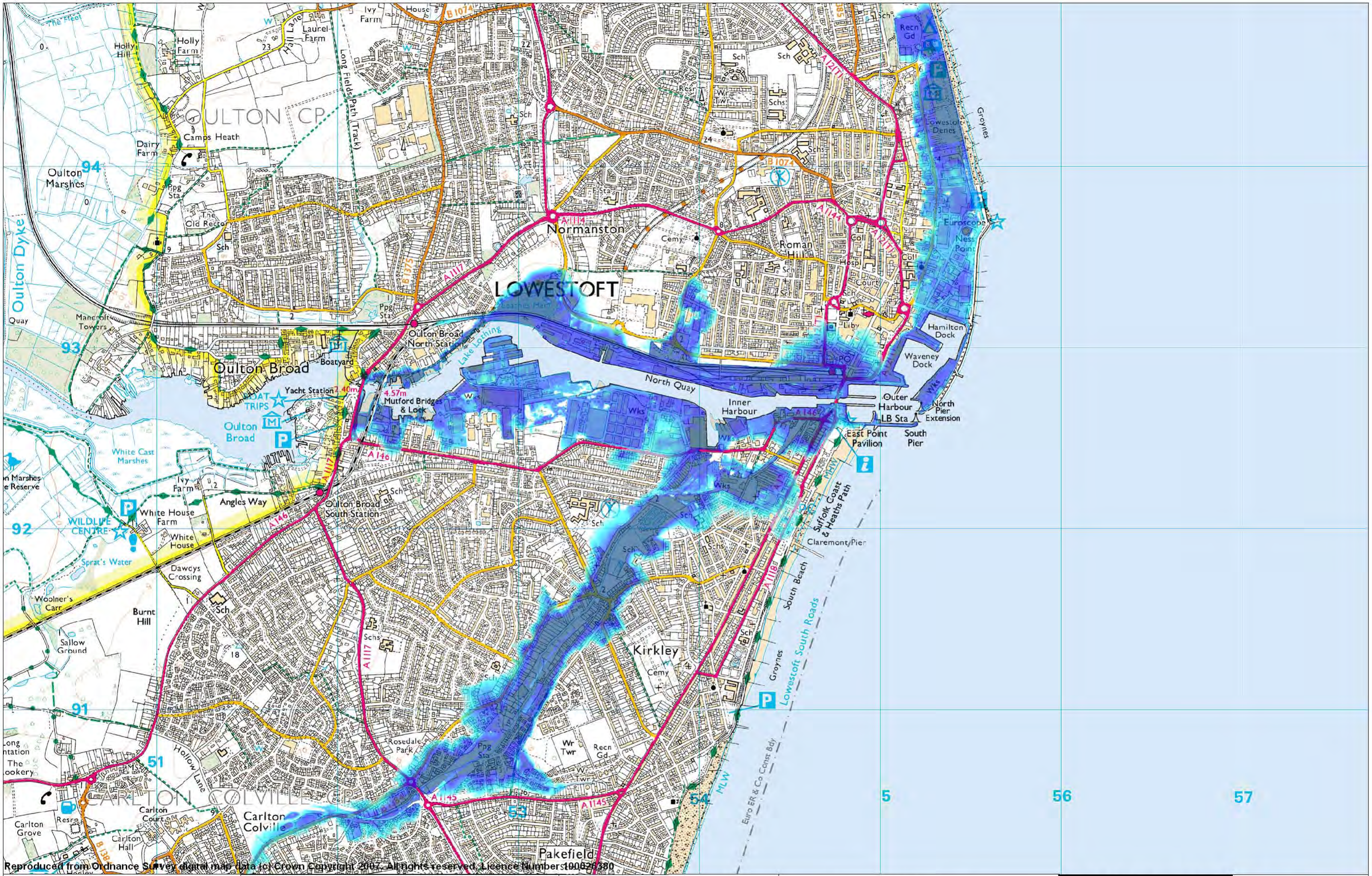


Project: **Suffolk & Waveney SFRA**	Title: **Lowestoft Flood Depth Map Existing Conditions 1 in 1000yr + Climate Change (2107)**	Description: Shows the maximum depth at any point during the 1 in 1000yr + climate change tidal cycle with existing defence heights	Maximum flood depth [m]: 0.05, 0.50, 1.00, 1.50, 2.00, 3.00

FIGURE A22

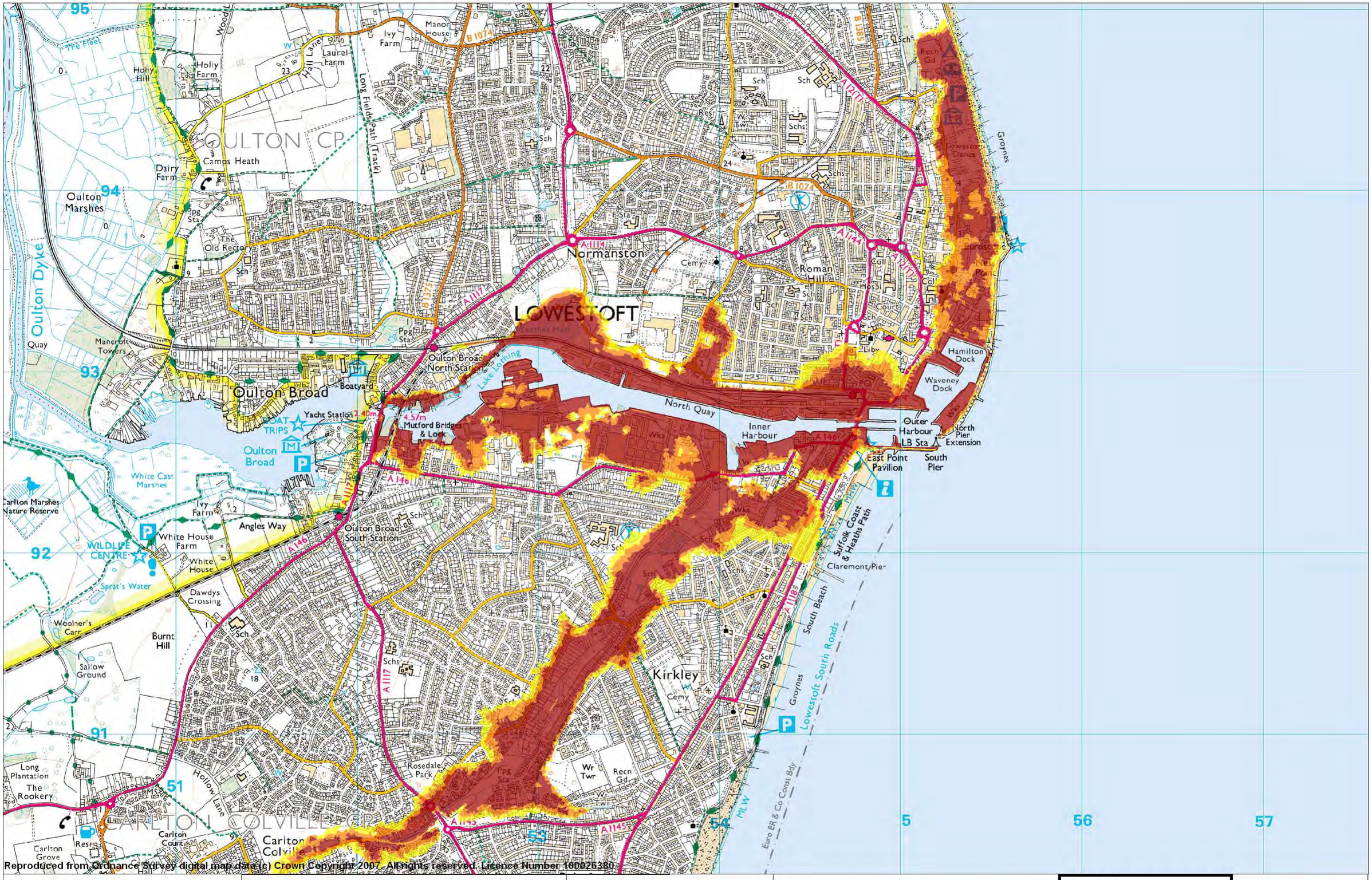
Scale:	1:20000 @ A3		
Drw:	AA	App:	JR
Chk:	LW	Date:	07/02/08

Scott Wilson

www.scottwilson.com

Project: **Suffolk & Waveney SFRA**	Title: **Lowestoft Hazard Map Existing Conditions 1 in 200yr + Climate Change (2107)**	Description: Shows hazard levels resulting from the 1 in 200yr + climate change event with existing defence heights	High Hazard; Medium Hazard; Low Hazard	**FIGURE A23** Scale: 1:20000 @ A3 Drw: AA App: JR Chk: LW Date: 07/02/08

Scott Wilson
www.scottwilson.com



Project: **Suffolk & Waveney SFRA**	Title: **Lowestoft Hazard Map Existing Conditions 1 in 1000yr + Climate Change (2107)**	Description: Shows hazard levels resulting from the 1 in 1000yr + climate change event with existing defence heights	High Hazard; Medium Hazard; Low Hazard	**FIGURE A24** Scale: 1:20000 @ A3; Drw: AA; App: JR; Chk: LW; Date: 08/02/08

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www.scottwilson.com

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Lowestoft (A0 Scenario)

Figure A25

Figure: A21

Scale: 1-22,000 @A3

RESULTS

Location of Main Flood Depth

1 in 200 years + 100 years of climate change scenario

The overtopping of man-made banks around Lake Lothing would cause inundation of large parts of Lowestoft. There are a number of areas where the floodwater spreads from Lake Lothing. These are: south along the A12, along a footpath/cycle track which leads from the Notley Road area to the northern region of Belvedere Road, around the quay area on the southern edge of Lake Lothing, on the north shore of Lake Lothing and spreading north along North Beach towards the camping area. The flood pattern around the north and south of Lake Lothing is similar to that seen as a result of Breach A1 plus Overtopping.

After about 2 hours flooding begins as a result of the overtopping of man-made banks on North Quay, around Riverside Road, adjacent to Inner Harbour and along the B1532. Shortly after, at about 3 hours, a number of other breaches occur at locations around the margins of Lake Lothing, including: Leathes Ham, the dock area on North Quay, the western end of Lake Lothing, the slipways in Brooke Business and Industrial Park and to the west of the crossing over the mouth of Lake Lothing. The floodwater resulting from these breach areas then spreads and inundates the land surrounding them. After about 12 hours flood water resulting from these breaches begins to spread rapidly along the railway line north of Lake Lothing and along the path/cycle track and A12 south of Lake Lothing. North of the lake, flooded areas extend north from the railway and commercial road towards the cemetery and into the Leathes Ham marsh area (4.2m flood depth). Water also flows north, to the west of Waveney Dock and Hamilton Dock to the Lowestoft and East Suffolk Maritime Museum in Sparrows Nest Park and campsite. Maximum flooding extents are reached by 19 hrs and reach north to the campsite, east to the A146 and south to Carlton Colville. Deep areas of floodwater are located along the A12 and in Leathes Ham marsh. These depths are 2m maximum between the two schools. Many transport networks are inundated, including the A12 and railway line to Lowestoft Station, which are of great importance to the area. Flood depths reach 1.6m on the railway.

Modelled scenarios

The defences surrounding the Lake Lothing area are significantly below standard, with their crest heights below the 1 in 200, 1000 and 200 plus climate change water levels. Therefore this scenario demonstrates the 'actual' risk to existing and proposed development during extreme water level events. The coastal defences north of lake Lothing are to a higher standard and much of the floodwater inundation is from pathways from lake Lothing not directly over the North Sea coastal defences.

Hazard Zone Results

1 in 200 + Climate Change – Figure A21 & 23
The majority of the northern flooding extent surrounding Lake Lothing is classified as high hazard in this scenario. To the north of the Lake the area around the Lowestoft and East Suffolk Maritime Museum in Sparrows Nest Park is also high hazard. To the south of the Lake, areas of high hazard are concentrated around Brook Business and Industrial Park, along the length of the flood extent on the A12 and along the path/cycle track from the A12 to the mouth crossing over Lake Lothing. There are a number of properties classified as high hazard to the east and west of the route of the A12.

1 in 1000 + Climate Change – Figure A22 & 24
High hazard areas exists along the banks of Lake Lothing. To the north these high hazard areas include the recreational ground and industrial estate on Rotterdam Road and north across Norwich Road while the high hazard area around the Lowestoft and East Suffolk Maritime Museum in Sparrows Nest Park has increased. The bulk of the coastal area north of Hamilton Dock is classified as high hazard in this scenario. To the south, high hazard areas affect the Brook Business and Industrial Park, Riverside Business Park and the banks of South Wharf and South Quay. The high hazard areas have increased along the length of the flood extent on the A12 and along the path/cycle track from the A12 to the mouth crossing over Lake Lothing. The majority of the flooding throughout the area is classified as high hazard with fringing areas of medium and high hazard in this scenario.

Flood Cell Description

This is an extensive flood cell and covers the area surrounding Lake Lothing, and Carton Colville to the southwest, Pakefield to the southeast and North Beach to the north. The flood cell is predominantly developed, and includes residential properties, industrial areas and recreational facilities. There are a number of transport networks included in the flood cell, of importance are the train line situated to the north of Lake Lothing, the A12 which runs from the north of Lowestoft, over the bridge at the mouth of Lake Lothing, to the south west of Lowestoft, following a waterway towards Carlton Colville. The area to the south of Lake Lothing, between the lake and Victoria Road, is industrial in land use.
The flood cell is bounded to the east by the North Sea. The harbour to the north east of the mouth of Lake Lothing is included in the cell. The topography is generally low lying, below 20m AOD but there is an area of higher ground to the west of North Beach.

Relevance to Development

Considerations for the Lowestoft Area Acton Plan
According to PPS25 where possible development should not be positioned within the flood plains. The areas of land at 'actual' risk of flooding as a result of the low standard of defence, should, in accordance with PPS25, only be developed once the Sequential and Exception Tests have been performed. Providing the EA have been supplied with evidence that the Sequential Test has been passed, objections to developments may only occur if the developer is unable to ensure a safe development for the lifetime of the development under part c) of the Exception Test.

General Considerations
In addition to flood hazard within Lowestoft, evacuation and access routes to the town are cut off during a breach event. Emergency access routes to and from the town should be improved over time to improve response times for breach closure and the ability of emergency services to access flooded areas.
Future developments in the area of Lake Lothing may need to enter into discussions early with the local authority with respect of developer contributions to improve existing defence standards.

Project:	Title:	Description:		
Suffolk & Waveney SFRA	**Lowestoft Flood Depth Map Breach of Defences at A1 1 in 200yr + Climate Change (2107)**	Shows the maximum depth at any time of the tidal cycle assuming a breach of coastal defences at A1 and no increase in defence heights	Maximum flood depth [m] 0.05 0.50 1.00 1.50 2.00 3.00	**FIGURE A26** Scale: 1:20000 @ A3 Drw: AA App: JR Chk: LW Date: 07/02/08 Scott Wilson www.scottwilson.com

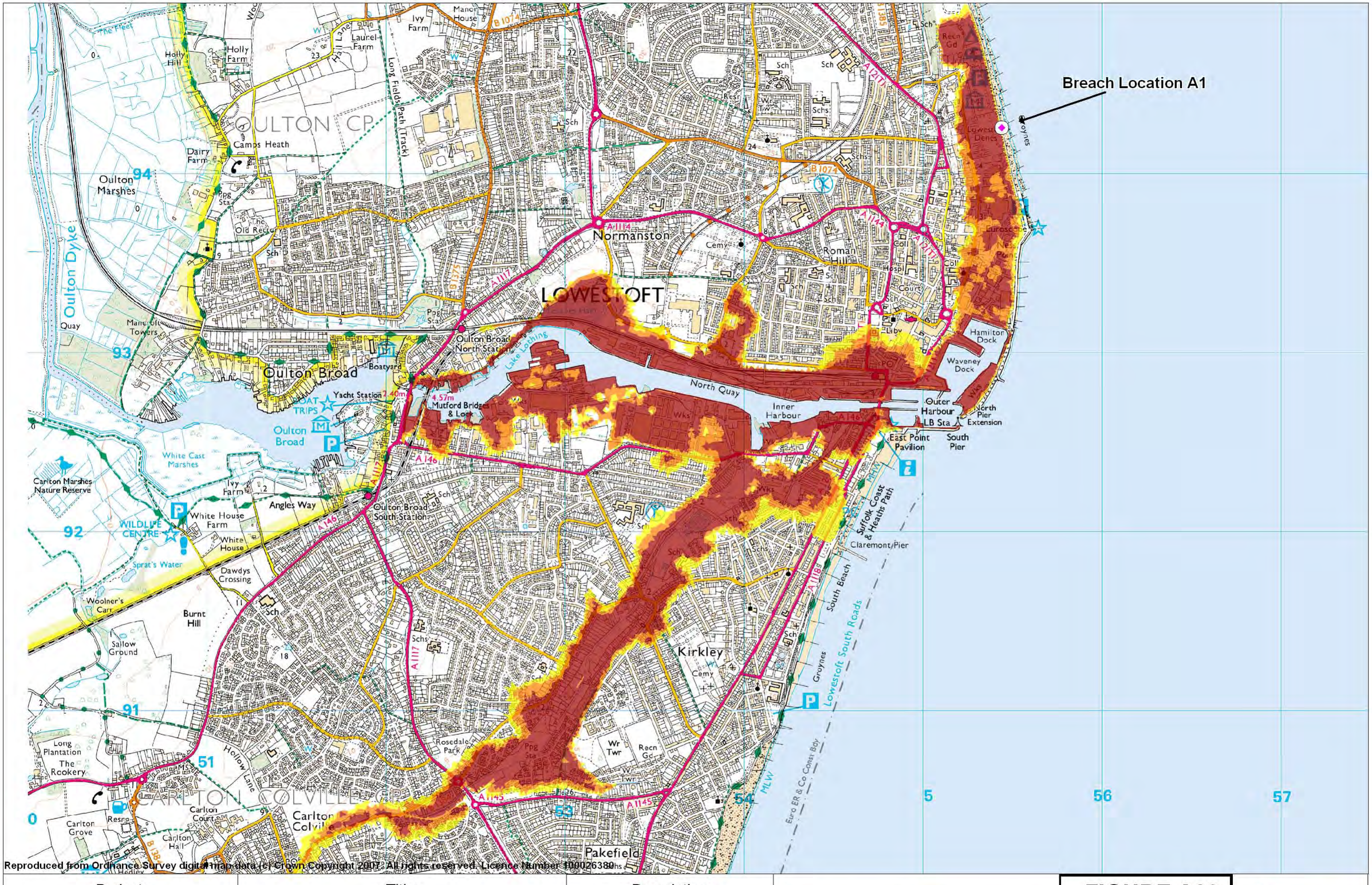
Project:	Title:	Description:	Maximum flood depth [m]
Suffolk & Waveney SFRA	**Lowestoft Flood Depth Map Breach of Defences at A1 1 in 1000yr + Climate Change (2107)**	Shows the maximum depth at any time of the tidal cycle assuming a breach of coastal defences at A1 and no increase in defence heights	0.05 0.50 1.00 1.50 2.00 3.00

FIGURE A27

Scale:	1:20000 @ A3		
Drw:	AA	App:	JR
Chk:	LW	Date:	07/02/08

Scott Wilson
www.scottwilson.com

Project:	Title:	Description:		FIGURE A28	
Suffolk & Waveney SFRA	**Lowestoft Hazard Map Breach of Defences at A1 1 in 200yr + Climate Change (2107)**	Shows the hazard levels assuming a breach of coastal defences at A1 and no increase in defence heights	High Hazard Medium Hazard Low Hazard	Scale: 1:20000 @ A3 Drw: AA App: JR Chk: LW Date: 07/02/08	Scott Wilson www.scottwilson.com



Project:	Title:	Description:		
Suffolk & Waveney SFRA	**Lowestoft Hazard Map Breach of Defences at A1 1 in 1000yr + Climate Change (2107)**	Shows the hazard levels assuming a breach of coastal defences at A1 and no increase in defence heights	**High Hazard** **Medium Hazard** **Low Hazard**	**FIGURE A29** Scale: 1:20000 @ A3 Drw: AA App: JR Chk: LW Date: 07/02/08 Scott Wilson www.scottwilson.com

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Lowestoft (A1 Scenario)

Figure A30

Figure: A26

Maximum flood depth [m]

0.05 0.50 1.00 1.50 2.00 3.00

Scale: 1-22,000 @A3

RESULTS

Location of Main Flood Depth

1 in 200 years + 100 years of climate change scenario

The breach in the flood defence, combined with the overtopping of existing man-made banks causes widespread inundation of Lowestoft. There are a number of areas where resultant floodwater spreads from the flood source, Lake Lothing, to the surrounding land areas. These areas are: south along the A12, along a footpath/cycle track to the east of the A12 corridor to Lake Lothing, around the quay area on the southern edge of Lake Lothing and spreading north from the breach location.
After about 1½ hours the flooding begins from overtopping of man-made banks on North Quay and around East Point Pavilion, followed by the inflow of water at the breach location 1 and overtopping of man-made banks on the southern edge of Lake Lothing. At about 4 hours, these areas are stable and there is limited further inundation until about 12:20hrs. Following this, further man-made banks are overtopped on the northern boundary of Lake Lothing and around the western edge of the lake, (on the northern edge the train line acts as a channel for the flood water). The area north of Breach 1 is also inundated from this time. The areas around the northern boundary of the lake become flooded, with particularly severe areas at Leathes Ham (4.2m flood depth), the mouth of the Lake and the area south of the cemetery.
Around the southern edge, water begins to spread south along the A12 passage and also uses a footpath/cycle track to the south west of the mouth of the Lake as a flood route. Areas around the western margin of the Lake are also flooded. Water continues to work south along the A12 and north to the Cemetery at about 14:30hrs and spreads south from Breach A1. By 20:35 hrs the water has spread as far southwest as the A12 junction with the A1117 and encroaching into Carlton Colville. Maximum flood depths of over 2m are found along the path of the A12, between the two schools, around Leathes Ham, and running east along the railway line, and around Breach location 1. The presence of this water would severely hinder transport routes in the area, particularly the A12 and the railway.

Modelled scenarios

The defences surrounding the Lake Lothing area are significantly below standard, with their crest heights below the 1 in 200, 1000 and 200 plus climate change water levels. Therefore this scenario demonstrates the 'actual' risk to existing and proposed development during extreme water level events. The coastal defences north of lake Lothing are to a higher standard and for this scenario have assumed a potential breach in the coastal defences at A1 combined with overtopping in the Lake Lothing area.

Hazard Zone Results

1 in 200 + Climate Change – Figure A26 & 28
The majority of the northern flooding extent surrounding Lake Lothing is classified as high hazard in this scenario. To the north of the Lake the area around the Lowestoft and East Suffolk Maritime Museum in Sparrows Nest Park is also high hazard. To the south of the Lake, areas of high hazard are concentrated around Brook Business and Industrial Park, along the length of the flood extent on the A12 and along the path/cycle track from the A12 to the mouth crossing over Lake Lothing. There are a number of properties classified as high hazard to the east and west of the route of the A12.

1 in 1000 + Climate Change – Figure A27 & 29
High hazard areas exists along the banks of Lake Lothing. To the north, these high hazard areas include the recreational ground and industrial estate on Rotterdam Road and extend north across Norwich Road, while the high hazard area around the Lowestoft and East Suffolk Maritime Museum in Sparrows Nest Park has increased. The bulk of the coastal area north of Hamilton Dock is classified as high hazard in this scenario. To the south, the entire bank of Lake Lothing is classified as high hazard, which affect the Brooke Business and Industrial Park, Riverside Business Park and the banks of South Wharf and South Quay. The high hazard areas have increased along the length of the flood extent on the A12 and along the path/cycle track from the A12 to the mouth crossing over Lake Lothing. The majority of the flooding throughout the area is classified as high hazard with fringing areas of medium and high hazard in this scenario.

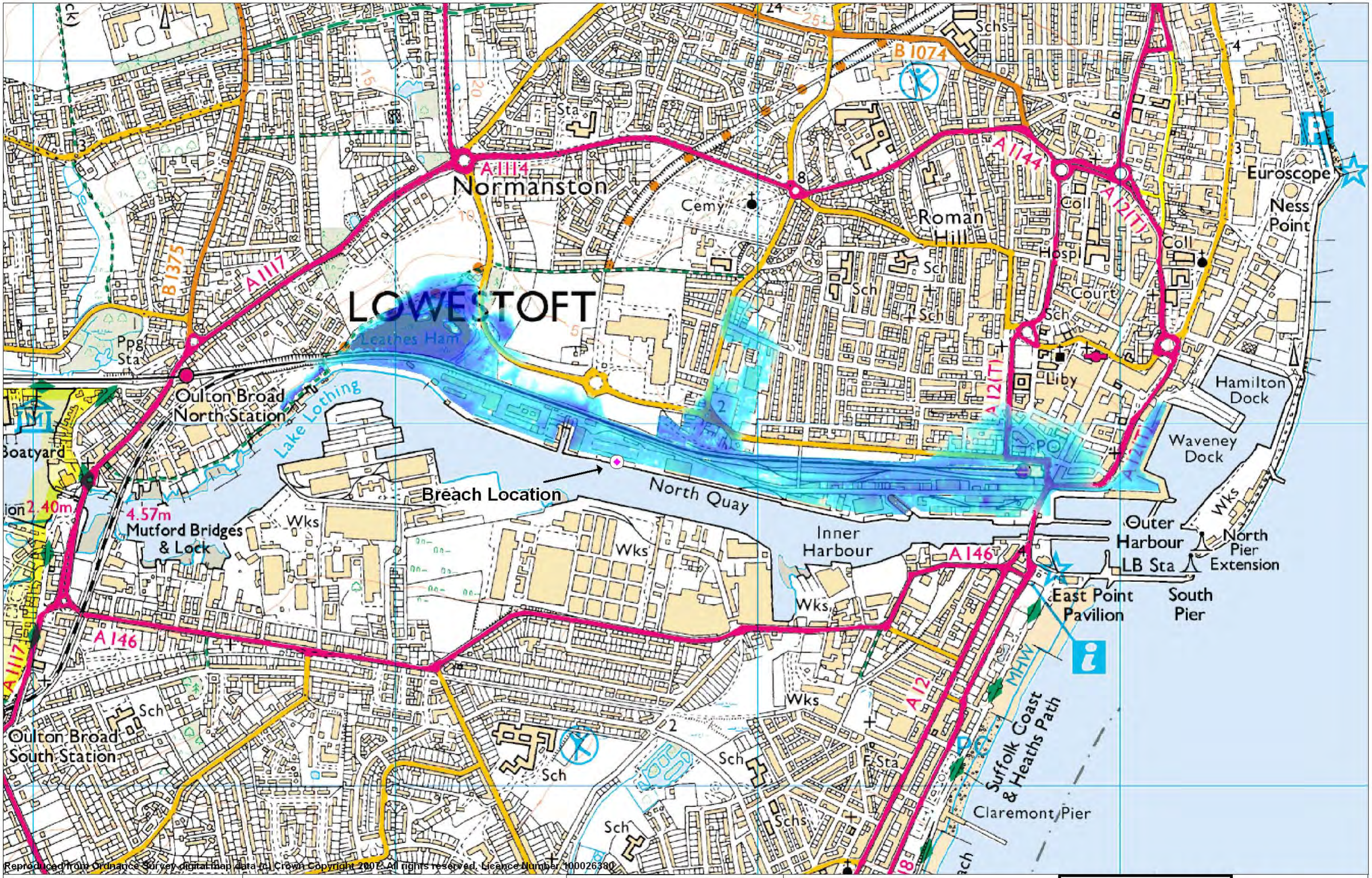
Flood Cell Description

This is an extensive flood cell and covers the area surrounding Lake Lothing, and Carton Colville to the southwest, Pakefield to the southeast and North Beach to the north. The flood cell is predominantly developed, and includes residential properties, industrial areas and recreational facilities. There are a number of transport networks included in the flood cell, of importance are the train line situated to the north of Lake Lothing, the A12 which runs from the north of Lowestoft, over the bridge at the mouth of Lake Lothing, to the south west of Lowestoft, following a waterway towards Carlton Colville. The area to the south of Lake Lothing, between the lake and Victoria Road, is industrial in land use. The flood cell is bounded to the east by the North Sea. The harbour to the north east of the mouth of Lake Lothing is included in the cell. The topography is generally low lying, below 20m AOD but there is an area of higher ground to the west of North Beach.

Relevance to Development

Considerations for the Lowestoft Area Acton Plan
According to PPS25 where possible development should not be positioned within the flood plains. The areas of land at 'actual' risk of flooding as a result of the low standard of defence, should, in accordance with PPS25, only be developed once the Sequential and Exception Tests have been performed. Providing the EA have been supplied with evidence that the Sequential Test has been passed, objections to developments may only occur if the developer is unable to ensure a safe development for the lifetime of the development under part c) of the Exception Test.

General Considerations
In addition to flood hazard within Lowestoft, evacuation and access routes to the town are cut off during a breach event at A1. Emergency access routes to and from the town should be improved over time to improve response times for breach closure and the ability of emergency services to access flooded areas.
Future developments in the area of Lake Lothing may need to enter into discussions early with the local authority with respect of developer contributions to improve existing defence standards. .



Project: **Suffolk & Waveney SFRA**	Title: **Lowestoft Flood Depth Map Breach of Defences at A2 1 in 200yr + Climate Change (2107)**	Description: Shows the maximum depth at any time of the tidal cycle assuming an increase in defence height and a breach of the defences at A2	Maximum flood depth [m]: 0.05, 0.50, 1.00, 1.50, 2.00, 3.00

FIGURE A31

Scale:	1:10000 @ A3		
Drw:	AA	App:	JR
Chk:	LW	Date:	07/02/08

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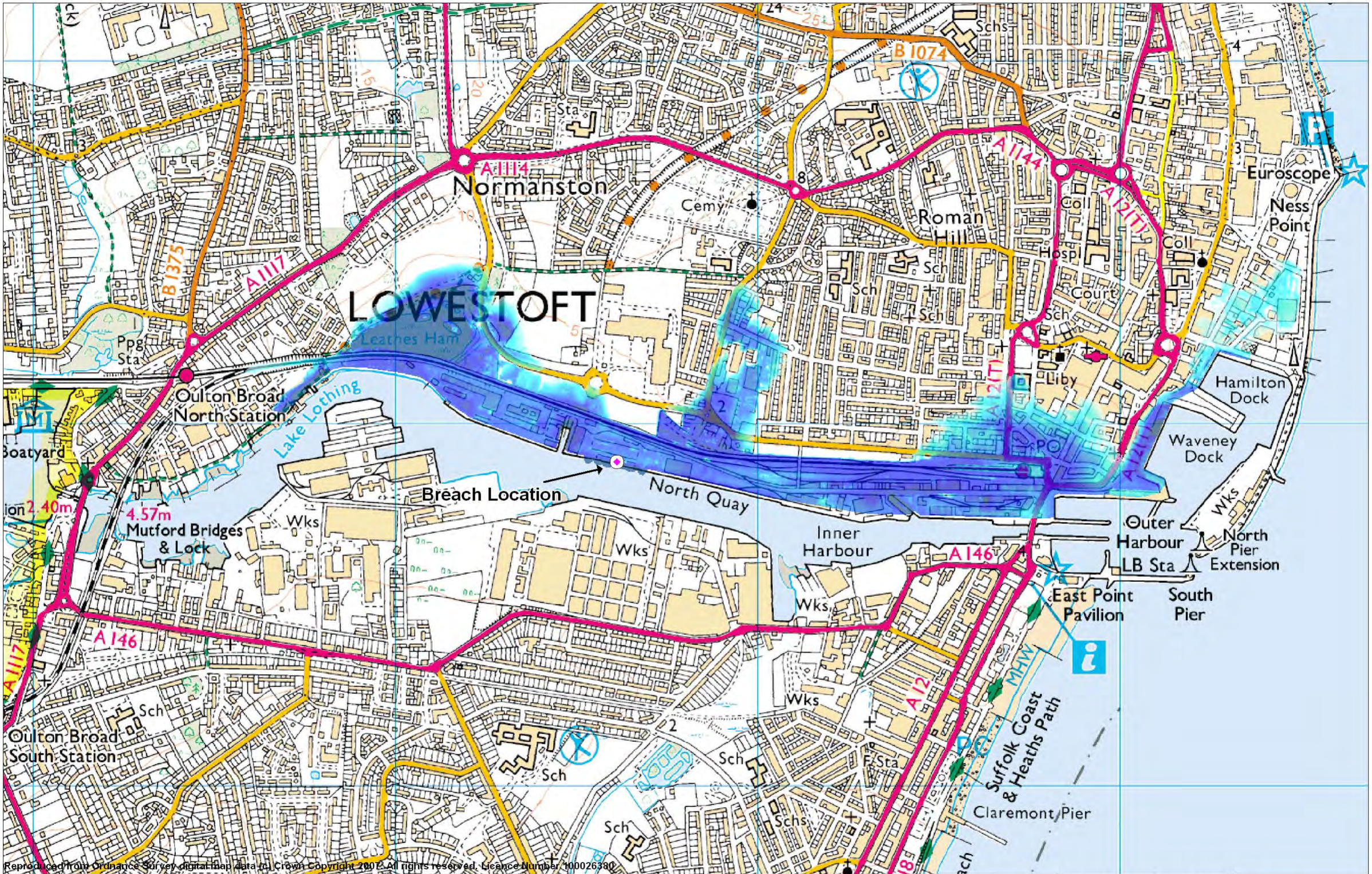

Project: **Suffolk & Waveney SFRA**	Title: **Lowestoft Flood Depth Map Breach of Defences at A2 1 in 1000yr + Climate Change Event**	Description: Shows the maximum depth at any time of the tidal cycle assuming an increase in defence height and a breach of the defences at A2	Maximum flood depth [m]: 0.05, 0.50, 1.00, 1.50, 2.00, 3.00	**FIGURE A32** Scale: 1:10000 @ A3; Drw: AA; App: JR; Chk: LW; Date: 07/02/08

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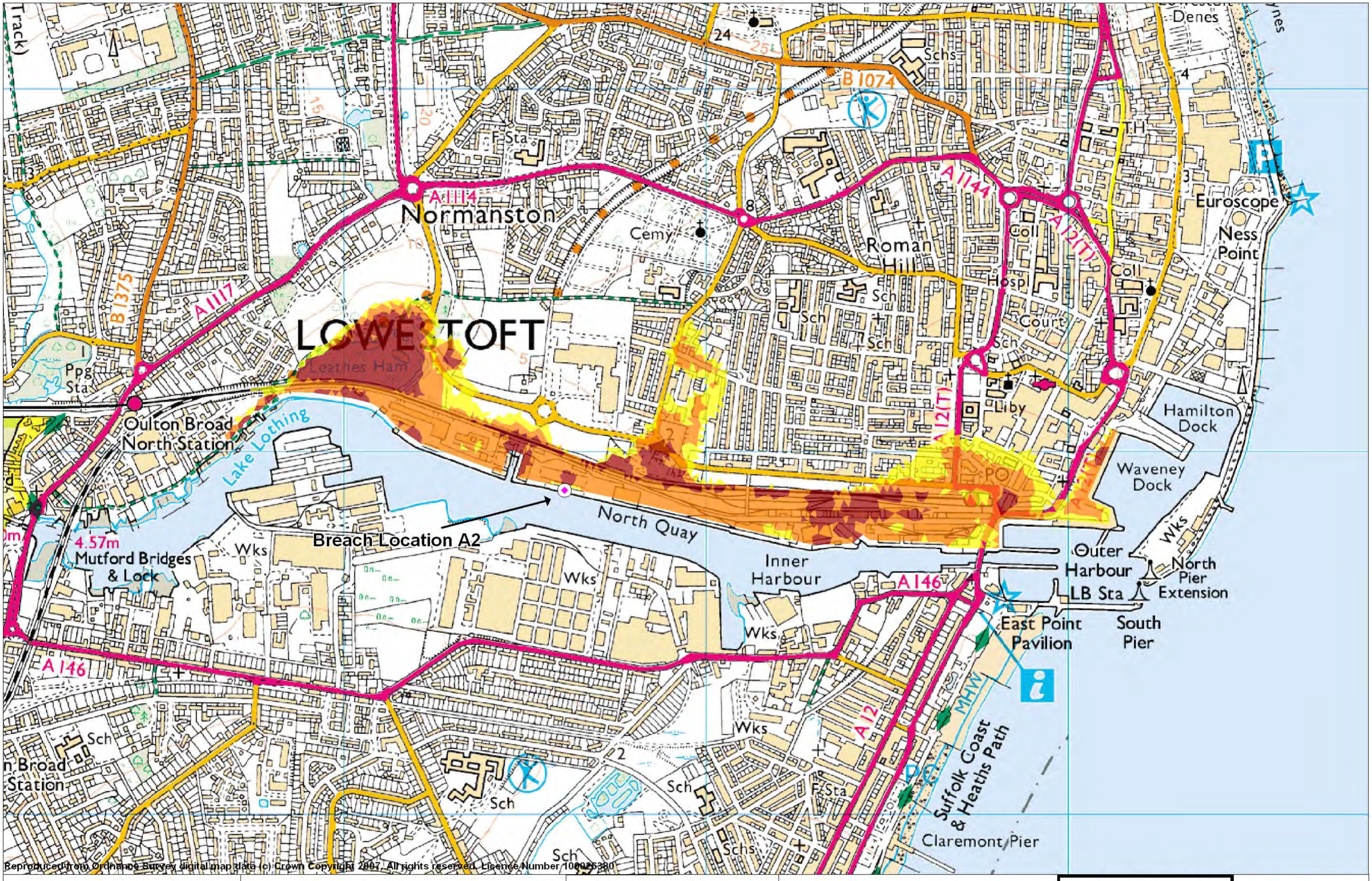

Project:	Title:	Description:
Suffolk & Waveney SFRA	**Lowestoft Hazard Map Breach of Defences at A2 1 in 200yr + Climate Change (2107)**	Shows the hazard levels assuming an increase in defence height and a breach of the defences at A2

High Hazard **Medium Hazard** **Low Hazard**

FIGURE A33

Scale:	1:10000 @ A3		
Drw:	AA	App:	JR
Chk:	LW	Date:	07/02/08

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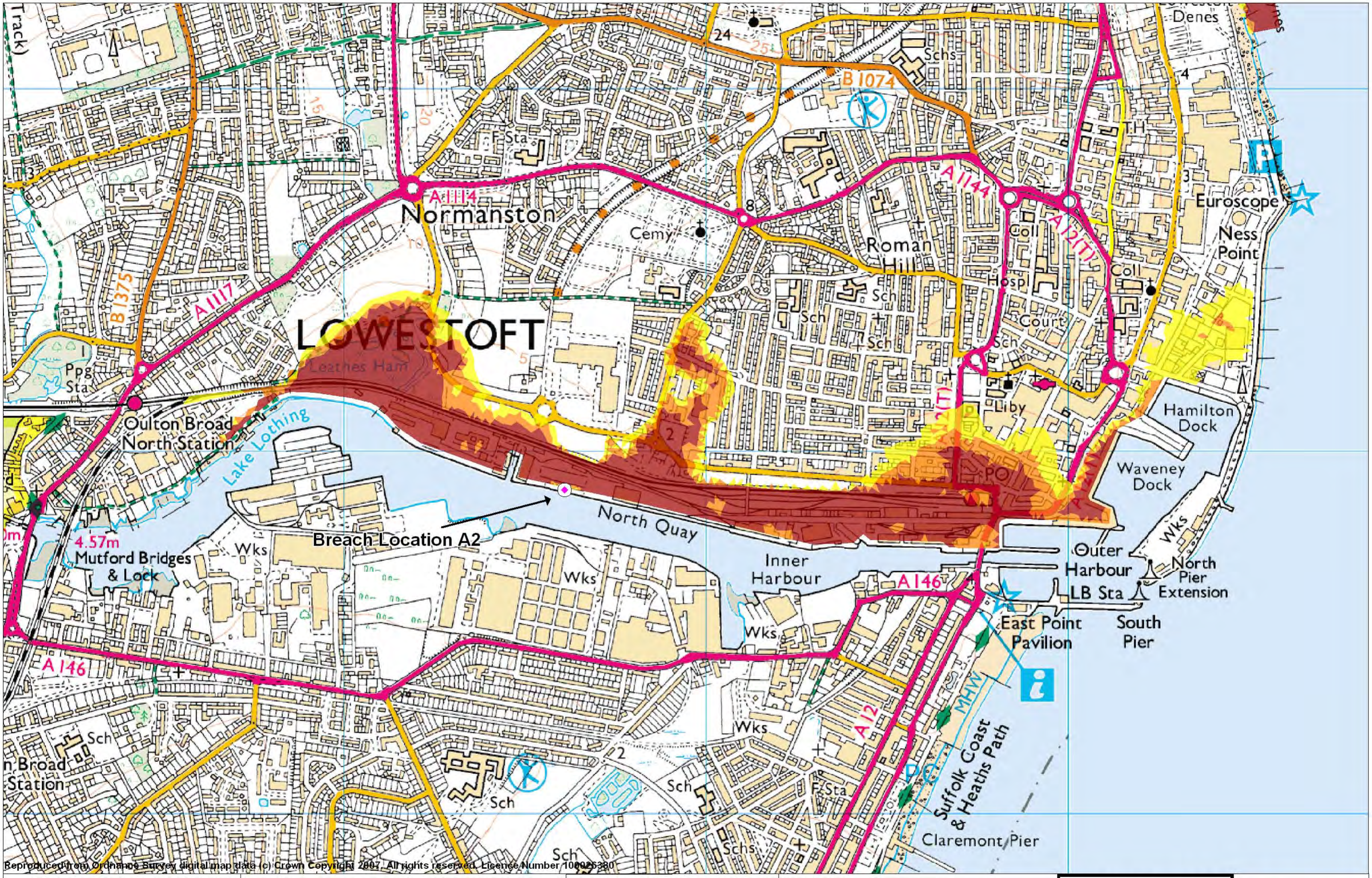

Project:	Title:	Description:		
Suffolk & Waveney SFRA	**Lowestoft Hazard Map Breach of Defences at A2 1 in 1000yr + Climate Change (2107)**	Shows the hazard levels assuming an increase in defence height and a breach of the defences at A2	**High Hazard** **Medium Hazard** **Low Hazard**	**FIGURE A34** Scale: 1:10000 @ A3 Drw: AA App: JR Chk: LW Date: 07/02/08 Scott Wilson www.scottwilson.com

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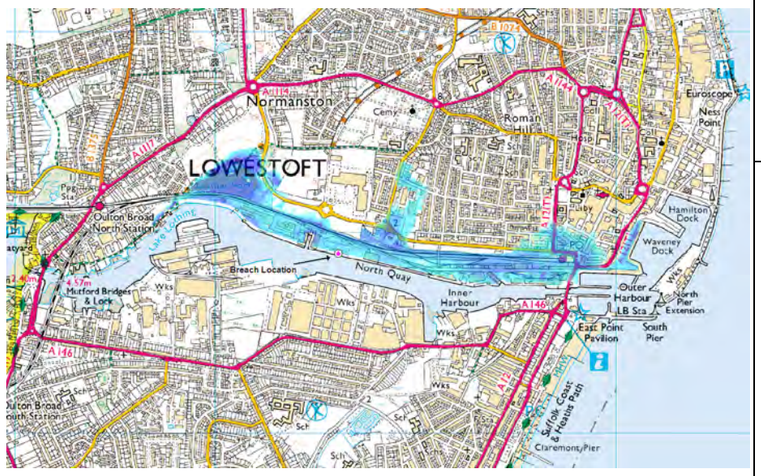
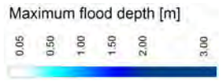
Lowestoft (A2 Scenario)

Figure A35

Figure: A31





Scale: 1-22,000 @A3

RESULTS

Location of Main Flood Depth

1 in 200 years + 100 years of climate change scenario

The maximum flood depth is located in the marshy area of Leathes' Ham, on the northern shore of Lake Lothing and is reaches a maximum depth of 3.7m. The main area of flood water is concentrated along the railway line and Commercial Road, which run along the northern shore of Lake Lothing, before terminating at Lowestoft train station and the A12 respectively. This area of flooding is generally confined to the train line area and flood depths reach a mean of 1.5m and a maximum of 1.6m north of North Quay. However, there are a number of areas where the flood waters extend north, including (from west to east), Leathes' Ham, an area extending north along Rotterdam Road towards the Normanston cemetery and the area around Lowestoft train station. Flood depths reach 1.2m on the roundabout between Peto Way, Rotterdam Road and Denmark Road and 1m at the train station. The maximum extent of the floodwater occurs at about 18:25 hrs.

The railway line acts as a flood path, routing the floodwater from the breach to the surrounding area. This results in the speedy transmission of the resultant breach floodwater east and west of Breach A2.

Modelled scenarios

It was assumed for these scenarios, that the potential development pressures in the Lake Lothing area will demand an increased standard of flood defence to protect not only existing but proposed developments. The funding for these improvements are likely to be sought from developers. The following breach scenarios have therefore been modelled to demonstrate the residual risk that will still need to be considered once the defences have been increased in standard (height of improved defences assumed at 300mm above 200yr + 100year climate change water levels).

Hazard Zone Results

1 in 200 + Climate Change – Figure A31 & 33
High Hazard zones are located within and surrounding the Leathes Ham area, which is characterised by lagoon and marsh land. There are also high hazard areas between the roundabout between Denmark Road, Roterdam Road and Peto Way and the railway line, and the area between Denmark Road and Lake Lothing. In addition there is a small area of high hazard to the east of Station Road and one to the west of Waveney Dock. The entire area between Leathes Ham and Lowestoft Railway Station is within a medium hazard zone, with fringe areas characterised by low hazard zones. There are some properties classified as medium hazard around the station and between the railway and the Normanston Cemetery.

1 in 1000 + Climate Change – Figure A32 & 34
The area south of the railway line to Lake Lothing is classified as high hazard with small pockets of medium hazard areas. High hazard zones are also located within and surrounding the Leathes Ham area, which is characterised by lagoon and marsh land. There are also high hazard areas around the recreation ground and the roundabout between Denmark Road, Roterdam Road and Peto Way. Medium hazard zones extend north and another zone of high hazard is located at the intersection of Norwich and Rotterdam Road. To the east, the area bounded by the A12 and Bevan Street East is high hazard with fringing areas of medium and low hazard. The banks of Waveney dock are classified as high hazard and a zone of low hazard extends north of Hamilton Dock.

Flood Cell Description

The northern area of the flood cell is concentrated around the breach location of A2.

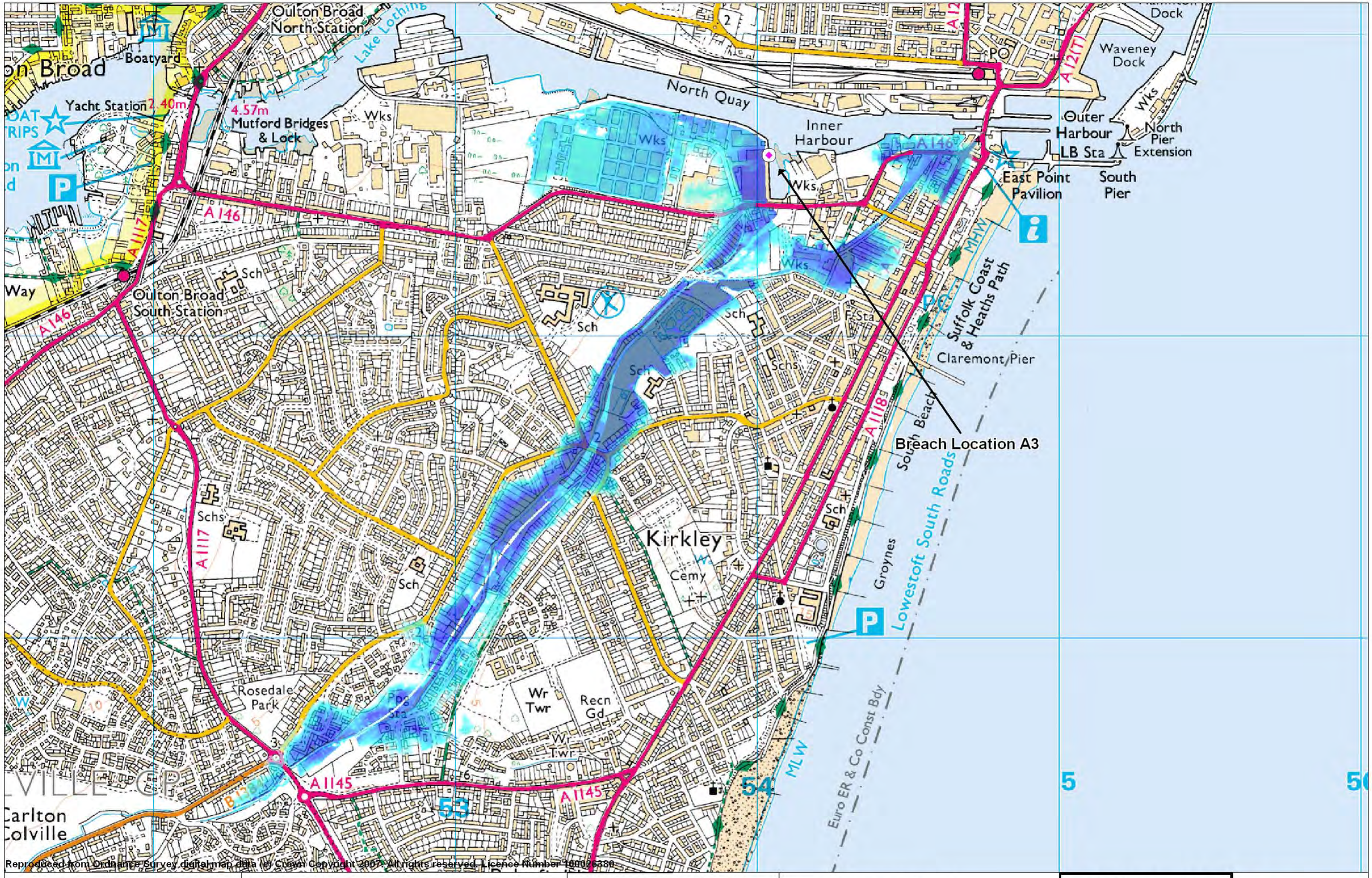
Relevance to Development

Considerations for the Lowestoft Area Action Plan
According to PPS25 more vulnerable development should not be sited in areas at risk from flooding. However within Flood Zone 3 areas of lower or medium hazard should be considered as preferential to high hazard areas.

General Considerations

In times of high floodwater and/or a breach in the flood defences the railway line and Commercial Road will become areas of varying hazard, from high to medium hazard. This will make access to the breach location and indeed the north shore of Lake Lothing difficult and dangerous.

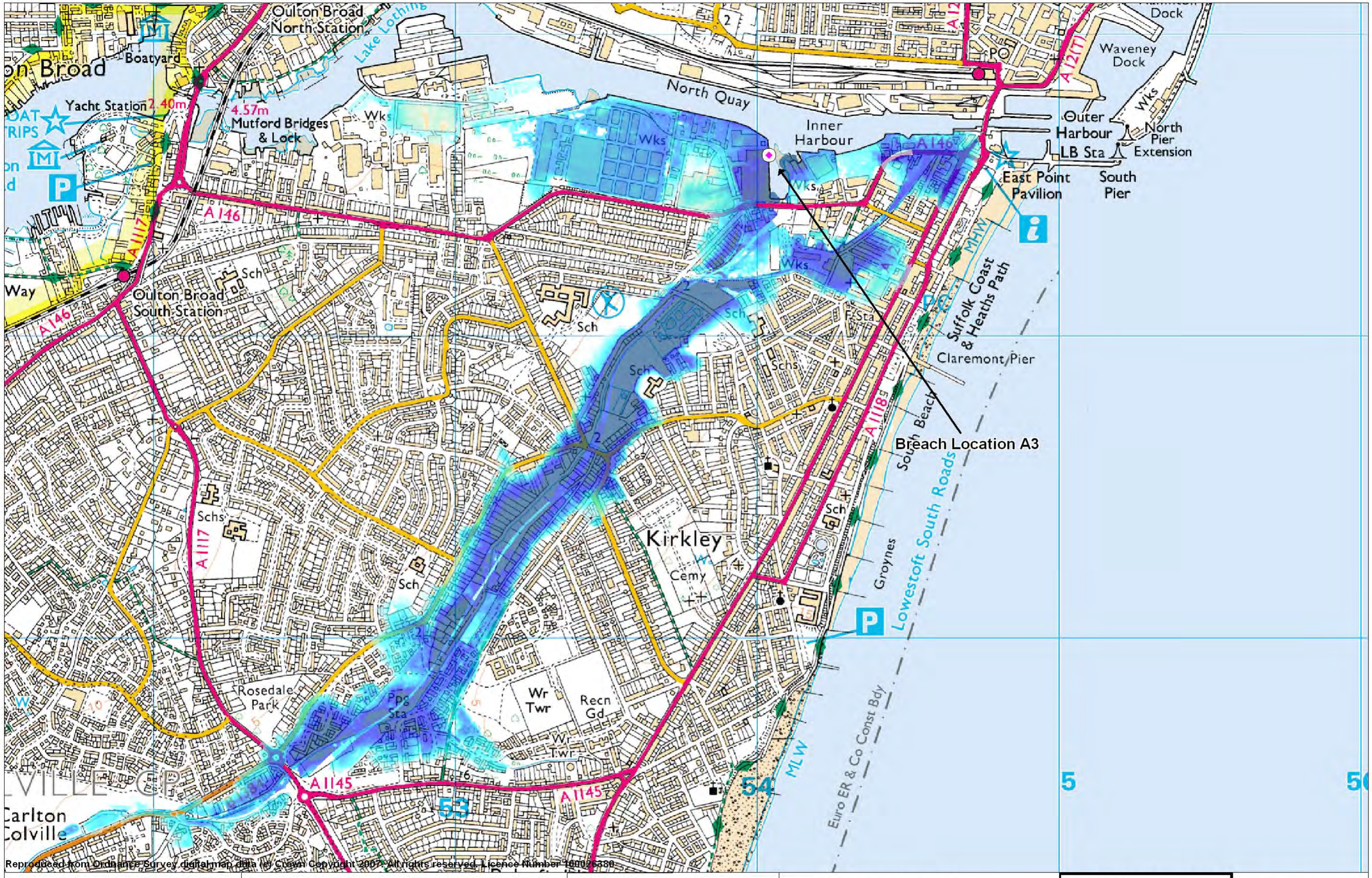
In addition, access to the proposed predominantly employment area and areas of the proposed Mixed Town Centre would be disrupted during flooding events as the whole of the Lake Lothing north shore is shown to be inundated, including the section of the A12 north of the crossing over the mouth of Lake Lothing. The Lowestoft train station would also become hazardous as it lies within the medium hazard flood zone.



Project:	Title:	Description:	Maximum flood depth [m]	FIGURE A36
Suffolk & Waveney SFRA	**Lowestoft Flood Depth Map Breach of Defences at A3 1 in 200yr + Climate Change (2107)**	Shows the maximum depth at any point of the tidal cycle assuming an increase in defence height and a breach of the defences at A3	0.05 0.50 1.00 1.50 2.00 3.00	Scale: 1:12000 @ A3 Drw: AA App: JR Chk: LW Date: 07/02/08

Scott Wilson

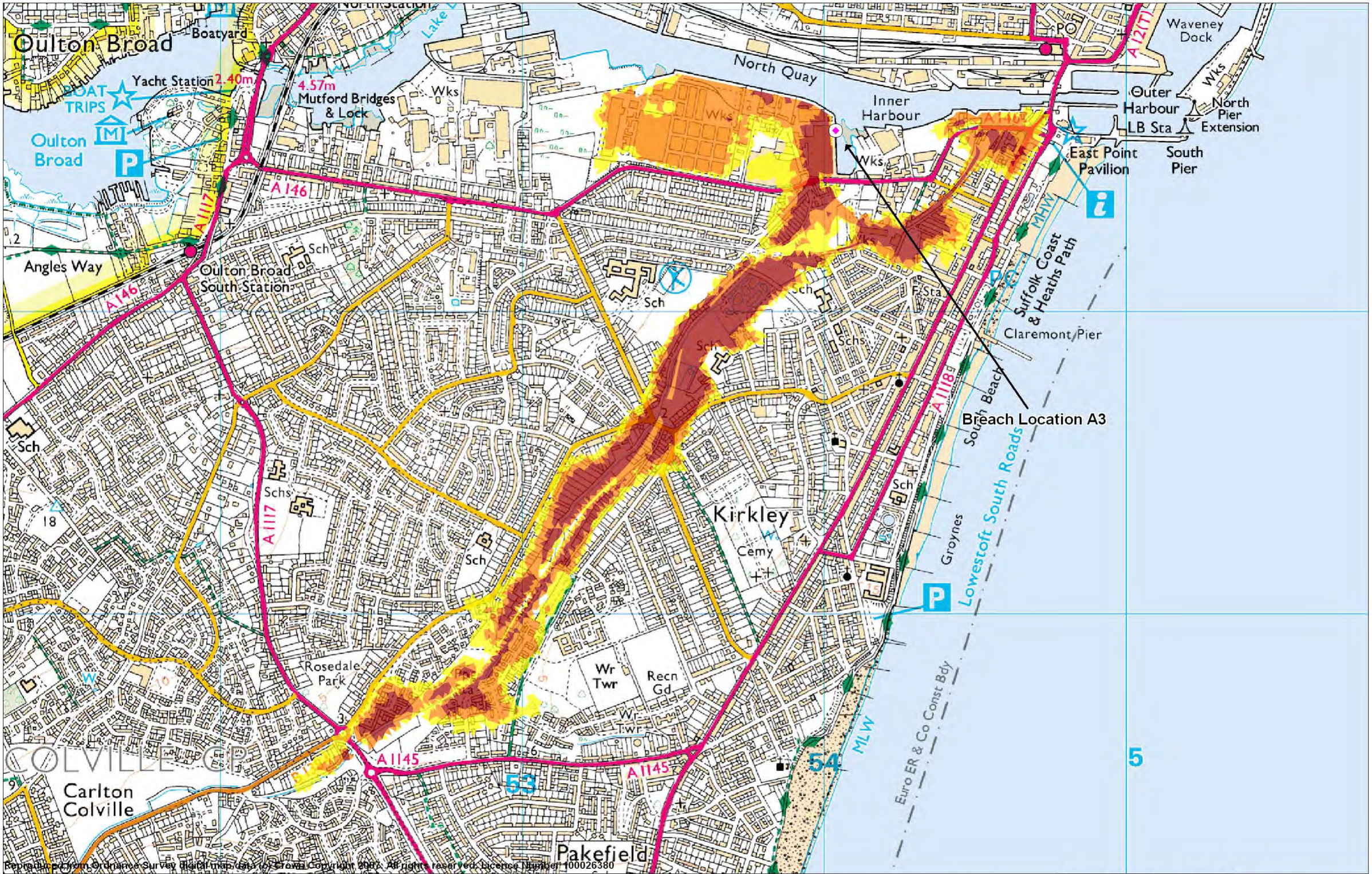
www.scottwilson.com



Project:	Title:	Description:	Maximum flood depth [m]	FIGURE A37
Suffolk & Waveney SFRA	**Lowestoft Flood Depth Map Breach of Defences at A3 1 in 1000yr + Climate Change (2107)**	Shows the maximum depth at any point of the tidal cycle assuming an increase in defence height and a breach of the defences at A3	0.05 0.50 1.00 1.50 2.00 3.00	Scale: 1:12000 @ A3 Drw: AA App: JR Chk: LW Date: 07/02/08

Scott Wilson

www.scottwilson.com

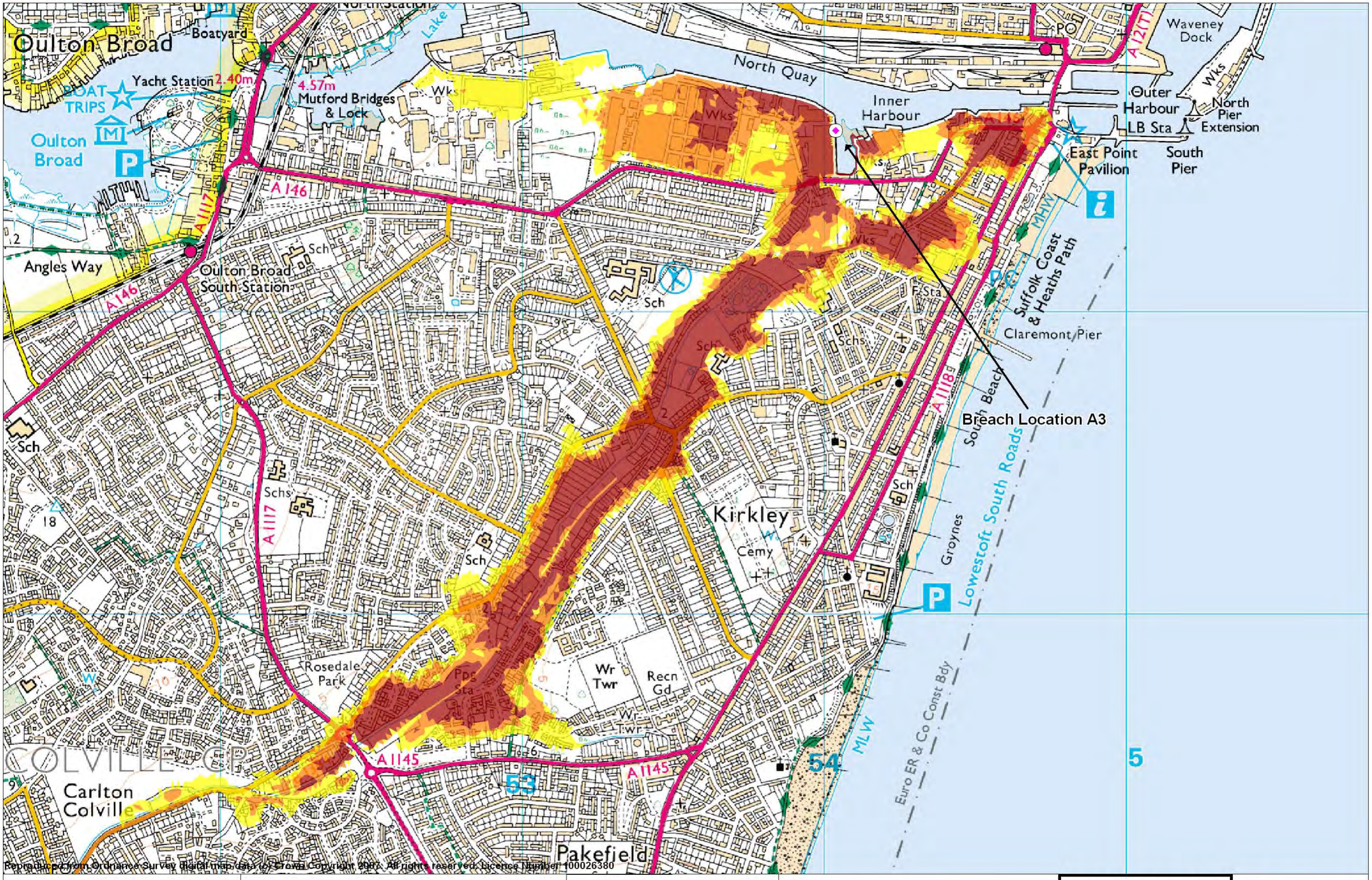


Project:	Title:	Description:		
Suffolk & Waveney SFRA	**Lowestoft Hazard Map Breach of Defences at A3 1 in 200yr + Climate Change (2107)**	Shows the hazard levels assuming an increase in defence height and a breach of the defences at A3	**High Hazard** **Medium Hazard** **Low Hazard**	**FIGURE A38**

Scale:	1:12000 @ A3		
Drw:	AA	App:	JR
Chk:	LW	Date:	07/02/08

Scott Wilson

www.scottwilson.com



Project:	Title:	Description:		FIGURE A39	
Suffolk & Waveney SFRA	**Lowestoft Hazard Map Breach of Defences at A3 1 in 1000yr + Climate Change (2107)**	Shows the hazard levels assuming an increase in defence height and a breach of the defences at A3	High Hazard; Medium Hazard; Low Hazard	Scale: 1:12000 @ A3	Drw: AA App: JR Chk: LW Date: 07/02/08

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www.scottwilson.com

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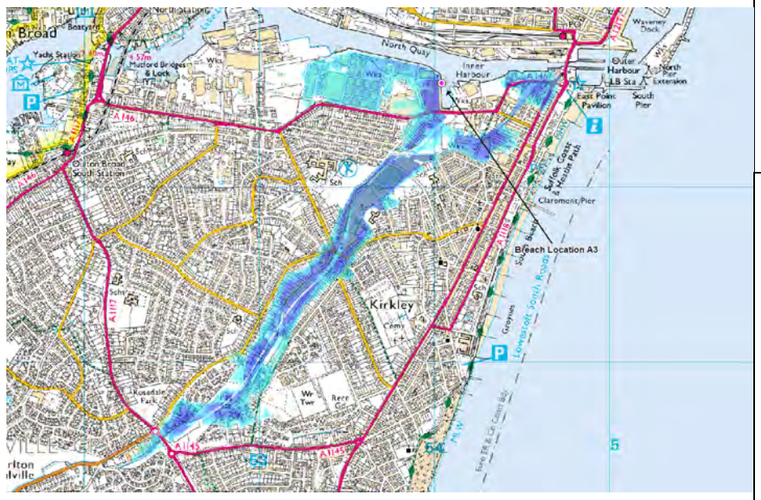
Lowestoft (A3 Scenario)

Figure A40

Figure: A36



Scale: 1-22,000 @A3

RESULTS

Location of Main Flood Depth

1 in 200 years + 100 years of climate change scenario

The deepest flood depths are located in the drainage ditch along the A12 and reach 3.31m. This waterway flows from the mouth of Lake Lothing southwest to join the A1117 north east of Carlton Colville. Floodwaters are also shown to inundate the Riverside Business Park to the west of the breach location to a depth of 1.6m immediately behind the breach and 1m in the works area. The path/cycle track from the A12 north east to Lake Lothing is also inundated to between 1 and 2m in depth.

Following a breach at A3 water is initially contained between the immediate breach area and the A12. After about 12: 30hours this water breaks through any road barriers and flows across the A12 heading south, and also from the breach location, northwest into the dock areas. As the flood waters flow south they intercept a path/cycle track located to the east of the A12 at about 13.40hrs and spread down this path/cycle track to inundate the area to the east of the A12 and towards mouth of Lake Lothing. The floodwater continues to flow south along the A12 and to the west to inundate the works area to the west of the breach. The floodwater reaches its full extent by about 23:30hours.

Modelled scenarios

It was assumed for these scenarios, that the potential development pressures in the Lake Lothing area will demand an increased standard of flood defence to protect not only existing but proposed developments. The funding for these improvements are likely to be sought from developers. The following breach scenarios have therefore been modelled to demonstrate the residual risk that will still need to be considered once the defences have been increased in standard (height of improved defences assumed at 300mm above 200yr + 100year climate change water levels).

Hazard Zone Results

1 in 200 + Climate Change – Figure A36 & 38
There are a number of high hazard zones resulting from this scenario, predominantly located along the A12 route and following the path/cycle track leading from the Notley Road area to Belvedere Road. Medium and low hazard areas fringe these high hazard areas. There is a large area of medium hazard located to the west of the breach location, inundating the works area south of Lake Lothing. To the west and east of the A12 properties are affected by high, medium and low hazard as are properties along the path/cycle track.

1 in 1000 + Climate Change – Figure A37 & 39
The is a large zone of high hazard located along the A12 route and following the path/cycle track leading from the Notley Road area to Belvedere which has increased in this scenario. Medium and low hazard areas fringe these high hazard areas. There is a large area of high and medium hazard located to the west of the breach location, inundating the works area south of Lake Lothing. A low hazard extends further westward through Brooke Business Park to School Road Quay. To the west and east of the A12 properties are predominantly affected by high hazard with fringing areas of medium and low hazard, as are properties along the path/cycle track,

Flood Cell Description

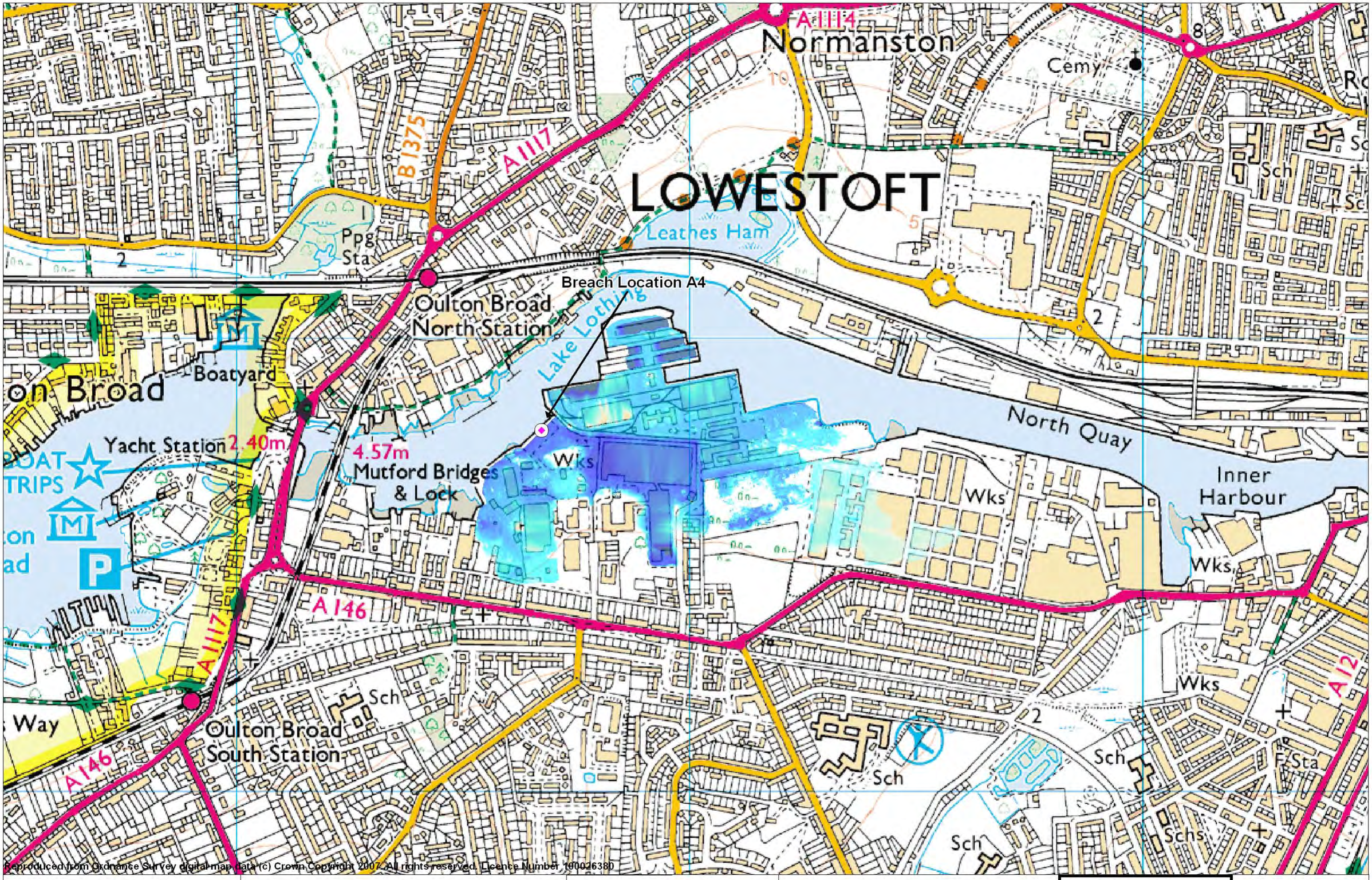
The southeastern area of the flood cell is focused around the breach location at A3 and takes in the flow paths under the new A12 route.

Relevance to Development

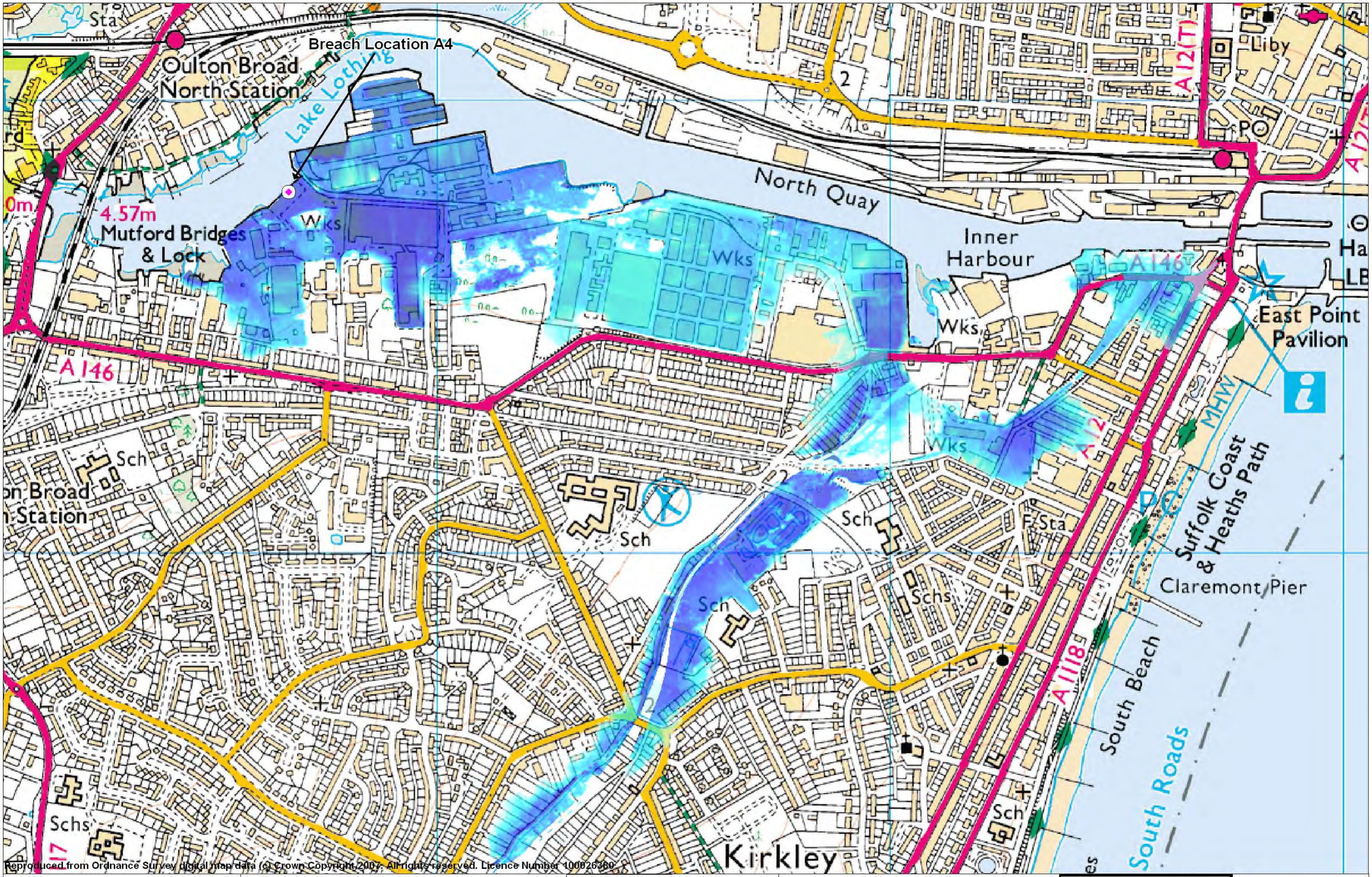
Considerations for the Lowestoft Area Action Plan
According to PPS25 development should not be sited in areas at risk from flooding. Where development has to be located in Flood Zone 3 (through the sequential test), where possible lower or medium hazard areas should be considered as preferential to high hazard areas

General Considerations
The A12 is affected by the breach and floodwaters located along this transport link are deep and hazardous. In times of flood, this access route will be unusable and alternative routes will have to be used to access the breach and flooded areas.

A contingency plan should be in place and exercised during such an event so that access is available to all flooded areas. The flooding of the A12 may affect access routes to these proposed developments.



Project:	Title:	Description:	Maximum flood depth [m]	FIGURE A41
Suffolk & Waveney SFRA	**Lowestoft Flood Depth Map Breach of Defences at A4 1 in 200yr + Climate Change (2107)**	Shows the maximum depth at any point of the tidal cycle assuming an increase in defence height and a breach of the defences at A4	0.05 0.50 1.00 1.50 2.00 3.00	Scale: 1:8000 @ A3 Drw: AA App: JR Chk: LW Date: 07/02/08 Scott Wilson www.scottwilson.com



Project:	Title:	Description:	Maximum flood depth [m]
Suffolk & Waveney SFRA	**Lowestoft Flood Depth Map Breach of Defences at A4 1 in 1000yr + Climate Change (2107)**	Shows the maximum depth at any point of the tidal cycle assuming an increase in defence height and a breach of the defences at A4	0.05 0.50 1.00 1.50 2.00 3.00

FIGURE A42

Scale:	1:8000 @ A3		
Drw:	AA	App:	JR
Chk:	LW	Date:	07/02/08

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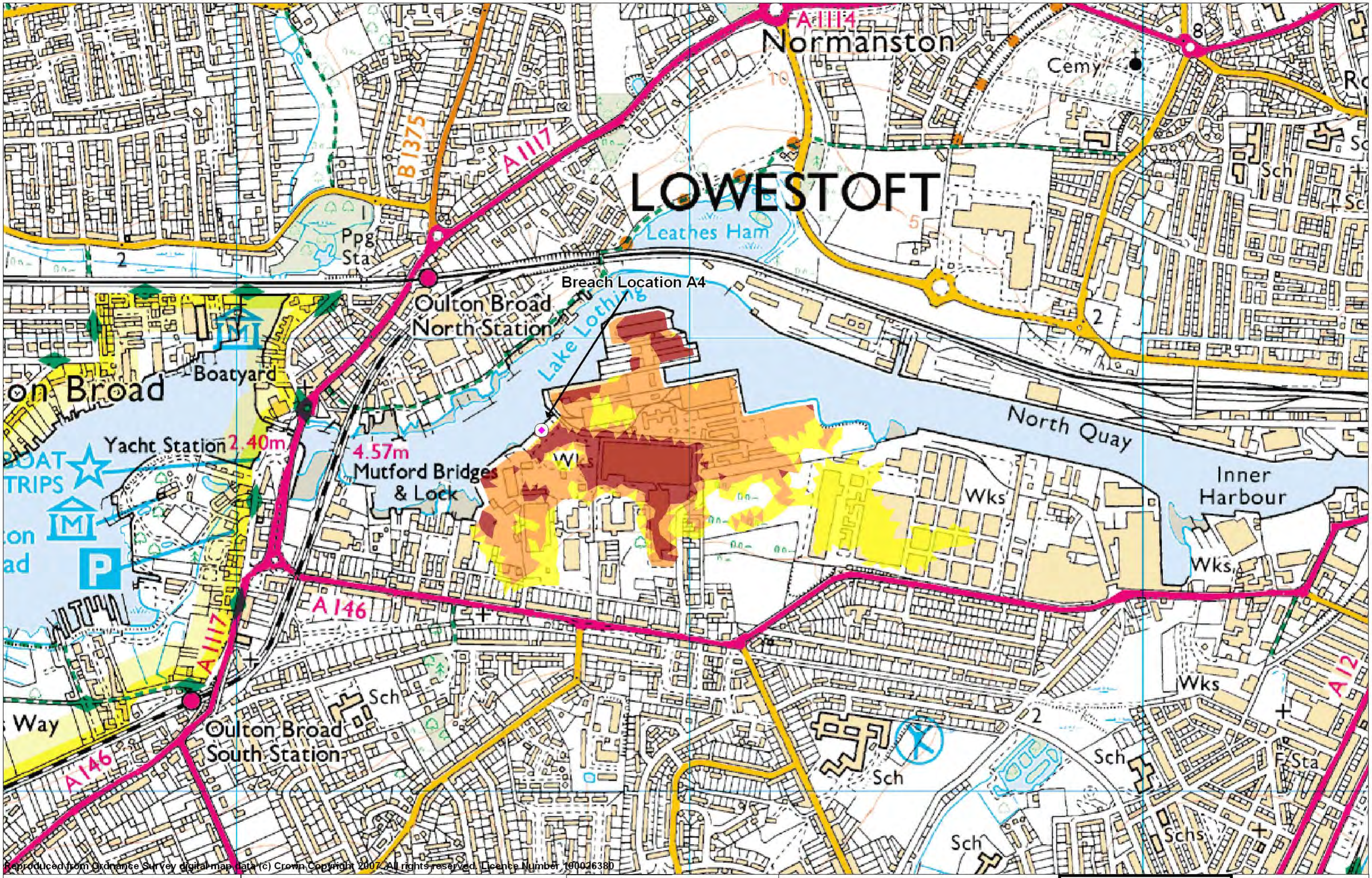

Project:	Title:	Description:		
Suffolk & Waveney SFRA	**Lowestoft Hazard Map Breach of Defences at A4 1 in 200yr + Climate Change (2107)**	Shows the hazard levels assuming an increase in defence height and a breach of the defences at A4	**High Hazard** **Medium Hazard** **Low Hazard**	**FIGURE A43**

Scale:	1:8000 @ A3		
Drw:	AA	App:	JR
Chk:	LW	Date:	07/02/08

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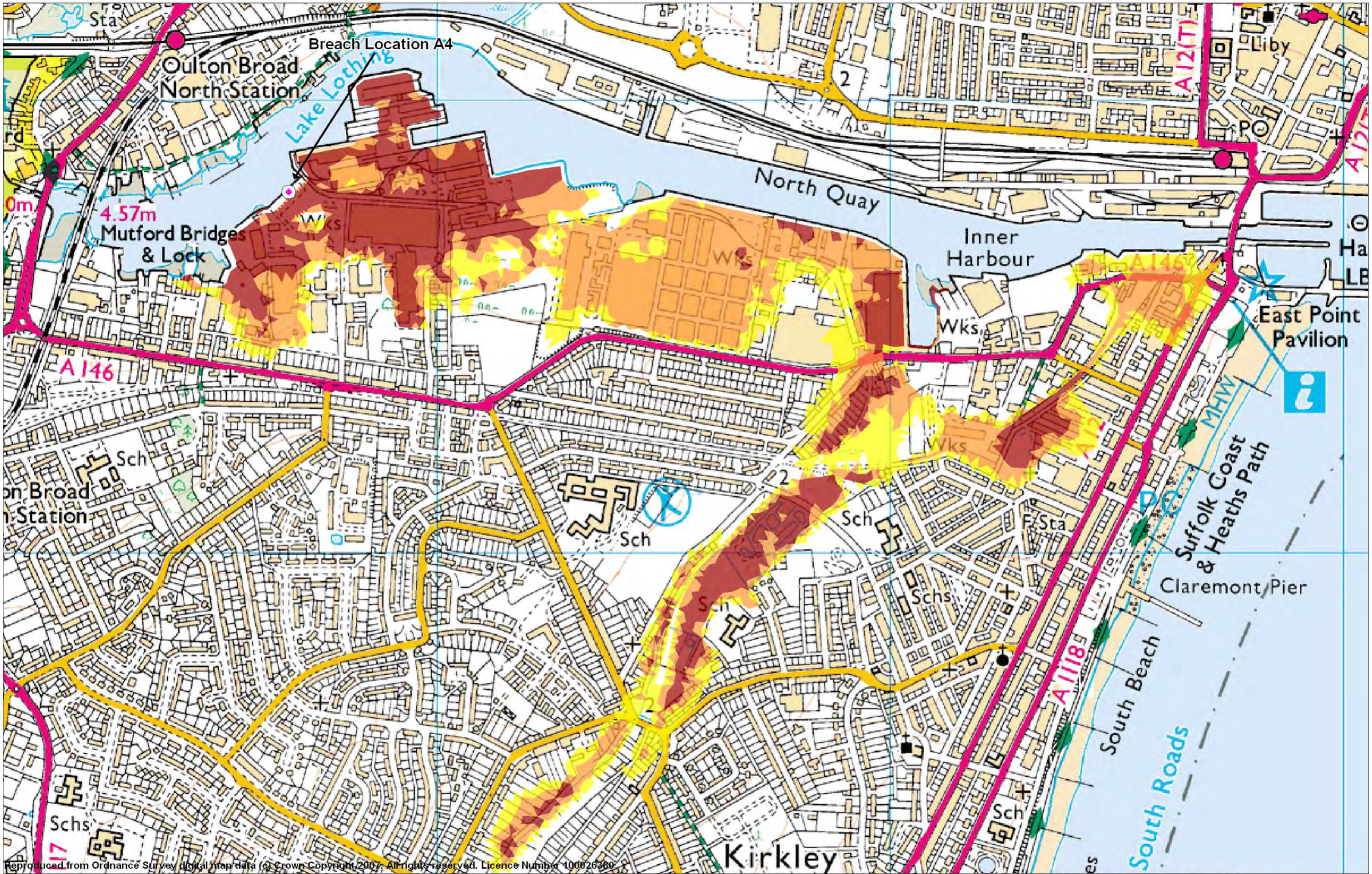

Project:	Title:	Description:		FIGURE A44	
Suffolk & Waveney SFRA	**Lowestoft Hazard Map Breach of Defences at A4 1 in 1000yr + Climate Change (2107)**	Shows the hazard levels assuming an increase in defence height and a breach of the defences at A4	**High Hazard** **Medium Hazard** **Low Hazard**	Scale: 1:8000 @ A3 Drw: AA App: JR Chk: LW Date: 07/02/08	Scott Wilson www.scottwilson.com

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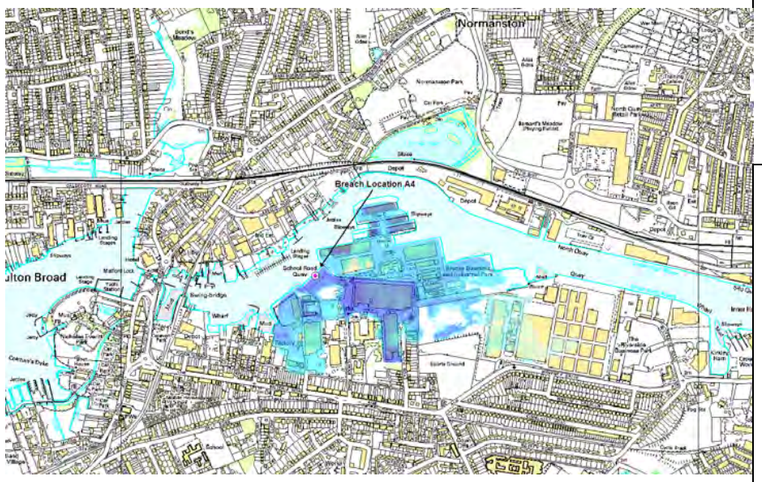
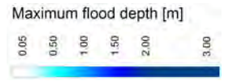
Lowestoft (A4 Scenario)

Figure A45

Figure: A41





Scale: 1-22,000 @A3

RESULTS

Location of Main Flood Depth

1 in 200 years + 100 years of climate change scenario

The breach at location A4 leads to the inundation of the employment area situated on Brooke Peninsula. This includes the Brooke Business and Industrial Park, Factory and Works, and slipways, all located north of Victoria Road. The areas of deepest floodwater are located around the slipways, towards the center of the inundated area where flood depths reach 1.7m, and to the west of heath road where flood waters reach 2.2m. The flood coverage extends to the rear of the private properties on Victoria Road at its maximum extent. The easterly extent reaches into the works area of the Riverside Business Park at 18:20 hrs and the westerly extent is limited to the boundary of the Factory, reached at about 14:00 hrs.

The flooding begins after 12 hrs and moves across the area to the east, inundating the central area of the Industrial Park and southwest to the factory area by 13:45 hrs. This floodwater then moves north into the slipway area, further south and encroaches into the sports ground and east by 15:35 hrs. The floodwater then continues to move east to reach the maximum extent at 18:20 hrs.

Modelled scenario

It was assumed for these scenarios, that the potential development pressures in the Lake Lothing area will demand an increased standard of flood defence to protect not only existing but proposed developments. The funding for these improvements are likely to be sought from developers. The following breach scenarios have therefore been modelled to demonstrate the residual risk that will still need to be considered once the defences have been increased in standard (height of improved defences assumed at 300mm above 200yr + 100year climate change water levels).

Hazard Zone Results

1 in 200 + Climate Change – Figure A541 & 43
In this scenario the main hazard zones are located on the northern slipways and from the breach location to the central region of the works, where the main buildings and employment area is situated. There are also a few small areas of high hazard located in the Factory area in the south west of the inundated area. Medium hazard regions surround these areas, indeed, much of the Brooke Business and Industrial, Works and Factory areas are characterized as medium hazard areas. The flood area extending east into the Riverside Business Park is classified as low hazard.

1 in 1000 + Climate Change – Figure A42 & 44
In this scenario high hazard zones exist on the Brooke Peninsula from the breach location to the central region of the works, where the main buildings and employment area is situated, and including Brooke Business and Industrial Park. There are also a few small areas of high hazard located in the Factory area in the south west of the inundated area. Medium hazard regions surround these areas, indeed, much of the Brooke Business and Industrial, Works and Factory areas are characterized as medium hazard areas. Other areas of high hazard also exist west of Kirkley Ham and south along the A12 route. These areas are fringed by medium and low hazard areas. A small area of high hazard also exits south of the cycle track and around Windsor Road. Medium and low hazard areas also affect the banks of South Quay

Flood Cell Description

The southwestern area of the flood cell is focused around the breach location at A4.

Relevance to Development

Considerations for particular Development areas/Area Acton Plans
According to PPS25 development should not be sited in areas at risk from flooding. Where development has to be located in Flood Zone 3 (though the sequential test), where possible lower or medium hazard areas should be considered as preferential to high hazard areas

General Considerations
As the B1513 is submerged at one location access to this potential development area may be stalled or inhibited during times of high flooding. This may increase the time to reach and repair the breach. The inundation of Heath Road will also cause access difficulties to the proposed residential area and existing employment area. Access and egress routes should be pre determined so that access and exit from the site is possible in times of flooding.

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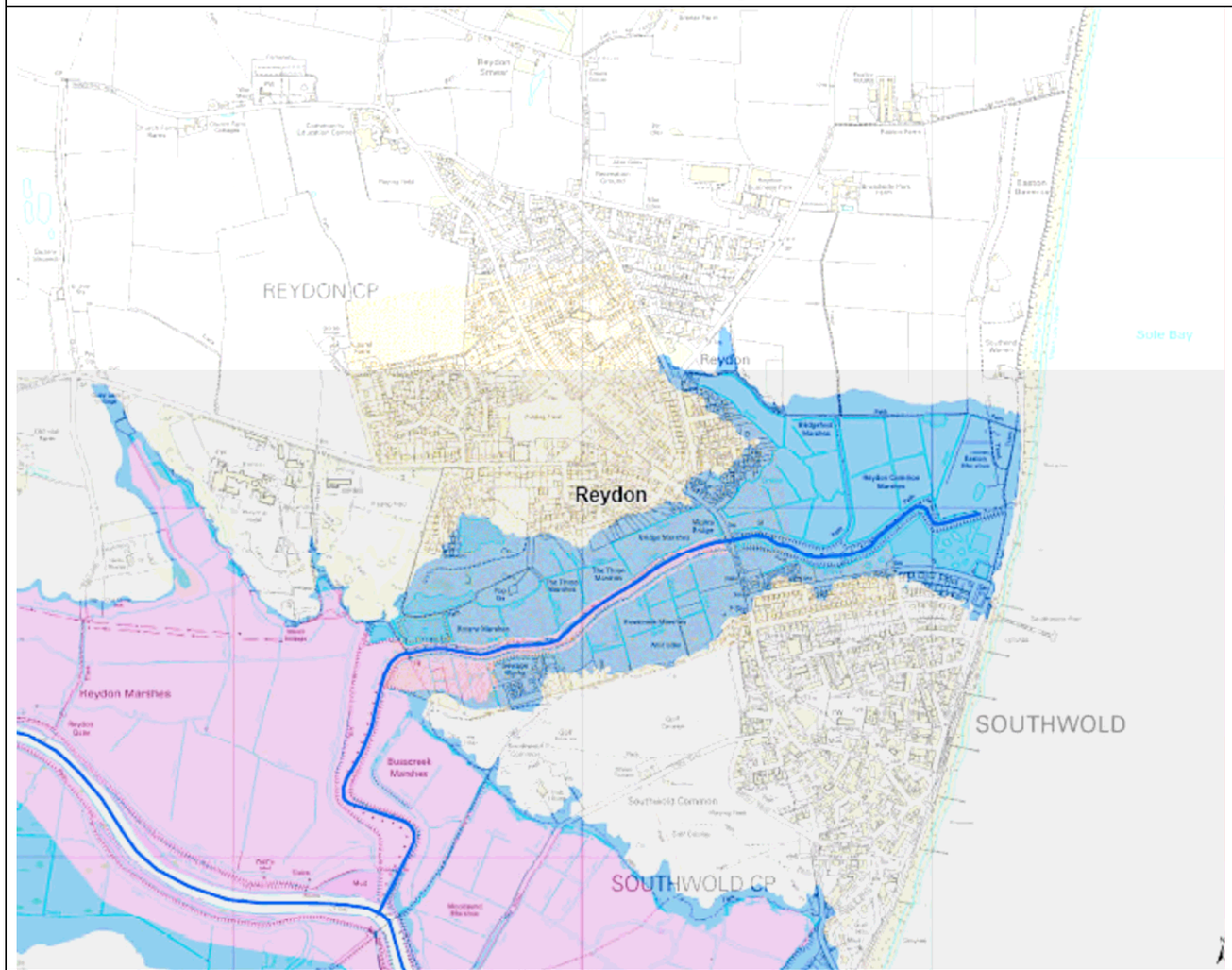
Southwold and Reydon

PPS25 Flood Zones 2007

Figure A46



Preliminary Core Strategy Assessment

Flood Zone	**1, 2, 3a & 3b**
Potential Housing Allocation	The Waveney Core Strategy Preferred Option report (June 2006) proposes 5,800 new homes to be built in the District by 2021. Some of these homes could be located in the Southwold and Reydon area. The map shows one possible growth area where this development could be located. Potential new allocations within the LDF Potential Growth Area in Southwold and Reydon could reasonably be accommodated outside Flood Zones 2 and 3.
Potential Employment Allocation	Potential new employment allocations within the LDF Potential Growth Area in Southwold and Reydon could reasonably be accommodated outside Flood Zones 2 and 3.
All Potential Development Allocations	The map shows that there are regions within the Potential Growth Area that are outside the Environment Agency mapped and PPS25 defined Flood Zones 2 and 3. Site allocations should therefore be sought in these areas primarily and all options exhausted before sites are allocated in areas at risk of flooding.
Main River	Buss Creek runs between Reydon and Southwold, and The River Blyth runs to the south of Southwold.
Problem drainage areas	No data available.
Flood Record Information data	In Southwold there are a number of premises, commercial and residential, situated on the unprotected side of the Environment Agencies tidal defence line.
Origin of Mapping	Environment Agency tidal outlines and modelled (overtopping) functional floodplain
Functional Floodplain	The extent of the Functional Floodplain generally follows the extent of Flood Zone 3 to the south of Reydon. This zone does not extend significantly between Southwold and Reydon.

Settlement Level Coarse Assessment

Potential Growth Area
Main River Centreline
Scale @ A3 – 1:10,000

Environment Agency Flood Zone 2
Environment Agency Flood Zone 3a
Functional Floodplain Flood Plain 3b

	Size of Potential Growth Area	Area in Zone 3	Area in Zone 2 (inclusive of Zone 3 where present)
Area (ha)	123.37	53.24	53.24
% of Area		43.16	43.16

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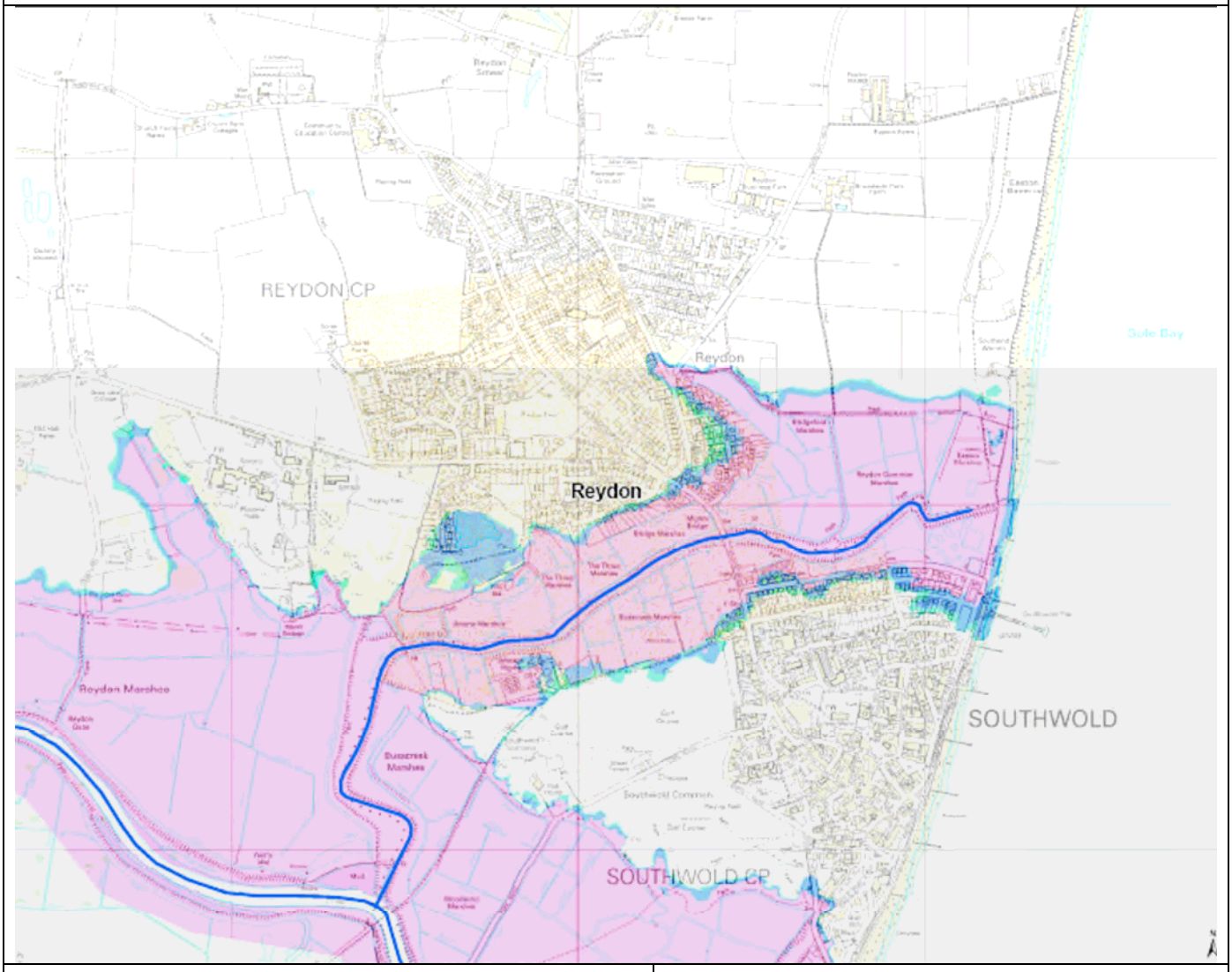
Southwold and Reydon | Figure A47

PPS25 Flood Zones 2107

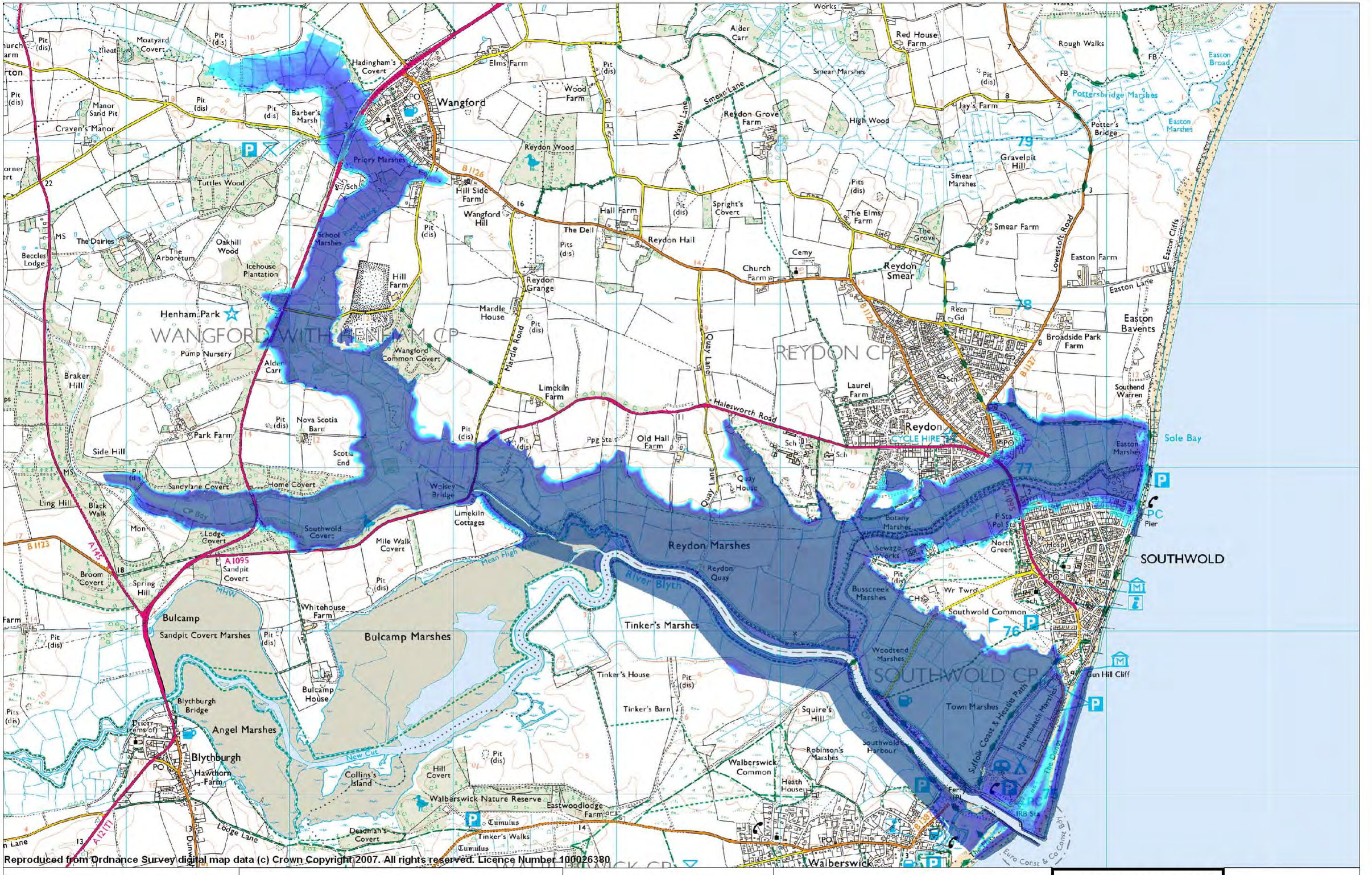


Potential Growth Area
Main River Centreline
Scale @ A3 – 1:11,000

Modelled Flood Zone 2
Modelled Flood Zone 3a
Functional Floodplain
Flood Plain 3b

The delineation of tidal Flood Zones 2 (1 in 1000 years) and 3a (1 in 200 years) with the influence of climate change in Southwold has been determined from the modelling undertaken as part of this SFRA. Outlines have been determined using the combined results of the breaches in this area.

The functional floodplain in 2107 has been mapped using the 1 in 20 tidal flood extent resulting from the overtopping modelled scenario in Southwold. This has been modelled as part of this SFRA. Functional floodplain extents for 2007 and 2107 are available as a result of tidal modelling.



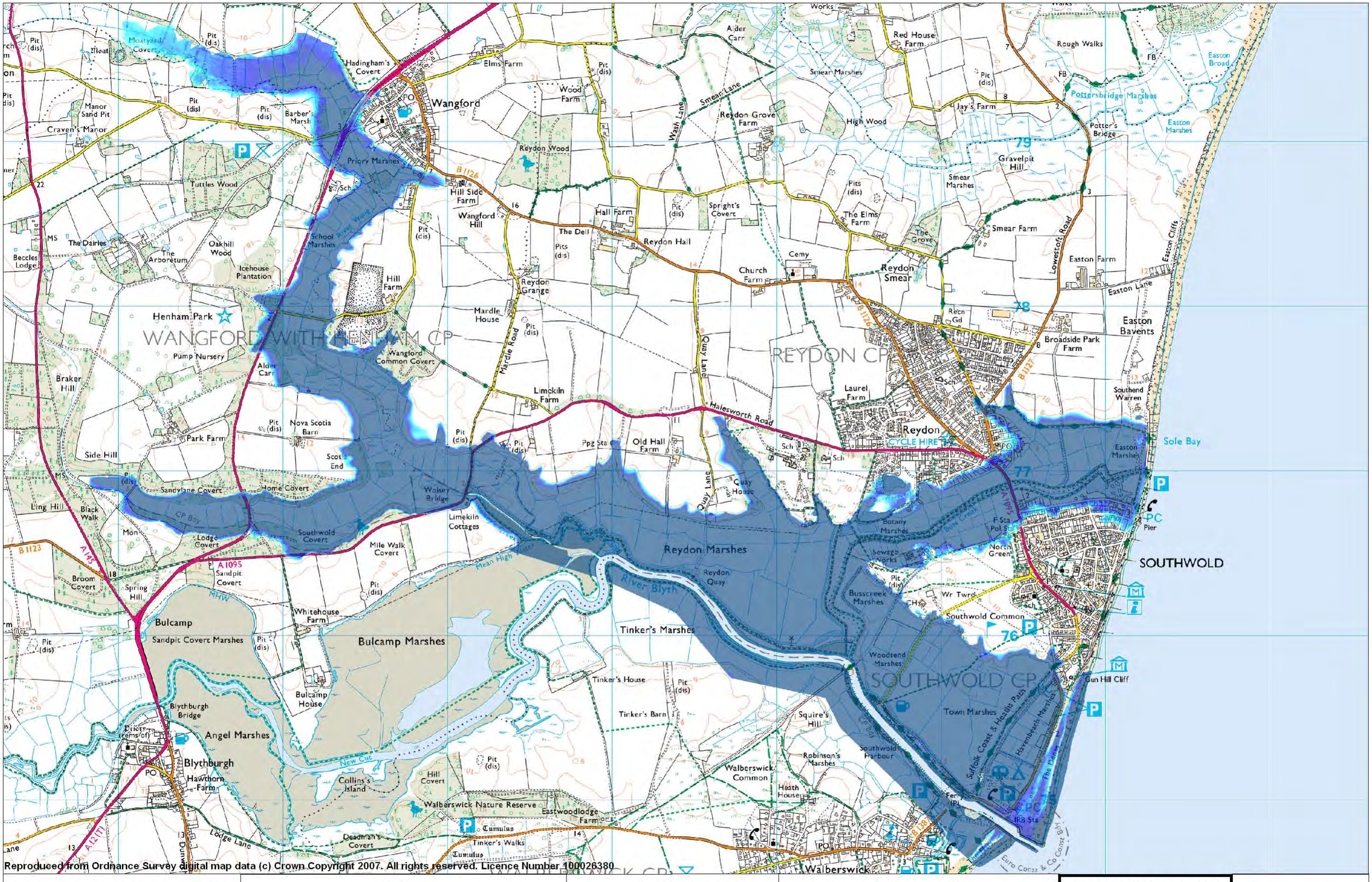
Project:	Title:	Description:
Suffolk & Waveney SFRA	**Southwold Flood Depth Map Existing Conditions 1 in 200yr + Climate Change (2107)**	Shows the maximum depth at any point during the 1 in 200yr + climate change tidal cycle with existing defence heights

FIGURE A48

Scale:	1:22000 @ A3		
Drw:	AA	App:	JR
Chk:	LW	Date:	07/02/08

Scott Wilson

www.scottwilson.com



Project:	Title:	Description:	Maximum flood depth [m]	FIGURE A49
Suffolk & Waveney SFRA	**Southwold Flood Depth Map Existing Conditions 1 in 1000yr + Climate Change (2107)**	Shows the maximum depth at any point during the 1 in 1000yr + climate change tidal cycle with existing defence heights	0.05 0.50 1.00 1.50 2.00 3.00	Scale: 1:22000 @ A3 Drw: AA App: JR Chk: LW Date: 07/02/08

Scott Wilson
www.scottwilson.com