

London Borough of Bexley

Bexley Strategic Flood Risk Assessment Level-1

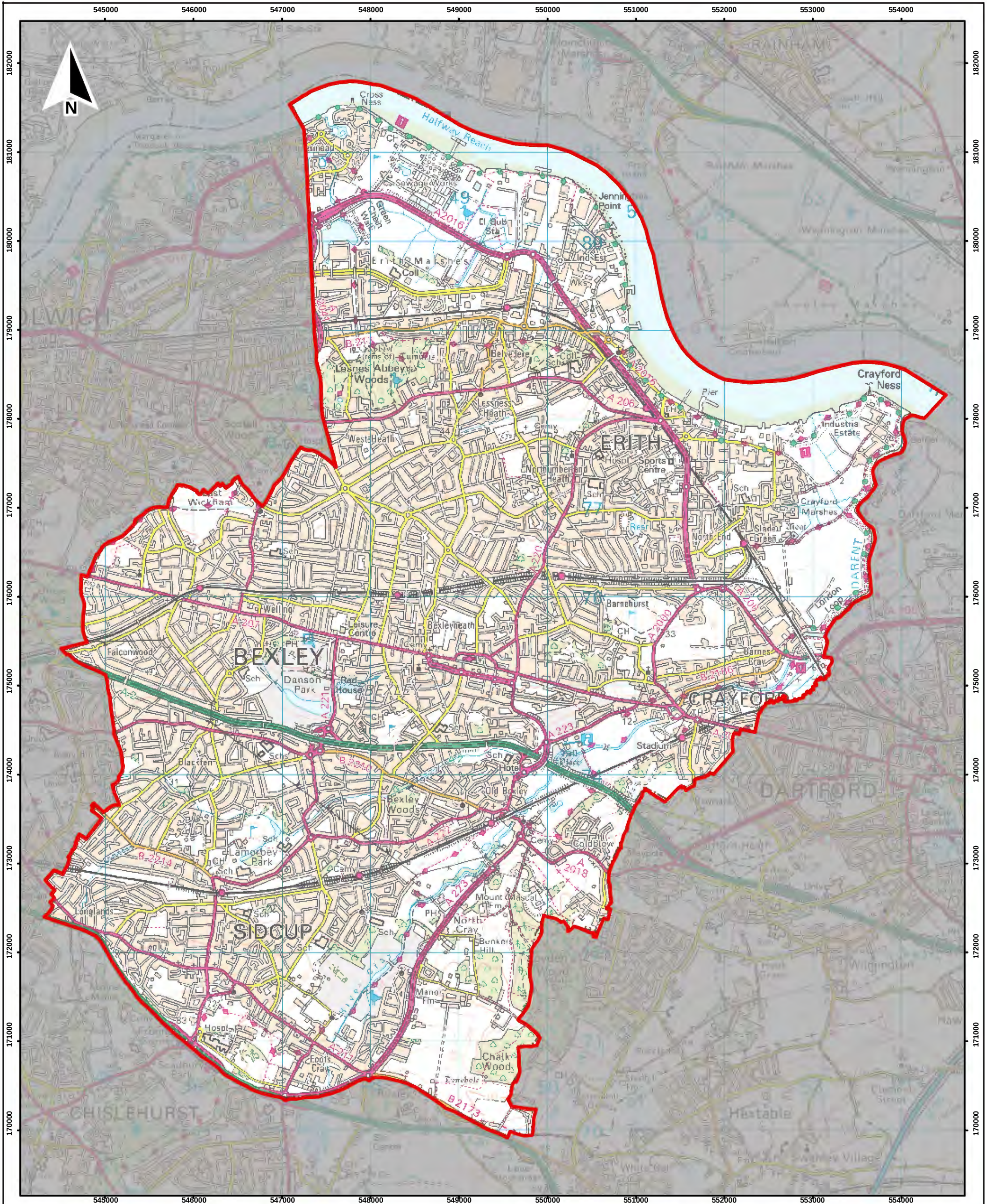
Appendix A - Mapping

June 2010



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Creating the environment for business



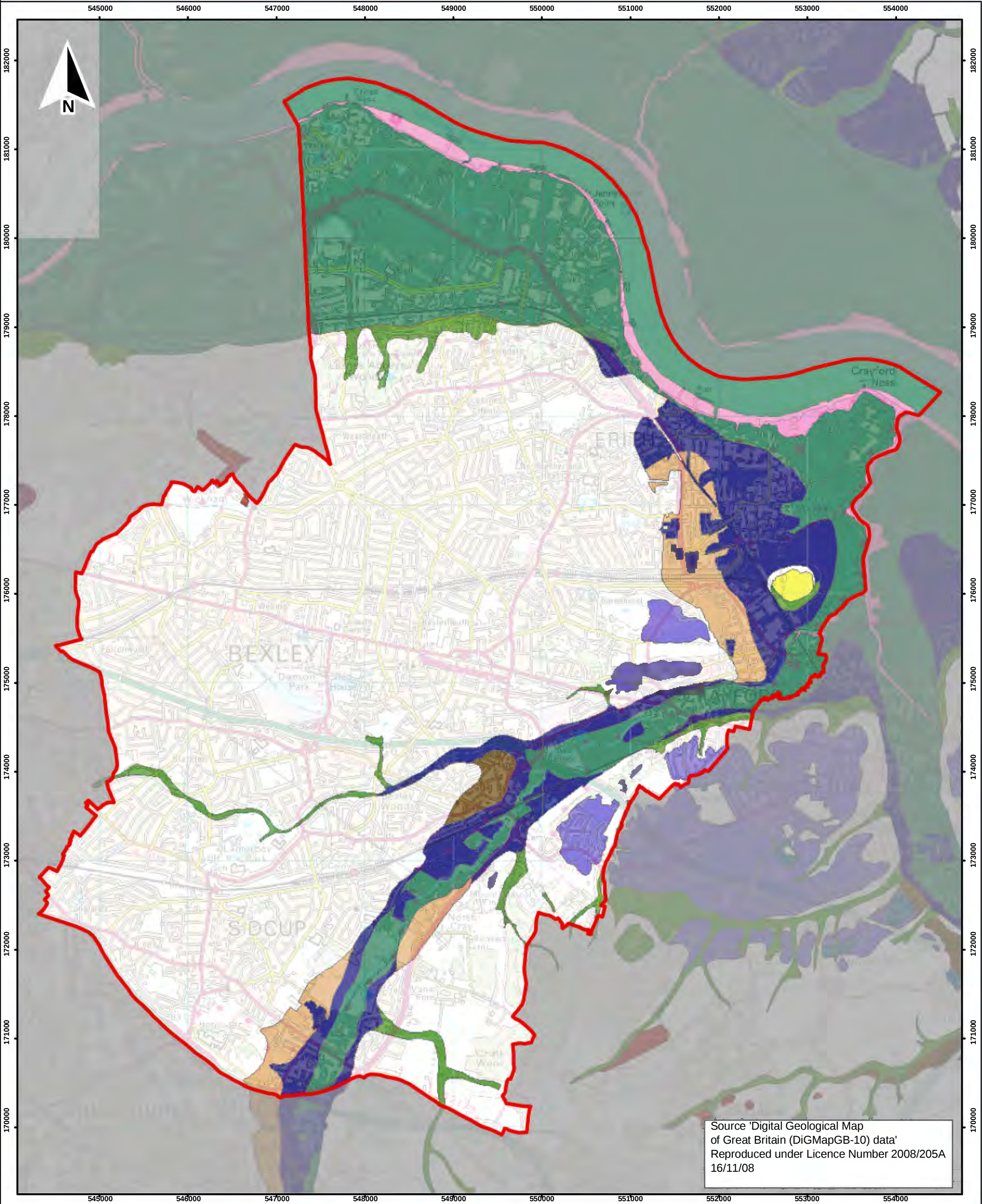
Key:

 Bexley borough

Bexley SFRA

Figure 1
Borough Overview of Geography

0 530 1,060 1,590 2,120 Meters
Scale: 1:40000 @ A3



Key: 1:10000 BGS Superficial Deposits

- ALLUVIUM
- BOYN HILL GRAVEL FORMATION
- CRAYFORD SILT FORMATION
- DARTFORD SILT
- HACKNEY GRAVEL FORMATION

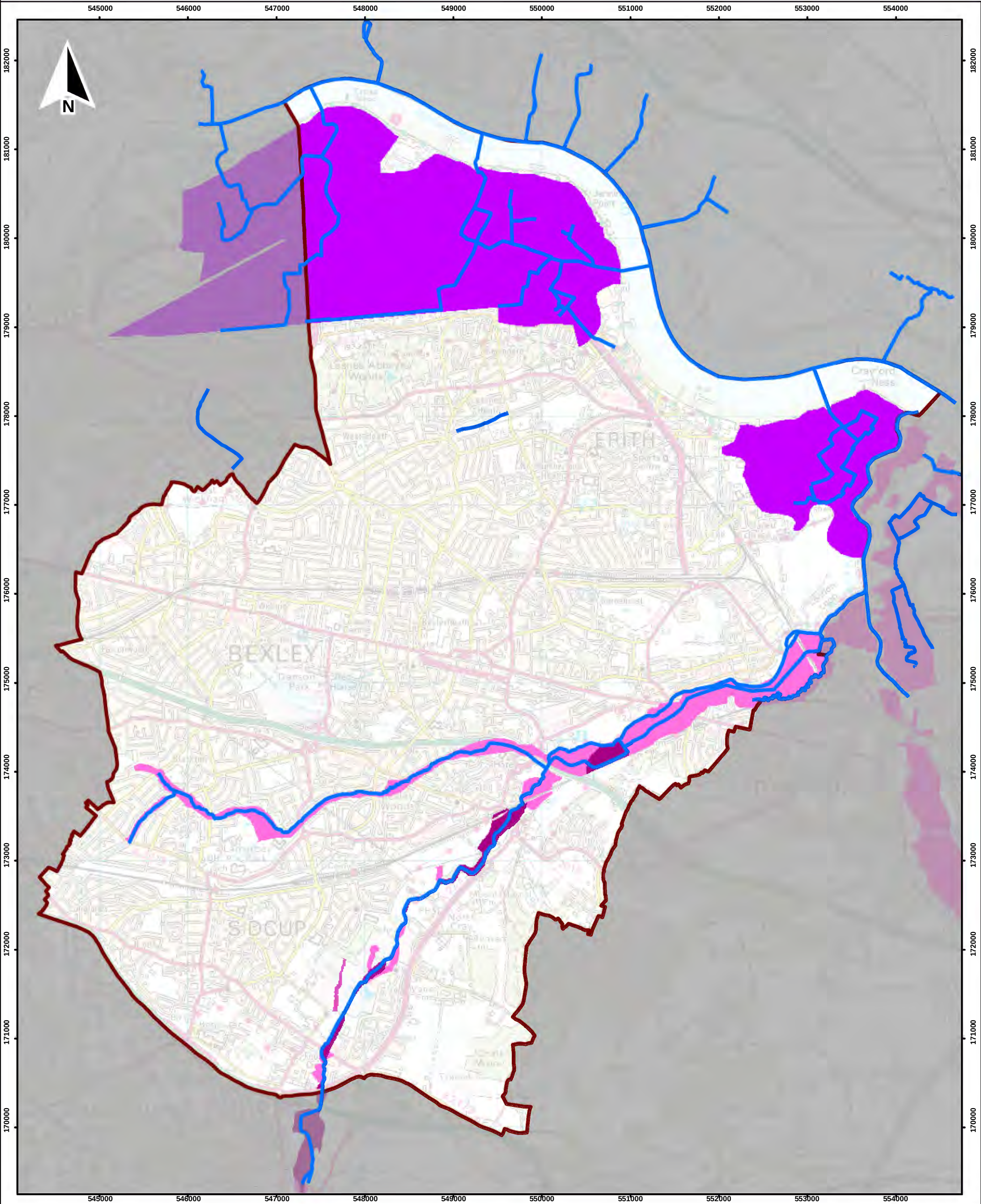
- HEAD (UNDIFFERENTIATED)
- KEMPTON PARK GRAVEL FORMATION
- LYNCH HILL GRAVEL FORMATION
- RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)
- STANMORE GRAVEL FORMATION
- TAPLOW GRAVEL FORMATION
- TIDAL RIVER OR CREEK DEPOSITS

Bexley borough

0 540 1,080 1,620 2,160 Meters
Scale: 1:10000
Based on the 1:10000 scale BGS
DiGMapGB-10

Bexley SFRA

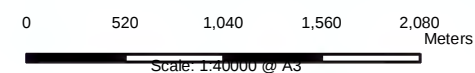
Figure 3
Superficial Geology BGS



Key:

- | | | | |
|--|----------------|--|--|
| | Bexley borough | | Environment Agency Main Rivers (Flood Map CD Oct 2008) |
| | 1968 Event | | |
| | 1953 Event | | |
| | 1977 Event | | |

Historic flood events were supplied by the Environment Agency (September 2008)



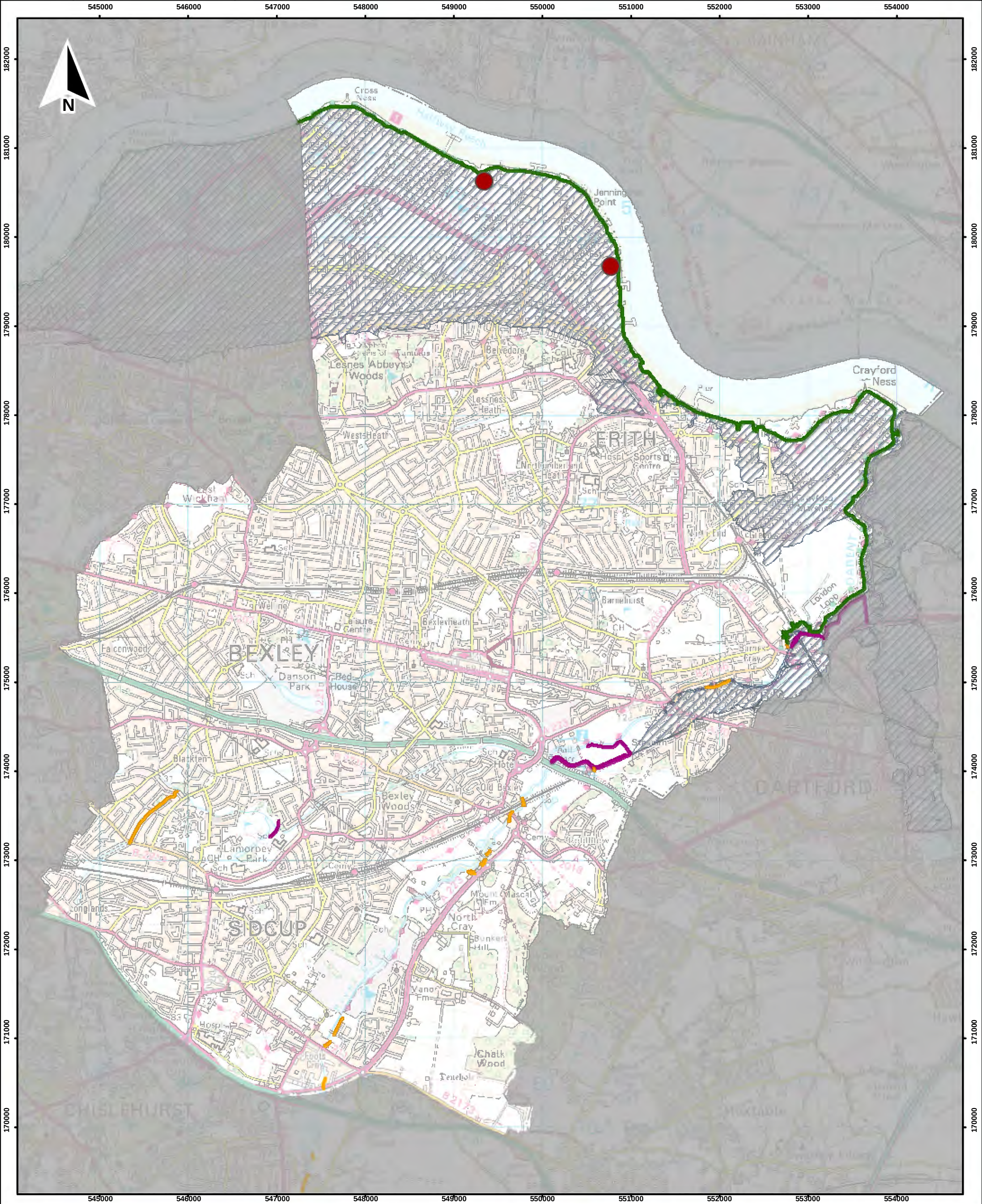
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Figure 4

Environment Agency Main Rivers
and Historic Flood Events

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23736-A04.mxd squij

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Key:

-  Bexley borough
-  Area benefiting from defence (ABD's)

Raised Defences (Tidal)

 Major

Raised Defences (Fluvial)

 Major

 Minor

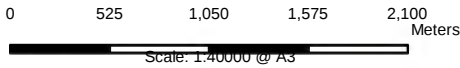


Location of Marsh Dyke Pumping Stations

All flood defence data supplied by the Environment Agency
September 2008

H:\Projects\HM-255\23000-Projects\23736 - Bexley SFRA\Data\GIS\ESRIMXD\23736-A17.mxd

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Figure 5

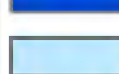
**Raised Flood Defences and Areas
Benefiting From Defences**

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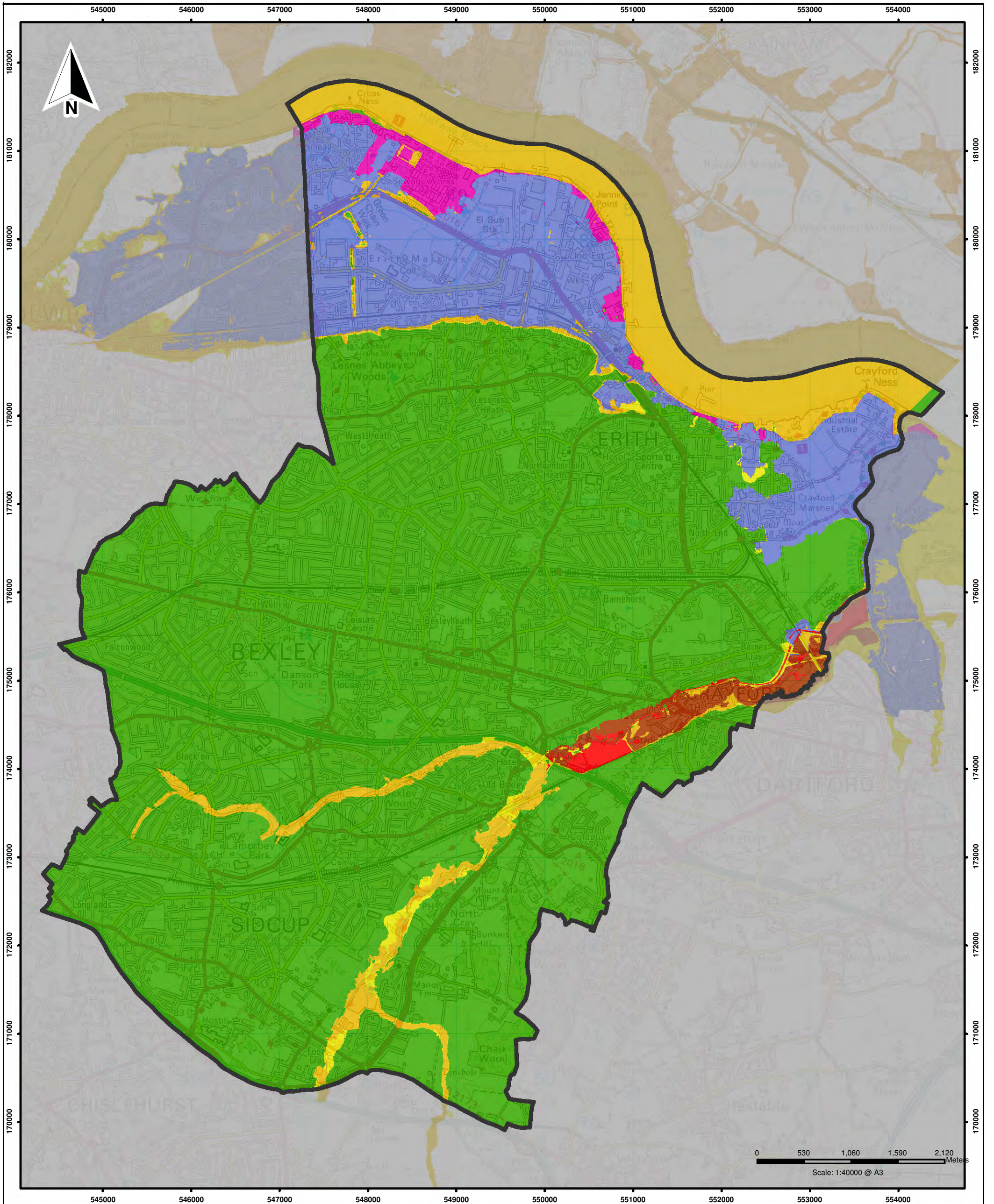
Key:

-  Bexley borough
-  Flood Zone 2 (issued September 2008)
-  Flood Zone 3 (issued September 2008)

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Figure 6

**Environment Agency Flood
Zones 2 and 3**



- Key:**
- Environment Agency Flood Zones (September 2008)**
- Flood Zone 3
 - Flood Zone 2
 - Flood Zone 1
- ISIS-TuFLOW modelling (Crayford Town Centre SFRA 2007)**
- Modelled 1 in 20 year (fluvial+CC) with defences
 - Modelled 1 in 100 year (fluvial+CC) with defences
- TuFLOW Modelled Tidal Residual Risk Zone**
modelled event = 1:200 year tide plus CC
- Zone of Potential Rapid Innundation (unmodelled)**
See Section 3.2.5 in the SFRA report
- Bexley borough**

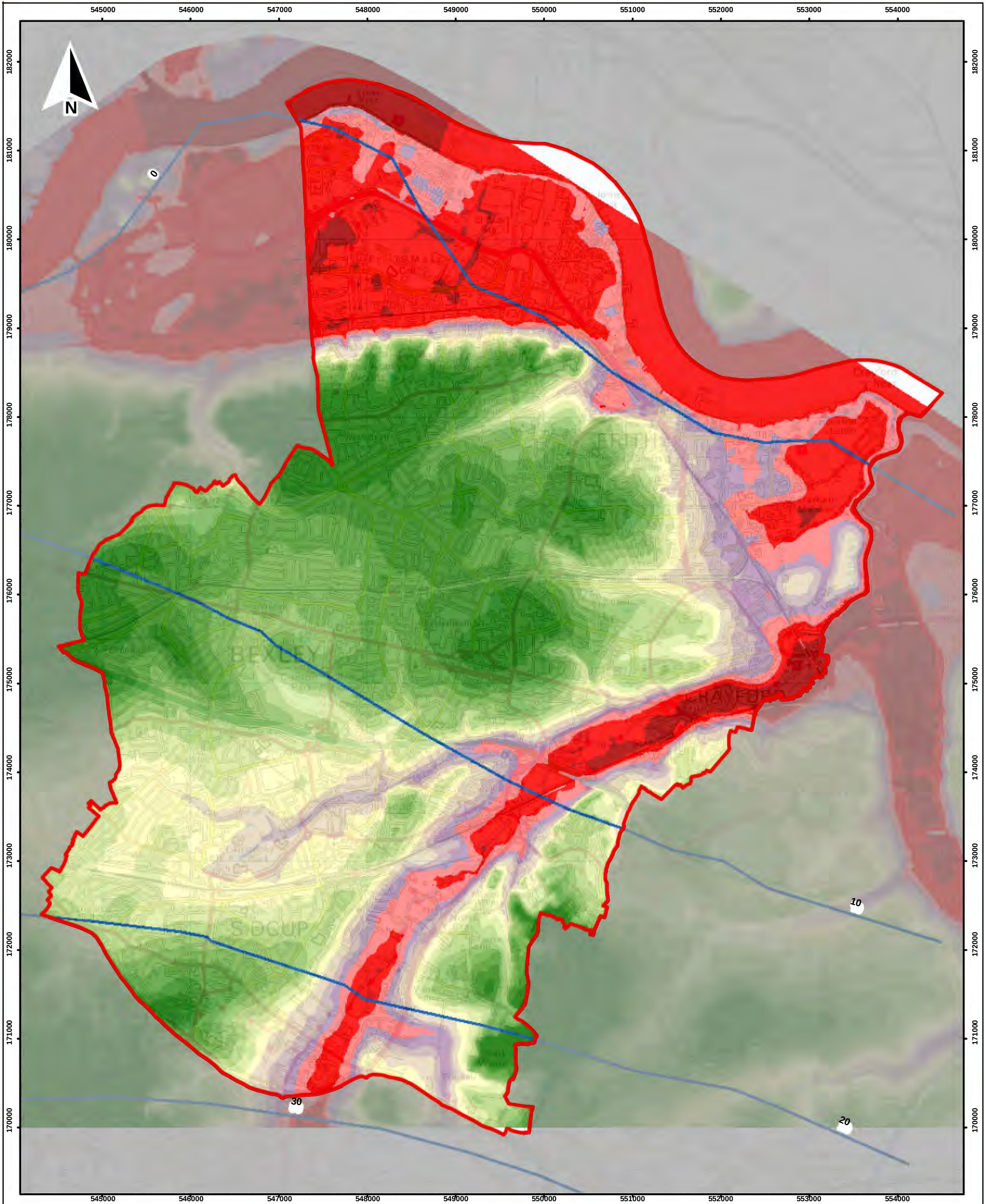
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Figure 7

Map of all Flood Zones and Modelled Flood Risk Zones

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Key:

Bexley borough

Groundwater Contours (m) below ground Supplied by EA

Groundwater Head (m below ground)		
	-3 - 0	15.01 - 20
	0 - 2.5	20.01 - 25
	2.51 - 5	25.01 - 30
	5.01 - 7.5	30.01 - 35
	7.51 - 10	35.01 - 40
	10.01 - 15	40.01 - 45
		45.01 - 50
		50.01 - 55

Depth to groundwater head was based upon ground elevations provided by 5m SAR topographic data

0

525

1,050

1,575

2,100

Meters

Scale: 1:30000 @ A3

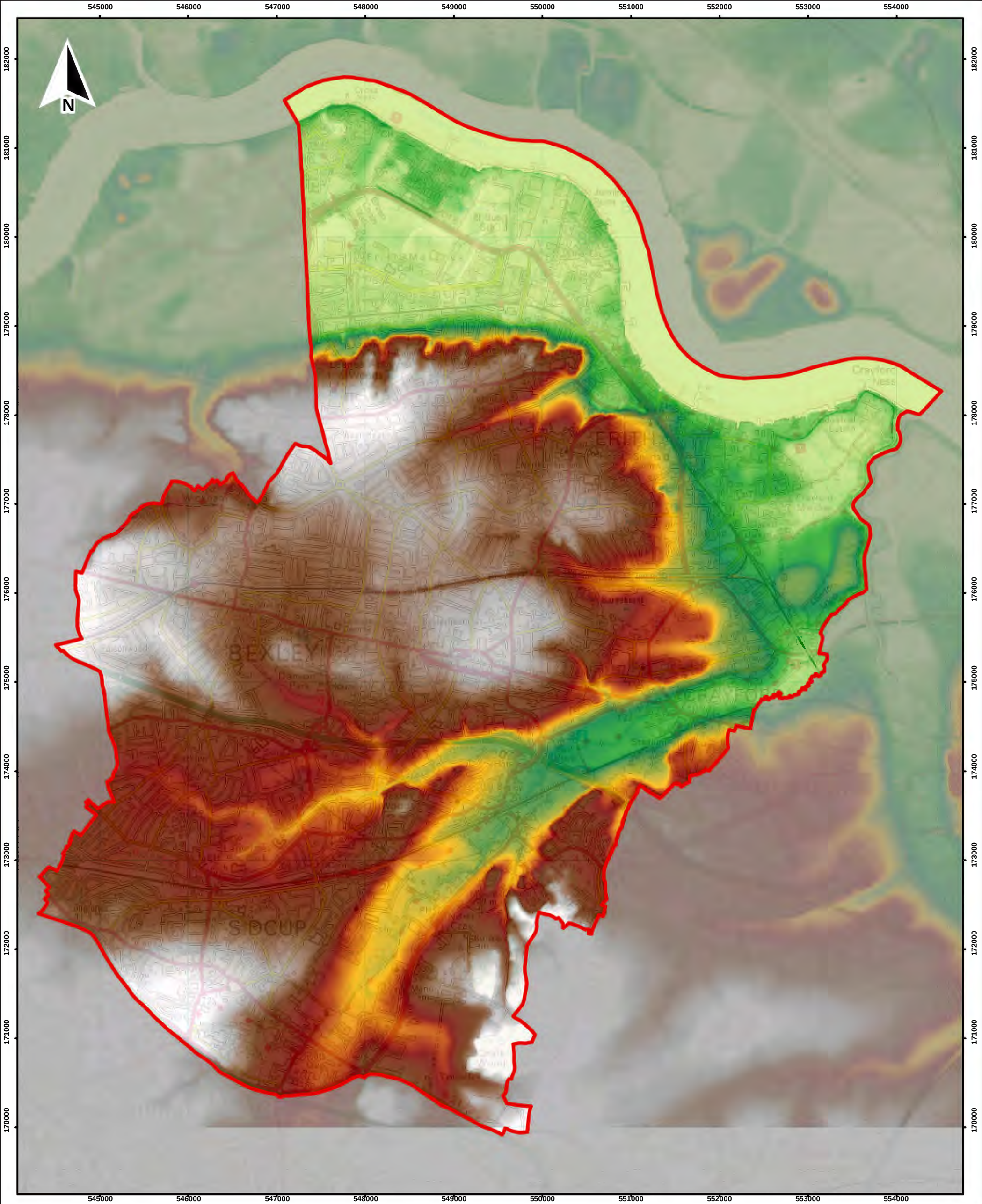
Bexley SFRA

Figure 8

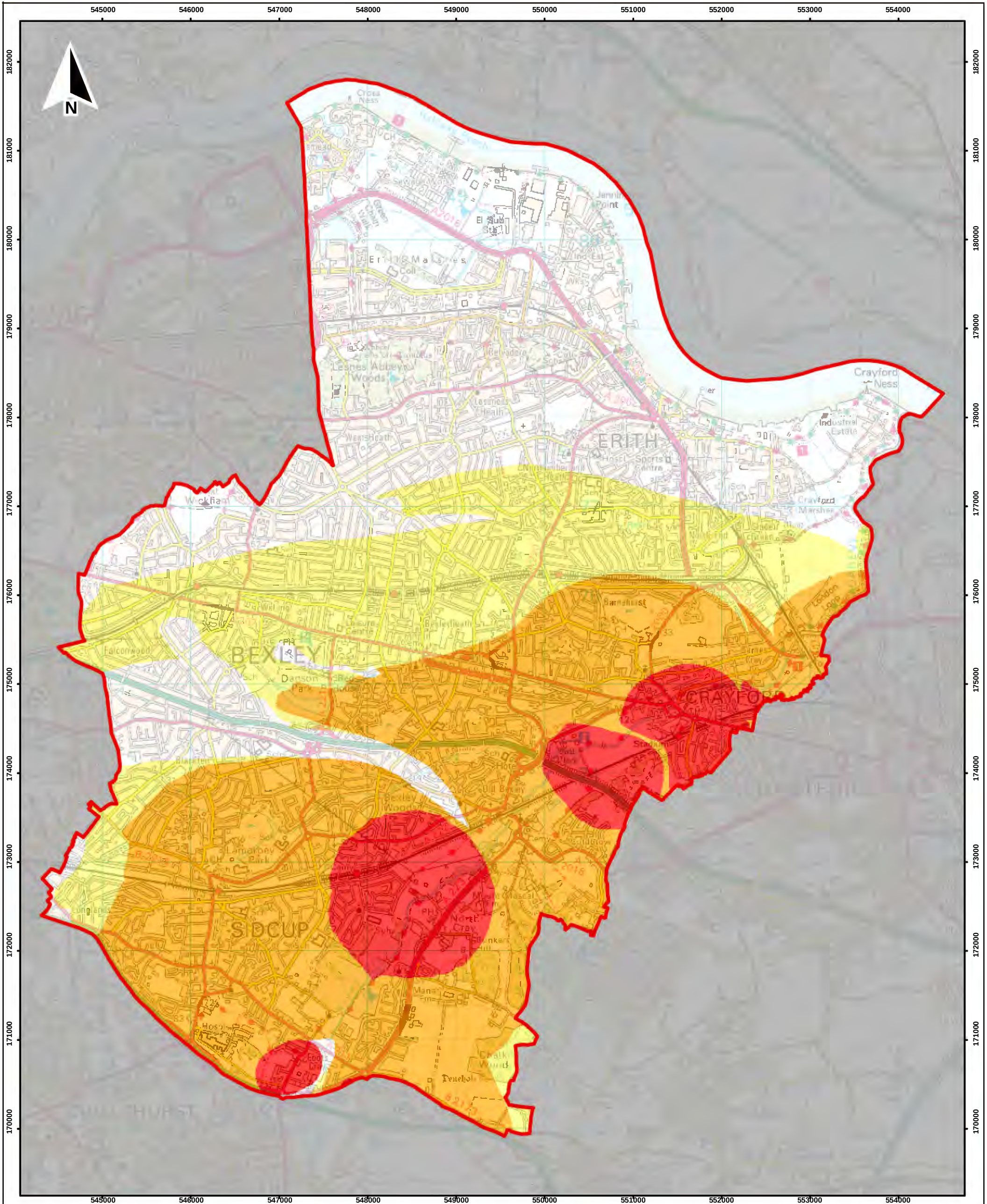
Depth to Groundwater Head

November 2008
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Key:		Ground Elevation (m) - Based on SAR data	
	Bexley borough		High : 140 Low : < 0
H:\Projects\HM-255\23000-Projects\23736 - Bexley SFRA\Data\GIS\ESRIMXD\23736-A03.mxd Based upon the Ordnance Survey Map with the permission of the Controller of Her Majesty's Stationery Office. © Crown Copyright. London Borough of Bexley AL100017693		0 530 1,060 1,590 2,120 Meters Scale: 1:30000 @ A3	
		Bexley SFRA Figure 9 Digital Elevation Model of Bexley - Based on NextMap SAR Data at a 5m Resolution	
		November 2008 23736-A09.mxd rampj Entec	



Key:

 Bexley borough

Groundwater Source Protection Zones

-  SPZ 1
-  SPZ 2
-  SPZ 3
-  SPZ 4

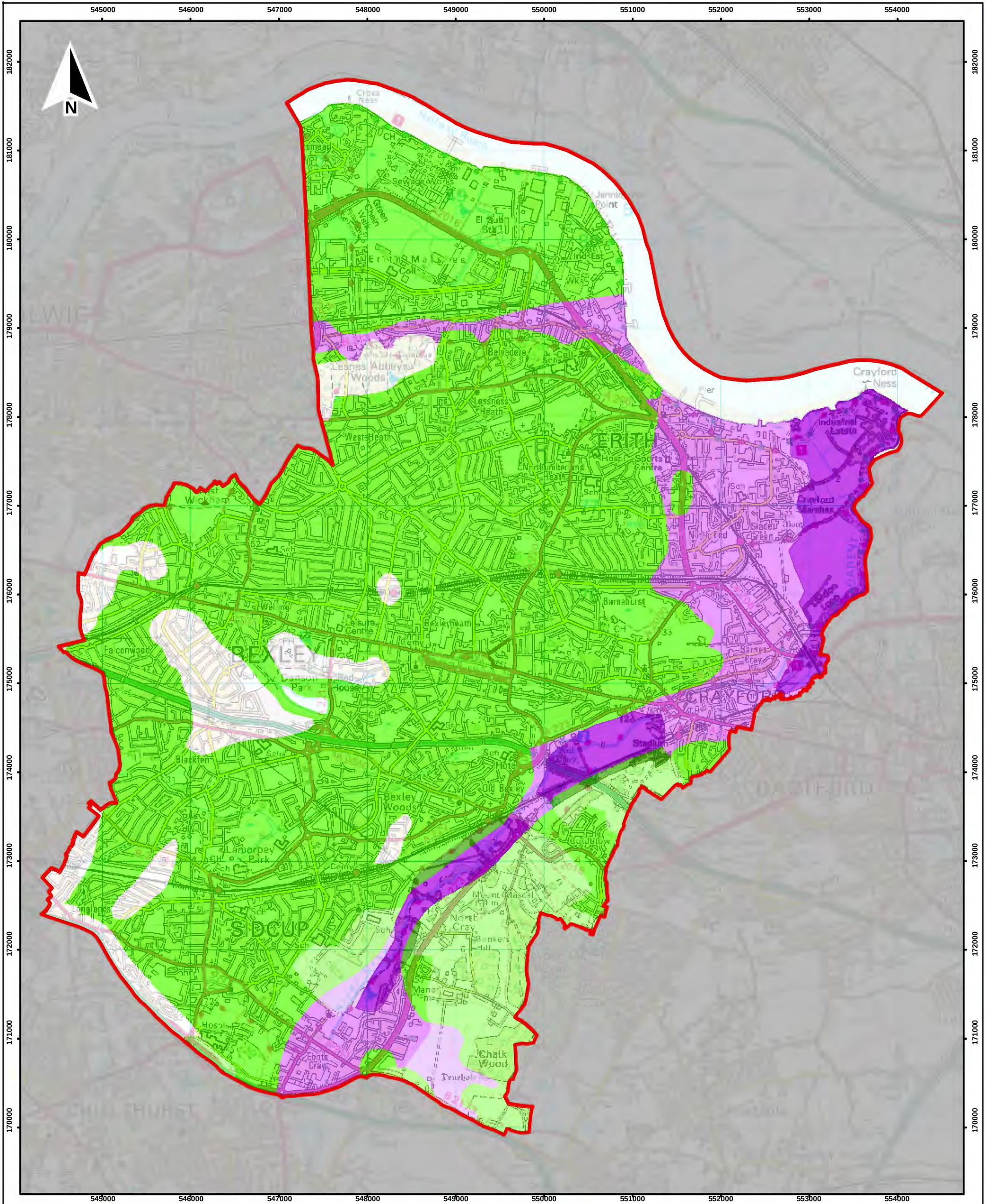
SPZs supplied by EA September 2008

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Figure 10

Groundwater Source Protection Zones

0 500 1,000 1,500 2,000 Meters
Scale: 1:30000 @ A3



Key:

	Bexley borough		Major Aquifer H1 Soils		Minor Aquifer HU Soils
	Major Aquifer HU Soils		Minor Aquifer I1 Soils		No Groundwater Vulnerability Data Available
	Major Aquifer I1 Soils				
	Minor Aquifer H1 Soils				

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Figure 11

Groundwater Vulnerability Map

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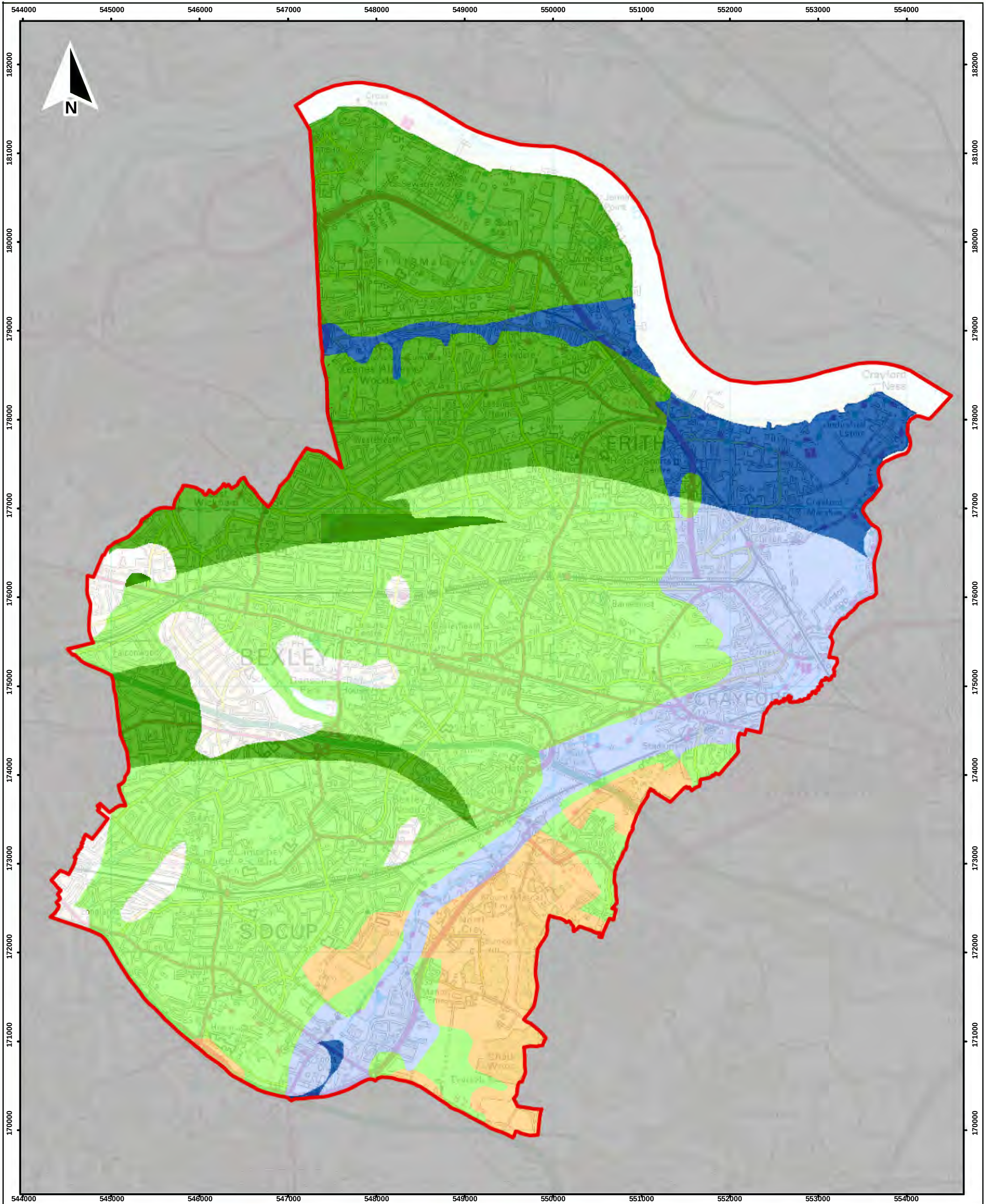
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0 525 1,050 1,575 2,100 Meters

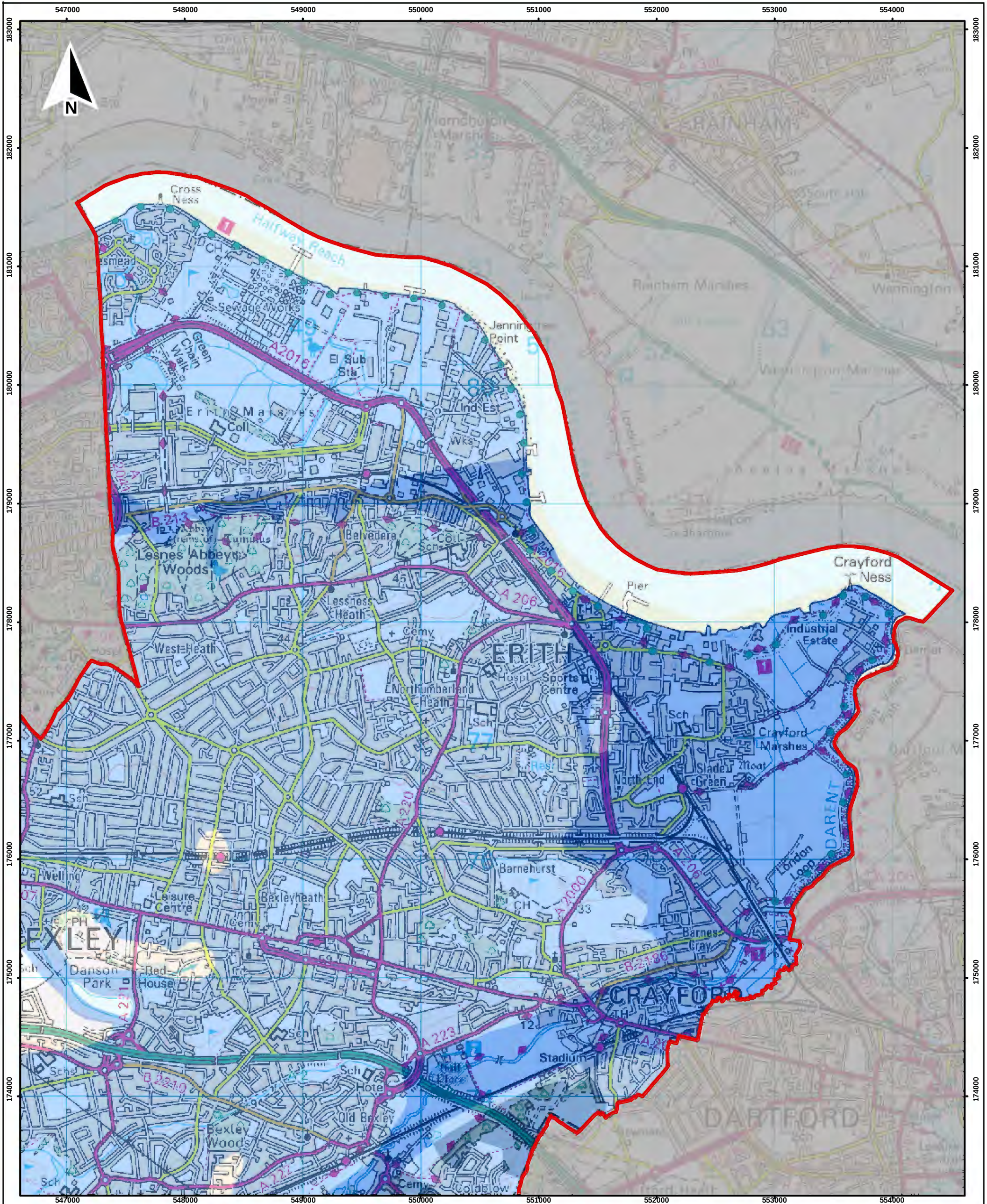
Scale: 1:30000 @ A3

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Key: Bexley borough	Infiltration Suitability Suitability of Infiltration SuDS <table border="0"> <tr> <td></td> <td>Highly</td> <td></td> <td>Low</td> </tr> <tr> <td></td> <td>Highly with caution - owing to SPZ designation</td> <td></td> <td>Low with caution - owing to SPZ designation</td> </tr> <tr> <td></td> <td>Intermediate</td> <td></td> <td>No data available</td> </tr> <tr> <td></td> <td>Intermediate with caution - owing to SPZ designation</td> <td></td> <td></td> </tr> </table> 0 530 1,060 1,590 2,120 Meters Scale: 1:30000 @ A3		Highly		Low		Highly with caution - owing to SPZ designation		Low with caution - owing to SPZ designation		Intermediate		No data available		Intermediate with caution - owing to SPZ designation			Bexley SFRA Figure 12 Soil Infiltration Potential to Inform the Suitability of Infiltration SuDS Techniques November 2008 23736-A012.mxd squij Entec
	Highly		Low															
	Highly with caution - owing to SPZ designation		Low with caution - owing to SPZ designation															
	Intermediate		No data available															
	Intermediate with caution - owing to SPZ designation																	



Key:

 Bexley borough

Surface Water Run-off Potential Generation

 High

 Low

 Medium

Based upon the soli classifications in the Groundwater Vulnerability Mapping

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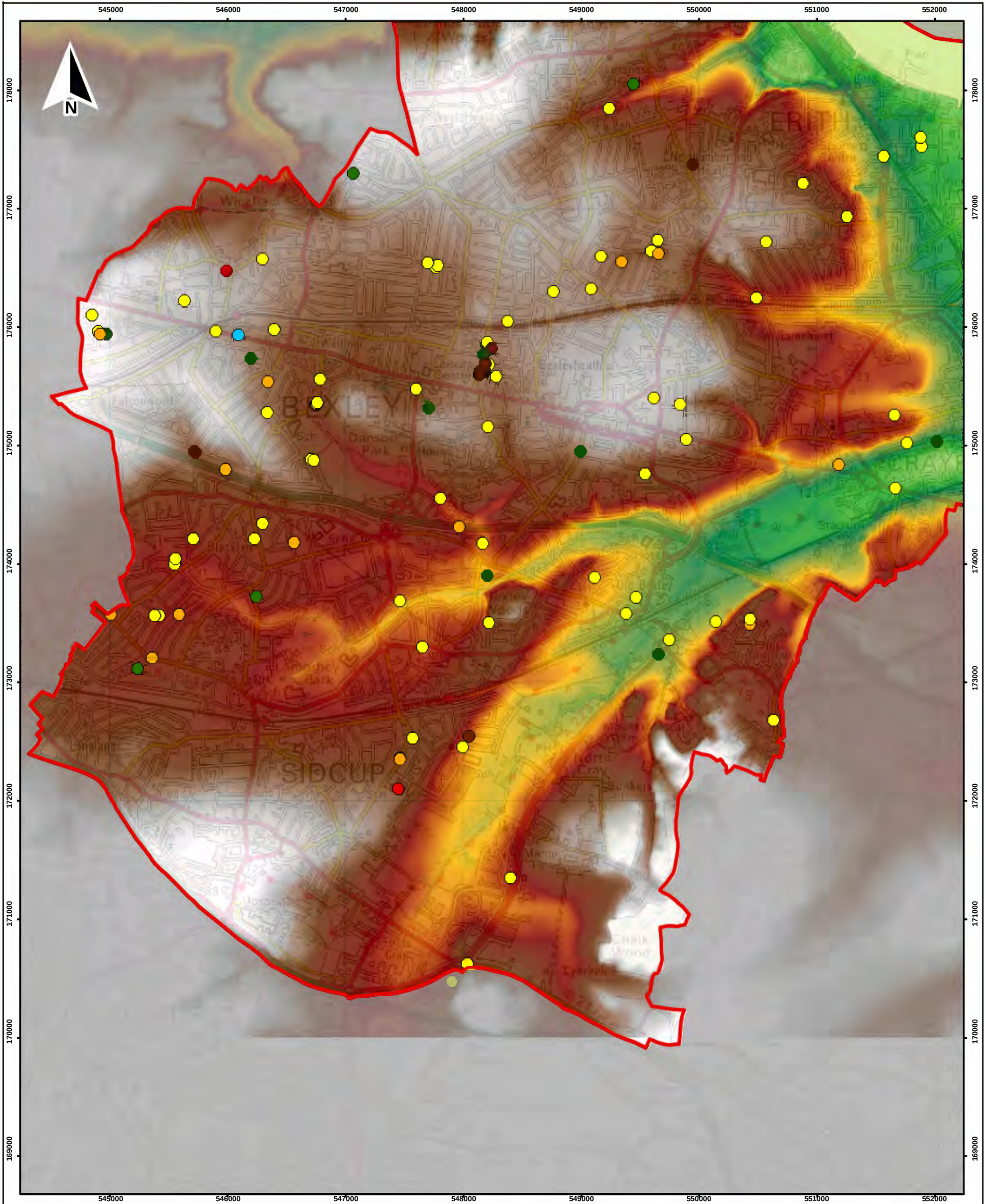
Figure 13

Surface Water Run-off Generation Potential

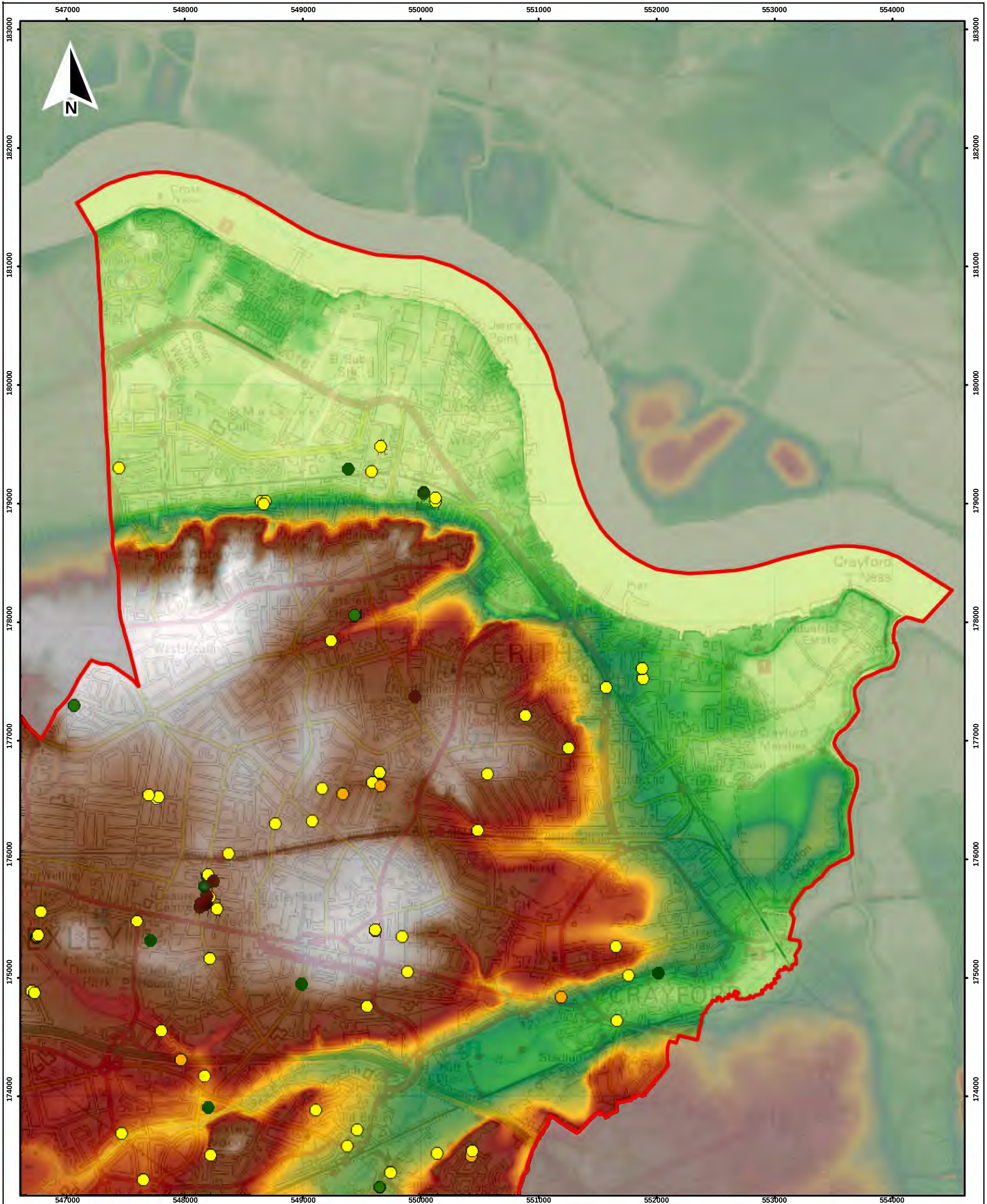
0 380 760 1,140 1,520 Meters
Scale: 1:30000 @ A3

November 2008
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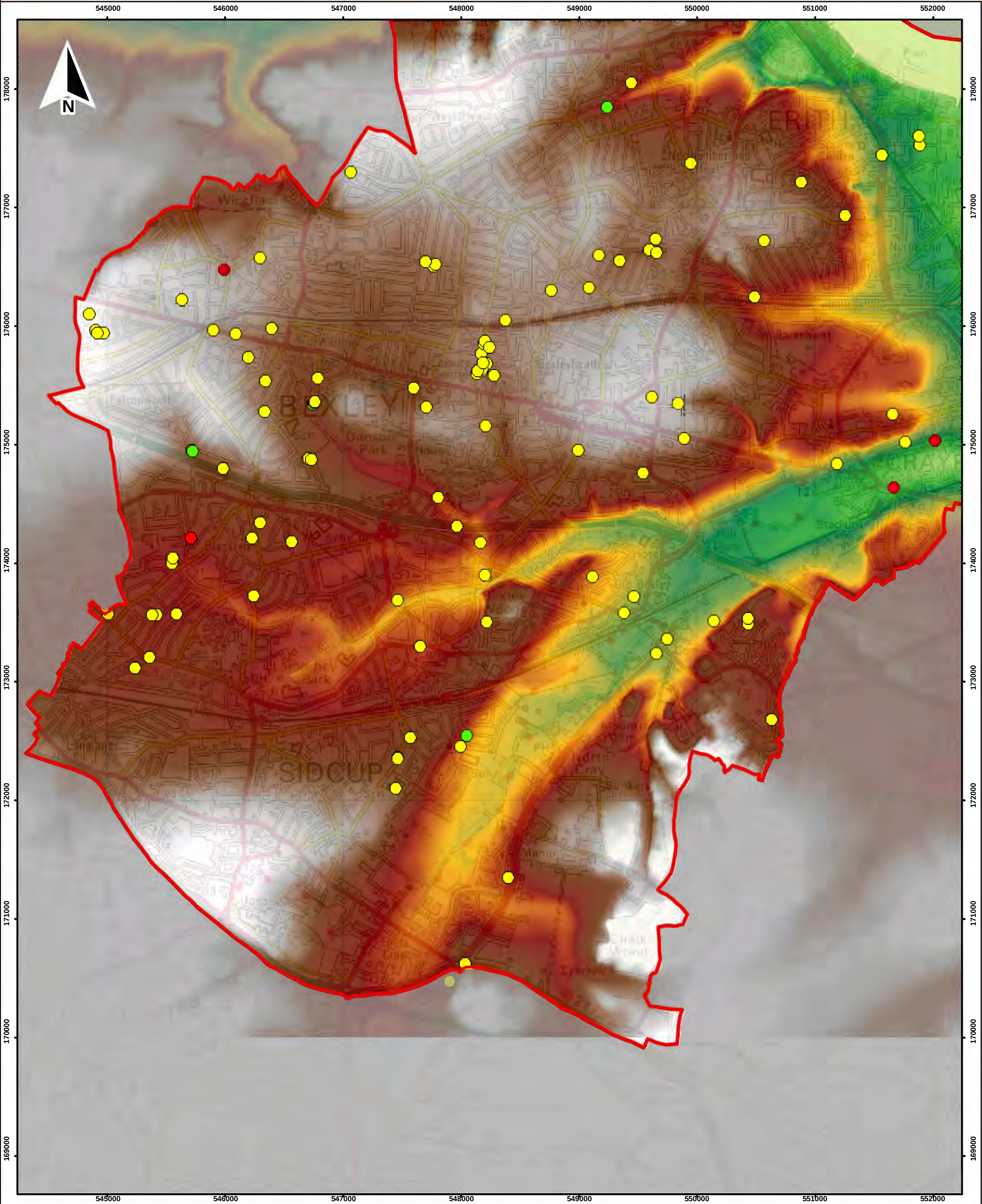
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Key:  Bexley borough	Drainage Locations Receptor  Commercial  Domestic  Highway  Highway/Domestic  School  Unknown	Ground Elevation (m) - Based on SAR data  High : 140 Low : < 0	Bexley SFRA	
			Figure 14 Historic Drainage Events (Receptors) (South)	
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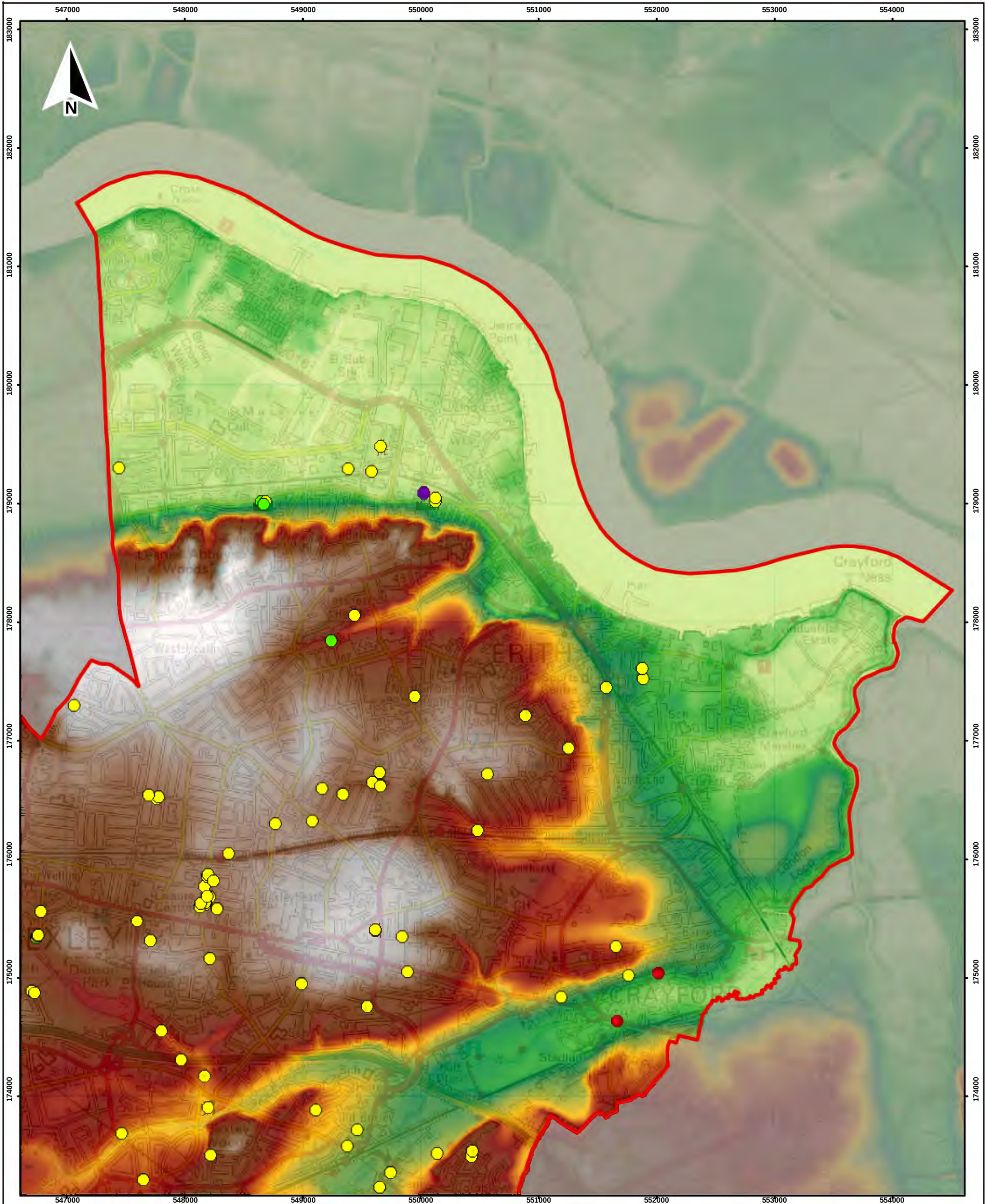


Key:  Bexley borough	Drainage Locations Receptor  Commercial  Domestic  Highway  Highway/Domestic  School  Unknown Data Source = London Borough of Bexley	Ground Elevation (m) - Based on SAR data High : 140 Low : < 0 0 380 760 1,140 1,520 Meters Scale: 1:30000 @ A3	Bexley SFRA Figure 15 Historic Drainage Events (Receptors) (North) <table border="1"><tr><td>November 2008 23736-A15.mxd squij</td><td>Entec</td></tr></table>	November 2008 23736-A15.mxd squij	Entec
November 2008 23736-A15.mxd squij	Entec				



Key:  Bexley borough	Drainage Locations Source  Foul water  Surcharge from sewers  Surface water  Unknown Data Source = London Borough of Bexley	Ground Elevation (m) - Based on SAR data  High : 140 Low : < 0 0 380 760 1,140 1,520 Meters Scale: 1:30000 @ A3	Bexley SFRA Figure 16 Historic Drainage Events (Source) (South) November 2008 23736-A16.mxd squij	Entec
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Key:

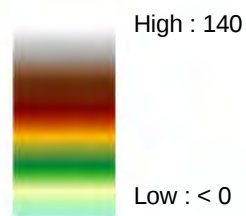
 Bexley borough

Drainage Locations Source

-  Foul water
-  Surcharge from sewers
-  Surface water
-  Unknown

Data Source = London Borough of Bexley

Ground Elevation (m) - Based on SAR data



0 390 780 1,170 1,560 Meters

Scale: 1:30000 @ A3

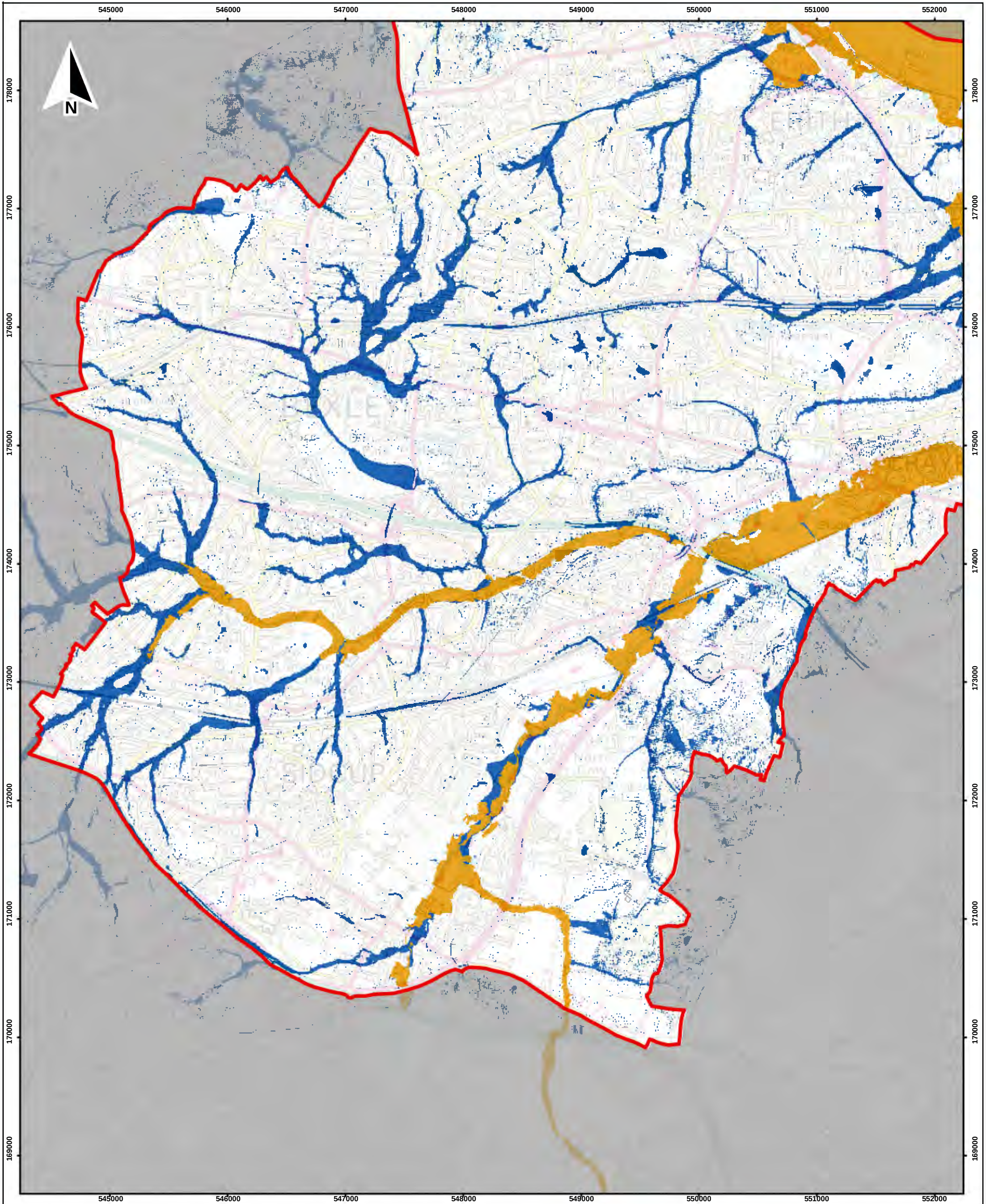
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Figure 17

**Historic Drainage Events (Source)
(North)**

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Key:

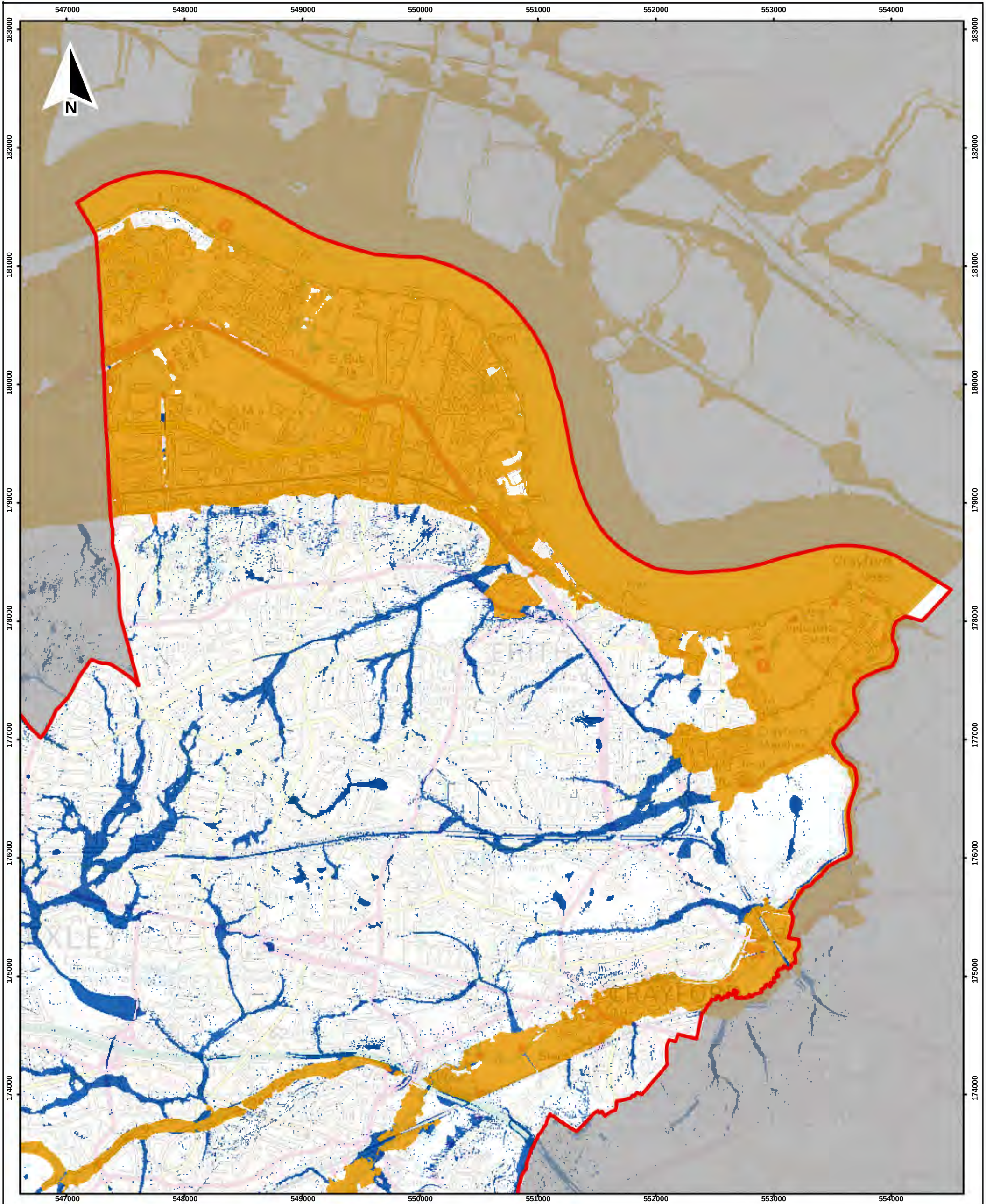
- | | |
|---|--|
|  Bexley borough |  Environment Agency
Flood Zone 3 (September 2008) |
| |  Potential Surface Water Flow Routes
and Ponding Areas |

Bexley SFRA

Figure 18

**Potential Surface Water Flow Routes
and Ponding Areas (South)**

0 390 780 1,170 1,560
Meters
Scale: 1:30000 @ A3



Key:

- | | |
|---|--|
|  Bexley borough |  Environment Agency
Flood Zone 3 (September 2008) |
| |  Potential Surface Water Flow Routes
and Ponding Areas |

0 380 760 1,140 1,520
Meters
Scale: 1:30000 @ A3

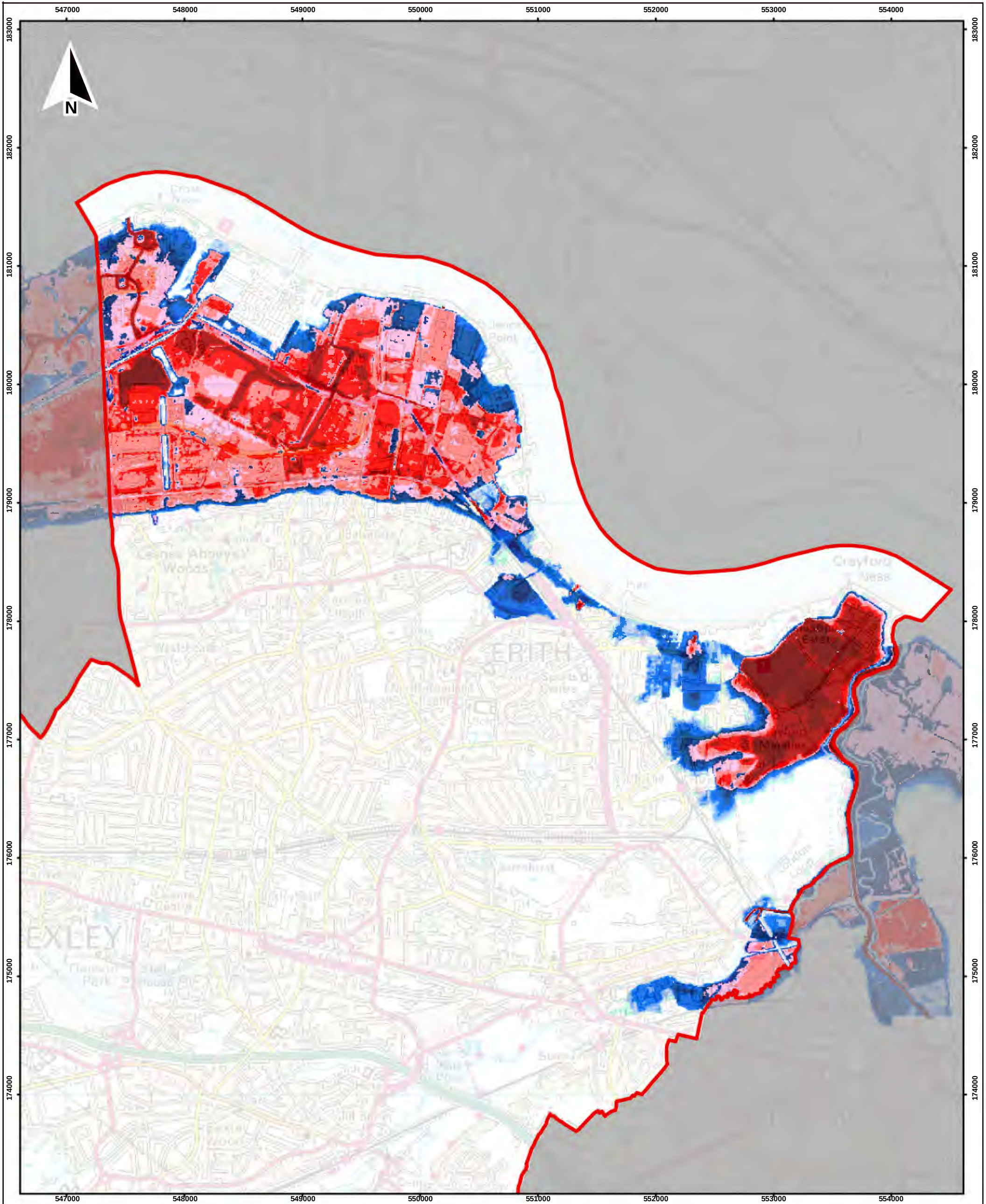
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Figure 19

**Potential Surface Water Flow Routes
and Ponding Areas (North)**

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NOTE - Please see Figure 24 for Fluvial Flood Depths in Crayford Town Centre

Key:

- Bexley borough
- Maximum Flood Depth (m)
- 0 - 0.25
- 0.25 - 0.5
- 0.50 - 0.75

- 0.75 - 1
- 1.00 - 1.5
- 1.51 - 2
- 2.01 - 2.5
- 2.51 - 3

- 3.01 - 3.5
- 3.51 - 4
- 4.01 - 5
- 5.01 - 6

0 380 760 1,140 1,520 Meters
Scale: 1:30000 @ A3

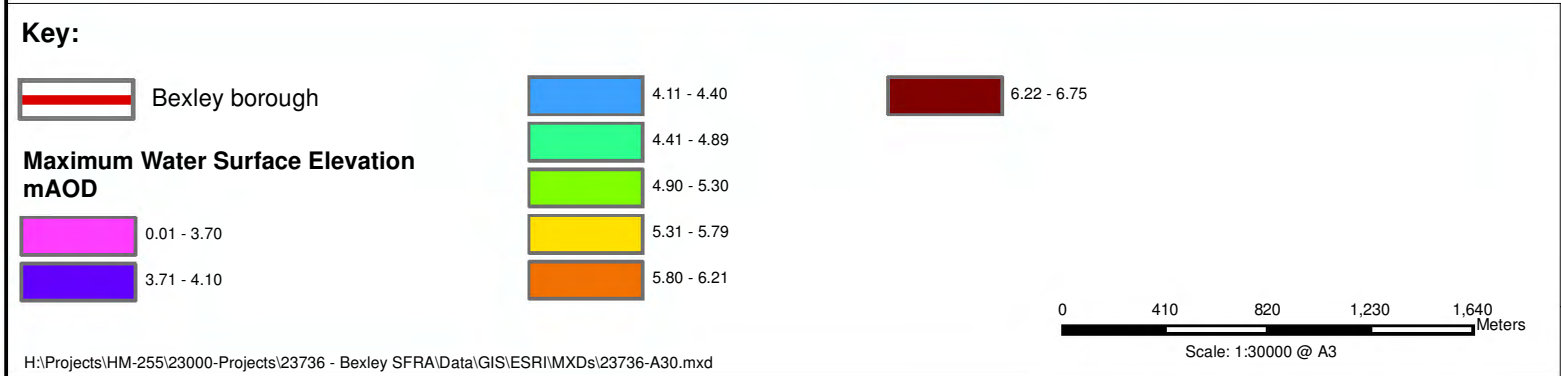
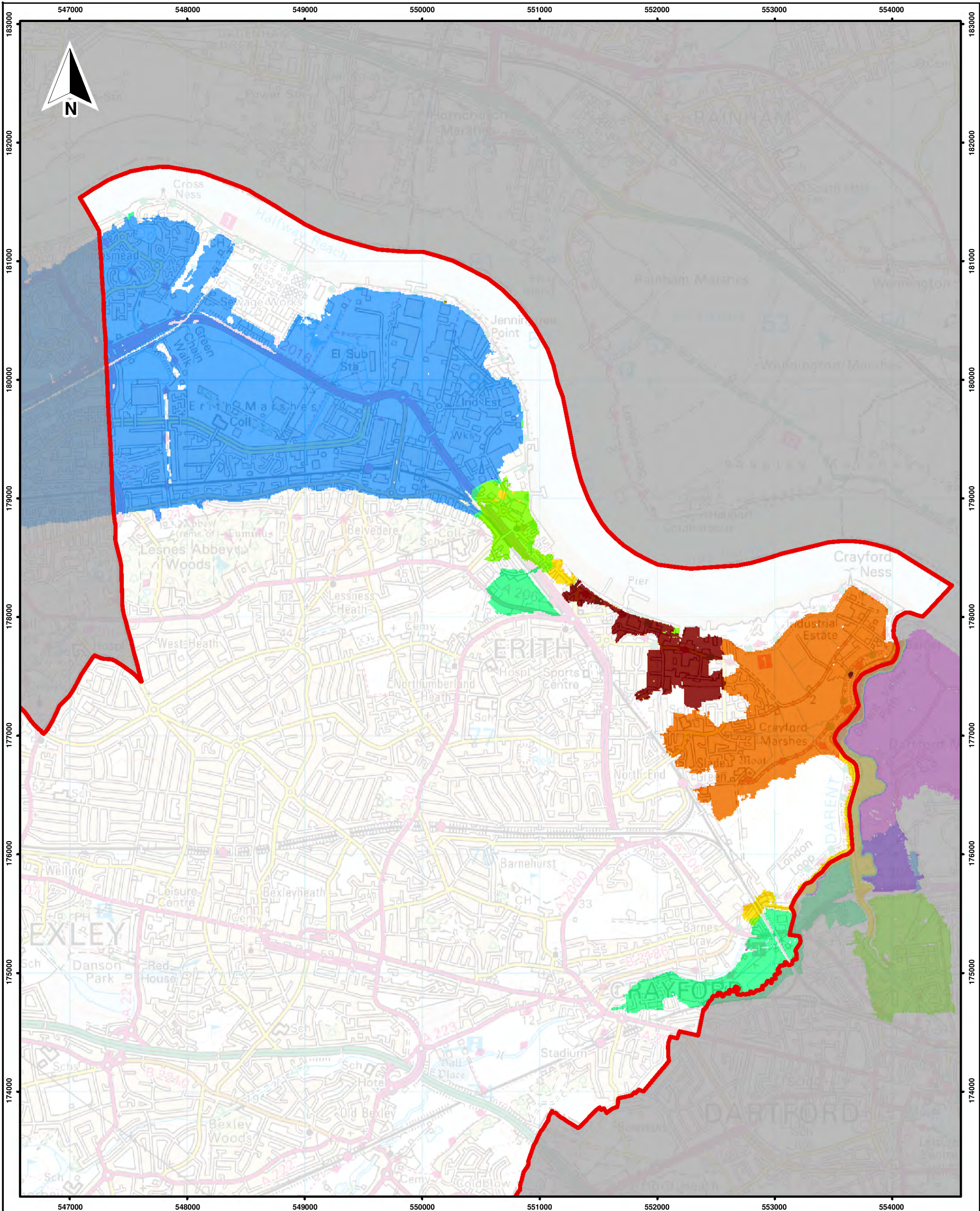
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Figure 20

Predicted Maximum Flood Depths
From all Breaches in the 1 in 200
Year Tidal Event Plus CC

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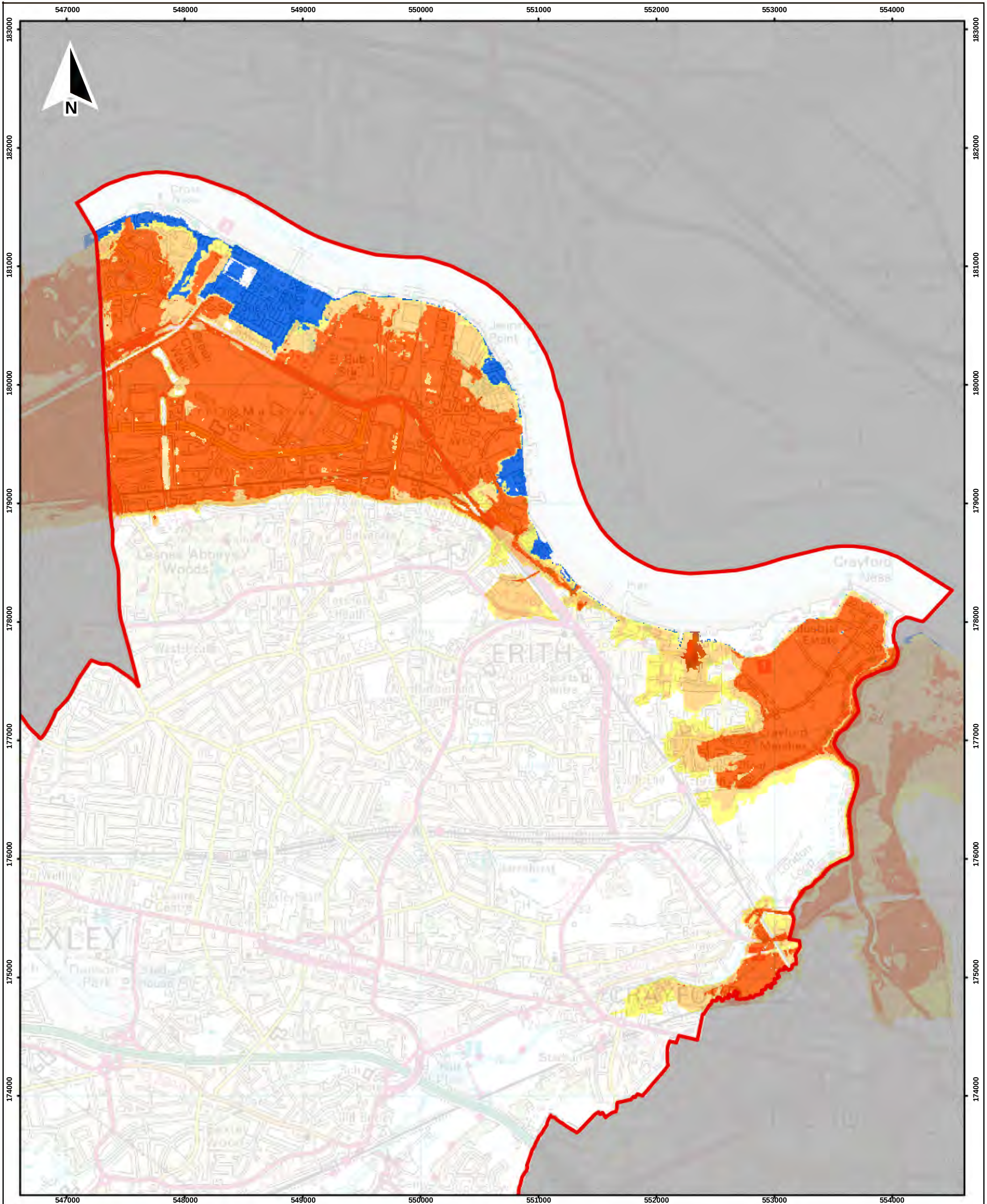
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Figure 21

Predicted Maximum Flood Water Levels from all Breaches in the 1 in 200 Year Tidal Event Plus CC

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Key:

-  Bexley borough
-  Zone of Potential Rapid Inundation
See Section 3.2.4 of SFRA Report for details of this zone

Flood Hazard (FD2321/TR2)

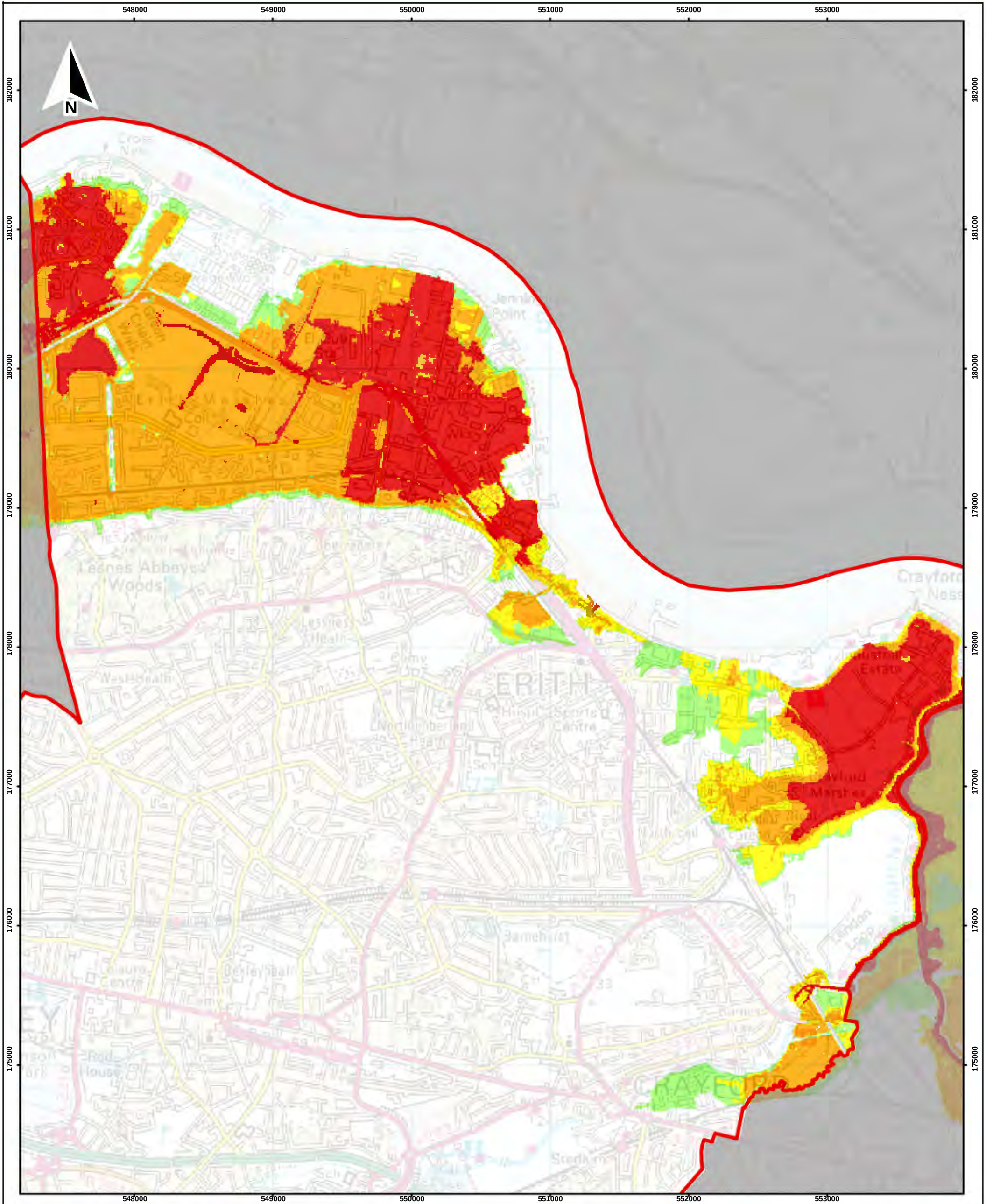
-  < 1.5 'Danger for Some'
-  1.50 - 2.5 'Danger for Most'
-  > 2.5 'Danger for All'

NOTE - Please see Figure 25 for Fluvial Flood Hazard Ratings in Crayford Town Centre

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Figure 22

**Predicted Maximum Flood Hazards
From all Breaches in the 1 in 200
Year Tidal Event Plus CC**



Key:

Bexley borough

Likely Rate of Flooding Onset (Hours)

Less than 3 hours

Less than 6 hours

Less than 15 hours

Area converted at maximum extent

0 350 700 1,050 1,400 Meters

Scale: 1:25,500 @ A3

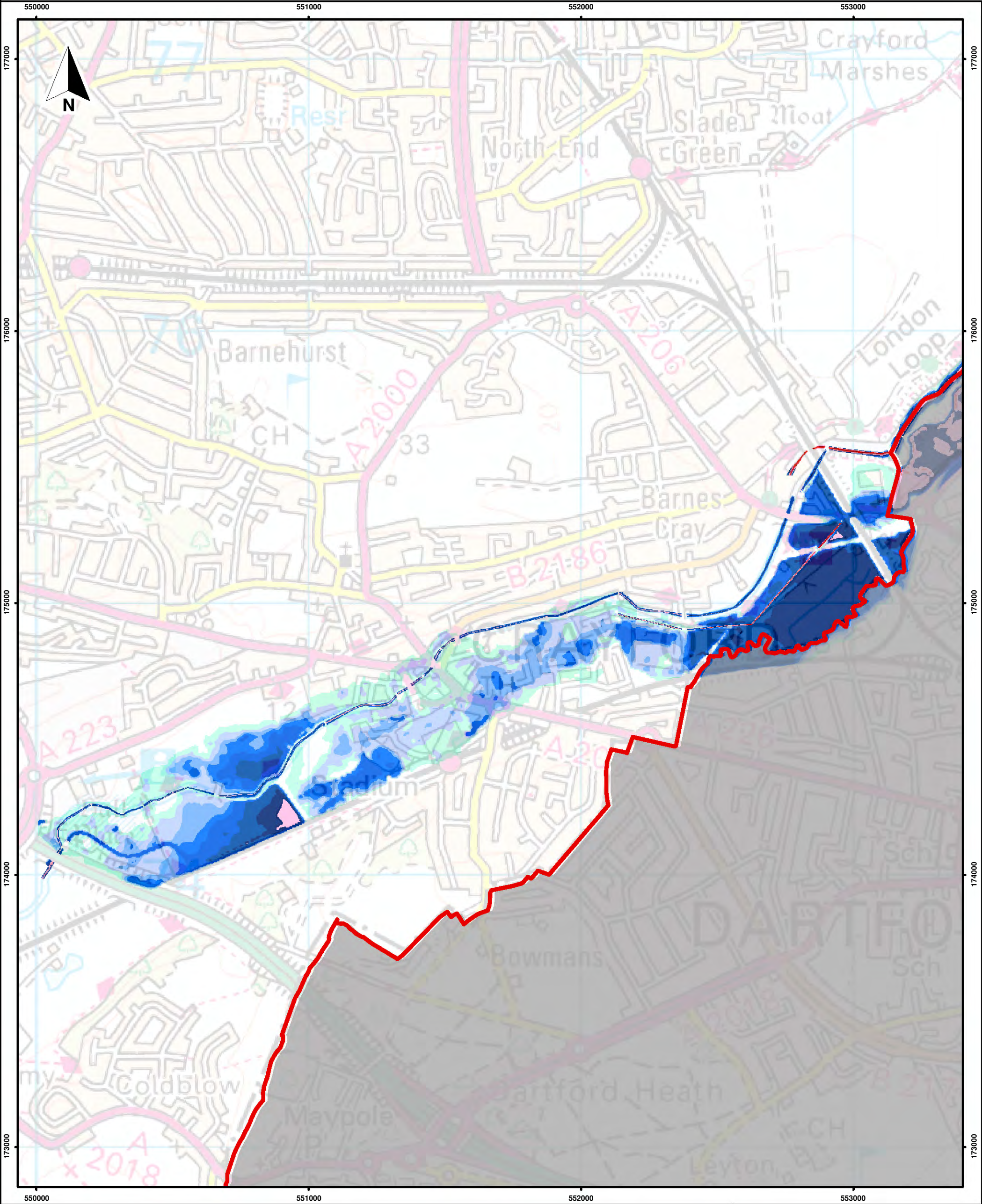
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Figure 23

Combined Rate of Inundation from all Breaches for the Simulated 1 in 200 Year Tidal Event Plus CC

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Key:

	Bexley borough
	0 - 0.25
	0.25 - 0.5
	0.50 - 0.75
	0.75 - 1
	1.00 - 1.5
	1.51 - 2
	2.01 - 2.5
	2.51 - 3
	3.01 - 3.5
	3.51 - 4
	4.01 - 5
	5.01 - 6

NOTE - Please see Figure 20 for Flood Depths from a defence breach

0 175 350 525 700 Meters

Scale: 1:30000 @ A3

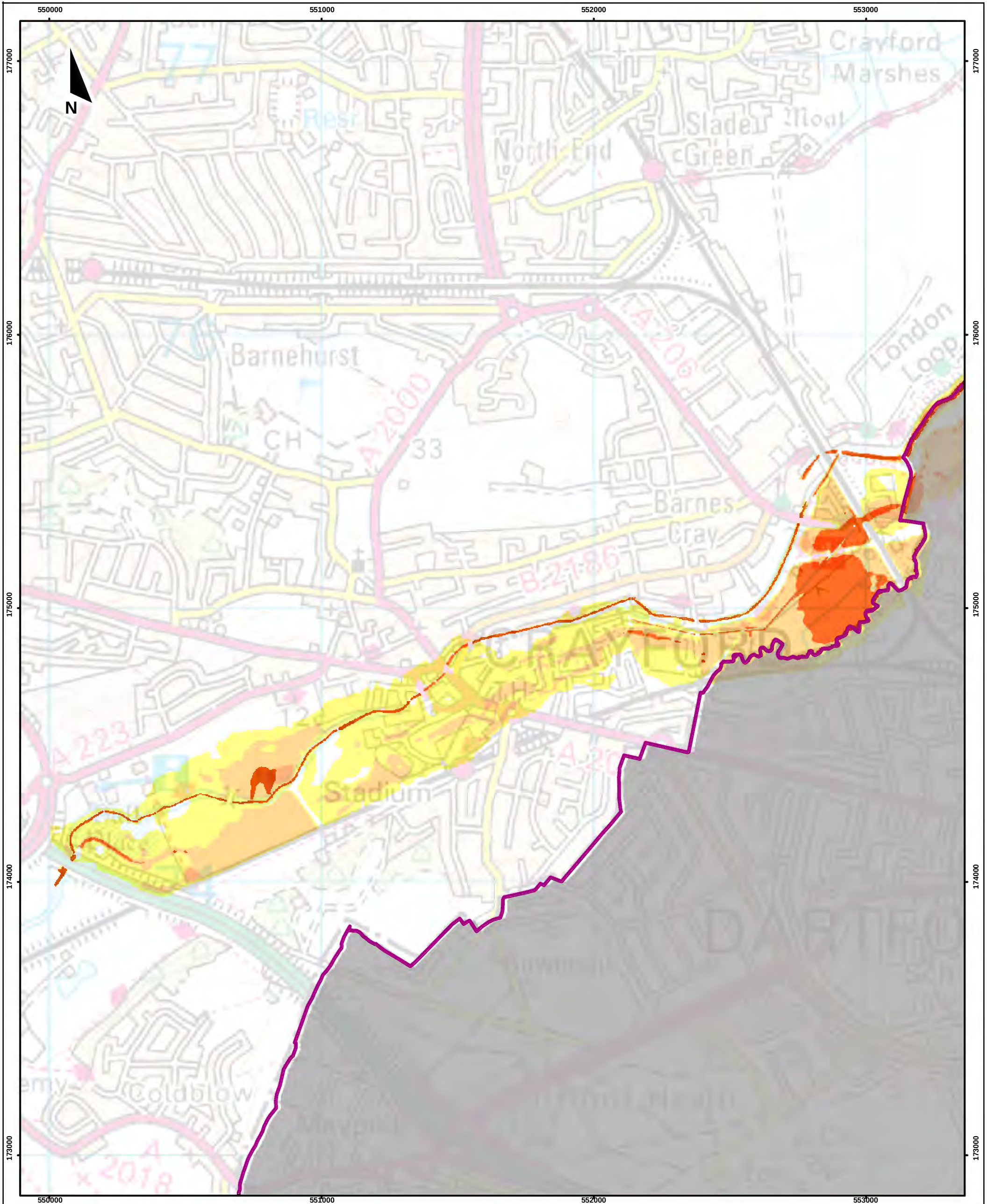
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Figure 24

Maximum Depth in the 1 in 100 Year Fluvial Event (Plus Climate Change) Crayford

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Key:

 Bexley borough

Flood Hazard (FD2321/TR2)

 < 1.5 'Danger for Some'

 1.50 - 2.5 'Danger for Most'

 > 2.5 'Danger for All'

0 180 360 540 720 Meters
Scale: 1:13000 @ A3

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Figure 25

**Maximum Hazard in the 1 in 100
Year Fluvial Event (Plus Climate Change)
Crayford**

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