

Max Hazard	
(Flood Risk to People : FD2320)	
	Less than 0.75 (Low Hazard)
	Between 0.75 and 1.25 (Danger for Some)
	Between 1.25 and 2.0 (Danger for Most)
	Greater than 2.0 (Danger for All)

Max Depth (m)	
	0 - 0.25
	0.25 - 0.50
	0.50 - 1.0
	1.0 - 1.6
	1.6 +

Max Velocity (m/s)	
	0 - 0.3
	0.3 - 1.0
	1.0 - 1.5
	1.5 - 2.5
	2.5 +

The map is based on computer modelling of simulated overtopping of the main coastal defences for specific tidal scenarios. It does not include overtopping along the following tidal rivers which are currently being investigated: Witham Haven (upstream of Hobhole), and Welland (upstream of Fosdyke Bridge)

The map only considers the consequences of overtopping of the defences, and does not show the possible consequences of breaches of the tidal defences. Separate maps of the flood extent from just breaching of the defences are available.

For future climate change scenarios it is assumed that defences remain at 2006 heights.

These maps do not replace the flood zone maps used in the National Planning Policy Framework (NPPF)



**Lincolnshire and Northamptonshire Overtopping Hazard Mapping**

Map Centred on TF 55900 73770

<b>Date Printed</b>	May 2023	<b>Scenario year</b>	2115	<b>Scenario Annual Chance</b>	0.1% (1 in 1000)	<b>CCN Number</b>	CCN-2023-310044
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General Enquiries No: 03708 506 506. Weekday Daytime calls cost 5p plus up to 6p per minute from BT Weekend Unlimited. Mobile and other providers' charges may vary

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**APPENDIX 3 – Geotechnical Information**



**MAP LAYERS**

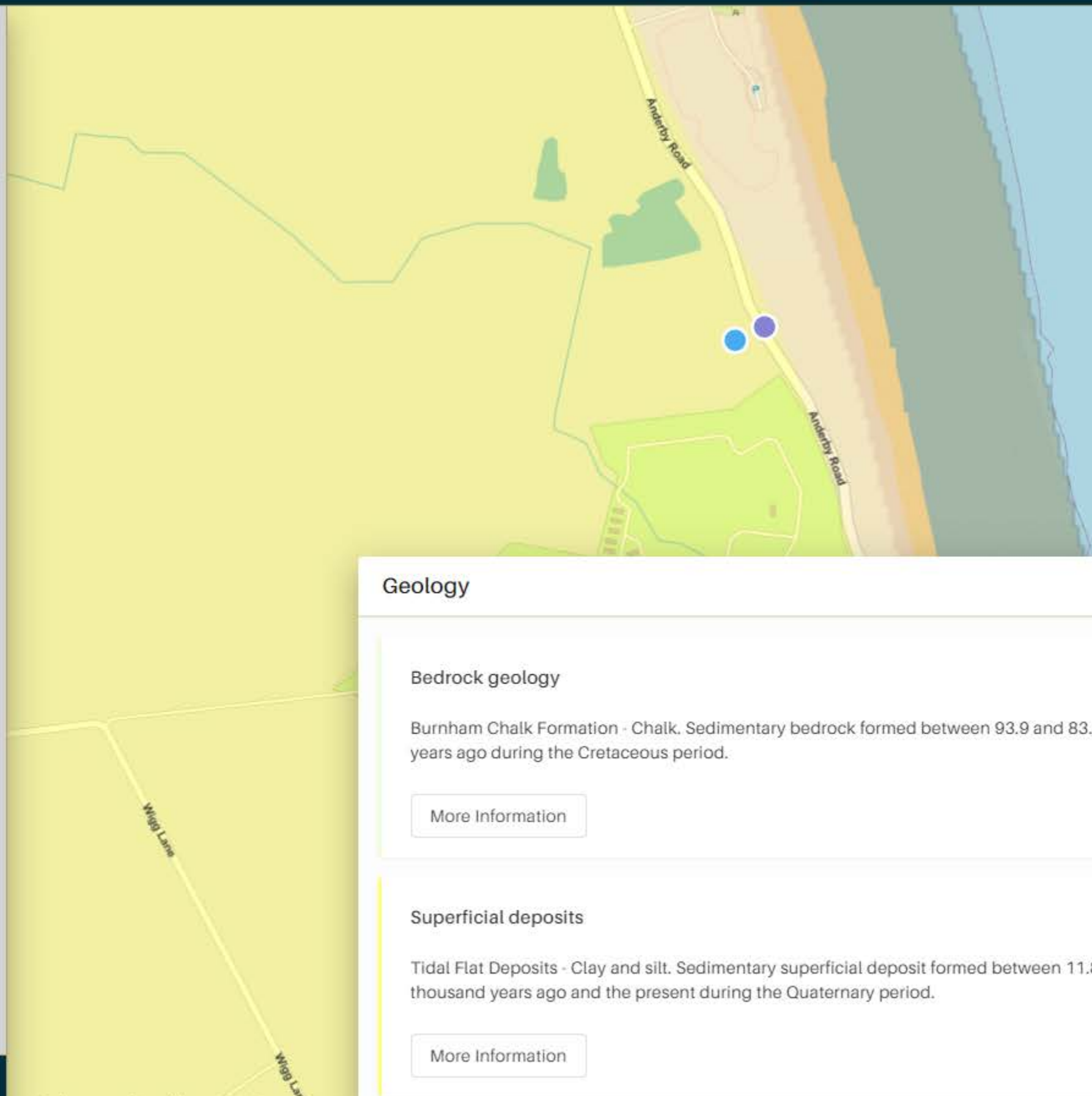
- Superficial Geology
- Bedrock Geology
- Combined Geology

About this layer:  
Combination of bedrock and superficial geology

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**OPTIONS**

- 
- 
- 
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- 



**Geology** [Close]

**Bedrock geology** [Expand]

Burnham Chalk Formation - Chalk. Sedimentary bedrock formed between 93.9 and 83.6 million years ago during the Cretaceous period.

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**Superficial deposits** [Expand]

Tidal Flat Deposits - Clay and silt. Sedimentary superficial deposit formed between 11.8 thousand years ago and the present during the Quaternary period.

**APPENDIX 4 - Calculations**

## CHAPEL ST LEONARDS – DRAINAGE CALCULATIONS

### Areas:

Site Area = 1.500 ha

Proposed impermeable area of site = 0.680 ha

### Run-off:

Greenfield area runoff:

Using IoH 124 for 0.680 =  $Q_{bar} = 2.5$  l/s

### Surface water storage design:

Proposed limited discharge rate = 2.5 l/s

100 year return period

Impermeable = 0.680 ha

40% allowance for climate change

Volume of storage (refer to Micro Drainage calculations) = 678.1m<sup>3</sup>

4 Coldstream Lane  
Hardingstone  
Northampton NN4 6DB



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ICP SUDS Mean Annual Flood

Input

Return Period (years) 1 Soil 0.450  
Area (ha) 0.680 Urban 0.000  
SAAR (mm) 600 Region Number Region 5

**Results 1/s**

QBAR Rural 2.5  
QBAR Urban 2.5

Q1 year 2.2

Q1 year 2.2  
Q30 years 6.0  
Q100 years 8.9



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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	0.284	0.284	1.7	218.5	O K
30 min Summer	0.341	0.341	1.7	265.8	O K
60 min Summer	0.408	0.408	1.7	322.4	O K
120 min Summer	0.485	0.485	1.9	389.2	O K
180 min Summer	0.535	0.535	2.0	433.0	O K
240 min Summer	0.571	0.571	2.1	465.9	O K
360 min Summer	0.624	0.624	2.1	514.3	O K
480 min Summer	0.662	0.662	2.2	549.3	O K
600 min Summer	0.690	0.690	2.3	576.2	O K
720 min Summer	0.713	0.713	2.3	597.7	O K
960 min Summer	0.713	0.713	2.3	597.9	O K
1440 min Summer	0.701	0.701	2.3	586.4	O K
2160 min Summer	0.671	0.671	2.2	558.1	O K
2880 min Summer	0.645	0.645	2.2	533.9	O K
4320 min Summer	0.606	0.606	2.1	497.6	O K
5760 min Summer	0.570	0.570	2.0	465.1	O K
7200 min Summer	0.538	0.538	2.0	435.8	O K
8640 min Summer	0.508	0.508	1.9	409.1	O K
10080 min Summer	0.480	0.480	1.9	384.7	O K
15 min Winter	0.316	0.316	1.6	244.8	O K
30 min Winter	0.379	0.379	1.7	297.7	O K
60 min Winter	0.453	0.453	1.8	361.3	O K
120 min Winter	0.539	0.539	2.0	436.6	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	172.195	19
30 min Summer	105.033	34
60 min Summer	64.066	64
120 min Summer	39.078	124
180 min Summer	29.265	184
240 min Summer	23.836	244
360 min Summer	17.850	362
480 min Summer	14.539	482
600 min Summer	12.400	602
720 min Summer	10.888	722
960 min Summer	8.455	962
1440 min Summer	5.920	1440
2160 min Summer	4.144	1920
2880 min Summer	3.218	2276
4320 min Summer	2.272	3028
5760 min Summer	1.774	3864
7200 min Summer	1.465	4680
8640 min Summer	1.252	5528
10080 min Summer	1.097	6352
15 min Winter	172.195	19
30 min Winter	105.033	34
60 min Winter	64.066	64
120 min Winter	39.078	122

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
180 min Winter	0.593	0.593	2.1	486.2	O K
240 min Winter	0.634	0.634	2.2	523.6	O K
360 min Winter	0.693	0.693	2.3	578.8	O K
480 min Winter	0.735	0.735	2.3	619.0	O K
600 min Winter	0.768	0.768	2.4	650.3	O K
720 min Winter	0.794	0.794	2.4	675.5	O K
960 min Winter	0.796	0.796	2.4	678.1	O K
1440 min Winter	0.788	0.788	2.4	670.0	O K
2160 min Winter	0.761	0.761	2.4	643.6	O K
2880 min Winter	0.728	0.728	2.3	612.1	O K
4320 min Winter	0.682	0.682	2.2	568.4	O K
5760 min Winter	0.636	0.636	2.2	525.5	O K
7200 min Winter	0.592	0.592	2.1	485.2	O K
8640 min Winter	0.551	0.551	2.0	447.9	O K
10080 min Winter	0.513	0.513	1.9	413.5	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
180 min Winter	29.265	182
240 min Winter	23.836	240
360 min Winter	17.850	358
480 min Winter	14.539	476
600 min Winter	12.400	594
720 min Winter	10.888	710
960 min Winter	8.455	942
1440 min Winter	5.920	1398
2160 min Winter	4.144	2052
2880 min Winter	3.218	2368
4320 min Winter	2.272	3244
5760 min Winter	1.774	4152
7200 min Winter	1.465	5048
8640 min Winter	1.252	5960
10080 min Winter	1.097	6768



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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
Site Location	GB 555750 373900 TF 55750 73900
C (1km)	-0.022
D1 (1km)	0.388
D2 (1km)	0.222
D3 (1km)	0.242
E (1km)	0.309
F (1km)	2.402
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time / Area Diagram

Total Area (ha) 0.680

Time (mins)	Area (ha)
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0-4	0.680
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Model Details

Storage is Online Cover Level (m) 1.100

Tank or Pond Structure

Invert Level (m) 0.000

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	725.0	1.100	1074.2

Hydro-Brake® Outflow Control

Design Head (m) 0.800 Hydro-Brake® Type Md4 Invert Level (m) 0.000  
 Design Flow (l/s) 2.5 Diameter (mm) 59

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.6	1.200	3.0	3.000	4.7	7.000	7.2
0.200	1.4	1.400	3.2	3.500	5.1	7.500	7.4
0.300	1.5	1.600	3.4	4.000	5.4	8.000	7.7
0.400	1.7	1.800	3.6	4.500	5.8	8.500	7.9
0.500	1.9	2.000	3.8	5.000	6.1	9.000	8.1
0.600	2.1	2.200	4.0	5.500	6.4	9.500	8.4
0.800	2.4	2.400	4.2	6.000	6.6		
1.000	2.7	2.600	4.4	6.500	6.9		

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Event: 960 min Winter

