



Flood Risk Assessment

University Academy Long Sutton, 84 Little London, Long Sutton,
Spalding PE12 9LF

Reference: 445 FRA-v2

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Purpose of this report

- 1.1 Urban Water has been appointed to undertake a Level 2 – Scoping Study Flood Risk Assessment for a development located at PE12 9LF.

Objectives

- 1.2 The objectives of this FRA are to demonstrate the following:
- * Whether the proposed development will likely be affected by current or future flooding.
 - * Whether the proposed development will increase flood risk elsewhere.
 - * Whether the flood risks associated with the proposed development can be satisfactorily managed.
 - * Whether the measures proposed to deal with the flood risk are sustainable.

Documents Consulted

- 1.3 To achieve these objectives, the following documents have been consulted and referenced:

The National Planning Policy Framework (NPPF)
CIRIA C753 document The SuDS Manual, 2015
Local Flood Risk Management Strategy (LFRMS)
Level 1 Strategic Flood Risk Assessment (SFRA)
Aerial photographs and topographical survey of the site
British Geological Society Records
Local Council flood Maps
Environment Agency flood maps
The CIRIA publication 'C635 Designing for exceedance in urban drainage— Good practice'

Development Site and Location

- 2.1 The site is located at Little London, Long Sutton. The nearest postcode is PE12 9LF. Refer to appendix A for site location plan.
- 2.2 The current use of the site is the University Academy Long Sutton . The current use vulnerability classification of the site is More vulnerable . The site is located in the River Flood Zone 3. Refer to Appendix B for more details.

Development Proposals

- 2.3 The proposed development includes the demolition of the current buildings and construction of new building centre and common areas. Refer to Appendix B for the layout of the proposed development.
- 2.4 The vulnerability classification of the proposed development is More vulnerable with an estimated lifetime between 50 and 100 years.

Site Hydrology and Hydrogeology

- Hydrology 2.5 The River Nene is located approximately 4800 m away from the development.
- Aquifer 2.6 The development is located within an unproductive strata. These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.
- Source Protection Zone 2.7 The site is not located within a Source Protection Zone.
- Groundwater Levels 2.8 The ground water levels for this site are unknown.

Site Geology

- Bedrock 2.9 The British Geological Survey records of the site show that it is located within the Ampthill Clay Formation - Mudstone.
- Superficial Deposits 2.10 The British Geological Survey records show that the superficial deposits are Tidal Flat Deposits - Clay And Silt.

National Planning Policy Framework (NPPF)

- 3.1 The NPPF and its technical guidance is a set of planning policies with the key objective of contributing to sustainable development. As part of it, they ensure that flood risk and sustainability are considered during the planning process. This ensures that developments are not located in flood risk areas and directs developments to lower risk areas. The NPPF applies a sequential risk-based approach to determining land suitability for development in flood risk areas. The NPPF also encourages developers to seek opportunities to reduce the overall level of flood risk through the development layout and the application of Sustainable Drainage Systems (SuDS).

The Flood and Water Management Act (2010)

- 3.2 The Flood and Water Management Act aims to reduce the flood risk associated with extreme weather events. It provides robust flood risk management for people, homes and businesses and encourages using SuDS for developments. A robust SuDS strategy should consider the recommendations in this Flood Risk Assessment.

Strategic Flood Risk Assessment (SFRA)

- 3.3 Planning policy with regard to development and flood risk in the area is detailed in the Strategic Flood Risk Assessment (SFRA) which was published in 2017. The proposed development site is located within the administrative boundary of the South East Lincolnshire.
- 3.4 The SFRA commits to direct new development to locations at the lowest flood risk. The SFRA provides information on the levels and flood hazards that could result from flooding. The Environment Agency flood zone maps and the SFRA ignore the presence of existing flood defences when defining the potential extent of flooding.
- 3.5 This report follows the guidance given in the Strategic Flood Risk Assessment by evaluating the flood risk and providing relevant flood mitigation.

- 4.1 The NPPF guidance states that the sequential test "is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. This means avoiding, so far as possible, development in current and future medium and high flood risk areas considering all sources of flooding including areas at risk of surface water flooding."

Applicability of the Sequential Test

- 4.2 The flood risks were determined by identifying all the sources of flooding and assessing their possible impact and likelihood to development. It is confirmed that the development is:

- In Flood Zone 3, based on the Planning Flood Risk Map
- In Flood Zone 3, based on the Product 4 provided by the EA
- At Low risk of surface flooding
- At very low risk of groundwater flooding
- Outside of a critical drainage area
- Outside of an area with sewer flooding

- 4.3 Due to the flood risk on the development, a sequential test is required. For this development, the sequential assessment was completed for the area within the red line of the planning application. The development has been located at the lowest flood risk. Regarding looking at other reasonably available sites, it is unlikely that other areas are available in lower flood risk probability as the development is a replacement of the current buildings and can only be located within the proximity of the existing land use and land ownership. It is concluded that the current proposals pass the sequential test.

Exception Test

- 4.2 Fluvial flood risk was assessed using the Environment Agency Flood Zone Maps and the sequential risk-based approach recommended in the NPPF guidance. The exception test requirement considers the flood risk vulnerability of land uses about the flood zone categorisation. These parameters are assessed to determine whether the development requires an exception test or is inappropriate.

Step 1
Flood Zone categorisation

- 4.3 The proposed development falls within The Environment Agency (EA) Flood Zone 3. The Flood Zone 3 is considered to have a high probability of flooding with a 200 years or greater annual probability or >0.5%AEP.

- Step 2** 4.4 Within Table 2 (Flood Risk Vulnerability Classification) of the NPPF Planning Practice Guide, the proposed development is classified as 'More vulnerable '.
- Flood risk vulnerability
- Step 3** 4.5 The Flood Risk vulnerability and Flood Zone incompatibility table of the NPPF Planning Practice Guide states that More vulnerable developments are required to pass the Exception Test in this area.
- Flood Zone incompatibility

The Exception Test

- 4.6 The development requires passing the Exception Test. To pass the exception test, they should be demonstrated the following:

(a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and

(b) the development will be safe for its lifetime, taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

Both elements of the exception test should be satisfied for development to be allocated or permitted.

- 4.7 The development reduces the flood risk overall and demonstrates that the measures go beyond just managing the flood risk resulting from the development. Reductions could be achieved, for example, by:
- Incorporating green infrastructure within the layout and form of development to make additional space for the flow and storage of flood water;
 - Providing Sustainable Drainage Systems that manage flood risk beyond the proposed site and above the usual standard, such as by removing surface water from existing combined sewers;
 - Providing infrastructure that will provide additional benefits to existing communities, such as a new university building and sports facilities.
- 4.8 The following sections of this flood risk assessment demonstrate that the proposed development can be safely established with an adequate standard of flood protection, including allowance for climate change, and that proposed surface water management provisions may contribute to the reduction in flood risk elsewhere. On this basis, it is concluded that the proposed development passes the Exception Test.

- 5.1 The development has been assessed for the following potential flood risks, river and tidal flood risk, surface water flooding, flooding from groundwater, reservoir flood risk and drainage systems.

Flood Defence and Historic Flooding

- 5.2 The Environment Agency records show that the site benefits from flood defences. They are in fair condition and reduce the risk of flooding (at the defence) to a 0.67% (1 in 150) chance of occurring in any year. The records also show that the area around the site has not been flooded in the past. See Appendix C for details.

Flooding from river and sea

- 5.3 The site is affected by Tidal Flooding. The proposed development falls within The Environment Agency (EA) Flood Zone 3. The Flood Zone 3 is considered to have a high probability of flooding with a 200 years or greater annual probability or >0.5%AEP.
- 5.4 The Environment Agency has provided tidal flood level data for the site. Predicted flood levels for a range of flood frequencies can be compared to the elevation of existing coastal defences to establish tidal flood risk. It has been assumed that wave action (overtopping) is unlikely to be at significant risk of flooding due to the distance of the development to the coast.
- 5.5 The levels provided by the Environment Agency are shown in table 1 below. The site is not affected by overtopping of the defences for the present day (2006) and climate change (2115) scenarios; however, it is at risk of breaching. The EA breach depths at the site vary between 0.5-1.5 m. The water depth has been added to the average site level. This level corresponds to the year 2115 0.5% (1 in 200). Further details are provided in Appendix D.

Flood Levels at coast node West Lighthouse

Return Period	Flood Level (m AOD)
1 in 200 (0.5 %)	5.82
1 in 1000 (0.1%)	6.14

Flood Levels at Site

Return Period	Flood Level (m AOD)
1 in 200 (0.5 %)	0.00
1 in 1000 (0.1%)	0.00
Extreme Water Level (m) (2115 + CC)	4.50

- 5.6 The life of the development is between 50 and 100 years. The flood risk level for Sea flooding is 4.5m AOD. The external depth of water is 1m.

Surface water (overland flows) flood risk

5.7 The Environment Agency maps show that the flood risk from surface water is low. A residual risk of localised shallow ponding remains likely. The Environment Agency surface water flood risk maps are defined by applying a specific procedure based on digital terrain models and assumptions regarding infiltration and urban drainage losses. The surface water flood maps are determined by the Environment Agency as follows.

5.8 *"The nationally produced surface water flood mapping only indicates where surface water flooding could occur due to local rainfall. It does not fully represent flooding that occurs from:*

- Ordinary watercourses
- Drainage systems or public sewers caused by catchment-wide rainfall events
- Rivers
- Groundwater

Due to the modelling techniques, the mapping picks out depressions in the ground surface. It simulates some flow along natural drainage channels, rivers, low areas in floodplains, and flow paths between buildings. Although the maps appear to show flooding from ordinary watercourses, they should not be taken as definitive mapping of flood risk from these as the conveyance effect of ordinary watercourses or drainage channels is not explicitly modelled. Also, structures (such as bridges, culverts and weirs) and flood risk management infrastructure (such as defences) are not represented.

The nationally produced surface water flood mapping does not consider the effect of pumping stations in catchments with pumped drainage. No allowance is made for tide locking, high tidal or fluvial levels where sewers cannot discharge into rivers or the sea."

5.9 The strategic flood risk for the South East Lincolnshire confirms that the flood risk for the site is Low. The surface water flood data has not been produced to determine the flood levels at individual properties. This data does not contain the climate change allowances for depth levels. Therefore, the Design flood level given above is an assumption. The new development may have greater or lower surface water flood depths.

5.10 Based on Environment Agency and the Strategic flood risk assessment's surface water mapping, together with the presence of surface water drainage systems at the site and surrounding area, it is concluded that the site is at Low risk of flooding from surface water sources. The depth of water is potentially between 300mm and 900mm. For this assessment, a depth of water of 0.6m with a climate change allowance of 0.15m has been taken as the most appropriate depth to the site. The average ground level at the site is 3.5m AOD. The surface water flood level on this site could be in the region of 3.66m AOD.

Flooding from drainage systems in adjacent areas

- 5.11 The council records have been reviewed. The flooding from drainage incidents maps were not found in the Strategic Flood Risk Assessment. Therefore, for the purpose of this report, it has been assumed that the risk of flooding from drainage systems is low.

Reservoirs Risks

- 5.12 The Reservoir Flood Map (RFM) produced by the Environment Agency do not show the risk to individual properties of dam breach flooding. The maps do not indicate or relate to any particular probability of dam breach flooding. The maps were prepared for emergency planning purposes. They can be used to help reservoir owners produce on-site plans, and the Local Resilience Forum produce off-site plans and to prioritise areas for evacuation/early warning in the event of a potential dam failure. The RFM shows that the development could be outside of the possible dam breach flooding path. See Appendix C.

Groundwater flood risk

- 5.13 The British Geological Survey's flood risk susceptibility maps show that the development has limited susceptibility to ground water flooding. The risk of groundwater flood to the site is considered very low. Refer to appendix C for record drawings.

Critical Drainage Areas

- 5.14 The Strategic Flood Risk Assessment was reviewed as part of this assessment. However, it does not show the critical drainage areas within the council. For this report, it has been assumed that the site is outside of a notified critical drainage area.

- 6.1 The Flood hazard assessment has demonstrated that the site is:
- In Flood Zone 3, based on the Planning Flood Risk Map
 - In Flood Zone 3, based on the Product 4 provided by the EA
 - At Low risk of surface flooding
 - At very low risk of groundwater flooding
 - Outside of a critical drainage area
 - Outside of an area with sewer flooding
- 6.2 Under the NPPF it is necessary to demonstrate that, for any new development on the site, it is possible to provide an adequate level of flood protection for personnel working or living at the development.

Design Flood Level

- 6.3 The design flood level is the maximum estimated water level during the design storm event including an allowance for climate change in line with current best practice and the national planning policy guidance.
- 6.4 The Design Flood Level for this development has been determined by evaluating the levels from the Pluvial/Sea, Surface Water and Groundwater flood levels.
- 6.5 For this site, the Design Flood Level is 4.5m AOD. This is the highest level and corresponds to the River/Sea Flood Level.

Flood Protection

- 6.6 The National Planning Guidance standing advice and Environment Agency, states that where possible, flood avoidance is provided by establishing the development's finished floor level 0.3m above the Design Flood Level. The finished floor should be 4.8m AOD. It would involve a height differential of 1.3m. This is the distance between the average external level (3.5m AOD) and the potential Finished Floor Level.
- 6.7 It is possible to achieve this FFL. As the foundations and other parts of the building are in contact with water, it is proposed that the following flood mitigation is provided.

- 6.8 The flood mitigation strategies for the development has been based on the CLG 2007 Improving the Flood Performance of New Buildings. See the figure below for the strategy highlighted in red. The strategy is based on the water level within the proximity to the building.

Figure 1: Rationale for flood resilient and/or resistant design strategies.

	Design water depth*	Approach	Mitigation measures
Resistance/Resilience**	Design water depth above 0.6m	Allow water through property to avoid risk of structural damage. Attempt to keep water out for low depths of flooding 'Water Entry Strategy'***	- Materials with low permeability up to 0.3m - Accept water passage through building at higher water depths - Design to drain water away after flooding - Access to all spaces to permit drying and cleaning
	Design water depth from 0.3m to 0.6m	Attempt to keep water out, in full or in part, depending on structural assessment. If structural concerns exist follow approach above***	- Materials with low permeability to at least 0.3m - Flood resilient materials and designs - Access to all spaces to permit drying and cleaning
	Design water depth up to 0.3m	Attempt to keep water out 'Water Exclusion Strategy'	Materials and constructions with low permeability
Avoidance		Remove building/development from flood hazard	Land raising, landscaping, raised thresholds

Notes:

* Design water depth should be based on assessment of all flood types that can impact on the building

** Resistance/resilience measures can be used in conjunction with Avoidance measures to minimise overall flood risk

*** In all cases the 'water exclusion strategy' can be followed for flood water depths up to 0.3m

- 6.9 The design water depth for this site is 1m. The development should utilise building materials that are suitable for a 'water exclusion strategy'. Materials classified as "Good" (highlighted in red) in the Figure below shall be used for new construction upto level of 5.1m AOD.

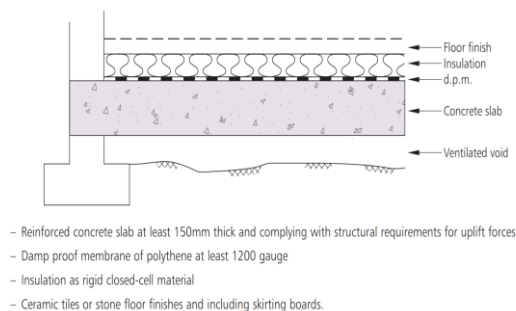
Figure 2: Flood resilience characteristics of building materials (based on laboratory testing)

Material	Resilience characteristics*		
	Water penetration	Drying ability	Retention of pre-flood dimensions, integrity
Bricks			
Engineering bricks (Classes A and B)	Good	Good	Good
Facing bricks (pressed)	Medium	Medium	Good
Facing bricks (handmade)	Poor	Poor	Poor
Blocks			
Concrete (3.5N, 7N)	Poor	Medium	Good
Aircrete	Medium	Poor	Good
Timber board			
OSB2, 11mm thick	Medium	Poor	Poor
OSB3, 18mm thick	Medium	Poor	Poor
Gypsum plasterboard			
Gypsum Plasterboard, 9mm thick	Poor	Not Assessed	Poor
Mortars			
Below d.p.c. 1:3(cement:sand)	Good	Good	Good
Above d.p.c. 1:6(cement:sand)	Good	Good	Good

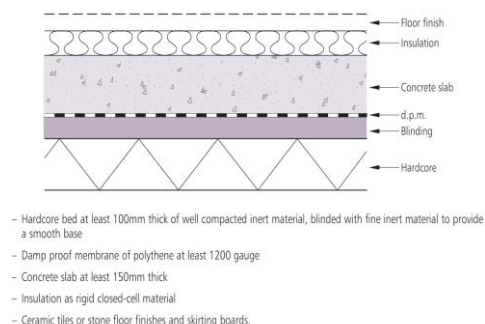
* Resilience characteristics are related to the testing carried out and exclude aspects such as ability to withstand freeze/thaw cycles, cleanability and mould growth

- 6.10 New services and fittings (communications wiring, heating systems, electrical services, water, electricity and gas meters) should be placed at above the level of 5.1m AOD. All service entries should be sealed (e.g. with expanding foam or similar closed cell material).
- 6.11 Closed-cell insulation should be used for pipes. Sealed PVC external framed doors or good fit and sealed wooden frames should be used.
- 6.12 Hollow core timber internal doors should not be used unless sufficient flood warning is given, butt hinges, can be used to allow internal doors to be easily removed and stored.
- 6.13 Suspended concrete floor slab at least 150mm thick is the preferred option. Beam and Block slabs with geomembrane and 75mm min screed can also be used. There should be a minimum space of 150mm ventilated void between the ground level and the bottom of the floor slab. Damp proof membranes should be included in the design. Floor insulation should be of the closed-cell type. Under floor services using ferrous materials should be avoided. Ceramic/concrete-based floor tiles, sitting on a bed of sand, cement render and water resistant grout can be used. Ground-bearing slabs are also an option. See figures below.

Suspended Concrete Slab detail



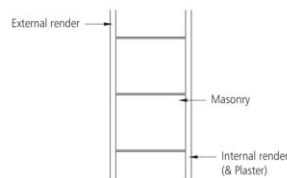
Ground bearing Concrete Slab detail



6.14 Concrete blocks used in foundations should be sealed with an impermeable material or encased in concrete to prevent water movement from the ground to the wall construction. In new walls use extended periscope subfloor ventilators or fit removable airbrick covers; fix plasterboard sheets horizontally rather than vertically, or split sheets mid-height with a dado rail, to reduce the extent of replacement; specify lime- or cement-based renovating plasters or renders rather than gypsum-based, with water-resistant paint finishes. The use of water-proof, water-resistant or micro-porous surface coatings on masonry should be avoided as they can inhibit the drying-out of the building fabric.

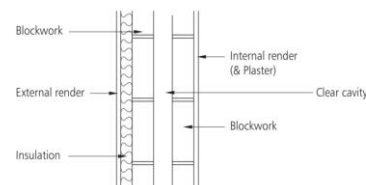
6.15 Good quality facing bricks or external renders with water-repellent properties can be used for the external face. See the examples below of external walls that can be used.

Solid External Wall



- External cement based render, preferably with lime content. Composition depends on masonry. The following mixes have good resilient properties:
 - 1 cement : 6 sand on bricks;
 - 1 cement : 4 sand: 1/2 lime on concrete blockwork or bricks;
 - 1 cement : 6 sand: 1 lime on Aircrete blocks.
 - Masonry with minimum thickness of 300mm (thin mortar joint construction using Aircrete blocks is effective as demonstrated in laboratory tests) or alternatively reinforced concrete wall
 - Internal cement-based render, preferably with lime content. Composition depends on masonry; the following mix is effective for flood resilience:
 - 1 cement : 6 sand: 1 lime on Aircrete.
- Apply external and internal renders, following good practice guidance, ensuring minimum total thickness of 20mm and at least two coats.
- Use external insulation in preference to internal insulation.

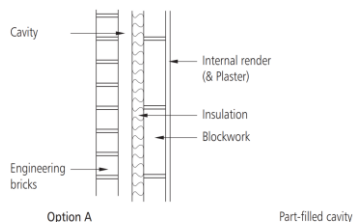
Cavity External Walls – Clear cavity



Clear cavity

- External cement based render, preferably with lime content. Composition depends on masonry; the following mixes are effective for flood resilience:
 - 1 cement : 4 sand: 1/2 lime on concrete blockwork (or bricks);
 - 1 cement : 6 sand: 1 lime on Aircrete.
- Apply render following good practice guidance, ensuring minimum total thickness of 20mm and two coats.
- Internal cement based render, preferably with lime content. Composition depends on masonry. The following mix works well:
 - 1 cement : 6 sand: 1 lime on Aircrete.
 - Stainless steel wall ties should be used to minimise corrosion and consequent staining.

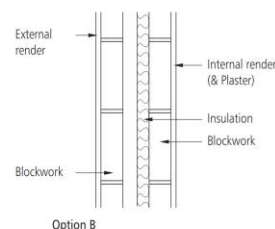
Cavity External Walls- Part fill Option A



Part-filled cavity – Option A

- External face consisting of engineering bricks up to required level for flood protection (up to 0.6m maximum above floor level plus one course). Other external facing materials can be used above this level, but ensure interface is watertight.
- Rigid insulation.
- Internal face consisting of blocks.
- Internal cement based render, preferably with lime content. Composition depends on masonry; the following mix is effective:
 - 1 cement : 6 sand: 1 lime on Aircrete.
- Ensure stainless steel wall ties are used to minimise corrosion and consequent staining.
- Sacrificial plasterboard can be used, but it needs to be removed between ground floor and flood level. The board should be fitted horizontally to make removal easier. In some cases a dado rail can be used to cover the joints.

Cavity External Walls- Part fill Option B



Part-filled cavity – Option B

- External cement based render, preferably with lime content. Composition depends on masonry; the following mixes are effective:
 - 1 cement : 4 sand: 1/2 lime on concrete blockwork
 - 1 cement : 6 sand: 1 lime on Aircrete.
- External face consisting of blocks.
- Rigid insulation.
- Internal face consisting of blocks.
- Internal cement based render, preferably with lime content. Composition depends on masonry; the following mix is effective for flood resilience:
 - 1 cement : 6 sand: 1 lime on Aircrete.
- Ensure stainless steel wall ties are used to minimise corrosion and consequent staining.

7.1 The NPPF specifically stipulates that consideration should be given to potential off-site flood impacts of any proposed development. These off-site impacts are in relation to the following:

- Surface water management
- Flood flow conveyance, storage and climate change

Surface Water Management

- 7.2 The surface water run-off will be disposed of using SuDS techniques. The aim is to provide a sustainable design that accommodates the proposed attenuation volume and replicates the existing drainage regime using the SuDS hierarchy, is shown in the figure below.
- 7.3 The Landis Top Soil classification is naturally wet. The SuDS techniques highlighted in red below could be used on-site. This assessment is based on the LANDIS Top Soil infiltration, ground conditions and available potential discharge points.

The SuDS Hierarchy (Source:EA Thames region, SuDS a practical guide)

Most Sustainable	SuDS Technique	Flood Reduction	Pollution Reduction	Landscape & Wildlife Benefit
	Living Roofs	X	X	X
	Basins and Ponds			
	- Constructed wetlands			
	- Balancing Ponds	X	X	X
	- Detention basins			
	- Retention Ponds			
	Filter strips and Swales	X	X	X
	Infiltration Devices			
	- Soakaways	X	X	X
	- Infiltration trenches and basins			
	Permeable Surfaces and Filter Drains			
	- Gravelled areas	X	X	
	- Solid Paving Blocks			
	- Porous Pavements			
	Tanked Systems			
Least Sustainable	- Over-sized pipes/tanks	X		
	- Storms cells			

- 7.4 With no increase in the rate of surface water discharge from the site, compared to the site in its current configuration, the proposed development would have no adverse impact on surface water flood risk at the site or surrounding area. The SuDS should be designed at the detailed project stage.

Flood Flow conveyance and storage

- 7.5 In tidal flooding environments, the volume of available on-shore flood storage is usually not a material consideration as the flood water volume is too large to be attenuated.
- 7.6 The proposed development will have no effect on flood flow conveyance through the site or surrounding area in relation to either defence overtopping or a defence breach. Similarly, although the development would reduce the volume of flood storage available, as the flooding mechanism is tidal, there will be no impact on flood risk in the surrounding area.

- 8.1 This flood risk assessment has identified the potential flooding mechanisms that could affect the site. As part of this, the following residual risks have been evaluated.

Public safety and Site Access

- 8.2 This assessment has demonstrated that the proposed development will have no adverse impact on flood risk in the area surrounding the site. Available evidence indicates that the development would not change surface water generation. Therefore, there is no basis to indicate that, with respect to flood risk, the proposed development would adversely impact public safety.
- 8.3 It will be necessary to ensure that all building users are fully informed of procedures to be implemented during the threat of imminent flooding.

Flood Warning and evacuation

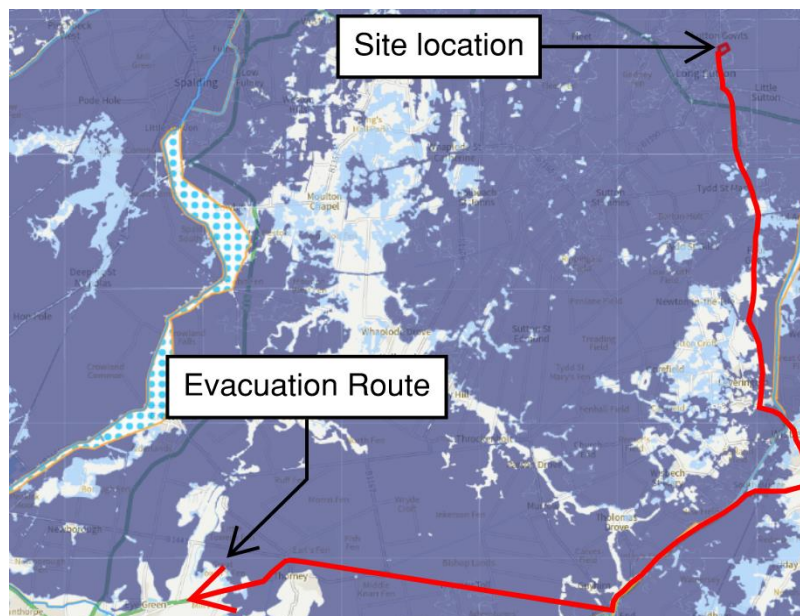
- 8.4 The site is located within an area covered by the Environment Agency Flood Alert service. It is recommended that the proposed development is registered with this service to receive early warning of imminent flood hazards.
- 8.6 The occupants of the site are encouraged to sign up for the alerts. They should use these to form an appropriate Flood Management and Evacuation Plan tailored to the use of the site before the site occupation. Table 4 below shows the actions that will be taken for each flood warning.
- 8.7 Action to be taken in the event of an Alarm being Raised or a Flood Warning Received:
- Raise the alarm and evacuate the site following the established Fire Drill procedures. The main assembly is as per the main house fire drill assembly point.
 - Contact Emergency Fire Services (999) if necessary and Environment Agency Floodline: (0845 988 1188) if the event is unexpected.
 - If safe to do so, locate and turn off critical services, e.g. water, gas & electricity.
 - Follow the routes below to evacuate the site altogether.

Actions that will be taken for each flood warning

Warning	Message	Timing	Action
 FLOOD ALERT	Flooding is possible. Be prepared.	2 hours to 2 days in advance of flooding.	- Be prepared for flooding. - Prepare a flood kit.
 FLOOD WARNING	Flooding is expected. Immediate action required.	Half an hour to 1 day in advance of flooding.	- Act now to protect your property. - Block doors with flood boards or sandbags and cover airbricks and other ventilation holes. - Move pets and valuables to a safe place. - Keep a flood kit ready. - Move any critical equipment and information to a safe location
 SEVERE FLOOD WARNING	Severe flooding. Danger to life.	When flooding poses a significant threat to life and different actions are required.	- Be ready should you need to evacuate from the property. - Co-operate with the emergency services and call 999 if you are in immediate danger.
Warning Removed	No further flooding is currently expected for your area.	Issued when a flood warning is no longer in force.	- Flood water may still be around and could be contaminated. - If you've been flooded, ring your buildings and contents insurance company as soon as possible.

- 8.8 Safe egress is achievable by following Little London up to Wisbech Road, then follow A1101 and A47, which is shown to be beyond the extent of flooding. See figure below for details.

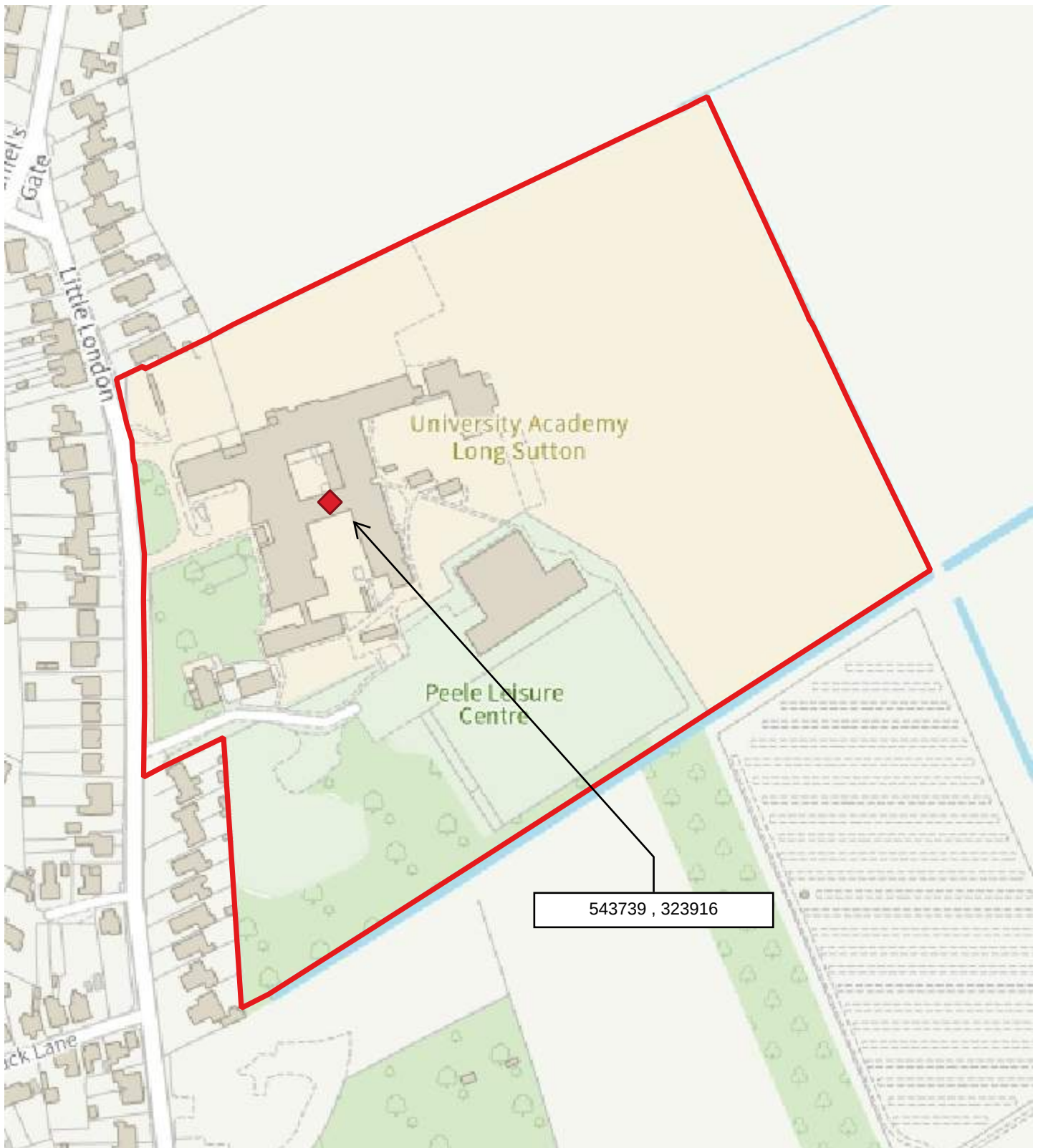
Evacuation Route



- 9.1 It is concluded that subject to the proposed mitigation measures, the site can be developed in accordance with the provisions of the NPPF and the requirements of the Environment Agency and the local planning authority.
- 9.2 This report demonstrates that the proposal will be safe, in terms of flood risk, for its design life and will not increase the flood risk elsewhere.
- 9.3 It is proposed that a formal Flood Warning and Emergency Response Plan is developed for the proposed development to communicate flood emergency response procedures to all the occupants of the site.

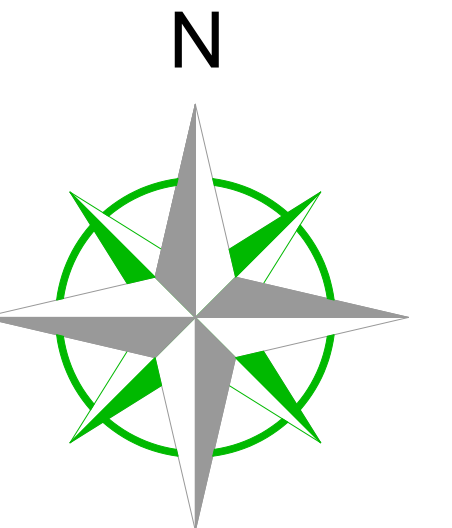


Appendix A





Appendix B



Station Information:

Station	Easting (m)	Northing (m)	Level (m)
GH1	543639.863	323932.253	4.207
GH2	543651.790	323811.222	4.333
GH3	543789.704	324005.930	3.513
GH4	543790.520	323915.420	3.537
GH5	543785.018	323826.600	3.539
GH6	543710.090	323813.179	3.559
GH7	543681.761	323894.721	3.544

OS Note:

The survey has been oriented to the Ordnance Survey (OS) National Grid OSG36(15) via Global Navigation Satellite Systems (GNSS) and the O.S. Active Network (OS Net).

A true OSG36 coordinate has been established near to the site centre via a transformation using the OSTN15GB & OSGM15GB transformation models.

The survey has been correlated to this point and a further one or more OSG36 (15) points established to create a true O.S. bearing for angle orientation.

No scale factor has been applied to the survey therefore the coordinates shown are arbitrary & not true O.S. Coordinates which have a scale factor applied.
Please refer to Survey Station Table to enable establishment of the on-site grid and datum.

Legend:

[illegible]

Rev	Date	Description	Drawn	Q. Re
-----	------	-------------	-------	-------



- Topographical Surveys
- Site Engineering
- Utility / CCTV Surveys
- Measured Building Surveys
- 3D Laser Scanning
- Revit & BIM Models

Rowan House
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Little Eaton
Derby
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Tel (01332) 830044 Fax (01332) 830055
admin@greenhatch-group.co.uk
www.greenhatch-group.co.uk

St Albans Unit B, The Courtyard Alban Park St Albans Hertfordshire AL4 0LA t. (01727) 854481	Newcastle 24 Riverside Studios Armistyst Road Newcastle Bus, Park Newcastle-U-Tyne NE4 7YL t. (01912) 736391	London 27, Cornwall Terrace New Regents Park London NW1 5LL t. (02072) 241806
--	--	--

CLIENT

Mott MacDonald

PROJECT

**UniversityAcademy LongSutton,
84 Little London, Long Sutton,
Spalding, Lincolnshire**

TITLE	Topographical Survey
-------	-------------------------

SCALE A0@ 1: 500	DATE 10.10.2022
DRAWN LP	QUALITY REF GH15117

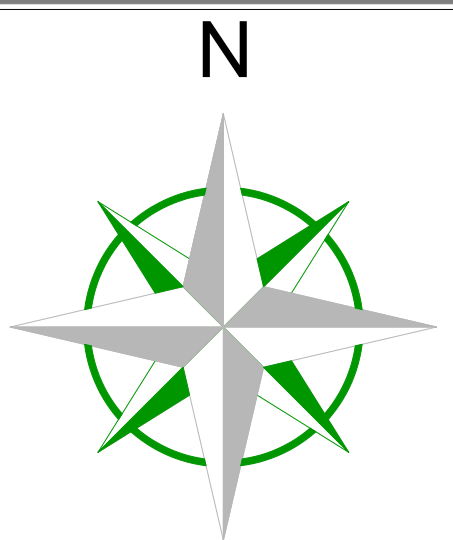
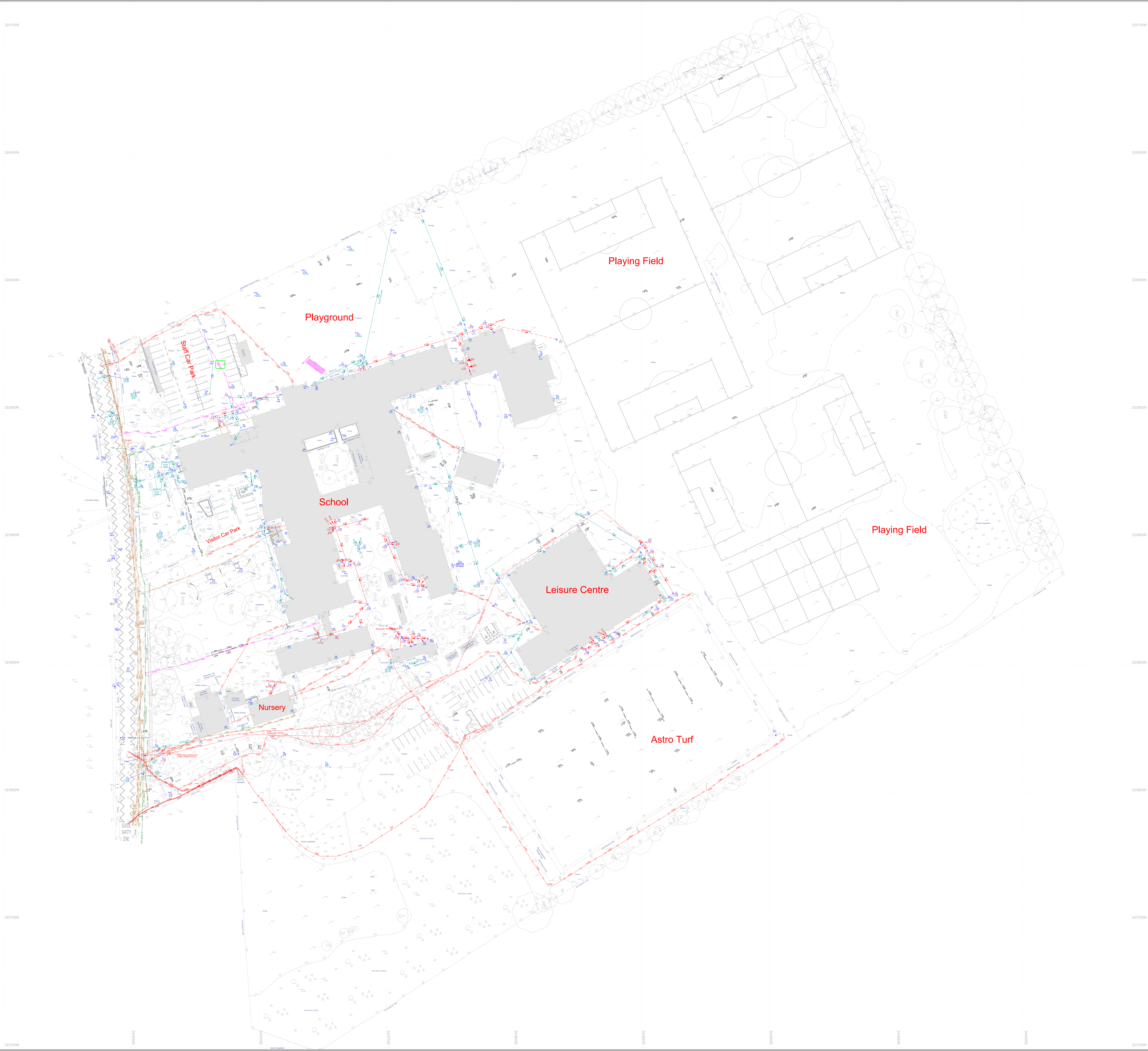
Level datum	See note
Grid orientation	See note

Drawing No.	Rev.
45301_T	0

Comments
This plan should only be used for its original purpose. Greenhatch Group accepts no responsibility for this plan if supplied to any party other than the original client.

Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

Notes



NOTES

1. All survey points and the 10m grid lines are shown on this plan. All other points shown are for reference only.
2. All survey points are shown on this plan. All other points shown are for reference only.
3. All survey points are shown on this plan. All other points shown are for reference only.
4. All survey points are shown on this plan. All other points shown are for reference only.
5. All survey points are shown on this plan. All other points shown are for reference only.
6. All survey points are shown on this plan. All other points shown are for reference only.
7. All survey points are shown on this plan. All other points shown are for reference only.
8. All survey points are shown on this plan. All other points shown are for reference only.
9. All survey points are shown on this plan. All other points shown are for reference only.
10. All survey points are shown on this plan. All other points shown are for reference only.

UTILITY LINETYPES

100V Cable	100V Cable	100V Cable	100V Cable	100V Cable	100V Cable
100V Cable	100V Cable	100V Cable	100V Cable	100V Cable	100V Cable
100V Cable	100V Cable	100V Cable	100V Cable	100V Cable	100V Cable
100V Cable	100V Cable	100V Cable	100V Cable	100V Cable	100V Cable
100V Cable	100V Cable	100V Cable	100V Cable	100V Cable	100V Cable
100V Cable	100V Cable	100V Cable	100V Cable	100V Cable	100V Cable
100V Cable	100V Cable	100V Cable	100V Cable	100V Cable	100V Cable
100V Cable	100V Cable	100V Cable	100V Cable	100V Cable	100V Cable
100V Cable	100V Cable	100V Cable	100V Cable	100V Cable	100V Cable
100V Cable	100V Cable	100V Cable	100V Cable	100V Cable	100V Cable

UTILITY SURVEY INFORMATION

Utility	Utility	Utility	Utility	Utility	Utility
Utility	Utility	Utility	Utility	Utility	Utility
Utility	Utility	Utility	Utility	Utility	Utility
Utility	Utility	Utility	Utility	Utility	Utility
Utility	Utility	Utility	Utility	Utility	Utility
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Utility	Utility	Utility	Utility	Utility	Utility
Utility	Utility	Utility	Utility	Utility	Utility
Utility	Utility	Utility	Utility	Utility	Utility
Utility	Utility	Utility	Utility	Utility	Utility

LEGEND

Symbol	Symbol	Symbol	Symbol	Symbol	Symbol
Symbol	Symbol	Symbol	Symbol	Symbol	Symbol
Symbol	Symbol	Symbol	Symbol	Symbol	Symbol
Symbol	Symbol	Symbol	Symbol	Symbol	Symbol
Symbol	Symbol	Symbol	Symbol	Symbol	Symbol
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Symbol	Symbol	Symbol	Symbol	Symbol	Symbol
Symbol	Symbol	Symbol	Symbol	Symbol	Symbol

PAS 100 1000 LEVEL 0 SURVEY

DATE	DATE	DATE
DATE	DATE	DATE
DATE	DATE	DATE
DATE	DATE	DATE
DATE	DATE	DATE
DATE	DATE	DATE
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DATE	DATE	DATE
DATE	DATE	DATE

DISCLAIMER

Whilst every effort has been taken in the preparation of this drawing, the original land marks/apparatus configuration may have been altered since the survey/drawing was produced. The user shall make further enquiries and investigations to satisfy himself as to the accuracy of the drawing and position of the apparatus. The exact positions of the apparatus should be verified by the use of suitable detection devices and not relying on the location of apparatus as shown on the drawing. All apparatus shall be located as the user provides otherwise, the user shall be responsible for ensuring that the information on the location of apparatus is provided to the persons (either direct labour or contractors) working in proximity to the apparatus.

Rev	Date	Description	Drawn	Q	Ref
-----	------	-------------	-------	---	-----

greenhatch group

- Topographical Surveys
- Site Engineering
- Utility / CCTV Surveys
- Measured Building Surveys
- 3D Laser Scanning
- Revit & BIM Models

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--	--	--

CLIENT

Mott MacDonald

PROJECT

**UniversityAcademy LongSutton,
84 Little London, Long Sutton,
Spalding, Lincolnshire**

TITLE

**Utility
Survey**

SCALE	DATE
A0@ 1: 500	28/10/22
DRAWN	QUALITY REF
MA	GH15243
Level datum	See note
Grid orientation	See note
Job number	45301
Drawing No.	45301_T_UG
Rev.	0

Comments

This plan should only be used for its original purpose. Greenhatch Group accepts no responsibility for this plan if supplied to any party other than the original client.

All dimensions should be checked on site prior to design and construction.

Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

Notes:

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Project: Feasibility
UA Long Sutton

Location:
84 Little London Long Sutton PE12 9LF

Drawing:
Existing External (BB103/104) Areas Site Plan

M
MOTT
MACDONALD

**LYALL
BILLS
& YOUNG**

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London EC2A 4NW
+44 (0) 20 7253 1630
www.lbyarchitects.com

Scale
1:1250 @A3

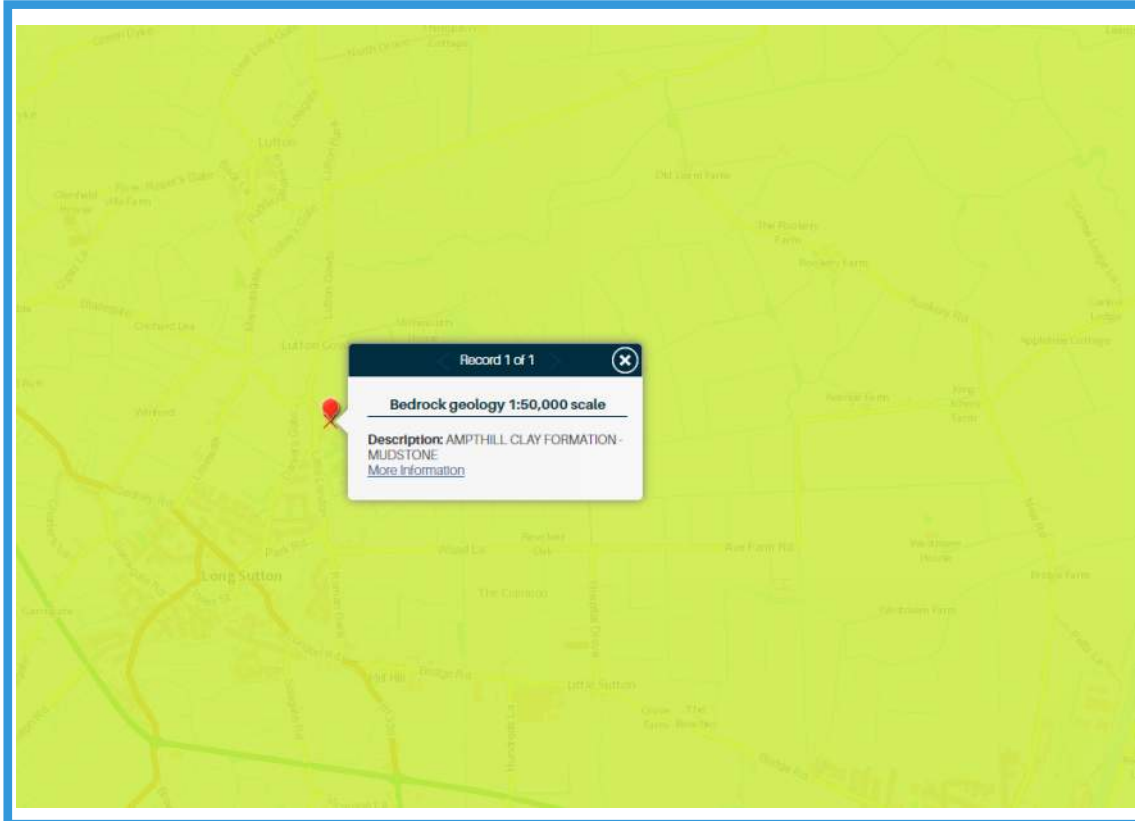
Drawing Number - Revision:
SRP1155-LBY-ZZ-00-D-A-6000-P01



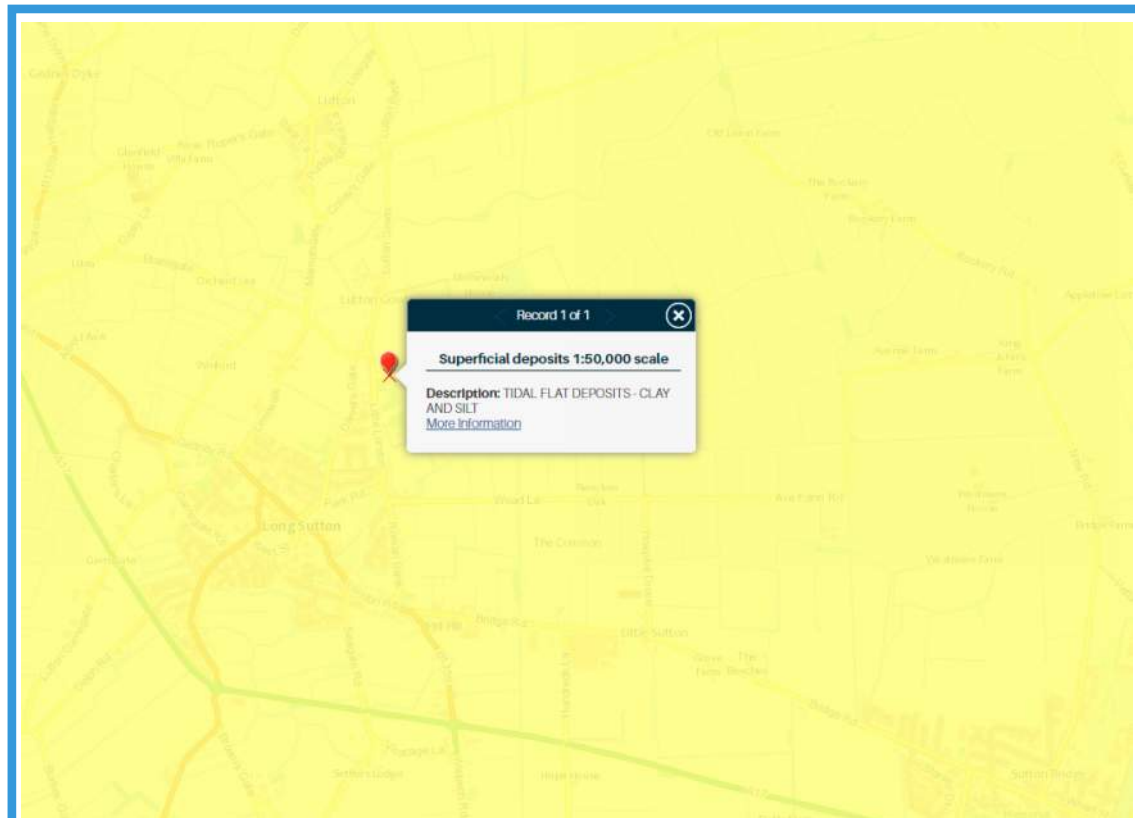
Appendix C

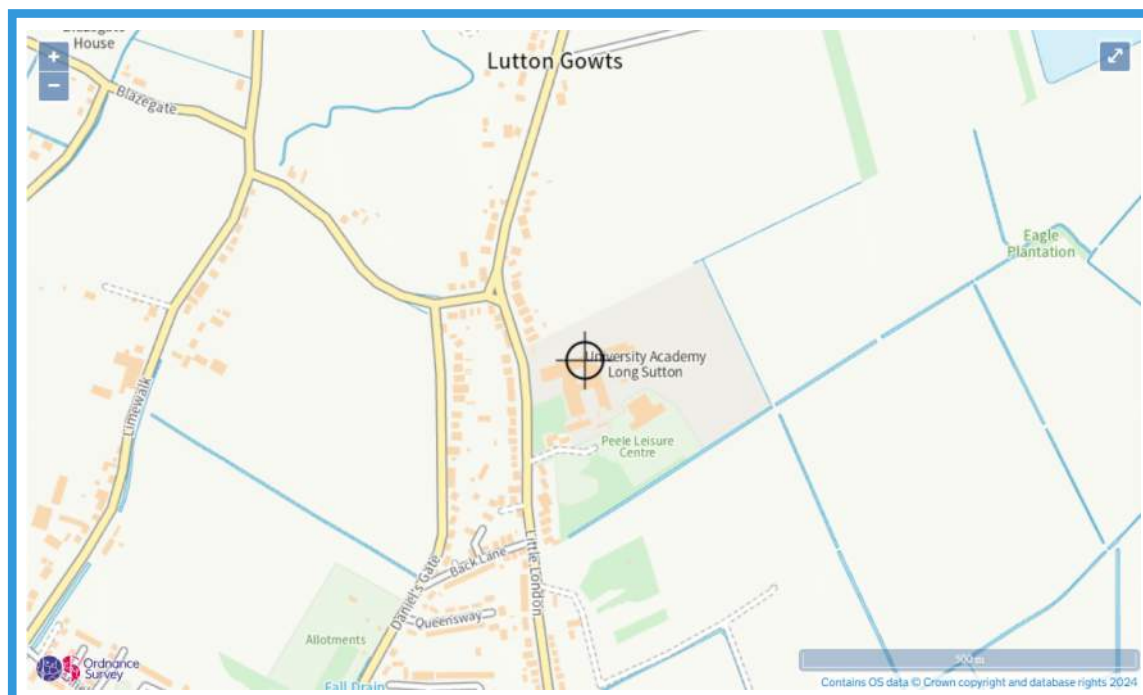
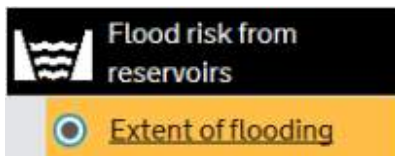
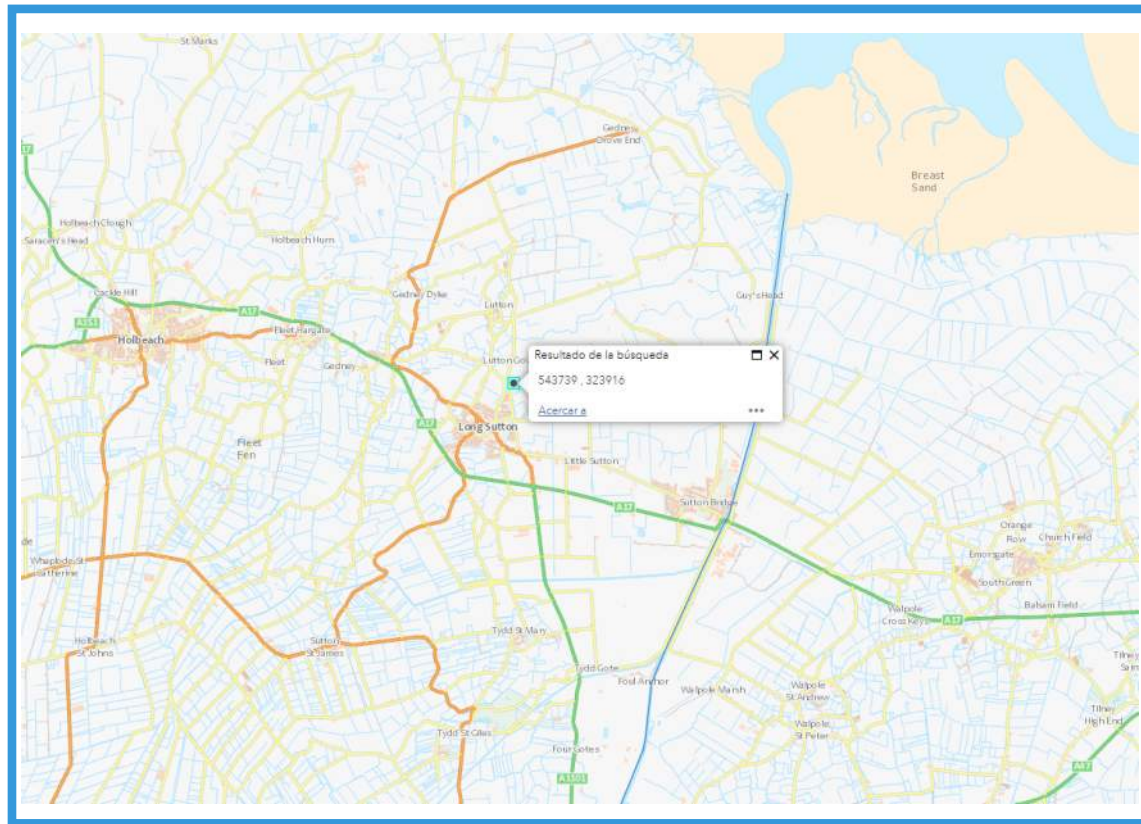


GEOLOGY - BEDROCK - AMPHILL CLAY FORMATION - MUDSTONE



GEOLOGY - SUPERFICIAL DEPOSITS - TIDAL FLAT DEPOSITS - CLAY AND SILT





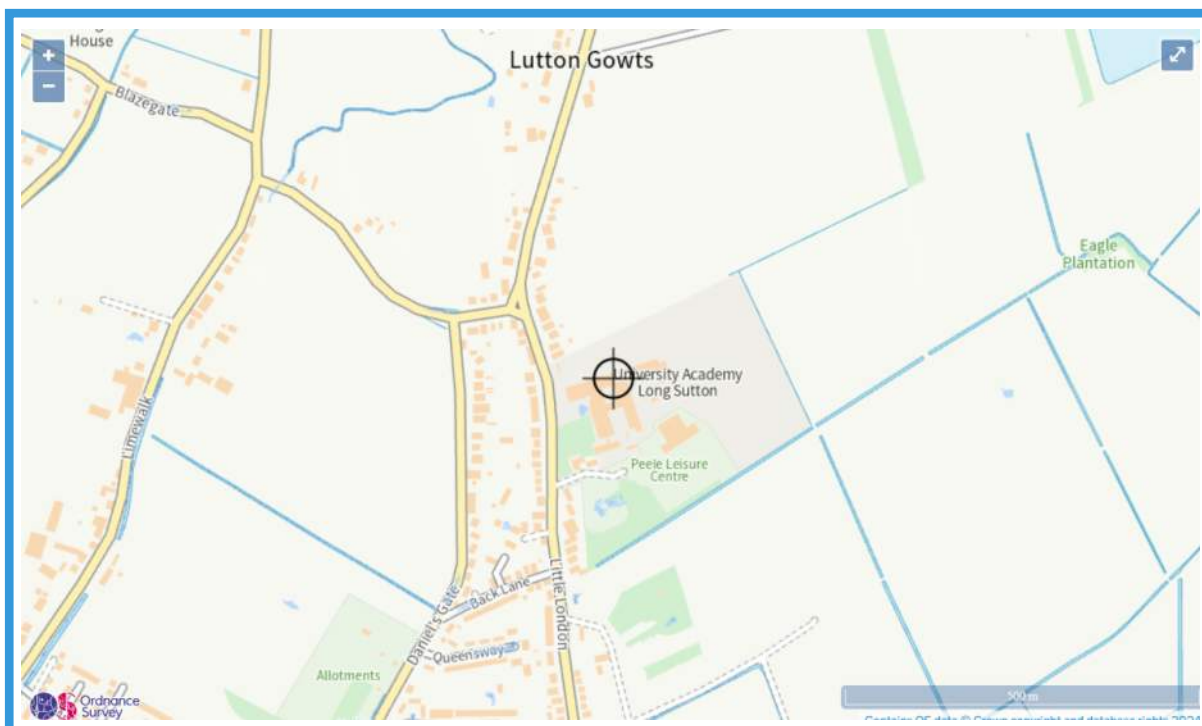
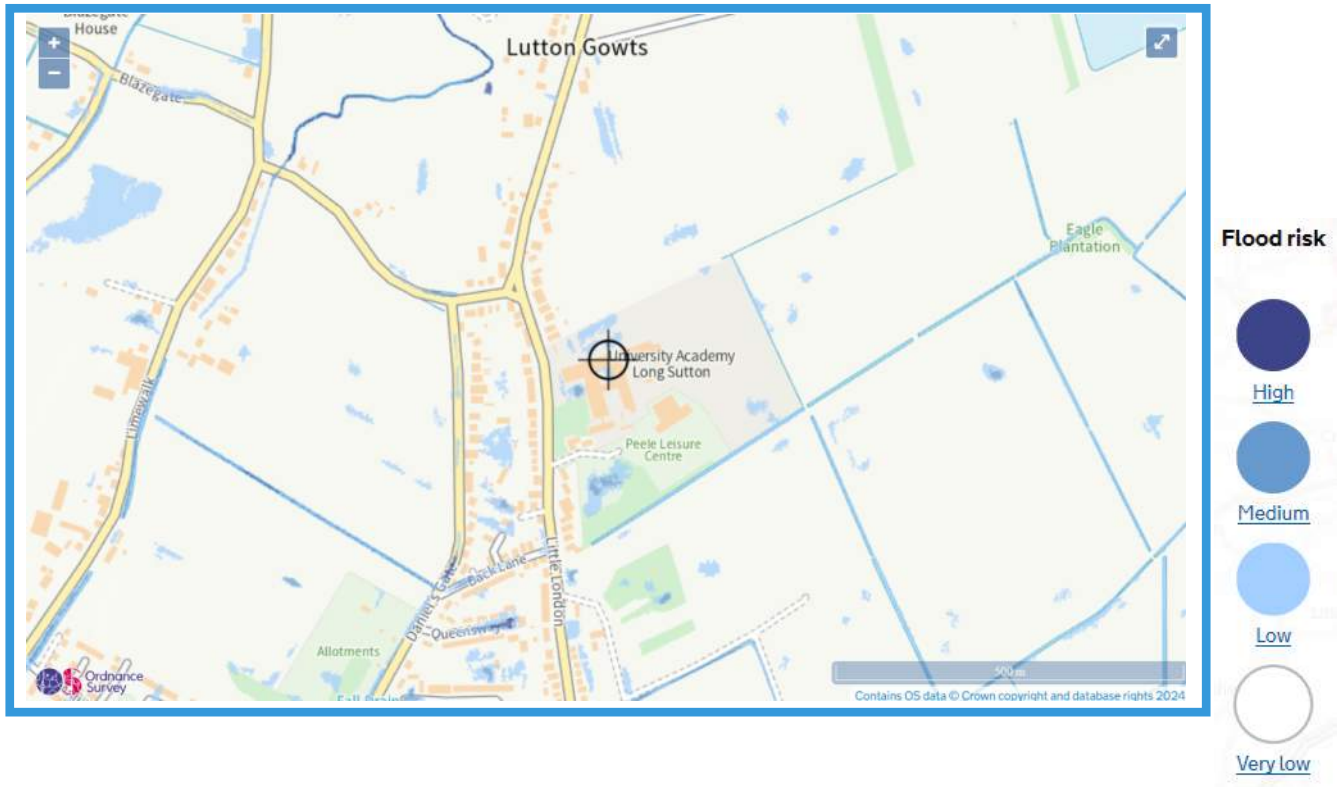
 when river levels are normal
  when there is also flooding from rivers

SITE SURFACE WATER FLOOD RISK


Flood risk from surface water

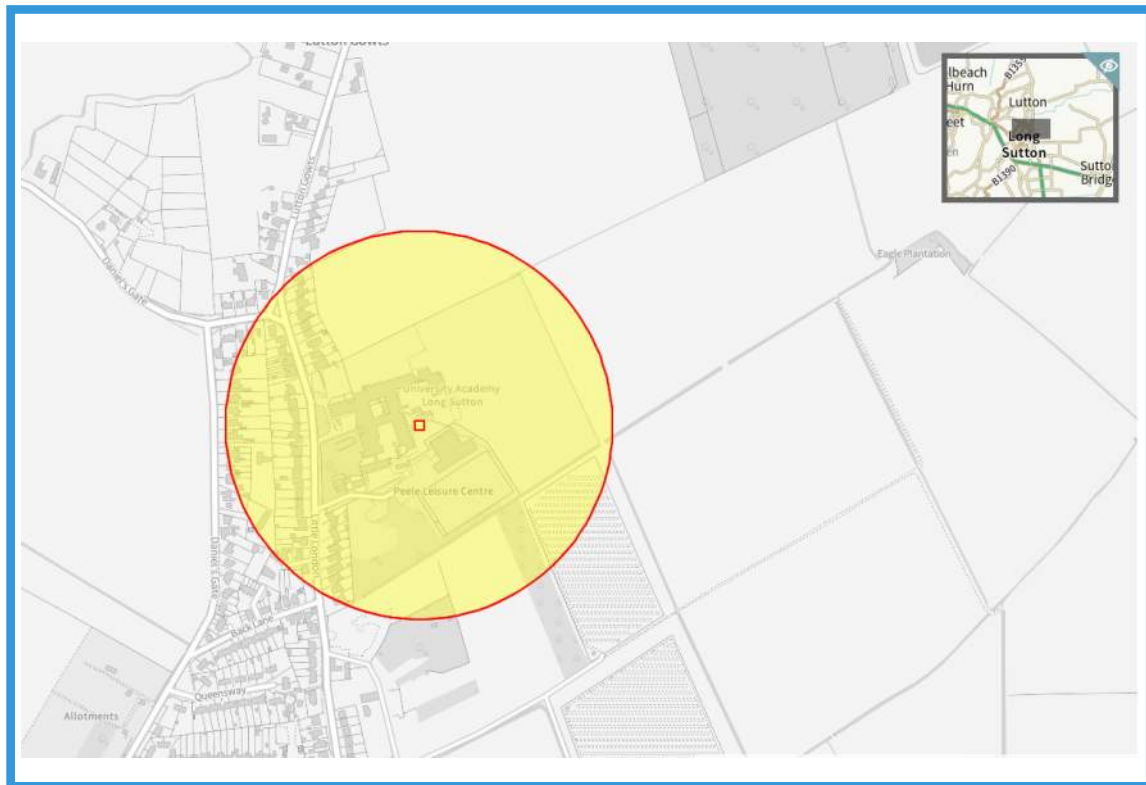

Extent of flooding

High risk means a chance of flooding greater than 3.3% (1:30)
 Medium risk means a chance of flooding of btw 1% (1:100) and 3.3%
 Low risk means a chance of flooding of btw 0.1% (1:1000) and 1%
 Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding



Over 900mm 300 to 900mm Below 300mm

MAGIC RESULTS



Site Check Results

Site Check Report Report generated on Fri Feb 09 2024

You selected the location: Centroid Grid Ref: TF43782390

The following features have been found in your search area:

Aquifer Designation Map (Bedrock) (England)

Typology

Unproductive

Aquifer Designation Map (Superficial Drift) (England)

Typology

Unproductive

Source Protection Zones merged (England)

No Features found

OK

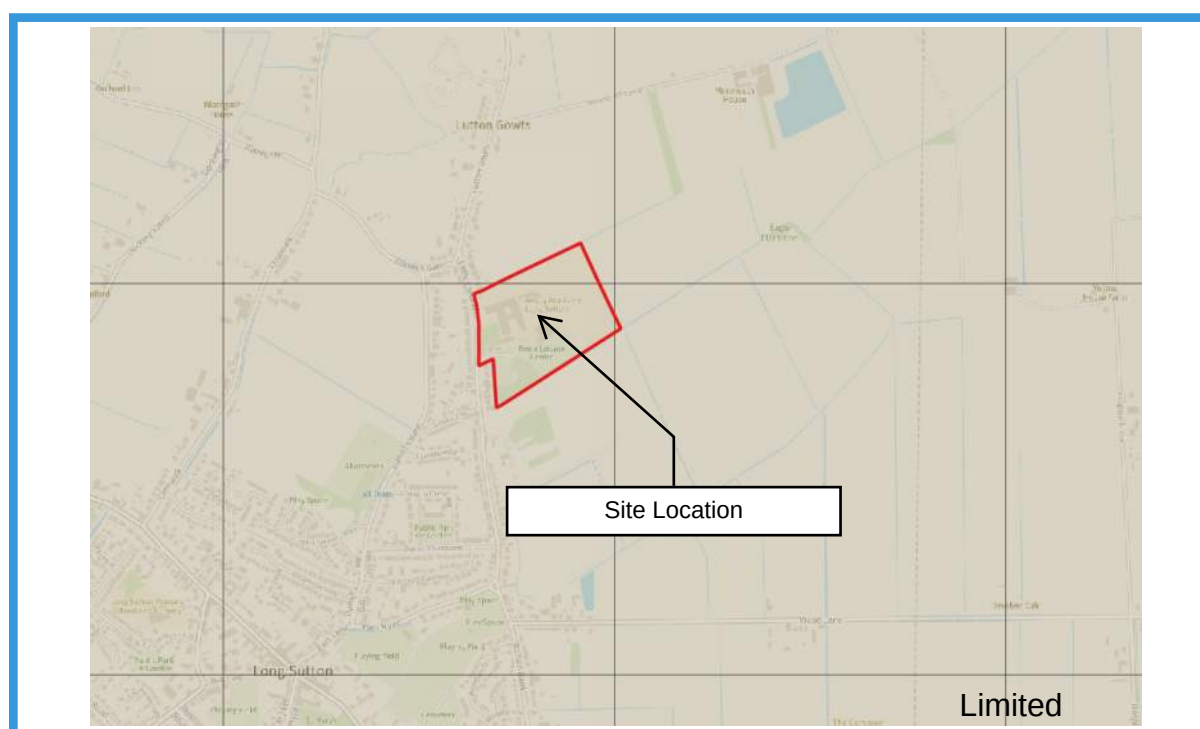
Cancel

Export to CSV

Print



GROUND WATER FLOOD RISK



HISTORIC FLOOD MAP



 Historic Flood Outline

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
543828/323892

Created
9 Feb 2024 11:02

**Your selected location is in flood zone 3
– an area with a high probability of flooding.**

This means:

- you may need to complete a flood risk assessment for development in this area
- you should ask the Environment Agency about the level of flood protection at your location and request a Flood Defence Breach Hazard Map (You can email the Environment Agency at: enquiries@environment-agency.gov.uk)
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (find out more at www.gov.uk/guidance/flood-risk-assessment-standing-advice)

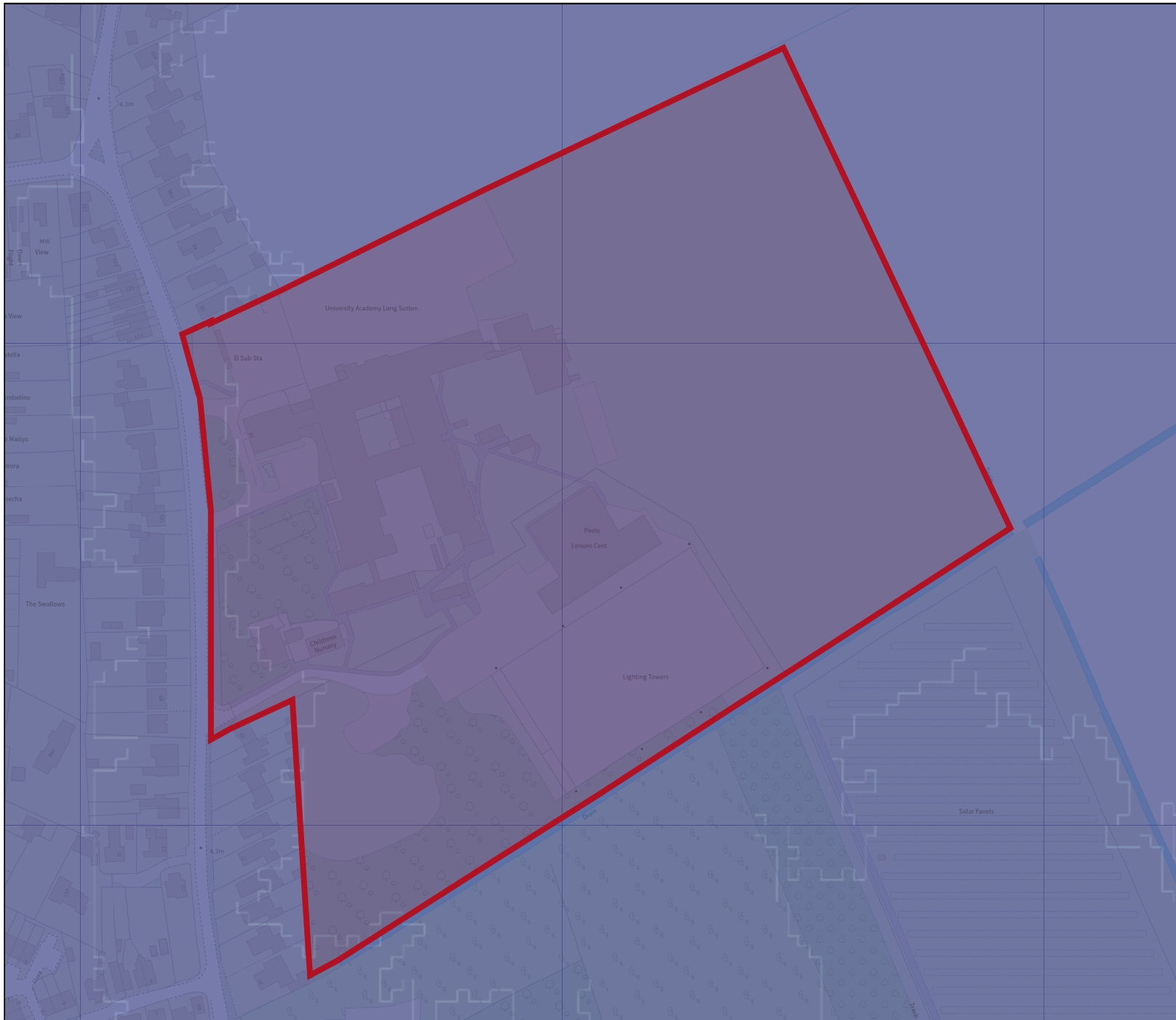
Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2022 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
543828/323892

Scale
1:2500

Created
9 Feb 2024 11:02

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area


0 20 40 60m

Appendix D

Mario Mora
mario@rida-reports.co.uk

Our ref: CCN-2024-346483

Date: 01/03/2024

Dear Mario,

Provision of Flood Risk Information for Little London, Long Sutton.

Thank you for your request for our flood risk information for the above site. The information is set out below and attached. It is important you read any contextual notes on the maps provided.

If you are preparing a Flood Risk Assessment (FRA) for this site, please note this information may not be sufficient by itself to produce an adequate FRA to demonstrate the development is safe over its lifetime. Additional information may be required to carry out an appropriate assessment of all risk, such as consequence of a breach in defences.

We aim to review our information on a regular basis, so if you are using this data more than twelve months from the date of this letter, please contact us again to check it is still valid.

Please read the letter in full as the information covered has been updated in **June 2023**.

1. Flood Map for Planning

The attached map includes the current Flood Map for Planning for your area. The map indicates the area at risk of flooding, **assuming no flood defences exist**, for a flood with a 0.5% chance of occurring in any year for flooding from the sea, or a 1% chance of occurring for fluvial (river) flooding. It also shows the extent of the Extreme Flood Outline which represents the extent of a flood with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater.

In some locations, such as around the fens and the large coastal floodplains, showing the area at risk of flooding assuming no defences may give a slightly misleading picture in that if there were no flood defences, water would spread out across these large floodplains. This flooding could cover large areas of land but to relatively shallow depths and could leave pockets of locally slightly higher land as isolated dry islands. It is important to understand the actual risk of the flooding to these dry islands, particularly in the event of defence failure.

The Flood Map for Planning also shows the location of formal raised flood defences and flood storage reservoirs. It represents areas at risk of flooding for present day only and does not take account of climate change.

The Flood Map for Planning only indicates the extent and likelihood of flooding from rivers or the sea. It should also be remembered flooding may occur from other sources such as surface water sewers, road drainage, etc.

2. Recorded Flood Outlines

With regards to the history of flooding I can advise we do not have any records of flooding in this area. It is possible recent flooding may have occurred which we are currently investigating, therefore this information may be subject to change. It is possible other flooding may have occurred which other risk management authorities, such as the Lead Local Flood Authority (ie top tier council) or Internal Drainage Board (where they exist) have responsibility.

Please note, our Recorded Flood Outlines do not reflect the latest (October 2023-present) flood incidents. Due to the scale of the events, it will take time to gather the information and verify the extent of the flooding before we are able to provide this information.

3. Schemes in the area

There are no ongoing capital projects to reduce or sustain the current flood risk to this site.

4. Fluvial Flood Risk Information

This site is not considered to be at risk of flooding from main rivers.

The site may be at risk from local ordinary watercourses for which other risk management authorities, such as the Lead Local Flood Authority (ie top tier council) or Internal Drainage Board (where they exist) have responsibility.

5. Tidal Flood Risk Information

This site is considered to be at risk from tidal flooding.

5.1 Tidal Defence Information

The existing tidal defences protecting this site consist of embankments.

They are in fair condition and reduce the risk of flooding (at the defence) to a 0.67% (1 in 150) chance of occurring in any year. We inspect these defences routinely to ensure potential defects are identified.

Refer to paragraph 3 for details of any ongoing capital projects to reduce the flood risk to this site.

5.2 Tidal Flood Levels

The attached data sheets show our current best estimate for extreme tide levels.

Please read the information notes on the data sheets.

5.3 Tidal Hazard Mapping

For certain locations we have carried out modelling to map the maximum values of flood depth, velocity and hazard rating (danger to people) resulting from overtopping and / or breaching of defences at specific locations for a number of scenarios.

At present this information is available along the full coastal / tidal floodplain, except the tidal Witham Haven in Boston (upstream of Hobhole) where only breaching and not overtopping has been modelled and the tidal River Welland upstream of Fosdyke Bridge where neither breaching nor overtopping are available.

The number of locations we have this information for is expected to increase in time.

The attached maps show the maximum values of flood depth, velocity and hazard rating (danger to people) resulting from breaching of the defences at specific locations for the scenarios below. For some locations the breach mapping also includes flooding from overtopping if this is expected in that scenario. The location of modelled tidal breaches is shown on a separate attached map.

5.3.1 Tidal Hazard Mapping – Breaches

- Year 2006 0.5% (1 in 200) chance
- Year 2006 0.1% (1 in 1000) chance
- Year 2115 0.5% (1 in 200) chance
- Year 2115 0.1% (1 in 1000) chance

5.3.2 Tidal Hazard Mapping - Overtopping

Your site is not affected by overtopping of the defences for the present day (2006) and climate change (2115) scenarios, though may be at risk from breaching.

6. Development Planning

If you would like local guidance on preparing a flood risk assessment for a planning application, please contact our Sustainable Places team at LNplanning@environment-agency.gov.uk. It will help if you mention this data request and attach your site location plan.

We provide free preliminary advice; additional/detailed advice, review of draft FRAs and meetings are chargeable at a rate set to cover our costs, currently £100 (plus VAT) per hour of staff time. Further details are available on our website at <https://www.gov.uk/guidance/developers-get-environmental-advice-on-your-planning-proposals>.

General advice on flood risk assessment for planning applications can be found on GOV.UK at <https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications>

Climate change will increase flood risk due to overtopping of defences. Please note, unless specified otherwise, the climate change data included has an allowance for 20% increase in flow. Updated guidance on how climate change could affect flood risk to new development - 'Flood risk assessments: climate change allowances' was published on GOV.UK in **July 2021**. The appropriate updated climate change allowance should be applied in a Flood Risk Assessment.

You should also consult the Strategic Flood Risk Assessment produced by your local planning authority.

7. Data Licence and Other Supporting Information

We respond to requests for recorded information we hold under the Freedom of Information Act 2000 (FOIA) and the associated Environmental Information Regulations 2004 (EIR).

This information is provided in accordance with the Open Government Licence which can be found here: <http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Further information on flood risk can be found on the GOV.UK website at:
<https://www.gov.uk/browse/environment-countryside/flooding-extreme-weather>

8. Other Flood Risk Management Authorities

The information provided with this letter relates to flood risk from main river or the sea. The Flood Map for Surface Water can be viewed at <https://www.gov.uk/check-long-term-flood-risk>

Additional information may be available from other risk management authorities, such as the Lead Local Flood Authority (ie top tier council) or Internal Drainage Board (where they exist).

I hope we have correctly interpreted your request. If you have any queries or would like to discuss the content of this letter further please contact Annabelle Webster using the email address below and quoting our CCN reference number above.

Yours sincerely,

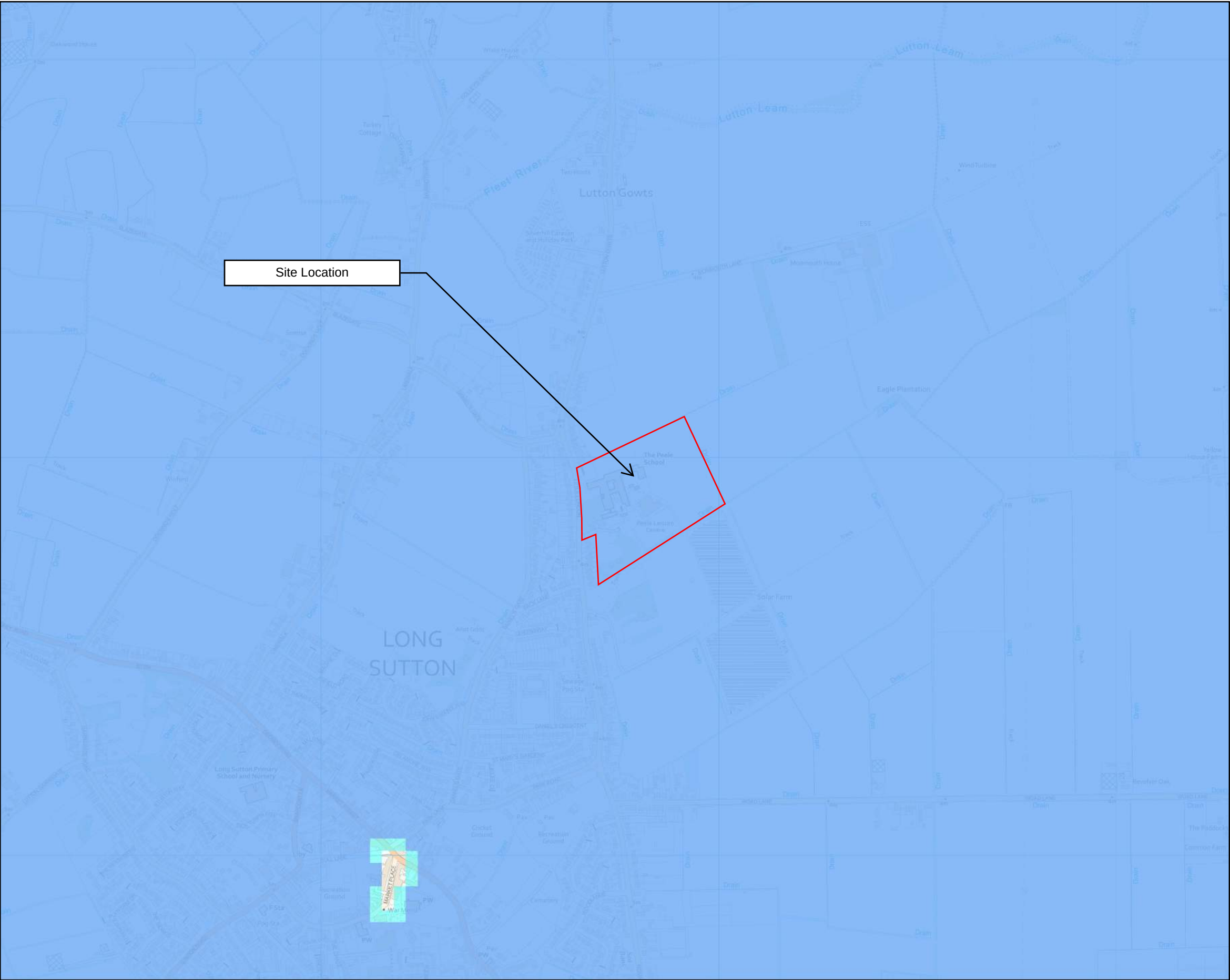


020 302 53535

for Ben Thornely
Welland and Nene Partnerships and Strategic Overview
Area Flood and Coastal Risk Manager
e-mail PSOWN@environment-agency.gov.uk

Enc.
Flood Map for Planning
Tidal Level Data Sheets - Map and Tables
Tidal Breach Points – Locations Map
Hazard Mapping – Breaching

Flood Map centred on TF 43739 23916 - created February 2024 [Ref: CCN-2024-346483]



Scale 1:10,000



- Legend**
- Main Rivers
 - Raised Defences
 - Flood Storage Areas
 - Areas at Risk of Flooding from Rivers or the Sea
 - Extreme Flood Outline

Dark blue shows the area that could be affected by flooding, either from rivers or the sea, if there were no flood defences. This area could be flooded:

- from the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year.
- or from a river by a flood that has a 1% (1 in 100) or greater chance of happening each year.

Light blue shows the extent of the Extreme Flood Outline, which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater.

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements. Sites outside the two extents, but behind raised defences, may be affected by flooding if the defences are overtopped or fail.

Created by the Partnerships and Strategic Overview Team, Kettering

East Coast and Wash - 2018 Coastal Flood Boundary [CFB] Dataset

Key Node Points



Scale 1:550,000



▲ East Coast and Wash

See separate data sheet for predicted flood levels

Created by the Partnerships and Strategic Overview Team, Lincoln

East Coast and Wash: Immingham to the West Lighthouse

2018 Coastal Flood Boundary Extreme Sea Levels

CFB REF	LOCATION	EASTING	NORTHING	ANNUAL CHANCE (1 IN X) OF TIDE LEVEL IN METRES ODN																						
				1			10			50			100			200			300			1000				
				Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound				
				2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%
3888	Immingham	520440	417625	4.16	4.17	4.19	4.50	4.53	4.62	4.73	4.80	5.00	4.83	4.93	5.19	4.93	5.06	5.41	4.98	5.14	5.55	5.15	5.38	6.01		
3890	Haborough Marsh	522100	416512	4.14	4.15	4.17	4.48	4.51	4.60	4.70	4.77	4.97	4.80	4.90	5.16	4.90	5.03	5.38	4.94	5.10	5.51	5.11	5.34	5.97		
3898	Grimsby	529295	413162	3.98	3.99	4.01	4.31	4.34	4.43	4.53	4.60	4.80	4.61	4.71	4.97	4.71	4.84	5.19	4.74	4.90	5.31	4.88	5.11	5.74		
3906	Buck Beck	534709	407369	3.87	3.88	3.90	4.19	4.23	4.31	4.41	4.50	4.68	4.50	4.61	4.86	4.61	4.75	5.10	4.64	4.82	5.22	4.80	5.05	5.66		
3910	Tetney	538035	405537	3.85	3.86	3.89	4.17	4.22	4.30	4.40	4.50	4.67	4.49	4.61	4.86	4.60	4.75	5.10	4.63	4.82	5.21	4.80	5.06	5.66		
3918	Donna Nook	544641	401997	3.82	3.83	3.86	4.14	4.19	4.27	4.38	4.48	4.65	4.47	4.60	4.85	4.58	4.74	5.10	4.63	4.82	5.22	4.81	5.08	5.68		
3928	Saltfleet	549131	393360	3.78	3.79	3.82	4.11	4.16	4.26	4.36	4.46	4.64	4.47	4.59	4.86	4.57	4.74	5.11	4.63	4.83	5.25	4.83	5.11	5.74		
3942	Boygrift	555131	380860	3.72	3.74	3.77	4.06	4.11	4.22	4.33	4.43	4.65	4.43	4.57	4.87	4.56	4.73	5.13	4.62	4.83	5.28	4.85	5.15	5.82		
3968	Gibraltar Point	557652	356181	4.16	4.17	4.20	4.51	4.56	4.67	4.76	4.85	5.08	4.85	4.97	5.27	4.94	5.10	5.49	4.99	5.18	5.63	5.14	5.41	6.09		
3992_14	Hobhole	535990	340116	4.96	4.97	5.01	5.40	5.44	5.56	5.66	5.76	5.98	5.78	5.90	6.20	5.88	6.04	6.44	5.92	6.11	6.57	6.03	6.31	6.99		
	Grand Sluice*	532366	344510	4.93	4.94	4.98	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3		
3992_9	Boston Barrier	532754	342852	4.93	4.94	4.98	5.41	5.45	5.57	5.73	5.83	6.05	5.85	5.97	6.27	5.93	6.09	6.49	5.94	6.13	6.59	5.98	6.26	6.94		
3992_5	Fosdyke Bridge	531886	332234	4.87	4.88	4.92	5.31	5.35	5.47	5.58	5.68	5.90	5.71	5.83	6.13	5.82	5.98	6.38	5.87	6.06	6.52	6.01	6.29	6.97		
4008	West Lighthouse	550094	329971	4.87	4.88	4.91	5.21	5.26	5.37	5.46	5.56	5.78	5.56	5.68	5.98	5.66	5.82	6.21	5.71	5.90	6.35	5.86	6.14	6.81		
-	Marsh Road	525988	324065	-	5.04	-	-	5.44	-	-	5.73	-	-	5.85	-	-	5.98	-	-	-	-	-	-	-		
-	Wisbech	546110	309940	-	4.83	-	-	5.25	-	-	5.53	-	-	5.66	-	-	5.78	-	-	-	-	-	-	-		
-	Dog-in-a-Doublet	527200	299287	-	3.67	-	-	4.00	-	-	4.22	-	-	4.32	-	-	4.42	-	-	-	-	-	-	-		

See next page for notes

2018 Coastal Flood Boundary Extreme Sea Levels

NOTES:

The following notes apply to all CFB sites (ie all on table excluding Marsh Road, Wisbech, Dog-in-a-Doublet)

- The base date for the data is 2017.
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
- Levels for other annual chance probabilities are available if required.
- For additional information relating to the 2018 Coastal Flood Boundary Extreme Sea Levels or to access the full dataset for the above sites or intermediate locations refer to the Defra Metadata Catalogue at <https://deframetadadata.com/geonetwork/srv/eng/catalog.search#/metadata/84a5c7c0-d465-11e4-b0bd-f0def148f590>

The following notes apply to all Marsh Road, Wisbech, Dog-in-a-Doublet

- The base date for the data is 2006
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
- Levels for other annual chance probabilities are available if required.
- These levels will be updated as their respective tidal river models are updated.

The following notes apply to Grand Sluice

- Grand Sluice remains the tidal limit for the River Witham.
- The data is based on CFB 2018 data for Boston Barrier site, capped at 5.3mAOD to reflect use of the barrier which raises for tides above this level.
- The base date for the data is 2017
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
- For additional information relating to the 2018 Coastal Flood Boundary Extreme Sea Levels or to access the full dataset for the above sites or intermediate locations refer to the Defra Metadata Catalogue at <https://deframetadadata.com/geonetwork/srv/eng/catalog.search#/metadata/84a5c7c0-d465-11e4-b0bd-f0def148f590>



★ **Modelled Breach Locations**

0 3.5 7 14
Kilometers

This map indicates the location of where we have modelled the consequence of breaches in the defences along the coastline and tidal rivers. We have mapped the maximum values of Hazard Rating (Danger to People), Depth and Velocity.

We have not assumed that all breaches occur at the same time, but have modelled each breach individually and overlaid the results to find the maximum values.

Our modelling only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. Our defences generally provide a good standard of flood defence but a risk of breaching remains.

Please contact the Environment Agency for information on how these maps are used in the management of flood risk.

General Enquiries No: 03708 506 506.

Weekday calls cost 5p plus up to 6ppm from BT Weekend Unlimited. Mobile and other providers charges may vary.

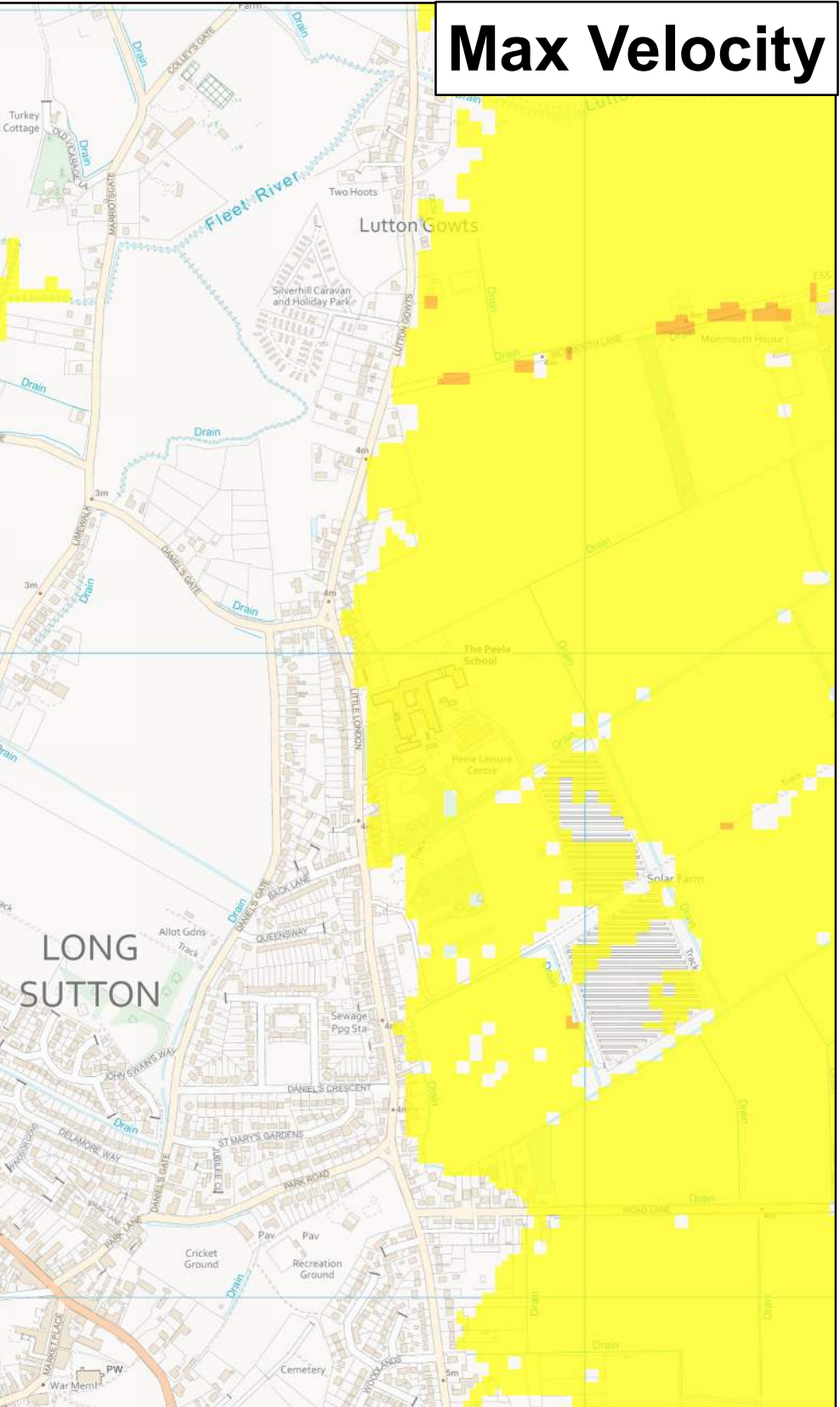
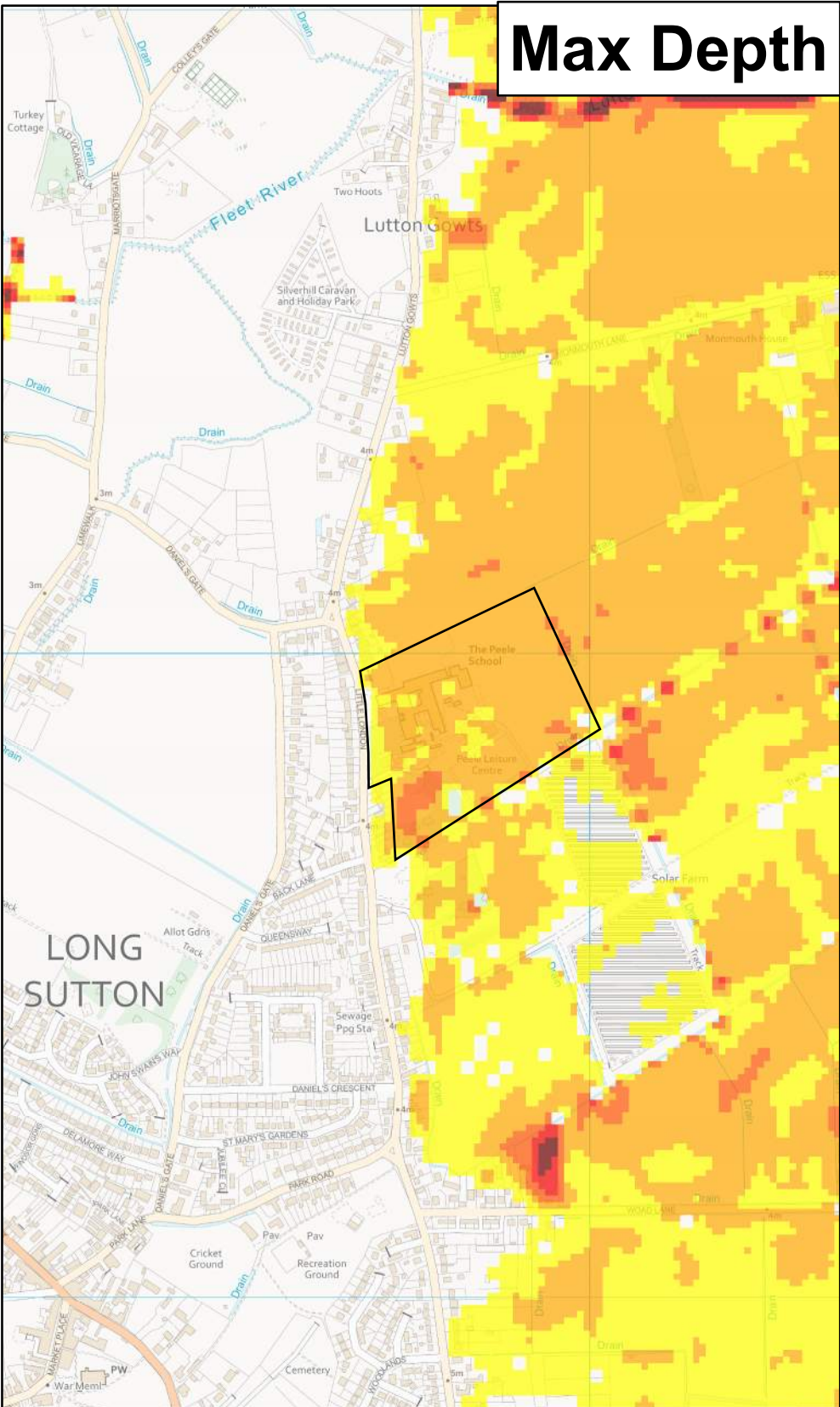
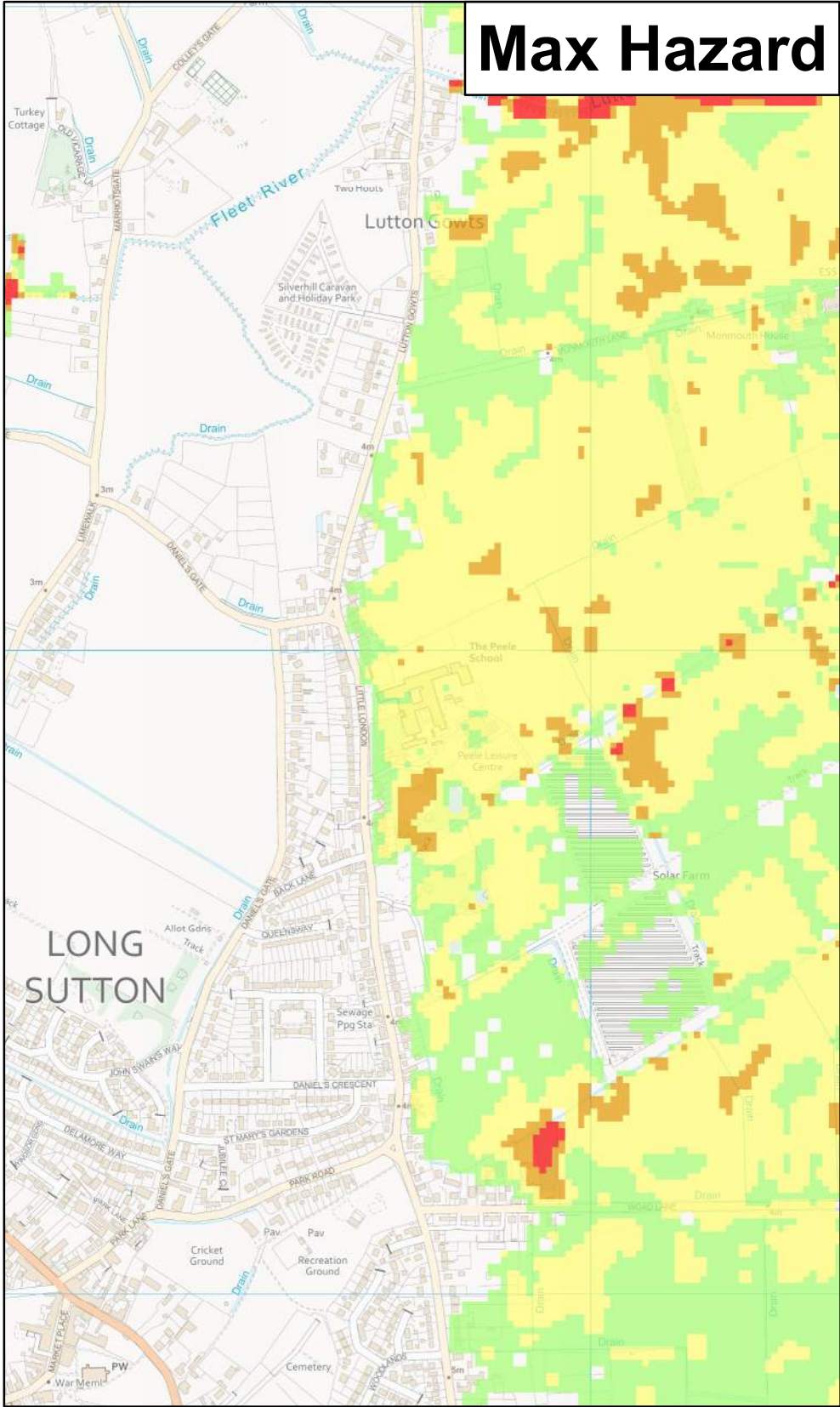


Produced by the Partnership and Strategic Overview Team, Lincoln
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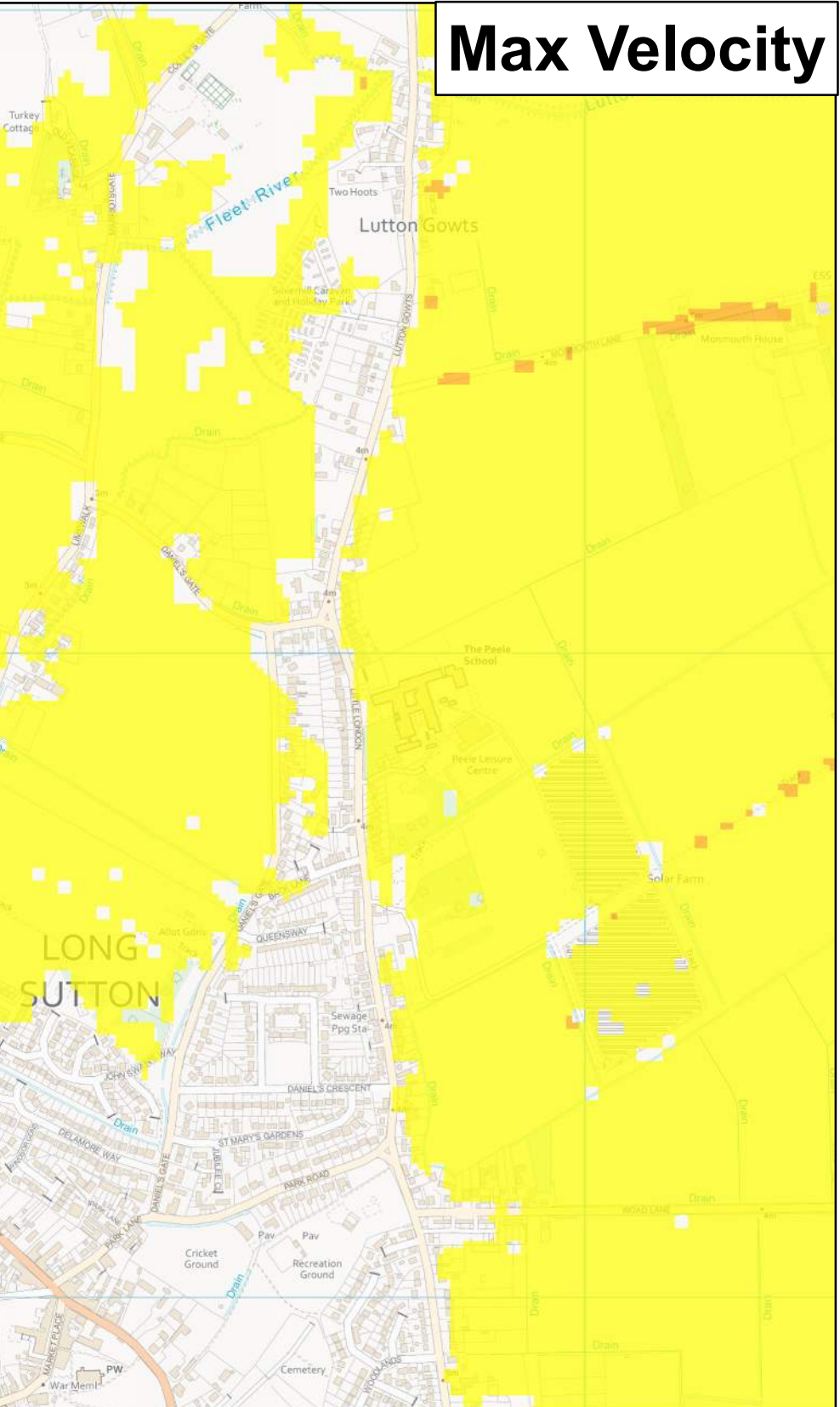
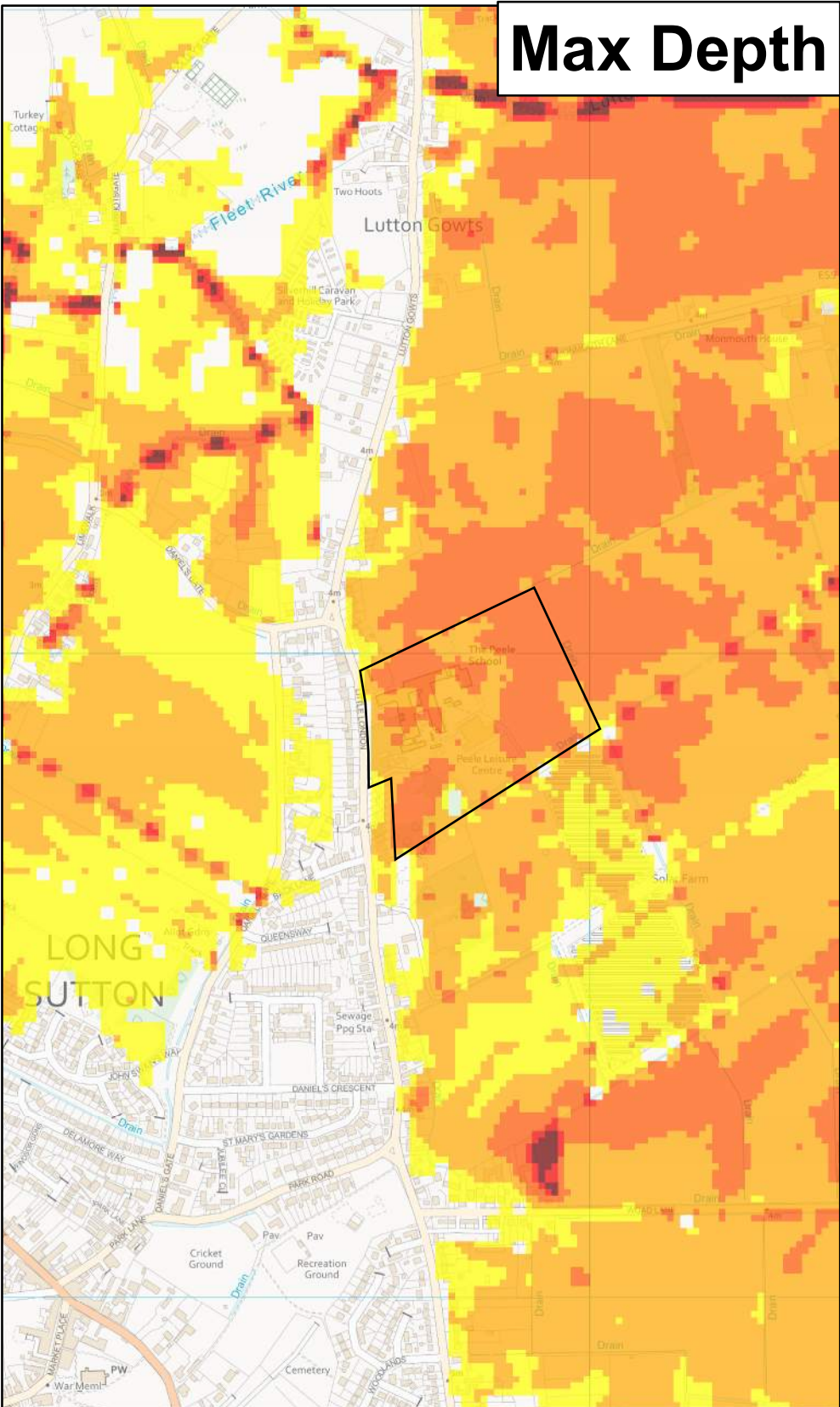
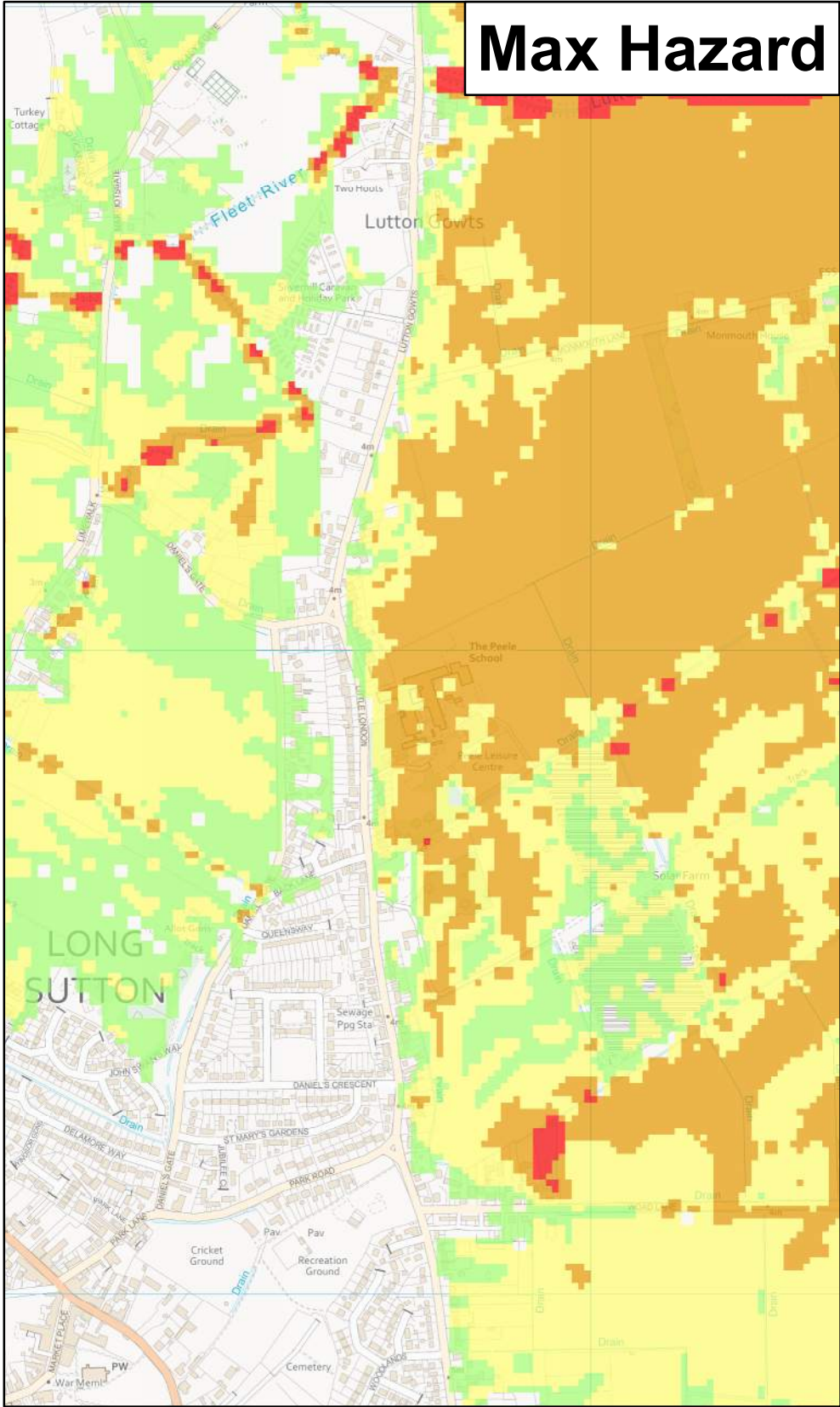
**Northern Area Tidal
Hazard Mapping**

Location of Modelled Breaches

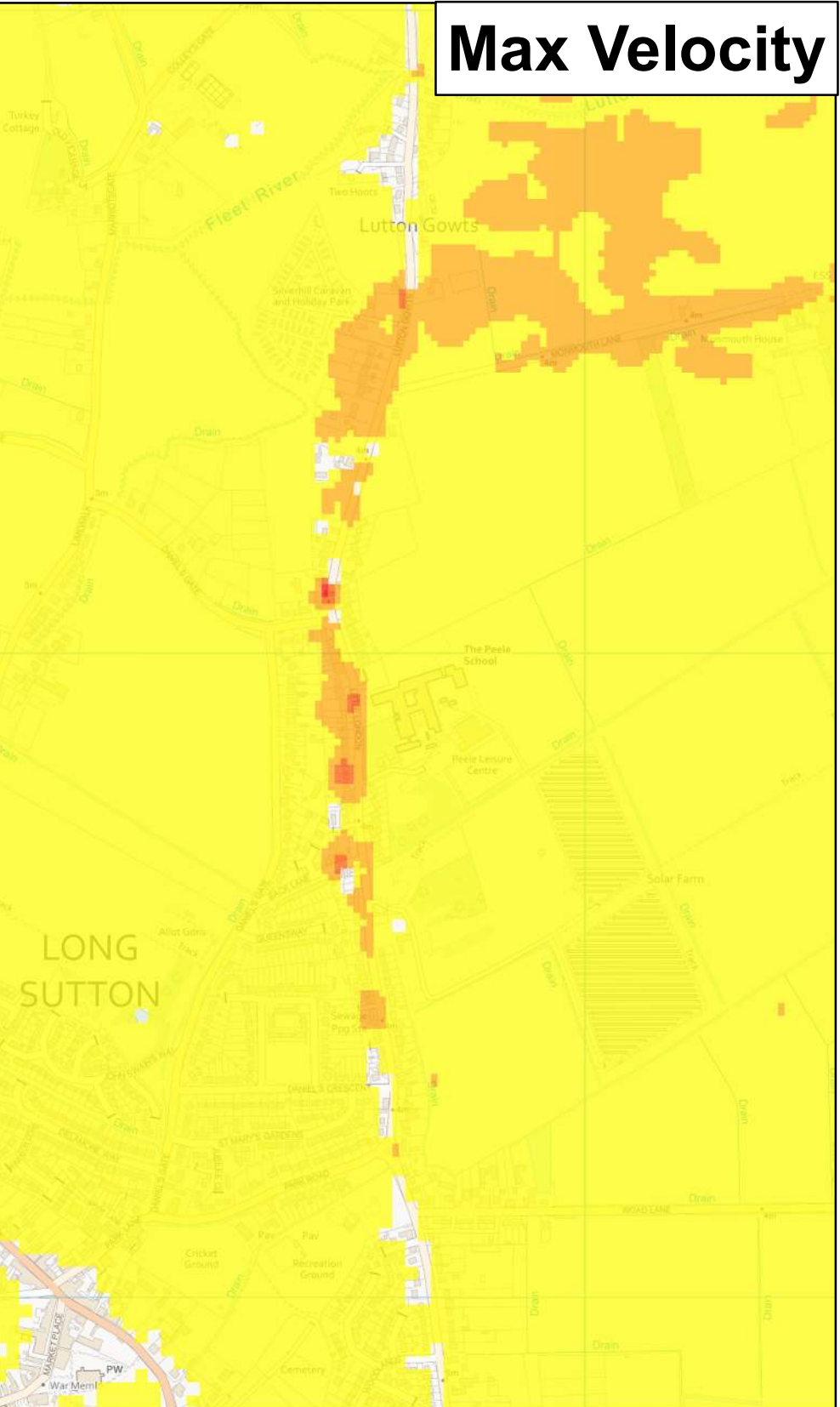
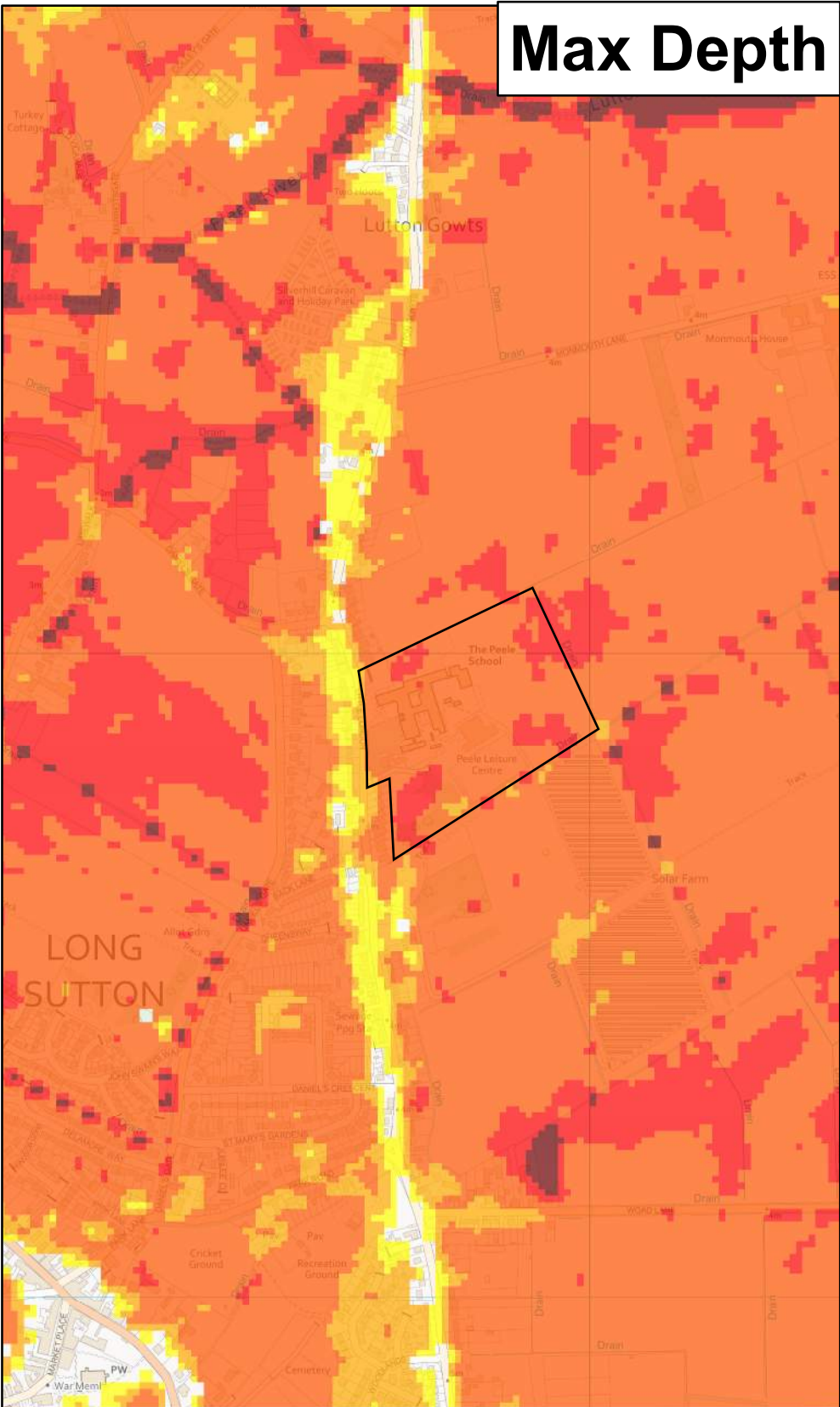
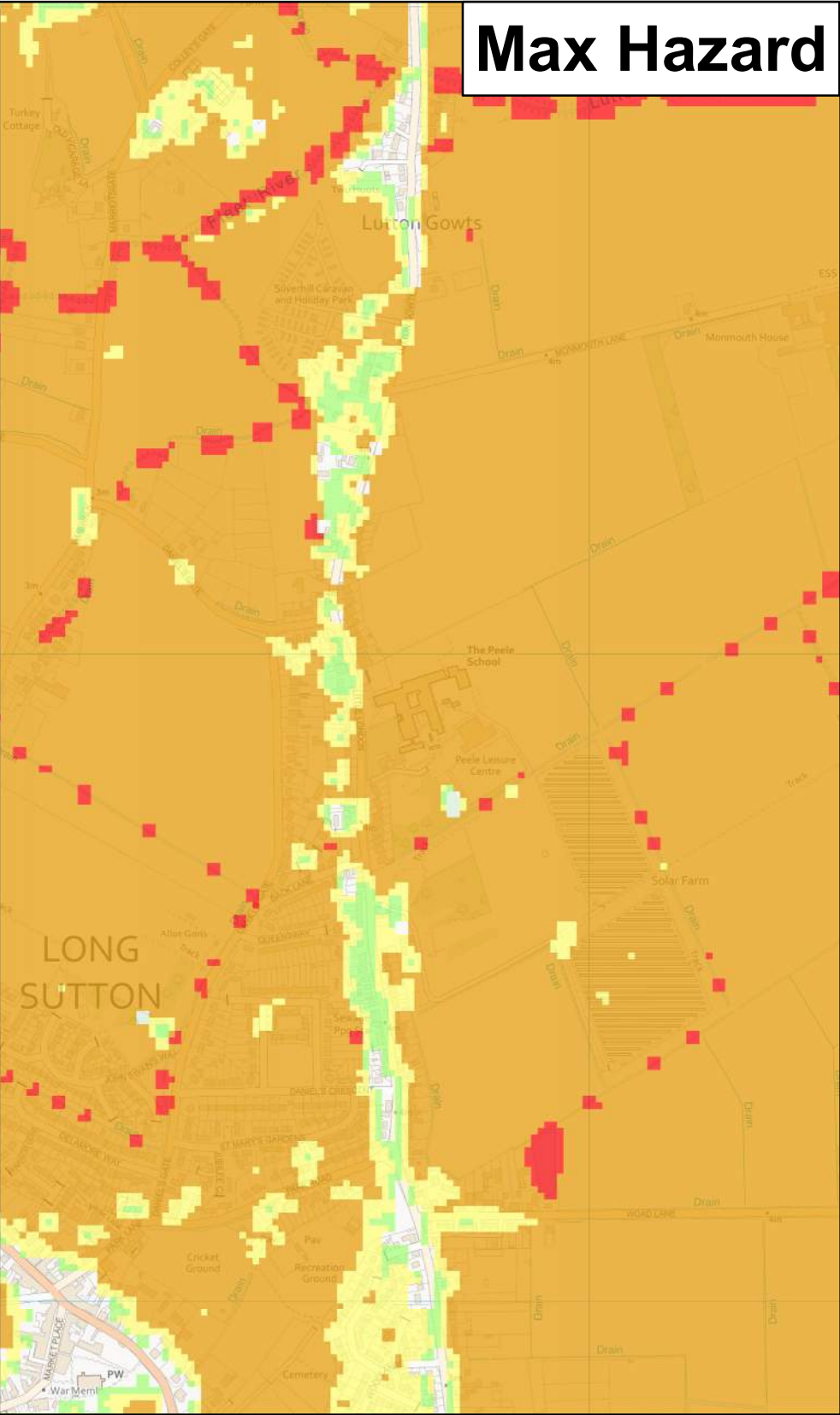
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★ Modelled Breach Locations - see also the accompanying plan "Location of Modelled Breaches"							This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped. The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results. The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. The likelihood of a breach occurring will depend on a number of different factors, including the construction and condition of the defences in the area. A breach is less likely where defences are of a good standard, but a risk of breaching remains. 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	Max Hazard (Flood Risk to People : FD2320)		Max Depth (m)		Max Velocity (m/s)	
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)		0 - 0.25 0.25 - 0.50 0.50 - 1.0 1.0 - 1.6 1.6 +		0 - 0.3 0.3 - 1.0 1.0 - 1.5 1.5 - 2.5 2.5 +									
Date Printed	February 2024	Scenario year	2006	Scenario Annual Chance	0.5% (1 in 200)	CCN Number		CCN-2024-346483					
Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping Map Centred on TF 43739 23916 1:10,000 © Environment Agency copyright and/or database rights 2024. © Ordnance Survey Crown copyright and database rights 2024 AC0000807064.													



★ Modelled Breach Locations - see also the accompanying plan "Location of Modelled Breaches"								 Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping Map Centred on TF 43739 23916 1:10,000 © Environment Agency copyright and/or database rights 2024. © Ordnance Survey Crown copyright and database rights 2024 AC0000807064.
Max Hazard (Flood Risk to People : FD2320)		Max Depth (m)		Max Velocity (m/s)				
 Less than 0.75 (Low Hazard)		 0 - 0.25		 0 - 0.3				
 Between 0.75 and 1.25 (Danger for Some)		 0.25 - 0.50		 0.3 - 1.0				
 Between 1.25 and 2.0 (Danger for Most)		 0.50 - 1.0		 1.0 - 1.5				
 Greater than 2.0 (Danger for All)		 1.0 - 1.6		 1.5 - 2.5				
		 1.6 +		 2.5 +				
Date Printed	February 2024	Scenario year	2006	Scenario Annual Chance	0.1% (1 in 1000)	CCN Number	CCN-2024-346483	
This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped. The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results. The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. The likelihood of a breach occurring will depend on a number of different factors, including the construction and condition of the defences in the area. A breach is less likely where defences are of a good standard, but a risk of breaching remains. 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								



★ Modelled Breach Locations - see also the accompanying plan "Location of Modelled Breaches"

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 +

Date Printed

February 2024

Scenario year

2115

Scenario Annual Chance

0.5%
(1 in 200)

CCN Number

CCN-2024-346483

This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped.

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Environment Agency

Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping

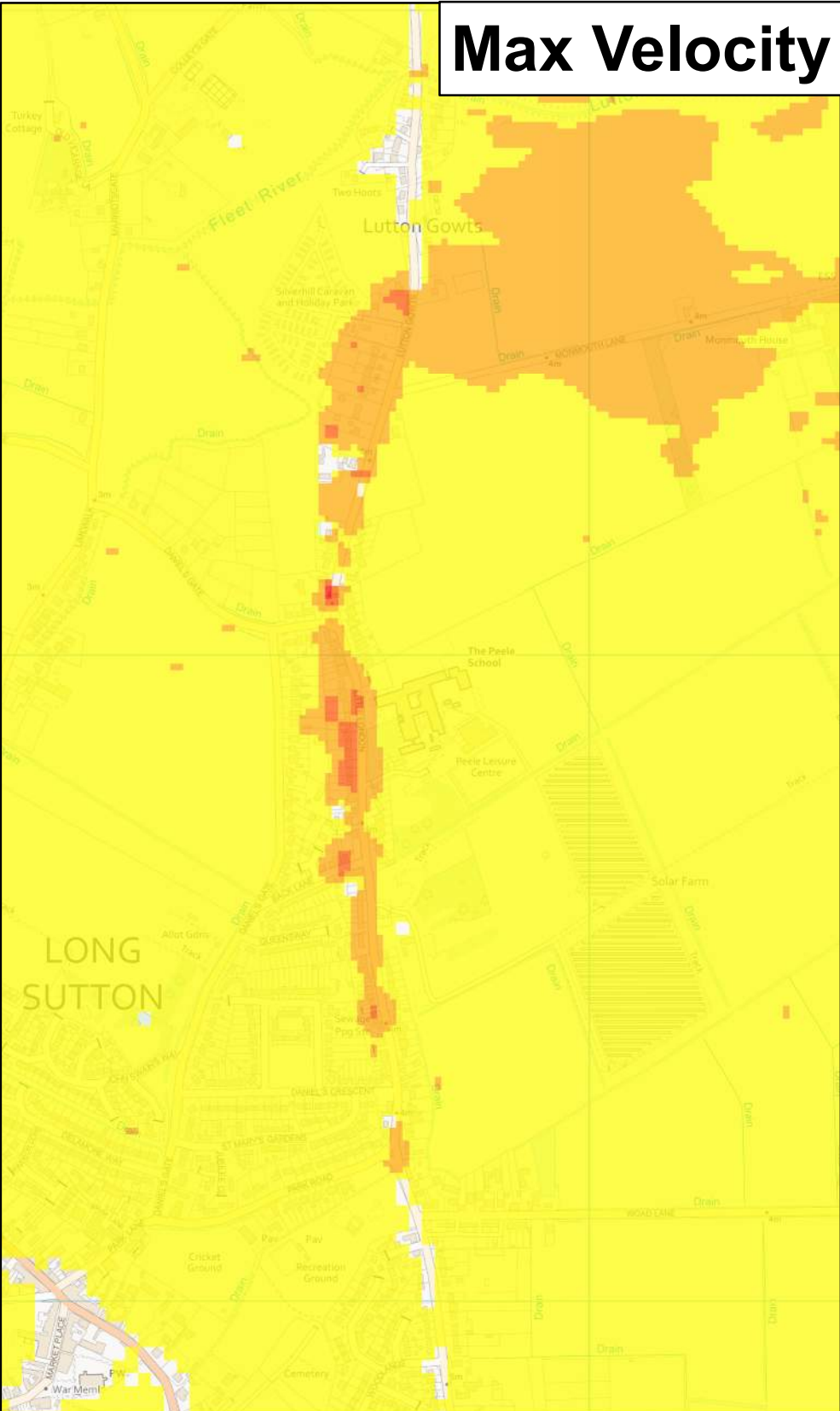
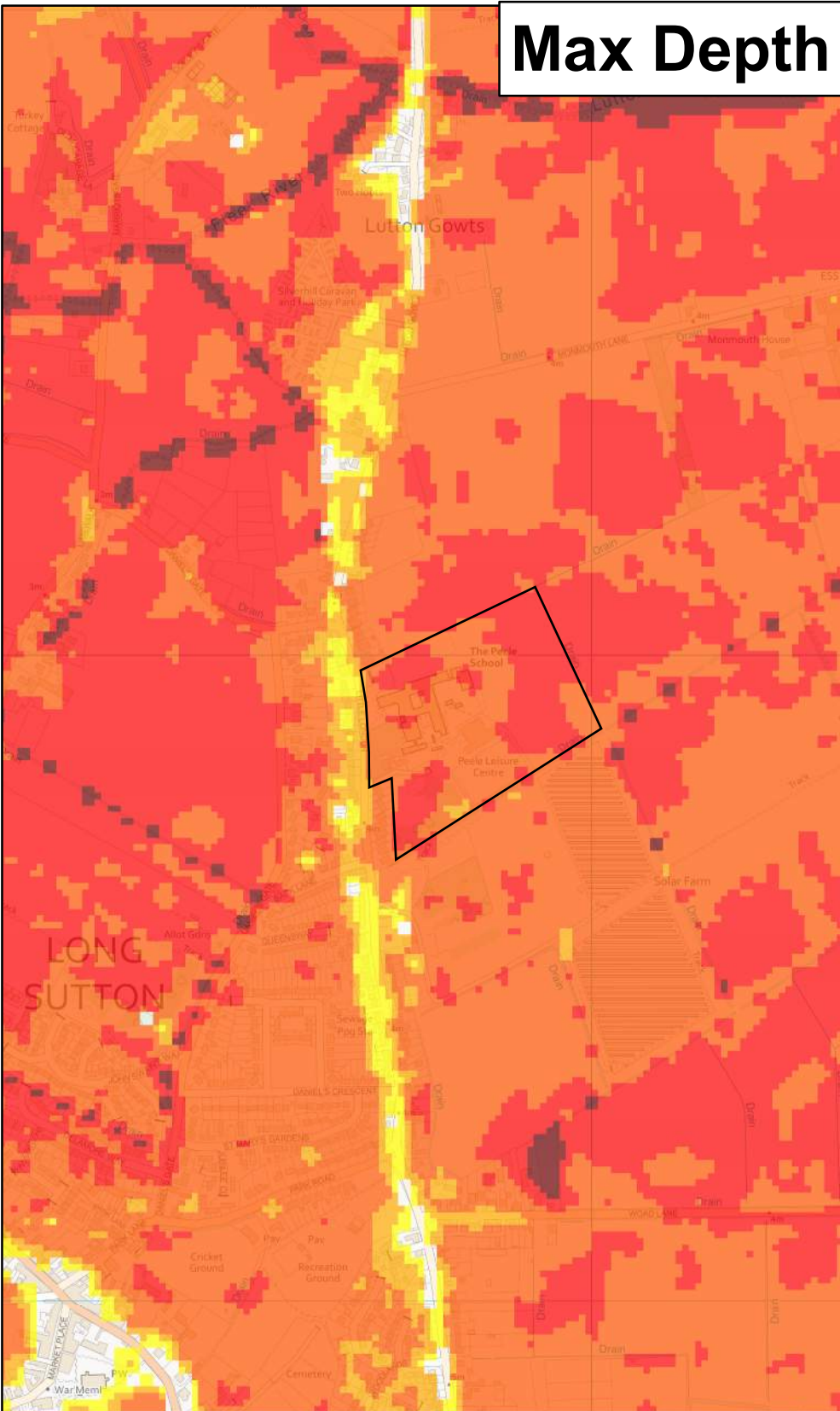
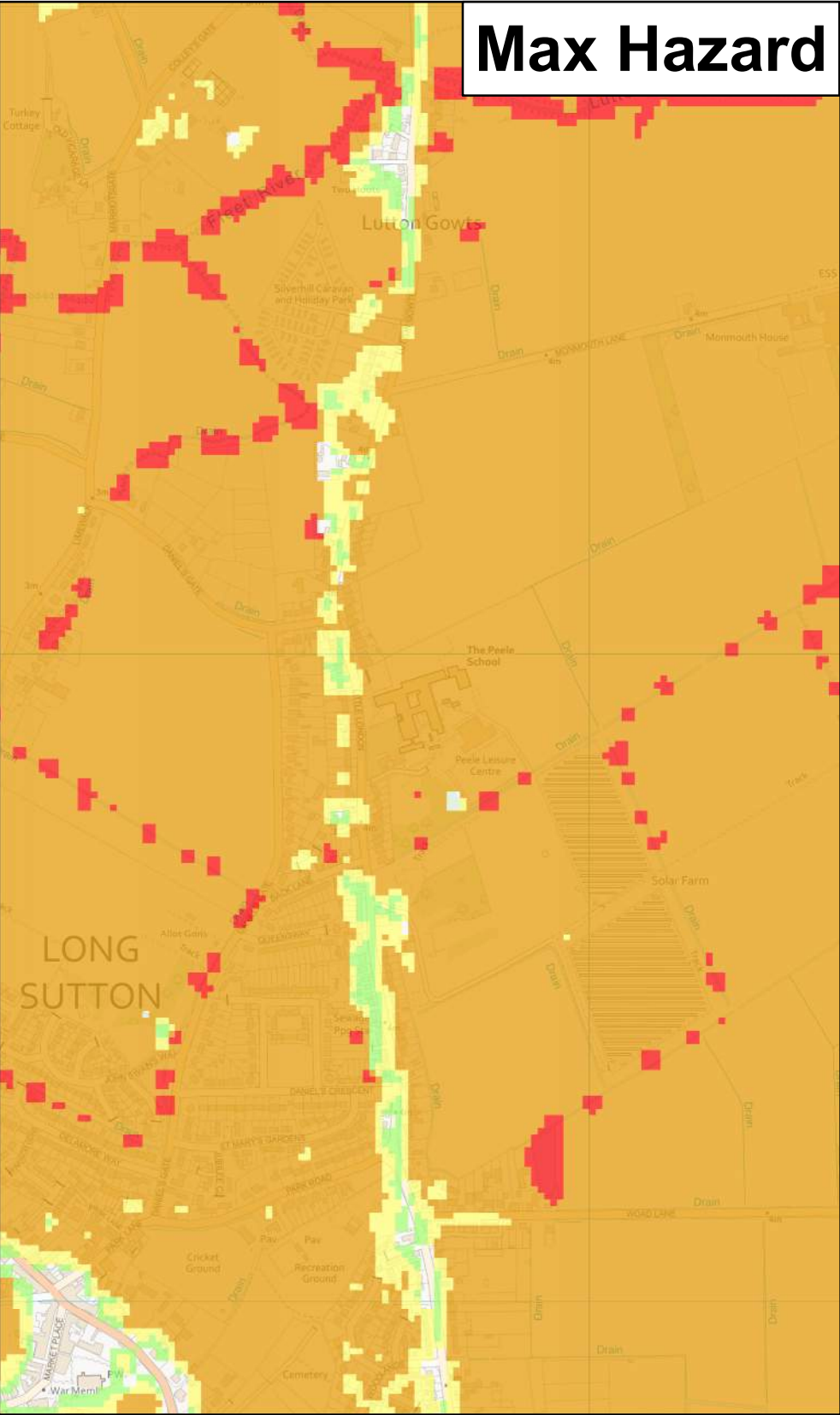
Map Centred on TF 43739 23916

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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



★ Modelled Breach Locations - see also the accompanying plan "Location of Modelled Breaches"								This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped. The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results. The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. The likelihood of a breach occurring will depend on a number of different factors, including the construction and condition of the defences in the area. A breach is less likely where defences are of a good standard, but a risk of breaching remains. 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
Max Hazard (Flood Risk to People : FD2320)		Max Depth (m)		Max Velocity (m/s)				
	Less than 0.75 (Low Hazard)		0 - 0.25		0 - 0.3			
	Between 0.75 and 1.25 (Danger for Some)		0.25 - 0.50		0.3 - 1.0			
	Between 1.25 and 2.0 (Danger for Most)		0.50 - 1.0		1.0 - 1.5			
	Greater than 2.0 (Danger for All)		1.0 - 1.6		1.5 - 2.5			
			1.6 +		2.5 +			
Date Printed	February 2024	Scenario year	2115	Scenario Annual Chance	0.1% (1 in 1000)	CCN Number	CCN-2024-346483	
								
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