

ADVISORY

Enviromena Project Management UK Limited
St Mary's in the Marsh
Land Off St Mary's Road, Romney Marsh, Kent
Flood Risk Assessment

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Birmingham
Livery Place, 35 Livery Street, Colmore Business District, Birmingham, B3 2PB
T: 0121 233 3322

Leeds
Whitehall Waterfront, 2 Riverside Way, Leeds
LS1 4EH
T: 0113 233 8000

London
11 Borough High Street
London, SE1 9SE
T: 0207 407 3879

Manchester
11 Portland Street, Manchester, M1 3HU
0161 233 4260

Nottingham
Waterfront House, Station Street, Nottingham NG2 3DQ
T: 0115 924 1100

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Author:	Alex Eaton BSc (Hons)
Checked:	Rachel Meredith BSc (Hons) MCIWEM
Approved:	Matthew Day BA (Hons) MSc FRGS MCIWEM C.WEM C.Sci C.Env

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EXECUTIVE SUMMARY

This Flood Risk Assessment (FRA) has been prepared in accordance with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance (PPG). It has been produced on behalf of Enviromena Project Management UK Limited in respect of a planning application for the proposed construction of a temporary solar farm at St Mary's in the Marsh, Romney Marsh, Kent (approximate grid reference: TR 07708 29272).

This report demonstrates that the proposed development is not at significant flood risk, subject to the recommended flood mitigation strategies being implemented.

The Environment Agency (EA) Flood Map for Planning shows the site is located entirely within Flood Zone 3 (land at high risk of flooding from rivers and the sea) attributed to tidal sources. However, the Flood Zones are undefended extents which do not account for the influence of flood defences within the area. To assess the tidal risk to the site hydraulic model information has been obtained from two studies: the Romney Marsh Tidal Mapping Study and the breach and overtopping of defences model completed as part of the Shepway District Council Level 1 Strategic Flood Risk Assessment (SFRA).

Results from the Romney Marsh Tidal Mapping Study show the site to be at an overall low risk of tidal flooding. The site is shown to be removed from the floodplain for all modelled events up to and including the 1 in 200-year 2070 epoch design event, and the extreme 1 in 1000-year 2115 epoch scenario. The results show that during a breach event the site is located outside of the 1 in 200-year 2070 epoch design event flood extents, however, the site is partially at risk of flooding during the extreme 1 in 200-year 2115 epoch scenario.

Results from the breach and overtopping of defences model completed as part of the Shepway District Council Level 1 SFRA show the site is not at risk of flooding during the present day breach and overtopping scenario. However, the site is shown to be at an overall low (caution) to moderate (danger for some) hazard, with small areas at a significant hazard (danger for most) hazard during the 2075 epoch design event. The site is also shown to be at an overall low to significant (danger for most) hazard during the extreme 2115 epoch scenario.

Overall, the site is considered to be at a low tidal flood risk, with a residual risk during a breach or overtopping scenario.

Due to the residual risk of tidal, fluvial and groundwater flooding, the lower edges of the proposed solar panels are to be raised a minimum of 600mm above surrounding ground levels., this will mitigate any residual risk of flooding. It is also recommended that the ancillary equipment associated with the solar development are raised 150mm above the external ground level. External levels adjacent to the ancillary equipment should be profiled away from the equipment to provide further mitigation against the residual risk of flooding.

The site access and egress route is shown to be at an overall low risk of flooding attributed to all sources. Therefore, safe access and egress can be achieved. The access route is shown to be at a residual risk of tidal flooding during a breach event. Should a breach event occur, it is likely that there will be sufficient warning time and prior evacuation allowing safe access and egress to occur.

The site is located entirely within the EA flood alert and warning area known as 'Coast from Folkestone to St Mary's Bay'. It is recommended that the site owners and visitors sign up to these services. Due to the nature of tidal flooding, it is likely that there will be sufficient warning time and prior evacuation and actions can be implemented. As the solar farm is expected to operate without constant on-site supervision, it is not expected that people will frequently be on-site. Therefore, the flood warnings and alerts should be used to inform when visiting the site should be avoided.

The site is located within the vicinity of an EA Main River (Clobsden Sewer), IDB maintained watercourses, and ordinary watercourses. All watercourses are understood to drain via gravity and eventually outfall to the English Channel to the south of the site. The main flood risk to the site is understood to be tidal. However, in order to assess the watercourses in isolation, the EA Risk of Surface Water (RoFSW) mapping has been used to provide an indication of the potential floodplain associated with the watercourses. The mapping shows the surface water extents attributed to the watercourses pose little risk to the site, with low risk flows shown to be contained to the watercourse channels. The movement of water within the Romney Marshes is controlled by water levels within Royal Military Canal and tidal locks. This ultimately controls the flow of water within the marshes and makes them a relatively low flood risk.

In the event of exceedance of the watercourses, flows are expected to be conveyed in a southerly direction following the general topography of the area. However, given the flat nature of the marshes, flows are likely to be held within the site and surrounding area until the water levels within the watercourses naturally lower and can freely drain.

The site is at an overall low risk of groundwater flooding. However, based on the presence of shallow groundwater found in borehole logs near the site underlain by similar bedrock, the site may be at a residual risk of groundwater flooding. Should groundwater be encountered during construction of the solar development, a groundwater specialist should be appointed, and appropriate dewatering procedures should be employed as necessary. Foundation types used for solar panels should be designed with appropriate consideration of the onsite groundwater levels.

The site has been assessed against other sources of flood risk including canals, reservoirs and large waterbodies, pluvial runoff, and sewers. None of these are considered to pose significant risk to the site and therefore no specific mitigation is considered to be required.

The site is shown to be located outside of the defended tidal flood extents during the 1 in 200-year 2070 epoch design event, and at a very low risk of surface water flooding. Therefore, no floodplain will be displaced under normal defended conditions, and no flows will be impeded as a result of the proposed development.

The proposed development is not anticipated to have an adverse impact on the surface water runoff rate and volume. No foul water flows will be produced as a result of the proposed development; therefore, no foul water provision is required.

In compliance with the requirements of the NPPF, and subject to the mitigation measures proposed, the development could proceed without being subject to significant flood risk. Moreover, the development will not increase flood risk to the wider catchment area subject to suitable management of surface water runoff discharging from the site.

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1. INTRODUCTION

- 1.1 This Flood Risk Assessment (FRA) has been prepared in accordance with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance (PPG). The FRA has been produced on behalf of Enviromena Project Management UK Limited in respect of a planning application for the proposed construction of a temporary solar farm at St Mary's in the Marsh, Romney Marsh, Kent.
- 1.2 This FRA is intended to support a full planning application, the level of detail included is commensurate and subject to the nature of the proposals at the planning stage. Summary information is included as **Table 1.1**.

Table 1.1: Site Summary

Site Name	St Mary's in the Marsh
Location	Romney Marsh, Kent
NGR (approx.)	TR 07708 29272
Application Site Area (ha)	39.76 (approx.)
Development Type	Solar Farm
Flood Zone Classification	Flood Zone 3
NPPF Vulnerability	Essential infrastructure
Anticipated Development Lifetime	Up to 40 years
Environment Agency Office	Kent, South London and East Sussex
Lead Local Flood Authority	Kent County Council
Local Planning Authority	Folkestone & Hythe District Council (Previously Named Shepway District Council)

Sources of Data

- Topographical Survey by BWB Consulting Ltd (reference: SMM-BWB-00-ZZ-M2-G-0001)
- 2022 1m spatial resolution Environment Agency (EA) Light Detection and Ranging (LiDAR) data
- EA consultation and model information from the Romney Tidal Mapping Study, Completed by JBA Consulting in 2020.
- Folkestone & Hythe District Council Consultation
- Kent County Council (KCC) Consultation

- vi. Romney Marshes Area Internal Drainage Board (IDB) Consultation
- vii. EA Risk of Flooding from Surface Water Data
- viii. Shepway District Council Strategic Flood Risk Assessment
- ix. KCC Preliminary Flood Risk Assessment
- x. Kent Local Flood Risk Management Strategy 2024-2034
- xi. Folkestone & Hythe Surface Water Management Plan
- xii. KCC Section 19 flood investigation reports
- xiii. South East River Basin District Flood Risk Management Plan
- xiv. Folkestone and Hythe District Council Core Strategy Review
- xv. Southern Water Sewer Records
- xvi. British Geological Survey Drift & Geology Maps

Existing Site

- 1.3 The site is located within the Romney Marsh area of Kent, situated approximately 2km northwest of St Mary's Bay village. The site is bound by agricultural land to the north, west and east, and by St Mary's Road to the south. A network of drainage ditches flow through and surround the site, with the Clobdsen Sewer, an EA Main River, located adjacent to the western and southern site boundaries, and the Eastbridge Sewer, a Romney Marshes Area IDB drain, located along the northern site boundary. The site's location is illustrated within **Figure 1.1**.
- 1.4 A topographical survey has been completed and is included as **Appendix 1**. The survey shows the site is relatively level, with elevations across the site remaining around 2 metres Above Ordnance Datum (mAOD). A high point of 2.62mAOD is shown to the north of the site associated with a raised topographical feature.
- 1.5 The current site comprises greenfield land consisting of arable farmland. The access and egress route to the site is via St Mary's Road to the south of the site.



Figure 1.1: Site Location

Proposed Development

- 1.6 The proposed development is for the construction of a temporary solar farm, including the installation of ground-mounted solar panels together with associated works, equipment, and necessary infrastructure. The existing access/egress location to St Mary's Road to the south will be retained.
- 1.7 The proposed site layout is included as **Appendix 2**.

2. FLOOD RISK PLANNING POLICY & GUIDANCE

National Planning Policy Framework

- 2.1 The NPPF¹ sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. The PPG is also available online².
- 2.2 The PPG sets out the vulnerability to flooding of different land uses. It encourages development to be located in areas of lower flood risk where possible and stresses the importance of preventing increases in flood risk off site to the wider catchment area.
- 2.3 The PPG also states that alternative sources of flooding, other than fluvial (river flooding), should be considered when preparing a FRA.
- 2.4 The PPG includes a series of tables that define Flood Zones (Table 1), the flood risk vulnerability classification of development land uses (Table 2) and 'compatibility' of development within the defined Flood Zones (Table 3). Table 2 and Table 3 are recreated within **Appendix 3** of this report for reference.
- 2.5 This FRA is written in accordance with the NPPF and the PPG.

Flood Map for Planning

- 2.6 With particular reference to planning and development, the Flood Map for Planning identifies Flood Zones in accordance with Table 1 of the PPG. Further details on the Flood Zone classifications are outlined in **Table 2.1**.

Table 2.1: Flood Zone Classifications

Flood Zone	Description
Flood Zone 1 (Low Probability)	Land having less than a 1 in 1000 annual probability of river or sea flooding (<0.1% Annual Exceedance Probability). All land outside of Flood Zone 2 and 3.
Flood Zone 2 (Medium Probability)	Land having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1% AEP); or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1% AEP).
Flood Zone 3a (High Probability)	Land having a 1 in 100 or greater annual probability of river flooding (>1% AEP); or land having a 1 in 200 or greater annual probability of flooding from the sea (>0.5% AEP). This is represented by "Flood Zone 3" on the Flood Map for Planning.
Flood Zone 3b (The Functional Floodplain)	Flood Zone 3b (The Functional Floodplain) is defined as land where water must flow or be stored in times of flood. This is not identified or separately distinguished from Zone 3a on the Flood Map for Planning.

¹ Revised National Planning Policy Framework, Ministry of Housing, Communities & Local Government, amended 2023.

² Planning Practice Guidance: <https://www.gov.uk/government/collections/planning-practice-guidance>

- 2.7 The site is located within Flood Zone 3 attributed to tidal sources, as shown in **Figure 2.1**. However, the site is also located in an area considered to be at a reduced risk of flooding from rivers/sea due to defences.

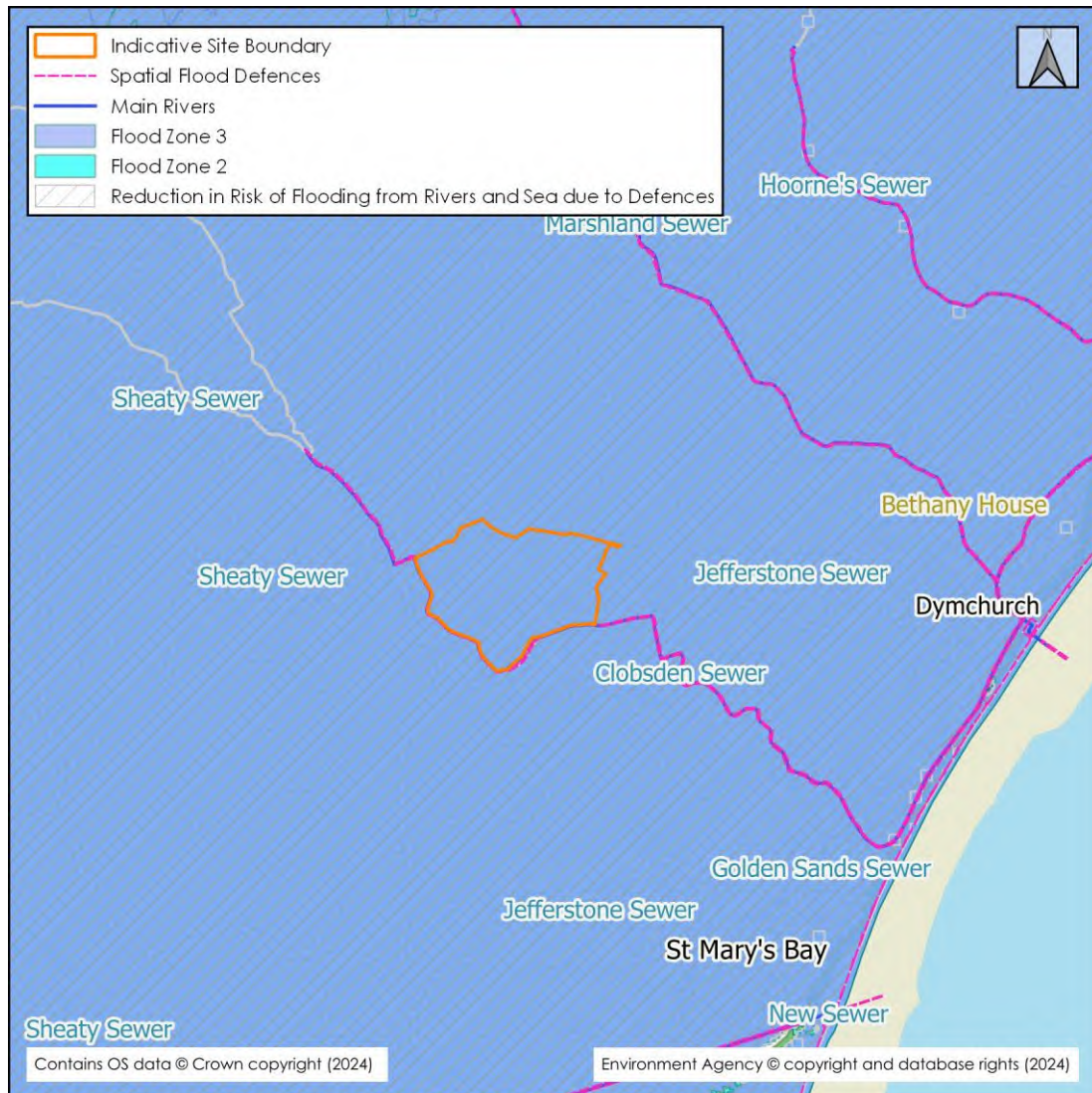


Figure 2.1: Flood Map for Planning

The Design Flood

- 2.8 The PPG identifies that new developments should be designed to provide adequate flood risk management, mitigation, and resilience against the 'design flood' for their lifetime.
- 2.9 This is a flood event of a given annual flood probability, which is generally taken as fluvial (river) and surface water (pluvial) flooding likely to occur with a 1% annual probability (a 1 in 100 chance each year), or tidal flooding with a 0.5% annual probability (1 in 200 chance each year), against which the suitability of a proposed development is assessed and mitigation measures, if any, are designed.

Climate Change

Peak River Flow

- 2.10 Predicted future changes in peak river flows caused by climate change are provided by the EA³, with a range of projections applied to regionalised 'River Basin Districts', which are further subdivided into Management Catchments.
- 2.11 The site falls within the Rother Management Catchment of the South East River Basin District. **Table 2.2** identifies the relevant peak river flow climate change allowances from this Management Catchment.

Table 2.2: Peak River Flow Climate Change Allowances for the Rother Management Catchment within the South East River Basin District

Allowance Category	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2125)
Upper End	29%	38%	66%
Higher Central	19%	23%	38%
Central	15%	16%	28%

- 2.12 When determining the appropriate allowance for use in a FRA the Flood Zone classification, flood risk vulnerability and the anticipated lifespan of the development should be considered. **Table 2.3** provides a matrix summarising the EA's guidance on determining the appropriate allowance(s).

Table 2.3: Application of Appropriate Peak River Flow Climate Change Allowances

Flood Zone	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
1	Use the central allowance where a location may fall within Flood Zone 2 or 3 in the future.				
2	Use the higher central allowance	Use the central allowance			
3a	Use the higher central allowance	Development should not be permitted	Use the central allowance		
3b	Use the higher central allowance	Development should not be permitted			Use the central allowance

³ Environment Agency, Flood risk assessments: climate change allowances: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>. Last Accessed March 2025.

Flood Zone	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
If development is considered appropriate by the local authority when not in accordance with Flood Zone vulnerability categories, then it would be appropriate to use the higher central allowance.					

- 2.13 The site is located entirely within Flood Zone 3 attributed to tidal sources. Therefore, the primary flood risk to the site is considered to be tidal and so the EA allowances for future sea level rise within the South East River Basin District will be used to determine the tidal flood risk to the site as summarised below.
- 2.14 To assess the fluvial flood risk from watercourses surrounding the site, the Peak River Flow Climate Change Allowances for the Rother Management will be used. The proposed development is classified as 'Essential Infrastructure', and it has an anticipated lifespan of up to 40 years. Therefore, the Higher Central allowance for the '2050s' epoch should be considered.
- 2.15 Therefore, to ensure the development is designed adequately for its lifetime, an allowance of 23% will be applied to the design flood to identify minimum development levels.

Sea Level Rise

- 2.16 It is predicted that future changes in climate conditions will result in the global sea level continuing to rise, which will change the frequency and magnitude of high-water events. Predicted future changes in sea levels are provided by the EA⁴, with a range of projections applied to River Basin Districts.
- 2.17 The site falls within the South East River Basin District. **Table 2.4** states the relevant sea level rise for this River Basin District.

Table 2.4: Sea Level Allowances for the South East River Basin District for each epoch in mm per year

Allowance		2000 to 2035 (mm)	2036 to 2065 (mm)	2066 to 2095 (mm)	2096 to 2125 (mm)	Cumulative Rise 2000 to 2125 (m)
Higher Central	Per Year	5.7	8.7	11.6	13.1	-
	Total	200	261	348	393	1.20
Upper End	Per Year	6.9	11.3	15.8	18.2	-
	Total	242	339	474	546	1.60

- 2.18 The climate change guidance states that for FRAs, both the higher central and upper end allowances should be assessed in order to understand the range of impact. With a development design horizon of up to 40 years, the sea level rise up to 2065 needs to be

⁴ Environment Agency, Flood risk assessments: climate change allowances: Environment Agency, Flood risk assessments: climate change allowances: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>. Last Accessed March 2025.

considered. This equates to a cumulative sea level rise of 461mm (Higher Central) to 581mm (Upper End).

Strategic Flood Risk Assessment

- 2.19 A Strategic Flood Risk Assessment (SFRA) is a study carried out by one or more local planning authorities to assess the risk to an area from flooding from all sources, now and in the future.
- 2.20 The Shepway District Council Level 1 SFRA⁵ has been reviewed in the production of this FRA. The SFRA provides information specific to the site location in the form of fluvial flood risk mapping, as well as records of historical flooding. It also includes flood risk policy and guidance for the area. Information from the Level 1 SFRA will be referenced within **Section 3** and **Section 4** where applicable.

Preliminary Flood Risk Assessment

- 2.21 A Preliminary Flood Risk Assessment (PFRA) is an assessment of floods that have taken place in the past and floods that could take place in the future. It generally considers flooding from surface water runoff, groundwater and ordinary watercourses, and is prepared by the Lead Local Flood Authorities (LLFAs).
- 2.22 The KCC PFRA⁶ considers flooding from surface water runoff, groundwater, ordinary watercourses and canals. However, no historical instances of flooding at the site are referenced. Information from the PFRA will be referenced within **Section 3** where applicable.
- 2.23 The KCC PFRA Addendum⁷ has also been reviewed in the production of this FRA. The PFRA Addendum provides an update to the 2011 PFRA. Information from the PFRA Addendum will be referenced within **Section 3** where applicable.
- 2.24 Key findings from the PFRA Addendum include:
- i. There have been a number of notable floods from surface water, groundwater, and ordinary watercourses since 2011. The Addendum references 10 additional instances of flooding within the county, however, no historical instances of flooding at the site are referenced.
 - ii. KCC have undertaken a number of Surface Water Management Plans (SWMPs) since the 2011 PFRA. The PFRA Addendum states that the SWMP for the Folkestone and Hythe district showed there are significant flood risks associated with surface water runoff and from ordinary watercourses.
- 2.25 The Folkestone and Hythe SWMP is discussed in further detail below.

⁵ Level 1 Strategic Flood Risk Assessment (Herrington Consulting Limited, July 2015)

⁶ Preliminary Flood Risk Assessment (Kent County Council, September 2011)

⁷ Preliminary Flood Risk Assessment Addendum (Kent County Council, December 2017)

Local Flood Risk Management Strategy

- 2.26 A Local Flood Risk Management Strategy (LFRMS) is prepared by a LLFA to help understand and manage flood risk at a local level.
- 2.27 The LFRMS aims to ensure that the knowledge of local flood risk issues is communicated effectively so that they can be better managed. The LFRMS also aims to promote sustainable development and environmental protection.
- 2.28 The Kent LFRMS 2024-2034⁸ has been reviewed and no applicable information in relation to flood risk at the site was identified.

River Basin Flood Risk Management Plan

- 2.29 Flood Risk Management Plans (FRMPs) explain the risk of flooding from rivers, the sea, surface water, groundwater, and reservoirs. FRMPs set out how risk management authorities will work with communities to manage flood and coastal risk. Risk management authorities include the EA, Natural Resources Wales, local councils, internal drainage boards, Highways England and LLFAs.
- 2.30 The first FRMPs were published in March 2016. They describe actions to manage flood risk across England between 2015 to 2021. The next revisions have subsequently been published at the end of 2022 which cover the ongoing period of 2021 to 2027.
- 2.31 The site is located within the South East River Basin District, and the South East River Basin FRMP⁹ has been reviewed. However, there are no relevant site scale objectives which relate to the site location.

Surface Water Management Plan

- 2.32 SWMPs are non-statutory plans which preceded the introduction of the Flood and Water Management Act 2010. They can provide an important evidence base of local flood risk issues which can include surface water drains, groundwater and small watercourses.
- 2.33 The Folkestone & Hythe SWMP¹⁰ plan has been reviewed, however, the SWMP focuses on the coastline between Dymchurch and Folkestone which is approximately 6.4km east of the site at its closest point. Therefore, the proposed application site is not located within the SWMP study area.
- 2.34 Although the KCC PFRA Addendum states that there are significant flood risks associated with surface water runoff and from ordinary watercourses within the Folkestone and Hythe district. A review of the SWMP shows this risk is associated with the district's urban areas, and the ordinary watercourses are not associated with the Romney Marshes. Therefore, no applicable information in relation to flood risk at the site was identified.

⁸ Local Flood Risk Management Strategy 2024-2034 (Kent County Council, June 2024)

⁹ South East River Basin District Flood Risk Management Plan 2021 to 2027 (Environment Agency, December 2022)

¹⁰ Folkestone & Hythe Surface Water Management Plan - Stage 1 (JBA Consulting, November 2012)

Section 19 Flood Investigation Reports

- 2.35 Under their duties of the Flood and Water Management Act 2010, LLFAs have a responsibility to publish reports of investigations of flood incidents. A Section 19 flood investigation report is a public statement of the circumstances of a historical flood event and what parties have a role in managing the risks. The investigation does not always give an in-depth analysis of the flood risk or mechanisms, but it can provide a valuable record of past events.
- 2.36 KCC have published 19 Section 19 reports on their website, which document the flooding that occurred between 2012 and 2023. The reports have been reviewed in relation to the site's location, but no evidence of flooding at the site was identified.

Local Plan

- 2.37 The Folkstone and Hythe District Council Core Strategy Review¹¹ and the Places & Policies Local Plan¹² have been reviewed in the production of this FRA. The Core Strategy Review takes into account the Places & Policies Local Plan development allocations and sets new development targets up until 2037. Key policies from the Core Strategy Review and Places & Policies Local Plan are outlined below.

Folkstone and Hythe District Council Core Strategy Review

Policy CSD5 – Water and Coastal Environmental Management

- 2.38 Development should contribute to sustainable water resource management which maintains or improves the quality and quantity of surface and ground water bodies, and where applicable, the quality of the coastal environment and bathing waters.

Folkstone and Hythe District Council Places & Policies Local Plan

Policy CC3 – Sustainable Drainage Systems (SuDS)

- 2.39 Development will be permitted where:
- Surface water is managed close to its source and on the surface where reasonably practicable to do so.
 - The features that manage surface water are commensurate with the design of the development in terms of size, form and materials and make an active contribution to place-making.
 - Surface water management features are multi-functional wherever possible in their land use.
 - There is no discharge from the developed site for rainfall depths up to 5mm of any rainfall event.
 - The run-off from all hard surfaces receives an appropriate level of treatment in accordance with SuDS guidelines.

¹¹ Folkstone and Hythe District Council Core Strategy Review (Folkstone and Hythe District Council, March 2022)

¹² Folkstone and Hythe District Council Places & Policies Local Plan (Folkstone and Hythe District Council, September 2020)

Other Relevant Policy and Guidance

- 2.40 This FRA has considered the following document when assessing sources of flood risk and when recommending mitigation and resilience measures.

Flood Risk to People and New Developments

- 2.41 The Flood Risk to People (FD2321/TR1)¹³ document was prepared as a research project considering flood hazard and factors that affect it.
- 2.42 FRA Guidance for New Development (FD2320/TR2)¹⁴ provides a framework and guidance for assessing and managing flood risks for new developments and sets flood hazard thresholds.
- 2.43 Hazard ratings are derived using the following equation in line with the above:

$$\text{Hazard Rating} = D * (V+0.5) + DF$$

Where:
D = depth
V = velocity
DF = debris factor

- 2.44 A supplementary note¹⁵ provides clarification of the hazard rating thresholds which should be used for development planning and control use. **Table 2.5** identifies the thresholds of the flood hazard categories.

Table 2.5: Hazard to People¹⁶

Threshold for Flood Hazard Rating	Degree of Flood Hazard	Description
< 0.75	Low	Caution "Flood zone with shallow flowing water or deep standing water"
0.75 - 1.25	Moderate	Danger for some (i.e.: children, the elderly and the infirm) "Danger: Flood Zone with deep or fast flowing water"
1.25 - 2.0	Significant	Danger for most (includes the general public) "Danger: Flood Zone with deep fast flowing water"
2.0 >	Extreme	Danger for all (includes the emergency services) "Extreme Danger: Flood Zone with deep fast flowing water"

¹³ Flood Risk to People Methodology (FD2321/TR1), Defra/Environment Agency, 2006

¹⁴ Flood Risk Assessment Guidance for New Development (FD2320/TR2), Defra/Environment Agency, 2005

¹⁵ Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purpose – Clarification of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1. (http://randd.defra.gov.uk/Document.aspx?Document=FD2321_7400_PR.pdf)

¹⁶ 2008, DEFRA, Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purposes.

3. POTENTIAL SOURCES OF FLOOD RISK

- 3.1 Flooding can occur from a variety of sources, or combination of sources, which may be natural or artificial. **Table 3.1** below identifies the potential sources of flood risk to the site in its current condition, and the impacts which the development could have in the wider catchment, prior to mitigation. These are discussed in greater detail in the forthcoming section. The mitigation measures proposed to address flood risk issues and ensure the development is appropriate for its location are discussed within **Section 4**.

Table 3.1: Pre-Mitigation Sources of Flood Risk

Flood Source	Potential Risk				Description
	High	Medium	Low	None	
Tidal			X		The site is located in Flood Zone 3 attributed to tidal sources. However, defended model results show the site to be located outside of the 1 in 200-year plus climate change design tidal floodplain. The site is at a residual risk of a breach and overtopping of defences scenario.
Fluvial			X		The water levels within the watercourses surrounding the site are maintained by external sources, and are therefore, considered to pose a low risk of flooding.
Canals			X		The Royal Military Canal is located approximately 4.7km north of the site.
Groundwater			X		The site is shown to fall within an area predicted to be at a low susceptibility to groundwater flooding.
Reservoirs and waterbodies			X		The site is shown to fall outside of the area at risk of reservoir failure.
Pluvial runoff			X		The site is shown to be at an overall low risk of pluvial flooding.
Sewers				X	There are no sewers present within the site or surrounding area.
Effect of Development			X		Development will not result in impedance/loss of fluvial or surface water flow routes.

Flood Source	Potential Risk				Description
	High	Medium	Low	None	
on Wider Catchment			X		The development will marginally increase the area of impermeable surfaces leading to a potential increase in runoff.

Tidal Flood Risk

- 3.2 Inundation of low lying coastal areas by the sea may be caused by seasonal high tides, storm surges and storm driven wave action. Tidal flooding is most commonly a result of a combination of two or more of these mechanisms, which can result in the overtopping or breaching of sea defences.
- 3.3 River systems may also be subject to tidal influences. Inundation of low-lying areas may occur where river systems are influenced by seasonal high tides, storm surges and storm driven wave action.
- 3.4 The site is located approximately 2km northwest of St Mary's Bay and the Kent coastline. The site is also located within the vicinity of an EA Main River (Clobsden Sewer), IDB maintained watercourses, and ordinary watercourses. Consultation with the Romney Marshes Area IDB confirms that all the watercourses within the Romney Marsh Area drain via gravity and are ultimately reliant on tidal influence. Therefore, the main risk to the site is of tidal influence.

Historical Flood Risk

- 3.5 EA consultation and the EA Historical Flood Map confirm there are no recorded flood outlines which have impacted the site.
- 3.6 The 'Historic Flooding Maps' appended to the Shepway District Council Level 1 SFRA shows there are no previously recorded flood events which have impacted the site or immediate surrounding area.
- 3.7 The 'Recorded Past Flood Events' map appended to the KCC PFRA shows there no previously recorded flood events which have impacted the site or immediate surrounding area.
- 3.8 KCC have provided historical flood data as part of their consultation. The records show there are no historical tidal flood events which have impacted the site or surrounding area.

Flood Map for Planning

- 3.9 As shown in **Figure 2.1**, the site is located entirely within Flood Zone 3 attributed to tidal sources. However, while the site is located within Flood Zone 3, this is based on undefended model extents. The Flood Map for Planning also identifies the site to be located in an area where there is a "reduction in risk of flooding from rivers and sea due

to defences", therefore, the actual flood risk to the site is reduced due to flood defences associated with the St Mary's Bay Sea Defence Scheme which provide a 1 in 150-year Standard of Protection (SoP) according to the EA 'AIMS Spatial Flood Defences' dataset.

- 3.10 The Shepway District Council Level 1 SFRA states that due to the tidal influence and the flat nature of the marshes, the flow within the IDB maintained watercourses and ordinary watercourses is maintained by intensive human intervention. Due to the number of parameters which affect fluvial flows within this region, fluvial flood risk has not been directly assessed, but the topography of the area means that the dominant source of flooding is tidal.
- 3.11 Therefore, to assess the risk of tidal flooding at the site over the lifetime of the proposed development, hydraulic model information has been obtained from two studies. The models used in this assessment are as follows:
- The Romney Marsh Tidal Mapping Study¹⁷, completed by JBA Consulting in June 2020 provided by the EA.
 - The breach and overtopping of defences model completed in 2015 as part of the Shepway District Council Level 1 SFRA.

Romney Marsh Tidal Mapping Study

- 3.12 The Romney Marsh Tidal Mapping study model information was provided by the EA and all data is included as **Appendix 4**. As part of this study the model was simulated for the 1 in 200-year and 1 in 1000-year events and included both undefended and defended extents for the present day (2018) and future scenarios (2070 and 2115 epochs).
- 3.13 As the development has an anticipated lifetime of up to 40 years (sea level rise up to 2065), the site will be assessed against the 2070 epoch scenario, with the 2115 epoch used as an extreme event.
- 3.14 Without the presence of flood defences considered, the site is shown to become completely inundated during all simulated events, including the 1 in 200-year and larger magnitude events.
- 3.15 Under normal operating conditions, the site benefits from the presence of flood defences which provide a 1 in 150-year SoP. The defended modelled flood extents are displayed in **Figure 3.1**.

¹⁷ Romney Marsh Breach and Flood Forecasting (JBA Consulting, June 2020)

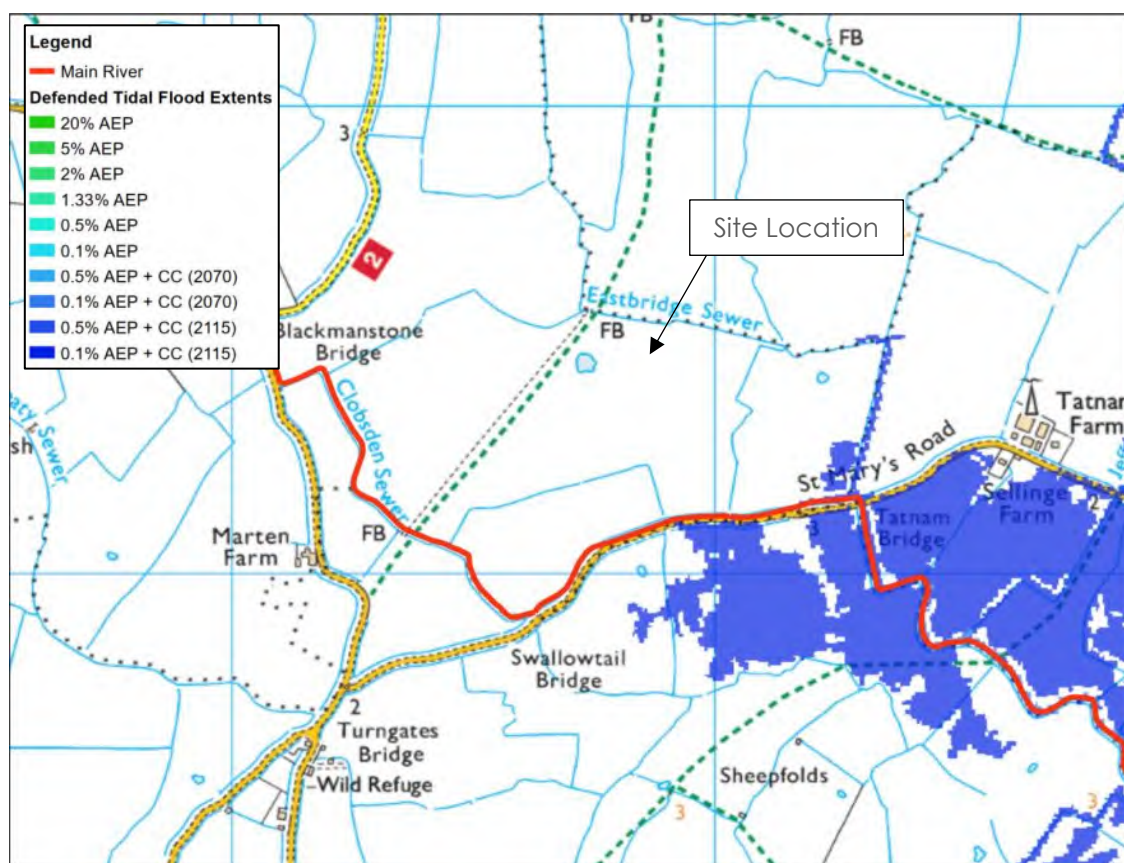


Figure 3.1: Romney Marsh Tidal Mapping Study Defended Model Extents

- 3.16 The modelling shows that the site is at an overall low risk of tidal flooding under normal, defended conditions. The site is shown to be removed from the tidal floodplain for all modelled events up to and including the 1 in 200-year 2070 epoch design event, and the extreme 1 in 1000-year 2115 epoch scenario. The site is shown to be located outside of the design event floodplain, and therefore, considered to be safe for its lifetime.
- 3.17 A breach of defences scenario was also undertaken to determine the impact on the site should a partial failure or collapse occur. A number of breach events were modelled at various locations along the Romney Marsh Coast, the site falls within the Hythe Ranges breach scenario, modelled as a 200m wide breach of the coastal defences at Hythe approximately 6.5km east of the site. The breach extents are shown in **Figure 3.2**.
- 3.18 **Figure 3.2** shows that during a breach event, the site is located outside of the 1 in 200-year 2070 epoch design event. The site is also shown to be partially at risk of flooding during the extreme 1 in 200-year 2115 epoch scenario, being subject to depths of up to 0.26m during the breach event. Overall, the site is considered to be at a low risk of tidal flooding during a breach.

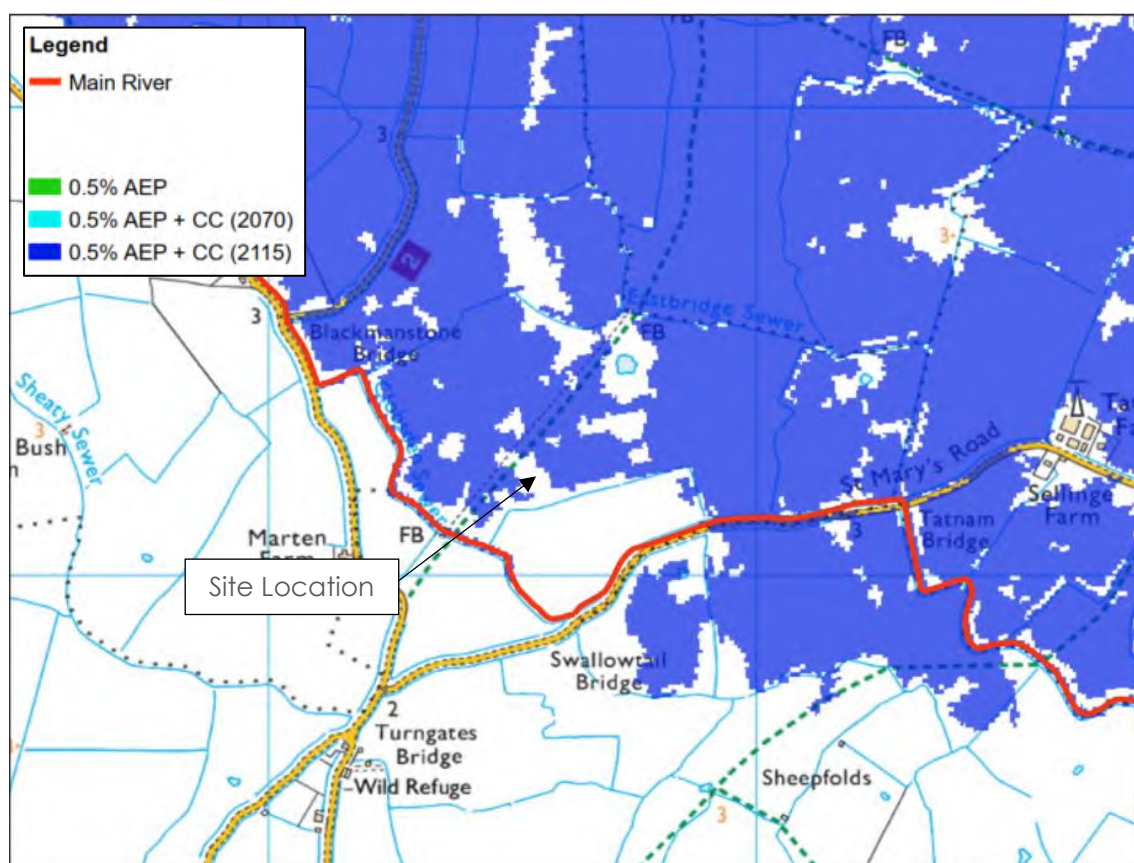


Figure 3.2: Romney Marsh Tidal Mapping Study Hythe Ranges Breach Scenario Model Extents

Breach and Overtopping of Defences Modelling (Shepway District Council Level 1 SFRA)

- 3.19 Breach and overtopping of defences modelling was also undertaken as part of the Shepway District Council Level 1 SFRA, as at the time of writing in 2015, there were no modelling studies which quantified the extent of flooding attributed to an extreme flood event. This modelling study has also been reviewed as part of the FRA as it includes different breach scenarios not undertaken as part of the Romney Marsh Tidal Mapping study.
- 3.20 The model was simulated for the 1 in 200-year and 1 in 1000-year events and included breach scenarios for the present day (2015) and future scenarios (2075 and 2115 epochs). As above, the site will be assessed against the 2075 epoch scenario, with the 2115 epoch used as an extreme event.
- 3.21 Breach of defences scenarios were undertaken at multiple locations, including 50m breaches at St Mary's Bay Pirate Springs and Dunstall Lane, located approximately 2.75km south east of the site and approximately 2km south east of the site respectively.
- 3.22 To reduce the complexity of the results, all breach and overtopping outputs have been combined to give a hazard rating, thus providing a conservative approach. Extracts of mapping for the 2075 and 2115 epoch scenarios are included as **Figure 3.3**, and **Figure 3.4**.

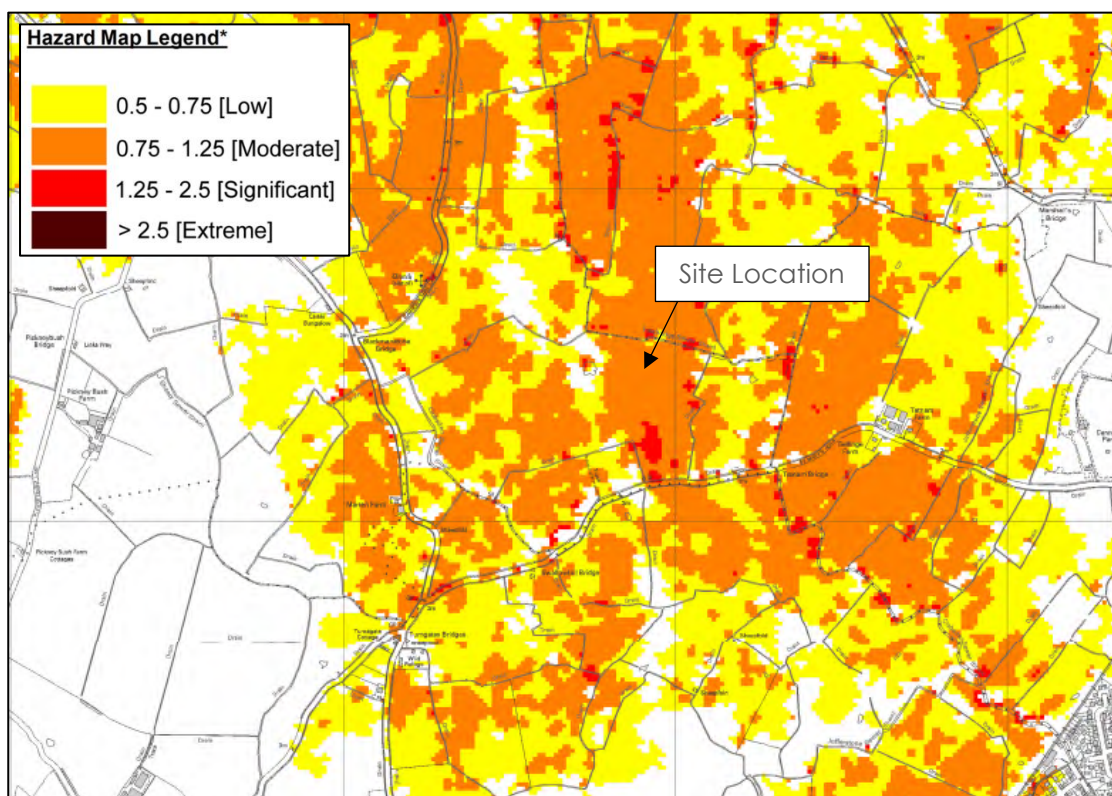


Figure 3.3: Shepway District Council Level 1 SFRA Breach and Overtopping of Defences Hazard Mapping (2075 Epoch)

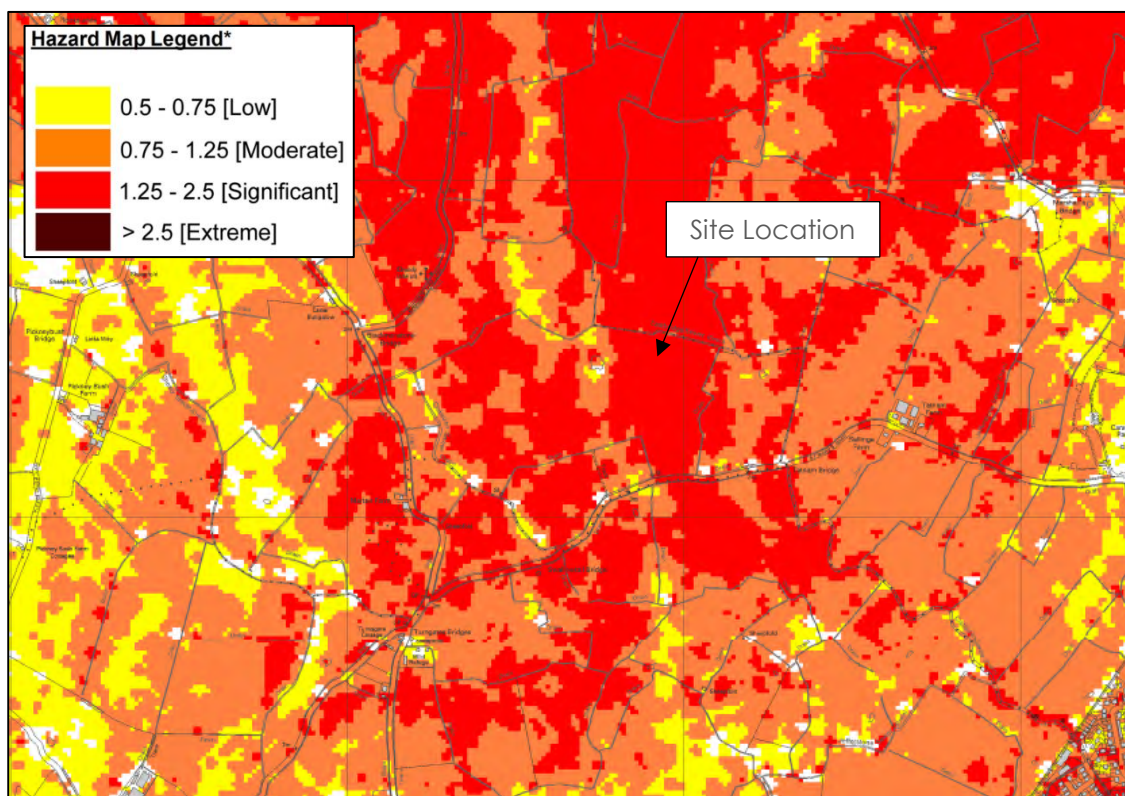


Figure 3.4: Shepway District Council Level 1 SFRA Breach and Overtopping of Defences Hazard Mapping (2115 Epoch)

- 3.23 The model outputs show that the site is not at risk of flooding during the present day breach and overtopping scenario. However, the site is shown to be at an overall low (caution) to moderate (danger for some) hazard, with small areas at a significant hazard (danger for most) hazard during the 2075 epoch design event as per definitions within **Table 2.5**. The site is also shown to be at an overall low to significant (danger for most) hazard during the extreme 2115 epoch scenario.
- 3.24 The St Mary's Bay Sea Defence Scheme is owned and maintained by the EA who have ultimate responsibility for the safety and management of their assets. Based on the safety legislation in place and the maintenance and repair responsibilities of the responsible authorities, the likelihood of a significant failure is expected to be low.
- 3.25 Therefore, based on the model results, the site is considered to be at an overall low risk of tidal flooding due to the presence of tidal flood defences in normal conditions. However, the site is shown to be at a residual risk of flooding during a breach/overtopping scenario. Appropriate mitigation measures are discussed within **Section 4**.

Fluvial Flood Risk

- 3.26 Flooding from watercourses occurs when flows exceed the capacity of the channel, or where a restrictive structure is encountered, which leads to water overtopping the banks into the floodplain. This process can be exacerbated when debris is mobilised by high flows and accumulates at structures.
- 3.27 As previously mentioned, the site is located within the vicinity of an EA Main River (Clobsden Sewer), IDB maintained watercourses, and ordinary watercourses. The topographical survey shows the watercourses within, and surrounding, the site to have a maximum depth of up to 2m. All watercourses are understood to drain via gravity in a southerly direction and eventually outfall to the English Channel. The watercourse designations within, and surrounding, the site are shown in **Figure 3.5**.

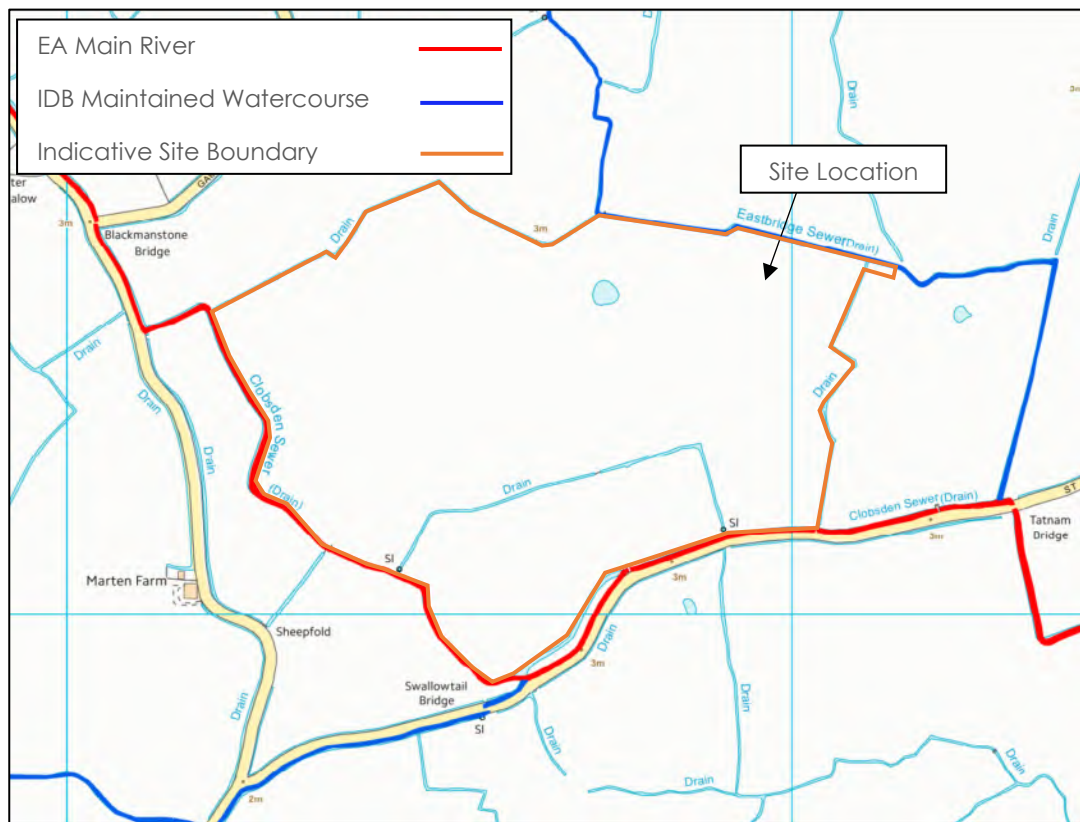


Figure 3.5: Watercourse Network in Site Vicinity (provided by Romney Marshes Area IDB)

- 3.28 The main flood risk to the site is understood to be tidal, therefore, the primary flood risk is understood to be assessed within the '**Tidal Flood Risk**' section above.
- 3.29 To assess the watercourses in isolation, the EA Risk of Surface Water (RoFSW) mapping can be used to provide an indication of the potential floodplain associated with watercourses. An extract of mapping is included as **Figure 3.6**.

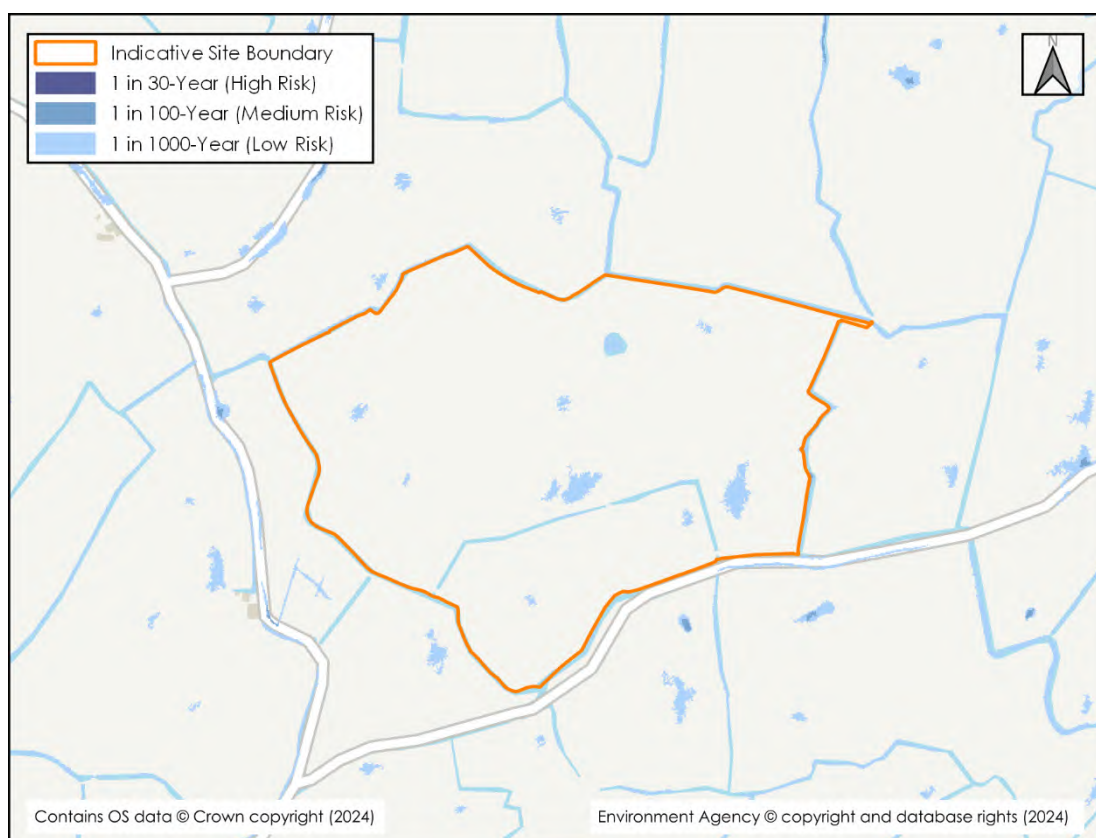


Figure 3.6: Risk of Surface Water Mapping

- 3.30 **Figure 3.6** shows the surface water extents attributed to the watercourses pose little risk to the site, with low risk flows shown to be contained to the watercourse channels.
- 3.31 A National Character Area profile undertaken by Natural England¹⁸ states that the movement of water within the Romney Marshes is controlled by water levels within the Royal Military Canal and tidal locks. This ultimately controls the flow of water within the marshes and makes them a relatively low flood risk.
- 3.32 In the event of exceedance, flows are expected to be conveyed in a southerly direction following the general topography of the area. However, given the flat nature of the marshes, flows are likely to be held within the site and surrounding area until the water levels within the watercourses naturally lower and can freely drain.
- 3.33 Overall, the site is considered to be at a low risk of flooding from fluvial sources.

Pluvial Flood Risk

- 3.34 Pluvial flooding can occur during prolonged or intense storm events when the infiltration potential of soils, or the capacity of drainage infrastructure is overwhelmed leading to the accumulation of surface water and the generation of overland flow routes.
- 3.35 RoFSW mapping has been collated and published by the EA, this shows the potential flooding which could occur when rainwater does not drain away through the normal

¹⁸ National Character Area Profile: 123. Romney Marshes (Natural England, 2013)

drainage systems or soak into the ground, but lies on or flows over the ground instead. An extract from the mapping is included as **Figure 3.6**.

- 3.36 **Figure 3.6** shows the site to be at a very low risk of pluvial flooding, with small areas of low risk surface water ponding associated with existing topographical low points. Low risk pluvial flood extents are also shown to be contained within the watercourse surrounding the site.
- 3.37 Neither the Shepway District Council Level 1 SFRA or KCC PFRA report any historical surface water flood events which have impacted the site.
- 3.38 KCC have provided historical flood data as part of their consultation. The records show there have been eight previously recorded surface water flood events which have impacted St Mary's Road between 2010 and 2016. However, each of these events impacted a residential area located approximately 1.6km southeast of the site.
- 3.39 Overall, the site is considered to be at a low risk of surface water flooding.

Flood Risk from Canals

- 3.40 The Canal and River Trust (CRT) generally maintains canal levels using reservoirs, feeders and boreholes and manages water levels by transferring it within the canal system.
- 3.41 Water in a canal is typically maintained at predetermined levels by control weirs. When rainfall or other water enters the canal, the water level rises and flows out over the weir. If the level continues rising it will reach the level of the storm weirs. The control weirs and storm weirs are normally designed to take the water that legally enters the canal under normal conditions. However, it is possible for unexpected water to enter the canal or for the weirs to become obstructed. In such instances the increased water levels could result in water overtopping the towpath and flowing onto the surrounding land.
- 3.42 Flooding can also occur where a canal is impounded above surrounding ground levels and the retaining structure fails.
- 3.43 The nearest canal to the site is the Royal Military Canal, located approximately 4.7km north of the site. A review of EA LiDAR data shows the canal is raised approximately 1m above the site and the surrounding Romney marshes.
- 3.44 The Shepway District Council Level 1 SFRA reports one previous flood event of the Royal Military Canal. The event occurred in December 2002 and is attributed to prolonged rainfall and high tidal levels which stopped the canal discharging to the sea, causing the canal to overtop. This impacted Hythe located approximately 9.4km east of the site.
- 3.45 Should a canal exceedance event occur, flows are expected to be conveyed in a southerly direction towards the marshes and the site. However, given the significant distance between the site and the canal, flows are expected to be intercepted by the ordinary watercourses within the marshes before reaching the site.

- 3.46 Due to the intervening watercourses, and the significant distance between the site and the Royal Military Canal, canals are considered to pose a low flood risk to the site.

Groundwater Flood Risk

- 3.47 Groundwater flooding occurs when the water table rises above ground elevations, or it rises to depths containing basement level development. It is most likely to happen in low lying areas underlain by permeable geology. This is most common on regional scale chalk aquifers, but there may also be a risk on sandstone and limestone aquifers or on thick deposits of sands and gravels underlain by less permeable strata such as that in a river valley.
- 3.48 British Geological Survey (BGS) mapping shows the site is entirely underlain by Tunbridge Wells Sand Formation (Sandstone), which is classified by the EA as a Secondary A Aquifer. Secondary A aquifers are described as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in sometimes forming an important baseflow to rivers.
- 3.49 The site is also entirely underlain by superficial deposits of Tidal Flat Deposits (Clay and Silt), which are classified by the EA as both a Secondary A Aquifer and Unproductive Strata. Unproductive Strata are largely unable to provide usable water supplies and are unlikely to have surface water and wetland ecosystems dependent on them.
- 3.50 The Shepway District Council Level 1 SFRA states that the district is located within a low risk groundwater area. However, the high level mapping does not consider localised causes of groundwater flooding associated with man-made watercourses and tidal flat deposits.
- 3.51 The 'Groundwater Risk Areas' mapping appended to the KCC PFRA shows the site is located within an area considered to be at a negligible risk of groundwater flooding. It should be noted that the mapping is based on strategic scale mapping that uses a 1km² grid. It identifies areas susceptible to flooding from groundwater at a broad scale on the basis of geological and hydrogeological conditions. Therefore, the classification could potentially be based on another area within the cell.
- 3.52 There are no previously recorded groundwater flood events which have impacted the site or immediate surrounding area reported within the Shepway District Council Level 1 SFRA or KCC PFRA.
- 3.53 The BGS holds historical records of borehole samples across the UK which include measurements of groundwater levels taken during the sample. These are measurements taken at one point in space and time and are not a substitute for a long-term record of groundwater levels. However, they can provide an indication of groundwater levels that could potentially be experienced.
- 3.54 There are no borehole records available within the site. However, there are five borehole logs available within a 2km radius of the site taken in 1962 and underlain by similar bedrock geology (references: TR02NE3, TR02NE4, TR02NE9, TR02NE10, and TR02NE31) which may be used to indicate conditions at the site. A summary of the logs is provided within **Table 3.2**.

Table 3.2: Borehole Logs

Borehole Log	Depth of Excavation (mbgl)	Depth of Water Strike (mbgl)
TR02NE3	5.2	2.9
TR02NE4	4.9	2.0
TR02NE9	5.2	1.8
TR02NE10	3.1	2.4
TR02NE31	3.7	1.3

- 3.55 Overall, the site is considered to be at a low risk of groundwater flooding. However, due to the presence of shallow groundwater found in borehole logs near the site underlain by similar bedrock, there may be some residual risk of groundwater flooding. Appropriate mitigation measures will be discussed in **Section 4**.

Flood Risk from Reservoirs & Large Waterbodies

- 3.56 Flooding can occur from large waterbodies or reservoirs if they are impounded above the surrounding ground levels or are used to retain water in times of flood. Although unlikely, reservoirs and large waterbodies could overtop or breach leading to rapid inundation of the downstream floodplain.
- 3.57 To help identify this risk, reservoir failure flood risk mapping has been prepared by the EA and included as **Figure 3.7**, this shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. The map displays a worst-case scenario and is only intended as a guide.
- 3.58 There are two flooding scenarios shown on the reservoir flood maps: a 'dry-day' and a 'wet-day'. The 'dry-day' scenario predicts the flooding that would occur if the dam or reservoir failed when rivers are at normal levels. The 'wet-day' scenario predicts how much worse the flooding might be if a river is already experiencing an extreme flood.

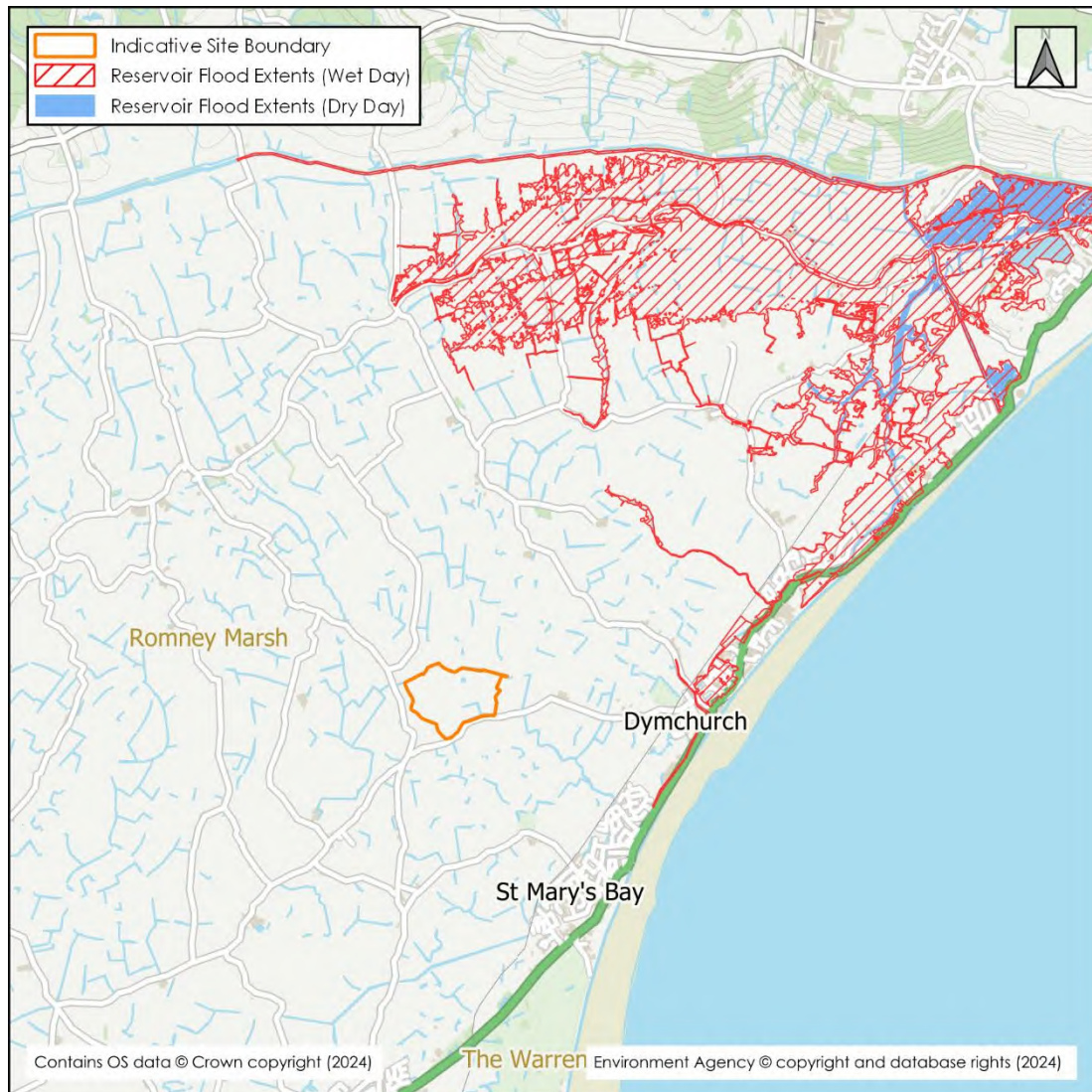


Figure 3.7: Reservoir Failure Flood Map

- 3.59 **Figure 3.7** shows the site to be located outside of the reservoir failure extents for both 'dry-day' and 'wet-day' scenarios. The nearest failure extent is located approximately 2km east of the site attributed to the Mill Leese Flood Storage Reservoir.
- 3.60 A review of OS mapping shows there are no large waterbodies within the vicinity of the site.
- 3.61 Due to the significant distance between the site and the nearest reservoir failure extents, the site is considered to be at low risk of flooding from reservoirs and large waterbodies.

Flood Risk from Sewers

- 3.62 Sewer flooding can occur when the capacity of the infrastructure is exceeded by excessive flows, or as a result of a reduction in capacity due to collapse or blockage, or if the downstream system becomes surcharged. This can lead to the sewers flooding onto the surrounding ground via manholes and gullies, which can generate overland flows.

- 3.63 The local sewerage undertaker is Southern Water, a copy of their asset plans is included as **Appendix 5**.
- 3.64 Due to the remote nature of the site, the records show that there are no public sewerage assets located within the site or surrounding area.
- 3.65 Neither the Shepway District Council Level 1 SFRA or KCC PFRA report any historical sewer flood events which have impacted the site.
- 3.66 Overall, the flood risk posed to the site by sewers is considered to be negligible.

Effect of Development on Wider Catchment

Displacement of Floodplain and Impedance of Flood Flows

- 3.67 The site is located entirely within Flood Zone 3 attributed to tidal sources. However, the actual flood risk to the site is reduced due to flood defences associated with the St Mary's Bay Sea Defence Scheme which provide a 1 in 150-year SoP.
- 3.68 The site is shown to be located outside of the defended tidal flood extents during the 1 in 200-year 2070 epoch design event, and at a very low risk of surface water flooding. Therefore, no floodplain will be displaced under normal defended conditions, and no flows will be impeded as a result of the proposed development.

Development Land Use/Drainage Considerations

- 3.69 The runoff regime will not be significantly impacted as a result of the proposed development.
- 3.70 The proposed development will result in a negligible increase in impermeable surfaces, leading to a minor increase in runoff rates and volumes. Appropriate mitigation measures to manage the residual risks are discussed in **Section 4**.

4. FLOOD RISK MITIGATION

- 4.1 **Section 3** has identified the sources of flooding which could potentially pose a risk to the site and the proposed development. This section of the FRA sets out the mitigation measures which are to be incorporated within the proposed development to address and reduce the risk of flooding to within acceptable levels.

Sequential Arrangement

- 4.2 The site is located entirely within Flood Zone 3; however, the site is shown to be located outside of the defended tidal flood extents during the 1 in 200-year 2070 epoch design event and at a very low risk of surface water flooding. The proposed development is therefore considered to be sequentially arranged.

Groundwater Flood Risk

- 4.3 Based on the presence of shallow groundwater found in borehole logs near the site underlain by similar bedrock, the site may be at a residual risk of groundwater flooding.
- 4.4 Should groundwater be encountered during construction of the solar farm development, a groundwater specialist should be appointed, and appropriate dewatering procedures should be employed as necessary.
- 4.5 Foundation types used for solar panels should be designed with appropriate consideration of the onsite groundwater levels.

Development Levels

- 4.6 Due to the residual risk of flooding from tidal, fluvial and groundwater sources, it is proposed that the solar panels will be raised upon a steel frame with the lowest edge of the solar array being a minimum of 600mm above the surrounding ground level. Given the site is subject to depths of up to 260mm during the extreme 1 in 200-year 2115 epoch scenario, this is considered to provide appropriate mitigation against this residual risk.
- 4.7 It is recommended that the ancillary equipment associated with the solar development are raised 150mm above the external ground level. External levels adjacent to the ancillary equipment should be profiled away from the equipment to provide further mitigation against the residual risk of flooding.

Watercourse Easements

- 4.8 The site is bound by a designated EA Main River, an IDB maintained watercourse, and an ordinary watercourse flows through the site. A 8m easement should be applied from the top of bank of all EA Main Rivers for maintenance access.
- 4.9 The Shepway District Council Level 1 SFRA states that for all developments within 8m of an IDB watercourse will require consent from the Romney Marshes Area IDB.

Safe Access and Egress

- 4.10 The site access and egress route is shown to be at an overall low risk of flooding attributed to all sources. Therefore, safe access and egress can be achieved.
- 4.11 The access route is shown to be at a residual risk of tidal flooding during a breach event. Should a breach event occur, it is likely that there will be sufficient warning time and prior evacuation allowing safe access and egress to occur. Further information on evacuation procedures are outlined below.

Flood Contingency Plan and Evacuation Procedures

Flood Warning and Evacuation

- 4.12 The site is located entirely within the EA flood alert and warning area known as 'Coast from Folkestone to St Mary's Bay'. It is recommended that the site owners and visitors sign up to these services. Due to the nature of tidal flooding, it is likely that there will be sufficient warning time and prior evacuation and actions can be implemented.
- 4.13 As the solar farm is expected to operate without constant on-site supervision, it is not expected that people will frequently be on-site. Therefore, the flood warnings and alerts should be used to inform when visiting the site should be avoided.

Surface Water and Foul Water Drainage

- 4.14 The runoff regime will not be significantly impacted as a result of the proposed development. An assessment of the surface water drainage regime has been undertaken within the accompanying Drainage Strategy (DS, reference: SMM-BWB-ZZ-XX-RP-CD-0001_DS).
- 4.15 No foul water flows will be produced as a result of the proposed development. Therefore, no foul water drainage provision is required.

5. CONCLUSIONS AND RECOMMENDATIONS

- 5.1 This FRA has been prepared in accordance with requirements set out in the NPPF and the associated PPG. The FRA has been produced on behalf of Enviromena Project Management UK Limited in respect of a planning application for the proposed construction of a temporary solar farm at St Mary's in the Marsh, Romney Marsh, Kent.
- 5.2 This FRA is intended to support a full planning application, the level of detail included is commensurate and subject to the nature of the proposals at the planning stage.
- 5.3 This report demonstrates that the proposed development is not at significant flood risk, subject to the recommended flood mitigation strategies being implemented. The identified risks and mitigation measures are summarised within **Table 5.1**:

Table 5.1: Summary of Flood Risk Assessment

Flood Source	Risk & Proposed Mitigation Measures
Tidal	The site is located entirely within Flood Zone 3 attributed to tidal sources. However, the Flood Zones are undefended extents which do not account for the influence of flood defences within the area. To assess the tidal risk to the site hydraulic model information has been obtained from two studies: the Romney Marsh Tidal Mapping Study and the breach and overtopping of defences model completed as part of the Shepway District Council Level 1 SFRA. Results from the Romney Marsh Tidal Mapping Study show the site to be at an overall low risk of tidal flooding. The site is shown to be removed from the floodplain for all defended modelled events up to and including the 1 in 200-year 2070 epoch design event, and the extreme 1 in 1000-year 2115 epoch scenario. The results show that during a breach event the site is located outside of the 1 in 200-year 2070 epoch design event flood extents, however, the site is partially at risk of flooding during the extreme 1 in 200-year 2115 epoch scenario. Results from the breach and overtopping of defences model completed as part of the Shepway District Council Level 1 SFRA show the site is not at risk of flooding during the present day breach and overtopping scenario. However, the site is shown to be at an overall low (caution) to moderate (danger for some) hazard, with small areas at a significant hazard (danger for most) hazard during the 2075 epoch design event. The site is also shown to be at an overall low to significant (danger for most) hazard during the extreme 2115 epoch scenario. Overall, the site is considered to be at a low tidal flood risk with residual risk in the breach and overtopping scenarios. Due to residual flood risks from tidal, fluvial and groundwater sources, the lower edges of the proposed solar panels are to be raised a minimum of 600mm above surrounding ground levels. It is also recommended that the ancillary equipment associated with the solar development are raised 150mm above the external ground level. External levels adjacent to the ancillary equipment should be profiled away from the equipment to provide further mitigation against the residual risk of flooding.

	The site access and egress route is shown to be at an overall low risk of flooding attributed to all sources. Therefore, safe access and egress can be achieved. The access route is shown to be at a residual risk of tidal flooding during a breach event. Should a breach event occur, it is likely that there will be sufficient warning time and prior evacuation allowing safe access and egress to occur. The site is located entirely within the EA flood alert and warning area known as 'Coast from Folkestone to St Mary's Bay'. It is recommended that the site owners and visitors sign up to these services. Due to the nature of tidal flooding, it is likely that there will be sufficient warning time and prior evacuation and actions can be implemented. As the solar farm is expected to operate without constant on-site supervision, it is not expected that people will frequently be on-site. Therefore, the flood warnings and alerts should be used to inform when visiting the site should be avoided.
Fluvial	The site is located within the vicinity of an EA Main River (Clobsden Sewer), IDB maintained watercourses, and ordinary watercourses. All watercourses are understood to drain via gravity in a southerly direction and eventually outfall to the English Channel. The main flood risk to the site is understood to be tidal. However, in order to assess the watercourses in isolation, the EA Risk of Surface Water (RoFSW) mapping has been used to provide an indication of the potential floodplain associated with the watercourses. The mapping shows the surface water extents attributed to the watercourses pose little risk to the site, with low risk flows shown to be contained to the watercourse channels. The movement of water within the Romney Marshes is controlled by water levels within Royal Military Canal and tidal locks. This ultimately controls the flow of water within the marshes and makes them a relatively low flood risk. In the event of exceedance of the watercourses, flows are expected to be conveyed in a southerly direction following the general topography of the area. However, given the flat nature of the marshes, flows are likely to be held within the site and surrounding area until the water levels within the watercourses naturally lower and can freely drain.
Groundwater	The site is at an overall low risk of groundwater flooding. However, based on the presence of shallow groundwater found in borehole logs near the site and underlain by similar bedrock, the site may be at a residual risk of groundwater flooding. Should groundwater be encountered during construction of the solar development, a groundwater specialist should be appointed, and appropriate dewatering procedures should be employed as necessary. Foundation types used for solar panels should be designed with appropriate consideration of the onsite groundwater levels.
Other Sources	The site has been assessed against other sources of flood risk including canals, reservoirs and large waterbodies, pluvial runoff, and sewers. None of these are considered to pose significant risk to the site and therefore no specific mitigation is considered to be required.
Impact of the Development	The site is shown to be located outside of the defended tidal flood extents during the 1 in 200-year 2070 epoch design event, and at a very low risk of surface water flooding. Therefore, no floodplain will be displaced under normal

	defended conditions, and no flows will be impeded as a result of the proposed development. The proposed development is not anticipated to have an adverse impact on the surface water runoff rate and volume. No foul water flows will be produced as a result of the proposed development.
This summary should be read in conjunction with BWB's full report. It reflects an assessment of the Site based on information received by BWB at the time of production.	

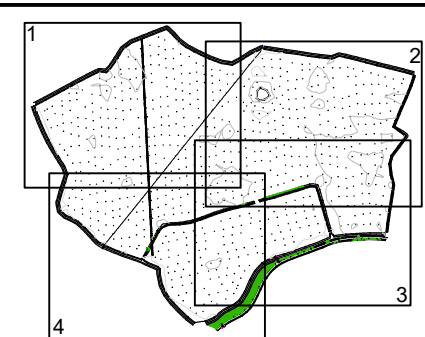
- 5.4 In compliance with the requirements of the NPPF, and subject to the mitigation measures proposed, the development could proceed without being subject to significant flood risk. Moreover, the development will not increase flood risk to the wider catchment area subject to suitable management of surface water runoff discharging from the site.

APPENDICES

Appendix 1: Topographical Survey

- Notes**
1. Do not scale this drawing. All dimensions must be checked/verified on site. If in doubt ask.
 2. This drawing is to be read in conjunction with all relevant architects, engineers and specialist drawings and specifications.
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 4. Any discrepancies noted on site are to be reported to the engineer immediately.
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 6. All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via OS smart net.
 7. All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space entry.
 8. OS license number: 100022432

Key Plan



Legend

- OS Buildings**
- Surveyed Buildings
 - Building
 - Wall
 - Kerb Channel Line
 - Top of Kerb
 - Edge of Surface
 - Top of Bank
 - Bottom of Bank
 - Canopy/Overhang
 - Line Marking
 - Centre Line
 - Watercourse
 - Centre Line
 - Barrier
 - Fence
 - Gate
 - Overhead Powerline
 - Overhead Utilities
- Contour Lines**
- Contour Lines
 - Flow direction and pipe diameter
 - Station and Name
 - Monitoring Borehole
 - Tree / Bush / Slipping
 - Area of Vegetation/Extent of Tree Canopy
 - Hedge
 - Body of Water
 - Body of Water from OS
 - Spot Level
 - Assumed Surface
 - Water Drainage Line
 - Surface Water Drainage Line
- AP** Anchor Point **FBW** Fence Barbed Wire **LB** Litter Bin
BO Back Gully **FCS** Fence Chain Board **LP** Lamp Post
BO Bollard **FCL** Fence Chain Link **MH** Manhole
BS Bus Stop **FEL** Fence Electric **MV** Service Marker
BT British Telecom **FMP** Fence Metal Panel **PS** Post Box
C Crest **FMR** Fence Metal Railing **PT** Post
CL Cover Level **FOS** Fence Open Board **RE** Road Eye
CMP Cable Marker **FPW** Fence Post & Wire **SP** Sign Post
Post **FSP** Fence Steel Plate/Post **ST** Stop Tap
CCTV/Security Camera **FWM** Fence Wire Mesh **SV** Stop Valve
CTV Cable TV **FFL** Finished Floor Level **TGB** Telephone
OC Drainage **FP** Flagpole **TL** Threshold Level
Channel **Gas** **Gas** **TL** **TL** **TL**
OK Drop Kerb **OV** Gas Valve **TL** **TL** **TL**
DP Down Pipe **GY** Gully **TP** Telegraph Post
ELC Electric **HS** Hedge **TS** Traffic Sign
EP Electricity Post **IC** Inspection Chamber **UTS** Unable to Survey
ER Earth Road **WL** Internal Floor Level **WS** Water Level
FH Fire Hydrant **IL** Invert Level **WM** Water Meter
FL Floodlight **(as a reduced level)** **WO** Wash Out

Station Coordinates			
Station Name	Easting (m)	Northing (m)	Height (m)
BWB01	607947.180	128903.945	2.375
BWB02	607712.504	128948.261	2.581
BWB03	607780.577	129056.730	2.703
BWB04	607924.692	129110.992	2.324

01	14.08.23	First Issue	DS	DS
Rev	Date	Details of issue / revision	Dw	Rev

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Client

Enviromena Property Management UK Limited

Project Title

St Mary in the Marsh

Drawing Title

Existing Site Plan
Sheet 1 of 4

Drawn:	D.Smith	Reviewed:	S.Shreeves
BWB Ref:	232827	Date:	14.08.23

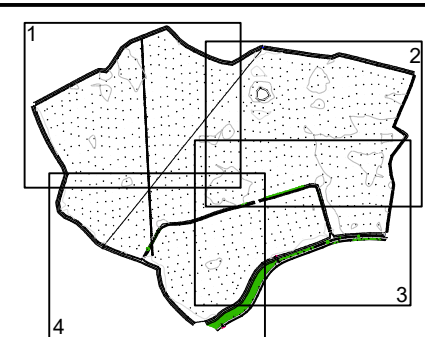
Drawing Status: Scales: A40 1:500

Information

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
SMM-BWB-00-01-DR-G-0001	S2	P1

- Notes**
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Key Plan



Legend

- OS Buildings**
- Building
 - Wall
 - Kerb Channel Line
 - Top of Kerb
 - Edge of Surface
 - Top of Bank
 - Bottom of Bank
 - Canopy/Overhang
 - Line Marking
 - Centre Line
 - Watercourse
 - Centre Line
 - Barrier
 - Fence
 - Gate
 - Overhead Powerline
 - Overhead Utilities
- Contour Lines**
- Contour Lines
 - Flow direction and pipe diameter
 - Station and Name
 - Monitoring Borehole
 - Tree / Bush / Slipping
 - Area of Vegetation/Extent of Tree Canopy
 - Hedge
 - Body of Water
 - Body of Water from OS
 - Spot Level
 - Assumed Surface
 - Water Drainage Line
 - Surface Water Drainage Line
- AP** Anchor Point **FBW** Fence Barbed Wire **LB** Litter Bin
BO Back Gully **FCS** Fence Chain Board **LP** Lamp Post
BO Bollard **FCL** Fence Chain Link **MH** Manhole
BS Bus Stop **FEL** Fence Electric **MS** Service Marker
BT British Telecom **FMP** Fence Metal Panel **PS** Post Box
C Crest **FMR** Fence Metal Railing **PT** Post
CL Canal Level **FOS** Fence Open Board **RE** Roadside Eye
CMP Cable Marker **FPW** Fence Post & Wire **SP** Sign Post
Post **FSP** Fence Steel Plate/Side **ST** Stop Tap
CCTV/Security Camera **FWM** Fence Wire Mesh **SV** Stop Valve
CCTV Cable TV **FVL** Finished Floor Level **TGB** Telephone
Drainage **FP** Flagpole **THL** Threshold Level
Channel **Gas** **Gas Valve** **TL** Traffic Light
OK Drop Kerb **GV** Gas Valve **TS** Traffic Sign
DP Down Pipe **GY** Gully **TP** Telegraph Post
Ele Electric **HS** Height **TS** Traffic Sign
EP Electricity Post **IC** Inspection Chamber **UTS** Unable to Survey
ER Earth Road **IL** Internal Floor Level **WL** Water Level
FH Fire Hydrant **IL** Invert Level **WM** Water Meter
FL Floodlight **WO** (as a reduced level) **WO** Wash Out

Station Coordinates			
Station Name	Easting (m)	Northing (m)	Height (m)
BWB01	607947.180	128903.945	2.375
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01	14.08.23	First Issue	DS	GS
Rev	Date	Details of issue / revision	Drw	Rev

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Project Title

St Mary in the Marsh

Drawing Title

**Existing Site Plan
Sheet 2 of 4**

Drawn:	D. Smith	Reviewed:	S. Shreeves
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BWB Ref:	232827	Date:	14.08.23	Scale/Alt:	1:500
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Drawing Status

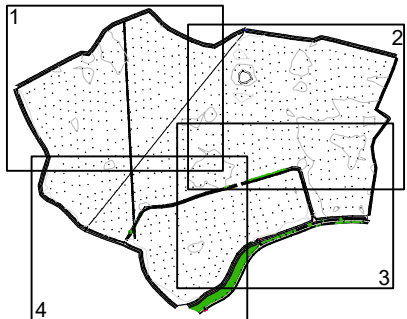
Information

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
SMM-BWB-00-02-DR-G-0001	S2	P1

Notes

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8. OS license number: 100022432

Key Plan



Legend

- OS Buildings

Surveyed Buildings

Building

Wall

Kerb Channel Line

Top of Kerb

Edge of Surface

Top of Bank

Bottom of Bank

Canopy / Overhang

Line Marking

Centre Line

Watercourse

Centre Line

Barrier

Fence

Gate

Overhead Powerline

Overhead Utilities

Contour Lines

Flow direction and pipe diameter

Station and Name

Monitoring Borehole

Tree / Bush / Sighting

Area of Vegetation/ Extent of Tree Canopy

Hedge

Body of Water

Body of Water from OS

Spot Level

Assumed Surface

Water Drainage Line

Surface Water Drainage Line
- AP Anchor Point

BG Back Gully

BO Bollard

BS Bus Stop

BT British Telecom

C Crest

CL Cover Level

CMP Cable Marker

CCTV/Security Camera

DC Drainage

CTV Cable TV

DK Drop Kerb

DP Down Pipe

Elc Electric

EP Electricity Post

ER Earth Rod

FH Fire Hydrant

FL Floodlight

FBW Fence Barbed Wire

FCB Fence Closed Board

FCL Fence Chain Link

FEL Fence Electric

FMP Fence Metal Panel

FMR Fence Metal Railing

FOW Fence Open Board

FPW Fence Post & Wire

FVM Fence Wire Mesh

IP Flagpole

Gas

GV Gas Valve

GY Gully

IC Inspection Chamber

IFL Internal Floor Level

IL Invert Level

LB Litter Bin

LP Lamp Post

MH Manhole

MV Service Marker

PS Post Box

PT Post

RE Rooding Eye

SP Sign Post

ST Stop Sign

SV Stop Valve

TCB Telephone

Call Box

THL Threshold Level

TL Traffic Light

TP Telegraph Post

TS Traffic Signal

UTS Unable to Survey

WL Water Level

WM Water Meter

WO Wash Out

Station Coordinates			
Station Name	Eastings (m)	Northings (m)	Height (m)
BWB01	607647.180	129903.945	2.375
BWB02	607712.504	129948.261	2.581
BWB03	607780.577	129056.736	2.703
BWB04	607924.662	129110.992	2.524

P1	14.08.23	First Issue	DS	BS
Rev	Date	Details of Issue / Revision	Dwn	Rev

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Project Title

St Mary in the Marsh

Drawing Title

Existing Site Plan
Sheet 3 of 4

Drawn:	D.Smith	Reviewed:	S.Shreeves
BWB Ref:	232827	Date:	14.08.23
Scale:	As Shown	Scale:	1:500

Information

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
SMM-BWB-00-03-DR-G-0001	S2	P1

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Key Plan



Legend

- OS Buildings
Surveyed Buildings
Building
Wall
Kerb Channel Line
Top of Kerb
Edge of Surface
Top of Bank
Bottom of Bank
Canopy / Overhang
Line Marking
Centre Line
Watercourse
Centre Line
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Fence
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Inspection Chamber
Flow direction and pipe diameter
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Monitoring Borehole
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Body of Water from OS
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Water Drainage Line
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- AP Anchor Point
BG Back Gully
BO Bollard
BS Bus Stop
BT British Telecom
C Crest
CL Cover Level
CMP Cable Marker
P Post
CCTV/Security Camera
DC Drainage
Channel
DK Drop Kerb
DP Down Pipe
Elec Electric
EP Electricity Post
ER Earth Rod
FH Fire Hydrant
FL Floodlight
- FBW Fence Barbed Wire
FCB Fence Closed Board
FCL Fence Chain Link
FEL Fence Electric
FMP Fence Metal Panel
FMR Fence Metal Railing
FOW Fence Open Board
FPW Fence Post & Wire
FWM Fence Wire Mesh
FPL Finished Floor Level
FP Flagpole
G Gas
GV Gas Valve
GY Gully
H Height
IC Inspection Chamber
IFL Internal Floor Level
IL Invert Level
L Litter Bin
LP Lamp Post
MH Manhole
MV Service Marker
PB Post Box
PT Post
RE Rodding Eye
SP Sign Post
SV Stop Valve
SY Stop Tap
TCB Telephone
Call Box
THL Threshold Level
TL Traffic Light
TS Traffic Signal
TP Telegraph Post
TSG Telegraph Signal
UTS Unable to Survey
W Water Level
WM Water Meter
WO Wash Out

Station Coordinates			
Station Name	Eastings (m)	Northings (m)	Height (m)
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P1	14.08.23	First Issue	DS	BS
Rev	Date	Details of revision / revision	Dwn	Rev

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**Enviromena Property
Management UK Limited**

St Mary in the Marsh

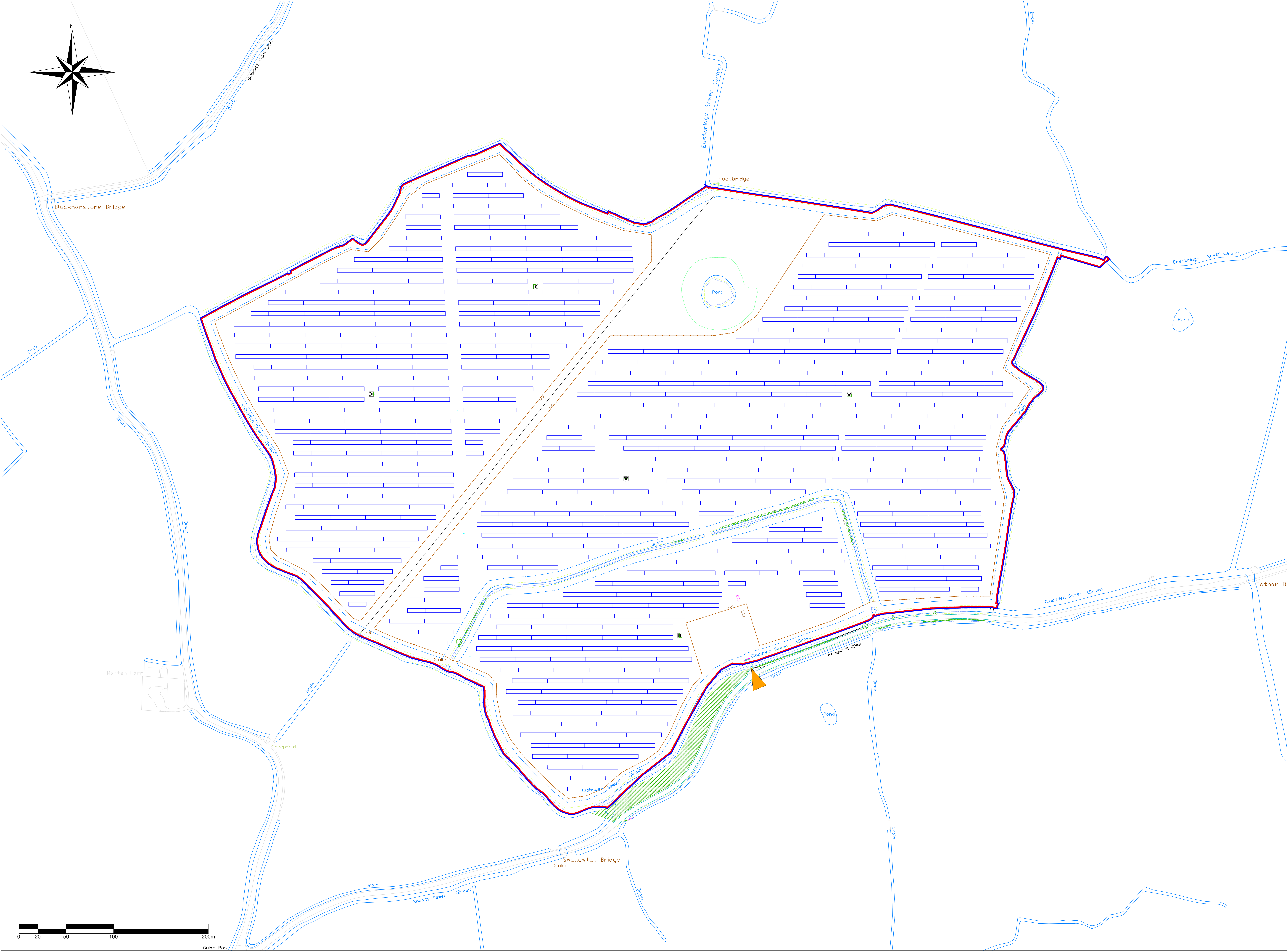
**Existing Site Plan
Sheet 4 of 4**

Drawn:	D.Smith	Reviewed:	S.Shreeves
BWB Ref:	232827	Date:	14.08.23
Scale@A0:	1:500		

Information

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
SMM-BWB-00-04-DR-G-0001	S2	P1

Appendix 2: Proposed Site Layout



- LEGEND
- Landlord's Boundary
 - Site Boundary
 - Site Access
 - Fence
 - PV Array
 - Transformer Station
 - DNO Substation
 - Customer Substation
 - Drainage
 - 6m Buffer

E	Drawing updated with General Layout Rev1	CC	30/07/24
D	Drawing updated with General Layout Rev1	CC	23/04/24
C	Drawing updated with General Layout Rev0	CC	29/02/24
B	Drawing updated with General Layout Rev1	CC	16/01/24
A	Drawing created with General Layout Rev1	CC	21/11/23
REV	DESCRIPTION	BY	DATE
ENVIRONMENTA			
COMPANY DETAILS Environmenta Project Management UK Ltd, 15 Didsbury Court, Grangeley, Reading, RG7 1JG T: +44 330 107 1415			
SITE ADDRESS: St Mary's Road Ramsey Marsh TN29 0BT			
PROJECT St Mary in the Marsh			
TITLE Planning Layout			
NUMBER R007053-08-PlanningLayout			
SCALE (A0)	SHEET	REVISION	
1:1250	1 OF 1	E	
DRAWN	CHECKED	APPROVED	
CC	CC	CC	

Appendix 3: NPPF Flood Risk Vulnerability and Flood Zone Compatibility

Flood Risk Vulnerability Classifications (recreated from the NPPF Planning Practice Guidance)

Vulnerability Classification	Description
Essential infrastructure	• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including infrastructure for electricity supply including generation, storage and distribution systems; including electricity generating power stations, grid and primary substations storage; and water treatment works that need to remain operational in times of flood. • Wind turbines. • Solar farms.
Highly Vulnerable	• Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure'.)
More Vulnerable	• Hospitals • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill* and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	• Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'more vulnerable' class; and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill* and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place. • Car parks.
Water-Compatible Development	• Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of Defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

Flood Zone Compatibility (recreated from the NPPF Planning Practice Guidance)

Flood Zone	Vulnerability Classification				
	Essential infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone 1 (Low Probability)	Development is appropriate	Development is appropriate	Development is appropriate	Development is appropriate	Development is appropriate
Flood Zone 2 (Medium Probability)	Development is appropriate	To be deemed appropriate an exception test is required to demonstrate: - The development will be safe for its life time without increasing flood risk elsewhere, and where possible reduce overall flood risk - the sustainability benefits of the development to the community outweigh the flood risk.	Development is appropriate	Development is appropriate	Development is appropriate
Flood Zone 3a (High Probability)	To be deemed appropriate an exception test is required to demonstrate: The development will be safe for its life time without increasing flood risk elsewhere, and where possible reduce overall flood risk the sustainability benefits of the development to the community outweigh the flood risk. Additionally, essential infrastructure should be designed and constructed to remain operational and safe in times of flood.	Development should not be permitted	To be deemed appropriate an exception test is required to demonstrate: - The development will be safe for its life time without increasing flood risk elsewhere, and where possible reduce overall flood risk - the sustainability benefits of the development to the community outweigh the flood risk.	Development is appropriate	Development is appropriate

Flood Zone	Vulnerability Classification				
	Essential infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone 3b (The Functional Floodplain)	To be deemed appropriate an exception test is required to demonstrate: - The development will be safe for its life time without increasing flood risk elsewhere, and where possible reduce overall flood risk - the sustainability benefits of the development to the community outweigh the flood risk. Additionally, development should be designed and constructed to: - remain operational and safe for users in times of flood; - result in no net loss of floodplain storage; - not impede water flows and not increase flood risk elsewhere.	Development should not be permitted	Development should not be permitted	Development should not be permitted	Development is appropriate if designed and constructed to: - remain operational and safe for users in times of flood; - result in no net loss of floodplain storage; - not impede water flows and not increase flood risk elsewhere.

Appendix 4: Environment Agency Flood Maps

Product 4 (Detailed Flood Risk) for: St Mary in the Marsh, Romney Marsh, Kent, TN29 0BT
Requested by: Alex Eaton / BWB Consulting
Reference: KSL 320214 RL
Date: 02 August 2023

Contents

- Flood Map Confirmation
- Flood Map Extract
- Model Output Data
- Data Point Location Map
- Modelled Flood Outlines Map
- Defence Details
- Historic Flood Data
- Use of information for Flood Risk Assessment
- Product 8

The information provided is based on the best data available as of the date of this letter.

You may feel it is appropriate to contact our office at regular intervals, to check whether any amendments/ improvements have been made to the data for this location. Should you contact us again, after a period of time, please quote the above reference in order to help us deal with your query.

Please refer to the [Open Government Licence](#) which explains the permitted use of this information.

Flood Map Confirmation

The Flood Map:

Our Flood Map shows the natural floodplain for areas at risk from fluvial and tidal flooding. The floodplain is specifically mapped ignoring the presence and effects of flood defences. Although flood defences reduce the risk of flooding they cannot completely remove that risk as they may be overtopped or breached during a flood event.

The Flood Map shows the probability of a flood of a particular magnitude, or greater, occurring in any given year. This is known as the Annual Exceedance Probability (AEP). Flood Zone 3 indicates areas of land having a 1 in 100 or greater annual probability (1% AEP) of flooding from rivers, or a 1 in 200 or greater annual probability (0.5% AEP) of flooding from the sea. Flood Zone 2 indicates areas of land having up to a 1 in 1000 annual probability (0.1% AEP) of flooding from rivers or the sea. The Flood Map also shows the location of some flood defences.

The Flood Map is intended to act as a guide to indicate the potential risk of flooding. When producing it we use the best data available to us at the time of completion, taking into account historic flooding and local knowledge. The Flood Map is updated on a quarterly basis to account for any amendments required. These amendments are then displayed on the internet at <https://flood-map-for-planning.service.gov.uk/>.

At this Site:

The Flood Map shows that this site lies within the outline of the 0.5% (Flood Zone 3) chance of flooding from the sea in any given year.

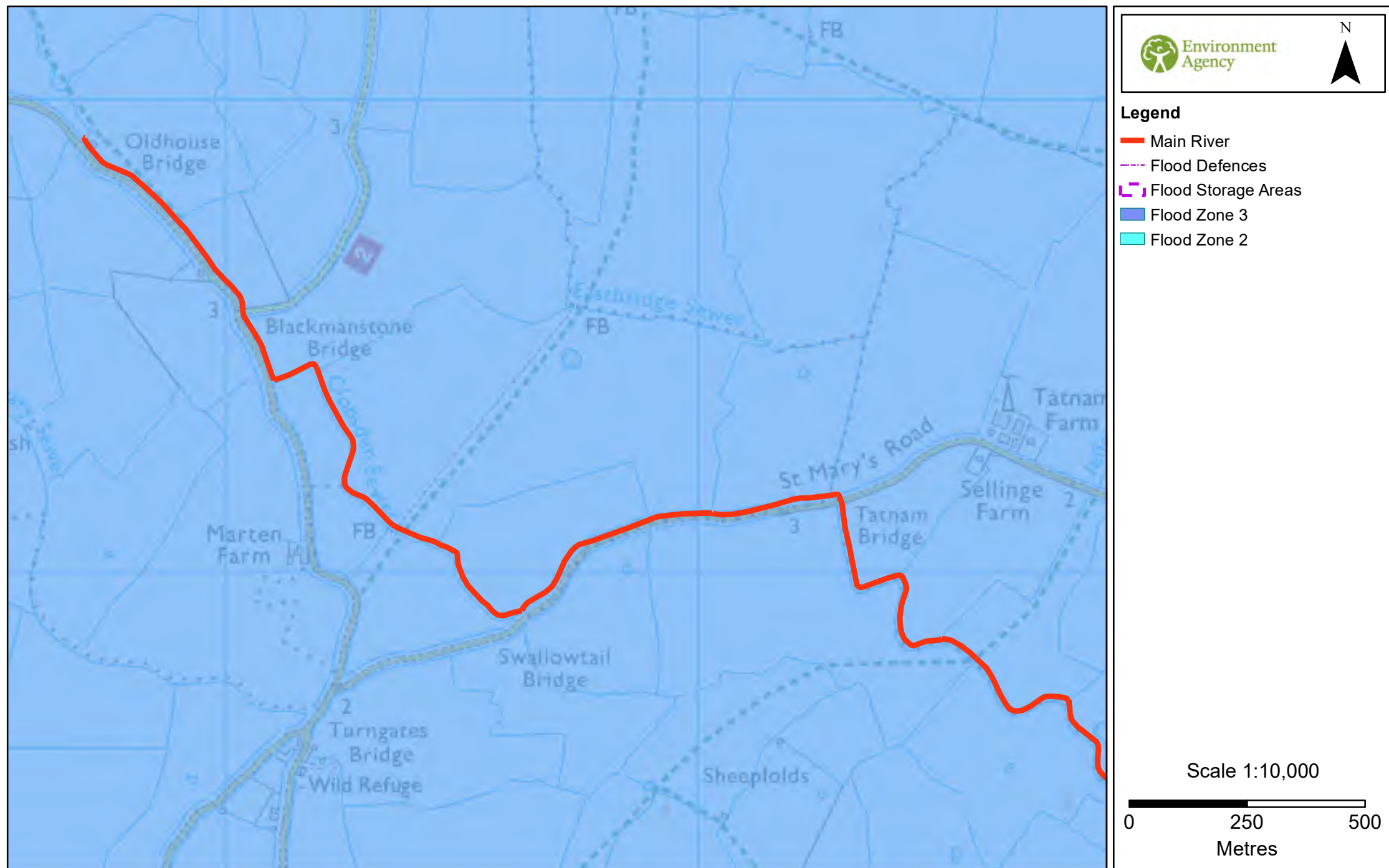
The Flood Map also shows that this site lies within the outline 0.1% (Flood Zone 2) chance of flooding from the sea in any given year.

Enclosed is an extract of our Flood Map which shows this information for your area.

Method of production

The Flood Map at this location has been derived using detailed tidal modelling of Romney Marsh, completed by JBA Consulting in 2020. The defended and undefended modelled outputs have been combined to produce the Flood Zones in order to capture the full flood risk from still water and wave overtopping.

Flood Map centred on St Mary in the Marsh, Romney Marsh, Kent, TN29 0BT
Created 02 August 2023 [Ref: KSL 320214 RL]



Model Output Data

You have requested flood levels and depths for various return periods at this location.

A 2D TuFLOW model has been used to represent the floodplain as a grid. The flood water levels and/or depths have been calculated for each grid cell. The modelled flood levels / depths presented here are for the closest most appropriate model grid cells. Any additional information you may need to know about the modelling from which they are derived and any specific health warnings for their use are set out below.

A map showing the location of the points from which the data is taken is enclosed. Please refer to the [Open Government Licence](#) which explains the permitted use of this information.

Romney Marsh baseline tidal mapping and data

Coastal flood boundary data set

The extreme sea levels used in the model were derived from the 'Coastal flood boundary conditions for UK mainland and islands' (Defra; SEPA; The Scottish Government; Environment Agency, 2011). The coastal flood boundary dataset was uplifted to a base year of 2018.

Model limitations

The flood inundation model has not considered infiltration losses into the ground. Additionally, no surface water drainage systems or sewer networks are included in the model. All wave overtopping calculations assume a static beach profile.

Undefended outputs

The undefended model scenarios are still water only and did not include any inflow boundaries for wave overtopping.

Climate change

The 0.5% AEP and 0.1% AEP climate change scenarios projected to 2070 and 2115 were modelled using National Planning Policy Framework (NPPF) 2016 guidance. The increases in sea level are shown in the table below.

NPPF sea level rise (SLR) estimates, metres per year (2008 base year)

Guidance	SLR projected to 2070	SLR projected to 2115
NPPF	0.521	1.166

In addition to sea level rise, the model applied an increase of 10% to both offshore wind speed and wave height for the 2070 and 2115 epochs. This is in line with NPPF 2016 guidance. Please note climate change allowances have been updated since this model was produced. Please refer to the following website for the latest guidance: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>.

Data Points Map centred on St Mary in the Marsh, Romney Marsh, Kent, TN29 0BT
Created 02 August 2023 [Ref: KSL 320214 RL]

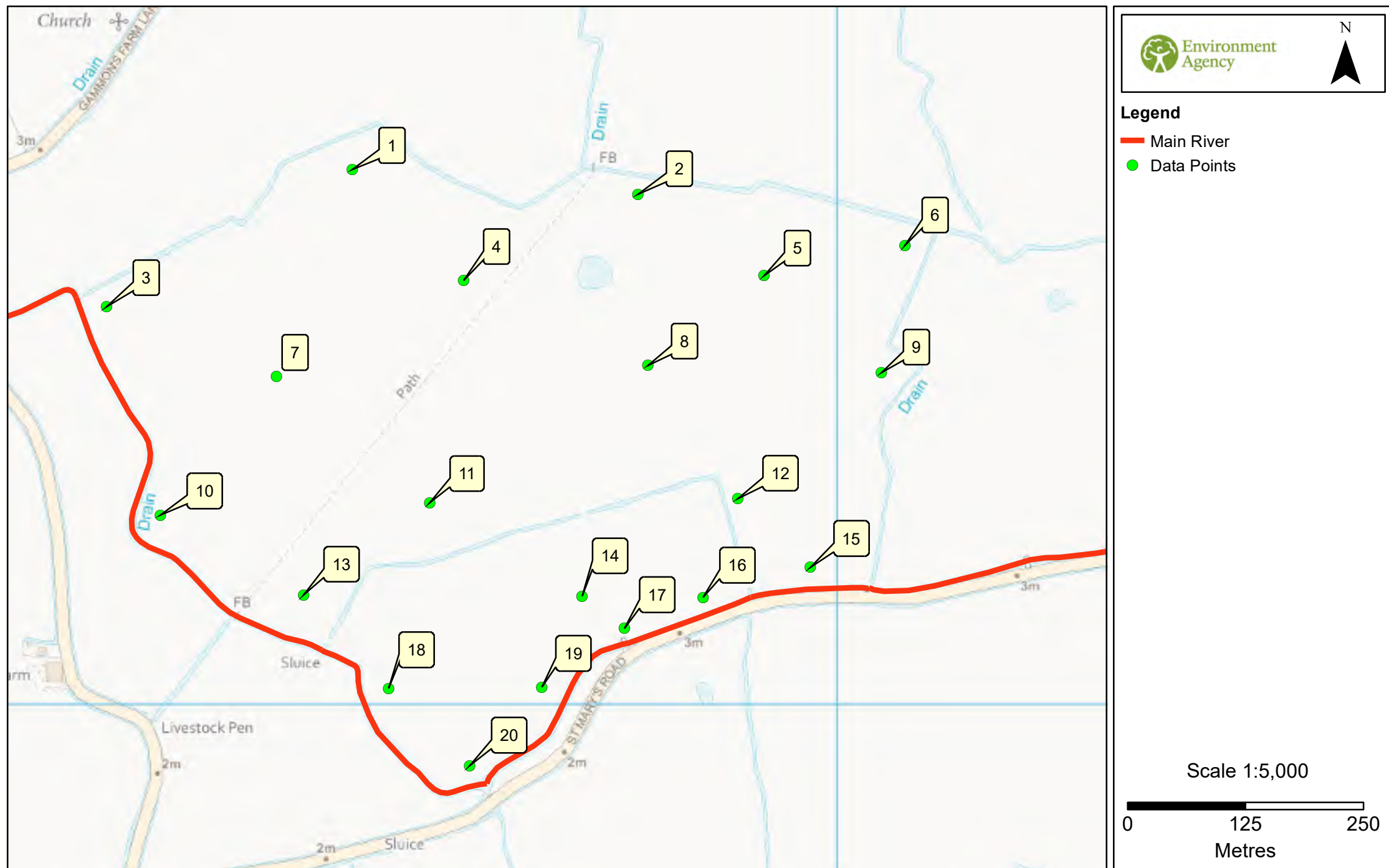


Table 1: Modelled undefended tidal flood levels for Annual Exceedance Probability (AEP) events shown (mAOD)

Point ID	National Grid Reference		Modelled Tidal Flood Levels for Annual Exceedance Probability (AEP) events shown (metres AOD)									
	Easting	Northing	Undefended									
			20% AEP	5% AEP	2% AEP	1.33% AEP	0.5% AEP	0.1% AEP	0.5% AEP + CC (2070)	0.1% AEP + CC (2070)	0.5% AEP + CC (2115)	0.1% AEP + CC (2115)
1	607487	129566	3.51	3.66	3.75	3.79	3.89	4.03	4.36	4.53	5.06	5.24
2	607790	129540	3.59	3.74	3.83	3.88	3.97	4.12	4.45	4.62	5.14	5.32
3	607226	129421	3.47	3.60	3.69	3.73	3.83	3.97	4.30	4.46	4.99	5.17
4	607605	129448	3.55	3.69	3.79	3.83	3.92	4.07	4.40	4.56	5.09	5.27
5	607924	129454	3.63	3.78	3.87	3.92	4.02	4.17	4.49	4.65	5.18	5.35
6	608073	129485	3.67	3.82	3.91	3.95	4.05	4.20	4.53	4.69	5.22	5.39
7	607406	129346	3.51	3.65	3.74	3.78	3.87	4.02	4.35	4.51	5.04	5.22
8	607801	129358	3.61	3.76	3.85	3.89	3.99	4.14	4.46	4.62	5.15	5.32
9	608048	129350	3.67	3.82	3.91	3.96	4.05	4.20	4.53	4.69	5.21	5.39
10	607283	129200	3.49	3.63	3.71	3.75	3.85	3.99	4.31	4.47	5.00	5.18
11	607569	129213	3.55	3.70	3.79	3.83	3.92	4.07	4.39	4.55	5.08	5.26
12	607896	129217	3.65	3.79	3.88	3.93	4.02	4.17	4.49	4.65	5.18	5.35
13	607435	129115	3.52	3.67	3.76	3.80	3.89	4.03	4.36	4.51	5.04	5.22
14	607730	129114	3.60	3.74	3.83	3.87	3.97	4.12	4.44	4.60	5.13	5.30
15	607973	129144	3.67	3.82	3.91	3.95	4.05	4.19	4.51	4.67	5.20	5.37
16	607859	129112	3.63	3.78	3.87	3.91	4.01	4.16	4.48	4.64	5.16	5.34
17	607775	129079	3.61	3.76	3.85	3.89	3.98	4.13	4.45	4.61	5.14	5.31
18	607525	129016	3.55	3.69	3.78	3.82	3.92	4.06	4.38	4.54	5.07	5.25
19	607688	129017	3.59	3.73	3.82	3.86	3.96	4.11	4.43	4.59	5.11	5.29
20	607611	128934	3.57	3.72	3.81	3.85	3.94	4.09	4.41	4.57	5.09	5.27

Data taken from the Romney Marsh Tidal Mapping Study, completed by JBA Consulting in 2020.

Climate change (CC) data represents modelled levels with an allowance for sea level rise for the years specified. In addition to sea level rise, the model applied an increase of 10% to both offshore wind speed and wave height for the 2070 and 2115 epochs. This is in line with 2016 NPPF guidance which has since been updated.

Values of 0.00 indicate locations at which the selected points lie outside of a particular modelled flood extent.

See Model Output Data section for health warnings and further information.

Table 2: Modelled defended tidal flood levels for Annual Exceedance Probability (AEP) events shown (mAOD)

Point ID	National Grid Reference		Modelled Tidal Flood Levels for Annual Exceedance Probability (AEP) events shown (metres AOD)									
			Defended									
	Easting	Northing	20% AEP	5% AEP	2% AEP	1.33% AEP	0.5% AEP	0.1% AEP	0.5% AEP + CC (2070)	0.1% AEP + CC (2070)	0.5% AEP + CC (2115)	0.1% AEP + CC (2115)
1	607487	129566	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	607790	129540	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	607226	129421	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	607605	129448	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	607924	129454	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	608073	129485	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	607406	129346	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	607801	129358	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	608048	129350	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	607283	129200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	607569	129213	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	607896	129217	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	607435	129115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	607730	129114	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	607973	129144	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	607859	129112	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	607775	129079	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	607525	129016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	607688	129017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	607611	128934	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Data taken from the Romney Marsh Tidal Mapping Study, completed by JBA Consulting in 2020.

Climate change (CC) data represents modelled levels with an allowance for sea level rise for the years specified. In addition to sea level rise, the model applied an increase of 10% to both offshore wind speed and wave height for the 2070 and 2115 epochs. This is in line with 2016 NPPF guidance which has since been updated.

Values of 0.00 indicate locations at which the selected points lie outside of a particular modelled flood extent.

See Model Output Data section for health warnings and further information.

Table 3: Modelled undefended tidal flood depths for Annual Exceedance Probability (AEP) events shown (m)

Point ID	National Grid Reference		Modelled Tidal Flood Depths for Annual Exceedance Probability (AEP) events shown (metres)									
	Easting	Northing	Undefended									
			20% AEP	5% AEP	2% AEP	1.33% AEP	0.5% AEP	0.1% AEP	0.5% AEP + CC (2070)	0.1% AEP + CC (2070)	0.5% AEP + CC (2115)	0.1% AEP + CC (2115)
1	607487	129566	1.35	1.50	1.59	1.63	1.73	1.88	2.21	2.37	2.90	3.08
2	607790	129540	1.39	1.54	1.63	1.67	1.77	1.92	2.25	2.41	2.94	3.12
3	607226	129421	1.14	1.28	1.37	1.41	1.51	1.65	1.98	2.13	2.67	2.85
4	607605	129448	1.21	1.36	1.45	1.49	1.59	1.73	2.06	2.22	2.75	2.93
5	607924	129454	1.50	1.65	1.74	1.79	1.88	2.03	2.36	2.52	3.05	3.22
6	608073	129485	1.50	1.65	1.74	1.79	1.89	2.04	2.36	2.53	3.05	3.23
7	607406	129346	1.38	1.53	1.62	1.66	1.75	1.90	2.22	2.38	2.91	3.09
8	607801	129358	1.45	1.60	1.69	1.73	1.83	1.98	2.30	2.46	2.99	3.16
9	608048	129350	1.58	1.73	1.82	1.86	1.96	2.11	2.44	2.60	3.12	3.30
10	607283	129200	1.19	1.33	1.42	1.46	1.55	1.69	2.01	2.17	2.70	2.88
11	607569	129213	1.44	1.59	1.68	1.72	1.81	1.96	2.28	2.44	2.97	3.15
12	607896	129217	1.53	1.68	1.77	1.81	1.91	2.06	2.38	2.54	3.07	3.24
13	607435	129115	1.36	1.50	1.59	1.63	1.72	1.87	2.19	2.35	2.88	3.06
14	607730	129114	1.42	1.57	1.66	1.70	1.80	1.95	2.27	2.43	2.95	3.13
15	607973	129144	1.58	1.73	1.82	1.86	1.96	2.11	2.43	2.59	3.11	3.29
16	607859	129112	1.15	1.30	1.39	1.43	1.53	1.68	2.00	2.16	2.68	2.86
17	607775	129079	1.18	1.33	1.42	1.46	1.56	1.71	2.03	2.19	2.71	2.89
18	607525	129016	1.41	1.55	1.64	1.68	1.78	1.92	2.24	2.40	2.93	3.11
19	607688	129017	1.35	1.50	1.59	1.63	1.72	1.87	2.19	2.35	2.87	3.05
20	607611	128934	1.13	1.27	1.36	1.40	1.50	1.64	1.96	2.12	2.65	2.83

Data taken from the Romney Marsh Tidal Mapping Study, completed by JBA Consulting in 2020.

Climate change (CC) data represents modelled depths with an allowance for sea level rise for the years specified. In addition to sea level rise, the model applied an increase of 10% to both offshore wind speed and wave height for the 2070 and 2115 epochs. This is in line with 2016 NPPF guidance which has since been updated.

Values of 0.00 indicate locations at which the selected points lie outside of a particular modelled flood extent.

See Model Output Data section for health warnings and further information.

Table 4: Modelled defended tidal flood depths for Annual Exceedance Probability (AEP) events shown (m)

Point ID	National Grid Reference		Modelled Tidal Flood Depths for Annual Exceedance Probability (AEP) events shown (metres)									
	Easting	Northing	Defended									
			20% AEP	5% AEP	2% AEP	1.33% AEP	0.5% AEP	0.1% AEP	0.5% AEP + CC (2070)	0.1% AEP + CC (2070)	0.5% AEP + CC (2115)	0.1% AEP + CC (2115)
1	607487	129566	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	607790	129540	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	607226	129421	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	607605	129448	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	607924	129454	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	608073	129485	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	607406	129346	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	607801	129358	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	608048	129350	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	607283	129200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	607569	129213	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	607896	129217	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	607435	129115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	607730	129114	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	607973	129144	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	607859	129112	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	607775	129079	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	607525	129016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	607688	129017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	607611	128934	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Data taken from the Romney Marsh Tidal Mapping Study, completed by JBA Consulting in 2020.

Climate change (CC) data represents modelled depths with an allowance for sea level rise for the years specified. In addition to sea level rise, the model applied an increase of 10% to both offshore wind speed and wave height for the 2070 and 2115 epochs. This is in line with 2016 NPPF guidance which has since been updated.

Values of 0.00 indicate locations at which the selected points lie outside of a particular modelled flood extent.

See Model Output Data section for health warnings and further information.

Undefended Tidal Flood Extents Map centred on St Mary in the Marsh, Romney Marsh, Kent, TN29 0BT
Created 02 August 2023 [Ref: KSL 320214 RL]



Legend

— Main River

Undefended Tidal Flood Extents

20% AEP

5% AEP

2% AEP

1.33% AEP

0.5% AEP

0.1% AEP

0.5% AEP + CC (2070)

0.1% AEP + CC (2070)

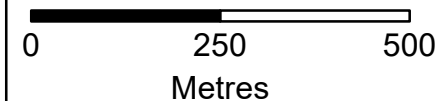
0.5% AEP + CC (2115)

0.1% AEP + CC (2115)

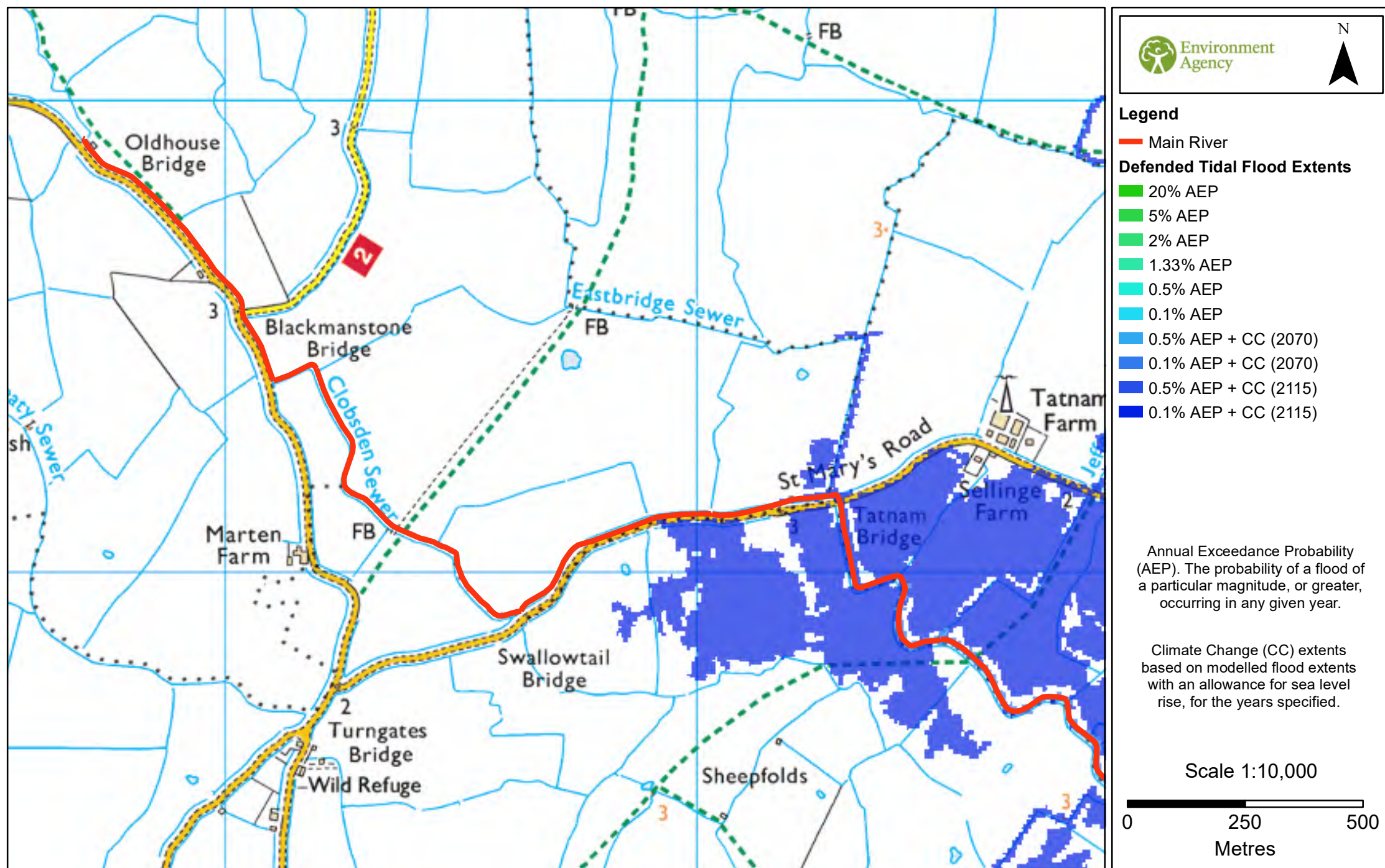
Annual Exceedance Probability (AEP). The probability of a flood of a particular magnitude, or greater, occurring in any given year.

Climate Change (CC) extents based on modelled flood extents with an allowance for sea level rise, for the years specified.

Scale 1:10,000



Created 02 August 2023 [Ref: KSL 320214 RL]



Defence Details

General Romney Marsh Defences

Due to the flat nature of Romney Marsh, much of which is below present day high tide level, flooding could regularly occur from many areas along the coast without properly maintained sea defences. At present the defences around Romney Marsh provide a varying standard of protection from 5% AEP (1 in 20 year) at Lydd Ranges, to in excess of 0.5% AEP (1 in 200 year) at Greatstone dunes.

As part of the Folkestone to Cliff End Strategy, we have significant investment planned to improve the remaining sea defences on Romney Marsh to provide a 0.5% AEP (1 in 200 year) standard of protection for a flood event occurring at any point along the coast by 2025

Romney Sands and Littlestone

Sea defences between Greatstone dunes and Jesson outfall comprise of a shingle beach, two rock groynes and a concrete sea wall.

The defences, together with annual shingle recycling undertaken between the two rock groynes, are designed to provide a 0.5% AEP (1 in 200 year) standard of protection for flooding from the sea in any given year.

The scheme was completed in 2003 and is owned and maintained by the Environment Agency.

St Mary's Bay

Sea defences between Jesson outfall and High Knocke comprise of a sea wall which includes a concrete wave return wall and stepped revetment. Timber groynes act to retain sand on the frontage.

The defences are designed to provide a 0.75% AEP (1 in 150 year) standard of protection for flooding from the sea in any given year.

The scheme was completed in 1995 and is owned and maintained by the Environment Agency.

Dymchurch A

Sea defences between High Knocke and Martello Tower number 23 comprise of a sea wall which includes a concrete wave return wall and stepped revetment. Timber groynes act to retain sand on the frontage.

The defences are designed to provide a 0.5% AEP (1 in 200 year) standard of protection for flooding from the sea in any given year.

The scheme was completed in 2011 and is owned and maintained by the Environment Agency.

Areas Benefiting from Flood Defences

The Environment Agency has taken the decision to retire this dataset and remove it from the Flood Map for Planning portal. This is because we have determined that it no longer meets the customer needs and creates a false sense of security for users.

To understand the long-term risk of flooding to an area, you can use the [Check Your Long Term Flood Risk portal](#); this will provide an understanding of flood risk from rivers and sea, taking into account the presence and condition of defences, and other sources of flood risk such as from surface water and reservoirs.

Historic Flood Data

We do not hold records of historic flood events from rivers and/or the sea affecting the area local to this property. However, please be aware that this does not necessarily mean that flooding has not occurred here in the past, as our records are not comprehensive.

We would therefore advise that you make further enquiries locally with specific reference to flooding at this location. You should consider contacting the relevant Local Planning Authority and/or water/sewerage undertaker for the area.

Please be aware that flooding can come from different sources. Examples of these are:

- from rivers or the sea
- surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system)
- overflowing or backing up of sewer or drainage systems which have been overwhelmed
- groundwater rising up from underground aquifers

Currently the Environment Agency can only supply flood risk data relating to the chance of flooding from rivers or the sea. However you should be aware that in recent years, there has been an increase in flood damage caused by surface water flooding or drainage systems that have been overwhelmed.

Additional Information

Information Warning - OS background mapping

The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.

Planning advice and guidance

The Environment Agency are keen to work with partners to enable development which is resilient to flooding for its lifetime and provides wider benefits to communities. If you have requested this information to help inform a development proposal, then we recommend engaging with us as early as possible by using the pre-application form available from our website:

<https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion>

Complete the form in the link and email back to kslplanning@environment-agency.gov.uk.

We recognise the value of early engagement in development planning decisions. This allows complex issues to be discussed, innovative solutions to be developed that both enables new development and protects existing communities. Such engagement can often avoid delays in the planning process following planning application submission, by reaching agreements up-front. We offer a charged pre-application advice service for applicants who wish to discuss a development proposal.

We can also provide a preliminary opinion for free which will identify environmental constraints related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

Flood Risk Assessments Guidance

Flood risk standing advice for applicants

In preparing your planning application submission, you should refer to the Environment Agency's Flood Risk Standing Advice and the Planning Practice Guidance for information about what flood risk assessment is needed for new development in the different Flood Zones. This information can be accessed via:

<https://www.gov.uk/flood-risk-assessment-standing-advice>

<http://planningguidance.planningportal.gov.uk/>

<https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications>

<https://www.gov.uk/guidance/flood-risk-and-coastal-change>

You should also consult the Strategic Flood Risk Assessment and flood risk local plan policies produced by your local planning authority.

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment where one is required, but does not constitute such an assessment on its own.
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or overland runoff. You should discuss surface water management with your Lead Local Flood Authority.
3. Where a planning application requires a FRA and this is not submitted or deficient, the Environment Agency may well raise an objection due to insufficient information

Surface Water

We have provided two national Surface Water maps, under our Strategic Overview for flooding, to your Lead Local Flood Authority who are responsible for local flood risk (i.e. surface runoff, ground water and ordinary watercourse), which alongside their existing local information will help them in determining what best represents surface water flood risk in your area.

Your Lead Local Flood Authority have reviewed these and determined what it believes best represents surface water flood risk. You should therefore contact this authority so they can provide you with the most up to date information about surface water flood risk in your area.

You may also wish to consider contacting the appropriate relevant Local Planning Authority and/or water/sewerage undertaker for the area. They may be able to provide some knowledge on the risk of flooding from other sources. We are working with these organisations to improve knowledge and understanding of surface water flooding.

Product 8

Breach scenarios were modelled for various locations along the Romney Marsh coast. These locations are listed in the table below.

Breach name	Defence type	Opening Width	Trigger	Restore Interval	Breach Information
Tillingham Sluice	Flood gate	Open gate	Low tide preceding the peak modelled tidal cycle	13hrs (1 tidal cycle) - Low tide following the peak modelled tidal cycle	Tillingham Sluice was modified to use operational controls based on model simulation time. This enabled failure of the sluice gate on low tide prior to the peak tide and emergency restoration of the sluice on low tide following the peak level.
Brede Sluice	Flood gate	Open gate	Low tide preceding the peak modelled tidal cycle	13hrs (1 tidal cycle) - Low tide following the peak modelled tidal cycle	Brede Sluice was modified to use operational controls based on model simulation time. This enabled failure of the sluice gate on low tide prior to the peak tide and emergency restoration of the sluice on low tide following the peak level.
Seapoint Outfall	Flood gate	Open gate	Low tide preceding the peak modelled tidal cycle	13hrs (1 tidal cycle) - Low tide following the peak modelled tidal cycle	Seapoint outfall was modified to use operational controls based on model simulation time. This enabled failure of the sluice gate on the trough prior to the peak tide and emergency restoration of the sluice on the following low tide.
King's Avenue	Earth embankment	50m	Water level $\frac{3}{4}$ defence height	30hrs (2.5 tidal cycles)	The earth embankment at King's Avenue was modelled as a 50m wide breach. Due to the tidal nature of the river, the trigger for breaching at this location were set to $\frac{3}{4}$ of the defence height.
Hythe Ranges	Earth embankment	200m	Water level $\frac{1}{2}$ defence height	56hrs (4 tidal cycles)	The earth embankment at Hythe Ranges was modelled as a 200m wide breach. Due to the breach occurring on the open coast, the trigger for breaching to occur were set to $\frac{1}{2}$ the defence height.
Jury's Gap	Earth embankment	200m	Water level $\frac{1}{2}$ defence height	56hrs (4 tidal cycles)	The earth embankment at Jury's Gap was modelled as a 200m wide breach. Due to the breach occurring on the open coast, the trigger for breaching to occur were set to $\frac{1}{2}$ the defence height.

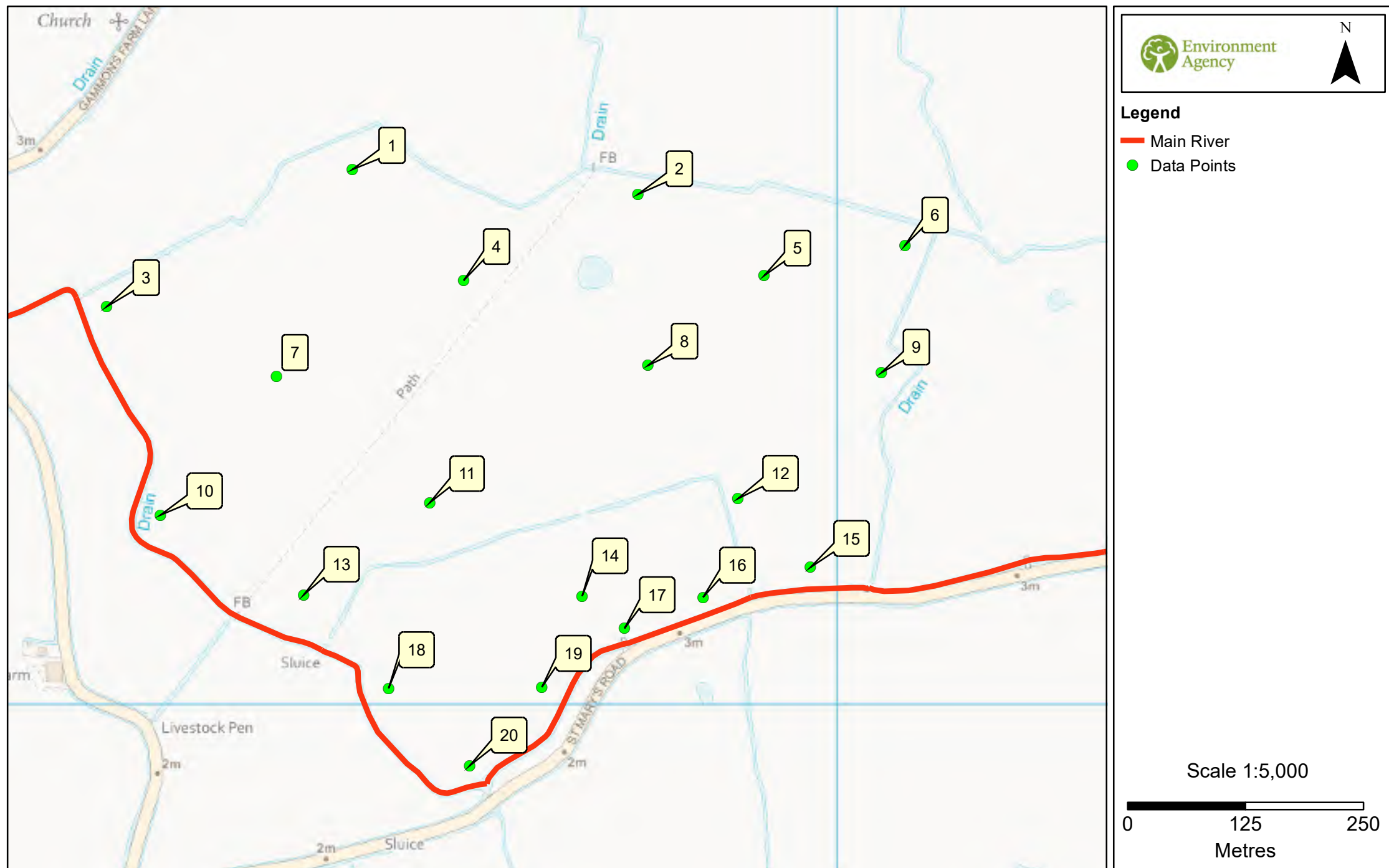
Breach name	Defence type	Opening Width	Trigger	Restore Interval	Breach Information
Union Channel	Earth embankment	50m	Water level $\frac{3}{4}$ defence height	30hrs (2.5 tidal cycles)	The earth embankment at Union Channel was modelled as a 50m wide breach. Due to the tidal nature of the river, the trigger for breaching at this location were set to $\frac{3}{4}$ of the defence height.
Monkbretton Bridge (upstream right bank)	Earth embankment	50m	Water level $\frac{3}{4}$ defence height	30hrs (2.5 tidal cycles)	The earth embankment at Monkbretton Bridge was modelled as a 50m wide breach. Due to the tidal nature of the river, the trigger for breaching at this location were set to $\frac{3}{4}$ of the defence height.
Monkbretton Bridge (downstream left bank)	Earth embankment	50m	Water level $\frac{3}{4}$ defence height	30hrs (2.5 tidal cycles)	The earth embankment at Monkbretton Bridge was modelled as a 50m wide breach. Due to the tidal nature of the river, the trigger for breaching at this location were set to $\frac{3}{4}$ of the defence height.
Winchelsea Beach	Concrete defence	50m	Water level $\frac{1}{2}$ defence height	30hrs (2.5 tidal cycles)	The concrete defence at Winchelsea Beach was modelled as a 50m wide breach. Due to the breach occurring on the open coast, the trigger for breaching to occur were set to $\frac{1}{2}$ the defence height.

Your site falls within the extent of the following breach: Hythe Ranges. The extent of flooding in the event of a breach is shown in the map below.

Levels and depths are included in addition to a map showing the location of the points from which the data is taken.

Please refer to the [Open Government Licence](#) which explains the permitted use of this information.

Data Points Map centred on St Mary in the Marsh, Romney Marsh, Kent, TN29 0BT
Created 02 August 2023 [Ref: KSL 320214 RL]



Romney Marsh tidal breach mapping and data

Coastal flood boundary data set

The extreme sea levels used in the model were derived from the 'Coastal flood boundary conditions for UK mainland and islands' (Defra; SEPA; The Scottish Government; Environment Agency, 2011). The coastal flood boundary dataset was uplifted to a base year of 2018.

Model limitations

The flood inundation model has not considered infiltration losses into the ground. Additionally, no surface water drainage systems or sewer networks are included in the model. All wave overtopping calculations assume a static beach profile.

Climate change

The 0.5% AEP and 0.1% AEP climate change scenarios projected to 2070 and 2115 were modelled using UK Climate Change Impacts Programme (UKCP09) guidance. The increases in sea level are shown in the table below.

UKCP09 sea level rise (SLR) estimates, metres per year (2008 base year)

Guidance	SLR projected to 2070	SLR projected to 2115
UKCP09	0.393	0.779

In addition to sea level rise, the model applied an increase of 10% to both offshore wind speed and wave height for the 2070 and 2115 epochs. This is in line with UKCP09 guidance. Please note climate change allowances have been updated since this model was produced. Please refer to the following website for the latest guidance: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>.

Planning applications

This is currently the Environment Agency's best available data for this area. However, please note for individual planning applications you should also refer to local planning policy and Strategic Flood Risk Assessments.

Product 8 Table 1: Modelled tidal flood levels for breach scenario shown (mAOD)

Point ID	National Grid Reference		Hythe Ranges Tidal Breach Modelled Flood Levels for AEP events shown (metres AOD)		
			Defended		
	Easting	Northing	0.5% AEP	0.5% AEP + CC (2070)	0.5% AEP + CC (2115)
1	607487	129566	0.00	0.00	2.32
2	607790	129540	0.00	0.00	2.36
3	607226	129421	0.00	0.00	2.31
4	607605	129448	0.00	0.00	0.00
5	607924	129454	0.00	0.00	2.36
6	608073	129485	0.00	0.00	2.36
7	607406	129346	0.00	0.00	2.31
8	607801	129358	0.00	0.00	2.35
9	608048	129350	0.00	0.00	2.35
10	607283	129200	0.00	0.00	0.00
11	607569	129213	0.00	0.00	0.00
12	607896	129217	0.00	0.00	2.35
13	607435	129115	0.00	0.00	2.17
14	607730	129114	0.00	0.00	0.00
15	607973	129144	0.00	0.00	2.34
16	607859	129112	0.00	0.00	0.00
17	607775	129079	0.00	0.00	0.00
18	607525	129016	0.00	0.00	0.00
19	607688	129017	0.00	0.00	0.00
20	607611	128934	0.00	0.00	0.00

Data taken from the Romney Marsh Tidal Mapping Study, completed by JBA Consulting in 2020.

Climate change (CC) data represents modelled levels with an allowance for sea level rise for the years specified. In addition to sea level rise, the model applied an increase of 10% to both offshore wind speed and wave height for the 2070 and 2115 epochs. This is in line with UKCP09 guidance which has since been updated.

Values of 0.00 indicate locations at which the selected points lie outside of a particular modelled flood extent.

See section above for health warnings and further information.

Product 8 Table 2: Modelled tidal flood depths for breach scenario shown (m)

Point ID	National Grid Reference		Hythe Ranges Tidal Breach Modelled Flood Depths for AEP events shown (metres)		
			Defended		
	Easting	Northing	0.5% AEP	0.5% AEP + CC (2070)	0.5% AEP + CC (2115)
1	607487	129566	0.00	0.00	0.17
2	607790	129540	0.00	0.00	0.16
3	607226	129421	0.00	0.00	0.02
4	607605	129448	0.00	0.00	0.00
5	607924	129454	0.00	0.00	0.22
6	608073	129485	0.00	0.00	0.20
7	607406	129346	0.00	0.00	0.19
8	607801	129358	0.00	0.00	0.19
9	608048	129350	0.00	0.00	0.26
10	607283	129200	0.00	0.00	0.00
11	607569	129213	0.00	0.00	0.00
12	607896	129217	0.00	0.00	0.24
13	607435	129115	0.00	0.00	0.01
14	607730	129114	0.00	0.00	0.00
15	607973	129144	0.00	0.00	0.26
16	607859	129112	0.00	0.00	0.00
17	607775	129079	0.00	0.00	0.00
18	607525	129016	0.00	0.00	0.00
19	607688	129017	0.00	0.00	0.00
20	607611	128934	0.00	0.00	0.00

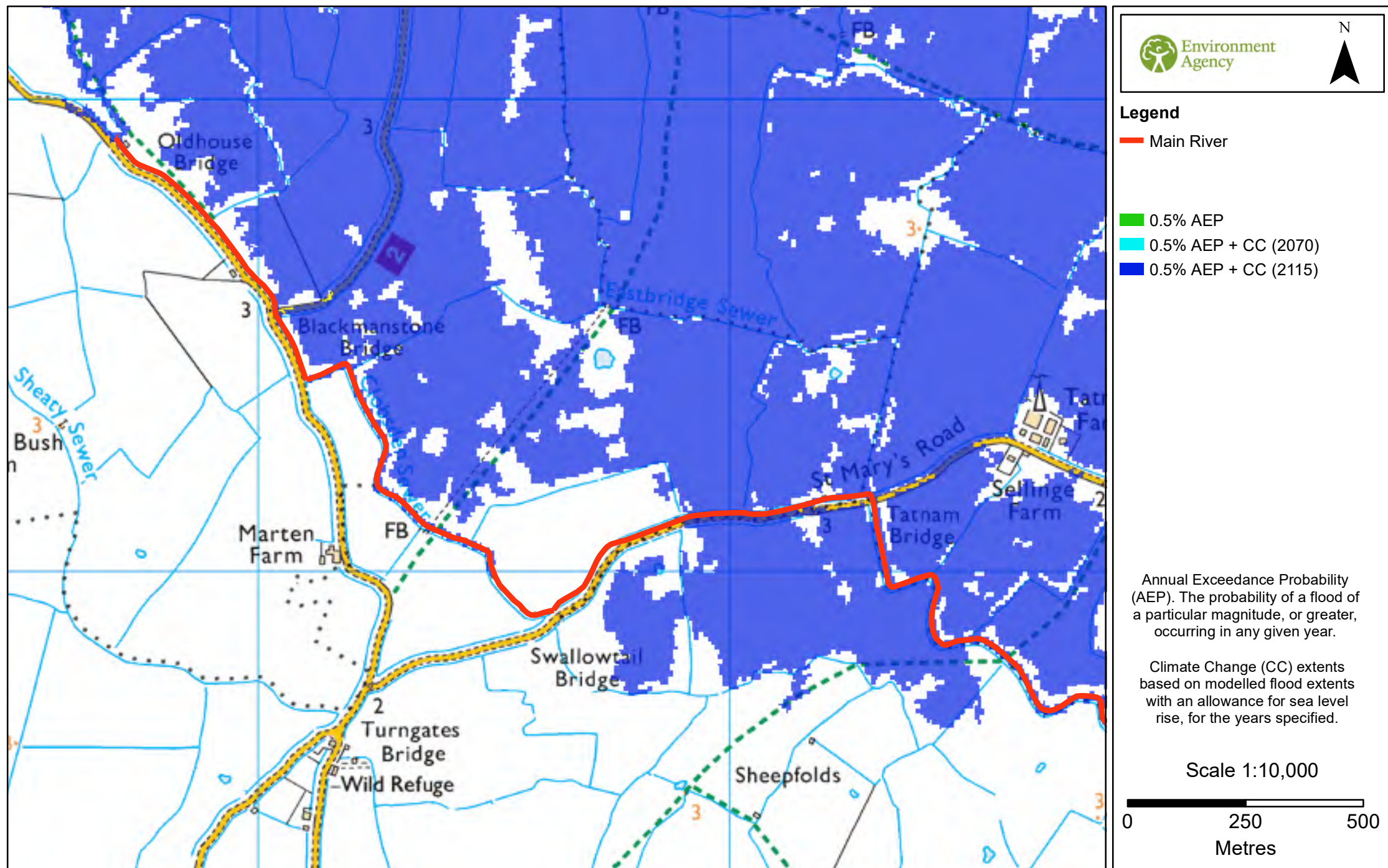
Data taken from the Romney Marsh Tidal Mapping Study, completed by JBA Consulting in 2020.

Climate change (CC) data represents modelled depths with an allowance for sea level rise for the years specified. In addition to sea level rise, the model applied an increase of 10% to both offshore wind speed and wave height for the 2070 and 2115 epochs. This is in line with UKCP09 guidance which has since been updated.

Values of 0.00 indicate locations at which the selected points lie outside of a particular modelled flood extent.

See section above for health warnings and further information.

Hythe Ranges Breach Extents Map centred on St Mary in the Marsh, Romney Marsh, Kent, TN29 0BT
Created 02 August 2023 [Ref: KSL 320214 RL]



Appendix 5: Southern Water Sewer Records



