



Product 4: Supporting Documentation

GUIDANCE INCLUDED:

1. PRODUCT 4 FACT SHEET.
2. FLOOD ZONE 3 FACTSHEET - EAST ANGLIA (EAST)
3. FLOOD RISK ASSESSMENT (FRA) CHECKLIST
4. NEW TIDAL CLIMATE CHANGE ALLOWANCES FOR ESSEX, NORFOLK AND SUFFOLK
5. UPDATED FLUVIAL CLIMATE CHANGE ALLOWANCES FOR ESSEX, NORFOLK AND SUFFOLK

PARTNERSHIP AND STRATEGIC OVERVIEW TEAM – EAST ANGLIA (EAST) Version 6 Updated May 2023

customer service line
03708 506 506

incident hotline
0800 80 70 60

floodline
03459 88 11 88

Product 4 Fact Sheet

Thank you for your enquiry.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

Please refer to the Open Government Licence available here:

<http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/> which explains the permitted use of this information.

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.

Areas Benefiting from Flood Defences

Areas benefiting from flood defences are defined as those areas which benefit from formal flood defences specifically in the event of flooding from rivers with a 1% (1 in 100) chance in any given year or flooding from the sea with a 0.5% (1 in 200) chance in any given year.

If the defences were not there, these areas would be flooded. An area of land may benefit from the presence of a flood defence even if the defence has overtopped, if the presence of the defence means that the flood water does not extend as far as it would if the defence were not there.

Flood Risk Assessment Checklist

If you are planning on using this data within a Flood Risk Assessment, we recommend that you take the time to fill in the attached FRA checklist, and to read the attachments which contain information relevant to the area that interests you.

We would like to stress the importance of filling in the Flood Risk Assessment check list and providing up-to-date and correct data. The data will be checked against our records when we review the Flood Risk Assessment in our role as statutory consultee.

It is important that you provide a map in section 2 of the FRA checklist (See Appendix A), including the highest and most representative flood levels for your site. We recommend using a number of nodes that provide a fair representation of the modelled data across your site. For example, if it is a small extension (< 250 square metres) then approximately 5-10 nodes would be sufficient. For larger sites, approximately 10 to 20 nodes would be appropriate.

If you have a new enquiry or would like us to review the information we have provided under the Freedom of Information Act 2000 and Environmental Information Regulations 2004 please contact us within two months by email at Enquiries_EastAnglia@environment-agency.gov.uk

East Anglia Area

Ipswich Office, Icen House, Cobham Road, Ipswich, Suffolk, IP3 9JD

General Enquiries: 03708 506506

Email: enquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>



Flood Zone 3 Factsheet

East Anglia (East)

Oct 2017 - v.7

This factsheet provides information to assist with the preparation of a Flood Risk Assessment (FRA) in support of development proposals reviewed by the East Anglia teams, based at Ipswich. It should be read alongside the Environment Agency's general FRA advice ([FRA Guidance note 3](#)). For information relating to proposals managed by East Anglia teams please contact: planning.eastanglia@environment-agency.gov.uk.

This factsheet covers issues relating to FRAs only and does not address other matters we may take into account when considering development proposals (e.g. proximity to a watercourse, contaminated land, Water Framework Directive and biodiversity requirements). For further information on those issues, please contact: planning.eastanglia@environment-agency.gov.uk

Sequential Test and Exception Test

The Local Planning Authority (LPA) will need to be satisfied that the proposed development passes the flood risk Sequential Test, and if applicable, the first part of the Exception Test, in line with requirements of the National Planning Policy Framework (NPPF). We therefore strongly suggest you speak to them prior to commencing work on an FRA. Information regarding the [aim of the Sequential Test](#), [applying the Sequential Test](#) and the [Exception Test](#) can all be found in the Practice Guide supporting the NPPF.

Inappropriate development

[Table 2](#) of the Practice Guide categorizes developments according to their vulnerability and [table 3](#) sets out which vulnerabilities are inappropriate in Flood Zone 3. You should be aware that we are likely to object in principle where it is indicated that a development is not compatible in Flood Zone 3. Please note that Flood Zone 3b is defined by the Local Planning Authority's Strategic Flood Risk Assessment, or by the 5% (1 in 20 year) modelled flood outlines and levels held by the Environment Agency.

More detail on what should be in the FRA (additional to that highlighted in Guidance Note 3):

The FRA should assess all sources of flooding and provide sufficient information on the characteristics of flooding at the site, such as frequency, depth, velocity, speed of onset, and duration. As a minimum the FRA needs to assess the flood risk on site by comparing our modelled flood levels with a GPS verified topographical survey of the site to determine the anticipated flood depths during the 5% (1 in 20), 1% / 0.5% (1 in 100 / 200) (design) and 0.1% (1 in 1000) (extreme) events including allowances for climate change. Climate change allowances can be found on [our website](#). If the area is protected by defences then the FRA should consider both the actual flood risk to the site through overtopping of the defences, and the residual risk posed by the defences being breached.

- **Sequential approach on site**

If the site contains a range of Flood Zones, the sequential approach should be applied within the site to direct development to the areas of lowest flood risk. If it isn't possible to locate all development in Flood Zone 1, then the most vulnerable elements should be located in the lowest risk parts of the site.

- **Finished Floor Levels**

Proposals for 'more vulnerable' development should include floor levels set no lower than 300 mm above the level of any flooding that would occur if defences were overtopped in a 1% / 0.5% flood event (including allowances for climate change). Safe refuge should also be provided above the 0.1% undefended/breach flood level (including allowances for climate change). We are likely to raise an objection where these requirements are not achieved.

We recommend 'less vulnerable' development also meets this requirement to minimize disruption and costs in a flood event. If this is not achievable then it is recommended that a place of refuge is provided above the 0.1% flood level (including allowances for climate change). Where safety is reliant on refuge it is important that the building is structurally resilient to withstand the pressures and forces (hydrostatic & hydrodynamic) associated with flood water. The LPA may need to receive supporting information and calculations to provide certainty that the buildings will be constructed to withstand these water pressures.

- **Safe Access**

During a flood, the journey to safe, dry areas completely outside the extent of a 1% / 0.5% flood event (including allowances for climate change), should not involve crossing areas of potentially fast flowing water. Those venturing out on foot in areas where flooding exceeds 100 millimetres or so would be at risk from a wide range of hazards, including, for example unmarked drops, or access chambers where the cover has been swept away. Safe access and egress routes should be assessed in accordance with the guidance document '[FD2320 \(Flood Risk Assessment Guidance for New Developments\)](#)'.

- **Emergency Flood Plan**

Where safe access cannot be achieved, or if the development would be at actual flood risk or residual risk of flooding in a breach, an emergency flood plan must be provided. The plan should deal with matters of evacuation and refuge, and should demonstrate that people will not be exposed to flood hazards. The emergency flood plan should be submitted as part of the FRA and will need to be agreed with the Local Planning Authority.

- **Flood Resilience / Resistance Measures**

To minimize the disruption and cost implications of a flood event we encourage development to incorporate flood resilience/resistance measures up to the extreme 0.1% climate change flood level. Information on preparing property for flooding can be found in the documents '[Improving the Flood performance of new buildings](#)' and '[Prepare your property for flooding](#)'.

- **Betterment**

Every effort should be made by the applicant to improve the flood risk to the local area, especially if there are known flooding issues. Opportunities should also be taken to provide environmental enhancements as part of the design, for example naturalizing any rivers on the site with a buffer zone on both sides.

- **Increases in Built Footprint (excluding open coast situations)**

It will need to be shown that any increase in built footprint within the extent of a 1% flood event (including allowances for climate change), can be directly compensated for on a volume-for-volume and level-for-level basis to prevent a loss of floodplain storage. If there are no available areas for compensation above the design flood level and compensation will not be possible, then a calculation of the offsite flood risk impacts will need to be undertaken. If this shows significant offsite impacts then no increases in built footprint will be allowed. Further guidance on the provision of compensatory flood storage is provided in section A3.3.10 of the CIRIA document C624.

Flood Defence Consent

Flood Defence Consents now fall under the Environmental Permitting (England and Wales) Regulations 2010 system (EPR). You may need an environmental permit for flood risk activities if you want to do work in, under, over or within 8 metres of a fluvial river or any flood defence structure or culvert / 16m from a tidal river or any flood defence structure or culvert. New forms and further information can be found at: <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits>.

Local policies and recommendations

You will need to demonstrate to the Local Planning Authority that the requirements of any local flood risk planning policies have been met and the recommendations of the relevant Strategic Flood Risk Assessment, Shoreline Management Plans and Catchment Flood Management Plans have been considered.

Further Information:

If you require the flooding information we hold for this site then please email our local Customers and Engagement Team: enquiries_eastanglia@environment-agency.gov.uk. For further details on our flood map products please visit our website at: www.environment-agency.gov.uk/research/planning/93498.aspx.

| Flood Risk Assessment (FRA) Checklist | |
|--|---|
| This document should be attached to the front of the Flood Risk Assessment (FRA) issued to Local Planning Authorities (LPA) in support of a development proposal which may be at risk of flooding. This document is not a substitute for a FRA. Please note, under our responsibilities as a statutory consultee we will review any submitted FRA only in respect to fluvial and tidal risk. Your FRA should also consider other sources of flooding such as surface water, drainage, and ground water flooding. | |
| 1. Development Proposal | |
| Site name | |
| National Grid Reference (NGR) | |
| Flood Risk Assessment | Reference/Title: Date: |
| Existing site use & vulnerability classification | |
| Proposed site use & vulnerability classification | |
| 2. Flood Risk | |
| Flood Zone(s) affecting the site/property | |
| Sources of flooding affecting the site | |
| Have you considered flood storage compensation? | Yes/No ** |
| 3. Please provide a node map and accompanying table in the Flood Risk Assessment similar to the example given (see Appendix A). You should clearly demonstrate the highest and most representative flood levels for your proposed development. For example, if it is a small extension (< 250 square metres) then approximately 5-10 nodes would be sufficient. For larger sites, approximately 10 to 20 nodes would be appropriate. | |
| 4. Mitigation | |
| Finished floor levels (in mAOD) for each proposed floor. | |
| Have you considered a freeboard for these Finished Floor Levels?*** | |
| Drawing reference showing Finished Floor Levels for proposed development | |
| Have you considered suitable internal and external access for safe refuge above the flood level? | Yes/No |
| 5. Proximity to the watercourse/ flood defence/ culvert | |
| Are the proposed developments on, over, under or within 8 metres of a fluvial main river or 16 metres of a tidal main river or flood defence? | Yes/No If yes, please provide a cross section drawing in your planning application showing the distance of the proposed development in relation to the watercourse/flood defence/culvert. If yes, this will require a Flood Risk Activity Permit. |
| Map Many of our flood datasets are available online: Flood Map For Planning (Flood Zone 2 , Flood Zone 3 , Flood Storage Areas , Flood Defences , Areas Benefiting from Defences , , Risk of Flooding from Rivers and Sea , Historic Flood Map , Current Flood Warnings) | |

** Please be aware floodplain compensation may be required for your site. Floodplain compensation is normally required when the proposed site use has an increased built footprint in relation to the existing site use and lies primarily in Flood Zone 3, which is considered the fluvial floodplain. This is normally demarked in the modelled data by the 1 in 100 + Climate Change flood return period.

*** Please refer to the Local Authority's SFRA for further guidance on freeboard requirements for each type of development

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 planning.eastanglia@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

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

Advice to Consultants

The data provided in the checklist and FRA will be checked against our records as we review the FRAs when consulted on by the Local Planning Authority in our remit as statutory consultee for flood risk from tidal and fluvial sources. We require you to get in touch with us to check for the most up to date model information and FRA checklist. Having the latest data is important as not having the data will possibly delay us in reviewing your application at planning stage.

Appendix A: (This is an example only for how to do the node map and accompanying table)



1. Outline your site boundary clearly
2. Clearly mark the node points where you are extracting data from
3. Select node points that cover the site, around the site itself, and along the access route to the site to give a representative sample

| | National Grid Reference | | Modelled Levels |
|------|-------------------------|----------|------------------------|
| Node | Easting | Northing | [insert return period] |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

Flood risk assessments: Climate change allowances

Application of the allowances and local considerations

East Anglia; Essex, Norfolk, Suffolk, Cambridgeshire and Bedfordshire

1) The climate change allowances

The [National Planning Practice Guidance](#) refers planners, developers and advisors to the Environment Agency guidance on considering climate change in Flood Risk Assessments (FRAs). This guidance was updated in October 2021 and is available on [Gov.uk](#). The guidance can be used for planning applications, local plans, neighbourhood plans and other projects. It provides climate change allowances for peak river flow, peak rainfall, sea level rise, wind speed and wave height. The guidance provides a range of allowances to assess fluvial flooding, rather than a single national allowance. It advises on what allowances to use for assessment based on vulnerability classification, flood zone and development lifetime.

2) Assessment of climate change impacts on fluvial flooding

Where existing EA flood risk datasets and models do not provide the required climate change allowances, it is up to developers to undertake any work needed to appropriately assess the impacts of climate change on flood risk. They can do this by using the approaches in **Table A** below:

Table A below indicates the level of technical assessment of climate change impacts on fluvial flooding appropriate for new developments depending on their scale and location. This should be used as a **guide only**. Ultimately, the agreed approach should be based on expert local knowledge of flood risk conditions, local sensitivities and other influences. **For these reasons, we recommend that applicants and / or their consultants should contact the Environment Agency at the pre-planning application stage to confirm the assessment approach, on a case by case basis.** The email addresses for our Sustainable Places teams at our respective offices can be found in Section 8 below.

Table A defines three possible approaches to account for flood risk impacts due to climate change, in new development proposals:

- **Basic:** Developer can add an allowance to the 'design flood' (i.e. 1% annual probability) peak levels to account for potential climate change impacts. The allowance should be derived and agreed locally by Environment Agency teams.
- **Intermediate:** Developer can use existing modelled flood and flow data to construct a stage-discharge rating curve, which can be used to interpolate a flood level based on the required peak flow allowance being applied to the 'design flood' flow.
- **Detailed:** Perform detailed hydraulic modelling, either through re-running Environment Agency hydraulic models (if available) or construction of a new model by the developer.

Table A – Indicative guide to assessment approach

| VULNERABILITY CLASSIFICATION | FLOOD ZONE | DEVELOPMENT TYPE | | |
|------------------------------|------------|-----------------------------|---------------------|---------------------|
| | | NON-MAJOR | SMALL-MAJOR | LARGE-MAJOR |
| ESSENTIAL INFRASTRUCTURE | Zone 2 | Detailed | | |
| | Zone 3a | Detailed | | |
| | Zone 3b | Detailed | | |
| HIGHLY VULNERABLE | Zone 2 | Intermediate/ Basic | Intermediate/ Basic | Detailed |
| | Zone 3a | Not appropriate development | | |
| | Zone 3b | Not appropriate development | | |
| MORE VULNERABLE | Zone 2 | Basic | Basic | Intermediate/ Basic |
| | Zone 3a | Intermediate/ Basic | Detailed | Detailed |
| | Zone 3b | Not appropriate development | | |
| LESS VULNERABLE | Zone 2 | Basic | Basic | Intermediate/ Basic |
| | Zone 3a | Basic | Basic | Detailed |
| | Zone 3b | Not appropriate development | | |
| WATER COMPATIBLE | Zone 2 | None | | |
| | Zone 3a | Intermediate/ Basic | | |
| | Zone 3b | Detailed | | |

Note: Where the table states 'not appropriate development', this is in line with national planning policy. If in exceptional circumstances such development types are proposed in these locations, we would expect a detailed modelling approach to be used.

NOTES:

- Non-Major: 1-9 dwellings/ less than 0.5 ha | Office / light industrial under 1ha | General industrial under 1 ha | Retail under 1 ha | Gypsy/traveller site between 0 and 9 pitches
- Small-Major: 10 to 30 dwellings | Office / light industrial 1ha to 5ha | General industrial 1ha to 5ha | Retail over 1ha to 5ha | Gypsy/traveller site over 10 to 30 pitches
- Large-Major: 30+ dwellings | Office / light industrial 5ha+ | General industrial 5ha+ | Retail 5ha+ | Gypsy/traveler site over 30+ pitches | any other development that creates a non-residential building or development over 1000 sq m.

The assessment approach should be agreed with the Environment Agency as part of pre-planning application discussions to avoid abortive work.

3) Specific local considerations

Where the Environment Agency and the applicant and / or their consultant has agreed that a 'basic' level of assessment is appropriate, the figures in Table B below can be used as a precautionary allowance for potential climate change impacts on peak 'design' (i.e. 1% annual probability) fluvial flood level rather than undertaking detailed modelling.

Table B – Local precautionary allowances for potential climate change impacts

Essex, Norfolk and Suffolk

| Hydraulic Model (Watercourse) | Precautionary allowance (basic approach) |
|---|---|
| Blackwater & Brain - Blackwater between TL7520925623 and TL7820324314 Brain between TL7373323312 and TL7683821321 | 500mm |
| Other main rivers, tributaries and ordinary watercourses | For other main rivers, tributaries and ordinary watercourses that are not stated above, basic allowances have not been calculated. In this instance you can either: <ul style="list-style-type: none"> • If flow data is available you can request this data from us and can conduct an intermediate assessment yourself • Or alternatively, you can choose to undertake a Detailed Assessment and "perform detailed hydraulic modelling, through either re-running our hydraulic models (if available) or constructing a new model |

Cambridgeshire and Bedfordshire

| Watercourse / Model | Precautionary allowance (basic approach) |
|--|---|
| Alconbury Brook | 600mm |
| River Kym | |
| Lower Ouse (Model Extent) | 700mm |
| Mid Ouse (Cold Brayfield to Bromham – between SP9156852223 and TL0132950919) | 700mm |
| Mid Ouse (East of Bedford to Roxton – between TL0791848903 and TL1618854543) | 700mm |
| River Hiz and River Purwell | 400mm |
| River Ivel | 500mm |
| Pix Brook | 450mm |
| Potton Brook | 500mm |
| River Cam and tributaries (excluding the Cam Lodes and the Slade System) | 450mm |
| Great Barford (ordinary watercourses) | 500mm |
| Bromham (ordinary watercourse) | 550mm |

NOTES:

Urban areas excluded from the 'basic' approach: St Ives, Holywell, Godmanchester, Swavesey, Over, Bedford, Newport Pagnell, Buckingham and Leighton Buzzard. More detailed assessment of climate change allowances will need to be undertaken in these locations.

Use of these allowances will only be accepted after discussion with the Environment Agency.

4) Fluvial flood risk mitigation

For planning consultations where we are a statutory consultee and our [Flood risk standing](#) advice **does not** apply we use the following benchmarks to inform flood risk mitigation for different [vulnerability classifications](#). **These are a guide only. We strongly recommend you contact us at the pre-planning application stage to confirm this on a case by case basis.** For planning consultations where we are not a statutory consultee or our [Flood risk Standing advice](#) applies, we recommend that local planning authorities and developers use these benchmarks but we do not expect to be consulted.

- For development classed as '**essential infrastructure**' our benchmark for flood risk mitigation is for it to be designed to the '**higher central**' climate change allowance for the epoch that most closely represents the lifetime of the development, including decommissioning. Please note that nationally significant infrastructure projects (NSIPs) may also need to assess a **credible maximum climate change scenario** by applying the '**upper end**' allowance for peak river flow as a sensitivity test. This will help to determine how sensitive the development is to changes in the climate and to ensure that it can be adapted to large-scale climate change over its lifetime.
- For **highly vulnerable, more vulnerable, less vulnerable and water compatible** developments in flood zones 2 and 3a, the '**central**' climate change allowance is our minimum benchmark for flood risk mitigation. For large urban settlement extensions or developments that form new communities, the credible maximum climate change scenario must be assessed; in these circumstances, you should use the '**upper end**' allowance.
- For **water compatible** development in flood zone 3b, the '**central**' climate change allowance for the epoch that most closely represents the lifetime of the development is our minimum benchmark for flood risk mitigation.

For peak river flow allowances and a visual representation of the above, please see Tables 1 and 2 below.

| Table 1 peak river flow allowances by Management Catchment (use 1961 to 1990 baseline) | | | | |
|--|--------------------|---|---|---|
| Management Catchment | Allowance category | Total potential change anticipated for '2020s' (2015 to 39) | Total potential change anticipated for '2050s' (2040 to 2069) | Total potential change anticipated for '2080s' (2070 to 2125) |
| Upper and Bedford Ouse | Upper end | 24% | 30% | 58% |
| | Higher central | 10% | 11% | 30% |
| | Central | 5% | 4% | 19% |
| Cam and Ely Ouse | Upper End | 21% | 22% | 45% |
| | Higher Central | 7% | 5% | 19% |
| | Central | 2% | -2% | 9% |
| Old Bedford and Middle Level | Upper End | 23% | 22% | 39% |
| | Higher central | 9% | 4% | 15% |
| | Central | 3% | -3% | 6% |
| North West Norfolk | Upper End | 30% | 34% | 57% |
| | Higher central | 18% | 18% | 33% |
| | Central | 13% | 11% | 23% |
| North Norfolk Rivers | Upper End | 26% | 27% | 48% |
| | Higher central | 13% | 11% | 24% |
| | Central | 7% | 4% | 14% |
| Broadland Rivers | Upper End | 27% | 27% | 44% |
| | Higher central | 14% | 10% | 20% |
| | Central | 8% | 3% | 11% |
| East Suffolk | Upper End | 25% | 29% | 54% |
| | Higher central | 13% | 13% | 29% |
| | Central | 8% | 7% | 19% |
| Combined Essex | Upper End | 27% | 37% | 72% |
| | Higher central | 13% | 16% | 38% |
| | Central | 7% | 8% | 25% |

| | | | | |
|-------------|----------------|-----|-----|-----|
| South Essex | Upper End | 22% | 27% | 48% |
| | Higher central | 11% | 11% | 26% |
| | Central | 6% | 5% | 17% |

If you are not sure which management catchment your site falls within, please use the guidance and link to the peak river flow map, which can be found at: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#peak-river-flow-allowances>

| Table 2: Using peak river flow allowances for flood risk assessments | | | | | |
|--|-----------------------------|----------------------|----------------------|-----------------|------------------|
| Flood Zone | Essential Infrastructure | Highly Vulnerable | More Vulnerable | Less Vulnerable | Water Compatible |
| 2 | higher central ¹ | central ² | central ² | central | central |
| 3a | higher central ¹ | X | central ² | central | central |
| 3b | higher central ¹ | X | X | X | central |

X – Development should not be permitted
If (exceptionally) development is considered appropriate when not in accordance with flood zone vulnerability categories, then it would be appropriate to use the higher central allowance.

¹ For NSIPs, the ‘upper end’ allowance should be used to assess a credible maximum climate change scenario.

² For large urban settlement extensions or developments that form new communities, the credible maximum climate change scenario must be assessed. In these circumstances, you should use the ‘upper end’ allowance.

There may be circumstances where local evidence supports the use of other data or allowances. Where you think this is the case we may want to check this data and how you propose to use it.

Assessing off-site impacts and calculating floodplain compensation

The appropriate allowance to assess off-site impacts and calculation floodplain compensation requirements depends on the land uses in affected areas.

The ‘**central**’ allowance should be used in most cases. However, the ‘**higher central**’ allowance should be used when the affected area contains essential infrastructure.

5) Development in tidal flood risk areas

For flood risk assessments and strategic flood risk assessments, assess both the **higher central** and **upper end** allowances for all development vulnerability classes (see table 3 below).

For NSIPs and large urban settlement extensions or developments that form new communities, the **credible maximum climate change scenario** should be assessed (sea level rise and sensitivity test allowances for offshore wind speed and extreme wave height and storm surge uplift). To assess the flood risk from a high impact climate change scenario, you should use the H⁺⁺ allowance of 1.9m for the total sea level rise to 2100.

Table 3: sea level allowances for each epoch in mm for each year (based on a 1981 to 2000 baseline) – the total sea level risk for each epoch is in brackets

| Area of England | Allowance | 2000 to 2035 (mm) | 2036 to 2065 (mm) | 2066 to 2095 (mm) | 2096 to 2125 (mm) | Cumulative rise 2000 to 2125 (metres) |
|-----------------|----------------|-------------------|-------------------|-------------------|-------------------|---------------------------------------|
| Anglian | Higher central | 5.8 (203) | 8.7 (261) | 11.6 (348) | 13 (390) | 1.20 |
| Anglian | Upper end | 7 (245) | 11.3 (339) | 15.8 (474) | 18.1 (543) | 1.60 |
| South east | Higher central | 5.7 (200) | 8.7 (261) | 11.6 (348) | 13.1 (393) | 1.20 |
| South east | Upper end | 6.9 (242) | 11.3 (339) | 15.8 (474) | 18.2 (546) | 1.60 |

6) Tidal flood risk mitigation

For planning consultations where we are a statutory consultee and our flood risk standing advice does not apply, we use the following benchmarks to inform flood risk mitigation for different [vulnerability classifications](#). **These are a guide only. We strongly recommend you contact us at the pre-planning application stage to confirm this on a case by case basis. Please note you may be charged for this advice.** For planning consultations where we are not a statutory consultee or our flood risk standing advice applies, we recommend that local planning authorities and developers use these benchmarks but we do not expect to be consulted.

- For development classed as essential Infrastructure, highly vulnerable development and more vulnerable development, our minimum benchmark for flood risk mitigation is the **‘upper end’** climate change allowance for the development lifetime (including decommissioning where relevant).
- For water compatible or less vulnerable development (e.g. commercial), our minimum benchmark for flood risk mitigation is the **‘higher central’** climate change allowance for the development lifetime. In sensitive locations it may be necessary to use the **‘upper end’** allowance to inform built in resilience.

If you are using our 2018 Coastal Flood Modelling Data outputs:

The **upper end** allowance become progressively higher each year than the climate change flood level outputs used in our current 2018 coastal flood model. So as an approximation we recommend that the following uplift values are added on to the on-site climate change flood levels provided in the Product 4:

- For development lifetimes extending to 2122, add 0.34m
- For development lifetimes extending to 2123, add 0.36m
- For development lifetimes extending to 2124, add 0.38m
- For development lifetimes extending to 2125, add 0.40m

If the proposed development is greater than 30 houses and the flood zone is in an open-coast location, we recommend that a more accurate impact of the increased upper end flood levels on the overtopping on-site flood levels is modelled by rerunning our coastal overtopping model with the new flood levels; you can obtain the model from us with a Product 6 and 7 request. If the site is located within a small or constrained tidal or coastal floodplain then regardless of the size of the development, you may also need to undertake remodelling of the flood levels to obtain an accurate assessment of the impacts of climate change; please contact us for advice (contact details in Section 8 below).

If you are using our Broads 2008 Flood Modelling Data outputs:

For the **upper end** allowance, please add the following uplift values onto the climate change flood levels provided in the Product 4:

- For development lifetimes extending to 2122, add 0.34m
- For development lifetimes extending to 2123, add 0.36m
- For development lifetimes extending to 2124, add 0.38m
- For development lifetimes extending to 2125, add 0.40m

If you are using our 2008 Thames Flood Modelling Data outputs:

Please add the appropriate climate change allowances for the South East River Basin District onto the present day flood levels obtained in the Product 4, starting from a base year of 2005. The allowances should be applied to the year appropriate to the respective development lifetime for residential or commercial developments.

**** note**:** *We anticipate that there will be updated flood modelling outputs available for the Thames Estuary in mid-2022. Developers preparing Flood Risk Assessments for developments in this area should check for availability of new data with the East Anglia (East) PSO team (contact details in Section 8 below).*

There may be circumstances where local evidence supports the use of other data or allowances. Where you think this is the case, we may want to check this data and how you propose to use it.

7) Assessment of climate change impacts for Surface Water Management

Please see the latest advice on the use of Peak Rainfall Intensity climate change allowances, which can be found here: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

The Environment Agency is not a statutory consultee to the land use planning system for the consideration of surface water flood risk and management. We therefore recommend that you contact the relevant Lead Local Flood Authority (contact details listed below) to discuss Flood Risk Assessment requirements to support your development's surface water management proposals.

Cambridgeshire County Council - fr.planning@cambridgeshire.gov.uk
 Central Bedfordshire Council – floodrisk@centralbedfordshire.gov.uk
 Bedford Borough Council – floodrisk@bedford.gov.uk
 Milton Keynes Council – llfa@milton-keynes.gov.uk
 Buckinghamshire County Council - floodmanagement@buckscc.gov.uk
 Herts County Council - floodandwatermanagement@hertscc.gov.uk
 Northamptonshire County Council - floodandwater@northamptonshire.gov.uk
 Norfolk County Council – llfa@norfolk.gov.uk
 Suffolk County Council – floods@suffolk.gov.uk
 Essex County Council – suds@essex.gov.uk
 Thurrock Council – TransportDevelopment@thurrock.gov.uk
 Southend-on-Sea Council – llfa@southend.gov.uk

8) Our Service**Non-chargeable service**

We will give a free opinion on:

- What climate change allowance to apply to a particular development type
- Which technical approach is suitable in the FRA

Chargeable service:

- Review of climate change impacts using intermediate and detailed technical approaches (i.e. modelling review)
- Assessment and review of proposals for managed adaptation.

Contact Details

For East Anglia (Great Ouse Catchment): planning.brampton@environment-agency.gov.uk

For East Anglia (East): planning.ipswich@environment-agency.gov.uk

Appendix 1 – Further information on the Intermediate approach.

- 1) The methodology the chart is based on does not produce an accurate stage-discharge rating and is a simplified methodology for producing flood levels that can be applied in low risk small-scale development situations.
- 2) The method should not be applied where there is existing detailed modelled climate change outputs that use the new allowances. In such circumstances, the ‘with climate change’ modelled scenarios should be applied.

An example stage-discharge relationship is shown below.

