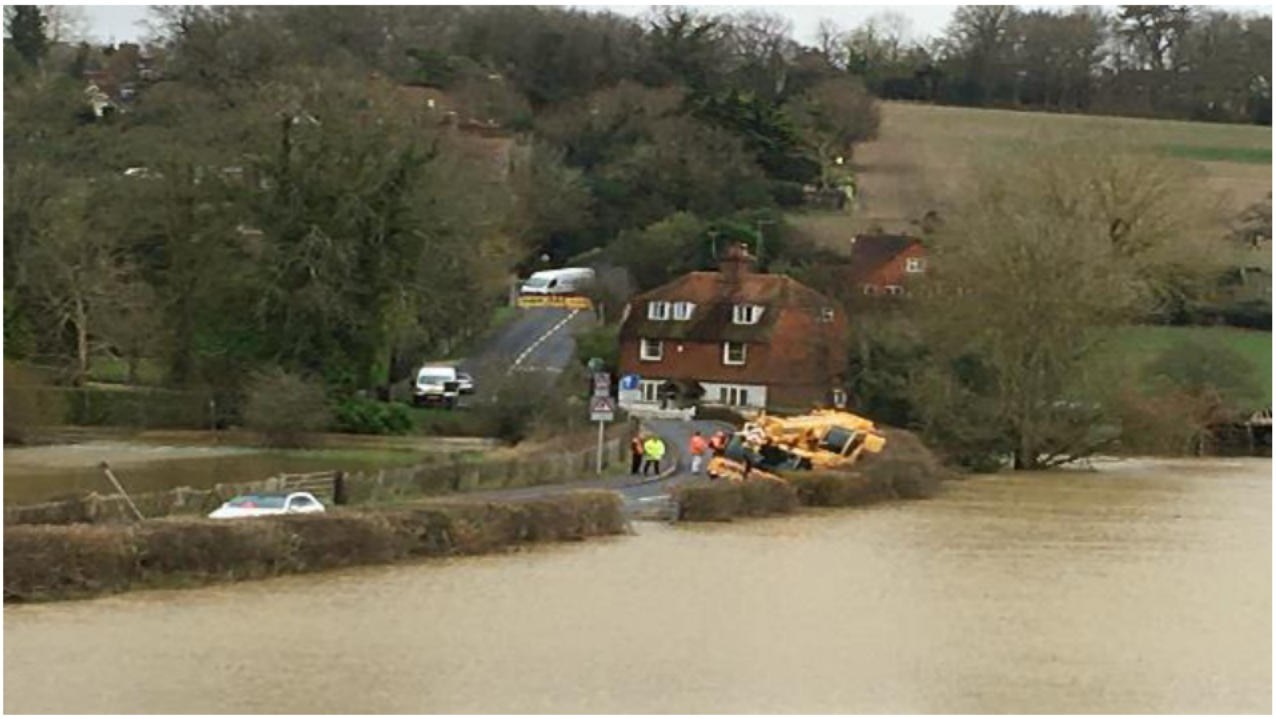
River Medway (Flood Relief) Act 1976

The Environment Agency's application to vary the Scheme for the operation of the Leigh Flood Storage Area

This is an Objection to the application

From Janie & Mike Hill

[redacted]



Photograph of February 2020 after the flood collapsed the road stranding a mobile crane.

The flooding of this road occurred after the Environment Agency operated the Leigh Barrier impounding the existing Flood Storage Area.

July 2020

1. Introduction

[redacted] is at the bottom of Rogues Hill close to the River Medway in Penshurst.

We have lived at [redacted] since 1993. We have seen for ourselves, over 27 years, the flood levels at Penshurst produced by the operation of the Leigh Barrier.

2. Fundamental reasons for Objection

2.1 We strongly object to this application to vary the Scheme for the operation of the Leigh Flood Storage Area. The EA has consistently failed to properly understand the effect that the operation of the FSA has on Penshurst. Because of this lack of understanding it has developed a theoretical model of flood events that is fundamentally flawed. This has a knock on effect through the whole project.

2.2 Despite having had at least ten years to measure the actual flood levels at Penshurst, the EA has taken an entrenched position on its theoretical modelling and simply denies that raising the level of the FSA will have an adverse effect on Penshurst. This is not based on actual evidence.

2.3 The River Eden joins the River Medway a few hundred metres upstream of Rogues Hill, and measurement of actual flood levels should have been taken after this confluence of two major Kent rivers, to understand the effect that the operation of the FSA causes during times of flooding. Instead the EA relies on measuring actual flood levels at Colliers Land Bridge for the River Medway and Vexour Bridge for the River Eden and then estimating the effect after the confluence. This is a fundamental flaw. Modelling is only ever as good as the inputs into it, if the inputs are flawed, the outputs will also be flawed.

2.4 The EA have never measured actual flood levels after the confluence of the two rivers.

2.5 Page 7 states *"There are no households within the additional area to be flooded."* This is simply untrue. Bridge House is within the existing FSA so must be within the enlarged FSA.

2.6 [redacted] has flooded 5 times since 2000. On every occasion, that flooding has been after the EA has commenced impounding of the FSA. Kevin and Jenny Storey, the owners, have submitted evidence of these five floods to the EA that shows the flooding took place after the EA started impounding of the FSA. In 2019 the EA accepted liability and paid them compensation for damage caused by the 2013 flood, yet they still maintain that Penshurst will not be affected by this application to raise the level of the FSA. It simply does not make sense.

2.7 The Technical Note (Appendix A) produced by the EA, shows for a 1 in 100 plus Climate Change scenario, a forecast flood level at [redacted] of 30.4 metres AOD. This is high enough to affect more houses on Rogues Hill than just [redacted].

3. Flawed Process

3.1 Natural Flooding

We refute the EA's assumption that "Natural Flooding" occurs rather than being the effect of impounding the FSA. In our experience as residents, this is simply not true. Evidence has been provided to the EA that all floods from 2000 to 2020 at [redacted] and the Village have occurred **after** the impounding of the FSA takes place. This flooding is greater than, and lasts for a longer duration than, any natural flooding.

3.2 Inconsistent standards

In the EA's Strategic Flood Policy it states that 1 in 100 years plus Climate Change is the scenario that should be defended against.

Throughout this project the EA have always quoted 1 in 100 years plus Climate Change as the scenario used.

In the application the EA have changed to a 1 in 75 years scenario. This conflicts with their own National Guidance.

3.3 Failure to gather evidence of actual flood levels

The EA have failed to measure the actual flood levels in Penshurst. Instead they have relied on theoretical modelling, which simply does not stand scrutiny when compared to the actual flood levels during impoundment of the FSA. The EA first raised the proposal to increase the FSA in 2010. Had they measured the flood levels then they would have actual data for the floods of 2013, 2019 & 2020. They failed to do this, instead they have relied on calculated flood levels and theoretical modelling. The EA have been sent the actual flood levels at [redacted] but they have chosen to disregard these. This is unacceptable.

3.4 Misleading statements

On Page 12 the EA state that they use "Better and more reliable gauging technology which provides more accurate information about actual river levels." Whilst this may be true, it is certainly not true in Penshurst. They have no gauging at all between the Leigh Barrier itself and Colliers Land Bridge for the River Medway and Vexour Bridge for the River Eden, a distance of 8km and 5 km respectively. And there is no gauging at all after the confluence of these two rivers.

3.5 Flow Rates

The current Scheme allows the FSA to be used when the rate of flow in the River Medway exceeds 35 cubic metres per second. Since 2011 the EA have only used the FSA when the flow exceeds 75 cubic metres per second, as to "go too early" would leave them with no spare capacity. Yet they ask to retain the lower figure. This places a great risk on Penshurst. With an increased capacity they could start impounding of the FSA too early and this would increase flood levels at Penshurst.

3.6 Biased letters of support

In the application the EA has submitted letters of support from many bodies. Not one person or organisation representing upstream communities have been invited to submit letters giving opposing views. For a Public Body this is unacceptable bias.

3.7 Failure to meet statutory obligation 1

The Environment Agency (EA) have not met the requirements of Section 17, Part II (e) of the River Medway (Flood Relief) Act 1976. The Act requires the EA to supply a copy of the revised scheme to "The Specified Interests" **BEFORE** submitting the scheme to the Minister for approval. The EA failed to do this. The scheme was submitted on the 10th June, but some Penshurst residents did not receive their copy until after this, denying us all the opportunity to (a) discuss the revised scheme with the EA and (b) to come to an agreement with them.

3.8 Failure to meet statutory obligation 2

The Environment Agency (EA) have not met the requirements of Section 17, Part II (e) of the River Medway (Flood Relief) Act 1976. The Act required the EA to supply a **COPY** of the revised scheme to "The Specified Interests." The EA failed to do this. The copy supplied is not the same as that which has been submitted to the Minister. The revised scheme on the reverse of the letter dated 8th June contains 5 paragraphs, whereas the revised scheme submitted contains 4 paragraphs. Again as the scheme had already been submitted, we were denied an opportunity to discuss the revised scheme with the EA.

3.9 Communication Failure

There has been no meaningful discussion with residents nor the Parish Council. What communication there has been, has simply been the EA telling us that their Theoretical Model shows that they are not responsible.

The EA have failed to monitor, assess safety and accessibility within the Village and to identify solutions.

3.10 Disregard for local MP

Tom Tugendhat MP has been supportive of our village's position within this proposal. He recognises the benefit to the homes downstream that will benefit from this proposal, but he also recognises the problems caused upstream in Penshurst. He has consistently raised this downside with the EA but has always been told that they were consulting with Penshurst. This has not been the case.

3.11 Risk of Judicial Review

All of the above flaws in the process mean that any decision made on the EA's Application could be challenged by means of a Judicial Review. The residents of Penshurst have twice raised funds to pay a QC to challenge two national decisions via Judicial Review, one planning decision and one aviation decision. Both decisions were quashed due to failure in process.

4. Penshurst Village

4.1 Risk of Death

Rogues Hill is a major route into and through the Village. It is the route used by the Fire Brigade, Police and Ambulance Service responding to emergency calls. It is also used by school buses and village traffic. When the EA impound the FSA this road floods to a depth of up to 1 metre, making it impassable, yet vehicles still attempt to pass. Raising the level of the FSA can only increase this flooding. This would create a **Moral Hazard**, with the

potential for death. The water flow is known to be in excess of 70 cubic metres per second and should a school bus attempt to go through the flood, it could easily be carried away downstream. This risk of multiple death is high. The EA have merely said that it is the responsibility of the Highways Agency. The **Grenfell disaster** has taught us that Moral Hazards can prove fatal, years later for many innocent members of the public.

4.2 Disregard for Penshurst Estate Residents

When the Leigh FSA was built in 1982 the EA's predecessor identified the risk of access to properties on the Penshurst Estate, and paid for the construction of a concrete road to ensure safe access. The EA's proposal to raise the height of the FSA now places access via that same concrete road at risk. On Page 21 the EA deny this problem, but say there may be scope to help . This is typical of the condescending attitude throughout both communications and the application. They have failed to provide a solution to a problem of their creation. A problem that affects not just six residential properties and farm buildings but also a nursery school with many children in its care.

4.3 Disregard for High Street Properties

Flooding will affect properties on High Street. There are buildings used for warehousing, hobbies and garages to the rear of these properties. Increased flooding will cause damage to property and access problems. One of these properties also claimed compensation for flooding caused by the EA's impounding of the FSA in December 2013. Early in 2020 the EA admitted liability and paid compensation to the owner of the property.

Appendix A

Project:	**Leigh Expansion and Hildenborough Embankments Scheme**		
Subject:	Penshurst modelled flood risk	**Consultant:**	VBA
Date:	June 2018	**Version:**	2

1. Purpose

This technical note outlines the modelled risk of flooding at and near to Bridge House, Rogues Hill, Penshurst under three Leigh Flood Storage Area (FSA) operational scenarios. This has been produced as part of the Leigh Expansion and Hildenborough Embankment Scheme (LEHES) which is currently being progressed by the Environment Agency and partner organisations.

2. Modelled events

Under the existing situation, the Environment Agency impound flood water in the Leigh storage area to a maximum level of 28.05m Above Ordnance Datum (AOD), measured at the main embankment near to the mechanical gates. The current study is investigating whether this storage level could be increased to 29m AOD to increase storage within the flood storage area. The upstream impact of both of these storage levels has been simulated in the hydraulic model.

The hydraulic model has also been used to understand the risk of flooding if there was no storage area. This is referred to as the undefended scenario. The Environment Agency do not intend to promote this option, but it provides an understanding of the 'natural' risk of flooding with no impoundment.

Six design flood events have been simulated for the two Leigh FSA storage levels, with two design flood events simulated for the undefended scenario. These cover a range of event probabilities. Maximum flood levels have then been extracted from each of the model results. These water levels have been analysed to assess the risk of flooding to Bridge House.

3. Ground and threshold levels

Approximate ground levels have been identified using Light Imaging, Detection and Ranging (LIDAR) data at the following key locations (Figure 1):

- Lowest point on Penshurst Road: 28.9m AOD
- Average ground level on floodplain upstream of Penshurst Road: 27.6m AOD

Threshold levels have been taken from survey data:

- Front threshold of Bridge House: 29.5m AOD
- Rear threshold of Bridge House: 29.1m AOD
- Outhouse building at Bridge House: 28.7m AOD

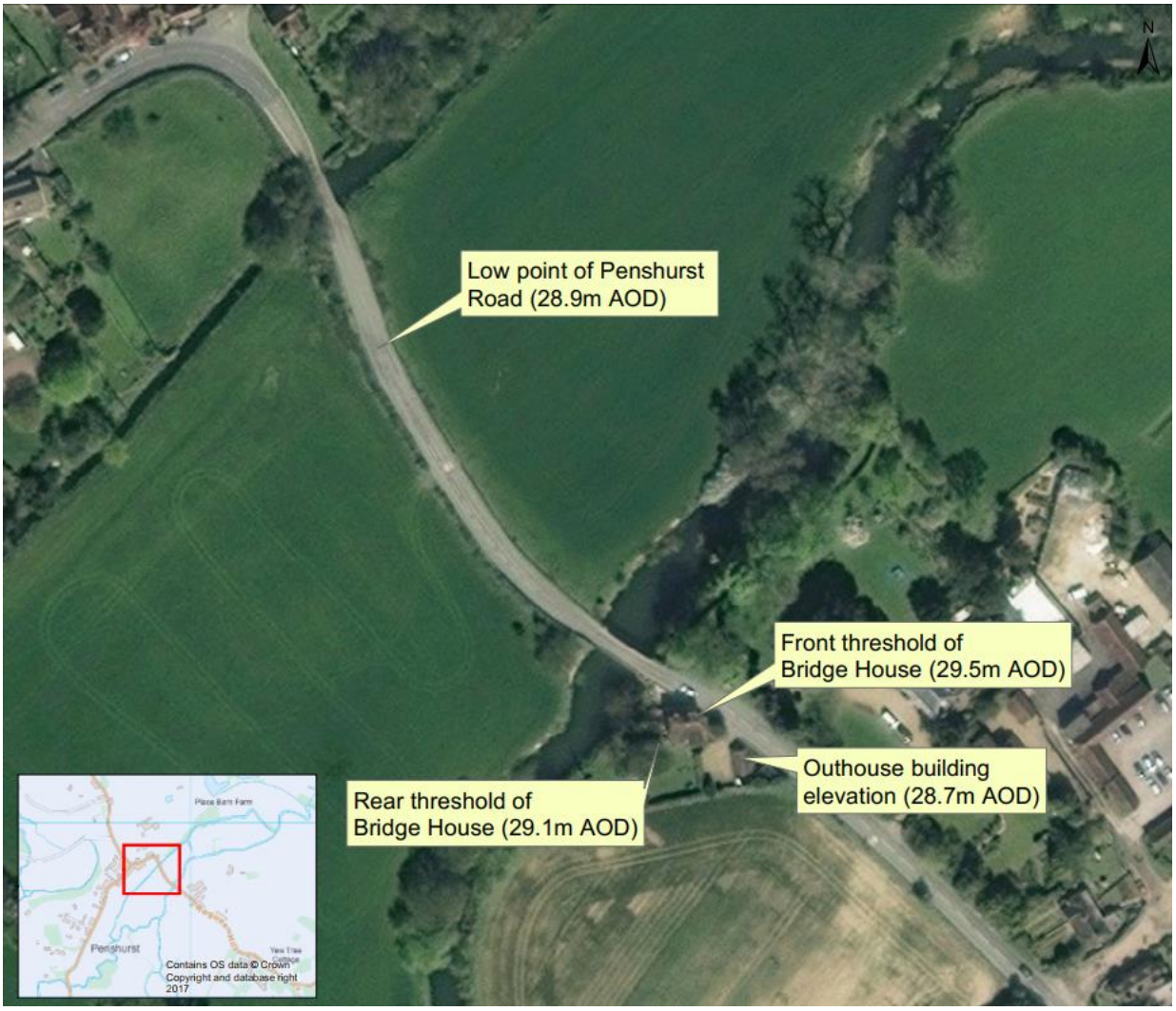


Figure 1. Locations of key ground and threshold elevations against which modelled flood levels are compared

4. Modelled flood risk

Impact of Penshurst Road

Penshurst Road is raised above the surrounding land, creating a causeway which restricts the natural flow of water across the floodplain. In lower order events, up to and including the 20% (1 in 5) annual probability flood, the modelled water level upstream of the road rises to approximately the same as the minimum road level (28.9m AOD) but does not exceed it. The restriction on floodplain flow caused by the road results in flood levels which are higher upstream of the road compared with those on the downstream side, increasing flood risk at Bridge House. Although in larger events, water is modelled to overtop the road, the effects of the restriction on flow are still observed. It is this flow restriction which causes the differences in water levels upstream and downstream of the road illustrated in Tables 1 to 3 below.

Undefended scenario

Undefended modelled water levels are given in Table 1. These indicate that part of Bridge House would be at risk of internal flooding in the 5% (1 in 20) Annual Probability (AP) event

with no impoundment at Leigh. The front threshold of the property is exceeded for a 1% annual probability event with climate change but not in a 5% annual probability event.

Table 1. Undefended modelled water levels

Flood Event annual probability	Water levels near Bridge House (m AOD)	Water levels downstream of Penshurst Road (B2176) (m AOD)
5% (1 in 20)	29.4	28.7
1% (1 in 100 + CC)	30.3	29.4

Existing Leigh Operation

Modelled water levels from the existing situation (storage at Leigh to 28.05m AOD) are given in Table 2. In the two events for which undefended water levels have been modelled (5%, and 1% with climate change annual probabilities), the water level near Bridge House is approximately 0.1m higher as a result of the impoundment at Leigh than for the Undefended model water level. This increase means that in the 5% (1 in 20) Annual Probability (AP) event, water levels are about equal to the front threshold of the property.

Table 2. Existing situation (storage at Leigh to 28.05m AOD) modelled water levels

Flood Event annual probability	Water levels near Bridge House (m AOD)	Water levels downstream of Penshurst Road (B2176) (m AOD)
20% (1 in 5)	28.9	28.4
5% (1 in 20)	29.5	28.8
2% (1 in 50)	29.9	29.1
1.3% (1 in 75)	30.0	29.3
1% (1 in 100 +CC)	30.4	29.5
0.4% (1 in 250)	30.4	29.6

Proposed Increase Storage Option

Modelled water levels caused by raising the maximum flood storage at Leigh from to 29m AOD are given in Table 3. This illustrates that the change in maximum water level at Leigh has no impact on flood levels upstream at Penshurst.

Table 3. Proposed options (storage at Leigh increased to 29m AOD) modelled water levels

Flood Event annual probability	Water levels near Bridge House (m AOD)	Water levels downstream of Penshurst Road (B2176) (m AOD)
20% (1 in 5)	28.9	28.4
5% (1 in 20)	29.5	28.8
2% (1 in 50)	29.9	29.1
1.3% (1 in 75)	30.0	29.3
1% (1 in 100 +CC)	30.4	29.5
0.4% (1 in 250)	30.4	29.7