

Public Participation | Day No.3

Area 6 Upstream of Water Rock Cave System / Underground Watercourse

The objective Provide flood risk mitigation to the design



standard of protection of the **1 in 100** year return period fluvial flood event

The problem

The Water Rock stream discharges into the underground cave system. The capacity of the cave system is unknown and cannot be determined.

If/when groundwater levels in the cave system rise (for example following prolonged rainfall events), this acts as a 'blockage' to the watercourse and water levels within the stream increase. This causes flooding of the area as shown in the figure.

The flood risk management measures considered:

Direct defences



Upstream storage



Culvert under railway line to west of Water Rock House and storage to west of cave system





Board

Not considered viable for following reasons:

- Excessively high defences required and are located adjacent to existing residential properties (greater than 3.5m high)
- Negative impact on landscape and visual
- Limited scope for climate change adaptability
- Standard of protection is not provided due to capacity of the cave system being unknown

Not considered viable for the following reasons:

• Standard of protection is not provided due to capacity of the cave system being unknown

Flood diversion channel/culvert

to the east to discharge into the

Owenacurra

- Excessively high impoundments embankments (+3.5m high) required
- Flood warning system not feasible
- Limited scope for climate change adaptability

Not considered viable for the following reasons:

- Standard of protection is not provided due to capacity of the cave system being unknown
- Introduction of flood risk to properties to the west, requirement for additional defences
- Difficulty draining the land following flood event
- Flood warning system not feasible
- Construction under railway line required
- Limited scope for climate change adaptability

Geo engineering measures -

Horizontal Directional Drilling (HDD)

1% AEP Fluvial/ 0.5% AEP Tidal Flood Extent (1 in 100 year fluvial/ 1 in 200 year tidal flood extent)

The outcomes of analysis

The standard of protection for some of the measures considered cannot be fully determined, as they rely on the cave system and the capacity of the cave system cannot be established.

Bypassing of the cave system by flood diversion channel/culvert/HDD could provide the standard of protection, however these are very expensive options relative to the economic benefit within the area, i.e. the cost benefit ratio is typically 3:1. Therefore these options are not cost beneficial.

All other areas within the scheme are cost beneficial. Inclusion of Area 6 would bring the cost benefit for the scheme below the desired 'greater than 1'.

Flood diversion channel/culvert to the south to discharge into the Water Rock stream downstream of the cave system







Although the standard of protection is provided, this option is not considered viable for the following reasons:

- Significant costs, resulting in an option that is not cost beneficial
- Significant construction complexity crossing under the railway line and the N25 road

• Increase of flood risk downstream

Although the standard of protection is provided, this option is not considered viable for the following reasons:

- Significant costs, resulting in an option that is not cost beneficial
- Significant construction complexity crossing under the railway line and the Northern Relief road
- Significant interaction with existing and proposed utility infrastructure adding to construction complexity

Although the standard of protection is provided, this option is not considered viable for the following reasons:

- Significant costs, resulting in an option that is not cost beneficial
- Significant construction complexity
- Potential environmental impacts

Ongoing work

Further investigation into flood risk management measures that will provide flood mitigation (albeit not to the required standard of flood protection) is actively ongoing. Consultation with the impacted landowners will continue.



Comhairle Contae Chorcaí Cork County Council







