Committee(s)	Dated:
Epping Forest and Commons	15 01 2018
Subject: Cripsey Brook – Thornwood Flood Alleviation Scheme (SEF 07/18)	**Public**
Report of: Director of Open Spaces and Heritage	**For Decision**
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Summary

The Cripsey Brook Flood Storage Area includes a Small Raised Reservoir maintained by the Environment Agency using Forest Land at Thornwood Common, within Lower Forest, to site the reservoir embankment, under a licence granted by the City Corporation in March 2000 to the Environment Agency and Epping Forest District Council.

The reservoir embankment dams a natural basin to prevent severe flooding in Thornwood hamlet which previously occurred in 1987 following intense thunderstorms.

The crest of the embankment is presently 75cm wide and is used as a footpath with grass slopes on either side. The reservoir is less than 25,000 m^3 and therefore is not currently governed by the requirements of the Reservoirs Act 1975.

The Environment Agency, in this case responsible for the Cripsey Brook dam, is also the enforcement agency and it has determined on a Risk Assessment basis that all of its non-statutory reservoirs be brought up to statutory standards.

Earth embankments can withstand limited overtopping if the downstream face is not too steep. A recent safety inspection has noted that the embankment is narrow with steep slopes and has poor vegetation, which the inspecting engineer concludes could reduce the length of the overspill path potentially resulting early failure and has recommended increase in the width of the crest. This would also make the slopes shallower, reducing overtopping velocity and overall improve its resistance.

The Environment Agency is therefore requesting permission to increase the width of the crest to 1.5m to bring the flood defence up to the statutory standard.

Recommendation(s)

Members are asked to:

- Approve the review of the terms of the licence dated the 20 March 2000 that was granted to the Environment Agency and Epping Forest District Council to enable them to carry out works within the original licenced area to widen the

crest of the Cripsey Brook dam to 1.5m but otherwise to retain all other remaining licence terms.

- Note that the Environment Agency is to contribute up to £2,000 towards legal costs.

- Instruct the Comptroller & City Solicitor to undertake any necessary documentation.

Main Report

Background

1. Following a much localised and extremely intense thunderstorm in 1987 which caused severe flooding in the Thornwood hamlet area, the Environment Agency (EA) and the District Council agreed the need for future flood relief measures.

2. Proposals were developed to create a Flood Storage Area (FSA) on the Cripsey Brook where the Brook flows north through a wooded area of Forest Land at the Lower Forest before passing through the developed area of Thornwood.

3. The EA and Epping Forest District Council (EFDC) were granted a licence by the City Corporation in 2000 for flood prevention works on Forest Land at Cripsey Brook - for the maintenance of the works and the site as a wildlife resource for the enjoyment of the public using Epping Forest.

4. The Reservoirs Act 1975 requires all Large Raised Reservoirs (LRR) – i.e. reservoirs that can hold more than 25,000 m^3 of water above ground level - to be regularly inspected and to meet safety criteria defined by independent Reservoir Engineers.

5. Reservoirs below the 25,000 m^3 capacity threshold are known as 'Small Raised Reservoirs'. There is no requirement under the Reservoirs Act to inspect the latter under the Act, and these reservoirs are obliged to be inspected under more general Health and Safety legislation.

6. Under the Flood and Water Management Act 2010 provision has been made to reduce the 25,000 m^3 de minimus capacity to 10,000 m^3 (or some other figure to be determined) , and indeed this measure has already been enacted in Scotland and Wales. A DEFRA working party is currently considered the introduction of suitable regulation in England.

7. The EA is the 'Enforcement Authority' under the Reservoirs Act, by which it has the role of enforcing the legal requirements of regular inspections and works required in the interests of safety on all statutory reservoirs in England.

8. Reflecting the risk-based approach enshrined in the Pitt Review of the 2007 national floods and subsequent legislation the Agency has decided that it is good practice to ensure that its small raised reservoirs be brought up to the standard that would be required of a Large Raised Reservoir, regardless of any change in the de minimis capacity for registration as a statutory reservoir.

Current Position

9. The EA watercourse inspector visits the site twice a year to monitor the site against a national checklist of items relating to maintenance and safety.

10. An earth embankment, 215m long and up to 2.0m high, forms the dam of the flood storage area at the downstream end of the woodland. The crest level is defined by concrete kerbs set into the upstream end of the crest. Where the narrow crest is used as an informal footpath, the crest has very poor grass cover.

11. At Cripsey Brook FSA western arm of the embankment, a gravel bridleway has been constructed between the toe of the downstream slope and the adjacent tall scrub. The inspector is concerned that as the scrub encroaches on the bridleway it will force horses to walk on the toe of the embankment. The Inspector has recommended a programme of on-going maintenance to the EA to improve grass cover on the embankment and to ensure vegetation is kept clear of the bridleway and all toes of the embankment.

12. The eastern part of the embankment is considered to be narrow with steep slopes and poor vegetation, and with an informal footpath along the narrow crest.

13. The relatively narrow embankment also reduces the length of any potential flow path through the embankment, and although visual inspections are carried out it is sometimes not until a reservoir fills that a leak is discovered.

14. The Inspector's recommendation to widen the crest to 1.5m increases the resistance to failure of the embankment, and means that even with an informal footpath there will be sufficient grass on the crest to resist erosion. At this width the crest can also be easily mown.

15. Flattening the slope to 1 on 3 also increases the opportunity of improving grass growth (and hence resistance to erosion), and reduces overtopping flow velocities.

16. The combination of increased crest width and flatter slopes therefore provides a significantly longer flow path for any potential leaks, and a greater volume of embankment fill to reduce the risk of a breach in the event of overtopping.

17. Should the FSA be subsequently registered as LRR reservoir the Inspector is confident that with these proposed changes there will be no measures required in the interests of safety when the reservoir receives its first statutory inspection,.

Proposals

18. It is proposed to allow the EA to increase the width of the crest of the embankment to 1.5 meters width at the eastern part. This increase in width will have no visual impact on the Forest. The land is within the area originally licenced to the EA, but the City & Comptroller Solicitor has advised that a new licence with new plans is now required. The EA has agreed to meet the City's reasonable legal costs.

Implications

19. **Financial** – there are no financial implications to the City Corporation.

20. **Legal** – Section S.33(v) of the Epping Forest Act 1878 provides the Conservators with the power to maintain watercourses. Under the Water Resources Act 1991 the EA has powers to compulsorily purchase any land which is required for the exercise of its functions.

21. **Property** – The proposed widening of the crest of the dam follows inspection and safety recommendations made to the EA. The works will improve public access over the crest and intend to make the dam slopes shallower, allowing for easier maintenance and possibly making public access on these areas easier. It appears that the works would not cause detriment to public access or the general character of the area, therefore it would be prudent to permit the works which are intended for safety reasons.

22. **Environmental** – There will be no additional visual intrusion associated with the widening, indeed the completed structure is likely to look more natural than the current steep profile. The site lies within the Epping Forest Site of Special Scientific Interest (SSSI) and the consent of Natural England will also be required.

Conclusion

23. The Cripsey Brook Flood Storage Area is currently a Small Raised Reservoir. Should regulatory change be enacted under the Flood and Water Management Act 2010, it will become a statutory reservoir and the EA has decided that it is good practice to ensure that its non-statutory reservoirs are brought up to the standard that would be required of a statutory reservoir.

24. The EA has recommended that the crest at the eastern part of the embankment be widened to 1.5 metres within the original licenced area. Natural England has not yet been consulted by the Environment Agency and their approval will also be required as this site lies within the SSSI.

Appendices

- Appendices 1 & 2 – Showing location of proposed works

Background Papers

SEF 28/92
'The Pitt Review; Lessons learned from the 2007 summer floods' Environment Agency (2011)

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