

<b>Committees:</b> Epping Forest & Commons Committee <i>[for decision]</i> Projects Sub Committee <i>[for decision]</i>	<b>Dates:</b> 18 November 2019 19 November 2019
<b>Subject:</b> Baldwins and Birch Hall Park Ponds  <b>Unique Project Identifier:</b> 11002	<b>Gateway 4:</b> <b>Detailed Options Appraisal (Regular)</b>
<b>Report of:</b> Director of the Built Environment  <b>Report Author:</b> Mark Bailey	<b>For Decision</b>
<h1>PUBLIC</h1>	

<b>1. Status update</b>	<p><b>Project Description:</b> This project involves the design and implementation of proposed works to the impounding earth embankment dams to two large ponds in Epping Forest in the interests of public safety, as independently recommended by the appointed reservoirs Panel Engineer. There is a need to stop progressive deterioration from leakage and internal erosion in both dams and to provide solutions which enable the dams to safely pass the flow from extreme storm events without the risk of uncontrolled overtopping and dam failure.</p> <p><b>RAG Status:</b> Amber (Amber at last report to Committee).</p> <p><b>Risk Status:</b> Medium (Low at last report to committee).</p> <p><b>Total Estimated Cost of Project (excluding risk):</b>  £ 1,335,000 (including works, fees, investigations, staff costs, approvals, etc.).</p> <p><b>Change in Total Estimated Cost of Project (excluding risk):</b>  The estimated cost of the preferred option at Gateway 3 was £675,000, with costs ranging up to £2,930,000 for other options. The latest estimated cost now proposed therefore exceeds the equivalent gateway 3 estimate but is within the previously estimated upper cost range last reported to Committee.</p> <p>It should be noted that comparative costs for this option at GW3 only included works costs and not fees, investigations or staff costs</p> <p>Whilst the works estimates for Birch Hall Park Pond have now reduced from £310k to £100k, the estimated works costs for Baldwins Pond have risen from £365k to £880k.</p>
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	<p>This is as a result of the ground investigations (since GW3) showing that the causes of seepage through the dam are more widespread than previously assumed, resulting in an increased extent of works to remediate.</p> <p><b>Spend to Date:</b> Approximately £40,000 (surveys, investigations and staff costs).</p> <p><b>Costed Risk Provision Utilised:</b> No CRP was established by previous reporting, although a CRP of £380,000 is now recommended for the project life as a whole, subject to further mitigation prior to Gateway 5, primarily relating to construction stage risks of specialist civil engineering works at Baldwins Pond at a remote and challenging location.</p> <p><b>Slippage:</b> Delivery of the project has been previously delayed (from estimates of completing works in 2014/2015) due to competing staff resources on other capital projects. However, the additional time in monitoring leakage at one of the two dams has been highly beneficial in helping to determine a relatively simple and economic solution.</p> <p><b>Fundamental Review:</b> Note that this project was agreed for progression outside of the fundamental review on essential health and safety grounds.</p>
<p><b>2. Next steps and requested decisions</b></p>	<p><b>Next Gateway:</b> Gateway 5</p> <p><b>Next Steps:</b></p> <ol style="list-style-type: none"> <li>1. Liaison with planning authority and other statutory bodies in relation to both work sites;</li> <li>2. In-house preparation of detailed design proposals and tender documentation for works to Birch Hall Pond;</li> <li>3. Early liaison and communication with local community.</li> <li>4. Tendering a traditional works contract for Birch Hall Pond with a target works programme in summer 2020;</li> <li>5. Preparation of project brief (employers' requirement) and tender documentation for a design-build contract for remedial works to Baldwins Pond;</li> <li>6. Tendering a design-build works contract for Baldwins Pond with a target works programme in summer 2021;</li> <li>7. Stage 1 appointment of design-build contractor to undertake detailed design and obtain statutory approvals for Baldwins Pond;</li> <li>8. Preparation of brief and tender documentation for a Cost Consultant to advise the City and check contractors proposals in respect of Baldwins Pond;</li> <li>9. Tendering and appointment of Cost Consultant in respect of Baldwins Pond;</li> </ol>

**Requested Decisions:**

1. That recommended Option 3 (to carry out repairs to the dams) is approved;
2. That the estimated total budget for the project of **£1,335,000** (excluding risk provision) is approved, including £40,000 spent to date.
3. Note the following proposed funding arrangements:
  - a. funding of £300,000 from **Epping Forest Capital Fund** (for Baldwins Pond only) be approved by the Epping Forest and Commons Committee
  - b. the balance of the future funding requirement (excluding risk) of up to £995,000 to be funded from **City's Cash Reserves**, subject to the approval of Resource Allocation Sub-Committee (and other relevant committees)
  - c. funding for the costed risk provision of up to £380,000 to be allocated from City's Cash reserves subject to the approval of Resource Allocation Sub-Committee (and other relevant committees) under separate report;

re: Birch Hall Park Pond

4. That a budget of **£30,000** from **City's Cash** is approved and released for fees, staff costs, statutory approvals and public engagement to further progress the project to Gateway 5 for **Birch Hall Park Pond**;
5. That Delegated Authority is given to Chief Officer to appoint a contractor for works at **Birch Hall Park Pond** at Gateway 5, subject to successful procurement and remaining within the estimated budget of **£100,000** for works at this location (but subject to use of Costed Risk Provision at G5 as item 10 below);

re: Baldwins Pond

6. That budget of **£242,500** from **Epping Forest Capital Fund** (EFCF) is approved and released for fees, investigations, staff costs, statutory approvals and public engagement to further progress the project to Gateway 5 for **Baldwins Pond**;
7. That Delegated Authority is given to Chief Officer to appoint a Design-and-Build contractor for the design stages of the **Baldwins Pond** scheme, subject to successful procurement and remaining within the estimated budget of **£100,000** for these fees (but subject to the use of Costed Risk Provision at G4 as item 9 below);

	<p>8. That Delegated Authority is given to Chief Officer to appoint a Cost Consultant for the design stages of the <b>Baldwins Pond</b> scheme, subject to successful procurement and remaining with the identified project budget of <b>£50,000</b> for these fees (but subject to the use of Costed Risk Provision at G4 as item 9 below);;</p> <p>9. That Delegated Authority is given to Chief Officer to appoint the Design and Build contractor for works at <b>Baldwins Pond</b> at Gateway 5, subject to satisfactory completion of design, statutory approvals and remaining with the estimated budget <b>£880,000</b> for works at this location (but subject to use of Costed Risk Provision at G5 and item 10 below).</p> <p><u>re: Costed Risk Provision</u></p> <p>10. That a Costed Risk Provision (CRP) of <b>£100,000</b> is approved at <b>Gateway 4</b>, to be drawn down via delegation to Chief Officer for the fee/investigation items specifically identified in the appended Risk Register, funded by <b>City Cash</b>.</p> <p>11. That a further Costed Risk Provision (CRP) of <b>£280,000</b> is approved for use at <b>Gateway 5</b> (if required and subject to mitigation in the interim) under delegated authority to Chief Officer, for works items specifically identified in the appended Risk Register, funded by <b>City Cash</b></p>
<p><b>3. Resource requirements to reach next Gateway</b></p>	<p><i>For recommended option 3:</i></p> <p>Please refer to Tables 1 and 2 below.</p>

Table 1: Resource requirements to reach next Gateway for Birch Hall Park Pond

<b>Item</b>	<b>Reason</b>	<b>Funds/ Source of Funding</b>	<b>Cost (£)</b>
<b>Birch Hall Park Pond</b>			
Statutory Approvals (including surveys)	To gain approval to commence works	City's Cash Reserves (subject to the approval of RASC and other relevant committees)	10,000
Public Consultation	PR/Reputation		5,000
Panel Engineer Fees	To review and approve designs		5,000
Internal Staff Costs	Design, tender preparation and project management		10,000
<b>Total</b>			<b>30,000</b>

Birch Hall Park Pond falls within Buffer Land and funding is therefore requested from City's Cash reserves, subject to the approval of Resource Allocation Sub Committee, the Policy and Resources and Finance Committees and the Court of Common Council.

Table 2: Resource requirements to reach next Gateway for Baldwins Pond

Item	Reason	Funds/ Source of Funding	Cost (£)
<b>Baldwins Pond</b>			
Statutory Approvals (including surveys)	To gain approval to commence works	Epping Forest Capital Fund (subject to a project cap of £300k), thereafter City's Cash Reserves (subject to the approval of RASC and other relevant committees)	10,000
Investigations	To confirm parameters needed for design		50,000
Design Fees	Stage 1 appointment of D&B Contractor		100,000
Cost Consultancy Fees	Appointment of Cost Consultant		50,000
Panel Engineer fees	To review and approve designs		10,000
Public Consultation	PR/Reputation		5,000
Internal Staff Costs	Checking, tender preparation and project management		17,500
<b>Total</b>			

Baldwins Pond is situated within Forest Land. Funding of Capital costs associated with this project are requested partly from the Epping Forest Capital Fund, on the basis that it falls with the meaning of Section 41(1) of the Epping Forest Act 1878 with regards "expenses properly chargeable on capital". However, this will be subject to a cap of £300,000, recognising the availability of resources and prioritisation against other calls on the Fund. It is proposed that funding of project costs above this cap will be met from City's Cash Reserves, subject to approval by Resource Allocation Sub Committee, Policy and Resources and Finance Committees and the Court of Common Council.

	<p><b>Costed Risk Provision requested for this Gateway: £100,000</b> (as detailed in the Risk Register – Appendix 2) from <b>City’s Cash Reserves</b> (subject to approvals)</p>
<p><b>4. Overview of project options</b></p>	<p>Both of these earth embankment dams are believed to be over 100 years old and are both subject to similar concerns which could potentially lead to catastrophic failure, namely: -</p> <ol style="list-style-type: none"> <li>a) Progressive internal erosion from seepage from the ponds.</li> <li>b) Erosion from uncontrolled over-topping under extreme weather events.</li> </ol> <p>These dams did not originally fall within the scope of the Reservoirs Act 1975, as impounding less than 25,000m<sup>3</sup> of water. However, the Flood and Water Management Act 2010 reduced this threshold down to 10,000m<sup>3</sup> and both reservoirs will be redefined as statutory Large Raised Reservoirs when the 2010 Act is brought into force. Irrespective of these potential changes in legislation, the dams are currently managed as statutory in respect of the City’s obligations under the Health &amp; Safety at Work Act 1974 and the Occupiers Liability Acts and are consequently subject to biannual inspections by the appointed reservoirs Panel Engineer.</p> <p>At Gateway 3, the following options were outlined for both dams, to mitigate risks: -</p> <ol style="list-style-type: none"> <li>1) Remove dam and pond,</li> <li>2) Demolish and reconstruct dam,</li> <li>3) Carry out repairs to dam,</li> <li>4) Reduce the size of the pond retained by the dam.</li> </ol> <p>Since Gateway 3, the following progress has been made: -</p> <ul style="list-style-type: none"> <li>• Topographic and bathymetric surveys</li> <li>• Ground investigations</li> <li>• Regular visual monitoring of dam leakage by Open Spaces staff</li> <li>• Biannual safety inspections by Panel Engineer</li> <li>• Consideration of preliminary design options by Department of Built Environment (Engineering Team) and Open Spaces.</li> <li>• Project liaison with Open Spaces, Chamberlain and City Procurement</li> </ul> <p>The summary of outcomes and recommendations from these detailed options appraisals are presented separately for the two sites: -</p>

### Birch Hall Park Pond (Deer Sanctuary)

Visual monitoring has indicated that seepage issuing on the downstream face of the dam ceases when pond levels fall below a certain level. This stable water level is approximately 300mm below the invert level of the temporary outfall pipe that was installed in 2012.

This pond is an important asset for watering of the deer herd within this sanctuary, but also has other positive environmental credentials.

After careful consideration, it has been established that by far the most expedient and economic option is a hybrid of options 3 and 4, with repair works (option 3) that involve: -

- a) The formation of a narrow overflow weir and spillway (up to 10m wide), to safely pass extreme flood events without uncontrolled overtopping along the dam crest,
- b) Setting the new weir level such that dry-weather water level in the pond is lowered to a point which mitigates leakage in the dam,
- c) Construction of a 2.5m wide unbound track across the sanctuary in order to facilitate current and future maintenance access requirements, or for use in an emergency.

The benefit of this option over options 1 and 2 is that it is considerably cheaper and less intrusive – particularly avoiding wholesale removal of trees and grubbing-out/repairing of root intrusions along the 150m length. As leakage is clearly only confined to the top 600 to 900mm of the dam (typical of the root zone of mature trees), the permanent lowering of water levels will mitigate this effect, with only a small reduction in the plan footprint of the pond being apparent.

In comparison, options 1 and 2 are very expensive, whilst option 4 alone does not fully mitigate risks for the dam.

### Baldwins Pond

Of the two locations, this is by far the most challenging and warrants a different approach in terms of technical solution, programme and procurement.

Removal of the dam/pond (Option 1) is likely to meet with strong objection from the local community and is potentially unacceptable on environmental grounds without extensive mitigation or remediation works. The pond forms an important feature within the Epping Forest Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC). This



is aside from the fact that this would be a challenging and costly earthworks exercise at this location.

Option 4 (lowering of water levels) would also be likely to meet resistance on aesthetic and environmental ground – but without doing anything on its own to significantly mitigate the risks to the dam from seepage or overtopping in flood events

Option 2 (reconstruction of the dam) would be very expensive and intrusive, particularly when there are repair solutions available which meet the project objectives at a much-reduced cost and with an adequate level of confidence.

This report therefore recommends a programme of repair works (option 3) as follows: -

- a) Excavating/forming a narrow impermeable cut-off wall through the dam on its long axis, taken to a depth of up to 8m maximum and toed into natural clay subsoil beneath the dam, supplement by injection grouting of the dam where necessary - to sever all leakage paths and mitigate internal erosion risks.
- b) Construction of an auxiliary emergency spillway at the dam crest, to safely pass extreme flood flows that cannot be conveyed by the current culverted outfall arrangement
- c) Relining the current 900mm culvert that passes through the dam, but whose integrity and impermeability has been compromised by previous vandalism (fire damage)
- d) Re-training works to the stilling basin on the downstream side of the dam, to dissipate culvert/spillway flows
- e) Improvements to current track access to form a haul route to this site within a steep sided valley, to assist the above construction works and future dam maintenance operations (or emergency access)

It should be made clear that internal erosion of dams from leakage flows is progressive and, over time, increases the risk of dam failure. It is therefore recommended that these works are not deferred any longer than is necessary to complete all design works and gain statutory approvals. In relation to the latter, a Habitats Regulations Assessment (HRA) is required and this would have to examine the impacts of all the aspects (programme a) – e) above) of the preferred Option 3 on the Special Area of Conservation (SAC) and also assess alternatives (including the other Options).

Given the prominent position of Baldwin's Pond and restrictions on public access during the works, it will be necessary for a co-ordinated communications programme to keep the public fully apprised of the projects progress.

	<p>For this reason, as well as the complexity of the solutions required for Baldwins Pond, which has become apparent from further investigation and analysis, the risk status of the project has been increased from low to medium.</p>
<b>5. Recommendation</b>	<ul style="list-style-type: none"> <li>• For both locations, Option 3 (repairs to the dam) is recommended for the reasons stated in the previous section.</li> <li>• In the case of Birch Hall Pond, the recommended repair solution also leads to a slight lowering of water levels in the pond and slight loss of plan footprint (as option 4).</li> <li>• It is considered that the recommended options mitigate the risks to the City and the public in the most economical and environmentally sensitive manner.</li> </ul>
<b>6. Risk</b>	<p>At the current time, a Costed Risk Provision (CRP) of £380,000 is estimated for the whole project life, although highly subject to further mitigation prior to Gateway 5. This figure mainly relates to construction stage risks and reflects the nature of design-and-build procurement and the current absence of a completed design and quantum of works for Baldwins Pond. Additionally, there are risks that a premium may need to be paid for the difficult access conditions at this site which is very difficult to quantify without contractor involvement.</p> <p>A Costed Risk Provision (CRP) of £100,000 from City Cash is requested for this Gateway, primarily due to current uncertainty on (a) the cost of Design-and Build contractor fees and (b) the scope of further investigations required by contractors to complete and underwrite their designs.</p> <p>Further information available in the Risk Register (Appendix 2) and Options Appraisal.</p>
<b>7. Procurement strategy</b>	<ul style="list-style-type: none"> <li>• It had previously been considered appropriate and most efficient to let the works at these two sites as a single contract. However, the technical solutions and programmes that have developed following the investigations and analysis subsequent to Gateway 4 now lend themselves to separate contracts and separate procurement strategies for the two sites.</li> <li>• In the case of Birch Hall Pond, the simple proposals do not require the services of external consultants to design or specify. The works required are relatively low complexity (mainly simple earthworks) and lend themselves to a traditional construction contract, let by competitive tender or under the term highways contract (by agreement). Subject to statutory approvals, implementation of these works in late-summer 2020 would appear feasible, when the soil on access routes is at its driest.</li> </ul>

	<ul style="list-style-type: none"> <li>• However, the works at Baldwins Pond are likely to be very challenging in terms of both access and the technical solution for forming the cut-off wall through the dam, as well as temporary works to protect the dam and access routes. These challenges do not fall within the normal field of expertise of design consultants and it is recommended that these considerations and risks are far better managed by a specialist civil engineering contractor as part of a design-and-build project. Due to the complexity of the proposals, the higher level of stakeholder coordination required and the more rigorous process to obtain approvals (not least for works in a SAC/SSSI), it is considered that implementation of works during summer 2021 is a more realistic target, to enable sufficient time for detailed design, consultation and statutory approvals.</li> <li>• The added advantage of separate contracts is that any delays in approvals or design for the more complicated Baldwins Pond scheme will not frustrate progress with Birch Hall Park Pond and mitigating the City's risks in respect of this asset at the earliest opportunity.</li> </ul>
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### **Appendices**

<b>Appendix 1</b>	Project Coversheet
<b>Appendix 2</b>	Risk Register
<b>Appendix 3</b>	Cost Breakdown for Recommended Option
<b>Appendix 4</b>	PT4 Procurement Form

### **Contact**

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## Options Appraisal Matrix

<b>Option Summary</b>	<b>Option 1</b>	<b>Option 2</b>	<b>Option 3 - Recommended</b>	<b>Option 4</b>
<b>1. Brief description of option</b>	Remove the dams and ponds	Demolish and reconstruct the dams	Carry out repairs to the dams	Reduce the size of the ponds by lowering dam crest levels
<b>2. Scope and exclusions</b>	<ul style="list-style-type: none"> <li>Includes for full removal of dams as impounding structures, with related loss of pond features.</li> <li>Would require a replacement bridge/walkway structure at Baldwins Pond to maintain the "Clay Ride" route across the steep sided valley, in addition to considerable environmental mitigation measures from loss of pond within SSSI/SAC</li> <li>Excludes a replacement source of drinking water for deer at Birch Hall Park</li> </ul>	<ul style="list-style-type: none"> <li>Includes for removal and full reinstatement of both dams, in order to retain both pond assets and valley crossing at Baldwins (Clay Ride)</li> </ul>	<ul style="list-style-type: none"> <li>Includes for construction of new overflow spillways and remediation of leakage paths at both dams, plus re-lining the existing culvert outfall to Baldwins Pond</li> <li>In the case of Birch Hall Park dam, remediating dam leakage is most effectively achieved by simply a permanent lowering of water levels by approximately 300mm, as monitoring has demonstrated that only the top of the dam is subject to leakage.</li> </ul>	<ul style="list-style-type: none"> <li>This option is partially inherent in the recommended solution to remediate dam leakage for Option 3 for Birch Hall Park Pond, but reduces the maximum volume of either pond to less than 10,000m<sup>3</sup> (the threshold under the Flood and Water Management Act 2010)</li> <li>However, this option does not obviate leakage problems at Baldwins Pond, nor works to safely pass design storm events at either location.</li> </ul>

<b>Project Planning</b>				
<b>3. Programme and key dates</b>	<ul style="list-style-type: none"> <li>Not established, but similar to recommended option 3</li> </ul>	<ul style="list-style-type: none"> <li>Not established, but more involved and longer than option 1</li> </ul>	<ul style="list-style-type: none"> <li>Expected programme of works at Birch Hall Park pond summer 2020</li> <li>Expected programme of works at Baldwins Pond summer 2021</li> </ul>	<ul style="list-style-type: none"> <li>Not established, but similar to recommended option 3</li> </ul>
<b>4. Risk implications</b>	<p>Medium Risk</p> <ul style="list-style-type: none"> <li>Removes liability in terms of raised reservoir but adverse effects on ecology and SSRI/SAC in the case of Baldwins, with risk of objection and/or expensive mitigation measures</li> </ul>	<p>Low Risk</p> <ul style="list-style-type: none"> <li>Liability for raised reservoir remains, albeit retained by modern dam construction</li> <li>Failure of dams/ponds in temporary works condition</li> </ul>	<p>Medium Risk</p> <ul style="list-style-type: none"> <li>Liability for raised reservoir remains</li> <li>Failure of dams/ponds in temporary works condition</li> <li>Further information available within the risk register (appendix 2).</li> </ul>	<p>Low Risk</p> <ul style="list-style-type: none"> <li>Liability for raised reservoir under Reservoirs Act or Flood and Water Management Act removed, albeit liability under other H&amp;S Acts remains</li> <li>Failure of dams/ponds in temporary works condition</li> </ul>
<b>5. Stakeholders and consultees</b>	<ul style="list-style-type: none"> <li>Epping Forest (City of London Open Spaces)</li> <li>Epping Forest District Council</li> <li>Environment Agency</li> <li>Natural England</li> <li>Local resident/amenity groups</li> </ul>			
<b>6. Benefits of option</b>	<ul style="list-style-type: none"> <li>Removal of any liability under the Reservoirs Act 1975 and Flood &amp; Water</li> </ul>	<ul style="list-style-type: none"> <li>Compliance with the Reservoirs Act 1975 and Flood &amp; Water</li> </ul>	<ul style="list-style-type: none"> <li>Compliance with the Reservoirs Act 1975 and Flood &amp; Water</li> </ul>	<ul style="list-style-type: none"> <li>Reduces maximum volume of ponds to less than 10,000m<sup>3</sup> and</li> </ul>

	<p>Management Act 2010 (should these reservoirs subsequently fall under the scope of the aforementioned legislation).</p> <ul style="list-style-type: none"> <li>• Mitigation of flood risks to members of the public who use the forest or who live in the downstream community.</li> <li>• Removal of future dam maintenance liability (and costs).</li> </ul>	<p>Management Act 2010 (should these reservoirs subsequently fall under the scope of the aforementioned legislation).</p> <ul style="list-style-type: none"> <li>• Mitigation of flood risks to members of the public who use the forest or who live in the downstream community.</li> <li>• High confidence solution to water leakage issues</li> <li>• Reduced future maintenance costs of new construction</li> </ul>	<p>Management Act 2010 (should these reservoirs subsequently fall under the scope of the aforementioned legislation).</p> <ul style="list-style-type: none"> <li>• Mitigation of flood risks to members of the public who use the forest or who live in the downstream community.</li> <li>• High confidence solution to water leakage issues</li> <li>• Most economically advantageous option</li> </ul>	<p>hence liability under the Flood and Water Management Act 2010.</p> <ul style="list-style-type: none"> <li>• Potentially the lowest cost option, although subject to expensive environmental/ecological mitigation measures</li> </ul>
<p><b>7. Disbenefits of option</b></p>	<ul style="list-style-type: none"> <li>• High cost option (major civil engineering earthworks)</li> <li>• Considerable disruption to forest users and nearby roads due to construction vehicle access</li> </ul>	<ul style="list-style-type: none"> <li>• Very high cost option (major civil engineering earthworks)</li> <li>• Considerable disruption to forest users and nearby roads due to construction vehicle access</li> </ul>	<ul style="list-style-type: none"> <li>• Slightly lower level of confidence of fully mitigating all water leakage issues in their entirety in-situ.</li> <li>• Reduced water levels at Birch Hall Park will reveal silt at margins and provide slightly less (but adequate) volume for deer drinking</li> </ul>	<ul style="list-style-type: none"> <li>• Does not adequately address leakage issues at Baldwins Pond.</li> <li>• The City would still attract responsibility for the ponds – even if not considered statutory large raised reservoirs – under the Health and Safety at Work Act and</li> </ul>

	<ul style="list-style-type: none"> <li>• Loss of water source for deer. New source would be required.</li> <li>• Loss of ecological habitat and/or expensive mitigation measures required</li> <li>• Access for forest users made considerably difficult at Baldwins if the earth dam supporting the Clay Ride is demolished and removed but not replaced or alternative</li> </ul>			the Occupiers Liability Acts.
<b>Resource Implications</b>				
<b>8. Total estimated cost</b>	<ul style="list-style-type: none"> <li>• Estimated combined cost indicated at G3 was £0.95M but this only included works.</li> <li>• Fees/staff/investigation/consultation costs are likely to be similar for all options (as costed for option 3)</li> <li>• Allowing for fees, staff costs, further investigations, approvals,</li> </ul>	<ul style="list-style-type: none"> <li>• Estimated combined cost indicated at G3 was £2.93M but this only included works.</li> <li>• Allowing for fees, staff costs, further investigations, approvals, consultation etc, this would significantly exceed option 3 costs</li> </ul>	<ul style="list-style-type: none"> <li>• Estimated cost indicated at gateway 3 was £675k</li> <li>• Total estimated cost (excluding risk): £ 1.335M, split £0.17M and £1.165M for Birch Hall Park Pond and Baldwins Pond respectively, including all works, fees, approvals and staff costs.</li> <li>• Total estimated cost (including risk): £1.715M,</li> </ul>	<ul style="list-style-type: none"> <li>• Estimated combined cost indicated at G3 was £0.72M but this only included works.</li> <li>• Allowing for fees, further investigations, approvals, consultation etc and the cost of environmental mitigation measures, costs would be expected to be similar to option 3 but</li> </ul>

	<p>consultation etc and the cost of environmental mitigation measures, this would be expected to equal or exceed option 3 costs, although it is very difficult to quantify the mitigation measures and consequential risks at this stage</p> <ul style="list-style-type: none"> <li>Total cost £0.95M works + £0.35M fees / staff / investigations etc = £1.30M + unquantified environmental mitigation measures + risk provision</li> </ul>	<ul style="list-style-type: none"> <li>Total cost £2.93M works + £0.35M fees/staff/investigations etc = £3.28M + risk provision</li> </ul>	<p>currently allowing for a £0.38M Costed Risk Provision</p> <ul style="list-style-type: none"> <li>Total cost £0.980M works + £0.355M fees/staff / investigations etc = £1.335M + risk provision (£0.38M) = £ 1.715M (inc. risk)</li> <li>Comparative costs quoted for this option at GW3 only included works costs and not fees/investigations.</li> <li>Whilst the works estimates for Birch Hall Park Pond have now reduced from £310k to £100k, the estimated works costs for Baldwins Pond have risen from £365k to £880k.</li> <li>This is as a result of the ground investigations (since GW3) showing that the causes of seepage through the dam are more widespread than previously assumed, resulting in an increased extent of works to remediate</li> </ul>	<p>without a comparable reduction in long term risk to the City from dam leakage and overtopping failure (albeit not a statutory reservoir)</p> <ul style="list-style-type: none"> <li>£0.72M works + £0.36M fees/staff / investigations etc = £1.08M + unquantified environmental mitigation measures + risk provision</li> </ul>
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<b>9. Funding strategy</b>	<ul style="list-style-type: none"> <li>Birch Hall Park Pond falls within Buffer Land and funding is therefore requested from City's Cash Reserves, subject to the approval of Resource Allocation Sub Committee and other relevant committees*</li> <li>Baldwins Pond is situated within Forest Land. The funding of Capital costs associated with this project is requested partly from the Epping Forest Capital Fund, on the basis that it falls with the meaning of Section 41(1) of the Epping Forest Act 1878 with regards "expenses properly chargeable on capital". However, it is recognised that this will be subject to the availability of resources and prioritisation against other potential calls, with the allocation of funds from the Epping Forest Capital Fund at the discretion of the Epping Forest and Commons Committee. An unallocated balance of £300k is currently available after making allowance for the cost of planned forest lodge refurbishments and staff welfare facilities. The remaining funding shortfall is proposed to be met centrally from City Cash reserves, subject to approval by Resource Allocation Sub Committee and other relevant committees*</li> </ul> <p>* Approval to the allocation of the additional funds from City's Cash Reserves will be required from Resource Allocation Sub Committee, Policy and Resources and Finance Committees and the Court of Common Council.</p>			
<b>10. Investment appraisal</b>	Not applicable			
<b>11. Estimated capital value/return</b>	Not applicable			
<b>12. Ongoing revenue implications</b>	<ul style="list-style-type: none"> <li>Removal of the dam at Baldwins Pond would obviate dam maintenance legacies but would necessitate future maintenance requirements for a</li> </ul>	<ul style="list-style-type: none"> <li>These two ponds/dams would have similar long-term inspection and maintenance costs as our other large raised reservoirs. The life cycle costs for long term maintenance/inspection of these two assets equates to approximately £10k per annum on average.</li> </ul>		

	<p>replacement walkway bridge across the Loughton Brook valley, in order to maintain connectivity of the historic Clay Ride route</p> <ul style="list-style-type: none"> <li>At Birch Hall Pond, removal would necessitate an alternative source of drinking water for the deer stock, with no natural watercourse present within this land plot</li> </ul>			
<b>13. Affordability</b>	<ul style="list-style-type: none"> <li>Second-most expensive option and ultimately likely to be higher than Option 3, albeit removing the City's long-term liability</li> </ul>	<ul style="list-style-type: none"> <li>Most expensive option and considered unnecessary if Option 3 is successfully implemented</li> </ul>	<ul style="list-style-type: none"> <li>This is considered the most economically advantageous option in mitigating the City's risks in the long term.</li> </ul>	<ul style="list-style-type: none"> <li>Potentially least expensive option, although not adequately reducing risks in comparison with other options.</li> </ul>
<b>14. Legal implications</b>	<ul style="list-style-type: none"> <li>Potential future liabilities under the Reservoirs Act 1975 (as amended by the Flood and Water Management Act 2010) are removed by this option</li> </ul>	<ul style="list-style-type: none"> <li>Compliance with the Reservoirs Act 1975 and Flood &amp; Water Management Act 2010 (should these reservoirs subsequently fall under the scope of the aforementioned legislation).</li> <li>The City would still attract responsibility for the ponds – even if not considered statutory large raised reservoirs – under the Health and Safety at Work Act and the Occupiers</li> </ul>		

	<ul style="list-style-type: none"> <li>• SSSI/SAC and Planning Permission.</li> <li>• Land Drainage Consent required</li> </ul>	<p>Liability Acts. The Health and Safety Executive may still have a duty to inspect under the H&amp;S (Enforcing Authority) Regulations 1988</p> <ul style="list-style-type: none"> <li>• SSSI/SAC and Planning Permission.</li> <li>• Land Drainage Consent required</li> </ul>		
<b>15. Corporate property implications</b>	<ul style="list-style-type: none"> <li>• Works are required in the interests of public safety and to protect the City's legal obligations thereof</li> <li>• Timely interventions will ensure that the City does not risk greater consequential damage and costs to the earth dams</li> </ul>			
<b>16. Traffic implications</b>	<ul style="list-style-type: none"> <li>• Both options 1 and 2 require significant earthworks import/export with a large number of heavy vehicles movements on public highway routes that are used to access these locations, in addition to the disruption to pedestrian/cyclist users within the Forest itself.</li> <li>• Significant closures of Clay Ride would be needed to facilitate works to Baldwins Pond</li> </ul>	<ul style="list-style-type: none"> <li>• This option represents a significantly reduced number of construction vehicle movements for both sites in comparison with options 1 and 2</li> <li>• Significant closures of Clay Ride would be needed to facilitate works to Baldwins Pond, albeit lesser duration than options 1 and 2</li> </ul>	<ul style="list-style-type: none"> <li>• This option represents the least number of construction vehicle movements for both sites</li> <li>• Some closures to the Clay Ride would still be needed to facilitate works to Baldwins Pond, albeit lesser duration than other options</li> </ul>	
<b>17. Sustainability and energy implications</b>	<ul style="list-style-type: none"> <li>• This option has questionable sustainability credentials, in terms of the loss of habitat associated with pond removal (in the absence of mitigation)</li> </ul>	<ul style="list-style-type: none"> <li>• This option necessitates large volumes of earthworks and vehicle movements and does not make best use of existing materials used</li> </ul>	<ul style="list-style-type: none"> <li>• This option requires the minimal quantity of earthworks and import of new material (with associated construction vehicle movements) to fully mitigate the long term risks</li> </ul>	<ul style="list-style-type: none"> <li>• Whilst this option would be the least intrusive and require the least volume of earthworks and vehicle movements, it does not fully address</li> </ul>

	measures), in addition to the number of vehicle movements generated by the works	in the dam construction, which would be replaced with newly imported materials	to the City of dam leakage and flood resilience	long term leakage issues at Baldwins Dam <ul style="list-style-type: none"> <li>Additionally, potential lowering of pond levels at Baldwins Pond could result in the loss of important habitats within the SSSI/SAC without significant mitigation measures</li> </ul>
<b>18. IS implications</b>	<ul style="list-style-type: none"> <li>Not applicable</li> </ul>			
<b>19. Equality Impact Assessment</b>	<ul style="list-style-type: none"> <li>As these options do not affect essential public transport routes, an EqIA is not considered applicable. Whilst all options require a temporary closure of Clay Ride of varying durations to facilitate the works, this is unlikely to discriminate against any disadvantaged or vulnerable people.</li> </ul>			
<b>20. Data Protection Impact Assessment</b>	<ul style="list-style-type: none"> <li>Not applicable</li> </ul>			
<b>21. Recommendation</b>	Not recommended	Not recommended	<b>Recommended</b> (for both Birch Hall Park Pond and Baldwins Pond)	Not recommended