

Committee(s):	Date(s):
Audit & Risk Management	March 2014
Subject: Strategic Risk 11 - Failure of any dams under the ownership or management of the City of London Corporation Hampstead Heath Hydrology – Highams Park Lake	Public
Report of: City Surveyor and Director of Open Spaces	For Information
<p>Summary</p> <p>This report is intended to provide an update on progress on both the above projects and to confirm the introduction of a new Strategic Risk covering failure of any dams under the ownership or management of the City of London Corporation</p> <p>The main body of the report is broken into three main areas</p> <ol style="list-style-type: none"> 1 New Strategic Risk on dam failure 2 Detailed Risk Registers– Hampstead Heath and Epping Forest 3 Hampstead Heath Project update 4 Highams Park Lake Project update 5 Eagle Pond Project update <p>Recommendation(s)</p> <ol style="list-style-type: none"> 1. To note the adoption of a new strategic risk covering the failure of any dam under the ownership or management of the City of London Corporation. 2. To note that detailed risk registers for Hampstead Heath, Higham Park Lake and any other identified dam, will remain and shall contain the details of issues and mitigation planned or taken 3. To note the updates on the three projects 4. To note that moving forward that a single Chief Officer will be named as the risk owner of the dams identified. – Sue Ireland Chief Officer Open Spaces. 	

Main Report

1 New Strategic Risk

Maintaining the City's Reservoirs - -Major flooding caused as a result of pond or reservoir failures

The City is responsible for a number of water bodies, some of which are classified as "Large Raised Reservoirs" under the provisions of the Reservoirs Act 1975 and Flood & Water Management Act 2010. "Large Raised Reservoirs" currently refer to those raised bodies of water with a capacity of more than 25,000m³.

It is anticipated that the full enactment of the 2010 Act will result in more of the City's raised water bodies being categorised as "high risk" – particularly those in cascade with the water Capacity being reduced from more than 25,000m³ to 10,000m³ when the provisions of the 2010 Act are fully brought into force.

Those reservoirs where there is a risk to life in the event of breach, the EA can define them as "high risk" – currently three on Hampstead, two at Epping, -Eagle Pond and Highams Park but not Wanstead are clarified as high risk

The City of London Strategic Flood Risk Assessment 2012 with new surface water modelling, identified 4 areas of risk in the City from upstream run-off (including Hampstead Heath). Epping Forest dams are already subject to a section 10 notice of improvement issued by the panel engineer and works are planned to commence on site in April 2014

It has already been recognised that the chains of ponds on Hampstead Heath are a significant liability under the 1975 Reservoir Act and other legislation. Approval was given by the Court of Common Council on 14 July 2011 for the project to upgrade the pond embankments on the Hampstead and Highgate chains.

If there were to be failure of the pond or reservoir embankments during a major storm, and no warning was given, the number of lives at risk on the Hampstead chain would be in the region of 400 and on the Highgate chain would be around 1000. This would also result in inundation and damage to local properties, roads and the railway lines towards Kings Cross. Detailed analysis has identified that dam crests are not currently able to cope with the level of overtopping expected to occur as a result of such a storm, increasing the risk of erosion and dam failure.

The aims of these projects are to reduce the current risk of pond overtopping, embankment erosion, failure and potential loss of life downstream; ensure compliance with the existing requirements of the Reservoirs Act 1975 together with the additional expected requirements under the Flood and Water Management Act 2010. The Hampstead Heath project will also need to meet the obligations of the Hampstead Heath Act 1871; and improving water quality where necessary.

In support of the new strategic risk a register of supporting information will be compiled which will include the following

- Name of reservoir
- Volume
- Risk to community downstream in the event of breach
- In a chain?
- Categorisation under 1975 / 2010

- Ownership
- Relevant projects
- Mitigation approach
- Links to other assets
- Responsible officers
- Inspection regime
 - Contractor / responsible officer
 - Date of last
 - Date of next
 - Outcome of last inspection

In addition it is intended to clarify who is the Chief Officer responsible for the ownership of the risk. All of the ‘at risk dams and reservoirs are located on land under the ownership, control and management of Open Spaces. The intention is that the Chief Officer for Open Spaces would be the ‘Responsible Officer’.

The current risk scoring for the new strategic - Failure of any dams under the ownership or management of the City of London Corporation is as follows

Gross Risk	R
Likelihood	Impact
3	5

The various projects to upgrade pond embankments are progressing, but until such time that these projects are completed (2015/16) there remains a risk that if any of the dams are breached the water normally stored in the ponds will also be released and combine with the flood water – very quickly and in a completely uncontrolled way – with risk to life and property downstream. Day to day management of the ponds and the community welfare aspects of this risk lies with the Director of Open Spaces

Net Risk	R
Likelihood	Impact
3	5
Control Evaluation	
A	

2 Detailed Risk Registers– Hampstead Heath and Epping Forest

Whilst the Corporation has introduced a strategic risk covering dam / pond failure it is intended to continue to hold and maintain a detailed risk register for each relevant project and where issue, actions and mitigation actions including the following points.

- Monitoring of dam condition and safety: Regulatory inspection regime
- Emergency plans and warning systems: Liaison with Lead Local Flood Authorities
- Changing regulatory regime
- Shared ownership
- Stakeholders and communication
- Register of supporting information for each identified dam / chain
- Identifying required works, budget availability, project progression

3 Update on Hampstead Heath Dams Project

It was agreed that the Audit & Risk Management Committee would receive updates on Strategic Risk 11 and the progression of the Hampstead Heath Ponds Project every 9 months

3.1 Specialist surveys:

The CoL has engaged specialist companies to undertake, Aquatic, Terrestrial, Water Quality and Archaeological studies. Atkins has specified the work and is managing the activities.

3.2 Design

Capita has been appointed as Project Manager for the Ponds Project with specialist consultants Atkins appointed to undertake a review of the current risk of flooding based on storm predictions. In addition a Strategic Landscape Architect has been appointed to assist the project and provide further advice to stakeholders.

Atkins have produced a short list of options for formal non-statutory consultation with the public and stakeholders with the intent of selecting a preferred option which will form the basis of a planning application to be submitted by the end of June 2014 and subject to consents, site works to commence during April 2015. Atkins engineering options information included various conceptual sketches, hydrographs, cross sections and 3D visuals.

3.3 Procurement

Capita has been appointed as Project Manager and Cost Consultant for the Ponds Project with specialist consultants Atkins appointed as Designers. These appointments have been made along with placement of orders for the various survey works.

Wider non-statutory public consultation commenced late November 2013 and is programmed to be complete by February 2014. The Contractor appointment is required from this point to provide detailed technical design input into the 'preferred' option and to also develop the Construction Environmental Management Plan as it forms part of the planning submission. A tender report was submitted and approved by HHMC committee on January 27th 2014 recommending the appointment of BAM Nuttall as contractor for the pre-construction phase of the Hampstead Heath Ponds Project.

3.4 Project Timetable

Members have been keen to ensure that the project progresses with “all deliberate speed”, as advised by Counsel. The current timetable is agreed by the Project Board and HHMC.

The agreed programme allows for an extended period for non-statutory consultation with the public and stakeholders to February 2014. Once complete, the intention is to submit a formal planning application in June 2014. During this period the appointed contractor will have time to input into the design development and undertake surveys and investigations required by the design team. This includes organising ground investigations.

The timetable remains challenging and has no ‘programme contingency’ and it is possible it will need further revision as some of the “unknowns” are identified. Atkins have produced a detailed project programme which aligns with these key dates.

The risk of a Judicial Review application remains and if this were to happen it could impact upon the timetable for the project. Similarly, the planning process or conditions onsite may also impact upon the project timetable.

Project Timetable (Under review)

	Updated Programme January 2014
Shortlist of four design options presented to CoL for consideration and for formal consultation with the Heath Management Committee and other appropriate Committees / Stakeholders.	July 2013 – October 2013
Wider non-statutory Public consultation on short listed four options	November 2013 – February 2014
Preferred Option agreement by CoL and Heath Management Committee and other appropriate Committees / Stakeholders	March 2014
Preparation of planning application	March 2014 – June 2014
Submission of Detailed Planning Application to Camden Council	June 2014
Estimated Determination of Detailed Planning Application	November / December 2014
Judicial Review Challenge period	Dec 2014 – Feb 2015
Commencement of Works on Site (Phasing to be agreed)	April 2015
Completion of Works	October 2016

Dr Andy Hughes, the Reservoir Supervising Engineer (Panel Engineer) has been consulted on the changes to the programme. Dr Hughes understands that the project will not succeed unless stakeholders feel that they have been listened to and are involved in the project and has agreed to the current programme.

3.5 Implementation of the Emergency Action Plan

Officers continue to engage with officers at Camden and the Metropolitan Police. The Superintendent of Hampstead Heath facilitated a workshop between all three organisations. In addition to this a table top event involving Hampstead Heath, City Surveyor's and the Emergency response contractor took place in March 2013.

The City is responsible for mitigation measures on the Heath whereas Camden is responsible for "warning and informing" as Lead Flood Authority, and Camden together with the Metropolitan Police are the Local Responders who implement Camden's off-site emergency plan.

3.6 Potential for Judicial review and other Legal challenges

The possibility of a Judicial Review application remains. Based on previous statements, it is likely that this would focus on the relationship between Reservoirs Act 1975 and the Hampstead Heath Act 1871, and the assessment of risk / appropriate safety standards under national industry guidelines on which the project is based. It is not clear when such a challenge might materialised, this may be a judgement based on the final designs and whether they are considered acceptable in terms of their impact on the Heath landscape. Any planning decision could also be the subject of further challenge.

3.7 Stakeholder engagement

The Ponds Project Stakeholder Group continues to meet monthly. While there continues to be constructive dialogue, officers are aware that there are two distinct schools of thought locally – those most concerned with the perceived negative impact of the project on the Heath and those concerned with the potential for flooding downstream. Until recently those expressing environmental concerns have been most prominent and have been highlighted in the local media. Officers are now aware of a growing concern about flood risk downstream (not solely related to the Hampstead Heath ponds) and it appears that there has been an increase in activity in support of flood mitigation measures.

The fact that the project is designed to prevent a catastrophic dam breach and an associated sudden influx of water but is unlikely to prevent flooding generally is of some concern to residents downstream. It is important to note that while the impact of flooding associated with the dams and ponds is of particular significance in parts of Camden, residents are affected by a number of flooding issues including surface water flooding associated with insufficient sewer capacity.

The Design Team have made it clear to stakeholders that the Ponds Project will not exacerbate the issues of surface water flooding downstream, and that the attenuation of water in the upper parts of the catchment may even assist with smaller rainfall events.

3.8 Resources

The current estimated project costs are within the £18,139m provision (including 20% tolerance)

3.9 Adjoining Owners

A report on adjoining owners was submitted and approved by HHMC committee on January 27th 2014

The above report was agreed by Policy and Resources on 20th February 2014. The report deals with both a funding strategy and reputation issue.

3.10 Corporate & Strategic Implications

The works support the strategic aim 'To provide valued services to London and the nation'. The scheme will improve community facilities, conserve/enhance landscape and biodiversity and contribute to a reduction in water pollution whilst meeting the City Corporation's legal obligations. The risk of any dam breach and serious downstream flooding of communities (and consequent harm to the City's reputation) is mitigated.

3.11 Implications

The risk of embankment failure at Hampstead Heath is assessed as a high risk on the City of London Corporations Strategic Risk Register. In addition to the current measures to mitigate risks the potential threat of legal challenge could still potentially delay the project.

3.12 Conclusion

The design process is continuing, following the Design Flood Assessment approval by the Hampstead Heath, Queen's Park and Highgate Wood Committee in May 2013. The revised project timetable provides stakeholders time to consider technical documents which will assist the development and agreement of the design.

The ponds project has continued at "all deliberate speed".

4 Update on Higham Park Dams Project

As advised in previous reports we have undertaken detailed surveys and flood analysis at Highams Park Lake.

These have confirmed the complicated hydrology during extreme flood events where flows initially spill from the Reservoir into the River Ching and then as this reaches capacity back in to the reservoir and overtop the Dam.

On the advice of our Supervising Engineer and Inspecting Engineer a further S.10 Inspection was undertaken which confirms the analysis and that the Dam is a Category A dam with Likely Loss of Life (LLoL) in the downstream community. The

Inspecting Engineer has recommended works in the interest of safety including reinforcing the dam.

It should be noted that the Reservoir is part of a Repton designed landscape for Highams House and whilst this has not been listed or protected in any way severe alterations to the Dam resulting in changes to the landscape may excite opposition to the project and persuade authorities to list the Reservoir. The design will therefore need to be sensitive to the environment and compliant with requirements of the Environmental Impact Assessment.

Following an inspection in April 2011 of Highams Park Lake under section 10 of the Reservoirs Act (1975), the appointed Panel Engineer reported that works would be necessary to ensure that the dam which impounds the lake can safely withstand the passage of design flood events. The Panel Engineer's report also required that these works must be commenced within 3 years of the inspection, in order to avoid potential enforcement by the Environment Agency.

4.1 Specialist surveys:

The CoL has engaged specialist companies to undertake topographic, CCTV and bathymetric surveys, archaeological desktop studies, environmental desktop studies and phase 1 habitat surveys. Ground investigations (including lake silt sampling and testing) have been scoped and are in the process of being procured.

4.2 Design

Royal Haskoning DHV we appointed in the role of Lead Consultant for the project in October 2013 and have commenced survey work and options design.

The statutory nature of this project and approval requirements means there are limited options and the "do nothing" alternative is not acceptable. The three options considered were

Removal of the Dam – Whilst this option will reduce the risk of flooding and the Likely Loss of Life as a result of a dam Breach, it would increase the risk of fluvial flooding with the reduction in storage capacity.

Reinforcement of the Dam Without Scout Hut

Reinforcement of Dam With Scout Hut

This option is now the preferred option and will require an engineered emergency spillway on half the dam. Due to the conditions of flow this is likely to be constructed in reinforced grass/subsoil or, in the extreme, concrete that is then overlain with topsoil and grass to maintain the natural aspect.

4.3 Procurement

Royal Haskoning DHV has been appointed in the role of Lead Consultant for the project. Procurement for the contractor has been undertaken and Balfour Beatty has been appointed as preferred contractor at the end of January 2014.

4.4 Project Timetable

	Updated Programme January 2014
Outline Design complete	Feb 2014
Submit Planning Application	8th Feb 2014
Planning consent expected	April 1st 2014
Detailed Design	March 2014
Advance Site Works	April- May 2014
Main Site Works	June 2014 – Sept 2014
Landscaping Works	Sept 2014 – Nov 2014
Completion	Nov 2014

The Environment Agency has been advised on progress of the project and the planned programme and has no comments at this stage.

4.5 Implementation of the Emergency Action Plan (EAP)

The EAP is in place and will be adopted and updated as the project progresses. Once the principle contractor has been appointed the responsibility for the management of the EAP move to contractor

4.6 Potential for Judicial review and other Legal challenges

The potential for a JR may be reduced by the preferred option, as this retains the Scout Hut – a previously sensitive issue locally and with residents

4.7 Stakeholder engagement

A local drop-in session was arranged in December 2013 and attended by local residents and other interested parties (Scouts, residents groups). Public consultation for the outline design is planned for February 2014

Consultation has already commenced with English Heritage, Environment Agency, Natural England and London Borough of Waltham Forest (LBWF). It has been confirmed by LBWF Planners that an Environmental Impact Assessment (EIA) will not be required for the project.

We are currently seeking confirmation from LBWF whether the works can actually be carried out under Permitted Development i.e. without the need for a full planning application.

4.8 Resources

The current estimated project costs are within the £1,865m provision (including £150K risk)

4.9 Corporate & Strategic Implications

This reservoir safety project fits the following three categories:-

1. Health and Safety
2. Statutory (Asset enhancement / improvement)

The works support the strategic aim 'To provide valued services to London and the nation'. The scheme will improve community facilities, conserve/enhance landscape and biodiversity and contribute to a reduction in water pollution whilst meeting the City Corporation's legal obligations. The risk of any dam breach and serious downstream flooding of communities (and consequent harm to the City's reputation) is mitigated.

4.10 Implications

The risk of embankment failure at Highams Park is assessed as a high risk on the City of London Corporations Strategic Risk Register.

4.11 Conclusion

The design process is continuing, following the Design Flood Assessment approval Highgate Wood Committee in May 2013 and advanced /enabling works will commence in advance of the April 2014 EA deadline.

5.0 Eagle Pond Update

A separate paper is being submitted to the committee for inclusion of Eagle Pond on the risk register

Appendices

- Appendix 1 New Strategic Risk Register
- Appendix 2 Risk registers for Hampstead Heath and Highams Park Lake
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Background Papers:

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