The British Dam Society

EVENING MEETING

Monday 3rd March 2025 – 18.00

Understanding the Reservoir Safety Risks of Non-Statutory Reservoirs - Abi Morgan & Guy Hitchens.
Leakage Remediation at a Small Heritage Reservoir – Peter Down.
Leakage Remediation at the Hampton Distributing Reservoir – Stan Qi.

For synopsis and brief presenter biographies see overleaf

This meeting will be streamed live on the internet. For more details, including enjoying the live stream as part of a group at one of our Regional Hubs around the UK, please visit the meetings page on the BDS website: www.britishdams.org

For more information, please contact the ICE on 020 7665 2147 or email: bds@ice.org.uk

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Synopsis

Understanding the Reservoir Safety Risks of Non-Statutory Reservoirs

In 2022, Severn Trent Water (STW) appointed Arup to carry out a project to appraise the reservoir safety risks posed by 71 reservoir sites with capacities identified in the range 10,000 to 25,000m^3 above natural ground level. Following the Flood and Water Management Act 2010, which amended the Reservoirs Act 1975 (the Act), it was anticipated that these reservoirs would likely be brought into the Act when the threshold is amended to 10,000m3; this would increase the number of statutory reservoirs within STW's portfolio. By investigating and studying each reservoir, the project helped STW to understand the potential increase in financial risk which could occur because of additional regulation. This considered both operational requirements and capital works, to ensure the potential statutory reservoir safety risks posed by the reservoirs are minimised and managed in good time.

This presentation explains the methodology that was applied to carry out the assessment, together with the key themes discovered, including common reservoir safety risks and recommended mitigation actions, as well as an exploration of the challenges and opportunities of the process.

Leakage Remediation at a Small Heritage Reservoir

Abbeydale Industrial Hamlet, on the outskirts of Sheffield, is a former steelworking site along the River Sheaf and has become a museum open to the public. The site, including the reservoir and dam, is designated a Scheduled Monument and the forge works are Grade I listed. Several other buildings within the site are Grade II* listed. It has a history thought to go back to 1685, with the present-day site reported to date from the early 18th century. To provide power for the machinery, a small reservoir was constructed and filled with water abstracted from the River Sheaf. The reservoir was enlarged as the site developed although remains below 25,000m3 capacity, and thus is not registered under the Reservoirs Act 1975 (as amended).

There has been a history of leakage from the reservoir. In November 2022, the most recent leakages and damage to structures were investigated with the aim of developing suitable remedial measures. At the end of May 2023, significant leakage from the reservoir into one of the Listed buildings occurred resulting in emergency action being taken. This presentation details the issues encountered, works previously performed, recent investigations and the development of remedial works to provide a longer-term solution.

Leakage Remediation at the Hampton Distributing Reservoir

Hampton Distributing Reservoir is a non-impounding reservoir built in 1900s and located in Hampton, southwest London. The reservoir, formed by a typical puddle clay core embankment, has

a total perimeter of 800m and a storage capacity of 32,000m3. An increase in embankment settlement was detected, starting from 2011, based on annual crest levelling surveys, which was then followed up with a non-intrusive geophysical survey in 2020. This identified a distinct leakage path at the foundation level of the reservoir embankment. In order to mitigate the risk of seepage-induced instability such as internal erosion, leakage remedial measures were proposed to arrest the leakage.

Limited working space and difficult access were some of the main constraints for the remedial works. Following an optioneering/feasibility study, permeation grouting using Tube-a-Manchette (TaM) was identified as the most practical remedial solution. Grouting works were carried out on both sides of the clay core to target flow paths and create a low permeability zone reducing the leakage/seepage through the dam.

This presentation presents the key aspects of the project, from the initial investigative works to construction, covering also the optioneering and design of the grouting works. Challenges and lessons learnt from the project are also highlighted.

Presenter's Biographies

Abi Morgan, Arup| Abi is an Associate at Arup, she has worked in the water industry for over 25 years. Abi leads the Arup Leeds Dams and Reservoirs team and was appointed to the Supervising Engineer Panel in 2024.

Guy Hitchens, Severn Trent Water | Guy is a Reservoir Supervising Engineer with Severn Trent and Hafren Dyfrydwy, and supervises nine reservoirs in Wales and England. He was appointed to the SE Panel in November 2023, prior to which he spent ten years in the water industry and sixteen in consultancy in a variety of engineering, auditing and project management roles.

Peter Down, Mott MacDonald | Peter is a 'Senior Associate – Dams and Reservoirs' based in the Leeds office of Mott MacDonald. He initially joined in 2008. He is responsible for guiding and directing design works for reservoir and water engineering projects and provides reservoir safety support within the company and to Clients. He provides Supervising Engineer services to a range of Undertakers and has been appointed to the Supervising Engineer panel since April 2008.

Stan Qi, AtkinsRéalis | Stan Qi is a Chartered Engineer (MICE) with over 8 years' industrial experience. His professional experience has spanned through contractors and design consultancies, working on geotechnical and civil infrastructure projects in the United Kingdom and overseas. He is currently working as a Senior Geotechnical Engineer at AtkinsRéalis for the design and management of various types of geotechnical works including water geotechnics, earthworks, foundations, numerical analyses etc.

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BRISTOL | WARRINGTON| LEEDS | GLASGOW

The Regional Hubs allow the live stream of BDS evening meetings in London to be enjoyed as part of a group elsewhere in the UK.

Refreshments are provided from 17:30 in conjunction with watching the live streaming of the evening meeting - anyone is welcome to attend!

We would be grateful if you could register your intention to attend with the relevant Regional Hub host – details below.

BRISTOL HUB | Liz Rivers | liz.rivers@jacobs.com | 07817 166204
Jacobs, The West Wing, 1 Glass Wharf, Bristol BS2 0EL

WARRINGTON HUB | Nathan Freeman |nathan.freeman@uuplc.co.uk|
United Utilities, Lingley Mere, Lingley Mere Business Park, Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP

LEEDS HUB | Victoria Walker | victoria.walker@mottmac.com | 01135 249250
Mott Macdonald, 26 Whitehall Road, Leeds, LS12 1BE

GLASGOW HUB | Chukwuemeka Agbo| Michael.agbo@mottmac.com | 01412223770
Mott Macdonald, 319 St Vincent St, Glasgow, G2 5LD

For general queries regarding the Regional Hubs please contact:
Stephen Cavanagh | cavanaghsp@binnies.com | 01244 304 125