Basic Details

Publish Date

12 October 2026

Case ID#

3369

Title

Deep-seated leakage through embankment foundation

Nation

England

Regulator Reference No.

544

Legal Status

Statutory

Reservoir Type

Non-impounding

Reservoir Capacity

10M+ m3

Year of Construction

1900 - 1929

Main Construction Type

Earth fill embankment

Dam Height

10 - 14.99 metres

Dam Flood Category

A

Hazard Class

High-risk reservoir

Reservoir Use

- Water supply

Owner Type

Limited company

Incident Details

Date & Time of Incident

19 June 2026 - 12:00

Date Incident Closed

Not provided

Observations that Caused the Incident to be Declared

- Leakage or seepage from a new leakage point

Describe the Incident

A wet patch at the toe of the embankment was identified on 9th June 2025 following a grounds maintenance machine getting bogged down in wet ground causing rutting. The location of the wet patch was noted to be in an area where a damp patch had previously been noted in April 2014 but had not reappeared since. The Supervising Panel Engineer was informed and visited the site on 10th June 2025. Following a period of monitoring a QCE was engaged on 17th June for further advice and visited the site on 19th June 2025. As a result of observations and monitoring further action was taken.

The wet area was marked out and observed with instruction not to increase water level and to carry out twice daily observations. No flow was noted but the wet patch remained within a hot dry weather spell. Hand excavations have been made into the embankment to observe origin of seepage along with cleaning out of a local soakaway.

The QCE advised to draw down the reservoir by 1m from Top Water Level to 19.18mAOD (Current level is 20.03mAOD and TWL is 20.18mAOD). This was a precautionary drawdown into supply over a period of 1-2 weeks. This will allow observations to be made of any changes in wetness and may confirm origin of seepage.

Supporting Photos

No images provided.

Causes and Impacts

Natural Processes which Initiated or Contributed to the Incident

- Not provided

Main Contributing Factors to the Incident Occurring

Dam Factors

- Deterioration of materials

External Factors

- Not provided

Shortcomings

- Unknown

Root Cause of the Incident

The precise root cause of the leakage has not been identified yet. Given the nature of the findings and the criticality of the asset, the current focus is on implementing permanent remedial works to arrest the leakage and maintain reservoir safety. Further information on the underlying cause may become available during the detailed design and construction phases of the remedial works.

Impacts on the Reservoir

- Internal erosion (foundation deterioration)

Supporting Photos

No images provided.

Supporting Contributions and Studies

Human Factors which Influenced the Incident

Human factors did not contribute to the cause of the incident. Grounds maintenance personnel are briefed on what to look for and how to escalate, making them complementary to routine surveillance activities as demonstrated in this incident.

Instrumentation at the Reservoir

Instrumentation did not contribute to the initial identification of the wet patch, which was detected through routine surveillance activities. However, the reservoir water level instrumentation output along with the French drain flow observations have been effective in recording and correlating drainage flows with varying reservoir water levels. This information has provided valuable supporting data for the Panel Engineer in interpreting site conditions and diagnosing the issue.

Was Instrumentation Effective?

Yes

Assistance by External Parties and Impacts on Downstream Population

None

Summary of Studies or Investigations Undertaken

Studies and investigations undertaken to determine the cause of the incident include:

1. Inspection and CCTV survey of the existing French drain.

2. Installation of a new French drain and monitoring chamber to monitor leakage flows

3. An electromagnetic leakage detection survey, undertaken with reservoir levels close to TWL, indicated deep-seated leakage through the foundation.

A French drain and monitoring chamber were installed at the toe of the embankment to collect and monitor any leakage flows. An existing French drain was also inspected by CCTV. Following drawdown, the reservoir water level was raised in controlled 100 mm increments at three-day intervals, with daily monitoring of flows within the drainage chamber. No flows were detected until the reservoir level reached approximately 20.05 mAOD (TWL = 20.18 mAOD), at which point minor flows were observed entering the chamber.

An electromagnetic leakage detection survey, undertaken when water levels were close to TWL, identified evidence consistent with deep-seated leakage through the foundation.

Following review of the survey findings and monitoring data, the QCE recommended that the reservoir be subject to a temporary operating restriction of 0.75 m below TWL, limiting the maximum water level to 19.43 mAOD, until the the matter is remediated. This recommendation has now been formalised in the Section 10 Report. The findings indicate that remedial works will be required to address the leakage mechanism. The undertaker has commenced planning for remedial works, which are expected to comprise the installation of a cut-off barrier through the embankment and foundation, likely in the form of a sheet pile cut-off wall, similar to previous leakage remediation works undertaken at the reservoir.

Supporting Photos

No images provided.

Lessons Learnt

Lesson 1

- Surveillance and Monitoring

Briefing of grounds maintenance contractors is important. All subcontractors should know what signs to look for on their routine visits. The prompt recognition of an abnormal condition, followed by timely escalation to the Supervising Engineer, who then directed immediate cessation of inflow pumping, enabled investigations to commence before any significant deterioration could occur.

Lesson 2

- Emergency response

Early precautionary intervention is important to minimise the risk of a major incident - Implementing an early precautionary water level restriction and enhanced surveillance visits provided additional assurance while investigations were undertaken, reducing uncertainty and supporting informed decision-making.

Lesson 3

Lesson 4

Closing Comments

Supporting Photos

No images provided.

Information provided has been sent from reservoir owners and engineers, and cleansed of personal information by the enforcement authority. We cannot guarantee the accuracy of the data, but if you find an error please contact the relevant enforcement authority.