Basic Details

Publish Date

02 September 2025

Case ID#

3265

Title

Sinkhole from deterioration of the overflow culvert at the interface between different pipe materials

Nation

England

Regulator Reference No.

528

Legal Status

Statutory

Reservoir Type

Impounding

Reservoir Capacity

10 - 24,999m3

Year of Construction

1900 - 1929

Main Construction Type

Earth fill embankment

Dam Height

2 - 4.99 metres

Dam Flood Category

C

Hazard Class

High-risk reservoir

Reservoir Use

- Conservation (ornamental / heritage)
- Recreation or general amenity

Owner Type

Public body

Incident Details

Date & Time of Incident

14 March 2024 - 12:00

Date Incident Closed

01 April 2024

Observations that Caused the Incident to be Declared

- Slope or face deformation (slippage, cracking, slumps, mounds, depressions)

Describe the Incident

A sinkhole developed on the dam downstream face some distance from the dam itself. No reduction of reservoir water level was required. The sinkhole was spotted during routine reservoir surveillance by the Undertaker, which triggered consultation with the Supervising Engineer's employer, as the SE was on holiday. The onsite plan had an alternative SE contact, who attended and agreed interim surveillance and actions with the Undertaker. An ARPE was informed and will oversee repairs with the Supervising Engineer. CCTV of the culvert has been undertaken along with some minor excavation. While the whole culvert could not be surveyed by the CCTV, the results indicated the culvert to be the cause at a location of two different culvert materials. It is clear that the incident related to a defect in the secondary overflow culvert. The defect was some distance downstream of the embankment and unlikely to impact the embankment in the short term. further CCTV to better inform what works will be required prior to excavating around the sinkhole to uncover the damaged culvert. The proposed details for the repair has yet to be determined but are likely to involve construction of a better connection detail between the culvert sections and possibly replacement of some sections of the culvert.

Supporting Photos

Causes and Impacts

Natural Processes which Initiated or Contributed to the Incident

Main Contributing Factors to the Incident Occurring

Dam Factors

- Deterioration of materials

External Factors

- None

Shortcomings

- Construction shortcoming

Root Cause of the Incident

Poor construction practice at the interface of different materials in the outflow pipe.

Impacts on the Reservoir

- Internal erosion (fill deterioration)
- External erosion

Supporting Photos

Supporting Contributions and Studies

Human Factors which Influenced the Incident

This reservoir has no instrumentation. The site is monitored by freuqnet visual inspections by the undertaker.

Instrumentation at the Reservoir

Not applicable

Was Instrumentation Effective?

Not Applicable

Assistance by External Parties and Impacts on Downstream Population

CCTV of the culvert has been undertaken along with some minor excavation. While the whole culvert could not be surveyed by the CCTV, the results indicated the culvert to be the cause at a location of two different culvert materials. After the interim visit the Supervising Engineer discussed the incident with an ARPE and action was required to investigate and undertake repairs in the short-term, which remain to be completed. It is clear that the incident related to a defect in the secondary overflow culvert. The defect was some distance downstream of the embankment and unlikely to impact the embankment in the short term.

Summary of Studies or Investigations Undertaken

Good surveillance after a significant rainfall event was key to spotting the the issue in a timely manner.

Lessons Learnt

Lesson 1

- Surveillance and Monitoring

Consider proactive surveillance (CCTV) of pipeline through the embankment.

Lesson 2

- Emergency response

Having a backup Supervising Engineer contact within the S12 and Onsite plan assisted in gaining quick access to Engineering advice.

Closing Comments

Supporting Photos

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.