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Assembly

## Research and Information Service Research Paper

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# The Reservoirs Act (Northern Ireland) 2015 – background, comparison, status and issues

NIAR 173-21

This research paper examines the Reservoirs Act (Northern Ireland) 2015, which aims to protect people and property from dam failure. It compares reservoir safety in Northern Ireland, other UK devolved administrations and the Republic of Ireland. It explains why few provisions of the Act have been commenced and indicates possible timescales for the Act's full implementation. It discusses issues associated with the Act. It also raises questions which the Committee for Infrastructure may wish to consider as the Department seeks to bring forward regulations to commence the Act.

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## Key Points

- Structural failure of reservoirs poses a hazard to people and property.
- There are believed to be 179 controlled reservoirs (over 10,000 m<sup>3</sup> capacity) in Northern Ireland (NI).
- Most of NI's reservoirs are impounded by embankment dams over 100 years old. These require increasing levels of inspection and maintenance.
- The Reservoirs Act (NI) 2015 aimed to introduce '*a regime for the management and regulation of reservoirs... to minimise the risk of flooding due to an uncontrolled release of water resulting from dam failure*'.
- The Act, once fully commenced, will bring NI's reservoir safety regime broadly into line with those of other UK jurisdictions.
- Currently in NI, and in the Republic of Ireland (RoI), reservoir owners have a common law duty to ensure that uncontrolled reservoir releases do not harm life or property.
- The Act has not been fully commenced, due to administrative error and the NI Executive's three-year hiatus between 2017 and 2020.
- The Department for Infrastructure (DfI) is currently working to commence the Act.
- The Department must decide how to bring forward regulations, designate reservoir risk, and appoint reservoir engineers to panels.
- Following commencement, implementation of the Act could take a further two years.
- Meanwhile, the Rivers Agency has persuaded some, but not all, reservoir managers to undertake urgent remedial works.
- England, Wales and Scotland have tightened regulations in recent years e.g. lowering registration thresholds and charging reservoir registration fees.
- Inspection, supervision and safety works can be costly:
  - Minor remedial works may cost over £10,000.
  - Major works on large structures may cost over £1 million.
- The latent Act is already having some effects:
  - The prospect of additional financial burdens is prompting some private reservoir managers to consider decommissioning or selling their reservoirs.
  - Changes in the management and ownership of some reservoirs have caused loss of public access, and concerns over amenity and biodiversity.
- Safety concerns have delayed downstream development. The Rivers Agency has conferred 'Responsible Reservoir Manager Status' to mitigate this in some cases.



## Executive Summary

Section 1 of this paper provides a short overview of reservoirs in Northern Ireland (NI). There are 179 controlled reservoirs (over 10,000 m<sup>3</sup>) in NI and many smaller ones. The main types of reservoirs are described. Most of NI's reservoirs are formed by embankment dams constructed in the nineteenth and early twentieth centuries.

Section 2 describes reservoir legislation in Great Britain (GB), Northern Ireland and the Republic of Ireland. GB's first reservoir safety legislation was the Reservoirs Act 1930. This was superseded by the Reservoirs Act 1975, which remains the basis of regulation. Large raised reservoirs (over 25,000 m<sup>3</sup>) must be registered, supervised and inspected by qualified engineers. Regulation has diverged in England, Wales and Scotland since 2010. For example, Wales has lowered the registration threshold to 10,000 m<sup>3</sup> and introduced fees for reservoir undertakers. The Reservoirs Act (NI) 2015 is modelled largely on the Reservoirs Act 1975, although it uses a 10,000 m<sup>3</sup> threshold and applies a 'risk-based' approach to reservoir designation (as 'high', 'medium' and 'low' consequence). Since 2015 there have been developments and recommendations in England, Wales and Scotland which DfI may wish to consider. There is no reservoir safety legislation in the Republic of Ireland.

Section 3 describes the status of the Reservoirs Act (NI) 2015 and reservoir safety. The Act received Royal Assent in July 2015. However, it has not been fully commenced due to administrative error and the Executive's three-year hiatus between 2017 and 2020. The Act was transferred from the Department of Agriculture, Environment and Rural Affairs (DAERA) to DfI on 1 June 2021 by the Departments (Transfer of Functions) Order (Northern Ireland) 2021. DfI may now bring forward orders to fully commence the Act. DfI must also appoint reservoir engineers, designate risk categories, and decide whether to provide grants towards the capital costs of remedial works. Since 2014 The Rivers Agency has audited and, in some cases, inspected reservoirs. In 2020, it had identified nine reservoirs in need of urgent interventions. The Rivers Agency has established an interim 'Responsible Reservoir Manager Status' scheme, whereby reservoir managers voluntarily comply with key provisions of the Act, to unlock development in proximity to reservoirs.

Section 4 discusses reservoir safety issues associated with the Act. In Wales and Scotland initial registration and annual subsistence fees cost up to around £500 for high risk reservoirs. Reservoir supervision and inspection are likely to cost several thousands of pounds per reservoir over a ten-year maximum inspection period. Some privately-owned reservoirs have not been adequately maintained. Obligatory remedial works for these may be expensive. Substantial works to large reservoirs can cost over £1 million. These new costs may prompt some reservoir owners to sell or decommission reservoirs. Particular issues have arisen at some reservoirs, including delayed development applications, lowering/decommissioning and transfers of ownership.



# Contents

- Key Points ..... 1
- Executive Summary ..... 3
- 1 Reservoirs in Northern Ireland ..... 7
- 2 Reservoir safety legislation ..... 8
  - 2.1 Pre-2015 Great Britain and Ireland reservoir safety ..... 8
  - 2.2 Reservoir safety in Northern Ireland ..... 9
  - 2.3 Comparison of reservoir safety regulation in Great Britain and Republic of Ireland ..... 12
  - 2.4 Post-2015 developments in England ..... 14
  - 2.5 Post-2015 developments in Wales ..... 15
  - 2.6 Post-2015 developments in Scotland ..... 16
  - 2.7 Recent developments in Republic of Ireland ..... 16
- 3 Status of the Reservoirs Act (Northern Ireland) 2015 ..... 17
  - 3.1 Enactment and departmental transfer ..... 17
  - 3.2 Progress towards commencement and outlook ..... 17
  - 3.3 Interim reservoir safety regime ..... 20
    - 3.3.1 Auditing of reservoirs ..... 20
    - 3.3.2 Safety works ..... 20
    - 3.3.3 Responsible Reservoir Manager Status voluntary scheme ..... 21
- 4 Reservoir safety and management issues in Northern Ireland ..... 22
  - 4.1 New costs associated with the regulatory regime ..... 22
  - 4.2 Cost of remedial works ..... 22
  - 4.3 Discontinuance, abandonment and transfers of ownership ..... 23
  - 4.4 Reservoir safety cases and themes ..... 23
  - 4.5 Insurance ..... 26
  - 4.6 Recent discussions of the Reservoirs Act (Northern Ireland) 2015 in the Assembly ..... 26





# 1 Reservoirs in Northern Ireland

Surface water reservoirs (hereafter referred to as ‘reservoirs’) supply public water for agriculture, industry and domestic use. They also regulate flows to maintain navigation and power generation, and provide recreation. There are 179 known controlled reservoirs (with a volume greater than 10,000 m<sup>3</sup>)<sup>1</sup>, including large public water supply reservoirs in the Mourne, such as Silent Valley/Ben Crom, and Spelga<sup>2</sup>. There are also an unknown number of smaller impoundments in NI including small ornamental ponds, fishing lakes and mill dams. As in GB, many of these are embankment dams over 100 years old (Box 1). A map showing controlled reservoirs in NI and their maximum potential flood extents has been compiled by DfI<sup>3</sup>.

## Box 1: Reservoir types

A reservoir is any built structure that can store water. Reservoirs fall into three broad types:

- 1 Impounding/online: where a structure is located on a natural watercourse, impeding its flow and causing water levels to rise.
- 2 Non-impounding/offline: where a structure is located away from a natural watercourse, and water is diverted into it either by gravity or pumping.
- 3 Closed: covered tanks, often ‘service reservoirs’ to store water prior to distribution.

Impounding reservoirs include two types:

- 1 Raised reservoir: an artificial waterbody, created by a constructed embankment.
- 2 Raised lake: a natural lake that has been enlarged by a constructed embankment e.g. Lough Guile, Lough Money, Lough Mourne.

Reservoir structures in GB and on the island of Ireland generally fall into four types<sup>4</sup>:

- 1 Embankment dams: usually earth or rock with an impermeable clay core, shaped like a long hill. Common in NI. Most small reservoirs, plus Silent Valley.
- 2 Gravity dams: usually concrete or masonry. These have triangular cross sections and are held down by gravity. Larger reservoirs e.g. Ben Crom, Spelga, Altnahinch.
- 3 Buttress dams: usually concrete or masonry. Similar to gravity dams, but with spaces between triangular buttresses. Uncommon e.g. Inniscarra Dam, Co Cork.
- 4 Weirs: unlike dams, where water can flow through channels, water can only flow over the top of a weir. E.g. Lough Fadda is a raised lake, enlarged by a weir.

Any reservoir with volume exceeding 10,000 m<sup>3</sup> will be a controlled reservoir.

<sup>1</sup> [NIA OR 2 December 2020, p.3](#)

<sup>2</sup> [Rivers Agency. \*Reservoirs in Northern Ireland Information Booklet\* \(2014\), retrieved 2 July 2021](#)

<sup>3</sup> [Department for Infrastructure. \*Reservoir Flood Mapping for Emergency Planning\* \(2021\), retrieved 2 July 2021](#)

<sup>4</sup> [British Dam Society. \*Types of Dam\* \(2021\), retrieved 2 July 2021](#)

## 2 Reservoir safety legislation

This section describes the historic development of, and recent changes to, reservoir safety regulation in GB. It compares reservoir safety in NI, the UK devolved administrations and the RoI.

### 2.1 Pre-2015 Great Britain and Ireland reservoir safety

Dam failures are rare. However, a failure would pose a potentially severe threat to life and property. Since the reservoir construction boom in the nineteenth century, reservoir owners in GB and Ireland have been liable for reservoir safety under common law. The introduction of statute was only considered in response to dam failures in England, Scotland and Wales<sup>5</sup>. Following the 1864 Dale Dyke catastrophe, which killed 244 people in the Sheffield area, a Waterworks Bill was introduced to Parliament in 1866. This would have subjected large reservoirs to regular inspections by government-appointment competent engineers. However the Bill was not made law. It was only after further disasters in the 1920s that the issue was revisited, and the Reservoirs (Safety Provisions) Act 1930 was introduced in GB, establishing responsibilities for reservoir safety.

The current regulatory framework for reservoir safety in GB was established by the Reservoirs Act 1975<sup>6</sup>. This sought to reduce risk from uncontrolled releases. However, as with the 1930 Act, NI was excluded<sup>7</sup>. The 1975 Act applies to 'large raised reservoirs', which it defined as raised structures or lakes capable of holding more than 25,000 m<sup>3</sup> (25ML) above the natural ground level. It also established roles relating to reservoir safety:

- **Undertaker:** The owner, operator, or nominated representative thereof. Responsible for day-to-day inspections and, in the case of high-risk reservoirs, commissioning reservoir engineers.
- **Supervising Engineer:** A qualified member of the Supervising Engineers Panel. Commissioned by the Undertaker to supervise the reservoir at all times and provide an annual report.
- **Inspecting Engineer:** A qualified member of the All Reservoirs Engineers Panel. Commissioned to inspect the reservoir and provide a report including recommendations to the Undertaker and Regulator.

Schedule 4 of the Flood and Water Management Act 2010 amended the Reservoirs Act 1975 for England and Wales, allowing the threshold of a large raised reservoir to be lowered to 10,000 m<sup>3</sup> (10 ML)<sup>8</sup>. In Wales, the lower threshold of 10,000 m<sup>3</sup> was

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<sup>5</sup> [Environment Agency. \*Lessons from historical dam incidents\* \(2011\), retrieved 2 July 2021](#)

<sup>6</sup> [GB Reservoirs Act 1975](#)

<sup>7</sup> [GB Reservoirs Act 1975, Section 30](#)

<sup>8</sup> [GB Flood and Water Management Act 2010, Schedule 4](#)

adopted in April 2016<sup>9</sup>. However, the Secretary of State has not made a commencement order to bring this into force in England. At the present time, the Government does not intend to lower the registration threshold<sup>10</sup>. In Scotland, the Reservoirs (Scotland) Act 2011 created provision for the threshold to be lowered to 10ML<sup>11</sup> (Box 2).

### Box 2: Reservoir threshold volumes

Reservoirs are regulated when they exceed a given volume threshold. In the GB Reservoirs Act 1975, a 'large raised reservoir' was originally defined as an area or structure capable of holding 25,000 m<sup>3</sup> (cubic metres) above the natural level of any part of the surrounding land. In the Reservoirs Act (NI) 2015, the threshold for a 'controlled reservoir' is 10,000 m<sup>3</sup>. Volumes may also be expressed in mega litres (ML, millions of litres). Since one cubic metre equals 1000 litres, 10,000 m<sup>3</sup> equals 10ML.

10ML is equivalent to the volume of four Olympic size swimming pools. As an example, the area of Let's Go Hydro waterpark measures ~ 70,000 m<sup>2</sup>. Assuming this were 1.43 m deep, it would have a 10ML volume.

## 2.2 Reservoir safety in Northern Ireland

Before 2015, there was no statute governing reservoir safety on the island of Ireland. Instead, reservoir owners had only a common law duty to ensure that uncontrolled reservoir releases did not harm life or property. This remains the case in the RoI today<sup>12</sup>. Fortunately, there has been no loss of life in NI due to reservoir failure. However, there have been several incidents of dam failure which are known to have caused property damage<sup>13</sup>. Anecdotal evidence showed that some reservoirs were not being properly inspected and maintained<sup>14</sup>. In 2008 the 'Living with Rivers and the Sea' government response to the Independent Flood Management Policy Review proposed reservoir safety regulation be brought forward for NI<sup>15</sup>. The Executive agreed in 2009 that Department of Agriculture and Rural Development (DARD) should bring forward legislation. In 2011, the Rivers Agency established a bill team to develop a reservoir safety regime for NI. The Reservoirs Act (NI) 2015 concerns '*regulation of the*

<sup>9</sup> [The Flood and Water Management Act 2010 \(Commencement No. 1 and Transitional Provisions\) \(Wales\) Order 2016](#)

<sup>10</sup> [Environment, Food and Rural Affairs Committee. Post-legislative scrutiny: Flood and Water Management Act 2010 \(April 2017\)](#)

<sup>11</sup> [J. Ashworth and H. Thomas. 'Implementation of the reservoirs \(Scotland\) Act 2011'. Paper presented at British Dam Society 18th Biennial Conference, Belfast, 3-5 September 2014](#)

<sup>12</sup> [Reservoirs Act \(Northern Ireland\) 2015, Explanatory Notes, Section 4](#)

<sup>13</sup> [Reservoirs Act \(Northern Ireland\) 2015, Explanatory Notes, Section 5](#)

<sup>14</sup> [D. Porter. 'Proposed reservoir safety legislation for Northern Ireland'. Paper presented at British Dam Society 17th Biennial Conference, Leeds, 12-15 September 2012](#)

<sup>15</sup> [Rivers Agency. Living with Rivers and the Sea \(August 2008\), retrieved 2 July 2021](#)

*management, construction and alteration of certain reservoirs, in particular in relation to their safety to collect and store water; and for connected purposes*<sup>16</sup>. It excludes structures that contain mining tailings, wastewater/sewage, ash, silt, sludge and chemicals (Section 5.2). These are covered by separate regulations in GB, NI and RoI<sup>17181920</sup>.

The policy objective of the Act is:

*...to introduce a regime for the management and regulation of reservoirs to protect the public from the risk of flooding. It is proposed that reservoirs should be managed and operated to minimise the risk of flooding due to an uncontrolled release of water resulting from dam failure thereby protecting people, the environment, cultural heritage and economic activity*<sup>21</sup>.

‘Dam failure’ is not explicitly defined in the Act. The Act concerns reservoir safety, which implies that ‘dam failure’ refers to structural failure. However, the phrase ‘*should be managed and operated to minimise the risk of flooding due to an uncontrolled release of water resulting from dam failure*’ appears to introduce some ambiguity, since water can be released from a reservoir in an uncontrolled manner that causes flooding, without a structural failure occurring (Box 3).

**Question: Is there value in clarifying that the ambit of the Reservoirs Act is specifically reservoir safety resulting from dam structural failure, and not flooding in itself?**

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<sup>16</sup> [Reservoirs Act \(Northern Ireland\) 2015](#)

<sup>17</sup> [M. Cambridge, ‘The application of the Mines and Quarries \(Tips\) and the Reservoirs Acts’. Paper presented at British Dam Society 15th Biennial Conference, Warwick, 10-13 September 2008](#)

<sup>18</sup> [GB The Mines Regulations 2014](#)

<sup>19</sup> [Quarries Regulations \(Northern Ireland\) 2006](#)

<sup>20</sup> [Ireland. Safety, Health and Welfare at Work \(Quarries\) Regulations 2008](#)

<sup>21</sup> [Reservoirs Act \(Northern Ireland\) 2015, Explanatory Notes, Section 9](#)

### Box 3 Reservoirs: flooding, dam failure and climate change

Different issues in relation to reservoirs and flooding are sometimes conflated. The Act concerns '*flooding due to an uncontrolled release of water resulting from dam failure*'. Dam failure is also referred to as 'structural failure', 'breach', 'break' etc.

**Flooding** is a natural phenomenon that may result from fluvial (river), pluvial (surface), coastal and groundwater sources, or combinations of these. Reservoirs may be present in surface water catchments where flooding occurs, but this does not mean that the reservoir is the cause of flooding. Reservoirs should be designed and maintained to enable them to pass floods without risking dam failure. The discharged floodwater may cause downstream flooding, without a dam failure having occurred. Reservoirs can modify downstream flood risk, for example by storing flood waters and attenuating (reducing) flood peaks. However, reservoirs are rarely managed solely for flood risk mitigation in the UK.

**Dam failure** occurs when the impounding structure breaks. This may occur when the reservoir water level is high i.e. in flood conditions. The resulting uncontrolled release of water is highly dangerous and potentially catastrophic. The 2019 Toddbrook Reservoir incident in England occurred following heavy rain, when a poorly maintained spillway was severely damaged by water. Fortunately, the spillway was not sufficiently damaged to cause the structural failure of the dam.

**Climate change** is projected to cause more intense summer rainfall<sup>22</sup>. More frequent reservoir drawdowns may also occur due to drought, affecting embankment stability. This does not necessarily mean that reservoirs are more likely to fail, providing they are well-designed and maintained. However, it does provide additional impetus to ensure that reservoirs are safely managed<sup>23</sup>.

The key features of the Reservoirs Act (NI) 2015 are<sup>24</sup>:

**Registration:** 'Reservoir managers' will be required to register 'controlled reservoirs'.

**Registration threshold:** Reservoirs over 10ML capacity. This is in line with Wales, and the intended threshold in England and Scotland.

**Designation:** Reservoirs are designated 'high', 'medium' or 'low' consequence. As in Scotland, this incorporates modern risk management practices by targeting regulation

<sup>22</sup> [Met Office. UK Climate Projections: Headline Findings \(2019\), p.7](#)

<sup>23</sup> [David Balmforth. Independent Reservoir Safety Review Report \(2021\), p.82](#)

<sup>24</sup> [Department for Infrastructure. Regulating reservoir safety in Northern Ireland \(2021\), retrieved 2 July 2021](#)

effort where it is most needed. The use of the term ‘consequence’ rather than ‘risk’ is a more accurate description of the designation process (Box 4).

**Commissioning of reservoir engineers:** To supervise and inspect reservoirs, as in England, Wales and Scotland.

**Compliance:** Reservoir managers must comply with reservoir engineers’ recommendations.

#### **Box 4: Reservoir safety risk concepts**

Reservoir safety regulation involves several concepts related to risk:

**Hazard:** The uncontrolled release of water from reservoir resulting from structural dam failure.

**Consequence:** Also ‘severity’ or ‘impact’. The consequence of the hazard if it were to occur. NI’s designation criteria are being developed. In Scotland, indicators of ‘high consequence’ include impacts on human life and critical infrastructure (e.g. hospitals, schools, utilities, main roads)<sup>25</sup>. Indicators of ‘low consequence’ include basic infrastructure (e.g. post offices, minor roads) and agricultural land.

**Probability:** The chance of a hazard occurring. This can be described qualitatively e.g. low to high, or quantitatively e.g. 0.1% chance of a given dam failure occurring within 1 year.

**Risk:** A function of the consequence and probability of a hazard occurring, usually risk = consequence x probability. Risk management involves setting tolerable levels of risk<sup>26</sup>.

### **2.3 Comparison of reservoir safety regulation in Great Britain and Republic of Ireland**

The Reservoirs Act (NI) 2015 is modelled on the Reservoirs Act 1975, with some differences (table 1).

<sup>25</sup> [David Balmforth. \*Independent Reservoir Safety Review Report \(2021\)\*, p.64](#)

<sup>26</sup> [David Balmforth. \*Independent Reservoir Safety Review Report \(2021\)\*, pp.70-72](#)

**Table 1 Summary of main reservoir safety regulations in England, Scotland, Wales, NI and RoI<sup>27282930</sup>**

	England	Wales	Scotland	NI	RoI
<b>Main legislation</b>	Reservoirs Act 1975 (as amended by the Flood and Water Management Act 2010)	Reservoirs Act 1975 (as amended by the Flood and Water Management Act 2010)	Reservoirs (Scotland) Act 2011. Reservoirs (Scotland) Regulations 2016	Reservoirs Act (Northern Ireland) 2015	Common law only
<b>Regulatory authority</b>	Environment Agency (EA)	Natural Resources Wales (NRW)	Scottish Environment Protection Agency (SEPA)	Department for Infrastructure (DfI)	N/A
<b>Registration threshold</b>	25ML (provision made by Flood and Water Management Act 2010 to reduce this to 10ML)	10ML (from 1 April 2016)	25ML (Provision made by Reservoirs (Scotland) 2011 Act to reduce this to 10ML)	10ML (when commenced)	N/A
<b>Registration and compliance fees</b>	None	Since 2017. Registration and high-risk reservoir annual compliance <sup>3132</sup>	Since 2016. Registration, and risk-based subsistence fees <sup>33</sup>	Act makes provision for charging of fees	N/A
<b>Risk designation</b>	High risk only	High risk only	High, medium and low risk	High, medium and low consequence	N/A
<b>Responsible party</b>	Undertaker	Undertaker	Reservoir manager	Reservoir manager	Reservoir owner
<b>On-site plans</b>	May be made a statutory requirement by regulations	May be made a statutory requirement by regulations	May be made a statutory requirement by regulations	A statutory requirement	N/A
<b>Enforcement powers</b>	Criminal	Criminal	Criminal and civil sanctions	Criminal & civil sanctions	N/A
<b>Public Register?</b>	Yes. Includes engineer reports, certificates & written statements	Yes. Includes engineer reports, certificates & written statements	Yes. Includes engineer reports, certificates & written statements	Yes. Not specified	N/A
<b>Reservoir flood maps</b>	Yes	Yes	Yes	Yes	N/A

<sup>27</sup> [British Dam Society. Reservoir legislation in England \(2016\)](#)

<sup>28</sup> [British Dam Society. Reservoir legislation in Wales \(2016\)](#)

<sup>29</sup> [British Dam Society. Reservoir legislation in Scotland \(2016\)](#)

<sup>30</sup> [D. Porter. 'Proposed reservoir safety legislation for Northern Ireland'. Paper presented at British Dam Society 17th Biennial Conference, Leeds, 12-15 September 2012](#)

<sup>31</sup> [Natural Resources Wales. A guide to the fees for our work under the Reservoirs Act 1975 \(2017\), retrieved 2 July 2021](#)

<sup>32</sup> [Natural Resources Wales. Reservoir charges \(2021\), retrieved 2 July 2021](#)

<sup>33</sup> [Scottish Environment Protection Agency. Charging scheme development \(2021\), retrieved 2 July 2021](#)

Since the Reservoirs Act (NI) 2015 was enacted, there have been several noteworthy developments in other jurisdictions.

## 2.4 Post-2015 developments in England

In August 2019 an incident occurred at Toddbrook Reservoir, Derbyshire. Toddbrook Reservoir, built c.1840, is a 24 m high earth embankment dam with a puddle clay core, with a ~1.3 million m<sup>3</sup> capacity. Following heavy rain, the dam's spillway was damaged, potentially undermining the structural integrity of the dam. 1500 residents living downstream were evacuated as a precaution. An independent review found that Toddbrook had been inspected and was legally compliant with the Reservoirs Act<sup>3435</sup>. However, the issues raised and actions recommended by the engineer had not been completed at the time of the incident. The review included 22 recommendations to improve reservoir safety management. The four recommendations related to legislation and regulation were:

- 11) Systematic review of the implementation of the Reservoirs Act and regulations, including the responsibilities of reservoir engineers, and safety assurance.
- 12) Periodic review of the safety management process.
- 13) Consideration of the issuing of 'certificates to operate safely' by Inspecting Engineers.
- 14) Review of the maximum period between inspections (currently 10 years).

**Question: Many of NI's dams are embankment dams over 100 years old, albeit most are somewhat smaller and newer than Toddbrook. Given that the Toddbrook incident occurred despite England's relatively well-developed reservoir safety regulatory regime, what is the probability of a dam incident or failure in NI?**

A following report into the current legislation and its implementation made 15 recommendations. Many of these may be considered best practice for reservoir engineers and training. Several regarded legislation and regulation<sup>36</sup>:

- 1) Adoption of a risk-based approach (i.e. probability and consequence), rather than simply probability.
- 3) Adoption of Reservoir Safety Management Plans by owners, detailing available evidence on reservoir construction, maintenance, operation, inspections and repairs.
- 12) Proper resourcing, duties, powers, and independence of the Environment Agency (EA), including the recovery of costs from reservoir owners.
- 14) Publication of information regarding the safety of national reservoir stock, and key information for individual reservoirs (without compromising security).

<sup>34</sup> [David Balmforth. \*Toddbrook Reservoir Independent Review Report \(2020\)\*](#)

<sup>35</sup> [Department for Environment, Food & Rural Affairs. \*Government welcomes findings of independent reservoir safety review \(2021\)\*, retrieved 2 July 2021](#)

<sup>36</sup> [David Balmforth. \*Independent Reservoir Safety Review Report \(2021\)\*, pp.86-108](#)



Following the Independent Review, the Secretary of State issued a Ministerial Direction to reservoir undertakers regarding the need to create flood plans<sup>37</sup>.

#### Questions:

- **Should any of the Independent Review’s recommendations for England be incorporated in NI? For example:**
  - **Should Inspecting Engineers issue reservoirs with ‘certificates to operate safely’?**
  - **Should the statutory maximum period (currently 10 years) between inspections be reviewed for high and medium consequence reservoirs?**
  - **Should owners adopt Reservoir Safety Management Plans, detailing reservoir construction, maintenance, operation, inspection and repairs?**
  - **Should the department publish an annual report regarding the safety of NI’s reservoir stock and key information for individual reservoirs?**
  - **Does the Department have sufficient resources, duties, powers and independence to effectively regulate reservoir safety?**

Since the 1970s, at least 40 reservoirs have been decommissioned (discontinued or abandoned) in GB<sup>38</sup>. The prospect of reducing the registration threshold for large raised reservoirs from 25ML to 10ML, plus other economic pressures, is expected to prompt reservoir owners to evaluate the fate of their reservoirs. In spring 2020, the EA commissioned a study to guide reservoir repurposing and decommissioning<sup>39</sup>. It will consider planning and legislation, engineering best practice, flood attenuation, biodiversity and carbon and long-term site management<sup>40</sup>. The commencement of the Reservoirs Act (NI) 2015 may add similar pressure on redundant and/or economically unattractive reservoirs in NI. These research outputs may therefore be of interest in NI.

## 2.5 Post-2015 developments in Wales

In 2016, the registration threshold for large raised reservoirs in Wales was lowered from 25ML to 10ML. This prompted a registration exercise by the regulatory authority, Natural Resources Wales (NRW)<sup>41</sup>. NRW itself went from being the undertaker of

<sup>37</sup> [Department for Environment, Food & Rural Affairs. \*The Flood Plan \(Reservoirs Emergency Planning\) Direction \(2021\)\*](#)

<sup>38</sup> [Daryl Hughes. \*Reservoir decommissioning in Britain: A review\*. Poster presented at River Restoration Centre Conference, Online, 9-10 September 2020](#)

<sup>39</sup> [Environment Agency. \*Benefits in removing redundant reservoirs \(2021\)\*, retrieved 2 July 2021](#)

<sup>40</sup> Environment Agency. *FRS18197 Maximising Benefits in Removing or Repurposing Redundant Reservoirs (2021)*

<sup>41</sup> [M. O'Brien et al. 'Amendments to Reservoirs Act 1975 in Wales and Natural Resources Wales potential reservoirs project'. Paper presented at British Dam Society 19th Biennial Conference, Lancaster, 7-10 September 2016](#)

seven reservoirs, to 45 reservoirs<sup>42</sup>. Many of these were remote, poorly maintained dams that required remedial works and, in some cases, discontinuance<sup>43</sup>. Registration of post-commencement reservoirs took until at least 2019 to complete<sup>44</sup>. Designation of these reservoirs required new information such as flood mapping to help inform the designation.

## 2.6 Post-2015 developments in Scotland

The Reservoirs (Scotland) Regulations 2016<sup>45</sup> implements parts of the Reservoirs (Scotland) Act 2011. The most pertinent elements of this relate to the form of records to be maintained for each reservoir (Section 51) and templates for other forms and certificates e.g. Inspecting Reports<sup>4647</sup>.

**Question: Would providing guidance or templates for reservoir managers and engineers, such as those provided in Scotland, enhance reservoir safety in NI? (NB Section 58 of the Act obliges reservoir managers to maintain records)**

## 2.7 Recent developments in Republic of Ireland

There is no reservoir safety legislation in RoI. ESB is a major owner of dams (for power generation) and has these inspected by an External Dam Safety Committee<sup>4849</sup>.

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<sup>42</sup> [D. Shaw et al. 'Managing Historical Legacies – Gwydyr Reservoirs'. Paper presented at British Dam Society 20th Biennial Conference, Online, 28 Sept 2020](#)

<sup>43</sup> [J. Pratten et al. 'Discontinuance of legacy Dams- Natural Resources Wales'. Paper presented at British Dam Society 20th Biennial Conference, Online, 28 Sept 2020](#)

<sup>44</sup> [Natural Resources Wales. \*Flood and Coastal Erosion Risk Management in Wales, 2016-2019 \(2019\)\*](#)

<sup>45</sup> [The Reservoirs \(Scotland\) Regulations 2016](#)

<sup>46</sup> [Scottish Government. \*Reservoirs: legislation \(2016\)\*, retrieved 2 July 2021](#)

<sup>47</sup> [Scottish Environmental Protection Agency. \*Guidance for completion of Schedule 12 - Inspection Reports \(2019\)\*, retrieved 2 July 2021](#)

<sup>48</sup> [ESB Energy International. \*Preliminary Flood Risk Assessment - ESB Dams and Embankments \(2011\)\*, retrieved 2 July 2021](#)

<sup>49</sup> [Daniel Bradlow et al. \*Regulatory Frameworks for Dam Safety \(2002\)\*, retrieved 2 July 2021](#)

### 3 Status of the Reservoirs Act (Northern Ireland) 2015

This section describes the progress made towards reservoir safety, including possible timescales for the Act's full commencement and implementation. It also outlines interim reservoir safety measures that have been put in place in lieu of the full implementation of the Act.

#### 3.1 Enactment and departmental transfer

The Act received Royal Assent on 24 July 2015. However, at the time of writing in July 2021, few of its provisions have been commenced. When enacted, the Act was the responsibility of the Rivers Agency, which was within the Department of Agriculture and Rural Development (DARD)<sup>50</sup>. In 2016, the functions of the Rivers Agency were moved to DfI in The Departments (Transfer of Functions) Order (NI) 2016<sup>51</sup>. However, the Act was not transferred to the DfI, but remained with DARD<sup>52</sup>. This appears to have been an inadvertent omission. Meanwhile, DARD was renamed the Department of Agriculture, Environment and Rural Affairs (DAERA) by the Departments Act (NI) 2016<sup>53</sup>. **The Reservoirs Act 2015 was transferred from DAERA to DfI in June 2021, following an affirmation of the Assembly on 1 June 2021 of The Departments (Transfer of Functions) Order (Northern Ireland) 2021<sup>54,55</sup>.**

#### 3.2 Progress towards commencement and outlook

By July 2021, little of the Reservoirs Act 2015 had been commenced. The following provisions – or parts of them – have been commenced, although they give relatively few powers in themselves:

- Sections 1, 2, 5: definition of a 'controlled reservoir'.
- Section 6: determination of who is a reservoir manager.
- Section 42: meaning of 'relevant works'.
- Sections 93-97: Powers of entry.
- Sections 126-128: Supplementary, incidental, consequential *etc.* provision; Orders and regulations; Definitions.
- Section 130: Commencement.
- Section 132: Short title.
- Schedule 2: (Index of Defined Expressions).

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<sup>50</sup> [Reservoirs Act \(Northern Ireland\) 2015, Section 128](#)

<sup>51</sup> [The Departments \(Transfer of Functions\) Order \(Northern Ireland\) 2016](#)

<sup>52</sup> [NIA OR 19 February 2020](#)

<sup>53</sup> [Departments Act \(Northern Ireland\) 2016, Section 1](#)

<sup>54</sup> [The Departments \(Transfer of Functions\) Order \(Northern Ireland\) 2021, Section 4](#)

<sup>55</sup> [NIA OR 1 June 2021, p.21](#)

Most of the provisions awaiting commencement are subject to negative resolution by the responsible Department. However, twelve regulations and two orders require Assembly resolution. These provisions include key areas such as:

- Section 2: structure to be treated as a controlled reservoir.
- Section 27: regulation of visits.
- Sections 81, 83, 86: enforcement undertakings and penalties.
- Section: 114 grants.

Since enactment in 2015, DfI has done some work to identify and inspect controlled reservoirs in anticipation of the Act's full commencement<sup>56</sup>. Now that the Act has been transferred to DfI, the Minister for Infrastructure is able to consider the secondary legislation needed to implement the key elements of the Reservoirs Act, such as registration, designation and appointment of reservoir engineers. Commencement orders and regulations will be required<sup>57</sup>. Subject to the Minister's agreement, these will be progressed simultaneously, followed as soon as possible by the required regulations. Subject to a timely transfer, and the Minister's agreement, it is envisaged that the key reservoir safety elements will be introduced during the current mandate (until April 2022)<sup>58</sup>. Priority will be given to the making of Orders and Regulations that will see the introduction of the key elements of the reservoir safety management regime<sup>59</sup>.

Some technical issues must be resolved before commencement. For example, DfI is developing the reservoir risk designation criteria. Subject to the Minister's agreement, although not required by the Act, these will be consulted on, along with the secondary legislation<sup>60</sup>. Furthermore, in order to implement the new safety regime, DfI must establish one or more panels of reservoir engineers. The Department will appoint engineers to these panels, under Section 4 of the Reservoirs Act 1975 in the first instance. These will be suitably skilled and recommended engineers who have been qualified by the Institution of Civil Engineers<sup>61</sup>.

Finally, Section 114 of the Act gives the Department powers to provide grants to help reservoir managers meet their new obligations under the Act. The Minister has indicated that she may be minded to introduce a time-bound capital grant scheme for reservoir safety works, subject to a viable Business Case and the availability of funding<sup>62</sup>. Regardless of legislative processes, technical issues and the availability of

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<sup>56</sup> [NIA OR 2 December 2020, pp.3,14](#)

<sup>57</sup> [NIA OR 2 December 2020, p.7](#)

<sup>58</sup> Correspondence with DfI, 24<sup>th</sup> May 2021

<sup>59</sup> [NIA OR 2 December 2020, p.3](#)

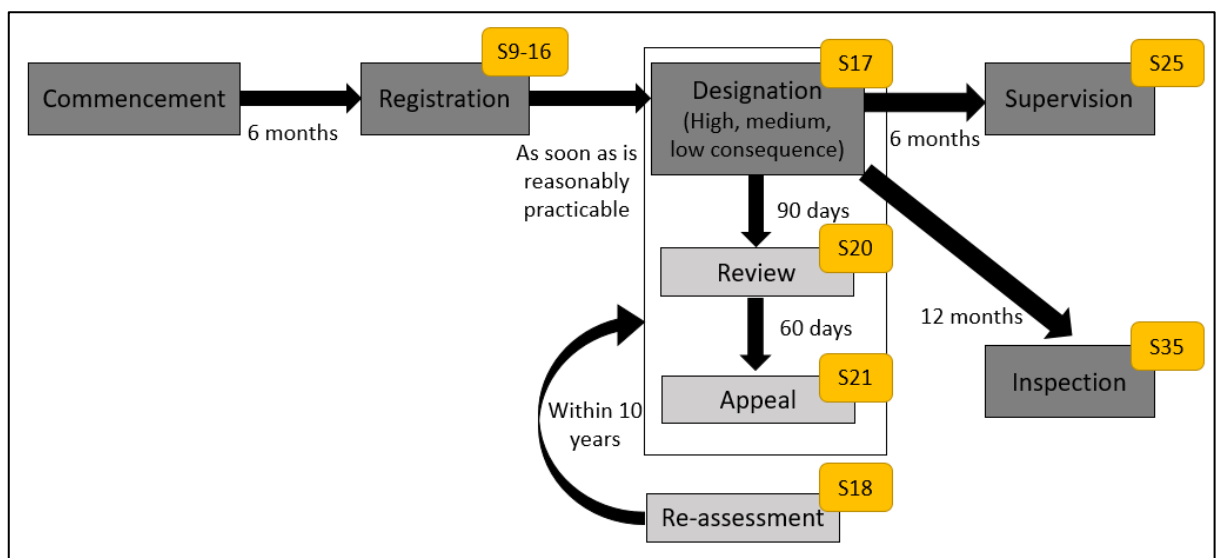
<sup>60</sup> Correspondence with DfI, 24<sup>th</sup> May 2021

<sup>61</sup> [NIA OR 2 December 2020, p.3](#)

<sup>62</sup> [NIA OR 2 December 2020, p.4](#)

grant schemes, implementation of the Act will require the following key legislative and regulatory steps (figure 1):

- Commencement
- Registration (Sections 9-16)
  - The reservoir owner registration process has not yet been implemented<sup>63</sup>.
  - Registration of controlled reservoirs will take up to six months (Section 11).
- Designation (Sections 17-24)
  - Reservoirs will be designated after the reservoir registration.
  - Reservoirs will be designated as high-, medium-, or low-consequence.
  - Reservoir managers can request a review of the designation within 90 days.
  - Reservoir managers can appeal the designation within 60 days.
  - Reservoir designations must be re-assessed at least every ten years.
- Compliance with the new safety regime (Sections 25-40)
  - The new safety regime will be implemented following reservoir designation.
  - This consists of supervision, inspections, remedial works and enforcement.



**Figure 1 Overview of implementation of reservoir safety regulatory process for existing reservoirs**

Following commencement, it could therefore take up to two years for some reservoirs to be inspected. Following inspection, Inspecting Engineers may direct remedial works ('measures in interests of safety') to be undertaken. There is currently little guidance to help reservoir managers understand, and apply for, the various permits that may be required for remedial works e.g. planning permission and other environmental

<sup>63</sup> [NIA OR 2 December 2020, p.3](#)

permits<sup>64</sup>. Guidance on reservoir decommissioning is currently limited to international guidance<sup>6566</sup>.

**Question: Would it be helpful to publish guidance regarding legal permissions and best practice when undertaking reservoir safety works e.g. engineering, environment, stakeholder engagement etc.?**

### 3.3 Interim reservoir safety regime

Despite the fact that few of the Act's provisions have been commenced, some progress has been made towards improving reservoir safety in NI.

#### 3.3.1 Auditing of reservoirs

Prior to 2015, it had been thought that there were 151 controlled reservoirs in NI<sup>67</sup>. Further controlled reservoirs have been identified and there are now thought to be 179<sup>68</sup>. Of these, 89 are owned by NI Water, 29 by other public sector organisations, 48 by the private sector, and 13 by the not-for-profit sector.

#### 3.3.2 Safety works

In lieu of the Act's commencement, DfI has encouraged reservoir managers to improve the safety of their reservoirs. A 2016 audit identified 45 reservoirs in poor condition<sup>69</sup>. DfI wrote to reservoir owners reminding them of their common law duties. By 2019, DfI were still concerned about 26 reservoirs. DfI then employed reservoir engineers to inspect these. This identified nine reservoirs in need of urgent interventions. Some of the reservoir managers have agreed to undertake remedial works, and some have been completed. DfI is unable to disclose the locations of the nine urgent reservoirs due to 'National Protocol for the Handling, Transmission and Storage of Reservoir Information and Flood Maps (June 2018)'. However, they are located in the following council areas<sup>70</sup>:

- Antrim and Newtownabbey Borough Council (1);
- Ards and North Down Borough Council (1);
- Armagh City, Banbridge and Craigavon Borough Council (2);
- Belfast City Council (1);
- Causeway Coast and Glens Borough Council (2);

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<sup>64</sup> [NI Water. Portavoe Reservoir Essential Safety Maintenance \(April 2014\), retrieved 2 July 2021](#)

<sup>65</sup> [ICOLD. Bulletin 160 Dam Decommissioning Guidelines \(2018\)](#)

<sup>66</sup> [United States Society on Dams. Guidelines for Dam Decommissioning Projects \(July 2015\), retrieved 2 July 2021](#)

<sup>67</sup> [D. Porter. 'The Reservoirs Bill for Northern Ireland'. Paper presented at British Dam Society 18th Biennial Conference, Belfast, 3-5 September 2014](#)

<sup>68</sup> [NIA OR 2 December 2020, p.3](#)

<sup>69</sup> [NIA OR 2 December 2020, p.14](#)

<sup>70</sup> [NIA AQW 11522/17-22](#)

- Mid and East Antrim Borough Council (1);
- Newry, Mourne and Down District Council (1).

Despite the limited regulatory progress since 2015, it appears that at least some new reservoir safety works have been carried out. The latent Act may have spurred DfI and/or reservoir managers into action.

### 3.3.3 Responsible Reservoir Manager Status voluntary scheme

The Rivers Agency wishes to improve reservoir safety, while minimising costs and delays to development applications resulting from the latent Act (see section 4). The Agency has therefore created an interim scheme whereby a Reservoir Manager of a controlled reservoir voluntarily agrees, in writing, to comply with ‘key provisions’ of the Act. NB Technical Guidance Note (TGN) 25<sup>71</sup>, in which this policy is explained, relates to *reservoir* flood risk only<sup>72</sup>. Reservoir management and maintenance is assessed against the Reservoirs Act 1975 in England and Wales. ‘Responsible Reservoir Manager Status’ can then be conferred on the reservoir. An All Reservoirs Panel Engineer must sign this off before DfI will give a Planning Authority ‘condition assurance’. There are two main scenarios:

- Reservoir condition is deemed **good**: DfI will advise the Planning Authority that the reservoir condition assurance has been met for planning purposes. The proposed development **will not** require a *reservoir* flood risk assessment. NB This doesn’t exclude assessment of risk from other sources<sup>73</sup> e.g. fluvial, coastal and surface water, as highlighted by the Strategic Planning Policy Statement for Northern Ireland (SPPS)<sup>74</sup>.
- Reservoir condition is deemed **poor**, or insufficient evidence on reservoir condition is provided: The proposed development **will** require a flood risk assessment, including reservoir flooding. DfI will only object to development on land where there is a significant hazard posed to people<sup>75</sup>.

**Question: To what extent has the Responsible Reservoir Manager Status voluntary scheme improved reservoir safety and mitigated delays to development?**

<sup>71</sup> [Department for Infrastructure. \*Technical Guidance Note 25: The Practical Application of Strategic Planning Policy for ‘Development in Proximity to Reservoirs’\* \(June 2020\)](#)

<sup>72</sup> Written communication with Kyle Somerville, Associate, McCloy Consulting, 30 June 2021

<sup>73</sup> Written communication with Kyle Somerville, Associate, McCloy Consulting, 30 June 2021

<sup>74</sup> [Department of the Environment. \*Strategic Planning Policy Statement for Northern Ireland \(SPPS\)\* \(September 2015\)](#)

<sup>75</sup> [Environment Agency. \*Supplementary note on flood hazard ratings and thresholds for development planning and control purpose\* \(May 2008\)](#)

## 4 Reservoir safety and management issues in Northern Ireland

This section discusses reservoir safety issues associated with the Act, and illustrates these with specific examples.

### 4.1 New costs associated with the regulatory regime

Reservoir managers must employ a Supervising Engineer, who produces a Section 12 report. Welsh Water budget around £3000 per annum for this. An Inspecting Engineer's Section 10 report can cost £10,000<sup>76</sup>. The Minister for Infrastructure has the power to charge for reservoir registration and administration (Section 14). Scotland and Wales charge registration fees of around £500<sup>77,78</sup>. Wales charges an annual subsistence fee of £230 for high-risk reservoirs. Scotland charges ~£460 for high-risk reservoirs, and lower rates for lower-risk reservoirs.

### 4.2 Cost of remedial works

Responsible reservoir owners will have maintained their stocks prior to the Reservoirs Act 2015. For example, NI Water has voluntarily adhered to the spirit of the GB Reservoirs Acts (1930 and 1975) since 1945<sup>79</sup>. However, private reservoir owners may not have done, meaning their reservoirs are likely to be in poorer condition. For these owners, obligatory remedial works in the interests of safety may be expensive. Minor remedial works may cost over £10,000<sup>80</sup>, while many remedial works can cost over £100,000 and substantial works can cost over £1 million<sup>81 82</sup>. For example, the cost of rehabilitating Camlough Reservoir, Co Armagh was around £3 million<sup>83,84</sup>.

**Question: Is a grant scheme needed to help reservoir managers meet remedial works costs resulting from the Act?**

<sup>76</sup> [Dwr Cymru. \*Dam Safety & Reservoirs – Cost Modelling\* \(September 2018\)](#)

<sup>77</sup> [Scottish Environment Protection Agency. \*Charging scheme development\* \(2021\), retrieved 2 July 2021](#)

<sup>78</sup> [Natural Resources Wales. \*Reservoir charges\* \(2021\), retrieved 2 July 2021](#)

<sup>79</sup> [Alan Cooper. 'The Geoffrey Binnie Lecture 2014: The heritage of dams in Northern Ireland'. \*Dams & Reservoirs\* \(2014\), 24:62-86](#)

<sup>80</sup> [NIA OR 4 February 2014, p.15](#)

<sup>81</sup> [J. Welbank \*et al.\* 'Remedial works at Sutton Bingham Reservoir'. Paper presented at British Dam Society 15th Biennial Conference, Warwick, 10-13 September 2008](#)

<sup>82</sup> [L. Dunne \*et al.\* 'Discontinuance of Small Reservoirs in Scotland'. Paper presented at British Dam Society 19th Biennial Conference, Lancaster, 7-10 September 2016](#)

<sup>83</sup> [Newry and Mourne District Council. \*Oral presentation to Agriculture and Rural Development Committee\* \(February 2014\), retrieved 2 July 2021](#)

<sup>84</sup> [NI Water. \*£3 Million Investment Complete at Camlough Reservoir\* \(20 June 2017\), retrieved 2 July 2021](#)



### 4.3 Discontinuance, abandonment and transfers of ownership

The increased costs of reservoir safety regulation for some reservoirs is likely to prompt the owners to reconsider whether they wish to continue to own, and how to operate, their reservoirs. This is especially true where reservoirs are no longer fulfilling their original purpose and/or are currently marginally financially viable. Many of NI Water's reservoirs are no longer needed for their original purpose<sup>8586</sup>. In 2014 the Rivers Agency considered the potential impacts of decommissioning redundant or marginal reservoirs on amenity, landscape, biodiversity, fishing, recreation, flood risk *etc.*<sup>87</sup>. Reservoir owners wishing to minimize their regulatory burden may consider three options: discontinuance, abandonment and transfer to a new owner.

- 1 Discontinuance – the alteration of a reservoir to make it incapable of holding 10,000 cubic metres of water above the natural level of any part of the surrounding land<sup>88</sup>.
- 2 Abandonment – the alteration of a reservoir to make it incapable of filling with any water above the natural level of any part of the surrounding land.
- 3 Transfer of ownership – reservoirs may be sold to a new owner, who would then take on responsibility for safety. NI Water have sold several reservoirs since 2012<sup>8990</sup>.

### 4.4 Reservoir safety cases and themes

There are known issues related to reservoir safety at a number of reservoirs. Table 2 shows a selection of cases.

**Table 2 Current and recent issues at NI reservoirs**

Reservoir	Main issue	Detail
Silent Valley/ Ben Crom, Co Down	Development delayed	Remedial works were required following inspection in 2018. This held up Downstream developments at Kilkeel <sup>91</sup> . Works were carried out, and DfI conferred 'Responsible Reservoir Manager status' to resolve the issue in December 2019 <sup>92</sup> .
Creggan (Upper and Lower), Co Derry/Londonderry	Development delayed	Constructed by 1880 for public water supply. Redundant. Owned by Derry City & Strabane District Council. Leased to Creggan Country Park as its main feature <sup>93</sup> .

<sup>85</sup> [Alan Cooper. 'The Geoffrey Binnie Lecture 2014: The heritage of dams in Northern Ireland'. \*Dams & Reservoirs\* \(2014\), 24:62-86](#)

<sup>86</sup> [NI Water. \*Implications of the Reservoir Bill to NI Water\* \(February 2014\), retrieved 2 July 2021](#)

<sup>87</sup> [Department for Infrastructure. \*Survey of reservoirs in Northern Ireland research documents\* \(2014\), retrieved 2 July 2021](#)

<sup>88</sup> [Reservoirs Act \(Northern Ireland\) 2015, Section 41](#)

<sup>89</sup> ['Fancy splashing out to buy your own reservoir?'. \*Belfast Telegraph\*, 20 July 2012, retrieved 2 July 2021](#)

<sup>90</sup> ['NI Water assessing reservoir for development prior to sell off'. \*Londonderry Sentinel\*, 30 May 2015, retrieved 2 July 2021](#)

<sup>91</sup> ['Reservoir safety concerns blight Kilkeel development'. \*The Planner\*, 22 November 2019, retrieved 2 July 2021](#)

<sup>92</sup> ['NI reservoirs planning issue resolved'. \*BBC\*, 11 December 2019, retrieved 2 July 2021](#)

<sup>93</sup> [Rivers Agency. \*Reservoirs in Northern Ireland Information Booklet\* \(2014\), pp.95-96, retrieved 2 July 2021](#)

		Designated 'high-consequence' <sup>94</sup> . Repairs (~£1m) likely to be unaffordable <sup>95</sup> . Safety concerns are causing delays to downstream development at Old George Fort <sup>96,97,98</sup> .
Lurgan Park Lake, Co Armagh	Development delayed	Constructed by 1832 as ornamental lake <sup>99</sup> . Development held up <sup>100</sup> .
Clandeboyne Lake, Co Down	Development delayed	Constructed ~c.1858 as ornamental lake <sup>101</sup> . Development had been held up as a result of safety concerns <sup>102,103</sup> .
Boghill dam, Co Antrim	Lowering	Eighteenth century mill dam believed to be unsafe by owner <sup>104</sup> . Local concerns over loss of amenity, biodiversity, recreation and angling <sup>105</sup> .
Hydepark Dam, Co Antrim	Lowering	Eighteenth century mill dam <sup>106</sup> . Safety concerns identified and notification of lowering given in November 2016. Local concerns over biodiversity <sup>107</sup> . Lowered in April 2017 <sup>108</sup> .
Kilwaughter, Co Antrim	Lowering	Engineer's report raised safety concerns. It has been reported that the owner wishes to lower volume to around 10ML. Local concerns over biodiversity <sup>109</sup> .
Portavoe, Co Down	Transfer of ownership	Portavoe Reservoir sold by NIW in 2020 to private owners for £67,575.00, who had sought first refusal <sup>110,111</sup> . Public Rights of Way and angling access issues <sup>112</sup> .
Knockbracken, Co Down	Transfer of ownership	Ex-service reservoir. Sold by NI Water and redeveloped as a 70,000 m <sup>2</sup> commercial waterpark 'Let's Go Hydro'.
Ballyversall, Co Derry/Londonderry	Transfer of ownership	Sold by NI Water in 2015.

<sup>94</sup> [Rivers Agency. 'Request for information held by Rivers Agency for Creggan Upper and Creggan Lower reservoirs', retrieved 2 July 2021](#)

<sup>95</sup> [NIA OR 1 April 2014, p.10](#)

<sup>96</sup> ['Dispute over Creggan Reservoirs remediation costs'. \*Derry Now\*, 30 September 2020, retrieved 2 July 2021](#)

<sup>97</sup> [NIA AQW 18452/17-22](#)

<sup>98</sup> ['Substantial funding still needed for Creggan Reservoir repairs'. \*Derry Now\*, 13 May 2021, retrieved 2 July 2021](#)

<sup>99</sup> [Rivers Agency. \*Reservoirs in Northern Ireland Information Booklet\* \(2014\), p.93, retrieved 2 July 2021](#)

<sup>100</sup> [NIA OR 2 February 2020, p.8](#)

<sup>101</sup> [Rivers Agency. \*Reservoirs in Northern Ireland Information Booklet\* \(2014\), p.179, retrieved 2 July 2021](#)

<sup>102</sup> [NIA AQW 13668/17-22](#)

<sup>103</sup> ['£50 million redevelopment of Bangor town centre approved despite concerns'. \*Belfast Live\*, 27 Jan 2021, retrieved 2 July 2021](#)

<sup>104</sup> [Rivers Agency. \*Reservoirs in Northern Ireland Information Booklet\* \(2014\), p.166, retrieved 2 July 2021](#)

<sup>105</sup> ['Campaign battle to drain 'unsafe' dam in Northern Ireland'. \*Belfast Telegraph\*, 2 October 2018, retrieved 2 July 2021](#)

<sup>106</sup> [Rivers Agency. \*Reservoirs in Northern Ireland Information Booklet\* \(2014\), p.168, retrieved 2 July 2021](#)

<sup>107</sup> ['Hyde Park Dam work carried out to prevent "potential loss of human life"'. \*Belfast Live\*, 15 April 2017, retrieved 2 July 2021](#)

<sup>108</sup> ['Rivers Agency given no advance notice of dam draining'. \*BBC\*, 13 April 2017, retrieved 2 July 2021](#)

<sup>109</sup> ['Draining of Kilwaughter reservoir 'could be devastating'. \*BBC\*, 10 June 2021, retrieved 2 July 2021](#)

<sup>110</sup> [Ards and North Down Borough Council. \*Portavo Reservoir: Update\* \(September 2020\), retrieved 2 July 2021](#)

<sup>111</sup> [NIA AQW 16766/17-22](#)

<sup>112</sup> [NIA AQW 18142/17-22](#)

Each of these reservoirs has specific engineering, legal, financial, social and environmental characteristics. However, the following themes appear to be common:

### **Development delayed**

- 'Responsible Reservoir Manager Status' can ensure reservoirs are managed safely and allow downstream developments to proceed.
- If reservoir managers are unable or unwilling to fund remedial works, significant delays to downstream development can result.

### **Lowering**

- Some reservoir managers appear to have become more concerned about reservoir safety and their liabilities recently.
- The motivation of private reservoir managers for undertaking works is unclear. Some cite their common law duty. The Reservoirs Act 2015 may have also increased awareness.
- Some reservoirs are lowered (drawn down) in order to reduce risk and liability. However, it is unclear whether these are being officially discontinued.
- Local stakeholders are often concerned about the impacts of lowering on amenity and wildlife.
- Local stakeholders may not be consulted about lowering, contributing to opposition to works.
- Reports often refer to 'high risk' reservoirs. This may be misleading, as the Reservoirs Act refers to 'consequence' rather than 'risk'.

### **Transfers of ownership**

- There may be misconceptions about the value of reservoir sites, related to a lack of understanding of the (high) costs of reservoir management.
- Reservoir sales can result in win-wins; reduced liability and capital generation for the seller, and new business opportunities for the buyer.
- Reservoir sales can result in loss of recreational access.

### **Questions:**

- **Are there other examples of planning permission being refused or delayed due to reservoir safety concerns?**
- **Are there examples of lowering works being carried out in an attempt to avoid the need for inspections?**
- **Are reservoir 'lowering' works being properly engineered and certified as discontinuance, or are owners merely temporarily reducing water levels?**

- **Has the mental health of residents living downstream of reservoirs been affected by awareness of reservoir safety issues?**

#### 4.5 Insurance

During the Reservoirs Bill phase, concerns were raised that the Act would negatively impact property owners downstream of reservoirs by making insurance unavailable<sup>113</sup>. The Rivers Agency believed that reservoir safety regulations should provide assurance that reservoirs were being managed safely and therefore insurance availability and cost would not be affected<sup>114</sup>. UK insurers generally consider the risk from reservoirs to be low<sup>115</sup><sup>116</sup>. In theory, depending on their attitude, insurers may decide to provide insurance to owners of property in reservoir inundation zones at the same rates, or decline cover<sup>117</sup>. Since 2014, more information about reservoir flood risk has become available. Insurers can, in theory, use this information to assess flood risk, which may affect premiums<sup>118</sup>. It is not clear what, if any, effect the Act and associated reservoir safety regulatory activity has had on insurance availability or premiums in NI.

##### Questions:

- **Have all of the ramifications of the Act for downstream properties, e.g. insurance and prices, been assessed?**
- **Has the Act and associated regulatory activity had any effect on the availability and cost of insurance for property owners downstream of controlled reservoirs?**
- **Have there been particular issues in proximity to the nine reservoirs assessed as requiring urgent remedial works?**

#### 4.6 Recent discussions of the Reservoirs Act (Northern Ireland) 2015 in the Assembly

There have been 74 questions to the Minister concerning reservoirs since January 2020. Of these, 48 related to the sale and management of Portavoe Reservoir, and eight related to the timescale and funding of remedial works at Creggan Reservoirs. Fifteen questions concerned reservoir safety in general. Of these, seven concerned

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<sup>113</sup> [NIA OR 25 February 2014, p.7](#)

<sup>114</sup> [DARD. Reservoir Bill Committee Meeting 25 February 2014 \(2 April 2014\)](#)

<sup>115</sup> [Home Protect. Flood risk: is my house at risk of flooding?, retrieved 2 July 2021](#)

<sup>116</sup> [Environment Agency. Reservoir Flooding Frequently Asked Questions \(2013\), p.9](#)

<sup>117</sup> [Insurance Post. Analysis: Reservoir dams - a water-tight insurance risk? \(11 November 2019\), retrieved 2 July 2021](#)

<sup>118</sup> [Chartered Insurance Institute. Flood plain speaking \(June 2018\), retrieved 2 July 2021](#)

departmental responsibilities, four concerned regulation and risk management, and three concerned repairs and maintenance.

Since 25 July 2015 reservoir safety issues have been raised by the Infrastructure Committee and in plenary sessions. Reservoir safety has been discussed several times at the Infrastructure Committee since January 2020. Topics include reservoir safety regulation<sup>119</sup>, the transfer of departmental responsibilities to DfI<sup>120</sup>, development delays caused by Lurgan Park Lake<sup>121</sup> and Creggan Reservoir<sup>122</sup>, the risk posed by nine reservoirs needing urgent work<sup>123</sup>, and funding of remedial works<sup>124</sup><sup>125</sup>.

There was extensive discussion of the Reservoirs Act at the 1 June 2021 plenary session, when the Departments (Transfer of Functions) Order (Northern Ireland) 2021 was presented<sup>126</sup>. During the session the Minister described the delays to commencement. In debate, Members asked why the transfer of functions had taken five years to resolve. Members also cited specific instances of issues caused by the Act not having been fully commenced sooner.

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<sup>119</sup> [NIA OR 28 January 2020](#)

<sup>120</sup> [NIA OR 26 February 2020](#)

<sup>121</sup> [NIA OR 5 February 2020](#)

<sup>122</sup> [NIA OR 19 February 2020](#)

<sup>123</sup> [NIA OR 2 December 2020](#)

<sup>124</sup> [NIA OR 21 April 2021](#)

<sup>125</sup> [NIA OR 9 June 2021](#)

<sup>126</sup> [NIA OR 1 June 2021, pp.15-21](#)