



Biennial report on reservoir safety 1 January 2015 - 31 December 2016

We are the Environment Agency. We protect and improve the environment.

Acting to reduce the impacts of a changing climate on people and wildlife is at the heart of everything we do.

We reduce the risks to people, properties and businesses from flooding and coastal erosion.

We protect and improve the quality of water, making sure there is enough for people, businesses, agriculture and the environment. Our work helps to ensure people can enjoy the water environment through angling and navigation.

We look after land quality, promote sustainable land management and help protect and enhance wildlife habitats. And we work closely with businesses to help them comply with environmental regulations.

We can't do this alone. We work with government, local councils, businesses, civil society groups and communities to make our environment a better place for people and wildlife.

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Foreword

Over the last 2 years we have seen significant improvements in the level of compliance with the Reservoirs Act 1975 and improved emergency planning, but there is still work to do.

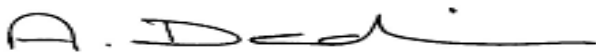
Non-compliance in 2015 has been at its lowest ever recorded levels due to a mixture of advisory and regulatory action taken. We have issued fewer notices and no prosecutions. Our regulatory effort is focused on those sites posing the highest risk to life.

A key to further reducing non-compliance will be to improve undertakers (reservoir owners and operators) understanding of what is expected of them under the Act. We aim to do this by:

- gaining a better understanding of our customers, including owners, operators and engineers;
- introducing more targeted communications;
- engaging locally with communities and others involved with reservoirs so that they are more aware of reservoir safety.

Undertakers of all large raised reservoirs must now report any 'incident' at their reservoir to the Environment Agency. Up until July 2013, such incidents were only reported on a voluntary basis. It is now a criminal offence for an undertaker not to report such incidents.

The safety legislation is aimed at minimising the risk of uncontrolled releases of water which could result in loss of life. There were 11 reported incidents during 2015 and 2016. Usually, they are limited in scale and do not result in a complete failure of the dam or reservoir. They are managed by draining down water from the reservoir to take the water pressure off the dam so that suitable repairs can be made.



Antony Deakin

Flood and Coastal Risk Manager - Reservoir Safety

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1. Our Role

The Environment Agency is the enforcement authority for the Reservoirs Act 1975 and is also an 'undertaker' (owner and operator) for 211 large raised reservoirs in England. This biennial report looks at the work that we have done to secure compliance with the requirements of the Act in England between 1 January 2015 and 31 December 2016.

In Section 4 we describe the work that we will be doing over the next two years.

Under the Reservoirs Act 1975 we:

- maintain a register of all reservoirs under the Reservoirs Act 1975 (the Act);
- make sure that undertakers appoint a construction engineer to design and supervise the construction or alteration of large raised reservoirs;
- designate reservoirs as 'high-risk', if we think that human life could be endangered in the event of an uncontrolled release of water from the reservoirs;
- encourage undertakers to comply with the Act by engaging with them at regular intervals;
- make sure that undertakers appoint a supervising engineer for their reservoirs;
- make sure that undertakers have their reservoirs inspected by inspecting engineers;
- make sure that undertakers carry out any necessary investigations, repairs, improvements or studies (i.e. 'measures to be taken in the interests of safety' (safety measures)) required by inspecting engineers;
- when necessary, appoint engineers and commission engineering work, including any necessary safety measures on their behalf, when an undertaker does not comply with the Act. We charge undertakers for this work;
- appoint engineers and take any other action necessary in an emergency, to make sure that safety measures are completed;
- make sure that undertakers report reservoir incidents and share lessons learnt from them;
- ensure that we observe and comply with the requirements of the Act for our own reservoirs.

2. Background

Although there have been no recent reservoir failures that have resulted in loss of life, it was the death of 21 people after the failure of two dams in 1925 that led to the passing of the Reservoir (Safety Provisions) Act 1930. This Act was updated by the Reservoirs Act 1975.

The Reservoirs Act 1975 introduced:

- the role of the supervising engineer;
- the role of the enforcement authority;
- the public register of reservoirs, which was to be kept up-to-date.
-

The Water Act 2003 transferred the responsibility for enforcing the Reservoirs Act 1975 in England and Wales to the Environment Agency. On 1 April 2013, Natural Resources Wales (NRW) became the enforcement authority for large raised reservoirs in Wales.

The Flood and Water Management Act 2010 (FWMA) made further amendments to reservoir safety legislation. Phase one of these amendments was implemented on 30 July 2013 in England and introduced the following main changes:

- reservoir undertakers must register their large raised reservoirs with the Environment Agency;
- the Environment Agency must designate a large raised reservoir as high-risk if we consider that human life could be endangered in the event of an uncontrolled release of water;
- the inspection and supervision requirements of the Act will only apply to high-risk reservoirs;
- Inspecting Engineers' recommendations as to the maintenance of a high-risk reservoir are now legally enforceable;
- all engineers' reports and statements for designated high-risk reservoirs must be sent to us;
- incident reporting is now a legal requirement for all large raised reservoirs;
- offences under the Act are now primarily strict liability. This means that for an offence to be committed, the mere fact that the non-compliance occurred is sufficient, rather than there being a need to prove wilful default and no reasonable excuse.

3. Regulatory Position

Compared to the biennial report for the period ending 31 December 2014 the regulatory position is as follows:

- the number of reservoirs without a supervising engineer appointed has **remained** at eight although it is noted that these eight reservoirs are not the same as those reported previously;
- the number of reservoirs with an inspection due and no inspecting engineer appointed has **reduced** from 14 to 13;
- the number of reservoirs with an inspection overdue by more than a year has **increased** from zero to seven, all of which have an inspecting engineer appointed. In some cases inspections have been deferred pending the outcome of a representation or appeal of a 'high-risk' designation;
- the number of reservoirs with overdue safety measures has **increased** from 40 to 48. The reasons for this include that some reservoirs with safety measures have been subject to representations or appeals against a 'high-risk' designation and completion of those measures may have been deferred pending the outcome;
- we have continued the process of assessing whether all 2020 large raised reservoirs in England were high-risk. By 31 December 2016 we had designated 199 reservoirs as not high-risk, reducing the level of regulation at these sites.

Table 1: reservoirs non-compliant on 01 January 2015 and 31 December 2016

	Situation on 01 January 2015	Situation on 31 December 2016
No supervising engineer appointed	8	8
Inspection due, and no inspecting engineer appointed	14	13
Section 10 inspection overdue by more than a year, but an inspecting engineer has been appointed	0	7
Measures in the interests of safety overdue (not completed as soon as practicable or have exceeded the deadline set by the inspecting engineer)	40	48

Table 2: Data recorded between 01 January 2015 and 31 December 2016

Number of newly constructed reservoirs	8
Number of supervising engineer appointments	684
Number of inspecting engineer appointments	590
Number of 10(5) certificates after the satisfactory completion of an inspection under Section 10 of the Act	450
Number of these 10(5) certificates which contained measures to be taken in the interests of safety	163
Number of section 10(6) certificates showing that measures to be taken in the interests of safety had been satisfactorily completed	105

Table 3: Progress with risk designations up to 31 December 2016

Summary of progress to the end of December 2016		No. of reservoirs	Undertaker informed
Reservoirs under construction (pre-designation)		145	n/a
STAGE: DESIGNATION			
Provisional designation	Provisional designation to be determined	84	n/a
Review of representations	Representations received	227	227
	Assessed	126	126
Final designation	Determined as not high-risk	199	199
	Determined as high-risk	1491	1491
STAGE: APPEAL			
	Appeals against final designation received	5	5
	Appeal resolved	2	2
STAGE: REVIEW			
	Reviews requested	1	1
	Assessed	1	1

At the time of writing this report, we have determined the risk designation for all regulated large raised reservoirs in England, with the exception of those in construction. Reservoirs where we think that an uncontrolled release of water could endanger human life have been designated as high-risk. .

Only large raised reservoirs that are high-risk are subject to the full regulatory requirements of the Reservoirs Act 1975. Other large raised reservoirs have seen a reduced level of regulation, with no statutory inspection or supervision requirements. However, other parts of the Act still apply and

these reservoirs still need to be registered in case of changes which alter the risk designation, such as downstream development or alterations to the reservoir.

To date 10% of the reservoirs we have assessed have been designated as not high-risk.

A risk based approach to enforcement

The main causes of non-compliance are:

- A supervising engineer has not been appointed. Every high-risk large raised reservoir must have a supervising engineer appointed at all times unless it is being supervised by a construction engineer;
- An inspecting engineer has not been appointed to carry out the Section 10 inspection;
- Safety measures identified by the inspecting engineer have not been completed by the specified date, or 'as soon as practicable'.

We continue to focus on reservoirs that pose the greatest risk to public safety. Our highest priority is to ensure that all reservoirs have a supervising engineer appointed at all times. We then make sure that reservoirs have an inspecting engineer appointed at the appropriate time, make sure the certificate and report are produced, and that safety measures are completed.

Provision of clear advice and guidance is our primary approach to secure compliance. We seek to encourage and persuade undertakers to comply by regular written and verbal communications and reminders. We continue to carry out site visits to meet face-to-face with reservoir undertakers and have found this to be very effective. Meeting with undertakers at their reservoir to explain why they should comply with the Reservoirs Act has been very effective in ensuring safety measures are completed. As a result, we have needed to serve fewer enforcement notices to get engineers appointed and safety work completed.

However, if advice, guidance and persuasion are unsuccessful then we will consider formal enforcement action.

When considering the appropriate course of action to ensure compliance we follow the Macrory Penalty Principles. These state that enforcement and sanctions should:

- aim to change the behaviour of the offender;
- aim to eliminate any financial gain or benefit from non-compliance;
- be responsive and consider what is appropriate for the particular offender and regulatory issue, which can include punishment and the public stigma that should be associated with a criminal conviction;
- be proportionate to the nature of the offence and the harm caused;
- aim to restore the harm caused by regulatory non-compliance, where appropriate; and aim to deter future non-compliance.
- We believe in firm but fair regulation. Underlying our commitment to firm but fair regulation are the principles of:
 - proportionality in the application of the law and in securing compliance;
 - consistency of approach;
 - transparency about how we operate and what those we regulate may expect from us;
 - targeting of enforcement action; and
 - accountability for the enforcement action we have taken.

Serving enforcement notices

Where we are unable to persuade undertakers to make the relevant appointments or to complete the safety measures, one enforcement option is to serve notice, giving them a deadline to comply. The table below shows the number of notices served. Over the past two years we have served 14 notices at 14 reservoirs (see Appendix 1 for details). The pie chart below shows whether or not the undertakers had complied with the notice by the end of 2016.

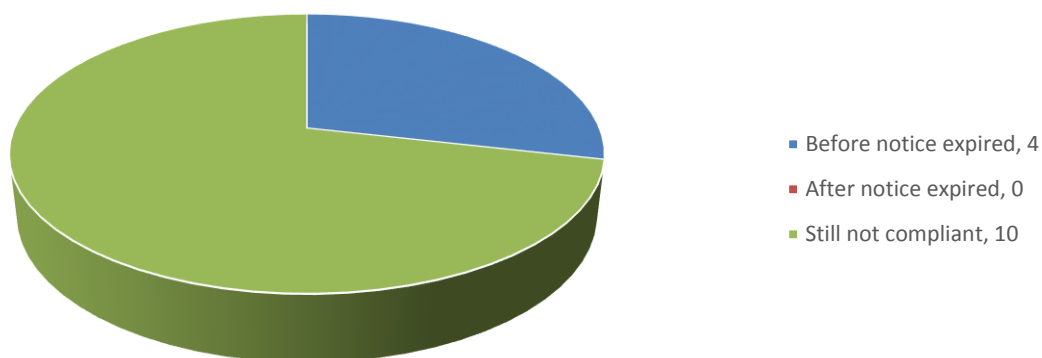
Table 4: Number of notices served 1 January 2015 – 31 December 2016

Notices served		
Section of the Reservoirs Act 1975	Non-compliance	Total number of notices served (1 January 2015 to 31 December 2016)
8(3)(a)	No construction engineer appointed	1
10(7)(b)	Safety measures not carried out	11
12(4)	No supervising engineer and/or construction engineer appointed	2
Total number of notices served		14

Table 5: Number of reservoirs by undertaker type where notices have been served

Notices served by undertaker type		
Undertaker type	Examples	Total number of undertakers
Private landowners and Trusts	Individuals, estates, developers	11
Public body	Local government	3
Total number of reservoirs		14

The number of reservoirs compliant following notice



Other enforcement action

We have issued seven formal written warnings to reservoir undertakers. One reservoir is under investigation and further enforcement action may have to be taken.

Environment Agency reservoirs

The Environment Agency is the undertaker for 211 large raised reservoirs in England. All Environment Agency reservoirs were compliant in 2015 and 2016.

Incident reporting

For incidents at large raised reservoirs (i.e. reservoirs with a volume of at least 25,000 cubic metres above ground level) located in England, incident reporting has been mandatory since July 2013

Post-incident reporting for small raised reservoirs (i.e. reservoirs not covered by the legislation) in England remains voluntary.

As soon as the incident is under control, the reservoir undertaker (i.e. the owner, operator or user) must provide a preliminary report of the incident to the Environment Agency and within one year a full report must be provided.

Table 6: Number of incidents reported between 2004 and 2016

	2015 - 2016	2004 - 2014
Total number of incidents	11	97
Incidents at large raised reservoirs	11	66
Incidents at small raised reservoirs	0	31

4. The Future

We believe that further reducing non-compliance will be gained by gaining a greater understanding of our customers and by building strong and effective relationships with them. Reservoir owners and operators are a diverse group ranging from large organisations such as the Environment Agency and water companies, through to farmers, fishing clubs and individual landowners. The public living downstream of reservoirs are largely aware of the risk posed by reservoirs situated upstream of them.

Not all owners and operators have the same level of legal and technical understanding. We will aim to focus the majority of our communications to target those owners and operators with a lower level of understanding of their responsibilities and those groups that have a poorer track record with regard to compliance.

Reservoir engineers are also our customers. We already engage with the British Dam Society (BDS) and Institution of Civil Engineers (ICE) through the BDS Conference, supervising engineers' forum and membership of the ICE Reservoirs Committee. We believe that even closer engagement with the dam safety industry is possible and would be beneficial.

We shall support Defra with their review of the regulatory impact of phase 1 of the Flood and Water Management Act (2010) and assist them in improving the evidence base related to the number and condition of reservoirs in England with a capacity between 10,000m³ and 25,000m³.

We have just switched to a new database system which replaces our reservoir act compliance and enforcement database. The new system will make it easier for our staff to access information about reservoirs, respond to queries and monitor compliance under the amended Act.

5. Appendices

Appendix 1 – Steps taken by the enforcement authority to ensure that undertakers observe and comply with the requirements of the Reservoirs Act 1975

Reservoir	Undertaker	Type	Location	Number of enforcement notices served under Reservoirs Act 1975 section					Other enforcement action	Compliance status as of 31 December 2016	Offence
				8(3)(a)	10(7)(a)	10(7)(b)	12(4)	16(3)			
Reservoir A	Private individuals	Private landowners and Trusts	Near Kidsgrove			1				Designated 'not high risk' so no longer regulated.	Failure to carry safety measures into effect by the due date
Reservoir B	Private individuals	Private landowners and Trusts	Near Bolton			1			Under investigation	Non-compliant	Failure to carry safety measures into effect by the due date
Whiteknights	University of Reading	Private landowners and Trusts	Near Reading			1				Non-compliant	Failure to carry safety measures into effect by the due date
Locko Park Lake	Locko Park Estates	Private landowners and Trusts	Near Derby			1				Non-compliant	Failure to carry safety measures into effect by the due date
Great Barr Lower Lake	BCG Lakes Limited	Private landowners and Trusts	Near Walsall			1				Non compliant	Failure to carry safety measures into effect by the due date
Marlbrook Quarry Landfill	Link Property Developments Ltd	Private landowners and Trusts	Near Bromsgrove	1						Non compliant	Failure to carry safety measures into effect by the due date
Withins	P&F Properties	Private landowners and Trusts	Near Radcliffe			1				Non-compliant	Failure to carry safety measures into effect by the due date

Eccleston Mere	Pheasant Equities Limited	Private landowners and Trusts	Near St Helens				1			Compliant	Failure to appoint Supervising Engineer
Reservoir C	Private individual	Private landowners and Trusts	Near Bolton						Warning letter	Non-compliant	Failure to appoint Supervising Engineer and failure to appoint Inspecting Engineer
Park Reservoir	Curley's Fisheries Ltd	Farms	Near Horwich						Warning letter	Compliant	Failure to appoint Supervising Engineer
Lucerne Lake	Ilchester Estate	Private landowners and Trusts	Near Evershot				1			Non-compliant	Failure to carry safety measures into effect by the due date
Melbury Lake	Ilchester Estate	Private landowners and Trusts	Near Evershot				1			Non-compliant	Failure to carry safety measures into effect by the due date
Reservoir D	Private individual	Private landowners and Trusts	Near Lichfield						Warning letter	Compliant	Failure to carry safety measures into effect by the due date
Poynton Pool	Cheshire East Council	Local Authority	Near Poynton						Warning letter	Compliant	Failure to appoint Supervising Engineer and Inspecting Engineer
Langold Lake	Bassetlaw District Council	Local Authority	Near Worksop				1		Warning Letter	Non-compliant	Failure to carry safety measures into effect by the due date

Willow Park Lake	St Helens Borough Council	Local Authority	Near Haydock			1				Non-compliant	Failure to carry safety measures into effect by the due date
Heapey 1,2 and 3	Wigan and District Angling Association	Private landowners and Trusts	Near Chorley						Warning Letter	Compliant	Failure to carry safety measures into effect by the due date
Osmaston Farm Lake	Okeover Estate	Private landowners and Trusts	Near Derby			1				Non-compliant	Failure to carry safety measures into effect by the due date
Reservoir E	Private individual	Private landowners and Trusts	Near Kidderminster						Warning letter	Compliant	Failure to carry safety measures into effect by the due date

Appendix 2 – Update on other third party non-compliant cases in England in appendix 1 of our 2013-2014 biennial report

Reservoir	Undertaker	Type	Location	Number of enforcement notices served under Reservoirs Act 1975 section					Enforcement outcome	Compliance status as of 31 December 2016	Comment
				8(1)	10(7)(a)	10(7)(b)	12(4)	16(3)			
Cheddar	Bristol Water PLC	Water Company	Near Wells			1			Warning letter sent	Compliant	Undertaker complied with the enforcement notice
Reservoirs A, B & C	Private individuals	Angling				3			Warning letter sent	Compliant	New s10 report received
Reservoir E	Private individuals	Private Landowners							No further action	Compliant	New s10 report received
Highams Park Lake	City of London Corporation	Local Government	Near Chingford			1			Warning letter sent	Compliant	Undertaker complied with the enforcement notice

Note: references A, B, C and E are specific to the 2013 - 2014 biennial report and do not reflect those listed in Appendix 1

Appendix 3 – Environment Agency non-compliance

Reservoir	Location	Dates non-compliant	Offence	Current compliance status as of 31 December 2016	Steps taken
None					

Appendix 4 – Statistics, engineer appointments and safety measures

Reference	Description	Number on 31/03/2005	Number on 30/03/2007	Number on 02/04/2009	Number on 05/04/2011	Number on 05/04/2013	Number of 02/01/2015	Number on 31/12/2016	Description
Statistics for all English reservoirs									
1	Total number of 'large raised reservoirs' (LRRs)	1,715	1,799	1,889	1,913	1,944	2,001	2,020	Comprises those reservoirs that are 'in operation', 'abandoned', and 'under construction'
2	Number of 'under construction' reservoirs	93	99	102	115	131	167	145	Includes both new reservoirs and those being modified

3	Number of 'abandoned' reservoirs	-	3	3	4	3	3	3	Although empty, an 'abandoned' reservoir is still capable of holding at least 25,000m3 of water above natural ground level
4	Total number of 'discontinued' reservoirs	-	175	191	210	219	225	235	
5	Number of 'proposed' reservoirs	-	14	19	37	47	59	64	These are locations at which a LRR may be constructed in the future
6	Total number of undertakers	431	644	691	708	736	772	847	
7	Total number of LRRs for which the Environment Agency is the undertaker	124	161	180	189	198	209	211	Comprises those reservoirs that are 'in operation', 'abandoned', and 'under construction'
Supervising Engineer (SE) appointments									
8	Number of LRRs with no SE	44	40	6	4	10	8	8	
Inspecting Engineer (IE) appointments									
9	Number of LRRs for which the next Section 10 Insp report is overdue	115	166	138	46	12	76	91	All 'high risk' reservoirs have to be inspected periodically by an IE, at intervals no greater than ten years. This includes cases in which an IE has been appointed, but a 10(5) certificate has not yet been issued.
10	Number of LRRs for which the next S10 Insp report is overdue, for which an inspection and report is in progress	-	129	134	45	0	62	78	
11	Number of LRRs for which the next S10 Insp has been overdue for at least one year	51	29	64	10	0	14	11	
12	Number of LRRs for which the next S10 Insp has been due for at least one year, for which an IE has NOT been appointed	-	1	3	0	0	0	4	

13	Number of LRRs for which the next S10 Insp has been due for less than one year for which an IE has NOT been appointed	-	-	1	1	12	14	9	
Measures to be taken in the interests of safety (MIOS)									
14	Number of LRRs with MIOS, including those within the 'target period' set by the IE	278	277	303	267	199	172	272	MIOS are essential works identified by an IE during an inspection carried out under section 10 of the Reservoirs Act 1975. The undertaker is legally required to implement MIOS*
15	Number of LRRs with MIOS that are still outstanding even though the target period has elapsed	-	49	40	41	35	36	57	
16	Number of LRRs with MIOS for which there is no target date but which have been outstanding for at least 5 years	-	5	5	1	3	0	2	If MIOS are still outstanding 5 years after the section 10 report then it is quite likely that they have not been implemented 'as soon as practicable'

* These figures do not necessarily represent non-compliance, just the total number of reservoirs that have safety measures identified, not all of which are outstanding beyond their target date. The figures will naturally vary according to how often engineers are identifying works that need doing at reservoirs, and we have no control over this. It is not necessarily a figure to be concerned about, unless the work is not done in time.

Distribution of dam category			
Dam category	Number of LRRs	% of total number of LRRs	Notes (Reference: Floods and Reservoir Safety; ICE1996)
A	692	34.2	Where a breach could endanger lives in a community
B	283	14.0	Where a breach could endanger lives not in a community or could result in extensive damage
C	438	21.7	Where a breach would pose negligible risk to life and cause limited damage
D	236	11.7	Special cases where no loss of life can be foreseen as a result of a breach and very limited additional flood damage would be caused
Not applicable	97	4.8	Historically, only impounding reservoirs have been assigned a dam category, which was originally for flood design purposes. Although this has changed, and the risks posed by all reservoirs are now being considered, some non-impounding and service reservoirs have not yet been assigned a dam category
Unknown	274	13.6	Section 10 Inspection reports, in which dam category information is normally supplied, are not available for all reservoirs (because the reports do not contain MIOS, and do not need to be submitted to the enforcement authority until a reservoir is designated high-risk).
Totals	2020	100	

Distribution of undertaker type		
Undertaker type	Number of LRRs	% of total number of LRRs
Agriculture (Farms and fish farms)	277	13.7
Environment Agency	211	10.4
Industrial	68	3.4
Other Government Agency	44	2.2
Other/unknown	26	1.3
Private landowner	395	19.6
Private utility	22	1.1
Public utility	178	8.8
Registered charity	148	7.3
Water company	651	32.2
Totals	2020	100

* Total number of reservoirs is slightly higher than stated elsewhere due to the later date that this data was collated.

Notes

1 – Reservoirs Act 1975 sections

- 8(1) No construction engineer appointed
- 10(7)(a) No inspection and report
- 10(7)(b) Measures to be taken in the interests of safety not carried into effect
- 12(4) No supervising engineer appointed

2 – Data protection

We have listed those undertakers that are limited companies, local authorities and charities.

The Data Protection Act 1998 does not permit us to publish the names of private individuals, including partnerships and sole traders.

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