

Annexe 6 – Reva Reservoir, DP2022-NE0270016030

A. Summary of the proposal

Yorkshire Water Services Limited (YW) is applying for drought powers under the Water Resources Act 1991 (as amended by Environment Act 1995) to replace the conditions under Yeadon Waterworks Act 1916. The Act authorises abstraction from the Reva Reservoir for public water supply, subject to a compensation release from the reservoir to the Hawksworth Beck Goit.



Figure 1: Reva Reservoir (Compensation Water Source) and Jum Beck and the River Aire (Receiving Watercourses) Note: Although on closer inspection it appears that the discharge location at Jum Beck does not sit on a waterbody, YW have informed us that the compensation is measured in a small chamber. They have provided photographs to support this.

Under the Yeadon Waterworks Act 1916 YW must release not less than 0.791 MI/d (174,000 gallons per day) from Reva Reservoir to compensate the downstream water course, the Hawksworth Beck. YW do not hold a licence for this site.

YW are applying to reduce the compensation release required to 0.396 MI/d. There would be a further reduction to 0.264 MI/d if regional reservoir stocks were below the regional Drought Control Line for four consecutive weeks or more, as defined in the Yorkshire Water Drought Plan.

The Drought Permit has been applied for due to an exceptional shortage of rainfall in the area. The proposed reduction of the compensation release will help to conserve water levels in the Reva Reservoir to maintain public water supply during winter 2022 – 23 and increase the chance of returning to normal reservoir levels by April 2023.

The proposed reduction in compensation release has been requested until 31 March 2023.

B. Details of proposal

Compensation release details	Existing details	Drought permit application changes
Location of discharge	Reva Reservoir	No change
Duration of drought permit	N/A	Up to and including 31 March 2023
Point of discharge	SE 15267 42546	No change
Rate of compensation release	0.791 MI/day	0.396 MI/day <u>If reservoir levels below Drought Control Line:</u> 0.264 MI/day

Drought permit further conditions

See section G for recommendations of the drought permit.

C. Quantities

There are no abstraction quantities associated with this application for a drought permit. Please see sections A and B for details of the existing and proposed compensation release quantities.

D. WFD

This application is outside the Abstraction Licensing Strategy process. This is because it relies on drought powers to address exceptional circumstances. However, the proposal still needs to be Water Framework Directive (WFD) compliant. The proposal will be assessed against the WFD statuses, including identifying the risk of any temporary deterioration of status.

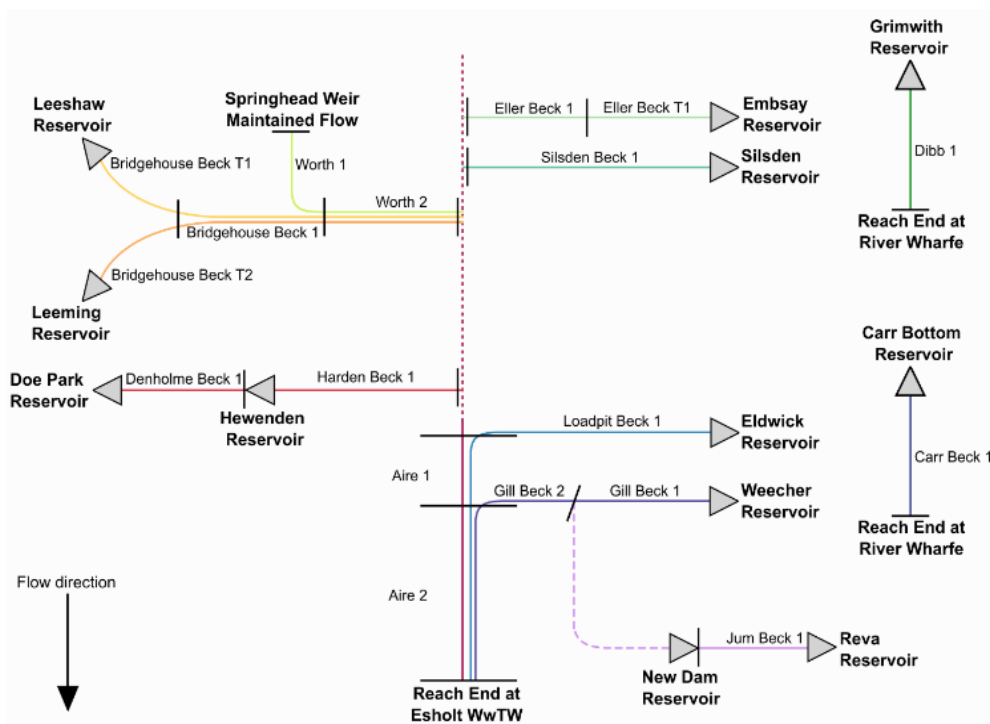


Figure 2: North West Area reservoirs drought permits reach schematic

Reva Reservoir is hydrologically linked to the following reaches (as shown above in Figure 2):

- Jum Beck 1 - Gill Beck (Baildon) from Source to River Aire GB104027062940

The corresponding WFD waterbody has therefore been assessed in relation to the Reva Reservoir drought option.

Gill Beck (Baildon) from Source to River Aire GB104027062940

This reservoir was not directly in a WFD waterbody, so we have used the waterbody supplied by YW in the EAR. The Gill Beck (Baildon) from Source to River Aire (GB104027062940) waterbody is just downstream of the reservoir. This is a heavily modified waterbody. These are water bodies where there is a significant risk of failing to achieve a good ecological status because of modifications to their hydro-morphological characteristics. Therefore, they have a target of achieving Good Ecological Potential (GEP) rather than Good Ecological Status (GES). For heavily modified water bodies, flow is the first element assessed as part of the classification. If flow standards are passed, then potential is based on a combination of mitigation measures and 'non-sensitive' quality elements. For river water bodies, these consist of the physico-chemical, specific pollutants and phytobenthos elements. If flow standards fail, then potential is based on the worst result of either the mitigation measures assessment or any of the quality element assessments.

Consideration	Status		
	Baseline status (2015)	Cycle 2 current status (2019)	Cycle 2 Objective

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	Baseline status (2015)	Cycle 2 current status (2019)	Cycle 2 Objective
Overall WB status	Moderate	Moderate	Good by 2027
Ecological potential	Moderate	Good	Good by 2027
Fish	Moderate (Quite Certain)	Good	Good by 2027
Invertebrates	High	High	Good by 2015
Macrophytes and Phytobenthos combined	High	High	Good by 2015
Phytobenthos	High	High	-
Hydrological regime	No data	Not assessed	Not set
Mitigation measures	Moderate/Less	Good	Good by 2027
Physico-chemical	High	Good	Good by 2015
Chemical	Good	Fail (Uncertain)	Good by 2015

Table 1: Gill Beck (Baildon) from Source to River Aire, GB104027062940 (Heavily modified)

Reasons For Not Achieving Good:

Hydrological regime – The hydrological regime element is not assessed for this surface water body, and therefore classification follows the pathway of flow conditions fail. Certain heavily modified waterbodies are no longer classified for hydrological regime where the hydrological regime test is not sufficient due to the nature of the waterbody. In this instance, ecological potential is based on the worst result of either the mitigation measures assessment or any of the quality elements.

Chemical – The chemical element of this WFD waterbody is currently at Fail. This can be attributed to Mercury and Its compounds and Polybrominated diphenyl ethers (PBDE) where measures have been delivered to address the reason for both. Perfluorooctane sulphonate (PFOS) are also considered to be a cause of the failing chemical status of this waterbody, for reasons that unknown and pending investigation.

WFD objectives assessment:

- The objective for hydrology regime has not been set as the waterbody has not been assessed for flow.
- The objectives of Good by 2027 indicates the long-term ambition for the waterbodies as it is technically feasible to fix the issues, but these were not funded in the Cycle 2 plan. In the Cycle 3 plan these objectives will be revised and if the required fixes are still not funded the deadline could be extended again.

- Where we have a baseline (2015) status of 'Good' then our objective has been set as Good by 2015. This is because the waterbody is already meeting its default objectives, and nothing less than good can be predicted as this would go against the directive.

Risk of deterioration due to drought permits:

Fish – The combined physical environment changes (river flows, river habitat and water quality) as a result of the implementation of the drought option, the risk to the WFD status the fish component of the WFD GB104027062940 Gill Beck (Baildon) from Source to River Aire (associated with Jum Beck 1) is considered to be **moderate**, however, there are uncertainties relating to the fish community within the impacted reach as limited survey data is available.

Invertebrates – The potential changes to river flows is likely to result in major reduction in flow and will lead to a moderate reduction in wetted width and depth which will directly reduce the overall habitat availability within the reach. The macroinvertebrate community shows a good level of diversity, and consequently, loss of habitat may reduce the diversity of the community as a result of habitat loss for certain species. Furthermore, the increased friction between flow and channel bed may reduce flow velocity, as the macroinvertebrate community is sensitive to flow velocity reductions, as indicated by high LIFE scores. This may reduce the suitability of the reaches to species which require high flow velocities. The combined physical environment changes (river flows, river habitat and water quality) as a result of the implementation of the drought option are predicted to present a **moderate** risk to the macroinvertebrate component of the GB104027062940 Gill Beck (Baildon) from Source to River Aire waterbody (associated with Jum Beck 1). The duration of impacts could be up to 6 months. However, the macroinvertebrate community recovery is expected to be relatively quick due to effective re-colonisation strategies in macroinvertebrates. Therefore, the risk to deterioration of the WFD status of the waterbody is considered to be moderate.

Macrophytes & Phytobenthos – This element is screened out of the impact assessment as neither are deemed to be impacted by changes in flow. Wetted width reduction would not result in a deterioration of status due to the way monitoring is carried out. Reduced dilution of phosphate caused by drought option implementation may have an impact if P deterioration is predicted but would be temporary and unlikely to impact on either status. We don't believe this drought option poses any risk to the deterioration of macrophyte or phytobenthos status.

Hydrological Regime – Not assessed.

Mitigation Measures – The drought permit will not exacerbate this particular classification as it will not result in changes to the physical modification structures.

Physico-chemical – There are no sampling locations in Jum Beck 1, as such the next downstream sampling located in Gill Beck 2, Gill Beck (Baildon) At Otley Road Bridge (NE-49400999), has been used as a representative example. There are no significant continuous or intermittent discharges into Jum Beck 1. There is a minor risk to total ammonia and oxygen as a result of this drought option. There is a **medium** risk to phosphates.

Chemical – Since the Chemical element for this waterbody is already at Fail, it cannot deteriorate any further.

Risk of Deterioration: A summary for all Reaches

Although YW EAR identifies that there is a possible moderate or major risk to certain WFD elements as a result of this drought option (Fish, Invertebrates, Physico-chemical, Chemical), we are satisfied that the monitoring and mitigation conditions included within the drought permit mitigates any possible risk of deterioration in the status of WFD elements (Fish, Invertebrates, Physico-chemical, Chemical). If the monitoring schedule identifies any impacts to the WFD elements as a result of this drought permit, then reactive mitigation will be carried out, dependent on the problems identified. Additionally, should any environmental problems be identified, YW will increase their compensation flows as laid out in the relevant permit.

E. Impact on ecology and conservation sites

Conservation sites

The sites, species and habitats listed in the table below are within the 4.8 km reach from the point of the compensation release at Reva Reservoir to the cumulative reach of the River Aire.

The River Aire downstream of that confluence has potential to be cumulatively affected by reservoirs in YW's North West area reservoir group. Please refer to the main determination report for this group of reservoirs for further details.

Nearest conservation sites (distance searched – 4.8 km downstream)			
Designation types	Name of site	Distance downstream	Potential Impact
Special Areas of Conservation (SACs)	None	N/A	N/A
Ramsar sites	None	N/A	N/A
Special Protection Areas (SPAs)	None	N/A	N/A
Sites of Special Scientific Interest (SSSIs)	None	N/A	N/A
Groundwater Dependent Terrestrial Ecosystems (GWDTEs) that are not designated as SSSIs	None	N/A	N/A
National Nature Reserves (NNRs)	None	N/A	N/A
Local Nature Reserves (LNRs)	None	N/A	N/A
Ancient	Hawksworth	2.2 km	Assessed under

Woodland	Spring		Hawksworth Spring LWS - see below.
Scheduled Ancient Monuments (SAMs)	None	N/A	N/A
Local Wildlife Sites (LWSs)	Tong Park and Hawksworth Spring	2.1 km	Assessed in Environmental Assessment Report (EAR) Table B2.80 - Unlikely to be in connectivity with impacted reach as the watercourse associated with the site is not impacted by the drought permit implementation.
National Parks	None	N/A	N/A
Areas of Outstanding Natural Beauty (AONBs)	None	N/A	N/A
Heritage Coast	None	N/A	N/A
Restoring Sustainable Abstraction (RSA) Programmes	None	N/A	N/A
Protected Species	Bullhead *	3.5 km	Impact on these species has been assessed in YW's EAR and appropriate monitoring and mitigation has been included in Appendix A.2.
	Brown/sea trout *	3.5 km	
	White-clawed fresh water crayfish	3.5 km	
Protected Habitats	Deciduous woodland *	0.8 km	Unlikely to be in connectivity with impacted reach or support aquatic receptors.
Invasive Non-native Species	Northern River crangonyctid *	0.4 km	The implementation of this drought option is not anticipated to increase the spread of Invasive non-native species.
	Himalayan balsam *	1.6 km	
	Fringed water lily	2.8 km	

Table 2: Conservation screening results

* There are several records of this feature within the screening distance, but only the closest record to the discharge point has been included in this table.

Protected fish species

There is a pathway for the drought permit to impact on fish species in the identified impacted reach. This has been assessed in YW's EAR and we agree with this assessment and the proposed monitoring and mitigation plan. Mitigation is set out in YW's EAR appendix A.2 and this will be included on the drought permit.

Monitoring and mitigation

YW will be required to carry out the following monitoring and mitigation measures (which will be included in Appendix 1 and 2 of the Drought Permit):

Monitoring:

- IDMON_1: Surveillance walkover surveys of habitat quality and ecological stress, recording signs of environmental problems at one site: Jum Beck between SE 15695 42264 and SE 15238 42446.
- Upon finding any signs of environmental problems the water company shall:
 - i) notify the Agency in writing and by telephone on 0800 80 70 60 and shall provide details of the signs of distress and the location;
 - ii) the water company shall undertake a remedial course of action to address the signs of environmental problems, as directed in writing by the Agency.

Mitigation:

- If, upon being notified of any signs of environmental problems, the Agency gives written notice that there is a disruption to the ecology, the water company shall increase compensation flow from Reva Reservoir to Hawksworth Beck Goit and the River Aire at National Grid Reference SE 15267 42546 to a rate of not less than 791 cubic metres per day, or a lesser quantity if agreed in writing by the Agency.
- The increase in compensation flow to Hawksworth Beck Goit and River Aire shall continue until the Agency serves a subsequent written notice stating that the reduction in compensation flow in accordance with conditions of this drought permit may be resumed.
- The changes to the compensation water specified in the conditions of this drought permit shall be made in a steady and controlled manner at a rate so as not to cause any flooding of land or disturbance to water users downstream or any adverse effects on the quality of water in the inland water or any adverse impacts on the ecology of the inland water or dependent ecosystems.
- If, upon being notified by the Agency, or upon discovering through environmental monitoring, or through other evidence that an increase in compensation flow is needed to support riverine ecology and/or support trout and salmon species, as identified in the Water Company Environmental Monitoring Plan North West Area Appendix, termed IDMIT_9 and IDMIT_17, the Water Company shall increase compensation flow at a time, to a rate and for a duration, as agreed in writing by the Agency, and release from Reva Reservoir to Hawksworth Beck Goit at National Grid Reference SE 15267 42546, or other location as agreed in writing by the Agency.

F. Measurement

The discharge from Reva Reservoir is authorised under the Yeadon Waterworks Act 1916. There will be no change to the way the discharge is measured as part of this drought permit.

G. Recommendations

Based on the conclusions of the main determination report (section 14), the Agency has decided to grant a drought permit under section 79A of the Water Resources Act 1991 subject to conditions, as drafted and attached to this report. The drought

permit will suspend the provisions of the Yeadon Waterworks Act 1916 during any period in which YW can abstract under the conditions of the drought permit.

The drought permit will be time limited to 31 March 2023 and will include the following conditions along with appendices detailing the monitoring and mitigation requirements.

Condition	Source of the condition wording
1.1 (i) Compensation Flow	Compensation flow reduced. Condition has been legally approved.
1.1 (ii) Compensation Flow	Compensation flow when regional reservoir stocks are below the Drought Control Line (as defined in YW Drought Plan 2022) for more than four consecutive weeks. Condition has been legally approved.
The following conditions will be included for environmental monitoring and mitigation. They have all been legally approved.	
2.1	Condition requiring YW to follow the monitoring set out in Appendix 1 of drought permit.
2.2	Mitigation actions to be undertaken by YW if environmental problems identified.
2.2.1 (i)	YW must notify Agency of any environmental problems.
2.2.1 (ii)	YW must formulate remedial course of action to address problems.
2.2.2	YW must increase compensation flow.
2.3	All changes to compensation flow must be made in a steady and controlled manner.
2.4	Freshet flows condition.
3.1	Drought permit only relied upon if Temporary Use Ban restrictions imposed and in force.

Table 3. Recommendations for permit