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Water Framework Directive

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CONTENTS

1. INTRODUCTION	1
1.1 BACKGROUND AND PURPOSE OF REPORT	1
1.2 THE WATER FRAMEWORK DIRECTIVE	1
1.3 WFD AND WRMP	1
2. WFD ASSESSMENT APPROACH	3
2.1 WFD ASSESSMENT OBJECTIVES FOR TESTING COMPLIANCE	3
2.1.1 Option Level WFD Assessment Objectives	3
2.1.2 Plan Level WFD Assessment Objectives	4
2.2 PROPORTIONATE LEVEL OF DETAIL FOR ASSESSMENTS	4
2.2.1 Stage 1 Option level full assessment	5
2.2.2 Stage 2: Programme level assessment	8
2.2.3 Stage 3: Assessment of the Preferred WRMP	8
3. WFD ASSESSMENT REPORTING	9

1. INTRODUCTION

1.1 BACKGROUND AND PURPOSE OF REPORT

Like all water companies in England and Wales, Cambridge Water is required ^[1] to prepare, maintain and publish a Water Resource Management Plan (WRMP). A WRMP sets out the strategy for water resource and demand management to ensure supplies of safe, clean drinking water are maintained to customers throughout the relevant company's region in a way that is economically, socially, and environmentally sustainable. WRMPs are reviewed on a rolling five-year basis; Cambridge Water published their most recent WRMP (WRMP19) in December 2019. The next cycle of WRMPs (WRMP24) cover the period 2025 to 2050 and beyond. Cambridge Water is now reviewing and updating their draft WRMP24 for consultation in autumn 2022.

Cambridge Water forms part of the Water Resources East (WRE)¹ regional group and is one of five regional water resources groups in England and Wales working under the National Framework for Water Resources (the 'National Framework')². Each regional group brings together the water companies operating in that region with key water users, stakeholders and environmental regulators including the Environment Agency. This enables greater co-ordination and alignment of water resources planning for WRMP and regional plan development. The other water companies that form WRE alongside Cambridge Water are Affinity Water, Anglian Water, Essex & Suffolk Water and Severn Trent Water.

In addition, Cambridge Water are merged with South Staffs Water. South Staffs Water are one of five water companies³ that make up the Water Resource West (WRW) regional group. As such, there is also the requirement for the Cambridge Water WRMP to align with that of South Staffs Water and the WRW regional plan.

This report draws on the Water Resource Planning Guideline (WRPG) produced by the regulatory bodies⁴ (Ofwat, The Environment Agency and Natural Resources Wales) along with guidance from UK Water Industry Research (UKWIR, 2021)⁵ on the application of the WFD to WRMPs.

This report will be issued to the Environment Agency as part of the enhanced pre-consultation process, with the aim of achieving agreement on the WFD Assessment Objectives to test compliance against and the assessment approach to be used.

1.2 THE WATER FRAMEWORK DIRECTIVE

The Water Framework Directive⁶ is an EU Directive establishing a framework for Community action in the field of water policy which aims to protect and improve the water environment. The Directive was brought into UK law in 2003 and subsequently revoked by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 in England and Wales. From this point forward "WFD" refers to the legislation applicable to England and Wales, not the EU Directive.

1.3 WFD AND WRMP

As part of the WRMP, water companies must demonstrate that they have considered a range of environmental legislation, including the WFD regulations. The requirements for a WFD assessment of a water company WRMP are outlined in the 2021 WRPG (**Box 1**).

¹ <https://wre.org.uk/>

² <https://www.gov.uk/government/publications/meeting-our-future-water-needs-a-national-framework-for-water-resources>

³ Along with Severn Trent Water, United Utilities Water, Dŵr Cymru Welsh Water and Hafren Dyfrdwy

⁴ Ofwat, NRW & EA (2021), Water Resources Planning Guideline – Updated 17 March 2021

⁵ Andrews R, Ashmole R, Fredenham E, Mant JM, Pitcher C, Sanders J, Twigg W, Wade TI and Westbrook M (2021) Environmental Assessments for Water Resources Planning. UK Water Industry Research Ltd Report 21/WR/02/15.

⁶ European Union (2000) Directive 2000/60/EC of the European Parliament and of the Council

Box 1: WRP 2021**Section 8.2.2. Assessing environmental constraints****“A. River Basin Management Plan and Water Framework Directive**

River Basin Management Plan (RBMP) and the Water Framework Directive environmental objectives are a constraint on your options. You should screen out any options that have unacceptable environmental impacts that cannot be overcome.

You should ensure that there is no risk of deterioration from a potential new abstraction or from increased abstraction at an existing source before you consider it as a feasible option. Alternatively, if investigations are yet to be completed, you should set out what your alternative options would be should those investigations demonstrate that there will be an unacceptable environmental impact.

You should also assess new supply options against the RBMP measures and objectives for each water body and meet your obligations to avoid future deterioration. You should ensure that your feasible options do not compromise the achievement of RBMP objectives.

You should talk to the Environment Agency or Natural Resources Wales about any intended actions that may:

- *cause deterioration of status (or potential)*
- *prevent the achievement of the water body status objectives in the river basin management plans*
- *prevent the achievement of water body status (or potential) for new modifications*

You should do this as soon as possible before developing your plan. You should make a clear statement in your plan about any potential impacts.”

The WRP 2021 refers to ensuring ‘no deterioration’ of water body status. A European Court of Justice (ECJ) ruling⁷ clarified that ‘no deterioration’ means a deterioration between a whole ‘status class’ (e.g. ‘good’, ‘moderate’, etc.) of one or more of the relevant ‘quality elements’ (e.g. biological, physico-chemical, etc.). This definition applies equally to Artificial Water Bodies and Heavily Modified Water Bodies in respect of the relevant quality elements that relate to the defined uses of these water bodies. The ECJ ruling further states that if the quality element concerned is already in the lowest class, any deterioration of that element constitutes a deterioration of the status. References to ‘no deterioration’ in this WFD methodology align to this ECJ ruling.

⁷ ECJ Case C-461/13: Bund für Umwelt und Naturschutz Deutschland v Bundesrepublik Deutschland
<http://curia.europa.eu/juris/document/document.jsf?docid=178918&mode=req&pageIndex=1&dir=&occ=first&part=1&text=&doclang=EN&cid=175124> [accessed 17.2.22]

2. WFD ASSESSMENT APPROACH

The purpose of this methodology report is to set out the approach to be used when assessing the WFD compliance of Cambridge Water's WRMP24. **Section 2.1** identifies the WFD Assessment Objectives to be used throughout the WRMP process. **Section 2.2** describes the proportionate level of detail for the assessments.

All assessments will be undertaken for the reporting unit of a WFD water body. The appropriate baseline information for water bodies status and targets is as set out using 2021 WFD status as published in the third cycle of RBMPs (RBMP3). It is worth noting that the 3rd cycle of RBMP3 is expected to be published later in 2022, however, it is our current understanding⁸ that the RBMP3 status, when published, will match the 2019 interim status as currently published. In the absence of the RBMP3 water body status, assessments will be undertaken against the RBMP2 status.

2.1 WFD ASSESSMENT OBJECTIVES FOR TESTING COMPLIANCE

This section provides the WFD Assessment Objectives to be used as a test of constraint when testing WFD compliance at an individual potential option level (**Section 2.1.1**) as set out in WRPG (2021)⁹. This section also provides the additional, progressive WFD Assessment Objectives to be assessed at a plan level once selected options have been collated into programmes for the WRMP (**Section 2.1.2**).

2.1.1 Option Level WFD Assessment Objectives

Principally, the WFD acts as an indicator of constraint and determines where the WRMP or options within do not meet WFD Objectives set out in Regulation 13 of the WFD Regulations. In line with WRPG (2021) and UKWIR (2021) guidance the principle WFD Assessment Objectives the WRMP will be tested against are as follows:

1. To prevent deterioration¹⁰ of any WFD element of any water body - in line with Regulation 13(2)a and 13(5)a¹¹.
2. To prevent the introduction of impediments to the attainment of 'Good' WFD status or potential for any water body, in line with Regulation 13(2)b and 13(5)c¹².
3. To ensure that the planned programme of water body measures in RBMP2 to protect and enhance the status of water bodies are not compromised.

Though not expected, if there is the possibility that a water resource option could influence priority hazardous substance or priority substances in a water body, additional WFD Assessment Objectives may be agreed with the regulator in line with Regulation 13(3) and 13(5)d.

If an option is assessed to definitively not comply with the WFD Assessment Objectives set out above, then the option is reported as WFD non-compliant and removed from the WRMP process. This will only apply to options for which a clear and obvious conclusion around non-compliance can be reached, and for which no mitigation to provide compliance is possible.

⁸ As identified to Ricardo by Environment Agency NAU lead for Severn to Thames Transfer SRO (Alison Williams) at WFD assessment approach meeting, 13 December 2021

⁹ Specifically set out in WRPG 2021 (updated 17 March 2021) at Section 8.2.2

¹⁰ As defined in Section 1.3

¹¹ The no deterioration baseline for each water body and element is the status reported in the RBMP. At present this is RBMP 3. Discussion with EA and through review of EA internal guidance^{#1} identified that the EA consider 'When making management decisions, any 'interim' classification results are also relevant [in addition to the published RBMP status] to making sure any deterioration in status is taken into account and to meet the objective of aiming to achieve good status in water bodies.'

^{#1} EA (2021) Supporting implementation of river basin management plans position. LIT 14339. 01/2021

¹² WRPG (2021) states that this a test to identify any options that 'prevent the achievement of the water body status objectives in the river basin management plan'. At present this is RBMP2. Discussion with EA and through review of EA internal guidance^{#1} identified that the EA consider 'less stringent objectives are not permanent and the assessment of any new activity or project must take into account the need to continue to aim for good status. The new activity or project must not jeopardise the achievement of good status in the future, irrespective of whether a less stringent objective was set in RBMP2'.

^{#1} EA (2021) Supporting implementation of river basin management plans position. LIT 14339. 01/2021

If an option is assessed to potentially not comply with the WFD Assessment Objectives set out above, then the option is reported as potentially WFD non-compliant. If an option is reported as potentially WFD non-compliant it may be appropriate to consider the option further where it is considered that additional evidence to improve confidence in the assessment and/or enhanced design could mitigate the potentially WFD non-compliant issues. It is at the discretion of the water companies as to whether a potentially WFD non-compliant option continues to progress through the WRMP process; however, if a potentially WFD non-compliant option is progressed it will be discussed and agreed by the water company with the relevant regulatory body.

2.1.2 Plan Level WFD Assessment Objectives

The WFD Assessment Objectives in **Section 2.1.1** are the fundamental WFD Assessment Objectives that will be tested against at both the option level and plan level.

There are a number of further WFD Assessment Objectives, set out in the WRPG, which will be tested against at a plan level. These further tests will only apply to a Plan containing options which pass WFD Assessment Objectives 1-3. These are considered as progressive WFD Assessment Objectives rather than tests of constraint and do not lead to WFD non-compliance if not achieved. These are as follows:

4. To assist the attainment of the WFD Objectives for the water body – in line with Regulation 13(2)b and 13(2)c
5. To assist the attainment of the objectives for associated WFD protected areas – in line with Regulation 13(6)
6. To reduce the treatment needed to produce drinking water and look to work in partnership with others; promoting the requirements of Article 7 of the WFD¹³.

A negative answer to the WFD Assessment Objectives above does not determine that the plan has WFD constraints; however, they can be used in decision making.

Where WFD Assessment Objectives 1, 2 and/or 3 are not met by a programme or plan then, unless there is no reasonable alternative, that plan should not be progressed as the preferred plan without discussion with the relevant regulatory body. Discussion with the regulatory body will include:

- If a plan is reported as potentially WFD non-compliant it may be appropriate to consider an adaptive plan where it is considered that additional evidence to improve confidence in assessment and enhanced design could mitigate the potentially WFD non-compliant issues.
- Where a plan is assessed as WFD non-compliant, in circumstances where there is an over-riding public interest or the benefits of achieving the WFD Assessment Objectives are outweighed by benefits to human health, human safety or sustainable development there is scope to apply for a Regulation 19 exemption as to why these WFD Assessment Objectives are not achieved.

2.2 PROPORTIONATE LEVEL OF DETAIL FOR ASSESSMENTS

Throughout the WRMP process WFD compliance will be tested at relevant stages parallel to the wider WRMP programme. The approach Cambridge Water will take to testing WFD compliance for their options and consequent programmes of options is as follows:

1. Option level full assessment – As set out in **Section 2.2.2**, this is a full assessment that covers the Constrained List of options.
2. Programme level assessment – As set out in **Section 2.2.3**, the cumulative effects of the options that make up any Programmes will be assessed.
3. Preferred WRMP programme assessment – As set out in **Section 2.2.4**, the preferred WRMP programme for the water company/ water resource zone must then be assessed for impacts with other water companies WRMPs, and regional WRMPs.

In order to ensure the WFD assessment is proportionate for each stage an outline of the assessment for each stage is provided in this section.

¹³ Specifically set out in WRPG 2021 (updated 17 March 2021) at Section 9.4.5

2.2.1 Stage 1 Option level full assessment

Stage 1 is where there is scope for the most detailed assessments. As advocated in the UKWIR (2021) guidance, each option will go through a process to determine if it is compliant with the three principle WFD Assessment Objectives (as set out in **Section 2.1**). For proportionality of option assessment there are 4 steps with each step becoming increasingly detailed. Where there is sufficient confidence in an assessment's conclusions the option will not progress onto the next step. The four steps are as follows:

- Step 1 Screening based on activities - to either exclude options from further assessment where it could be reasonably expected that the option would not have an influence on any WFD status elements or supporting elements, or identify which activities require progressing to Steps 2 or 3 assessment and in which water bodies (**Section 2.2.1.1**).
- Step 2 Screening based on magnitude of hydrogeological/hydrological impact and water body context - to either exclude options from assessment where they are negligible or low impact, or identify which activities require progressing to Step 3 assessment and in which water bodies (**Section 2.2.1.2**).
- Step 3 Impact assessment – either using existing assessments or an expert judgement approach based on source-pathway-receptor to establish likelihood of compliance with agreed WFD Assessment Objectives in all relevant water bodies. A confidence rating will be given to all assessments to reflect the amount of uncertainty in the design, environmental baseline and magnitude of impact (**Section 2.2.1.3**).
- Step 4 Detailed impact assessment - specific to the option using measured baseline data, including additional bespoke collected evidence, and detail on design and operating pattern. This level of detail would be by exception (**Section 2.2.1.4**).

Further detail on how these steps will be assessed is set out below for the option level assessment.

2.2.1.1 Step 1: Screening based on activities

All options in the Constrained List will be subject to this step. If an option is screened as WFD compliant at this stage it will be accompanied by a robust explanation as to why this assessment can be made without the need to progress the option to Step 2. Instances where there is considered no risk to WFD compliance are identified as:

- Demand management activities;
- Supply options which have passed a sustainability assessment¹⁴ at an abstraction rate up to the proposed option rate;
- Network constraint (i.e. improving infrastructure to achieve greater deployable output) options that do not result in additional abstraction (in comparison to recent abstraction rates), or where that additional abstraction has been identified as sustainable¹⁵; provided the construction does not affect WFD protected areas or increase the risk of the transfer of INNS.

Where an option is concluded as not compliant with the WFD Assessment Objectives after Step 1 screening, the option is progressed to Step 2 screening.

2.2.1.2 Step 2: Screening based on magnitude of hydrogeological/hydrological impact and waterbody context

Step 2 screening will identify the water body name, ID and type of any water bodies that could potentially be impacted. The potential impacts will be determined by the type of option. The UKWIR (2021) guidance identifies a range of option types and their potential impacts (**Table 2-1**).

¹⁴ e.g. Surface water options WRGIS Band 1, 2 and 3 pass at fully licensed; groundwater options passing WFD groundwater tests; WINEP investigation are identified as sustainable by EA (UKWIR, 2021).

¹⁵ *ibid*

Table 2-1 Potential effects to screen in to WFD assessment by option type

Option type	Impact type to test
New groundwater abstraction, increase in license rate	<ul style="list-style-type: none"> • Change in groundwater quantity • Impact on groundwater dependent terrestrial ecosystems • Impact on connected surface waters (flow change effects on ecology and water quality dilution) • Likelihood of saline ingress into aquifer
Aquifer recharge/ aquifer storage and recovery	<ul style="list-style-type: none"> • Effects specific to source water used for recharge
Reservoir	<ul style="list-style-type: none"> • Impact on connected surface waters (flow change effects on ecology and water quality dilution)
Run-of-river abstraction	<ul style="list-style-type: none"> • Flow change effects on ecology and water quality dilution
River regulation	<ul style="list-style-type: none"> • Flow change effects on ecology and water quality dilution in regulated reach
Reuse	<ul style="list-style-type: none"> • Flow and water quality change effects on ecology and chemical status in receiving watercourse • Flow and water quality change effects on ecology and chemical status in water course previously receiving discharge
Desalination	<ul style="list-style-type: none"> • Hydrodynamic changes on ecology in abstracted water body, including through pathways of salinity and sedimentation pattern change
Inter-basin transfer	<ul style="list-style-type: none"> • Flow change effects on ecology and water quality dilution in donor watercourse • Direct ecological effects from introduction of invasive non-native species • Flow and water quality change effects on ecology and chemical status in receiving watercourse

For any options that are sourced from groundwater a hydrogeologist will determine any local surface water bodies that are hydraulically connected. The impact on both the groundwater water body and the surface water bodies will be assessed. Similarly, any links between lake water bodies and river water bodies will be taken into consideration when assessing options that impact lake water bodies.

Impacts are not confined to the water body where the option is located as the impacts of an option can traverse multiple water bodies. In these instances, assessments will be conducted against each water body in the flow pathway until no WFD compliance risk is identified.

In England & Wales, hydrology is a supporting element to WFD status and is not a status element that contributes directly to WFD ecological status. Regulators' hydrogeological/hydrological assessment tools and their outputs can provide suitable information from which to assess the magnitude of effect. Hydrogeological/hydrological appraisal tasks to be undertaken are:

- Review the regulatory position¹⁶ on water available for abstraction in an aquifer, reach or catchment, based on modelling tools. The available quantity can be compared with the increase in abstraction associated with an option. These assessments often include an indication of water availability under different flow conditions which adds specificity to potential operational considerations such as hands-off flow conditions.
- Review the regulatory position on WFD hydrology, including the pass forward flow from rivers to transitional waters¹⁷.

¹⁶ Environment Agency Abstraction Licensing Strategy datasets:
<https://data.gov.uk/dataset/b1f5c467-ed41-4e8f-89d7-f79a76645fd6/water-resource-availability-and-abstraction-reliability-cycle-2> (April 2021)
<https://data.gov.uk/dataset/54181453-b5bd-4694-96b2-a1b5d40985b5/groundwater-management-units-coloured-according-to-water-resource-availability-colours> (September 2020)

¹⁷ In England this is reported by the EA through the RNAG assessment (Reasons for Not Achieving Good status/potential)

- Review the regulatory position on the extent of influence of flow on status elements failing their targets, including biological status elements, physico-chemical status elements, hydro-morphology and groundwater quantitative status¹⁸.
- For surface waters, review the likely changed river flow regime against measured river flows from nearby gauging stations long-term records held on the National River Flow Archive¹⁹ to inform the magnitude of change in flow.

Where the hydrogeological/hydrological appraisal identifies operational activities that are considered with confidence to be low impact these will be concluded as WFD compliant, subject to review of local WFD protected areas.

2.2.1.3 Step 3: Impact assessment

Where a WFD assessment is not identified as WFD compliant through the screening processes of Step 1 and Step 2 the option will be subject to impact assessment.

For each option the construction and operational activities which have been screened in to Step 3 impact assessment will be identified. A source-pathway-receptor approach to identifying effects on WFD Assessment Objectives will be undertaken. Using that approach, the source of change would be the construction or operational activity. The pathway would include physical environment changes such as water level change, flow velocity change, morphological change. The receptor would be the WFD status element or the WFD protected area.

For a proportionate assessment, WFD status elements will be screened for those at risk of change from water resource plan options. These will be used as the basis of the assessment for deterioration and target impediment WFD Assessment Objectives, with other elements included on a case-by-case basis. Where the pathway of option impact is physical environment changes only (e.g. not to water quality), the sensitive biological status elements (to flow and morphology) are as follows:

- River water bodies: macrophytes, invertebrates, fish
- Lake water bodies: macrophytes
- Transitional water bodies: fish, benthic invertebrate (extent), sea grass (extent)
- Coastal water bodies: benthic invertebrate (extent), sea grass (extent).

Further pathways will depend on local conditions and local environmental quality pressures such as changes in dilution of point or diffuse pollution pressures; changes in fish passability at structures losing and gaining river reaches in a groundwater connected system (particularly in chalk streams). Under these circumstances the assessment will also consider WFD compliance impacts to physico-chemical water quality, particularly sanitary and nutrient quality which are the main supporting water quality elements to ecological quality, as well as the associated biological status elements to nutrient and water quality pressures. In exceptional circumstances, where there are known discharges of specific pollutants or substances regulated through WFD chemical status, the dilution change of these will be included in the assessment.

Water quality changes are often associated with river flow reductions as a result of the change of dilution of water quality pressures. Existing known pressures are listed by the Environment Agency's Reasons for Not Achieving Good (RNAG) datasets and these will be reviewed for their level of influence.

Expert judgement by a hydroecologist, working with any other appropriate disciplines required, is considered to be the most appropriate Step 3 impact assessment, utilising a level of confidence indicator.

For groundwater bodies, a hydrogeologist is required to advise on the outcome of the four quantitative tests and the relevant linked surface water bodies, as well as any of the qualitative tests screened into the assessment. This advice should be from existing reports or modelling (including regulators regional groundwater models) where readily available or, failing that, expert judgement (noting that no additional modelling will be conducted at this step).

¹⁸ *ibid*

¹⁹ <https://nrfa.ceh.ac.uk/data/search>

A confidence rating will be assigned to all assessments to reflect the amount of uncertainty in the option design, environmental baseline and magnitude of impact. The confidence level categories to be used are presented in **Table 2.2**.

Table 2.2 WFD compliance assessment confidence level categories

Confidence category	Description
Low	Known WFD compliance risks/ failures and potential pathways from option's activities - where assessment based on expert judgement alone
Medium	Reasonable levels of evidence for at risk activities. Some assumptions and expert opinion required around risk areas.
High	Good level of evidence with minimal assumptions or low risk activity

2.2.1.4 Step 4: Detailed impact assessment

If there remains low confidence as to whether an option is compliant with the WFD Assessment Objectives and the option is included in the preferred or alternative plan, it will require a more detailed impact assessment (this may include bespoke regulator groundwater modelling). This will require discussion with the environmental regulators at an early stage as the option may pose a risk to the plan. A bespoke method for this assessment methodology will be produced on an ad-hoc basis for a Step 4 detailed impact assessment.

2.2.2 Stage 2: Programme level assessment

In order to support programme development, the potential for cumulative effects of different combinations of constrained options will be highlighted. A programme level assessment of WFD compliance requires a list of the options included in the programme, their construction start date and implementation date (to define overlaps in the construction period). The option level assessment will already have been set out per water body and this will be assimilated into a list or map of all WFD water bodies assessed for the individual options. Where more than one option was assessed for the same water body then a cumulative assessment should be undertaken of the multiple options, against the agreed set of WFD Assessment Objectives using the methodologies for the option level assessment. This may require revision of the high level hydrological and/or hydrogeological assessment which underpins the testing of the WFD Assessment Objectives. It is noted that this programme level assessment may identify further linked water bodies for assessment – either downstream surface water bodies, or additional surface water bodies linked to groundwater bodies.

An overall WFD compliance statement for each programme will be prepared setting out compliance with each of the agreed WFD Assessment Objectives and the level of confidence in the assessment.

The results from this level of WFD assessment will inform the preferred water resource plan.

2.2.3 Stage 3: Assessment of the Preferred WRMP

Once a 'best value plan' for each WRZ is selected, these plans then require assessment for cumulative impacts for the whole WRMP, regional WRMPs and with WRMPs for other water companies. This will follow a similar process identified in **Section 2.2.2**.

A compliance statement of the preferred programme will be presented. This should set out compliance with each of the agreed WFD Assessment Objectives and the level of confidence in the assessment.

3. WFD ASSESSMENT REPORTING

A stand-alone WFD compliance assessment report will be prepared for consultation at the same time as the draft WRMP. That document will be for review by the environmental regulator and is not necessarily a wider stakeholder document. An updated document will accompany the Final WRMP that will reflect any changes to options, programmes, or more current information on other company water resources plans.



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