Cyfoeth Naturiol Cymru
Natural Resources Wales

Water Company Drought Plan Technical Guideline

August 2017

Contents

Section 1 Introduction

Water undertakers in England and Wales are required to prepare and maintain drought plans under Sections 39B and 39C of the Water Industry Act 1991, as amended by the Water Act 2003. The Water Industry Act 1991 defines a drought plan as 'a plan for how the water undertaker will continue, during a period of drought, to discharge its duties to supply adequate quantities of wholesome water, with as little recourse as reasonably possible to drought orders or drought permits'.

A drought plan sets out how you will supply water to your customers during periods of low rainfall when water supply becomes depleted, whilst minimising any negative impacts of your actions during a drought. It should set out the short-term operational steps you will take before, during and after a drought.

We have produced this technical guideline for you (a water company wholly or mainly in Wales) to follow when preparing a drought plan. It has been produced to help you show how you intend to manage a drought. It is designed to help you write a plan that complies with all the relevant statutory requirements and Welsh Government policy. If you decide to take a different approach to those in this guideline you should clearly demonstrate how you are still fulfilling your obligations. We are fully supportive of new approaches but will need time to understand different methods. It is vital that you engage with Natural Resources Wales as early as possible to avoid unnecessary delays later in the process.

The Welsh Government's guiding principles for developing drought plans have been published separately to this guideline and sets out the drought plan statutory process and policy expectations. You should refer to the guiding principles in-conjunction with this guideline when preparing your drought plan. We have consulted with the Welsh Government, the Environment Agency, Natural England and water undertakers wholly or mainly in Wales on this guideline.

If you are a water company wholly or mainly in England, you will need to follow Defra and the Environment Agency's water company drought plan guidance when developing your plan. However, where your drought management actions (e.g. drought permits or orders) affect Wales, you will need to use this guideline in relation to our expectations for your environmental assessments, environmental monitoring plans, SEA and HRA for these sites. This will aid any discussions with ourselves on your supply-side actions in Wales. In addition, you will have to consider your obligations in relation to the Environment (Wales) Act 2016 and Well-being of Future Generations (Wales) Act 2015 for these sites.

1.1 The role of Natural Resources Wales

We have a duty for long-term water resources planning and are a statutory consultee in the development and review of water company drought plans within Wales. We review and advise the Welsh Government on draft drought plans. We aim to be a good practice regulator and are required to follow the principles of better regulation. This means that we take a risk based and efficient approach to water company drought planning. During a drought, we regulate the water companies to ensure that they follow their drought plans to ensure water supplies are protected for both people and the environment.

Section 2 – What to include in your drought plan

This section provides an overview of what to include in your plan and Section 3 onwards contains further technical detail.

2.1 Content of your drought plan

You must follow any statutory directions you receive from the Welsh Ministers about the content of your drought plan. We expect your drought plan to set out:

- your chosen drought triggers[1] and what they do, eg. establish that a drought is occurring
- how you have tested your plan against different drought scenarios to prove your chosen triggers are appropriate to a range of droughts
- How you will be able to provide supplies through a repeat of historic droughts in your company records. We strongly encourage you to plan for challenging but plausible droughts beyond the capabilities of your supply system (with relevant links to your water resources management plan).
- what you will do during a drought, eg. what drought management actions you will take to reduce demand and/or maintain supplies (including any drought permits and orders you may apply for)
- the details of any permits and approvals that you may need in order to implement these actions
- an overview of the discussions that have occurred between Natural Resources Wales and the bodies responsible for granting those permissions
- the arrangements for discussions with these bodies during a drought
- how you will monitor the effects of the drought and potential impacts from the actions taken under the plan
- the measures that may be needed to mitigate for and to minimise any adverse effects on the environment resulting from the implementation of your actions
- any permits and approvals that you may need to carry out these activities
- the compensation that may need to be made as a result of implementing your actions
- what is your management structure and how you will communicate with your customers and others about the drought management actions
- what you will do when the drought is over, including how you will review what you have done

You do not need to say what you would do during a civil emergency as this is covered by your emergency plan but you should set out the range of actions that you will use up to this point.

We also expect you to complete an environmental assessment for each supply-side drought management action which sets out any potential consequences of these actions on the environment. An environmental monitoring plan is also needed which

[1] In relation to bulk supply agreement(s) with another water company, you may choose to use drought triggers defined by the bulk supplier(s). You will still need to set out the drought triggers used and the actions associated with them within your drought plan.

sets out the monitoring you have used or will use to inform your understanding of the environment that may be affected by your plan. You should discuss your approaches for developing your environmental assessments and environmental monitoring plans with Natural Resources Wales and/or the Environment Agency, if affects England. This will aid any discussions with ourselves on our expectations for your supply-side actions.

We expect the supporting information for the environmental assessment (including the environmental monitoring plans) to be submitted to Natural Resources Wales and/or the Environment Agency, if applicable. If your supply-side action affects a designated site in England, the relevant supporting information should also be shared with Natural England. We recommend that you submit this information in advance of the draft plan submission to the relevant regulator(s), given the nature and size of these documents to review.

You should provide in your plan a summary of any 'likely' environmental impacts of your actions, mitigation or compensation measures (including any permissions or approvals required) alongside the monitoring requirements. The supporting information should either be:

- included in the appendices of your plan or;
- referenced in the main plan, with contact details provided for where these documents can be made available upon request to any interested parties (such as environmental groups).

The Welsh Government expects you to carry out a Strategic Environmental Assessment (SEA) and Habitats Regulations Assessment (HRA) of your plan. These could also incorporate any additional requirements under the Environment (Wales) Act 2016 and Wellbeing of Future Generations Act 2015 (where appropriate). We recommend that you use the conclusions from your environmental assessments to inform both your SEA and HRA, as appropriate.

2.2 What else you should consider

Your drought plan should include maps showing:

- the water company area, water resource zones (WRZs) and any drought management areas you use
- the location of all potential drought permit and drought order sites
- important sites that your actions may affect, eg designated and non-designated sites of conservation importance

Your drought plan should include details of:

- any agreed data exchange arrangements you have made with Natural Resources Wales and/or the Environment Agency (as relevant)
- any agreements with other water companies and organisations about bulk supplies, transfers or division of shared resources
- any drought management arrangements with Water Supply & Sewerage Licensees (WSSLs) and how they have helped inform your plan

- any consultations you have carried out with other organisations (including water companies) and a statement of how you have taken these into account

You must consider whether any information is commercially confidential or a risk to national security before including it in you plan. If it does, you will need to submit a statement to the Welsh Ministers.

2.3 Check your plan is consistent with other plans

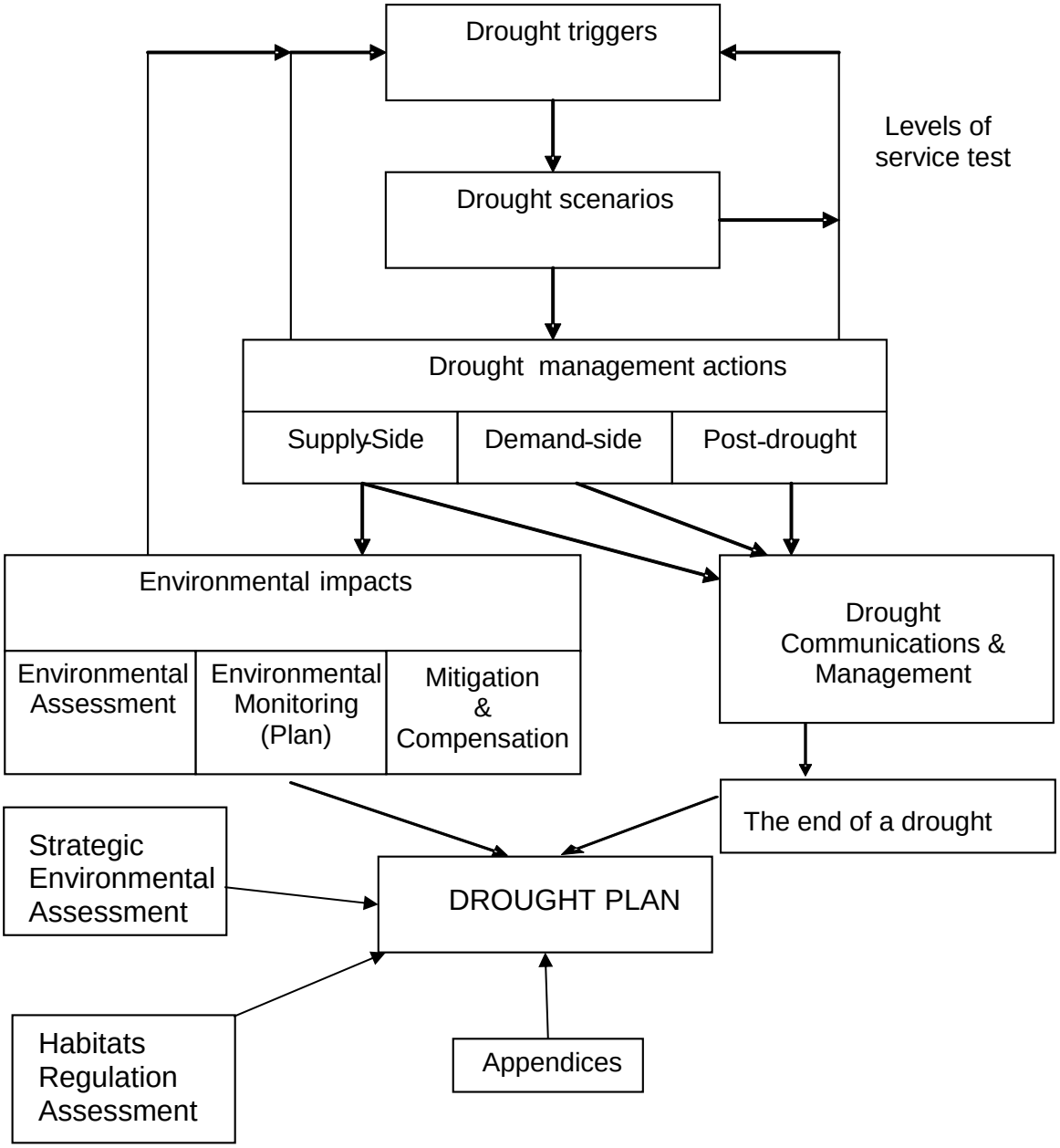
Your drought plan may have links with other plans. You should consider and explain how your drought plan links to:

- your water resources management plan (WRMP)
- your business and emergency plans
- drought plans by Natural Resources Wales and/or the Environment Agency (as relevant)
- other water company drought plans (as relevant)
- river basin management plans

2.4 Structure and format of a drought plan

Figure 1 below sets out the components of a drought plan and the links that exist between them. You can determine the precise structure and layout of your plan, however we recommend you follow Figure 1 below and the drought plan structure presented in Appendix C.

Figure 1 Components of your drought plan



Section 3 – Drought triggers and scenarios

This section sets out how you should:

- develop drought triggers
- how to select and assess an appropriate range of drought scenarios
- how to test triggers against scenarios and
- how these triggers should link to drought management actions.

3.1 Drought triggers

Drought triggers help you to identify when you need to take action, such as to reduce demand or obtain extra resources, at all stages during a drought, from its onset to its end. Your drought plan should include your chosen drought triggers and the actions connected with each one.

You can develop your drought triggers at different levels;

- at the water company level
- at a WRZ level
- for groups of resource zones
- for drought management areas

You should provide clear justification for your choice of levels for drought triggers. If you choose to manage a drought differently in separate WRZs or drought management areas, the drought plan should include maps showing the geographical area in which the different triggers apply.

You should explain why you have chosen your drought triggers within your drought plan. There are several methods that you can use to develop your drought triggers:

- Historic rainfall records can be used to demonstrate an exceptional shortage of rain (refer to Appendix H) and identify triggers to initiate drought actions. Triggers can be set by comparing the historic rainfall record for the area of interest to the long term average rainfall record, or the cumulative rainfall total for a specified time period.

- Reservoir levels can be developed into trigger curves to identify reservoir storage below which specific drought actions should be implemented. This type of trigger can be developed using water resource system modelling techniques, and/or from historic reservoir drawdown records, previous drought experience and expert knowledge of the water company system response.

- Measured flows at relevant river gauging stations can be used to develop drought triggers for direct river abstractions.

- Groundwater levels from established observation boreholes, or from pumped borehole sources, can be used to develop drought triggers for groundwater resources. Triggers can be set based on groundwater level data from known

historical drought periods and, where available, data from test pumping of sources, or from suitable groundwater models.

- You may identify other relevant parameters, such as peak demand, or use a combination of triggers to aid your decision making during a drought.

Where necessary control curve and 'decision' diagrams, showing your chosen triggers and details of action to be taken, should be provided in your plan and/or an Appendix. Control curves display your level of operation (eg level 1 might be normal operations whilst level 4 might enact all supply side drought management actions). An example of a control curve diagram is presented in Appendix D and is for illustrative purposes only.

You might consider using multiple trigger lines or similar to illustrate the time period required between the starting point of an action, for example, the start of an application or consultation process and the implementation of the action. This would be particularly appropriate for drought management actions that utilise temporary restrictions and drought permits and orders. Control curves more commonly are linked to reservoir storage. We recognise that alternative control curves can also be used to determine actions, such as 'Hands Off' flows and groundwater levels.

Your drought triggers should allow for an appropriate lead-time to prepare for and carry out the actions associated with each trigger, eg applying for a drought permit or drought order or introducing water restrictions. Your plan should provide a clear description of the drought actions associated with each trigger level. Section 4 provides further guidance on the type of action(s) that should be associated with each trigger.

You should also demonstrate that your drought triggers are consistent with your WRMP including levels of service.

3.2 Drought scenarios

Each drought is different in terms of severity, location and hence impact. You should at least plan to be able to provide supplies through a repeat of historic droughts in your company records. However, we encourage you to plan for drought events that are of longer duration and lower rainfall than those in the historic record, or if you choose not to, you should explain why.

We recommend you follow the processes set out in the UKWIR publication Risk Based Planning Methodology (16/WR/02/11) to develop more challenging but plausible drought scenarios. You should have used this methodology when producing your WRMP to define a 'risk composition' for each of your WRZs. The stated risk composition is the underlying way in which risk and uncertainty have been accounted for within the WRMP, and specifically how they dictate the Level of Service and drought resilience that is offered to customers.

Therefore, your WRMP should have communicated the drought supply/demand risks for your WRZs using two statements:

1. The Level of Service Statement, which describes the frequency at which you expect to have to impose interventions such as Temporary Use Bans.

2. The Drought Resilience Statement, which describes the severity of drought that you expect to be able to manage without having to resort to measures such as Emergency Drought Orders to restrict supplies (eg standpipes).

You should use the statements and drought scenarios identified within your WRMP to inform your drought scenario testing of your drought plan.

3.2.1 Test your drought triggers and proposed actions

You should use a drought scenario assessment to test your chosen drought triggers are appropriate to a range of droughts. Your tests should:

- identify how well your drought triggers would work in different drought scenarios
- assess what the effects of past droughts would be and what actions you should take if they occurred today under current water resource infrastructure, demands and operational assumptions
- assess what the effects of more challenging but plausible drought scenarios would be and what actions you should take

Different drought durations should be assessed, including:

- short-term, one-season droughts (typically 6 to 12 months)
- medium-term, multi-seasonal droughts (1 to 2 years, typically consisting of two dry summers and an intervening dry winter)
- long-term droughts, typically lasting over 2 years.

If your scenarios selected differ from the typical durations specified above, the assumptions made to determine them should be presented in your plan to increase understanding of the scenario assessment.

You should explain what relevant data and methods you have used to derive the conditions for each of your scenario tests. This should include historic data (eg worst drought on record) and any data you may have had to produce through statistical simulation or collect indirectly (eg from similar catchments). Your drought plan should:

- describe the timeline leading up to your scenarios: what combination of drought triggers initiated the drought and when they were each triggered
- provide details of the scenario used (eg rainfall deficit-duration)
- justify why you chose these scenarios, explaining why they were appropriate for a particular area
- show how you have used the tests to develop drought triggers
- you should revise your drought scenario tests every time you review your drought plan to make sure the most up-to date data are included

Section 4 – Drought management actions

After setting drought triggers and testing them against the selected scenarios, you should clearly and concisely set out everything that you plan to do during a drought. Your drought plan should:

- demonstrate how your drought management actions link to drought triggers
- explain what actions you would take for each scenario
- confirm that these actions are consistent with your WRMP

One or more drought triggers should be proposed for each of the actions identified. We recommend that you use a clear referencing system in your plan to help customers and partners understand how each trigger links to the action(s).

For each action, you should provide information on:

- the trigger(s) and/or details of preceding actions to show the relative priority of an option (likelihood of use/drought scenario trigger)
- the expected demand reduction or increase to supply in mega litres per day
- where relevant, percentage reduction on peak week demand
- which WRZ or area the action will affect and apply to
- the time it will take to implement the action
- the duration that the action is expected to be in place
- the period or time of year during which the action would be effective
- details of any permits and approvals required in order to implement the action; including a summary of the liaison that has occurred with the bodies responsible for granting the permissions
- an assessment of the risks associated with the implementation of an action, for example, environmental impacts, uncertainties associated with timing, quantity, quality, or cost

Your drought plan should also consider;

- how these actions affect the sustainable management of natural resources, under the Environment (Wales) Act particularly in relation to your biodiversity and resilience of ecosystems duty and the Section 7 Biodiversity lists and duty
- how these contribute towards the Well-being Goals, under the Well-being of Future Generations Act

Drought management actions should be implemented in an appropriate order of priority in terms of ease of implementation, impacts on the environment and amount of additional water gained from each action. You are expected to increase your promotion of water efficiency ahead of implementing any other actions.

A graph/diagram (or series) presenting further information that demonstrates the links between triggers, scenarios and actions could be used to help improve the understanding of a drought plan for customers and partners. We recommend producing an annotated graph, including trigger lines where appropriate, showing the effects on water availability from actions and/or scenarios from selected drought

events in the context of control curves. An example of what this graph could look like can be found in Appendix E.

4.1 Other water company considerations

Where other water companies are operating in your supply area, you should consider any drought management arrangements you will have with them within your drought plan.

Companies with WSSLs can supply water to large non-domestic customers using your public water networks if they are operating in your area. WSSLs are not required to prepare their own plans. However, they must under terms of their special licence conditions provide you with any relevant information you request to inform your plans. You should take account of how you will work with WSSLs in order for them to comply with any drought management actions you may implement.

If you are a small water undertaker whom has been granted a licence by applying for a new appointment or variations, you are required to produce a drought plan. You should take account of donor/neighbouring companies' data, information and drought management actions when preparing your plan. Therefore, you should work with neighbouring companies whilst preparing your drought plans. Any differences in planned actions should be clearly presented and explained in the plan.

For more information about other water companies, refer to Ofwat's website: http://www.ofwat.gov.uk/regulated-companies/licences/

4.2 Demand-side drought management actions

You should demonstrate how you have implemented appropriate demand-side drought management actions, before you apply for any drought permits or orders. Actions with minimal anticipated savings such as implementing specific water use restrictions in winter will not necessarily be expected. Therefore, your drought plan must set out what you will do to reduce demand for water during a drought.

Actions to reduce demand could include:

- promote extra water efficiency with businesses and industry
- encourage voluntary reduction of non-essential water use
- carry out initiatives to improve household water efficiency, beyond those already in place during normal circumstances
- mains pressure reduction
- increased active leakage control
- temporary water use restrictions
- non-essential use restrictions

Many demand-side actions will be most appropriate at the water company level. Usually you will not be expected to reduce demand in areas smaller than WRZs. However, if you decide that demand-side actions should be implemented at sub zonal level, you should provide justification under what circumstances these would arise in your plan.

You should summarise what you will do to reduce demand, and at what scale, using the form in Appendix F. Additional information to illustrate the demand-side actions presented in the completed form should be set out in the main body of your plan.

Effective communication and engagement with customers and consumer interest groups are key to the success of many demand-side actions and encourages positive behavioural changes of water users. You should also set out how and where demand-side management actions fit within a communications plan; for further details refer to Section 7.1.

4.2.1 Temporary water use restrictions

Your plan must explain how you will temporarily restrict water use during a drought. When considering how to implement temporary restrictions, you should consider and include details within your drought plan on:

- what temporary restrictions (different categories of use) you plan to carry out including the priority order in which they will be carried out
- how you will comply with the Water Use (Temporary Bans) Order 2010
- potential exceptions
- how you will balance expected water savings against adverse impacts on customers and businesses – whether direct or indirect
- how you will manage in-drought consultation
- how much time you will set aside for comment during the consultation period before using a restriction and how you will deal with an unexpectedly large response
- how you will tell customers, neighbouring companies and interests groups about the introduction, phasing in and subsequent lifting of temporary restrictions and how you will keep this information up to date
- how you will prove to customers, partners and the government that you have acted in a proportionate and reasonable way

Before you can apply temporary restrictions, you should provide the opportunity for comments to be made by customers and interested groups. We expect you to allow an appropriate amount of time for comments to be received and considered prior to implementing any restrictions, and you should allow for this in your plan (eg lead-in times). This should be proportionate to the scale of the proposed implementation and the customer base likely to be affected by the restrictions.

Using an appropriate method to deliver communications will ensure customers are able to make comments and may decrease the consultation period. Contact information should also be kept up to date so that it is correct and available without delay. This information should be presented in your communication plan.

Information specific to the proposed restriction during a drought is still required to be prepared, regardless of the information presented in your plan. You must publish a notice of the proposed restricted use(s) in at least two newspapers circulating in the area, and on your company's website. This notice must give details of how and by

when to make comments about the proposed restriction or prohibition. You should provide an example of this notice within your plan.

We recommend that you record your decision making process and actions during consultation and implementation of temporary restrictions. This will provide an audit trail where any challenges to your actions or decisions could be made.

For further information, you should consult Water UK and UK Water Industry Research (UKWIR) report Code of Practice and Guidance on Water Use Restrictions (14/WR/33/6) when considering how to temporarily restrict water use.

4.2.2 Estimate water savings you can make

You should provide an estimate of the expected water savings from your demand-side drought management actions in your plan. You should specify where your information comes from and highlight any uncertainties you have about your estimates.

These estimates help show how you have determined the priority, order, timing and combination of actions you will take in a drought. The plan should clearly set out the assumptions made to derive these figures. They are also required to inform control curves, estimate the impact of these actions upon sources and to aid decision making during a drought.

It can often be difficult to estimate water savings for demand-side actions, particularly for educational and promotional activities. Experience from previous droughts and known savings from other programmes should be used to improve the accuracy of your estimates. Further sources of evidence for water savings could include neighbouring water company experience.

You can use these UKWIR publications to help you reduce demand and understand the water savings you could make:

- Estimating the Water Savings for Baseline Water Efficiency Activities (09/WR/25/4)
- Drought and Demand: Modelling the Impact of Restrictions on Demand During Drought (07/WR/02/3)
- Drought and demand: potential for improving the management of future drought (07/WR/02/2)
- Understanding the impacts of drought restrictions (14/WR/01/13)

In addition, the Environment Agency has published a drought demand modelling study (2014) which should also be used to understand the impact of demand drought measures and how to carry out rigorous analysis and modelling of the impacts.

4.3 Supply-side drought management actions

Supply-side drought management actions are used to maintain or increase water supply during a drought. For example you could:

- re-commission unused sources of water that you still have licences for
- transfer water in bulk from other water companies or other WRZs
- use of alternative sources, eg satellite boreholes that you have licences for
- lower pumps or deepen boreholes, where test pumping or reassessment of yield characteristics demonstrates it is worthwhile
- carry out engineering work, eg water treatment works enhancements and/or distribution network improvements
- use other options – either temporary or permanent engineering works and/or tankering by lorries
- use of drought permits and orders
- reschedule planned works to avoid outage

In addition to the information highlighted at beginning of section 5, for each of your supply-side actions, you should:

- Estimate how much each of your actions will contribute to maintaining water supply and provide supporting information for how you arrived at this estimate. This could include evidence of test pumping, pilot schemes and previous operational data, and where appropriate using deployable output methodologies identified in our water resources planning guideline.
- Ensure that where the action chosen by you affects other companies that each of your drought plans are consistent. This is particularly important where you share sources and/or are contracted to bulk transfers.
- set out the limits to the amount of water you can transfer from other companies
- ensure that, if the implementation of any action results in infrastructure improvements that permanently increase deployable output in 'non-drought' year operation, then this is fed back into your WRMP 'deployable output yield assessment'
- complete an environmental assessment showing the likely effects of the action on the environment
- explain how you will monitor potential environmental impacts (set these out in your environmental monitoring plan)
- include how you will provide mitigation and/or compensate for any adverse effects
- include any permissions or approvals required

A summary of each supply-side action should be presented using the form in Appendix G. Additional information to illustrate the supply-side actions presented in the form should be set out in the main body of your plan.
Section 5 presents further information on environmental assessment, monitoring and mitigation, including the supporting information reporting requirements for your drought plan.

4.3.1 Drought permits and drought orders

Your drought plan must include details of all the possible drought permits and orders you might apply for under the range of droughts that you have planned for. The presence of a permit or order in your plan and the supporting information you include

in your published plan will form part of the justification of need when you come to formally apply for it.

Drought permits and orders allow you to increase water supplies during a drought. Drought orders can also be used to restrict use of water (non-essential use bans). They are not for managing resources during a natural disaster such as flooding or other emergencies (eg mismanagement or other infrastructure damaging events).

You can apply for a drought permit or order when there has been an exceptional shortage of rain (ESOR) resulting in a serious deficiency in water supplies. It is your responsibility to demonstrate this as part of any drought permit or order application you might make. Further advice on how you might demonstrate ESOR has been provided in Appendix H.

Before you apply for a drought permit or order we expect details of what you are doing and what you plan to do to reduce demand for water.

Further information on the procedure, timescales for applying and what information to include with an application is available in joint guidance published by Welsh Government, Natural Resources Wales, Defra and the Environment Agency in2015. The pdf documents of this guidance are available here:

- Before you apply for a drought permit, drought order or emergency drought order
- Apply for a drought permit
- Apply for a drought order or emergency drought order

As a result of section 79 of the Water Resources Act 1991 as amended by section 64 of the Water Act 2003, Natural Resources Wales or the Environment Agency will recover from you all reasonable and significant costs incurred in the exercise of our functions that are attributable to applications and issuing of any drought permits or orders.

4.3.1.1 Being drought permit or order application ready?

We expect the information you include in your drought plan to be ‘as close’ to application ready as possible, especially for those sites that have been identified as

- potentially causing moderate to major environmental impact, especially those drought permits and orders that have been identified as ‘Likely Significant Effect’ under Habitats Directive or as potentially causing ‘deterioration’ under Water Framework Directive.

  and/or

- have a higher likelihood of use in a drought (eg drought permits and orders that have been identified as being required under the most ‘likely’ drought scenarios)

Being drought permit or order application ready will:

- reduce time to prepare and determine an application in a drought by having all the necessary information available beforehand
- reduce uncertainty in your plan, eg you are already aware of any issues or objections relating to the application
- help prioritise drought actions as you will understand environmental sensitivity, probability of use and the likely impacts

The guidance on apply for a drought permit/order provides what to include in your application. The main information you should prepare in advance of an application is as follows:

- **Your case for 'exceptional shortage of rain':** you may not be able to produce your exact case in advance but you can prepare how the case will be made (eg which rain gauges and methodologies will be used and what rainfall patterns could cause the drought permit/order to be required).
- **Justification for the order of use:** you should explain why some permits or orders are likely to be applied for above others (eg those with the least significant impacts on the environment).
- **An environmental assessment and to carry out any monitoring:** you should carry out baseline environmental monitoring (where existing data is insufficient) and an environmental assessment in advance of a drought to inform the environmental report required as part of an application. Refer to Section 5 for more information.
- **Any further assessments that may be required:** some of the sites may require more than just a standard environmental assessment, for example, a 'full' Appropriate Assessment for a Habitats Directive site). Based on best available information, these assessments should be completed to inform the application process and to meet any legislative requirements, such as HRA.
- **A plan for any unsuccessful applications:** you should be prepared for any possibility of objections and a public hearing/inquiry if an application is less than straightforward. You should consider the impacts and risks your drought permits or orders (if granted) may have on other stakeholders (eg other licence holders, water companies, navigation authorities, the environment and other water users) and discuss these with them in advance of an application. Where applications are not straightforward (eg significant objections or issues) you should consider what you would do to maintain supply in the event of an unsuccessful application.

We accept that some of the work will need to be done at the time of application, such as, the full justification of need case and setting out what actions your company has taken to reduce demand and increase supply in an actual situation).

You should estimate the amount of time you will need to complete this work at the time of application and factor this into your drought triggers and scenario projections. You will also need to provide a plan or programme to show how you will do the necessary work.

We recommend you engage with Natural Resources Wales and/or the Environment Agency early to discuss our expectations on being application ready. For more details on expected ‘levels of effort and reporting’ is available in Section 5.4.

Section 5 – Environmental assessment, monitoring and mitigation

This section sets out how you should:

- assess and mitigate the impacts of your supply-side drought management actions on the environment
- monitor and measure these impacts
- consult relevant bodies where potential environmental impacts have been identified

We expect your drought plan to include:

- an ‘alone’ and ‘in-combination’ environmental assessment of the impacts that each of your actions may have on the environment
- an environmental monitoring plan
- details of any mitigation or compensation measures you will carry out to lessen the impacts of your actions on the environment

You must include an assessment of the impacts that each of your supply-side drought management actions will have on Water Framework Directive (WFD) status or potential and consider the effects your actions might have on environmental objectives and measures set out in River Basin Management Plans (RBMPs). Further details of the WFD legislation requirements have been provided in Appendix I.

Contact Natural Resources Wales and/or the Environment Agency if you are unsure about the WFD assessment required for your plan or need more information on the objectives or measures set out in the RBMPs.

Where a supply-side action may affect a SAC, SPA, NNR, Ramsar site or SSSI you must also consult Natural Resources Wales or Natural England to ascertain likely effects on the designated site and to agree monitoring arrangements. Any actions identified within National Park Authority boundaries should also be discussed with the relevant National Parks authorities.

In addition, you must show how you will meet the requirements of:

- Habitats Directive
- Fisheries legislation: Salmon and Freshwater Fisheries Act 1975 and the Eel (England and Wales) Regulations 2009
- Legislation covering invasive non-native species (INNS)
- Other non-statutory requirements (local wildlife sites, etc.)
- Protected areas designated under international agreements, including Ramsar sites
- Protected areas designated under national legislation (eg SSSIs) - Wildlife and Countryside Act 1981 & Countryside and Rights of Way Act 2000

- Environment (Wales) Act 2016 –Section 6 Biodiversity and Resilience of Ecosystem Duty and Section 7 Biodiversity list and duty to take steps to maintain and enhance biodiversity.

You should also refer to Appendix I for further details on the relevant legislation requirements.

In addition, the Welsh Government expects you to undertake a SEA and HRA of your drought plan. We expect you to use the conclusions from your environmental assessments to inform both your SEA and HRA, as appropriate. Further guidance on the SEA and HRA processes can be found in Section 6.

5.1 Environmental assessment

For each supply-side drought management action, you must include an environmental assessment of the impacts that your planned actions will have on the environment. Your environmental assessment should:

- establish the baseline
- identify the likely changes in hydrology, hydrogeology and geomorphology, due to implementing the action
- identify the features that are sensitive to these changes
- identify the likely impacts on sensitive features
- include any additional evidence/data requirements
- identify any mitigation or compensation measures required to lessen the impact of your actions on these features
- identify any impacts your actions may have on other existing water users

Where your actions could have a combined effect on the environment you should consider their impacts together (eg a group of licences in a particular habitat or designated site). You should also consider the in-combination impacts of your actions with the existing pressures on the watercourse (eg actions of a neighbouring water company).

5.1.1 Carry out an environmental assessment

We recommend that you use the Handbook for scoping projects: environmental assessment and the Guidelines for the ecological impact assessment in the UK & Ireland to carry out your assessment. You should also refer to Appendix I for further details on environmental assessment process.

5.1.1.1 Establish the baseline

You should identify the baseline conditions which are those existing in the absence of your proposed drought action. The environmental assessment determines how the conditions will change in relation to this baseline to facilitate a clear understanding of the impacts of your action.

The conditions that define the baseline need to be carefully considered. This is because you are required to identify the likely baseline conditions at some point in

the future, based on data collected in the past. Therefore, when establishing your baseline, this should be based on the best available information and methods.

Evidence/data used to establish baseline conditions can be obtained from a range of sources, including:

- historical data, desk study and field surveys
- expert judgement relating to the specific habitat type
- evidence from similar sites nearby, which may include evidence from other water company sites.

All proposed surveys to support establishing the baseline should be determined on a site-specific basis. In designing your baseline surveys, spatial and temporal limits need to be established for obtaining the necessary evidence/data and a clear rationale provided. Variation in populations, habitats or ecosystems over time in the absence of your action should always be considered. The spatial and temporal extent of the baseline should also be informed by the potential for cumulative effects.

Standard survey methods should be used to ensure that the data collected are robust and results can be easily interpreted and compared with those from other investigations. If survey methods vary from accepted good practice this should be explained and justified, and reliability of the results discussed within your plan.

Your approach to establishing the baseline should be agreed after discussion between Natural Resources Wales and/or the Environment Agency, and if relevant Natural England. In addition, consult with other relevant stakeholders.

Once you have established the baseline, the environmental assessment process involve three stages:

Stage 1 Hydrological, hydrogeological and geomorphological impact
Stage 2 Environmental sensitivity assessment
Stage 3 Identifying any additional evidence/data requirements

5.1.1.2 Assess hydrological, hydrogeological and geomorphological impact

For each supply-side drought management action we expect you to demonstrate that you understand the impacts your actions may have on the hydrology, hydrogeology and geomorphology of every river reach, wetland or lake area that they influence.

You should:

- identify the drought conditions (eg drought scenario) which trigger your proposed action
- identify any changes that your actions are likely to bring about, specifying their length, severity and location in relation to existing natural and artificial features (eg flow, water level, channel dynamics and sediment changes)
- describe the likely conditions in the absence of your proposed action
- describe how the likely conditions would differ with the action in place compared to the same (or analogous) watercourse under natural conditions

- identify the extent of the area affected by your planned actions

5.1.1.3 Environmental sensitivity assessment

You must assess the sensitivity of the habitats and species that are present in each reach or area affected by your actions. You should consider:

- their sensitivity to any hydrological, hydrogeological and geomorphological changes your actions are likely to cause - eg habitat loss due to level change or degradation of the habitat due to changes in sediment processes
- the extent to which your actions will affect the current WFD status for water bodies - refer to the current UK Technical Guidance Group method statements to ensure you're using the correct assessment methods and tools
- that you have regard to the Section 7 Biodiversity lists[2] of species and habitats under Environment (Wales) Act
- the risk of your action spreading or introducing invasive non-native species
- if your actions will affect any measures proposed in RBMPs
- the sensitivity of designated sites to your actions
- potential for cumulative effects (eg when combined with any other existing or proposed action, process or feature in that reach or area)

In determining the importance of a feature, you should demonstrate how you will comply with statutory requirements and policy objectives for biodiversity. European, national and local governments and specialist organisations have identified a large number of sites, habitats and species that provide the key focus for biodiversity conservation in the UK, supported by policy and legislation.

You should discuss the affected site(s)/area(s) with Natural Resources Wales and/or the Environment Agency, and if relevant, Natural England contacts.

5.1.1.4 Identifying any additional evidence/data requirements

The outcome of stage 1 and 2 will be an assessment of the site and its sensitivity to the changes introduced as a result of implementation of the action.

In some cases, there will not be sufficient information or data to complete the environmental assessment. The first two stages should identify any gaps in understanding and what data is required to fill these gaps. If any additional evidence/data is required, it is your responsibility to collect this, although you may choose to fund a third party to carry out this data collection. You will need to identify any evidence/data requirements in your environmental monitoring plan.

Your additional surveys should be tailored to the individual characteristics of each reach/area and will be informed by the knowledge and assessment of environmental sensitivity. You should consider the extent of hydrological, hydrogeological and geomorphological influence downstream of the proposed action. This will determine the extent of your survey reach/area.

[2] Until Section 7 list is published, refer to the Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006

As a minimum requirement for sensitive features, data should be presented from at least one drought period and two ‘average’ years. You also need to consider including control sites where a moderate to major impacts to the environment is likely.

Natural Resources Wales and/or the Environment Agency can discuss with you and provide advice as needed on the locations and frequency of additional surveys and which environmental parameters may be required to be surveyed.

If a drought occurs and supply-side drought management actions need to be implemented before additional data has been gathered to support the environmental assessment, we accept that the assessment can only be based on the best available information at the time. We will take this into account as the monitoring frequency and timings set out within your environmental monitoring plan has been adhered to.

You should refer to Appendix J for more information on environmental monitoring.

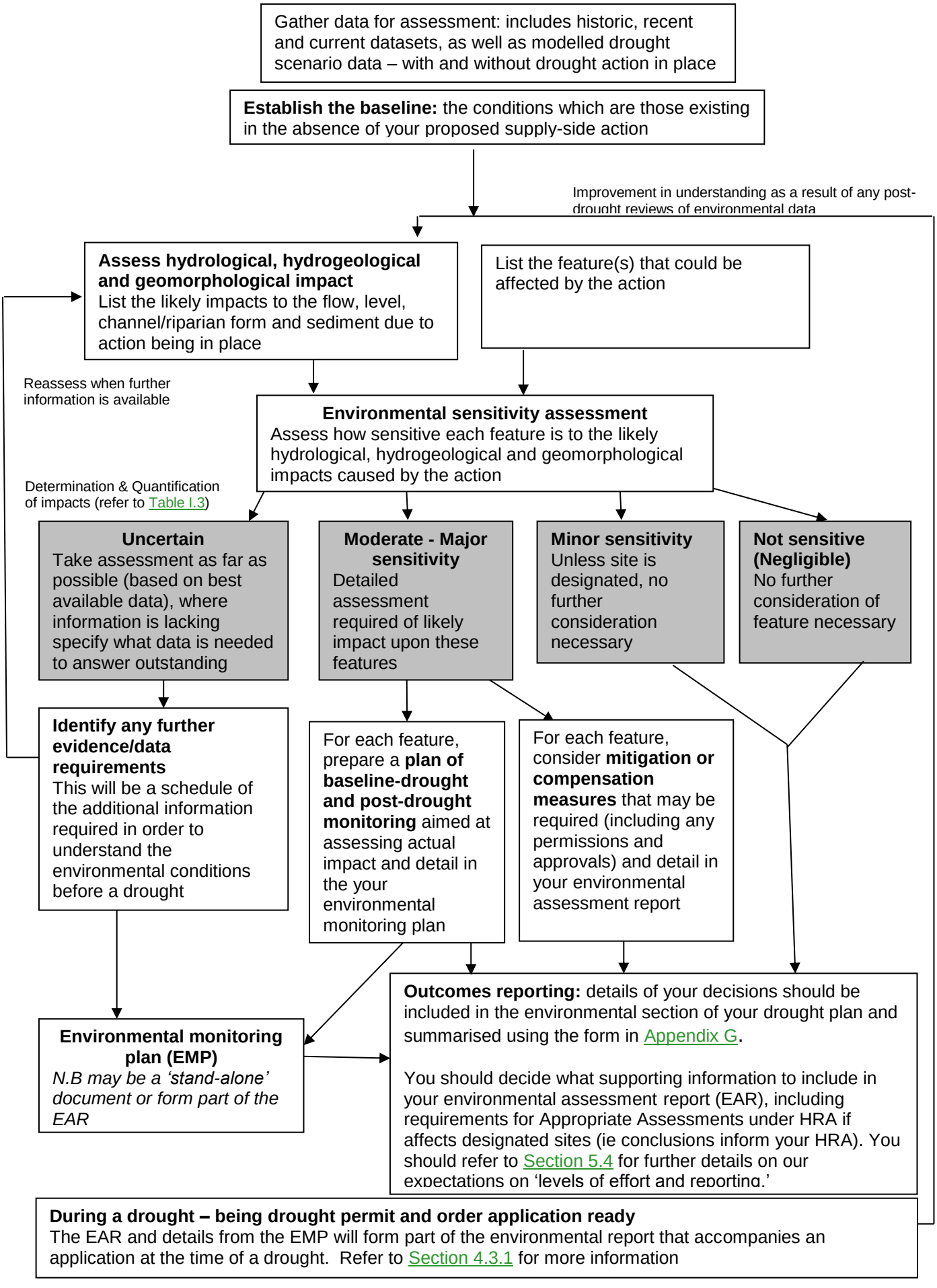
5.1.2 Assessment of the environmental impacts

Figure 2 shows the suggested activities that you will need to complete to assess the environmental impacts of your supply-side actions. We recommend that you follow a generic environmental impacts assessment (EIA) framework to identify and characterise the ‘likely’ impacts on sensitive features. You will need to determine:

- the magnitude of the impact (effect) over the lifetime of the proposals (including the impact during and following decommissioning of any associated structures and/or ceasing the operation)
- the sensitivity of the environmental feature
- the probability that the interaction will occur (likelihood)
- the determination and qualification of the level of impact
- the level of certainty of all of the above

Appendix I.1.2 contains further guidance on the assessment of the environmental impacts of your actions.

Figure 2 Environmental impact activities flow chart



5.2 Environmental monitoring

You are responsible for understanding the effects of a drought and your drought management actions on the environment. You should ensure that adequate arrangements for environmental monitoring are detailed in your environmental monitoring plan.

In general, the level of monitoring required should be risk-based. Not all sites will require in-drought and post-drought monitoring. Where you can clearly show through your environmental assessment that an action has a negligible to minor impact to the environment (due to the type of action, or the lack of sensitive features) it is likely that no further monitoring is required.

You must carry out further environmental monitoring if:

- you do not have enough evidence/data to carry out an environmental assessment
- your actions present a moderate to major impact to protected habitats, species or designated sites and there is not enough monitoring in place to assess it
- your environmental assessment has highlighted that the drought management action presents a risk of spreading or introducing INNS

Effective monitoring is essential to understanding the spread of INNS in relation to specific actions, and to enable the rapid response and eradication in the event of INNS being spread or introduced. Such monitoring, and subsequent control if necessary, is required to comply with legislation relating to INNS.

5.2.1 Environmental monitoring plan

Your environmental monitoring plan sets out all the monitoring you will need to do for each of your supply-side drought actions (if applicable). It should set out:

- how you will use new monitoring data to fill gaps in your understanding of:
    - the environmental sensitivity of a site and the damage your actions may cause
    - the normal (baseline) conditions at a site
    - the recovery of the environment after drought
- how you will assess the impacts of your actions during and after a drought
- how you will use the data to review and refine your drought triggers and mitigation measures (if relevant)

Your environmental monitoring plan should also include:

- the feature(s) to be monitored and the methods used
- the location of survey sites
- the timing and frequency of monitoring and
- who will undertake the monitoring

When designing your monitoring requirements, it is your responsibility to collect any data required, although you may choose to fund a third party to carry out this data collection. You can use data from sites that are subject to ongoing monitoring by Natural Resources Wales and/or the Environment Agency for other purposes, such as, WFD. However, there is no guarantee of the long-term availability of these datasets. When you update your environmental monitoring plan, you should check the availability of their data that you may want to use. Any changes to monitoring programmes, should be altered in your environmental monitoring plan accordingly.

You should also consider other potential sources of historic monitoring data such as county wildlife trusts, biological records centres and managers of relevant areas (eg designated sites).

You should discuss your environmental monitoring plan as early as possible with Natural Resources Wales and/or the Environment Agency, and if relevant Natural England. We will advise you on:

- availability of our historic monitoring data and ongoing monitoring programmes
- our understanding of the hydrology, hydrogeology, geomorphology, habitats and species at sites likely to be affected by your actions
- information on WFD status and programme of measures
- environmental sensitivity of sites and areas
- the design of your environmental monitoring plan

After you publish your drought plan you should contact Natural Resources Wales and/or the Environment Agency, and if relevant Natural England, to understand if there are any changes that might affect your plan. If you plan to use monitoring data from the regulators, you should update your environmental monitoring plan annually to reflect annual changes to our sampling programmes.

Further details on environmental monitoring can be found in Appendix J.

5.3 Mitigation or compensation measures

It may be possible to mitigate or reduce adverse effects that your actions have on the environment. In some cases, this may provide betterment for the environment. You must provide details in your drought plan of any measures required to:

- minimise the environmental impact of your actions
- mitigate the impacts and assess the effectiveness of mitigation where it is not possible to protect the environment sufficiently
- where legally required, compensate for the impacts where it’s not possible to minimise or mitigate for them

Therefore, your drought plan must identify:

- pre-drought mitigation measures (these are measures you will implement before or whilst the drought is developing)

- in-drought mitigation measures (these are measures you will implement during a drought)
- post-drought mitigation measures (these are measures you will implement following a drought)

We accept that mitigation measures taken during a drought will be tailored to the specific drought conditions exhibited, therefore the level of detail given on mitigation measures within your drought plan will depend upon current understanding of the sites' likely response as well as experience from any measures taken in previous droughts.

In some cases, mitigation may be necessary to prevent a reduction of flows available to other abstractors. You should consider how you intend to avoid impacts on other abstractors and provide details in the plan.

Your drought plan should also provide evidence that the mitigation measures you are proposing will be effective for the features that could be at risk from your drought management actions. It should show how you will monitor this.

Where, even with mitigation and compensation measures implemented, it is not possible to comply with the WFD, you should clearly demonstrate that the criteria set out in Article 4.6 to 4.9 is met. Refer to Box 2 in Appendix I for more information on these requirements.

You should discuss your proposed mitigation or compensation measures with Natural Resources Wales and/or the Environment Agency, and any other affected parties. Your drought plan should also include details of any additional permits or approvals you need to carry out these activities.

5.4 Expected levels of effort and reporting

You must ensure that your drought plan meets the requirements of the Drought Plan Regulations 2005, and the Drought Plan Direction and any further directions given by the Government.

To achieve this, we expect a summary of any 'likely' environmental impacts of each of your supply-side actions, mitigation or compensation measures (including any permissions or approvals required) alongside the monitoring requirements presented in your plan using the form in Appendix G.

For each of your supply-side actions, the supporting information is commonly presented within an environmental assessment report. We expect your environmental assessment report to include as a **'minimum'** the information presented in Appendix I.1.3.

The supporting information should either be:

- included in the appendices of your plan or;
- referenced in the main plan, with contact details provided for where these documents can made available upon request to any interested parties (such as environmental groups).

Your environmental monitoring plan may be a stand-alone document within your drought plan or form part of your environmental assessment report.

We expect the supporting information for the environmental assessment (including the environmental monitoring plan) to be submitted to Natural Resources Wales and/or the Environment Agency. If your supply-side action affects a designated site in England, the relevant supporting information should also be shared with Natural England. We recommend that you submit this information in advance of the draft plan submission to the relevant regulator(s), given the nature and size of these documents to review.

The level of effort (resources) used to complete each environmental assessment, including your environmental monitoring plan, should be relative to the overall impacts and likelihood of use of your proposed action. As a company you should be able to provide justification for why you have decided on a particular level of effort (resource) appropriate for each of your environmental assessments, particularly if you have opted for a 'minimal' assessment. This is illustrated by Table I1.4 in Appendix I. Note that this table should be used to determine your levels of effort and reporting.

Your assessment of the likelihood of use can be linked to drought triggers and scenarios. If there are operational constraints that affect your likelihood of use, this should be taken into account in your justification.

Section 6 Strategic Environmental Assessment and Habitats Regulations Assessment

The Welsh Government expects you to carry out a SEA and HRA of your drought plan. This section describes the SEA process and outlines the HRA requirements of your plan. Information that is applicable to both processes should be identified to minimise overlap and repetition of effort and information.

We expect you to use the conclusions from the environmental assessment for each supply-side drought management action to inform both the SEA and HRA, as appropriate.

For further guidance on SEA and HRA (and how these link with your environmental assessments) refer to UKWIR guidance for water resources management plans and drought plans.

6.1 Strategic Environmental Assessment

The SEA Directive (2001/42/EC) requires a formal environmental assessment of certain categories of plans and programmes which are likely to have significant effects on the environment. The Welsh Government has transposed the Directive into appropriate Regulations: The Environmental Assessment of Plans and Programmes (Wales) Regulations 2004.

Useful documents for download on SEA are as follows:

- A Practical Guide to the Strategic Environmental Assessment Directive
- Strategic Environmental Assessment in Wales
- Consultation Bodies in Wales- Services and Standards for Responsible Authorities

6.1.1 SEA stages

The stages in the SEA process are:

- screening to determine if SEA required
- setting the context and objectives, establishing the baseline and deciding the scope (and consulting on it);
- developing and refining alternatives and assessing effects;
- preparing the SEA environmental report [3];
- consulting on the draft plan or programme and the environmental report;
- monitoring the significant impacts of implementing the plans or programmes on the environment

All ‘stages’ of SEA are likely to be required where your environmental assessment carried out previously and HRA indicates that the implementation of your drought

[3] Note that the environmental report in this context is for the SEA and is separate to the report required for a drought permit or order application.

management actions in your plan are likely to result in significant impacts on the environment.

6.1.2 SEA consultation

You must consult with Natural Resources Wales and Cadw on the areas of SEA that affects Wales and the Environment Agency and Natural England where it affects England. We recommend that you consult us and the other statutory bodies at the following stages of the SEA process:

Screening stage: Our role at this stage is to advise you on whether your plan is likely to have a significant impacts on the environment.

Scoping stage: At this stage in the SEA process we expect you to consult us on your understanding of the baseline conditions; other relevant plans, policies and programmes relevant to your plan; preferred option for delivery and realistic alternatives; and your proposed method for assessing the impacts from your plan.

Environmental report (SEA): The environmental report should be published for consultation in parallel with the period of public consultation of the draft drought plan. This should set out the significant environmental impacts, and identify measures to mitigate any significant adverse impacts, and enhance any positive impacts. We would also expect you to demonstrate how previous advice submitted by us during the scoping stage has been considered.

For further information with regard to the consultation requirement of SEA, the Directive prescribes what bodies should be consulted, the process of public consultation, where required, and various practical aspects of consultation.

6.2 Habitats Regulations Assessment

You must ensure that your drought plan meets the requirements of the Conservation of Habitats and Species Regulations 2010, and must undertake a HRA on the effects of your plan on European sites, alone or in combination with other plans or projects (eg the effects of drought management actions on European sites).

HRA refers to the assessment of the likely or potential effects of a plan or project on one or more European Sites, namely designated Special Areas of Conservation (SACs) and Special Protected Areas (SPAs), candidate SACs (those submitted formally to the EC but not yet adopted or designated), proposed SPAs and SACs (sites subject to consultation on whether they should be designated) and proposed and designated Ramsar sites, which are not European sites but under Welsh Government policy should have the same level of protection as SACs and SPAs.

More information on designated sites is available at these links: Designated sites in England and Wales

A plan or project will not normally be enacted or adopted unless it can be shown that it would not have a *likely significant effect* on or an *adverse effect on the integrity* of a European site**.** In exceptional cases, a plan or project can be enacted or adopted *despite* having an adverse effect on the integrity of a European site, when:

- there are no alternative solutions to the plan or project
- there are Imperative Reasons of Overriding Public Interest (IROPI), *and*…
- …when compensatory measures are secure to maintain the coherence of the European Sites Network

Therefore, it is important that your HRA is started as early as possible during preparation of your plan as this gives the HRA the greatest opportunity to influence the plan and therefore avoid or minimise impacts on European sites. HRA should be seen as an iterative process throughout the plan's development, which, when impacts are identified, enables changes to be made to you plan and projects, before being re-assessed.

6.2.1 HRA stages

The 'broad' stages in the HRA process are:

- screening stage, including the test of likely significance
- Appropriate Assessment (AA) stage and Integrity test, including deciding the scope and method of the AA and consultation

A screening should involve a relatively simple assessment to check whether an AA is required. You should consider temporary, permanent, direct and indirect effects on affected European site(s). During this stage, any judgements of likely significant effect must relate to all interest features for which the site is of European importance and their conservation objectives. This does not include SSSI features, as they are considered under the CRoW Act. Possible examples of likely significant effects have been identified in Appendix I.

Your plan or project (eg supply-side drought management actions) must be subject to an AA if significant effects on a European site cannot be ruled out at the screening stage, i.e. you must undertake an AA if:

- the available evidence/data suggests there may be (or would be) a significant effect
- there is insufficient evidence to reach a firm conclusion - it should then be assumed that there may be a significant effect

The principal purpose of the AA is to inform your decision as the Competent Authority on whether your plan or project may have an adverse effect on the integrity of any European site (the 'AEIS decision'). Therefore, the AA helps to provide the scientific basis for taking this decision. The AA can be broken down into two distinct stages:

- a scientific appraisal of all the likely significant effects of the plan or project on the relevant qualifying interests of a European site;
- a decision-making process based on this scientific appraisal; eg reaching a conclusion regarding the integrity of a European site – this is the Test of Integrity.

This decision must take account of the effects of the plan or project alone or in combination with other plans or projects. Examples of adverse effects have been identified in Appendix I**.**

It is our advice that you should complete any AAs as part of your plan and that they should not be deferred until the time of drought permit or order application (i.e. during a drought). Your AA should be appropriate, i.e. it only needs to assess impacts on the specific interest features on specific European sites that have been identified as having a likely significant effect, or where it is uncertain, and only assess them in as far as they might undermine their conservation objectives.

6.2.2 HRA consultation

Natural Resources Wales and/or Natural England are statutory consultees for the HRA process and we advise that you consult us at an early stage. There is also a legal requirement to consult us at the AA stage, and have regard to our advice. In practice we are consulted throughout the process, including in particular at the screening stage. You should also consult the Environment Agency. As the competent authority for granting drought permits in England, they may use your HRA to inform their assessment of any applications.

Section 7 – Drought communications and management

Your drought plan should include how you will communicate with your customers, partners and other interested groups and how you intend to manage your internal staff resources during a drought.

7.1 Drought communications plan

You should develop a drought communications plan that sets out how you intend to communicate your actions during a drought. Effective communications can help to reduce customer demand during a drought, increasing the available water for supply and also reducing the potential impact on the environment. It is also an opportunity to explain and clarify the role and responsibilities of your company in managing the drought.

Your communication plan should identify during a drought how you will:

- increase customer awareness of the limited availability of water
- keep customers, Consumer Council for Water, Natural Resources Wales and/or the Environment Agency, Welsh Government and/or Defra, Public Service Boards (PSBs) and other relevant organisations up to date about:
    - how a drought is developing
    - how it might affect their supply
    - what you're doing to manage it
- work with any 'Drought Liaison Groups' in order to contribute to the cross sector views of drought issues
- encourage your customers to become more water efficient
- work with wider interest groups and partners to help reduce demand

When planning communications with your customers you should consider the conclusions of the Consumer Council for Water's report 'Understanding drought and resilience'. In addition, you should consider the findings in the UKWIR report 'Drought and demand: potential for improving the management of future drought'.

Your plan should also set out:

- how your proposed communications activities are linked to drought triggers
- allow for an appropriate lead-in time for any communication actions that are directly linked to the drought management action(s)
- how you will announce and reinforce any water restrictions (Temporary Use Bans and Non Essential Use Bans) that may be introduced
- the different audiences that specific communications apply to, the main messages for these audiences and how you will tailor and communicate your activities to each audience
- how you will make sure these activities are cost efficient for your customers
- what information you have agreed to exchange with Natural Resources Wales and/or the Environment Agency during a drought – you should agree this during pre-consultation.

Where a drought affects more than one water company, you should work with your neighbouring water companies to share information and best practice, and develop and implement joined-up communication activities. In addition, you should work with Natural Resources Wales and/or the Environment Agency (as relevant).

These joined up communications could include:

- joint press releases and press conferences
- joint advertising campaigns (internet, newspaper, radio, cinema)
- joint customer newsletters and briefings

You should monitor and evaluate the effectiveness of your communication activities during a drought, eg through customer feedback, website or social media traffic or a change in demand for water.

A list of groups and organisations that could form potential audiences for drought communication activities is presented in Appendix K.

7.2 Your communications lead and management structure

Your drought plan should set out the management structure you will put in place during a drought. You should include a communications lead who will be in charge of carrying out the activities described in the communications plan.

Suggested roles within a drought management structure include:

- drought manager
- drought communications lead
- public relations lead
- customer services representative
- technical staff

Include details of individual roles and responsibilities and any changes to the structure as a result of a worsening drought. You should also describe any management actions that are linked to drought triggers, eg how often the drought management team meets.

Section 8 - The end of a drought

As well as considering drought management actions during a drought, your plan should contain what you plan to do after a drought. Your drought plan should set out:

- the triggers you will use to identify the end of a drought
- the actions you will take as drought pressures are reducing
- the timings for the removal of your drought management actions and show how you will communicate this to your customers
- how you will review the actions taken during the drought and improve your plan after a drought

8.1 Identifying the end of a drought

A drought ends when:

- the risks to the security of supply and environment from drought are no greater than they would be during a normal year
- normal conditions have resumed for a specified period of time

You should use several indicators, rather than just one, to determine that a drought has ended. We recognise that the hydrological conditions as drought pressures reduce can be complex and that identifying the end of a drought can be difficult to determine. Therefore, you can also use modelling to predict impacts of a return to dry weather and assess if there is still a risk from drought.

You should only declare the end of drought after confirming with Natural Resources Wales and/or the Environment Agency that the water resource situation has returned to normal.

8.2 Reviewing your plan performance after a drought

Your drought plan should set out what you will do to review your performance during a drought and directly after a drought. You should identify in your plan what you will release as a result of the review (eg a ‘lessons learned’ report) and give a clear timetable for the completion of these including any relevant milestones (eg data gathering stage or report writing stage).

You will also need to review the performance of any drought management actions and your environmental assessments, monitoring plans and mitigation measures (as relevant to the actions you have implemented). You will need to understand:

- how successful, effective and cost efficient your drought management actions are (including any restrictions to water use and drought permit or order applications)
- whether the drought triggers were effective at identifying when to implement actions
- the environmental impacts of your actions (use pre-drought, in-drought and post drought monitoring data and appropriate analytical techniques)

- if the appropriate environmental monitoring was carried out to measure the impact of any actions (update the environmental assessment and environmental monitoring plan if required)
- how effective any mitigation or compensation measures you carried out were
- whether your estimates of reductions in water demand matched actual reductions

If the environment is taking longer than expected to recover after the drought has ended, you should undertake staged reviews to reflect this delay.

You may also need to use the results of your review to update your WRMP where relevant. Any changes to deployable output, demand forecasts or infrastructure improvements and identification of any drought resilience options should be reflected in your WRMP. Therefore, you will need to understand:

- how well individual sources delivered additional water and determine where any re-assessments of yields may be needed or investment to maintain the yield of sources
- if you need to make any changes to your demand forecast or longer term demand management strategy
- If any strategic investments made as a result of a drought event affect other plans or programmes. For example, where the implementation of an infrastructure improvement has been brought forward as a result of a drought event.

We expect you to work with Natural Resources Wales and/or the Environment Agency at an early stage to help shape your review. In addition, you should invite any other people or organisations involved in the drought to contribute to your review.

Appendices

Appendix A: References

Water resource planning guideline, Natural Resources Wales, Environment Agency, Welsh Government, Defra and Ofwat updated 2017.

https://naturalresources.wales/media/681612/interim-wrpg-update-final-april-2017.pdf

Drought orders and permits guidance, Welsh Government, Defra, Natural Resources Wales and Environment Agency, 2015.

https://www.gov.uk/government/collections/apply-for-a-drought-permit-drought-order-or-emergency-drought-order

The pdf documents of the guidance are available on Natural Resources Wales.

https://naturalresources.wales/permits-and-permissions/water-abstraction-and-impoundment/drought-permits-and-drought-orders/?lang=en

Natural Resources Wales website - drought management & planning

https://naturalresources.wales/guidance-and-advice/environmental-topics/water-management-and-quality/drought/?lang=en

Water Company drought plan guideline (wholly or mainly in England), Environment Agency updated 2015.

https://www.gov.uk/government/collections/how-to-write-and-publish-a-drought-plan

WRMP 2019 Method, Risk based planning, UKWIR, report 16/WR/02/11, 2016

Code of Practice and Guidance on Water Use Restrictions, UKWIR and Water UK, report ref 14/WR/33/6, 2014

Risk Based Planning Methodology, UKWIR, report ref (16/WR/02/11), 2016

Estimating the Water Savings for Baseline Water Efficiency Activities, UKWIR, report ref 09/WR/25/4, 2010.

Drought and Demand: Modelling the Impact of Restrictions on Demand during Drought, UKWIR, report ref 07/WR/02/3, 2007.

Drought and demand: potential for improving the management of future drought, UKWIR, report ref, 07/WR/02/2, 2007.

Understanding the impacts of drought restrictions, UKWIR report ref 14/WR/01/13, 2014

Understanding drought and resilience, Consumer Council for Water, 2013

http://www.ccwater.org.uk/wp-content/uploads/2013/12/Understanding-Drought-and-Resilience.pdf

Drought demand modelling study, Environment Agency, 2014

From meteorological to hydrological drought using standardised indicators, Centre of Ecology and Hydrology (2016) http://nora.nerc.ac.uk/512401/1/N512401JA.pdf

Handbook for scoping projects, Environment Agency, 2002 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/296952/geho0411btrf-e-e.pdf

Guidelines for ecological impact assessment in the UK & Ireland, 2016, CIEEM

http://www.cieem.net/data/files/Website_Downloads/Guidelines_for_Ecological_Impact_Assessment_2015.pdf

Strategic Environmental Assessment and Habitats Regulations Assessment - Guidance for Water Resources Management Plans and Drought Plans, UKWIR, 2012 report ref 12/WR/02/7

Common implementation strategy for the Water Framework Directive (2009)

Invasive Non-Native Species (INNS) Implications on the Water Industry UKWIR (2016) 16/DW/02/82

Appendix B: Glossary

Abstraction	The removal of water from any source, either permanently or temporarily.
Abstraction licence	The authorisation granted by Natural Resources Wales or Environment Agency to allow the removal of water from a source.
Baseline	Information on the environment that details conditions prior to implementation of a drought action.
Bulk transfers	A legal agreement for exporting and importing water between a donor and recipient operator.
Control curves	A diagram or graph presenting drought triggers levels.
Demand management	The implementation of policies or measures which serve to manage control or influence the consumption or waste of water.
Drought management area	The area within a water resource zone (WRZ) that a particular drought management action(s) will apply to as specified.
Deployable output	The output of a commissioned source or group of sources or of bulk supply as constrained by: • environment • licence, if applicable • pumping plant and/or well or aquifer properties • raw water mains and/or aquifers • transfer and/or output main • treatment • water quality
Drought order	An ordinary drought order is an authorisation granted by the Welsh Ministers (for sites in Wales) or Secretary of State (for sites in England) under drought conditions which imposes restrictions upon the use of water (as defined in Drought Directions 2011) and/or allows for abstraction/impoundment outside the schedule of existing licences on a temporary basis. An emergency drought order is the same as an ordinary drought order, which additionally is used: • to prohibit or limit the use of water for any purposes the water company considers appropriate • set up and supply water by means of stand-pipes or water tanks within its water supply area

Drought permit	An authorisation granted by Natural Resources Wales (for sites in Wales) or the Environment Agency (for sites in England) under drought conditions which allows for abstraction/impoundment outside the schedule of existing licences on a temporary basis.
Environmental assessment (Report)	An assessment of environmental sensitivity and likely impacts from implementing drought management actions. The report that contains the supporting information arising from the environmental assessment.
Environmental monitoring plan	The plan of how your company will address: • gaps in the environmental assessment of the supply-side drought management actions • baseline monitoring • in- drought monitoring • post drought monitoring
Environmental report	The report that accompanies an application for a drought permit or drought order. It should be based on the information from within the environmental assessment and updated with any additional information.
Exceptions	An 'exception' to a water use restriction is where special allowance is given by a water company to customer, that allows a particular customer to continue using water for that particular use. Alternative and different terminology has been used in the past to describe exceptions, such as exemptions and concessions.
Feature	A way of describing an ecological, chemical, habitat or morphological element to be assessed. For example a species of plant or animal, habitat type or sub-habitat type.
Government	In this guideline Government refers to central Government, the Welsh Government and Defra.
Habitats Regulations	The Conservation of Habitats and Species Regulations 2010. The domestic legislation which transposes the EU Habitats and Wild Birds Directives into UK law and replaces the Conservation (natural habitats &c) Regulations 1994, known as the Habitats Directive.
In-drought monitoring	Monitoring that is undertake during the implementation of a drought management action.
Levels of service	The standard of service that water company customers can expect to receive from their water company, commonly setting out the frequency of restrictions that a company expects to apply to its customers.

New Appointments and Variations	New appointments and variations allow companies to offer water, sewerage or water and sewerage services to a specific geographic area instead of the existing appointee. As a result, developers and large non-household customers can choose their supplier for these services. This allows them to negotiate for different service offerings or price levels, enabling them to enjoy the benefits that a more competitive market brings about. • A **new appointment** occurs when we appoint a company for the first time to provide water and sewerage services, water only or sewerage only services for a specific geographic area. • A **variation** occurs when an existing appointed company asks us to vary its existing appointment so that it can extend the areas to which it provides services.
NNR	National Nature Reserve - designation to protect the most important areas of wildlife habitat and geological formations in Britain, and as places for scientific research.
Ramsar site	Internationally important wetland site.
SAC	Special Area of Conservation - Designated under the European Habitats Directive (1991).
SPA	Special Protection Area - Classified under the European Birds Directive (1979).
SSSI	Site of Special Scientific Interest - A site given a statutory designation by Natural Resources Wales or Natural England because it is particularly important, on account of its nature conservation value.
Strategic Environmental Assessment (SEA) Directive	The Strategic Environmental Assessment Directive ensures significant environmental effects arising from proposed plans and programmes are identified, assessed, subjected to public participation, taken into account by decision-makers and monitored.
Water resource management plan or WRMP	A water company long-term strategic plan for water supply and demand over 25 years.
Water Resource zone (WRZ)	The largest possible zone in which all resources, including external transfers, can be shared and hence the zone in which all customers experience the same risk of supply failure from a resource shortfall.

WSSL

Currently, non-household customers who meet the 50Ml threshold requirement are able to choose a different supplier for water retail services reflecting the policy position of the Welsh Government.

From April 2017, all retailers who wish to participate in this market will have to apply for a WSSL with a restricted retail authorisation allowing them to provide water retail services to eligible Welsh customers. It will not be possible for a WSSL to provide sewerage services to these customers.

Appendix C: Recommended structure for a water company drought plan

Non-technical summary

Executive summary

Introduction
- Overview of process
- Water company specific information
- Baseline water resources situation and levels of service
- Pre-draft and draft consultation details

Drought triggers and scenarios
- Groundwater & Surface Water triggers
- Other triggers eg peak demands
- Data sources and arrangements
- Drought scenarios (including historic droughts and forecasting)
- Links to actions/measures with timing information

Drought management actions
- Demand-side actions
  - Temporary water use restrictions
- Supply-side actions
  - Drought permits and drought orders

Environmental impacts
- Environmental assessment (including data provision)
- Environmental monitoring (plan)
- Mitigation / Compensation measures

Drought Management Structure and communications strategy
- Management structure
  - Roles and responsibilities
- Communications plan
- Lessons learned since the previous plan

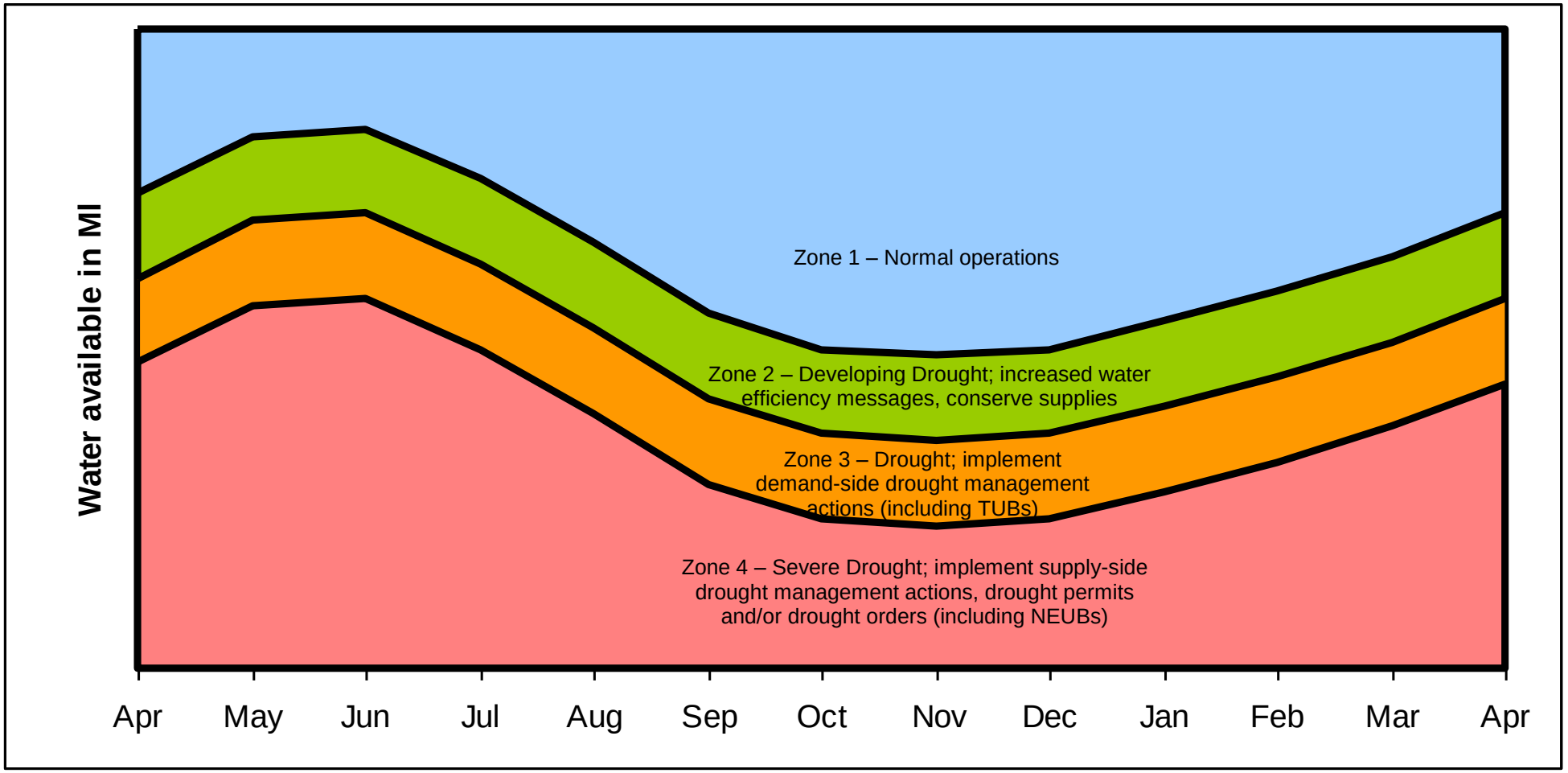
Post-drought actions

Conclusions and summary of plan

Appendices
- Graphs, Maps, Data/tables
- WRZ summaries (including drought management actions forms)
- Technical and/or supplementary information (eg EARs / EMPs)
- Glossary / References

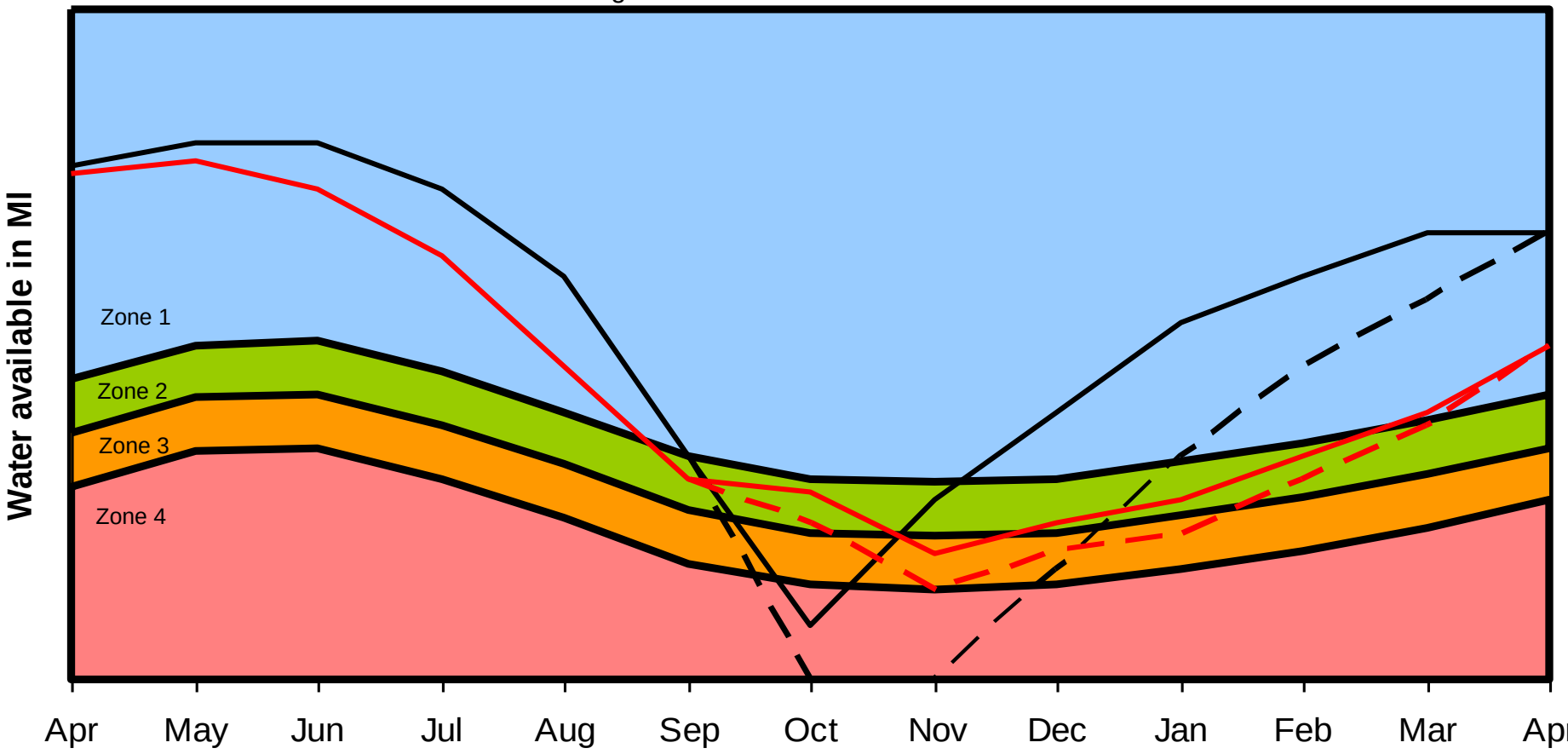
Separate reports: SEA and HRA (with Appropriate Assessments)

Appendix D: Example control curve



Appendix E: Example control curve plus scenario lines

- Black solid line - severe one season drought scenario with supply-side actions (drought permit)
- Black dotted line - severe one season drought scenario without supply-side actions
- Red solid line - moderate one season drought scenario with demand-side actions (increased water efficiency messages and temporary water use restrictions (TUBs)
- Red dotted line - moderate one season drought scenario without demand-side actions



Appendix F: Demand-side drought management actions

Demand-side drought management action **Name:** *example enhanced water efficiency initiatives*	**Phase 1**	**Phase 2**
Trigger(s) (or preceding actions)		
Demand Saving Ml/day unless stated otherwise Percentage reduction on peak week demand		
Location Area affected: eg Company, Demand Management Area, WRZ or sub-zonal level		
Implementation timetable Time from drought trigger to implementation (including any consultation required), time of year effective, duration of action being in place		
Any permissions or approvals required and constraints that apply Including details of liaison carried out with bodies responsible for giving any permits or approvals		

Risks associated with action Effects on the environment, social and economic factors and uncertainties associated with timings, quantity, quality or cost. Link to your SEA findings (as relevant)		
Other considerations For example, how does this action affect your duties under the Environment (Wales) Act and your contribution to the Well-being Goals under the Well-being of Future Generations Act (as relevant)		

Appendix G: Supply-side drought management actions

Action Implementation Assessment	**Supply-side drought management action** **Name:** *example reduced reservoir compensation requirements* *N.B: Ensure that where the action affects other companies that each of your drought plans are consistent, eg bulk transfers.*	**Phase 1**	**Phase 2**
	Trigger(s) (or preceding actions)		
	Deployable Output or yield of the action Ml/day unless stated otherwise, including how you have arrived at this estimate (referencing any supporting information)		
	Location Area affected: eg: WRZ or sub-zonal level		
	Implementation timetable Time from drought trigger to implementation (including any application required), time of year effective, duration of action being in place		
	Risks associated with action Effects on the environment, social and economic factors and uncertainties associated with timings, quantity, quality or cost. Link to your SEA findings (as relevant)		

	Other considerations For example, how does this action affect your duties under the Environment (Wales) Act and your contribution to the Well-being Goals under the Well-being of Future Generations Act (as relevant)		
Environmental Assessment: alone & in-combination	**Risk to the Environment:** (Major, Moderate, Minor/ Negligible or uncertain) Include whether there is a 'temporary' or 'permanent' risk to deterioration under WFD & '*Likely Significant Effect*' under Habitats Regulations (as relevant)		
	Summary of likely environmental impacts Include details for features of moderate and major sensitivity and minor sensitivity features from designated sites (referencing any supporting information eg EAR).		
	Baseline information used		
	Summary of additional monitoring requirements Include baseline, during and post drought		
	Mitigation & Compensation measures		
	Impact on other activities eg. fisheries, industry, other water users etc.		

	Any permissions or approvals required and constraints that apply Including details of liaison carried out with bodies responsible for giving any permits or approvals		

Appendix H: Exceptional shortage of rain (ESOR)

Background

The legal criteria that must be met in granting a drought permit or order include:

'If the Welsh Ministers / Natural Resources Wales is satisfied that, by reason of an exceptional shortage of rain, a serious deficiency of supplies of water in any area exists or is threatened…..'

It is not appropriate to set a prescriptive approach to assessing the exceptional shortage of rain. Each drought and each situation is unique. Previous drought permit and order hearings and inquiries have confirmed that there should be no set definition of exceptional shortage of rain.

Matters to consider in the assessment of ESOR

Technical analysis methods - methods can include return period analysis, such as using Tabony tables and extreme value analysis (EVA), Standardised Precipitation Index (SPI) and other indices, rainfall deficits as percentages of long term average and as cumulative deficits. Comparisons may be made to other drought events and ranking of deficits. Pattern, timing and effectiveness of rainfall may all feature. It is important that the method that you use is based on up to date rainfall datasets.

Period of analysis - should reflect the conditions that have led to the supply shortfall. It should take into consideration the starting point of the drought and its effects on the water supply situation. This could include distinct periods within the longer timescale of the event.

Geographic extent of analysis - the rainfall deficit should be relevant to the catchment area of the public supply sources that require the drought permit or order.

Other meteorological and hydrometric measures - the legislation is clear, but the effectiveness of rainfall as shown by secondary measures, such as temperature, soil moisture deficit, river flows, groundwater levels, can also be relevant. Statistics and analysis should clearly make the link between the two, for example winter rainfall deficits leading to exceptionally low groundwater levels; high winter temperatures leading to dry soils and lack of runoff for reservoir refill. However these measures should not detract from deciding that the reason for serious deficiency is exceptional shortage of rain.

Relationship to the serious deficiency question – where a serious deficiency of supplies of water in any area exists or is threatened, you will still need to demonstrate ESOR in order to apply for a drought permit or order. An assessment of the risk of supplies worsening can form part of the case but should not be the primary consideration.

Relationship to water company system - the analysis should consider the company's supply system critical period and its customer levels of service in broad terms. It should show that the exceptional shortage of rain analysis is appropriate to the type

of system, seasonality and deployable output as outlined in the company's water resources management plan and drought plan.

Other sources of information - consider previous inspector's decisions, advice from technical colleagues and neighbouring regions / companies.

Presentation - the analysis should be technically rigorous. A plain English summary and explanation of the case that can be understood by third party interests is desirable.

For more information you may want to consider this paper ‘From meteorological to hydrological drought using standardised indicators’ (2016): http://nora.nerc.ac.uk/512401/1/N512401JA.pdf

Appendix I: Environmental assessment

This appendix sets out the following:

- what to consider when you carry out an environmental assessment
- assessment of the environmental impacts
- what to include in an environmental assessment report

We recommend that you use the Handbook for scoping projects: environmental assessment and the EcIA guidelines to carry out your environmental assessment.

I.1.1 Carry out an environmental assessment

The environmental features for consideration (where relevant) within the environmental assessment are detailed in Box 1.

In addition, your environmental assessment should show how you will meet the requirements of all relevant legislation. The Water Framework Directive and other relevant legislation to consider has been provided in Box 2 and Box 3.

More information on the process for assessment of the environmental impacts is available in Appendix I.1.2.

Box 1 Environmental features for consideration (where relevant) within your environmental assessment

The environmental features you should include, where relevant, in your environmental assessment:

Hydrological and Hydrogeological

- Rainfall, river flows, groundwater levels, soil moisture deficit, reservoir levels, abstraction rates, velocities and levels associated with river transfers.
- For wetlands, determining the way a site functions hydrologically is likely to be necessary to determine the potential impacts arising from drought management actions (for example, whether the site is ground- or surface-water dependant and the sources of this water).

Fish

- In waters designated 'important fisheries' or sites designated for fish species you must evaluate the impacts of your drought actions on fish.
- In waters that are not designated 'Important fisheries', you should evaluate the benefits of undertaking environmental assessment for fish. For example fish may be more sensitive to drought (and thus any additional effects of a drought plan action) in upland rivers with natural morphology. Monitoring during a drought should be discussed with Natural Resources Wales and/or the Environment Agency fisheries teams.
- If you plan to undertake fish monitoring during drought, you must consider the potential impacts that your monitoring may have, in terms of causing additional stress to an already stressed fish community. This applies particularly during periods of high temperature.

- You may support your assessment using hydraulic-habitat surveys and modelling of fish habitat, eg to quantify the effects of a river flow change on suitable habitat for a sensitive fish species. However you should not rely exclusively on such studies.

Bryophytes and Lichens

- If a watercourse runs through a SAC with Old Sessile Oakwood habitat, consideration should be given to links between flows and humidity alongside the river, and whether your actions would affect the woodland ecosystem and the bryophytes and lichens that may characterise that woodland.
- If a watercourse is in a SSSI with bryophyte or lichen features, it will be necessary to examine whether those features are flow-sensitive or not; there are rare species of both lichen and bryophyte that require regular inundation, splash, spray or humidity
- Although many bryophytes are drought-tolerant, surviving by closing down their metabolism, some species are desiccation-intolerant. Therefore, any statements you may make about bryophytes being able to withstand desiccation should be considered carefully.
- Some bryophytes and lichens are good colonisers but others are unable to recolonize a site when lost. Careful consideration should be made before any statement about recoverability of bryophyte- and lichen-rich ecosystems within your environmental assessment.

Macro-invertebrates

- Macro-invertebrates should be your default biological quality elements (BQE) for assessing drought impacts on flowing water habitats. You should identify samples to Natural Resources Wales or the Environment Agency mixed-taxon resolution (River Invertebrate Classification Tool, RICT Taxonomic Level 5: RICT Website hosted by Scottish Environmental Protection Agency.
- You should sample at least in two seasons (spring and autumn). You should consider whether summer sampling is also necessary.
- Macro-invertebrates in lakes/reservoirs/wetlands – no specific data is generally required unless there are specific designated features or a specific reason identified requiring the data that cannot be fulfilled using other data, for example: modelling of water levels or identifying water quality changes.

Macrophytes

- In waters designated for their macrophyte communities, you should evaluate the impacts of your actions on the macrophyte community.
- Otherwise, macro-invertebrates and/or fish are generally more appropriate quality elements with which to assess and monitor the effects of your drought plan actions.
- For rivers and standing waters which dry out (whether naturally or due to water abstraction), macrophytes should be considered as an appropriate biological quality element to monitor. This is because it is difficult to sample consistently the macro-invertebrate and fish communities during both wet and dry conditions.

Algae

- Diatom data is not required for most sites and is generally not considered appropriate to use in drought monitoring and assessment. There may be circumstances where routine diatom monitoring is currently in place to monitor the effects of nutrient enrichment from sewage treatment works. In these circumstances existing data can be used to help support the environmental assessment.

- Monitoring of planktonic algae may be appropriate in lakes and larger rivers where there is a risk of algal blooms, whether nuisance or toxic.

Water quality

- WFD Classification results will provide information on current status. If declines in water quality are considered a potential issue historical data records should be reviewed and additional monitoring considered.
- Relevant elements might include temperature, dissolved oxygen, phosphate and ammonia. If Chlorophyll a data is available, it may also be relevant.

Biodiversity

- Specialist organisations, including Natural Resources Wales have identified a large number of sites, habitats and species that provide the key focus for biodiversity conservation in Wales, supported by policy and legislation. You can find different kinds of protected areas, eg wetland sites, national parks or special scientific sites, across the Wales, including:
- Sites of Special Scientific Interest - the most important sites for Wales' natural heritage. They are highly protected to safeguard the range, quality and variety of habitats, species and geological features in all parts of Wales. They are the cornerstones of conservation work, protecting the core of our natural heritage.
- Sites protected by European and international law – including Special Areas of Conservation, Special Protected Areas, and Ramsar sites.
- Marine Protected Areas - areas of sea, seabed or shore protected under other laws such as Special Areas of Conservation, Special Protection Areas, Marine Conservation Zones and Ramsar Sites.
- National Nature Reserves - these are the very finest examples of our wildlife habitats and geological features.
- National Parks – large areas designated by law to protect their special landscape qualities and promote outdoor recreation. National Parks have their own Authorities, which control planning.
- Local Nature Reserves - places with wildlife or geological features that are of special interest locally.
- Areas of Outstanding Natural Beauty – protected by law because of their special landscape qualities, wildlife, geology and geography. They have more protection than other areas under the planning process and, in terms of landscape and scenery, are equal to National Parks.
- Find information on the wildlife and habitats that are protected by UK law here: UK protected species.
- Find out which plant and animal species are protected under European law here: European protected species.

Physical

- River habitats survey (RHS) data can be used to characterise the diversity of a river reaches' habitat, it can also be used to indicate the distribution and extent of flow sensitive habitats. Although RHS monitoring is not recommended for in-drought/post drought, baseline surveys may be required to support the environmental assessment. If available measurements on wetted width, wetted depth, and photographs can be used.
- Lake bathymetry for certain sites may also be required.
- For wetland sites, the main habitat areas should be mapped with those susceptible to drought impacts clearly identified.

- Geomorphological survey of the physical form and processes of the channel and riparian zones including natural and artificial features eg. Fluvial Audit may be required.

Invasive Non-Species

- Data search and survey for the presence and absence of INNS
- An assessment of the risk of the proposed operation of spreading or introducing INNS
- Provision of robust pathway assessment, proposed mitigation and monitoring measures

Human environment

- Socio-economic & health (includes nuisance), amenity & aesthetics, recreation, navigation, architectural or archaeological and heritage.
- Monitoring changes in aesthetics, archaeology and heritage can be achieved through visual checks and a photographic record at important locations.

Box 2 Water Framework Directive legislation requirements for consideration within your environmental assessment

Water Framework Directive (WFD)

The Water Framework Directive established a legal framework for managing the water environment across Europe. This requires the sustainable use of water, preventing deterioration of water body status and the protection and improvement of inland surface waters, groundwater and transitional and coastal waters. The purpose of the WFD is set out in Article 1 and, amongst other things, it is intended to contribute to mitigating the effects of floods and droughts.

The ways the requirements of the WFD will be delivered are set out in river basin management plans (RBMP). The environmental objectives of the WFD are set out in Article 4 and include preventing the deterioration in status of water bodies and aiming to achieve good status (or potential) in all waters.

The published RBMPs (2015-2021) on Natural Resources Wales website where appropriate.

The RBMPs (2015) include:

- classification results that form the baseline for assessing deterioration in water body status for the 6-year period December 2015 to 2021
- updated water body status objectives
- updated protected area objectives.

You can view the status objectives for all water bodies in Wales at Water Watch Wales. For England and the Severn, refer to the Environment Agency's catchment data explorer.

When preparing your drought plan you should consider whether your supply side drought management actions, including existing abstraction licences (standby sources) and your drought permits and orders are likely to affect water body status.

The articles relevant to drought plans are 4.1 and 4.6 to 4.9.

- Article 4.1 Environmental objectives
- Article 4.6 Temporary deterioration in status, see below for more details on whether article 4.6 is likely to be applicable
- Article 4.7 Defence against breach of WFD objectives
- Article 4.8 Impact on other water bodies
- Article 4.9 Level of protection

For more information on these articles, refer to Common implementation strategy for the Water Framework Directive (2009)

The way you assess the potential for changes to water body status will depend on the environmental sensitivity of the WFD quality elements monitored in each water body. You should consider the impacts of your actions on the elements that are used to determine WFD status or potential and whether these impacts will cause deterioration.

Deterioration is a drop in status class of any element set out in Annex V of the WFD, irrespective of whether this causes a deterioration in status of the water body overall. You should set out the approach you have taken for each water body affected and clearly describe whether changes are likely to be temporary.

If you believe deterioration is likely to occur as a result of your actions you should clearly set out what this will be and how you will mitigate it referencing the relevant articles from the WFD.

Compliance with Article 4.6

If the impacts of a drought temporarily cause deterioration to water body status and all the criteria in Article 4.6 can be met, this defence can be used to justify why deterioration in the status of a water body occurred. This is always done on a case by case basis. Prolonged drought is one of the natural causes under which 'temporary deterioration' in water body status can be declared. Drought has the capacity to affect the status of surface water (rivers and lakes) and groundwater. There should be a robust approach to identify prolonged drought effects across relevant water body classification elements. The European Commission Common Implementation Strategy Guidance Document No. 20 provides more information on exemptions from environmental objectives including droughts.

The conditions considered to be prolonged drought should be exceptional or could not reasonably be foreseen. Your drought plan should cover all circumstances that can be reasonably foreseen (eg the worst drought on record). You would need to make a clear distinction between the effects of natural causes and the effects of measures taken to lessen the impacts of drought on people, environment and water supplies.

There should be a clear set of indicators for identifying prolonged drought based on hydrological data as well as other indicators to demonstrate that the conditions are exceptional.

Box 3 Other relevant legislation requirements for consideration within your environmental assessment

Habitats Directive

Special Areas of Conservation (SAC) or Special Protection Areas (SPA) known as Natura 2000 sites; Ramsar sites (together referred to as European sites) all require a high level of confidence for decision making due to their designated status. They may require a more detailed assessment depending on the effects on their designated features. You must determine and be satisfied for 'alone' and 'in-combination drought management actions that:

- there is no likely significant effect on a SAC, SPA or Ramsar site (known as European sites) or
- a conclusion of no adverse effect on the integrity of the European sites can be ascertained from implementing your actions.

Your drought plan should be considered 'likely' to have such an effect if you are unable (on the basis of objective information) to exclude the possibility that the plan could have significant effects on any European site, either alone or in combination with other plans or projects - in other words not a certainty or a probability, however the possibility or a risk of significant effects is sufficient to trigger further assessment, as is being uncertain.

An effect will be 'significant' in this context if it could undermine the site's conservation objectives. The assessment of that risk must be made in the light of factors such as the characteristics and specific environmental conditions of the European site in question.

However there must be credible evidence that there is a real, rather than a hypothetical, risk. Therefore a likely significant effect is one where you may reasonably predict that a drought action may affect the conservation objectives of the features for which the site was designated, excluding trivial or inconsequential effects. For example:

- altering community structure (species composition)
- causing ongoing disturbance to qualifying species or habitats
- causing direct or indirect damage to the size, characteristics or reproductive ability of populations of qualifying species, or species on which they depend, on a site
- causing a reduction in the resilience of the feature against other anthropogenic or natural changes. For example the ability to respond to extremes of environmental temperature.

Based on the findings of the appropriate assessment, you must decide whether your plan may have an adverse effect on the integrity of a European site, alone or in combination with other plans or projects. You should take the 'integrity' of a European site to mean the coherence of its ecological structure and function across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which the site is designated. You should conclude that your plan would not adversely affect the integrity of a European site only if you have made certain that this is the case. In order to be certain, you should be convinced that no reasonable scientific doubt remains as to the absence of such effects.

The potential for adverse effect on the integrity of the site depends on the scale and magnitude of the action and its predicted impacts. Factors to consider may include:

- the distribution of designated habitats, species (or the habitats of species) and any trend data on extent, quality and abundance
- ecological requirements of designated habitats and species, particularly their sensitivity to the impact identified for that site
- extent and magnitude of exposure of designated habitats and species to potential impact, that is, physical, chemical and biological; evidence of biological effect, including the exceedance of site specific critical thresholds/targets

Wildlife and Countryside Act 1981 & Countryside and Rights of Way Act 2000

Under the terms of the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000) (known as the CRoW Act) a water company is a 'Section 28G' authority and will need to have regard to the requirements of the CRoW Act, in particular Sections 28G and Section 28H.

These duties require you to take reasonable steps, consistent with the proper exercise of your functions, to further the conservation and enhancement of SSSI features. You must give notice to Natural Resources Wales and/or Natural England, if you intend to carry out an operation likely to damage features of the SSSI. This includes operations which are outside of the boundaries of the site but could affect the site. If you proceed with an operation likely to damage against the advice of Natural Resources Wales and/or Natural England for England and damage to the site occurs, you may be required to restore the SSSI to its former condition.

You should adopt a similar technical approach as used for assessing likely significant effect on European sites when you assess whether a drought action is likely to damage an SSSI.

Fish (including eels)
The principal fisheries specific legislation is the Salmon and Freshwater Fisheries Act 1975. Fisheries protection is also provided by the Habitats Directive legislation, the Wildlife & Conservation Act, and the requirements of the WFD.

Fish that are protected priority species under the UK Post-2010 Biodiversity Framework as required under the Natural Environment and Rural Communities (NERC) Act 2006 include salmon, trout, eel, lamprey and shad. These fish are features of interest of a number of Habitats Directive sites and SSSIs. Information on the distribution of priority fish species can be found on the National Biodiversity Network Gateway. Important fisheries include:

- **principal salmon rivers** – these have been identified with Conservation limits (CLs) and Management Targets (MTs) and are used to give annual advice on stock status and to assess the need for management and conservation measures. For more information see Salmon Stocks and Fisheries in England and Wales in 2015
- **principal sea trout rivers** – these are fisheries designated on the basis that the actual or potential rod catch exceeds 50 per year on average

- **principal trout fisheries** - those that support wild brown trout fisheries
- **principal coarse fisheries** - significant or popular river fisheries where angling matches take place; day tickets are sold; public angling is available (eg. free fishing); or which are operated by angling clubs
- **other coarse fisheries** - those that support organised angling, but at a lower level than principal fisheries
- **rivers that support, lamprey and shad**
- **waters frequented by eels**.

Information about location of sites that support important fish populations is available from Natural Resources Wales and/or the Environment Agency. Your assessment for fish should include investigating the potential impact of proposed drought measures on migrating fish and fish life stages, including spawning, juvenile and adult. Potential impacts include: delayed/restricted migration, loss of habitat, stranding, fish distress, fish kills, and transfer of invasive non-native species and impacts on angling.

The Eel (England and Wales) Regulations 2009 (Eel Regulations) implement the EC Council Regulation (1100/2007) in the UK. Natural Resources Wales and/or the Environment Agency must take actions to halt and reverse the decline in the European eel stock, aiming to meet a target set for the number of mature adult eels leaving each river basin to return to spawn at sea. The Regulation specifically requires us to consider eel passage measures as part of the solution. You must consider if the implementation of your drought management actions could have an impact on eel passage.

Environment (Wales) Act 2016
As a statutory undertaker, you must have regard to Section 6 and Section 7 under this act within your environmental assessment.

Section 6 - Biodiversity and resilience of ecosystems duty:
The resilience of ecosystems features prominently in recent environmental legislation in Wales. The Well-being of Future Generations (Wales) Act (2015), includes a goal to develop a more resilient Wales, which is described as “a nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change (for example climate change).”

The Environment (Wales) Act 2016 (Section 6) contains the Biodiversity and resilience of ecosystems duty, which states that public authorities must “seek to maintain and enhance biodiversity in the exercise of functions in relation to Wales, and in so doing promote the resilience of ecosystems, so far as consistent with the proper exercise of those functions.”

It goes on to set out a series of aspects of resilience that must be taken into account. NRW has interpreted these as the four attributes:

- Diversity
- Extent
- Condition
- Connectivity.

These generally relate to existing information and processes, and many of the subjects listed in the box above can be assigned to them. For example diversity relates to biodiversity and mechanisms that maintain it, as well as physical diversity, for example of rivers; condition will relate to water quality, WFD quality or condition of designated sites.

Together, the attributes provide a practical framework for assessing resilience and for structuring actions required to help build resilience. NRW's State of Natural Resources Report (SoNaRR) provides more information and examples of its use to assess ecosystem resilience, and opportunities to build resilience in Wales: https://naturalresources.wales/media/679405/chapter-4-resilience-final-for-publication.pdf

Section 7 - Biodiversity lists and duty to take steps to maintain and enhance biodiversity. This section replaces the duty in section 42 of the NERC Act 2006*. The Welsh Ministers will publish, review and revise lists of living organisms and types of habitat in Wales, which they consider are of key significance to sustain and improve biodiversity in relation to Wales. *Until Section 7 list is published, refer to the Section 42 of the (NERC) Act 2006.

For any English sites within your drought plan, you will need to take account of your duty under Section 40 of the NERC Act 2006, and the list of species and habitats published, in accordance with section 41 of the Act. You should also use the Defra published guidance for public authorities Biodiversity duty: public authority duty to have regard to conserving biodiversity.

Other locally designated sites (eg. local nature reserves) may be considered lower risk, but specific consideration may need to be given to particular features

Invasive non-native species (INNS)

Aquatic and riparian INNS have significant adverse social, economic and environmental impacts, and can cause the ecological status of WFD water bodies to deteriorate or not achieve their ecological objectives. You will need to consider EU regulation (1143/2014) on invasive alien (non-native species) which came into force on 1st of January 2015. This regulation places duties to prevent, monitor, eradicate and manage INNS (these duties relate to a specific list of 37 species of INNS). Additionally you are at risk of committing and offence under the Wildlife and Countryside Act 1981 if your operations spread INNS listed in Schedule 9 of the act.

You must review whether your current abstraction operations and/or drought management actions will risk spreading INNS. INNS could be spread by:

- new or existing transfers of raw water
- removal of existing impoundments
- alterations to existing impoundments that increase the ability of species to move upstream-for example, fish-passes and by-pass channels
- insufficient biosecurity at sources of water
- movement of staff, contractors and equipment between sites, and importing of materials to sites (for construction purposes)

The GB Invasive Non-native Species Strategy and more information on INNS and their impact can be found on the GB non-native species secretariat webpages.

Box 4 Additional information that may be required for more detailed studies

For important river fisheries (i.e. those with Salmon Action Plans, major sea trout, principal brown trout and principal coarse fisheries)
Natural Resources Wales and/or the Environment Agency should hold data from annual quantitative surveys for at least the last five years. Although designed to establish variability over a longer timescale, these may provide an acceptable baseline. Where there is insufficient data or where data indicates a high level of variability, additional and tailored fish population monitoring may be required.

For designated sites
For drought sensitive species or habitats, additional specific targeted monitoring may be required in addition to the above. It is important to discuss these sites with Natural Resources Wales and/or Natural England. They are likely to hold existing data on the sites condition and status of designated features and be able to provide advice on monitoring protocol.

Other considerations
Hydraulic surveys and wetted area assessments of rivers and modelling (including groundwater studies) may also be appropriate. Assessment of likely habitat impacts should always be linked to infer likely impact expected upon the sensitive target species in question.

Control sites are more important in detailed studies. Specifically when considering what effects there may be on European designated sites, the company must establish there will be no adverse effect on the designated feature from their proposed drought order or permit. The environmental assessment should be in sufficient detail to support this level of decision making.

I.1.2 Assessment of the environmental impacts

When assessing the environmental impacts you will need to determine:

- the magnitude of the impact (effect) over the lifetime of the proposals, (including the impact during and following decommissioning of any associated structures and/or ceasing the operation)
- the sensitivity of the environmental feature
- the probability that the interaction will occur (likelihood)
- the determination and qualification of the level of impact and
- the level of certainty of all the above.

The **magnitude of an impact** provides a useful initial measure of the likelihood of an impact arising. Magnitude can been defined via four factors:

- Extent – the area over which an impact occurs
- Duration – the time for which the impact occurs
- Frequency – how often the impact occurs and
- Severity – the degree of change relative to the baseline.

The **sensitivity of the environmental feature** is a function of its capacity to accommodate change and reflects its ability to recovery if it is affected. The sensitivity can be quantified via the following factors:

- Adaptability – the degree to which a feature can avoid or adapt to an impact;
- Tolerance –the ability of a feature to accommodate 'temporary or permanent' change without a significant adverse impact;
- Recoverability – the temporal scale over and extent to which a feature will recover following an impact; and
- Value – a measure of the features importance, rarity and worth

In order to help define the magnitude and sensitivity of features, the information presented in Table I.1 could be adopted when identifying and characterising the impacts.

Table I.1: Generic Guidelines for EiA

Magnitude / Sensitivity	EiA Guidelines
Very High	**Magnitude**: Loss of species and/or integrity of the habitat/site; severe damage to key characteristics, features or elements. Permanent / irreplaceable change, which is certain to occur. **Sensitivity**: Feature / receptor has no capacity to accommodate physical **(hydrological, hydrogeological and geomorphological)** or chemical changes (**water quality)** or other influences due to implementing the proposed action.

Magnitude / Sensitivity	EiA Guidelines
High	**Magnitude**: Loss of species, but not affecting integrity of the habitat/site; partial loss of or damage to key characteristics, features or elements. Permanent / irreplaceable change: which is likely to occur. **Sensitivity**: Feature / receptor has a very low capacity to accommodate physical or chemical changes or other influences.
Medium	**Magnitude**: Minor loss of, or alteration to, one (maybe more) key characteristics, features or elements; measurable change in attributes, quality or vulnerability. Long-term change which is reversible; which is likely to occur. **Sensitivity**: Feature / receptor has a low capacity to accommodate physical or chemical changes or other influences.
Low	**Magnitude**: Very minor loss of, or alteration to, one (maybe more) key characteristics, features or elements; noticeable change in attributes, quality or vulnerability. Short- to medium-term impact which is reversible, which could possibly occur. **Sensitivity**: Feature / receptor has a moderate capacity to accommodate physical or chemical changes or other influences.
Very Low	**Magnitude**: Temporary or intermittent very minor loss of, or alteration to, one (maybe more) characteristic, feature or element; possible change in attributes, quality or vulnerability. Short-term, intermittent and reversible change, which is unlikely to occur. **Sensitivity**: Feature / receptor is generally tolerant of and can accommodate physical or chemical changes or other influences.

Traditionally, the **probability of an impact** occurring has also been considered in environmental impacts assessment process. The consideration of the following factors is equally relevant:

- the probability that an interaction will occur (capturing the probability that the impact will occur and also the probability that the feature will be present);
- the spatial extent of the interaction; and
- the temporal duration of the interaction.

Therefore, the probability that the feature will be present at the same time as the drought management action being implemented should be acknowledged. For example, the presence of migratory fish (and the risks to that feature) maybe lower in the winter months compared to the spring and summer months).

The **determination and qualification of impact**

The significance of an impact, can be determined by a combination of the above measures of ‘magnitude’ and ‘sensitivity’ of the environmental feature.

In practice, the determination and qualification of impact will carry a degree of subjectivity and expert judgement. This may be as a result of limited evidence/data on the sensitivity of features and/or the complexity of interactions that require assessment to determine the magnitude of change.

The significance ratings can be derived through a generic Impact Assessment Matrix (IAM) similar to that set out in Table I.2. This can also be described in a generic manner as presented in Table I.3 below. The generic descriptions also provide a greater understanding of the nature, scale and type of determined impact.

Table I.2: Impact Assessment Matrix

Feature's Sensitivity	Magnitude of Impact				
	Very High	High	Medium	Low	Very Low
Very High	Major	Major	Moderate	Minor	Negligible
High	Major	Moderate	Minor	Minor	Negligible
Medium	Moderate	Minor	Minor	Negligible	Negligible
Low	Minor	Minor	Negligible	Negligible	Negligible
Very Low	Minor	Negligible	Negligible	Negligible	Negligible

Table I.3: Generic Description of Significance Ratings

Level of Significance	Description
Major	Very large or large change in environmental or socio-economic conditions, which, if lost, cannot be replaced or relocated. The impacts are generally, but not exclusively associated with features and sites of national to regional importance because they contribute to achieving national / regional objectives. The impacts are likely to result in exceedance of statutory objectives and/or breaches of legislation (eg Likely Significant Effects or deterioration of WFD status).
Moderate	Intermediate change in environmental or socio-economic conditions. The impacts are likely to affect important considerations at a regional and local level. The impacts are unlikely to affect key decision making processes (eg statutory objectives). Nevertheless, the cumulative effect of such impacts may lead to an increase of overall effect on a particular area or on a particular features.
Minor	Small change in environmental or socio-economic conditions. These effects may be raised as local issues but are unlikely to be of importance in the decision making process.

Level of Significance	Description
Negligible	No discernible change in environmental or socio-economic conditions. The impact is likely to have a negligible or neutral influence, irrespective of other effects (eg within normal bounds of variation).

Table based on information from *(*DCLG) *Environmental Impact Assessment: A guide to good practice and procedures* (2006)

I.1.3 What to include in an environmental assessment report

We expect your environmental assessment report (EAR) to include the following as a minimum for each your supply-side drought management actions:

Summary

Details of the proposed action to maintain water supply. The location of the proposed site (eg for drought permit or order) should be presented on a map within your environmental assessment report. Important ecological sites that may be affected by the action should also be included.

Proposal

- Evidence to justify the proposed action(s); this should include the drought triggers and drought scenario relating to requiring the action (eg. likelihood of use)
- where there is a change to an abstraction or a discharge, the time of year and duration required, where it is from / to and which sites / water bodies and other abstractions (water users) will be affected
- any proposed and alternative measures such as different periods of abstraction or a lower hands-off flow (HoF)

Establish the baseline

- collecting information and describing the conditions in the absence of the proposed action, to inform the assessment of impacts.

Assessment of the impacts of your actions

Your assessment of the 'likely' impacts over time – short and long term including:

- the likely changes in hydrology (flow/level/channel dynamics), hydrogeological and geomorphological, due to implementing the action
- the features that are sensitive to these changes (eg important ecological features)
- potential impacts on sensitive features, including designated sites, priority species and habitats (ascertain if any likely significant effects)

- impact on WFD water body status or potential (defined by biological, physico-chemical and hydromorphological elements) and compliance with the requirements of the WFD including Articles 4.6 to 4.9.
- impact on Section 7 Biodiversity List and duty under Environment (Wales) Act
- impact on priority substances, priority hazardous and other pollutants
- the likelihood of the impacts being 'temporary or permanent '
- the risk of spreading invasive non-native species
- potential for cumulative effects (eg when combined with other actions in your plan and other abstractions likely to be taking place in that reach or area over a period of time).
- determine if more detailed assessment may be required, for example, an Appropriate Assessment for a Habitats Directive site
- impact on the well-being goals under Well-being of Future Generations (Wales) Act
- impact on aesthetics, recreation, navigation, archaeology and heritage

You should also include:

- evidence to support your environmental assessment
- any hydrological and geomorphological modelling undertaken
- describe the process used to select the data and the main sources of uncertainty.

Mitigation or compensation measures

Specific details of mitigation may only be determined once the nature of the drought and firm proposals for the action are understood. However, potential mitigation measures should be included in your environmental assessment, including, where possible, the conditions that will trigger their use. You will also need to include where legally required, compensation measures for the impacts where it's not possible to minimise or mitigate for them.

Potential impacts identified within the environmental assessment report as moderate or major can be regarded as significant and must be reduced through mitigation or compensation measures.

Any permissions and approvals required to carry out your measures should also be included in your environmental assessment.

Monitoring

You may include your pre, during and post drought monitoring (as outlined within your environmental monitoring plan) within this document. You should also include any data required to fill gaps in your understanding.

I.1.4 Levels of effort and reporting

The levels of effort (resources) to complete each environmental assessment can be determined by using the 'likely' significance of impact rating (eg overall impact assessment) and the likelihood of use, as described in Table I1.4 below.

Table I1.4 Describes level of effort

'likely' significance of impact rating (link to Table I1.3)	**Likelihood of use (linked to your drought triggers and scenarios)**		
	High (eg likely to be used under a worse historic drought events)	Medium (eg not likely to be used for decades)	Low (eg under the extreme drought scenario)
Major (*LSE*)			
Major (*no LSE*)			
Moderate			
Minor / Negligible			
Uncertain			

Key: amount of effort (resources) used to complete environmental assessment

Comprehensive
Standard
Minimal
To be determined

Comprehensive: we expect a comprehensive environmental assessment to be completed. The information included within the environmental assessment report should be drought permit or order application ready, including a detailed WFD 'deterioration' assessment, detailed environmental monitoring plan and accompanied by a 'full' appropriate assessment under HRA where *Likely Significant Effects* have been identified for the relevant features**.**

Standard: we expect a detailed environmental assessment to be completed. The information provided within the environmental assessment report to be drought permit or order application ready, including a detailed WFD 'deterioration' assessment and detailed environmental monitoring plan.

Minimal: we expect an environmental assessment to be completed that meets the requirements of the Drought Regulations and Directions, as set out in section 6.4, but does not have be drought permit ready. There are likely to be no further environmental monitoring requirements or additional assessments.

To be determined: additional evidence/data will be required to complete the environmental assessment and any additional assessment under WFD/HRA.

Appendix J: Environmental monitoring

Environmental monitoring data plays distinct roles in the drought planning process. You need to have appropriate data to assess the environmental risk (severity, sensitivity and likelihood) of your proposed actions, the potential role of mitigation and the overall risk of actions in your plan as a whole. This will comprise baseline monitoring in non-drought conditions and where possible, historical data collected during and after past droughts.

In advance of any drought (baseline) - monitoring data support the overall environmental assessment of your drought plan (eg Strategic Environmental Assessment), setting of drought triggers and environmental assessment of your individual supply-side actions (eg drought permits or orders).

In-drought monitoring - will enable you to assess the actual environmental impact of any actions you take.

Post-drought monitoring – will enable you to assess the long term impact, or recovery of the environment from your actions.

Environmental monitoring data include:

- ecological monitoring
- hydrological, hydro-geological and geomorphological monitoring (including flow, level, channel dynamics and sediment)
- morphological monitoring (including habitats)
- chemical and physico-chemical monitoring
- other monitoring eg fixed point photography

We expect you to carry out further environmental monitoring if:

- you do not have enough evidence/data to carry out an environmental assessment
- your actions present a moderate to major impact to protected habitats, species or designated sites and there is not enough monitoring in place to assess it

J.1.1 In advance of any drought (baseline)

The baseline data you use for your environmental assessment should be of a sufficient length to provide confidence in the results. This includes covering more than one previous drought where data are available. It may be appropriate to give more weight to more recent environmental monitoring data. This is because of environmental change (eg. water quality improvements) not associated with the hydrological cycle.

Ideally, you should assess environmental sensitivity using historical ecological and hydrological data (which may be from your own monitoring and, where available, from the regulatory authorities) to identify the environmental response to historical

droughts. This should be undertaken at sites(s) potentially affected by your drought action(s) and compared to suitable control locations not affected by your actions.

Where you have limited baseline data, such as some historical data that excludes drought events, your assessment will need to account for this. For example, you may combine available data for the potentially affected site with longer historical data records from comparable sites.

In some cases you may be able to complete the assessment but will need to note a higher degree of uncertainty. In other cases (low risk sites) expert judgement and analysis of data from comparable sites may be sufficient.

J.1.2 In-drought and post-drought monitoring

Monitoring of environmental features during and after the implementation of supply-side drought management actions should be prioritised to focus on the most sensitive features identified in the environmental assessment. Where sites have been assessed negligible or minor impact, further monitoring is not needed within the environmental monitoring plan.

For higher risk sites (moderate to major impacts), you should ensure that in-drought and post-drought monitoring:

- for Habitats Directive sites, data collected will be sufficient to demonstrate no adverse effect on the features
- for SSSIs will need to be sensitive enough to pick up the likelihood of damage at the site
- for WFD sites, data collected will be to assess any potential ‘deterioration’ to status and allow you to comply with the requirements of articles 4.6 to 4.9.

At these locations, control sites are important to provide a comparison between the ‘natural’ impacts of the drought and the impacts of supply-side action. Where possible, we recommend maintaining continuity of data by using the same survey sites as those used in the environmental assessment; this will also strengthen data analysis.

Separating the 'natural' impacts of a drought from those resulting from the implementation of drought management actions can be very complex and made more difficult where data problems and/or a lack of hydroecological understanding exists. We expect you to ensure that your environmental monitoring plan is adequate to assess the most significant environmental impacts of your proposed drought actions and associated mitigation measures.

After a drought, your in-drought and post-drought monitoring forms part of the baseline and contributes to improvement of your drought plan.

J.2.1 Environmental monitoring plan

You should produce an environmental monitoring plan that includes details of:

- the data and sources of information used to understand environmental sensitivity to drought and describe non-drought (baseline) conditions
- a summary of additional monitoring requirements before an application for a drought permit or order
- the status of the environmental assessment and to what extent it will be updated when your supply-side action are prepared and implemented
- uncertainties with the assessment, how these have been assessed and how they will be reduced in future (for example by further monitoring and assessment)

Your environmental monitoring plan should cover all the stages of drought planning and monitoring from normal, in advance of any drought, in-drought and through to post-drought (recovery). During a drought you may increase frequency of monitoring and analysis. Your environmental monitoring plan should set out:

- the feature(s) to be monitored
- the location of survey sites (including maps)
- the timing, frequency and methods of monitoring
- who will undertake the monitoring

You will also need to state how you will use new monitoring data to improve you understanding of:

- the normal (non-drought) conditions at a site / water body
- the environmental sensitivity of a site / water body
- how you will assess the environmental impacts of your action during and post drought
- how you will use the data collected to re-evaluate and refine your drought triggers and mitigation measures (if relevant)

Your environmental monitoring plan should be agreed by Natural Resources Wales and/or the Environment Agency, and if relevant Natural England. This is to ensure that there is sufficient time to deal with any issues or gaps in understanding before a drought event occurs. The environmental monitoring plan should be updated when data from planned surveys are completed, and an annual light-touch review of the plan is recommended to ensure this information in included.

Appendix K: Drought communications audiences

This list is not exhaustive and includes a sample of relevant audiences.

Group	Organisation
Domestic and commercial customers	Private customers
	Consumer Council for Water
	Citizens Advice Bureau
Regulators	Natural Resources Wales and/or the Environment Agency
	Ofwat
	Welsh Government
	Defra
	Drinking Water Inspectorate
	Natural England
Environmental and other relevant interest organisations and groups	Local wildlife groups and campaign groups
	Friends of the Earth
	WWF
	RSPB
	Resource Efficient Wales
	Angling Trust
	Local fisheries bodies and groups
	Waterwise
	Cadw
	National Trust
	National Parks
MPs and Local Authorities	Councils
	MPs, AMs
	MEPs
Representative bodies	eg Confederation of British Industry, NFU, FUW, Chambers of Trade and Commerce, Countryside Landowners and Business Association, Horticultural Trade Association
Community based institutions and organisations	Parish Councils
	Town Councils
Public services	Public Service Boards
Press and media	TV
	Radio
	Newspaper
	Internet based
Water Companies	Neighbouring water companies
Sports and interest groups	Angling clubs
	Canoe clubs
Waterways and navigation	Port authorities
	Canal & River Trust

Published by:
Natural Resources Wales
Cambria House
29 Newport Road
Cardiff
CF24 0TP

0300 065 3000 (Mon-Fri, 8am - 6pm)

enquiries@naturalresourceswales.gov.uk
www.naturalresourceswales.gov.uk