Drought Plan 2019
Technical Summary

July 1, 2019
Version 1

from
Southern
Water

Contents

Executive Summary

Our Drought Plan sets out the activities Southern Water (the company) will implement to manage the impacts of drought, based on current circumstances and existing infrastructure. This plan covers the five year period from 2019, unless the plan is reviewed before then.

This is a technical summary of our 2019 Drought Plan. We consulted on our draft Drought Plan for 8 weeks from 5 March 2018 to 30 April 2018. Following the consultation, we prepared and published a Statement of Response, and submitted a revised draft Drought Plan to the Secretary of State. These were considered by the Secretary of State and we were directed to publish our final Drought Plan on 25 February 2019.

The Drought Plan is consistent with the company's target levels of service which were previously published in our 2014 Water Resources Management Plan (WRMP), which is a strategic plan that sets out how we will provide a constant supply of high quality drinking water for our customers over a minimum 25 year period by managing the demand for water and developing permanent water resources schemes where necessary. Our WRMP is also being updated and we expect to publish our final plan in 2019 subject to receiving Secretary of State approval to do so.

The Drought Plan includes information on the following:

- How we define a drought and the trigger levels we use to determine the status of our water resources and the corresponding activities we should be undertaking.
- Customer and stakeholder communication during a drought and the consultation the company will undertake during a drought, including working with neighbouring water companies.
- Demand management activities we will promote to conserve water.
- Activities we will undertake to maintain or increase the amount of water available to us, and an assessment of how these could impact the environment and how we propose to monitor and mitigate this.

The Drought Plan is designed to set out the measures we will employ to meet the needs of customers and to protect the environment. It follows a range of guidance and legislation, including the Environment Agency's Drought Plan Guidance (2015) and the requirements of the Water Industry Act 1991 (as amended by the Water Act 2003).

Updates since our previous (2013) Drought Plan

We have made the following changes and improvements in this plan compared to our 2013 Drought Plan:

- We have undertaken detailed environmental assessments for all our Drought Permit and Order options, working closely with the Environment Agency (EA) and Natural England (NE)
- We have used our stochastically generated sequence of rainfall events to test our water supply system and when drought options would be needed
- We have reflected the approved licence changes to the Rivers Test and Itchen and outcomes of the Hampshire Abstraction Licences Public Inquiry held in March 2018 and the agreement reached between Southern Water and the Environment Agency, formalised in an operating agreement under Section 20 of the Water Resources Act 1991 (s20 agreement).
- As a result of the above, we have included Drought Permit and Order options in Hampshire

(in our Western area) for the first time, due to changes to our abstraction licences in the area

- We have re-organised the structure of our plan to make it more accessible and customer focussed. This includes producing a non-technical summary.
- We have developed draft Drought Permit and Order applications and a methodology to speed up the process of applying for a Drought Permit or Order, focussed on the Western area. Our 'application ready' approach includes each area having a generic 'Statement of Reasons' and 'application pack'
- We have included our Drought Plan options within the appraisal of new supply and demand options for our next WRMP, which is due in 2019. This will help us show what drought events the WRMP19 will cover and which will be covered by the Drought Plan
- We have adopted the common exemptions to water use restrictions agreed by all water companies following publication of the UKWIR document "Managing through Drought: Code of Practice and Guidance for Water Companies on Water Use Restrictions 2013" (published 2014).

1. Introduction to our Drought Plan

1.1 Drought Plan documents

We have organised our Drought Plan documents to make them more accessible and this includes presenting the plan on three levels, as follows:

- **Level 1: Non technical summary of the Drought Plan** – customer and stakeholder focused, high-level outline of our Drought Plan, with a focus on restrictions and activities that would affect customers
- **Level 2: Technical summary of the Drought Plan** – this links to the Level 3 technical annexes for further information and summaries of the Strategic Environmental Assessment (SEA), Habitats Regulations Assessment (HRA) and Water Framework Directive (WFD) assessments of the Drought Plan
- **Level 3: Technical annexes to the Drought Plan** - technical reports covering specific sections of the Drought Plan

Information about our plan and links to our Drought Plan documents are available on our website (https://www.southernwater.co.uk/our-drought-plan).

1.2 What is a drought?

Droughts are naturally occurring events and are typically characterised by a prolonged period of abnormally low rainfall, leading to a shortage of water.

The Environment Agency's definition of drought is as follows: *"A drought happens when a period of low rainfall creates a shortage of water for people, the environment, agriculture, or industry."*

Droughts can be of differing duration and intensity, for instance a short event caused by a hot, dry summer, or a drought over several years where persistent low rainfall may result in a lack of replenishment of water resources. The spatial extent of droughts can also vary widely, from being concentrated in a few catchments, to covering wider areas, such as South East England or the whole country.

While there is no technical reason why sufficient water supplies cannot be provided to cover all but the most extreme droughts, there is a trade-off between the costs of providing the required infrastructure to maintain supplies in severe droughts and the potential impact on the environment.

Therefore, to manage droughts of differing severity, water companies plan to use a range of drought management interventions, which include demand restrictions, supply-side measures and operational management of their sources.

1.3 Purpose of a drought plan

A drought plan is defined by the Water Industry Act 1991 (as amended by the Water Act 2003) 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'.

Under sections 39B and 39C of the Water Industry Act 1991 (as amended by the Water Act 2003),

water companies are required to prepare and maintain statutory drought plans. The drought plan sets out the operational steps a water company will take before, during and after a drought to maintain essential water supplies to customers.

The drought plan identifies triggers that act as decision points for implementing a range of drought management actions. The nature of the triggers varies for each water resource zone (WRZ), and the nature of the drought management actions that will be considered also varies depending on the prevailing drought conditions.

1.4 Development of this plan

Figure 1.1 shows the process we have undertaken to develop our Drought Plan. We published our last Drought Plan in February 2013. There have been significant changes to the availability of water resources in Hampshire since the last plan, as a consequence of changes to abstraction licences relating to the River Test, River Itchen and Candover boreholes. We have had to consider further drought intervention options in Hampshire in order to be able to maintain supplies to customers following the implementation of the licence changes, and pending our development of new long term solutions through the WRMP. There has also been further updates on the guidance for writing drought plans which we have taken account of.

We published our draft Drought Plan for consultation on 5 March 2018. Following feedback from the public consultation, we prepared a Statement of Response and a revised draft Drought Plan (and associated SEA, HRA and WFD assessments). The Drought Plan was updated to reflect the licence changes to the Rivers Test and Itchen, approved on 25 February 2019. This followed the Hampshire Licences Public Inquiry held in March 2018 and the agreement reached between Southern Water and the Environment Agency as part of the inquiry process, formalised in an operating agreement under Section 20 of the Water Resources Act 1991 (s20 agreement).

This document is our final Drought Plan, following approval to publish by the Secretary of State on 25 February 2019 subject to completing further work relating to three technical areas. We have added further information to our plan to address these issues which relate to the environmental assessment of drought permits and drought orders, drought control curves and bulk transfers. We have also added information in relation to commitments made in our Statement of Response.

In relation to the environmental assessment of our drought options we have updated and completed the Environmental Assessment Reports (EARs) of our Drought Permit and Order options, and are ‘application ready’ for the highest priority drought options in our plan. We have also updated our Strategic Environmental Assessment (SEA), Habitats Regulations (HRA) and Water Framework Directives (WFD) assessments of those options (these are included as annexes to our final Drought Plan). We have also updated Annex 5 (Environmental Monitoring Plan) to reflect the progress made with finalising a baseline monitoring programme following discussions with the Environment Agency and Natural England, and we have included an updated timetable for agreeing and implementing specific mitigation measures.

We have included further information in Annex 1 to reflect the 35 day and 60 day lead in times for a Test surface water Drought Permit application as set out in the Section 20 Operating Agreement (s20 agreement) between Southern Water and the Environment Agency. We have also provided further information to ensure it is clear what each drought trigger level represents.

In relation to bulk transfers we have confirmed, in Annex 4, the reliability of the new Portsmouth Water bulk supply into our Hampshire supply area. We have also provided more details of the status of existing bulk supply contracts, where we are working to update some of these, and how we will

incorporate ‘pain share’ arrangements to improve clarity on how they will be operated during drought events.

For those Drought Orders included as part of Annex 4 to the Section 20 Agreement, detailed discussions have taken place with Natural England and the Environment Agency to develop compensation packages and associated implementation timetables for each Drought Order. The scale and technical nature of the measures constituting the compensation package expected for the Lower Itchen and Candover Drought Orders were largely agreed in draft with the Environment Agency and Natural England at the Public Inquiry in March 2018. Agreement on the nature of the measures has been reached through further discussion with the Environment Agency and Natural England during 2018-2019, and further discussions regarding the implementation of the measures have been ongoing during 2019. As the compensation measures involve habitat creation in the river or within the riparian area, it means they should be implemented before a drought starts developing. However it is also recognised that the actual risk of either of the two Drought Orders being required is remote: they should only need to be implemented if a severe drought develops. It has also been agreed this is a special case of interpretation of the pertinent law and expectations; there is no precedent. Balancing all these issues, Southern Water has committed to a ten year implementation schedule of the compensation measures package for both the Drought Orders, with periodic reviews of progress and future risks. The Environment Agency and Natural England have agreed this approach. At the time of finalising this Drought Plan, the final wording of the IROPI Compensation Package documents was being refined for final agreement and sign-off. The implementation phase will then commence.

More information on the work we have undertaken is in included in Annex 8: Engagement and Consultation.

The Drought Plan guides Southern Water’s response to any drought events that may arise from 2019 until the plan is next reviewed.

We are also updating our Water Resources Management Plan (WRMP) and expect to publish our final WRMP in 2019. Further details of the relationship between this Drought Plan and the WRMP are discussed in section 2.4.

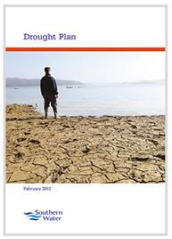
1.5 Consultation approach

Pre-consultation

As set out in Figure 1.1, under Section 39B(7) of the Water Industry Act 1991, prior to preparing its drought plan, each water company must consult with the Environment Agency, the Authority (Ofwat), the Secretary of State (Defra), and any licensed water supplier which supplies water to premises in the undertaker’s area via the undertaker’s supply system.

Figure 1.1 : Our drought planning journey

1



Our last drought plan was published in 2013.

2

We developed a new way to help us plan for future droughts.

3

We've talked to our customers, interested groups and industry regulators to hear their views.

4

Our drought plan was updated for consultation.

5

We held an eight-week public consultation on this plan between March and April 2018.

6

We reviewed the feedback from the consultation and update the plan.

7

We published our updates and a Statement of Response in June 2018.

8

Department for Environment Food & Rural Affairs

We sent the updated plan to Defra for approval.

9

We published our final drought plan.

We took the opportunity to widen the scope of this pre-consultation phase prior to the preparation of our draft plan. We wrote to the following organisations inviting their comments:

- statutory consultees: Environment Agency, Defra, Ofwat, and Natural England
- other stakeholders: Thames Water, Wessex Water, South East Water, Affinity Water, South East, SES Water, Bournemouth Water, Portsmouth Water, and the Consumer Council for Water.

Responses to our pre-consultation letter were received from:

- Environment Agency
- Defra

In addition, we worked closely with the Environment Agency and Natural England to assess the potential environmental impact of the measures in our Drought Plan and to develop detailed Environmental Assessment Reports (EARs) for our Drought Permit and Drought Order options.

During December 2016, we undertook a consultation on our approach to the Strategic Environmental Assessment (SEA) and Habitats Regulation Assessment (HRA) for the draft Drought Plan 2018.

Comments on the SEA Scoping Report were received from the following organisations:

- Natural England
- Environment Agency
- Historic England
- Hampshire and Isle of Wight Wildlife Trust
- Sussex Wildlife Trust
- WWF

The full schedule of our meetings with regulators, including the Environment Agency and Natural England is captured in Annex 8: Engagement and consultation.

In addition, we also considered the opinions of our customers, community representatives and wider stakeholders when developing this plan.

Our consultation, which was conducted as part of wider engagement on the company's future planning and business-as-usual engagement included:

- workshops, panels and face-to-face meetings with interested groups and individuals
- customer research using apps at home
- customer focus groups and discussions
- focused research with young people and businesses.

In addition, we considered the results of research with customers following the 2011-12 drought and introduction of Temporary Use Bans for the first time, and feedback we incorporated during the development of our previous Drought Plan.

The overarching results of this engagement from customers and stakeholders were the following

responses:

- there is an understanding that there will be severe droughts which cannot be avoided
- the restrictions are thought to be appropriate, even though they are not desirable
- customers don't want us to invest more to avoid droughts if it will increase bills significantly
- rota cuts to ration water are only thought to be acceptable in extreme circumstances
- we should balance the needs of customers, the environment and the economy.

Consultation on our draft Drought Plan

We consulted on our draft Drought Plan between 5 March 2018 and 30 April 2018.

We undertook a range of consultation activities to engage with everyone who may be impacted by the actions contained in the draft Drought Plan. It included all domestic and commercial customers of Southern Water, retail partners, community representatives, environmental groups and wider stakeholders and regulators. The outcome of that consultation is included in Annex 8 to the Drought Plan.

Further reading: Annex 8: Engagement and consultation

2. Setting the scene

2.1 Southern Water's supply area

Southern Water provides water supplies to just over 2.4 million customers across an area of 4,450 square kilometres, extending from east Kent, through parts of Sussex, to Hampshire and the Isle of Wight in the west. In normal conditions, our supplies come from the following sources.

Groundwater abstractions

Water supplies are predominantly reliant on the transmission and storage of groundwater from the widespread chalk aquifer that underlies much of the region. This extends throughout parts of Kent, Sussex, Hampshire and the Isle of Wight and makes up 70% of the total water supply.

River abstractions

River abstractions account for 23% of the water supplies, most notably: the Eastern Yar and Medina on the Isle of Wight; the Rivers Test and Itchen in Hampshire; the Western Rother and Arun in West Sussex; the River Eastern Rother and River Brede in East Sussex; and the River Teise, River Medway and Great Stour in Kent.

Reservoir abstractions

Four surface water storage reservoirs provide the remaining 7% of water supplies: Bewl Water, Darwell, Powdermill and Weir Wood. The total storage capacity of these four reservoirs amounts to 42,390 million litres. South East Water is entitled to 25% of the yield from the River Medway Scheme, which incorporates the storage within Bewl Water reservoir.

Rainfall is integral to the maintenance of water supplies despite the South East being one of the driest regions in the UK. During winter, when most of the effective rainfall occurs, groundwater reserves are recharged naturally through infiltration processes. Rain infiltrates through the soil to recharge the natural storage in the underlying groundwater to support river baseflows for the following year. Annual rainfall averages 730 millimetres across the Southern Water region. Rainfall experienced outside of winter is of less value to groundwater recharge as it is mostly lost to evaporation, plant transpiration or runs off directly into rivers from the land.

2.2 Water resource zones

Water companies also prepare long-term Water Resources Management Plans that set out forecasts of demand and reliable water supply, with forecasts calculated at the level of water resource zones (WRZs). Figure 2.1 shows Southern Water's area of supply and how this is divided into 14 water resource zones. All the customers within a water resource zone have the same risk of loss of supplies. The 14 WRZs are amalgamated into three larger, sub-regional supply areas in the Water Resources Management Plan by virtue of the connectivity that exists between some of the WRZs. For the purpose of this Drought Plan we treat the three water supply areas as our drought management areas.

- Western area – comprising the following seven WRZs:
  - Hampshire Andover (HA)
  - Hampshire Kingsclere (HK)
  - Hampshire Winchester (HW)
  - Hampshire Rural (HR)
  - Hampshire Southampton East (HSE)
  - Hampshire Southampton West (HSW)
  - The Isle of Wight (IW).
- Central area – comprising the following three WRZs:
  - Sussex North (SN)
  - Sussex Worthing (SW)
  - Sussex Brighton (SB)
- Eastern area – comprising the following four WRZs:
  - Kent Medway West (KMW)
  - Kent Medway East (KME)
  - Kent Thanet (KT)
  - Sussex Hastings (SH)

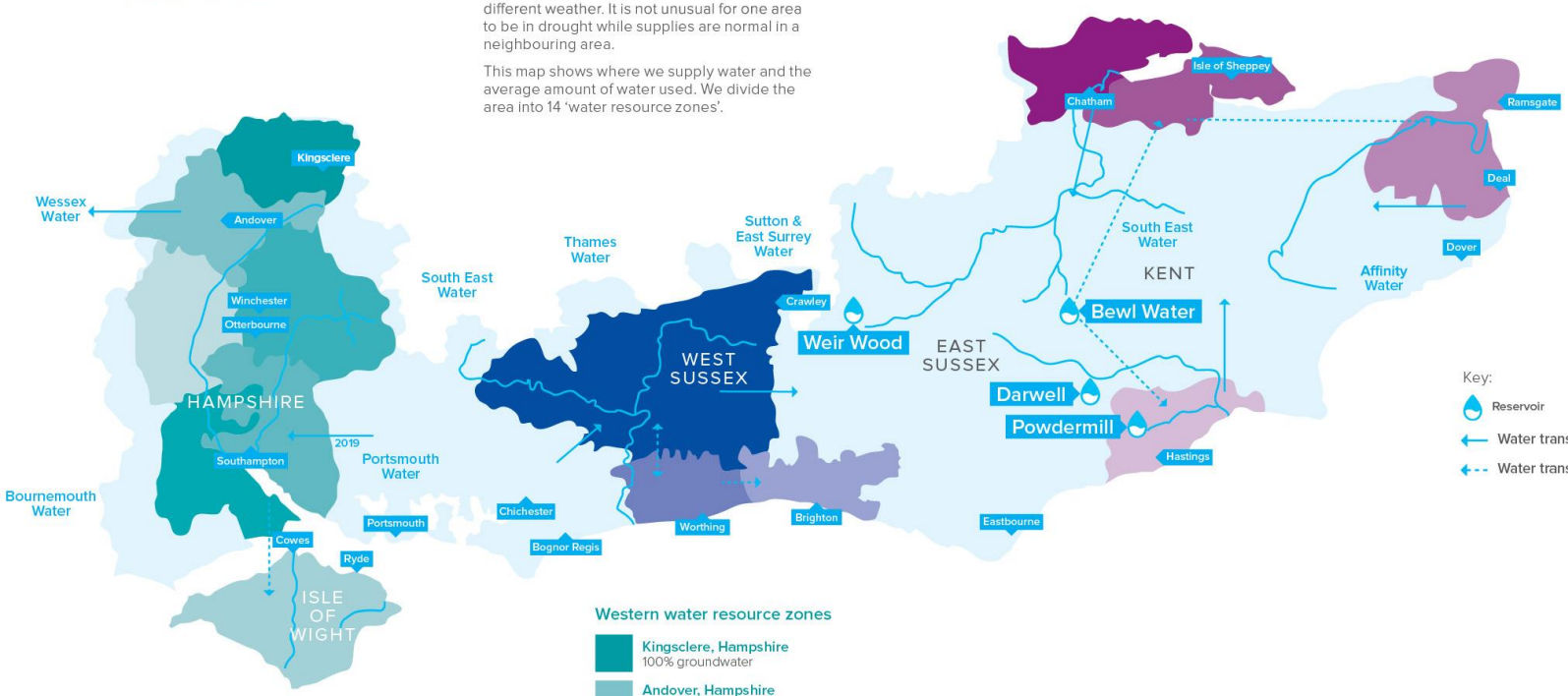
Southern Water's supply area is bounded by eight other water companies (Thames Water, Wessex Water, Cholderton and District Water, South East Water, Affinity Water, SES Water, Bournemouth Water and Portsmouth Water). A number of bulk water supplies are made between Southern Water and several of these adjacent companies.

Figure 2.1 : Southern Water's Supply Area

We supply water to more than one million homes and businesses in Kent, Sussex, Hampshire and the Isle of Wight.

Most of the region is officially classed as 'water-stressed', which means that at times the demand for water can be higher than the amount available. However, each county also has different water sources and experiences different weather. It is not unusual for one area to be in drought while supplies are normal in a neighbouring area.

This map shows where we supply water and the average amount of water used. We divide the area into 14 'water resource zones'.



Central area

Brighton, Worthing and surrounding areas take all their water from groundwater, while north Sussex has a mix of water from rivers, groundwater, a reservoir and a water supply from Portsmouth Water.

Metered water use per person per day: 137 litres

Unmetered water use per person per day: 163 litres

Central water resource zones

- **North Sussex** 35% groundwater, 51% river, 8% reservoir, 6% transfers
- **Worthing, Sussex** 98% groundwater, 2% transfers
- **Brighton, Sussex** 100% groundwater

Western area

North Hampshire takes all of its water from groundwater. South Hampshire takes one-third from groundwater and two-thirds from the River Test and the River Itchen. The Isle of Wight takes its water from the River Yar, the River Medina and groundwater, but also relies on water pumped across from south Hampshire for a third of its drinking water.

Metered water use per person per day: Hampshire – 135 litres Isle of Wight – 115 litres

Unmetered water use per person per day: Hampshire – 143 litres Isle of Wight – 194 litres

Western water resource zones

- **Kingsclere, Hampshire** 100% groundwater
- **Andover, Hampshire** 100% groundwater
- **Isle of Wight** 47% groundwater, 23% river, 30% transfers
- **Rural Hampshire** 100% groundwater
- **Winchester, Hampshire** 100% groundwater
- **Southampton East, Hampshire** 52% river, 48% groundwater
- **Southampton West, Hampshire** 100% river

Eastern area

In Kent, Medway East, Medway West and Thanet take most of their water from groundwater and the rest from the River Medway, some of which is stored in Bewl Water reservoir and later released into the River Medway. Hastings in Sussex takes most of its water from Darwell Reservoir and Powdermill Reservoir, with the rest from groundwater. Water is transferred by pipeline from Medway to Thanet, and from Medway to Hastings.

Metered water use per person per day: 124 litres

Unmetered water use per person per day: 158 litres

Eastern water resource zones

- **Medway East, Kent** 100% groundwater
- **Medway West, Kent** 56% river and reservoir 44% groundwater
- **Thanet, Kent** 77% groundwater, 2% river, 21% transfers
- **Hastings, Sussex** 5% groundwater, 79% reservoir, 16% transfers

2.3 How droughts affect our water resources

All of our sources rely on sufficient rain for us to supply water. The big difference between our three main types of water resources - groundwater, rivers and reservoirs - is the speed at which they respond to rain or the lack of it, as shown in Table 2.1.

Table 2.1 Water resource types and drought response

Resource type	Water source	Water source type	Speed of response to rainfall events		Resilience Level
Groundwater	Underground water-bearing rocks (aquifers)	Chalk (83% of groundwater abstraction)	Generally slow Due to the time it takes for rain to percolate through the ground there is typically a lag between rain and an increase in groundwater levels. An exception to this occurs when cracks (fissures) in the chalk aquifer allow rain to refill local sources more quickly		Can be resilient for up to two dry winters in a row.
		Greensand (17% of groundwater abstraction)			
Rivers	Rivers rely on a mixture of groundwater and water running off the land when it rains	Groundwater dominated	E.g. River Test	Rivers that have a higher ratio of groundwater to surface water tend to respond slower to rainfall but maintain higher flows for longer	Dependent upon ratio of surface water to groundwater flow. Generally resilient to one dry winter. Recover quickly when drought ends
		Mix of groundwater and surface water	E.g. River Rother		
		Surface water dominated	E.g. River Medway	These rivers tend to be flashy, responding quickly to rainfall but they also enter low flow situations more quickly. We release water from Bewl Water reservoir into the Medway in the summer to allow our abstraction to continue in low flows	
Reservoirs	Reservoirs are filled using pumped water from rivers and land run off water	Bewl Water Darwell Weir Wood Powdermill	Reservoirs, which are refilled through pumping from rivers and from natural catchment inflows, will respond more quickly than groundwater. Weir Wood, which is only refilled from surface water inflows, is dependent upon saturation of the surrounding catchments		Dependent upon reservoir size, Bewl Water reservoir is resilient for up to two dry winters.

Note: we define resilience in this context as the ability of a water source to cope with and/or recover from lack of rain to continue providing supplies for people now and in the future, without harming the environment.

2.4 Relationship with the Water Resources Management Plan

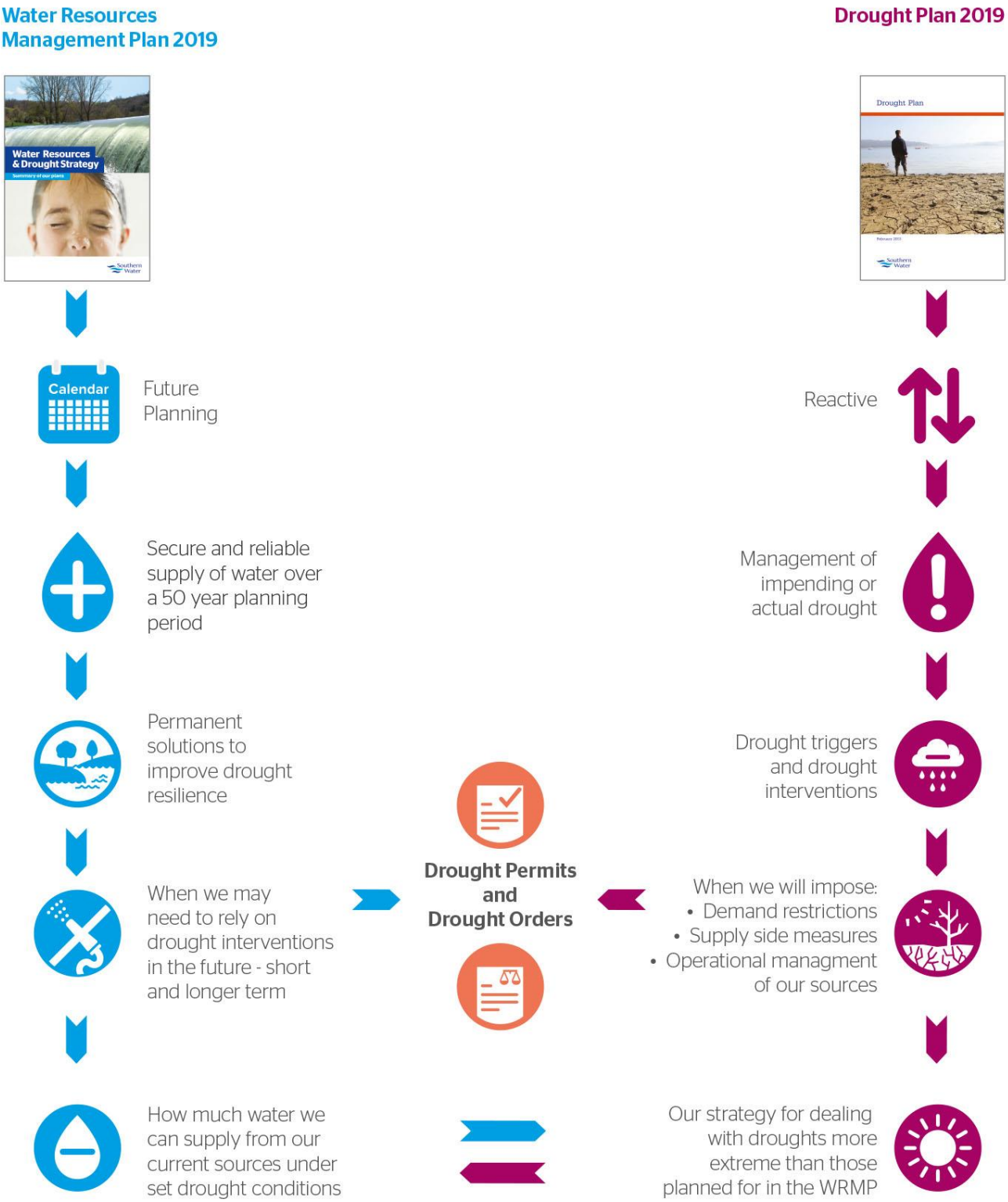
Our Water Resources Management Plan (WRMP) sets out the interventions we will develop to ensure a constant supply of high-quality drinking water to customers.

The WRMP ensures we have a long term plan to be resilient to drought and the Drought Plan sets out the operational steps that can be taken over the short term if droughts occur outside the range of droughts we have planned for in the WRMP. In some situations we might be able to bring forward new permanent schemes that are being delivered to meet our long term WRMP strategies in order to overcome short term drought events.

We are updating our 2014 WRMP and expect to publish the final version of our new WRMP in 2019, subject to Secretary of State approval to do so. A draft WRMP19 was consulted upon from March – May 2018. We published our Statement of Response, and submitted a revised draft WRMP to the Secretary of State, in September 2018. We provided further information to the Secretary of State in June 2019.

The drought options described in this Drought Plan are included within the WRMP, as this helps us clearly show which events the WRMP will cover and which events the Drought Plan will cover. Figure 2.2 shows how our WRMP and Drought Plan interact.

Figure 2.2 : How our Water Resources Management Plan and Drought Plan interacts



3. Our Western area abstraction licences

3.1 Licence changes

Southern Water's 2014 WRMP proposed to accommodate changes required to three abstraction licences in the River Itchen catchment (Lower Itchen surface water, Lower Itchen groundwater and Twyford groundwater), required to satisfy the Habitats Regulations as set out in the Environment Agency's River Itchen Site Action Plan (2007).

The licence changes include new monthly abstraction limits for June, July, August and September and a new 'hands-off' flow condition of 198Ml/d (as measured at the Environment Agency flow gauging station at Allbrook and Highbridge). Abstraction under the three licences must cease if the flow falls to this level. During drought, as flows fall toward 198Ml/d, the three abstractions will have to be managed (curtailed) to help maintain flow above 198Ml/d. In severe and extreme drought it is expected that all three abstractions will be reduced and may have to cease. This means the 'deployable output' is significantly reduced and the WRMP baseline supply-demand balance scenarios fall into deficit.

More recently, in June 2017, the Environment Agency also notified the company of changes it proposed to make to the company's River Test surface water abstraction licence. These changes reduce the deployable output of that source to zero in severe drought, and cause significant reduction in deployable output in less severe droughts. The Environment Agency also notified the company of changes to its own licence for the Candover boreholes, the effect of which reduces the water potentially available from those sources.

Until permanent replacement supplies can be implemented the company would be dependent on Drought Permits or Orders to temporarily relax or remove the new licence conditions during drought. This requirement could occur frequently. The company's 2019 WRMP would include necessary schemes (both demand management and resource development) to maintain the supply-demand balance. Once the WRMP solution is implemented the impact of the licence changes on the supply-demand balance is reduced such that there is no additional risk over and above that of the planned levels of service of the WRMP and Drought Plan.

However, the company was concerned that if the abstraction licence changes were implemented before the WRMP solution, the supply-demand balance deficit increases the risk of needing to apply for and implement Drought Permits and/or Orders. As a result, the company registered objections to the proposed timing of the licence changes on the Itchen and the Test (and changes proposed to the Environment Agency's Candover augmentation scheme licence) and following a request by Defra, a Public Inquiry was held in March 2018.

3.2 River Itchen, River Test and Candover abstraction licence Public Inquiry

The Public Inquiry was instigated following representations by Southern Water to the Environment Agency's proposed variations to a series of its abstraction licences. The need for licence changes for more sustainable abstraction was not a principle that was opposed by Southern Water.

The company's concern was that, particularly during times of drought, the conditions were such that they had the potential to impede the ability for the company to meet its statutory duties to supply public water.

The Inquiry opened on March 13, 2018. It focused on a proposed operating agreement between Southern Water and the Environment Agency (EA) under Section 20 of the Water Resources Act 1991 (the s20 agreement"). The s20 agreement had been drafted following submissions of evidence to the Inquiry in the preceding weeks and as a result of both parties reaching a better understanding the critical issues presented by the other.

During the course of the Inquiry the s20 agreement was finalised and an outline package of monitoring, mitigation and IROPI compensation measures prepared. (An explanation of IROPI - imperative reasons of overriding public interest under the Habitats Directive is provided in Annex 11).

The s20 agreement was signed and presented to the Inquiry at its closure on 29 March 2018. Following consideration of the Inquiry Inspector's report, the licence changes were approved by the Secretary of State on 25 February 2019.

3.3 The s20 agreement

The Section 20 (s20) agreement, signed by Southern Water and the Environment Agency under Section 20 of the Water Resources Act 1991, enables a new, positive way forward for both parties, for public water supplies and for the habitats and ecology of the River Itchen and River Test. Southern Water accept the abstraction licences changes. The EA commits to procedural reassurances around how Southern Water can utilise the Drought permit and Drought order process to maintain public water supplies pending the implementation of new reliable water supplies to replace the water resource lost by the licence changes. This is therefore a short to medium term solution for the duration of the s20 Agreement. It is not a permanent arrangement and is referred to within the s20 agreement as the "interim abstraction scheme". These drought options have been incorporated into the revised draft WRMP, and will be in the final 2019 WRMP.

Southern Water has also committed to a significant package of environmental monitoring, mitigation and compensation measures associated with the potential Drought Permits and Drought Orders that may be needed over the next ten years or so. It has been agreed that many of these measures will be carried out in advance of (and irrespective of the implementation of) any Drought Permit or Drought Order meaning that there is an overall positive benefit to the environment.

The main elements of the s20 agreement are as follows.

Southern Water has agreed to:

- Accept all of the EA's proposed licence changes, to be implemented immediately (upon the Secretary of State's determination).
- Use all best endeavours to implement the long term scheme for alternative water resources set out in its final Water Resources Management Plan 2019
- Rely on the use of Drought Permits and Drought Orders on the River Test and River Itchen during the interim period while long-term resources are developed, by following the procedure as set out in the s20 agreement. For the avoidance of any doubt, the agreed procedure does NOT vary the statutory requirements for such applications but agrees the timing of drought permit applications to the Environment Agency and a set of principles to ensure that this process can be used and relied on more effectively.
- Ensure that the River Test surface water Drought Permit is reviewed every 6 months, to ensure that it is 'application ready'.
- Accept that on the basis of current ecological evidence a likely significant effect and adverse

effect on the integrity of the Itchen SAC cannot be ruled out from the operation of the Candover Drought Order

- Commit a substantial package of environmental monitoring, mitigation and potential IROPI compensation measures in respect of the Drought Permits and Drought Orders.

The Environment Agency has agreed to:

- A timetable for the acceptance and determination of the River Test Drought Permit (35 days or less in the case of extreme urgency)
- Accept that at the time of the application:

  (a) Water use restrictions do not have to be in place (and only have to be in place at time of implementing the permit),;

  (b) The case for 'exceptional shortage of rain' can include a forecast component (c) The refusal of access by landowners for monitoring and/or mitigation is not a detriment to being 'application ready'
- Accept that Southern Water's proposed Candover scheme could be implemented under a Drought Order during the interim period..
- Accept a 'force majeure' clause within the abstraction licences, so that Southern Water will be allowed to abstract above the new licence limits, should certain events or incidents (as defined in the s20 agreement) develop outside of Southern Water's control, and it is necessary to maintain public water supplies.
- Use Article 4(6) of the Water Framework Directive in principle to enable the grant of a Test surface water Drought Permit authorising abstraction; and to accept that low flows on the River Test of between 355 Ml/d and 265 Ml/d are capable of constituting exceptional circumstances for the purposes of Article 4(6) WFD.
- Accept that subject to a material change of circumstances and until long-term solutions are implemented, Southern Water has a good case that it has no alternative solutions to its Candover and Itchen Drought Order schemes in order to maintain public water supply and that the schemes satisfies the test in Article 6(4) Habitats Directive, for an imperative reason of overriding public interest (IROPI).

In addition the s20 agreement establishes a number of principles that are agreed between the Environment Agency and Southern Water. The most significant being:

- The Test, Candover and Itchen Interim Abstraction Scheme – This is the sequencing in which Southern Water plans to implement drought actions. It is subject to the principle that Southern Water will take into account ecological conditions (based on up to date monitoring data) in deciding the order of Drought Orders. This scheme has been incorporated throughout this Drought Plan.
- Southern Water to investigate diurnal variation of abstraction from the River Test to identify any potential impacts on fish migration (to conclude mid-2021, the results of which will aim to be utilised when preparing future drought and water resource management), as part of the National Environmental Programme.

Southern Water's monitoring commitments

The package of measures is documented in Annex 5.

This includes supplementing existing monitoring by other parties with a further network of:

- Hydrological monitoring (flows, velocities and groundwater water levels).
- Water quality modelling (including temperature).
- River, riparian and wetland ecological modelling, including fish monitoring.

The Environment Agency has also agreed to perform some of the monitoring commitments.

All of the commitments identified in the respective monitoring packages will be funded by Southern Water.

The monitoring plans have been approved by the Environment Agency and Natural England.

Southern Water's mitigation commitments

The package of measures is documented in Annex 5.

Up front mitigation commitments will be implemented by 2023-24. This is irrespective of whether need for the Drought Permits or Drought Orders arises by then. They will improve ecological resilience on a permanent basis on both the River Test and River Itchen, including the Candover.

The schemes have been approved by the Environment Agency and Natural England. These are documented in Annex 5 and are intended to be implemented in partnership with the EA and other delivery partners such as the Hampshire and Isle of Wight Wildlife Trust. The majority of implementation will be led by the EA, with some specific enhancements for southern damselfly and white clawed crayfish to be delivered by the Wildlife Trust. Again these works will be funded by Southern Water.

The Test and Itchen Catchment Partnership and the Watercress and Winterbournes Landscape Partnership Scheme (operating in the headwaters of the Test and Itchen), will also receive additional funding from Southern Water to help deliver some of the agreed mitigation commitments. The organisations involved in these partnerships will prioritise, agree, and implement works across the catchment that are complementary to the mitigation works outlined above.

The package of measures will include:

- White Clawed Crayfish habitat and population enhancement
- Southern Damselfly habitat and population enhancement
- River restoration and general habitat and ecological resilience enhancement.

Southern Water's IROPI compensation commitments

The Environment Agency in the s20 agreement has agreed in principle to Southern Water's case for an imperative reason of overriding public interest under the Habitats Directive (considered in greater detail in Annex 11).

The need for a Drought Order may or may not in reality materialise. Nevertheless, a set of compensation commitments have been agreed, intended to be put into operation ahead of implementing the Candover and Itchen Drought Orders. The delivery timetable has been agreed with the Environment Agency and Natural England and the company will work closely with the Environment Agency, Natural England and the Wildlife Trust to ensure that the measures are secured. At the time of finalising this Drought Plan, the final wording of the Compensation Package documents was being refined for final agreement and sign-off. The measures must be at locations which are not directly impacted by the Drought Orders and include:

- Further White Clawed Crayfish habitat and population enhancement
- Further Southern Damselfly habitat and population enhancement
- Further river restoration and general habitat and ecological resilience enhancement including measures specifically focused on Salmonids.

3.4 Incorporating the s20 agreement into our Drought Plan

The s20 agreement commitments have been incorporated throughout our Drought Plan and programmes of work that will be delivered over the course of this and subsequent drought plans. Some of the key features of the Agreement are:

- Drought permit readiness (Annex 14)
- 6 month application ready process (see below)
- The actions set out in the s20 agreement are time limited to 2030 so will not run indefinitely - ONLY until a long term solution is in place. They will however need to be incorporated into at least one future Drought Plan.
- Timing and sequencing of when the Drought Permits or Orders could be triggered (Table 4 in Annex 1)
- Stakeholder engagement intentions relating to s20 agreement (Annex 6)

Application readiness

As part of its commitment in the s20 agreement Southern Water has undertaken additional work on its drought order and permit applications for the Itchen, Test and Candover to ensure that they are “application ready”. Template documents are included in Annex 14.

This commitment includes an agreed schedule of monitoring and mitigation measures, as described in Annexes 4 and 5 to this Drought Plan.

The Hampshire Abstraction Licence Public Inquiry has focused attention onto the drought order and permit applications that were discussed at length during the inquiry process. Southern Water recognises, however, that the rigorous approach being adopted for the drought order and permit documentation for the Hampshire area would be equally beneficial for the drought order and permit applications across its supply area as a whole. As a result, Southern Water has committed in Annex 4 of the Drought Plan to a specific programme of work (in order of priority) to enhance and update all of the EARs. Environmental Assessment Reports (EARs) have been discussed and reviewed by EA and NE as part of finalising the Drought Plan. A full set of EARs have been finalised should drought conditions arise in summer 2019.

Furthermore the Environmental Monitoring Plan (Annex 5) sets out a programme to define and implement monitoring and mitigation measures for each Drought Permit and Order option. Southern

Water has proposed a risk based approach and the principle of this has been agreed by the Environment Agency.

In light of the higher potential frequency of needing to apply for the Test surface water Drought Permit, and as agreed in the s20 agreement, Southern Water has also committed to providing updated documents (including the EAR) for that application on a twice-yearly basis in early September and February each year for the Environment Agency's review to ensure application readiness. The application readiness process also requires extended public consultation and engagement and a 'trial-run' of the process. This is designed to ensure that at any time, the permit application is in a robust condition and potential issues are highlighted and can be addressed expediently. Timing is critical to the success of this process as a reliable means of tackling potential threats to water supply

Southern Water has agreed a detailed programme of environmental monitoring and mitigation for the drought order and permit applications for the Itchen, Test and Candover. Funding is secured and contracts put in place with a number of parties, including primary delivery partners and landowners to enable the monitoring to commence and to continue through the period of this Drought Plan. This will provide invaluable information and evidence to inform any drought order or permit applications, the design and implementation of proposed mitigation, and to inform updates of the EARs.

In addition, Southern Water has discussed a detailed programme of work to ensure that enhanced environmental monitoring is undertaken across all of its supply areas. While not yet to the same level of detail as those produced through the Inquiry process, Annex 5 sets out Southern Water's proposals for this work, including a commitment to a 5 year programme of monitoring across its supply areas (see table 2.4 in Annex 5). This will be developed further in dialogue with the Environment Agency (and Natural England as appropriate).

Southern Water has also taken the principle of the Test, Candover and Itchen Interim Abstraction Scheme, to have regard to the potential environmental effects of the drought order and permit applications, and intends to apply this principle to all Drought Permits and Drought Orders proposed in this Drought Plan wherever it has the option to do so.

By adopting similar principles to those commitments of the s20 agreement to the plan as a whole, it is hoped that this will go some way to ensuring that Southern Water is Drought Permit ready for all of its Drought Permits and Orders to ensure public water supplies are protected up to a 1:500 year drought (above and beyond the 1:200 year Southern Water is required to plan for). Southern Water consider this to be a responsible method of planning for a water stressed region with unique natural assets that need protection.

The commitments set out in this plan will deliver improved environmental evidence, a wider public understanding of drought scenarios, an increase in the application readiness of Southern Water's Drought Permit and Order applications, and will improve the resilience of the measures set out in the Drought Plan. Southern Water looks forward to working closely with the Environment Agency, Natural England, and a wide range of environmental partners in delivering this ambitious programme of work. Southern Water also looks forward to using the outcomes of this work when considering future challenges and to influence the direction of future Drought Plans.

4. Identifying a drought

4.1 Drought monitoring

We use a combination of three types of monitoring data to inform drought status, relating to rainfall, water levels in reservoirs and groundwater aquifers, and river flows. Triggers have been set in relation to these hydrometric indicators, and are used in conjunction for assessing the progression of a drought, with no single indicator used to classify drought status. This is a deliberate reflection of the mix of resource types and vulnerability that characterise our supply area.

The majority of these monitoring stations are run by the Environment Agency, which provides us with this data on a regular basis. For each resource type we have developed specific trigger curves to help us determine the drought status for our areas of supply. Detailed information covering why we have chosen these specific sites and generated these trigger curves can be found in **Annex 1: Drought monitoring and trigger levels**. The data from these stations and the drought trigger status are used to generate a drought dashboard report which is updated on a monthly basis and circulated within the company.

Indicators of rainfall deficit

We use a number of specific rainfall gauges as part of our monitoring network to support a robust method of determining the degree of rainfall deficit.

Rain gauges with long-term records, which continue to be monitored by the Environment Agency (EA), have been identified within each drought management area. The data is analysed to provide two categories of drought triggers, each represented in our drought dashboard:

- Comparisons against long-term average values. These are used during normal conditions and in the lead in to a drought to monitor general conditions within each area;

And as a drought progresses:

- Analyses of Standard Precipitation Indices (SPI) and cumulative rainfall deficits, expressed as Drought Severity Indices (DSI), are used within each area to provide more comprehensive coverage against indicators that have been specifically derived to reflect the water resource vulnerability of each area. Both parameters are based on internationally accepted approaches to measuring drought severity.

Indicators of reservoir levels

Drought monitoring indicators for reservoirs use the same control curves that inform the deployable output analyses that have been carried out for the Water Resources Management Plan. These curves allow us to determine the available storage and most appropriate abstraction regime

Indicators of groundwater levels and surface water flows

For river and groundwater abstractions, trigger curves have been developed based on a probability distribution of historic river flows and groundwater levels. These curves have been derived so that they are breached with an average frequency equal to the return period used for the trigger value. For example, if a groundwater record spans 100 years, then the one in 20 year trigger curve' is

equivalent to a monthly profile that would have been breached (at one or more points) in five years of the groundwater level time series record for that observation borehole.

4.2 Drought triggers

Drought triggers are used to identify when we should change from normal operation, to taking proportional action in response to a lack of rainfall. This might lead to the introduction of demand-side and supply-side drought intervention measures as set out in this plan. The triggers are used to ensure that measures are applied in a timely fashion.

The triggers are based on a variety of monitoring data. The range of water resource types within our region means there are various triggers and intervention measures within each drought management area.

Drought triggers are generally used to inform which 'stage' of drought is being experienced. The drought stages and frequency of when each stage might be reached, defined in terms of a drought return period, is as follows:

- Impending drought (1 in five years)
- Drought (1 in 10 years)
- Severe drought (1 in 20 years)

Actions are often phased across the different drought stages based on the effect that each measure has on increasing supply or reducing demand, the impact that this might have on customers and/or the environment, and the complexity involved in introducing the measure. The triggers that have been developed by Southern Water are therefore intended to reflect the increasing severity of a drought event so the measures associated with each set of triggers are only introduced when they are required.

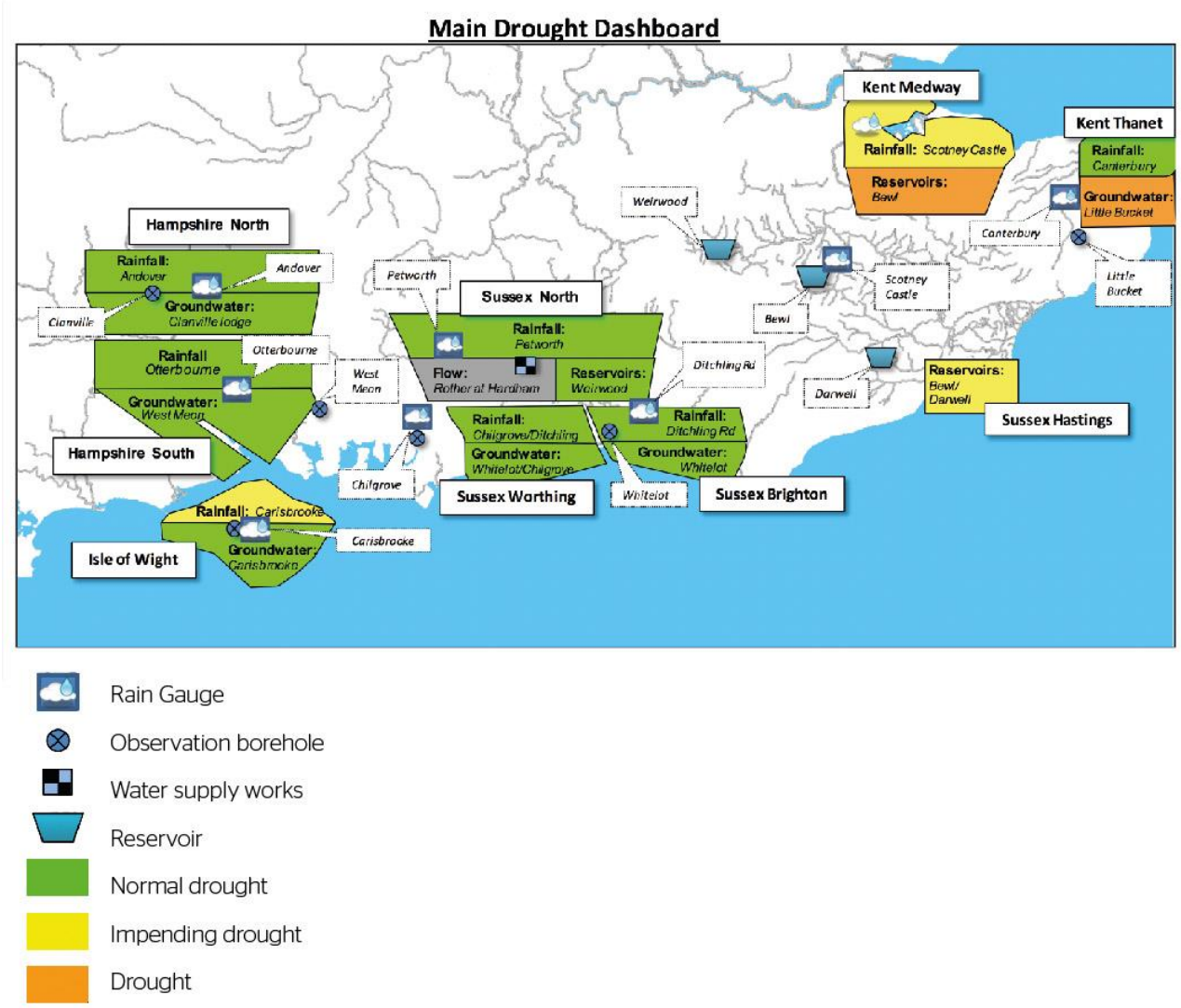
We have not formally defined triggers that describe the transition from "normal" conditions to "impending drought". Droughts can develop in numerous ways and implementation of appropriate drought management actions will vary depending on the style and speed of drought development and the antecedent water resource position. In considering the transition towards drought conditions we will review a wide range of potential indicators and escalate drought actions appropriately as our Level 1 (Drought) triggers are approached.

An overview of the relationships between monitoring, analysis tools, triggers, and intervention measures, as applied by Southern Water, is provided in **Annex 1: Drought monitoring and trigger levels**. This shows how activities in each of these four categories are required as drought severity increases and how the various aspects of drought management relate to the drought triggers. It should be noted that all categories are cumulative – i.e. monitoring, analysis or intervention measures introduced during less severe drought conditions will continue to be in place as further actions are considered and implemented.

4.3 Drought dashboard

Southern Water maintain a 'drought dashboard' which is updated on a monthly basis. This dashboard collates the key drought indicator metrics for each of the company's nine drought monitoring areas. It tracks and reports how the metrics have varied over time in relation to the trigger curves and also reports the aggregated drought status for each area. An example of Southern Water's drought dashboard aggregated map view is shown on Figure 4.1.

Figure 4.1 : Example of Southern Water's drought dashboard aggregated map view



The metrics which are tracked relate to the key water supply types in each drought monitoring area, and include:

- Rainfall Standard Precipitation Index and Drought Severity Index metrics (short and long duration)
- Groundwater levels
- Reservoir levels
- River flows

The indicator metrics displayed by the drought dashboard are used as one, key part of the overall decision making framework when the company is addressing a drought situation. As a drought progresses, further assessments are made to forecast potential future changes in supply and demand and project the degree of supply risk faced by customers.

Key decisions related to drought interventions (for example imposition of demand restrictions on customers, or application for Drought Permits or Drought Orders) are made on the basis of

comprehensive assessments of future supply-demand risks as well as consideration of environmental impacts of the drought and consultation with key stakeholders.

Any decisions taken that would impact either on customers or the environment, such as restrictions or a drought permit, would be notified to customers and stakeholders through notices in the local papers, press notices on our web sites or announcements in the local media.

Further reading: **Annex 1: Drought monitoring and trigger levels (contains more detailed information on triggers for our WRZs)**

Annex 2: Scenario testing and what ifs

5. Developing our Drought Plan

There are two broad categories of actions a company can undertake in response to a developing drought:

- interventions to reduce the pressure on available supplies; and,
- supply interventions to maintain or increase supplies.

To reduce the pressure on available supplies, we can introduce water restrictions through Temporary Use Bans (TUBs) and Drought Orders.

TUBs were introduced in 2010 and replace hosepipe and sprinkler bans. They were first used in 2012 during the last drought in the region. TUBs are the first stage of restrictions we introduce during the drought stage. The restrictions mostly focus on homes and gardens and can be introduced quickly.

If a drought continues to get worse, a second extended phase of TUBs and new restrictions under Drought Orders may be introduced. These restrictions can affect businesses and public facilities. We must apply to the Secretary of State for the Environment to introduce restrictions under Drought Orders.

Supply interventions to maintain or increase supplies, are applied for through Drought Orders or Drought Permits. We apply to the Environment Agency for a Drought Permit and the Secretary of State for the Environment for a Drought Order. Actions permitted might include:

- Balancing our abstractions from rivers, reservoirs and underground aquifers;
- Bringing water from regions not affected by drought;
- Bringing old sources of water back into action;
- Increasing abstraction from some sources;
- Drilling new boreholes; and,
- In severe droughts, utilising emergency desalination, implementing water re-use schemes and tankering water.

If we experience a drought more severe than we have planned for, we may need to consider applying to the Government for an Emergency Drought Order. We would only apply for this after we have implemented the full range of restrictions and Drought Permits and Orders available to us, and only in a civil emergency. An Emergency Drought Order allows for the introduction of standpipes or water tanks in the street and rota cuts where the water supplies are restricted to a few hours each day.

In order to determine which options we should include in this Drought Plan we have been through an optioneering process, working with Natural England and the Environment Agency. The process for defining options to include in the Drought Plan has followed a very similar process to that typically used for developing a WRMP. It consists of three principal stages:

- **Unconstrained option list**: this is a high level list of options including generic option types as well as taking account of government policy and aspirations, where appropriate.
- **Constrained option list**: This is an initial screened version of the unconstrained list to filter out options that are impracticable or have unacceptable environmental or economic impacts,

and, taking account of our water supply duties, to exclude options that may adversely affect European sites (Habitat Directives) or lead to deterioration of water body status under the Water Framework Directive.

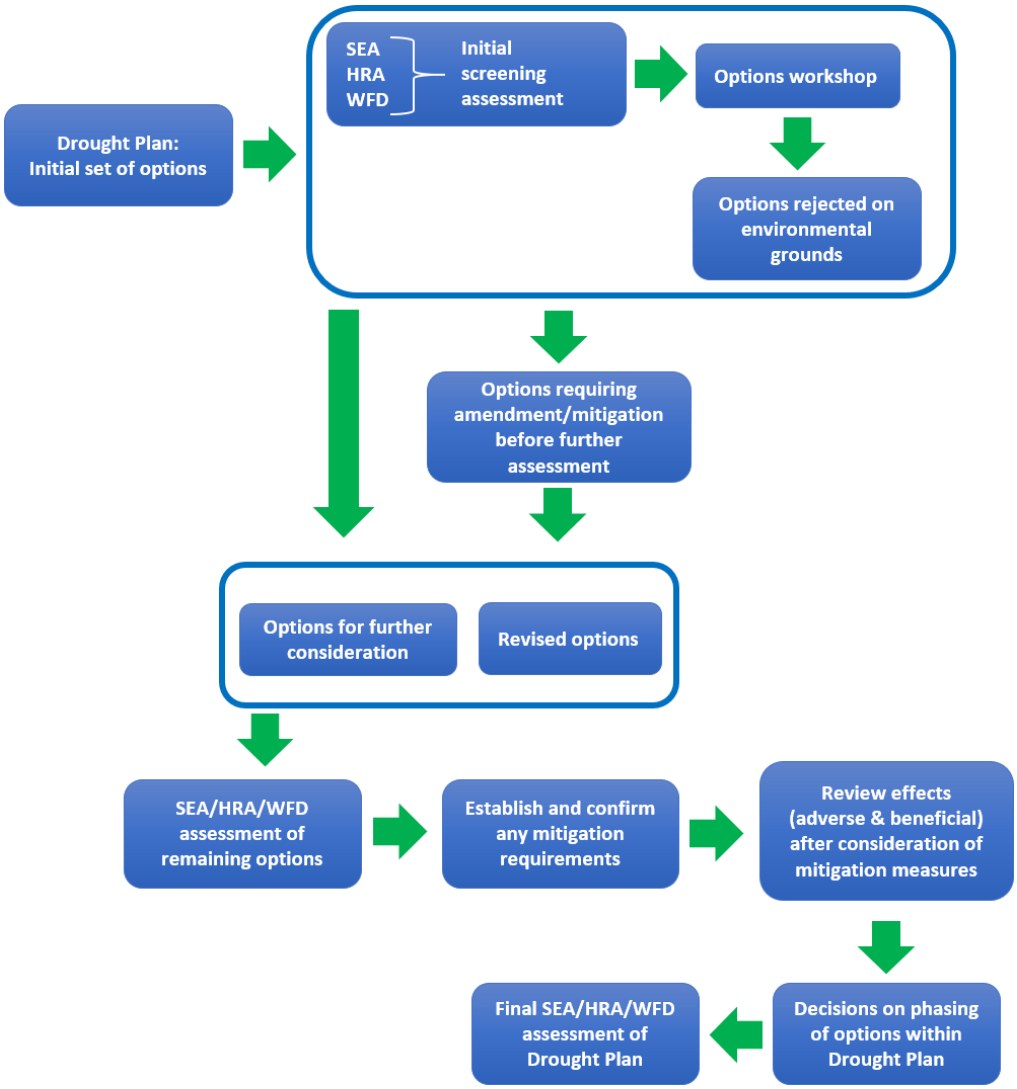
- **Feasible option list**: this is the final set of options that have passed a more detailed screening test to ensure they are feasible, deliverable in the timescales of a drought and that they deliver a demand saving or supply benefit.

In addition, the feasible options set was further assessed for their potential environmental impacts under each of the following statutory processes:

- Strategic Environmental Assessment
- Habitats Regulations Assessment
- Water Framework Directive assessment.

The process followed in relation to these statutory assessment processes is summarised in Figure 5.1.

Figure 5.1: Option assessment process with SEA, HRA and WFD considerations



The outcomes of the environmental assessments of the drought management options are described, as applicable, in Annex 11 (Habitats Regulations Assessment), Annex 12 (Strategic Environmental Assessment), and Annex 13 (WFD assessment). In summary, the application of these processes, together with the development of Environmental Assessment Reports (EARs) for Drought Permits and Orders, has:

- Informed dialogue with the Environment Agency and Natural England as to the options to be included in the Drought Plan and their sequencing in relation to the Drought Plan to reflect their environmental or social effects.
- identified a small number of options that have been excluded from the Drought Plan, where this is feasible (taking account of our supply duties), due to environmental concerns, including some drought management options on the Isle of Wight (for example, a Drought Permit for the Rookley source) and in Hampshire (for example, options to develop new satellite boreholes associated with existing licensed sources)
- identified a number of HRA risks which has either led to:
  - the option being modified and / or additional mitigation measures being included to address these risks to ensure no likely significant effects on any designated European site
  - the option being retained in the Drought Plan and consideration of Imperative Reasons of Over-riding Public Interest being sought after demonstrating there are no other feasible alternative options available in severe drought: Candover Augmentation Scheme and the Lower Itchen sources Drought Order only.
- identified risks in relation to temporary deterioration to WFD status for some of the Drought Permit/Order options and consideration of mitigation measures
- identified various environmental impacts through the SEA process for some of the supply-side options (including Drought Permit / Order options), mainly on the water environment and associated aquatic and (in some cases, terrestrial) habitats, flora and fauna
- identified where additional environmental monitoring, studies or data are required to better understand the potential environmental risks relating to implementation of various Drought Plan measures, both to support future drought management planning and during an actual drought event
- identified potential mitigation measures to address identified environmental effects of various Drought Plan measures to reduce the risks of the effects arising during a drought
- identified no impacts of the demand-side measures sufficient to exclude any options on environmental grounds, but noting that two options are likely to have major adverse effects on human health and safety, economic activity and livelihoods:
  - those water use restrictions to be implemented under the phase 2 Temporary Use Ban powers and phases 1 and 2 of the Non-Essential Use Ban Drought Order that impact on small businesses which are entirely dependent on using water; and
  - an Emergency Drought Order to ration essential supplies by use of standpipes or rota cuts.

Consequently, the more onerous water use restrictions are only planned to be introduced when the severe drought stages (3 and 4) are reached, whilst the Emergency Drought Order is only included as a ‘last resort’ option in a civil emergency (equivalent to an extreme 1 in 500 year drought). Conversely, the phase 1 Temporary Use Ban would normally be implemented before the implementation of Drought Permits / Orders, although this may not be the case for a winter Drought Permit / Order given the negligible demand savings that would be achieved.

Further reading:

- Annex 9: Options appraisal approach
- Annex 11: Habitats Regulations Assessment
- Annex 12: Strategic Environment Assessment
- Annex 13: Water Framework Directive Assessment

6. Drought Actions

6.1 Demand interventions

This section sets out the demand management interventions that the company may implement during a drought event including estimates of the likely reduction in demand (in million litres per day) that would be achieved. Table 6.1 summarises the company's target levels of service in relation to introducing demand restrictions during drought events. Table 6.2 summarises all demand interventions against the corresponding drought status under which they would be implemented and Table 6.3 shows how the company's Drought Plan stages relate to terminology that is commonly used in the water industry to describe different levels of restriction. Table 6.3 also shows the drought return periods associated with each drought stage.

Levels of service

Levels of service set out the standard of service that customers can expect to receive from their water company.

The **target levels of service** sets out what the company aims to achieve. There are two target levels of service relevant to water resource planning:

- **Customer target levels of service** – which relate to the frequency and nature of restrictions on water use that customers may experience (in the form of Temporary Use Bans (TUBs) restricting different categories of water use and Drought Orders to implement Non Essential Use Bans during drought conditions)
- **Environmental target levels of service** – which relate to the frequency of Drought Permits and Drought Orders allowing modified abstraction regimes at some of Southern Water's sources.

The company's current target levels of service are set out in Table 6.1. These are the same levels as stated in WRMP14 and our revised draft WRMP19.

In our Western supply area, covering large parts of Hampshire and the Isle of Wight, we are at risk of having to introduce water use restrictions more often than target (planned) levels until at least 2029. This risk will persist until we secure new water supplies to replace those no longer available because of the changes to our abstraction licences on the Test and Itchen which were approved by the Secretary of State in February 2019. As soon as new reliable water supplies are in place, our commitments will return to the target levels above.

Table 6.1: Southern Water's Levels of Service

Type of restriction or measure	Frequency (return period)
Customer target level of service	
Advertising to influence water use	1 in 5 years
Temporary Use Ban on different categories of water use	1 in 10 years*
Drought Order to implement a Non Essential Use Ban	1 in 20 years*
Apply for Emergency Drought Order to restrict water use	Only in civil emergency (> 1 in 500 years)
Environmental target levels of service	
Apply for Drought Permit/Order to increase supplies through relaxation of licence conditions, increase in licensed quantities, or other measures	1 in 20 years**

*Frequency of first implementation but would be introduced via a phased approach as laid out in Table 5

**In Western area in the short term there is a risk we will fail to meet our environmental target levels of service following the Section 20 Agreement reached at the Hampshire abstraction licences Public Inquiry in March 2018

The risk of more frequent restrictions in Hampshire and the Isle of Wight remains in place in the short term, as a consequence of the changes to our abstraction licences. This is reflected in the Section 20 Agreement reached between Southern Water and the Environment Agency. The agreement provides a specific protocol around managing the need for Drought Permits, Drought Orders and water use restrictions for the River Test and River Itchen and associated supply areas, until new permanent water supplies are in place.

- In the short term, until sufficient new permanent water supply resource is available, the changes to our Test surface water abstraction licence mean we will need to apply for a Drought Permit on the River Test up to four times in the next 10 years. However we would only need to implement this permit if a drought of one in 10 to one in 20 years severity develops. There is a 40-60% chance of this in the next ten years.
- We may also need to apply for a Drought Order for the Candover Augmentation Scheme as frequently as one to two times every 10 years on average, implementing it if a drought of one in 60 to one in 80 years develops (15% chance in the next 10 years).
- As such for the Test Drought Permit and Candover Drought Order we may not be able to meet our environmental target levels of service as set out in Table 6.2 until sufficient

permanent water resources are available.

- For the Test Drought Order and Lower Itchen sources Drought Order we should meet our environmental target levels of service i.e. we should not need to apply for these more frequently than 1 in 20 years on average. There is around a 40% chance we would need to apply for these in the next ten years. We would expect to implement the Test Drought Order if a drought of between 1 in 150 and 1 in 180 years develops and there is around a 6% chance of this in the next ten years. We would implement the Lower Itchen sources Drought Order if a drought of between 1 in 200 and 1 in 300 years develops and there is around a 5% chance of this in the next ten years.
- The Section 20 Agreement allows that water use restrictions (TUBs) do not have to be implemented until the Test drought permit is implemented. Hence we should not need to implement TUBs more frequently than our target level of service of 1 in 10 years. There is around a 40% chance we would need to do this in the next ten years.
- The Section 20 Agreement also assumes we would apply for a Drought Order to restrict non-essential water use (NEUB) when the Test Drought Permit is implemented. Hence we should not need to implement a NEUB more frequently than our target level of service of 1 in 20 years. There is around a 22% chance we would need to do this in the next ten years.
- Provided our Drought Permits or Orders can be implemented, we will only need to resort to extreme water saving, such as rota cuts or standpipes in the street, once every 500 years on average. If the Drought Permits or Orders cannot be implemented, we will have enhanced risk of needing to resort to extreme water saving measures. The agreement provides reassurance that, subject to due procedure, environmental monitoring and mitigation commitments, the Drought Permits and Drought Orders will be allowed when necessary.

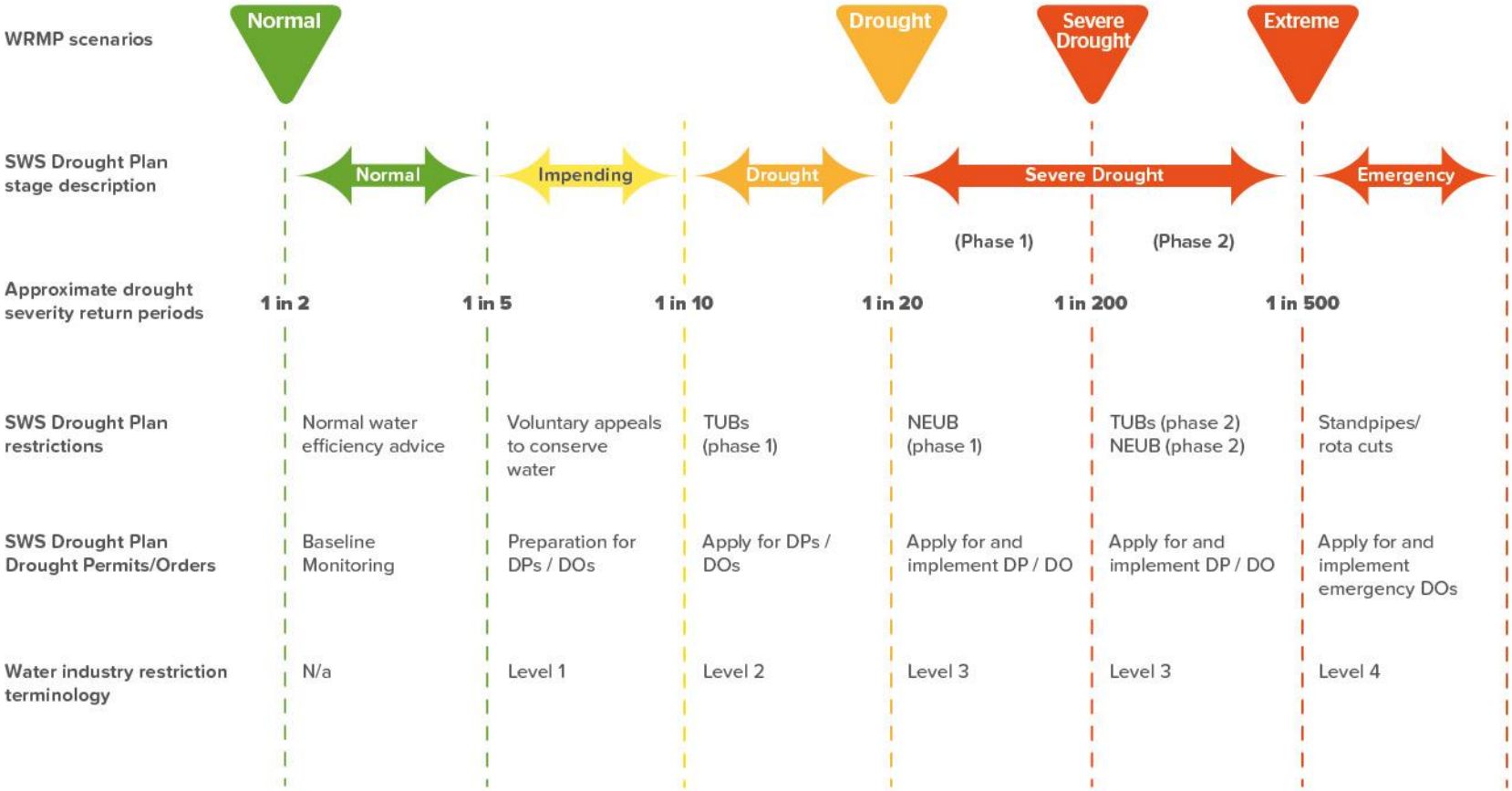
Table 6.2 : Demand interventions

Actions	Trigger	Demand saving (Ml/d)	Demand saving (% on peak weekly demand)	Location	Timeline from trigger to implementation	Permissions needed/ constraints	Risk associated
Media campaigns to encourage water efficiency	Impending Drought	Not quantified	Not quantified	Affected water supply area (Eastern, Central, Hampshire and IOW)	1 week**	Inform the EA, NE, DWI, Defra, Fire Authority and Local Suthorities of impending drought status	Uncertainty in the effectiveness of this measure - whether customers will collaborate conserving water or not
Increased leakage control and repair	Impending Drought	Up to 2-3 Ml/d after a dry mild winter	Up to 1.5%	Affected water supply area (Eastern, Central, Hampshire and IOW)	3 months**	Inform the EA, NE, DWI, Defra, Fire Authority and Local Suthorities of impending drought status	Time needed for training and resourcing staff may delay the implementation
Temporary Use Ban (Phase 1)	Drought	9.6 Ml/d in the Western area (excl.IOW); 10.6 Ml/d in the Central area; 6.1 Ml/d in the Eastern area*	5% in the Western area (excl.IOW)and Central area; 3% in the Eastern area*	Affected water supply area (Eastern, Central, Hampshire and IOW)	Minimum 4-8 weeks after appeal for restraint**	Inform the EA, NE, DWI, Defra, Fire Authority and Local Suthorities of impending drought status. Advertise the TUB (phase 1)	Time for representations (objections) may delay the implementation. Large number of responses possible. Customer satisfaction: requires careful considerations for the right balance pf water saving and minimum of inconvenience for customers
Non-essential use ban Drought Order (Phase 1)	Severe Drought (Impending drought trigger demand activities plus below). N.B; Could be applied for under "Drought" stage	15.4 Ml/d in the Western area (excl.IOW); 17 Ml/d in the Central area; 8.2 Ml/d in the Eastern area*	8% in the Western area (excl.IOW); and Central area; 4% in the Eastern area*	Affected water supply area (Eastern, Central, Hampshire and IOW)	Minimum 8-12 weeks from Temporary Use Ban**	Inform the EA, NE, DWI, Defra, Fire Authority and Local Suthorities of severe drought status. Consult with Defra and apply for a Drought Order	Objections from commercial water users. Financial costs to provide compensation against any impacted licence holders
Non-essential use ban Drought Order (Phase 2) and Temporary Use Ban (Phase 2)	Severe Drought (Impending drought and drought trigger demand activities plus below).	Unknown	Unknown	Affected water supply area (Eastern, Central, Hampshire and IOW)	Minimum 4-8 weeks from phase 1 NEUB Drought Order**	Consult with Defra and apply for a Drought Order. Advertise the TUB (phase 2)	Objections from commercial water users. Financial costs to provide compensation against any impacted licence holders

* Refer to Annex 3 for how the percentages were derived

** In respect of the River Test and the River Itchen, a Water Resources Act Section 20 Operating Agreement (March 2018) between Southern Water and the Environment Agency provides some procedural and timing interventions, especially relative to the drought permit on the River Test that is likely to be needed as an early measure (during relatively low severity drought)

Table 6.3 : Relationship between SWS Drought Plan stages, approximate return periods, interventions and water industry restriction terminology



TUBs – Temporary Use Bans; NEUB – Non-Essential Use Bans; DP – Drought Permit; DO – Drought Order

Media campaigns to influence water use

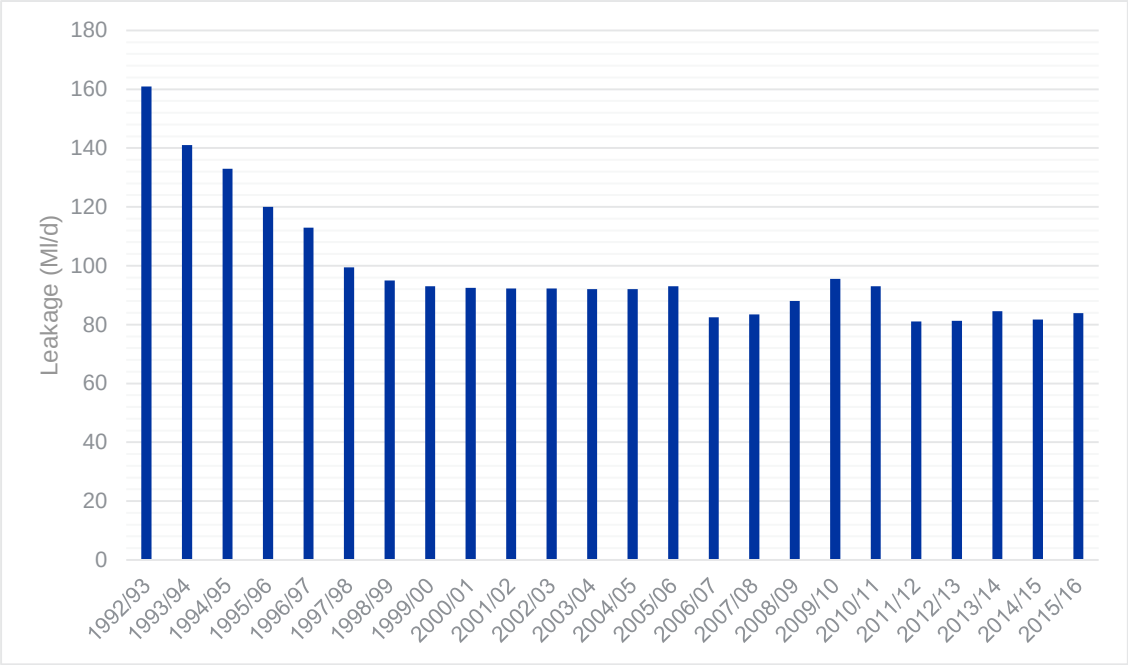
Campaigns to raise public awareness of water use can be carried out in a number of ways using a variety of different types of media. The central message is to urge customers to conserve water, especially during periods of drought. This message should be underpinned by an explanation of the prevailing water resource conditions and how the drought might continue to intensify. In addition, we may promote enhanced water efficiency programmes. Our communication campaigns to influence water use and create awareness, and the phasing of these actions are explored in detail in the Drought Communications Plan in **Annex 6: Management and communications**.

Leakage reduction

As part of its normal operations, Southern Water has invested significantly in leakage reduction since 1992, which has yielded significant savings in water, as shown in Figure 6.1.

During a drought there is the potential for additional leakage control to reduce demand to conserve supplies for customers. The company regularly reviews its leakage performance, especially during periods of drought. It will prioritise leakage control activity in WRZs where supplies are most at risk from the effects of drought. We also aim to reduce leakage repair times during a drought to further conserve supplies. This might be achieved by recruiting additional resources and temporarily increasing staff overtime and night working.

Figure 6.1: Historic total leakage for Southern Water 1992-2016



Temporary Use Bans

Since 2010 there has been a significant change in legislation regarding the implementation of restrictions on water use. This recent legislation, which significantly widened the scope of the previous hosepipe ban powers, is:

- Section 76 of the Water Industry Act 1991 (WIA 1991), as amended by section 36 of the Flood and Water Management Act 2010 (FWMA 2010)
- The Water Use (Temporary Bans) Order 2010, which is a statutory instrument (No. 2231) providing definitions of words and phrases and certain exceptions to the categories of water use specified in section 76 of the WIA 1991.

Under section 76(2) of WIA1991 the widened range of uses of water that a water company can control without referring the decision to the Secretary of State is as set out in Figure 6.2.

Figure 6.2: Restrictions under a Temporary Use Ban or Drought Order

Most water use prohibited under a Temporary Use Ban (TUB) applies to the use of water drawn through a hosepipe or similar apparatus.

Also it should be noted that the aforementioned legislation, in WIA 1991 76(1), states:

> *"a water undertaker may prohibit one or more specified uses of water supplied by it if it thinks it is experiencing, or may experience, a serious shortage of water for distribution".*

Although this means there is no express link to drought when applying the above powers, a drought event is the most likely reason a company would experience a shortage of water for distribution.

Drought Order to restrict water use

Where the drought situation requires it, Southern Water may need to apply for a Non-Essential Use Ban (NEUB) Drought Order to further restrict water use, particularly of commercial activities. However, before applying for a Drought Order to restrict water use, water companies are expected to have made full use of their powers under the WIA 1991, as stated in the Explanatory Memorandum to the Water Use (Temporary Bans) Order 2010:

"By extending the water uses that water undertakers may prohibit under section 76(1) of the Act [WIA 1991], water undertakers may be able to delay or avoid the need for drought orders under the Water Resources Act 1991".

The Drought Direction 2011 (which replaced the Drought Direction 1991) sets out the restrictions available under an Ordinary Drought Order, as allowed for under Section 73 of the Water Resources Act 1991 (WRA 1991). These are:

- Watering outdoor plants on commercial premises;
- Filling or maintaining a non-domestic swimming or paddling pool;
- Filling or maintaining a pond;
- Operating a mechanical vehicle-washer;
- Cleaning any vehicle, boat, aircraft or railway rolling stock;
- Cleaning non-domestic premises;
- Cleaning a window of a non-domestic building;
- Cleaning industrial plant;
- Suppressing dust; and
- Operating cisterns.

In order to grant a Drought Order under WRA 1991 73(2), the Secretary of State must be satisfied that:

"By reason of an exceptional shortage of rain, a serious deficiency of supplies of water in any area exists or is threatened".

The potential timescales for introducing restrictions by recourse to a Drought Order are significantly longer than those for Temporary Use Bans under the WIA 1991, and the Secretary of State would require a public inquiry or hearing to be held if an objection were received.

Under Schedule 8, paragraph 3(c) of the WRA 1991, the company must publish a notice of its application for a Drought Order to restrict water use, which shall state that objections to the application may be made to the Secretary of State within seven days from the date on which it is served or published.

Phasing of water use restrictions

Table 6.4 sets out how we propose to phase the introduction of restrictions as a drought develops. This phasing followed customer research for our 2012 drought, during which customers favoured reducing the impact upon small businesses that depend upon these activities for their livelihoods until severe drought.

Whilst water use restrictions to reduce demand are normally expected to be in place before Drought

Permits and Orders to relax abstraction licence conditions are implemented, there may be circumstances when this would not be appropriate. The main reason would be when applying for a Drought Permit or Order to enhance supply availability during the winter when, unless water use restrictions are already in place, the imposition of them at this time of year would have a very small impact because discretionary water use is low. An example of this was when we applied for a Drought Permit to help refill Bewl Water reservoir in January 2018 but customer restrictions were not imposed.

With regard to the phasing of TUBs, it should be noted that "the variation of a prohibition is to be treated as a prohibition" (WIA 1991, 76B (4)). Hence the procedure for providing notice would need to be followed for each variation in prohibition, with the consequent time delay that would entail. This is important to consider when determining the number of phases the company might adopt.

Reducing garden watering with a hosepipe has higher benefit in demand reduction during the early months of a drought when compared with other activities such as washing cars, boats and domestic windows. However, it is during spring that many plants start to grow or recover from winter, and it would be seen as unfair by many customers to restrict garden watering with a hosepipe, if the allowance of other uses continues.

After careful consideration on phasing of temporary water use restrictions, Southern Water believes that introducing the majority of TUBs in a single first phase is the optimum approach. This has the benefit of providing a strong message for the need to conserve water (even where some restrictions would not necessarily be expected to provide a significant water saving in their own right) and is less confusing in terms of what restrictions may be in place at any given time. The company will, however, consider delaying certain TUB restrictions until a later phase, primarily to avoid the potential impact these can have on some small businesses. This consideration is based on experiences and findings from the 2004-07 drought.

Table 6.4: Phasing of restrictions and drought triggers

Restriction activity	TUB / NEUB Drought Order (DO)	Impending drought	Drought conditions	Severe drought conditions (Phase 1)	Severe drought conditions (Phase 2)
Watering a garden using a hosepipe (includes parks; gardens open to public; lawns; grass verges; areas of grass used for sport or recreation; allotment gardens; any area of allotment used for non-commercial purposes; and any other green space)	TUB		✓	✓	✓
• Including national or international sports events; grass surfaces used for sport or recreation where watering is undertaken in relation to particular playing or other surfaces designated by the company, for no more than 2 hours a week and only between the hours of 1900hrs and 0700hrs	TUB				✓
Cleaning a private motor-vehicle using a hosepipe	TUB		✓	✓	✓

• Including businesses specialising in hand car-washing using hosepipes as part of their process	TUB				✓
Watering plants on domestic or other non-commercial premises using a hosepipe	TUB		✓	✓	✓
Cleaning a private leisure boat using a hosepipe	TUB		✓	✓	✓
Filling or maintaining a domestic swimming or paddling pool	TUB		✓	✓	✓
Drawing water, using a hosepipe, for domestic recreational use	TUB		✓	✓	✓
Filling or maintaining a domestic pond using a hosepipe	TUB		✓	✓	✓
Filling or maintaining an ornamental fountain	TUB		✓	✓	✓
Cleaning walls, or windows, of domestic premises using a hosepipe	TUB		✓	✓	✓
• Including small businesses using water-fed poles to clean domestic walls and windows; where the purpose of cleaning is the removal of graffiti	TUB				✓
Cleaning paths or patios using a hosepipe	TUB		✓	✓	✓
• Including small businesses whose sole operations are the cleaning of paths and patios; where the purpose of cleaning is the removal of graffiti	TUB				✓
Cleaning other artificial outdoor surfaces using a hosepipe	TUB		✓	✓	✓
• Including small businesses whose sole operations are the cleaning of hard standings; where the purpose of cleaning is the removal of graffiti	TUB				✓
Watering outdoor plants on commercial premises	DO			✓	✓
• Including watering of newly bought plants and plants watered using certain water efficient apparatus such as drip- or micro-irrigation through perforated hosepipes and sprinkler irrigation systems	DO				✓
Filling or maintaining a non-domestic swimming or paddling pool	DO			✓	✓
Filling or maintaining a pond	DO			✓	✓
Operating a mechanical vehicle-washer	DO			✓	✓
• Including Washers that recycle water and as a consequence use less than 23 litres of mains water per vehicle	DO				✓
Cleaning any vehicle, boat, aircraft or	DO			✓	✓

railway rolling stock					
• Including where the purpose of cleaning is the removal of graffiti	DO				✓
Cleaning non-domestic premises	DO			✓	✓
• Including where the purpose of cleaning is the removal of graffiti	DO				✓
Cleaning a window of a non-domestic building	DO			✓	✓
• Including small businesses using water-fed poles to clean non-domestic windows	DO				✓
Suppressing dust	DO			✓	✓
Operating cisterns	DO			✓	✓
Cleaning industrial plant	DO				✓

Exemptions

We are signed up to the UKWIR Code of Practice and Guidance for Water Companies on Water Use Restrictions (2013). This code of practice sets out the statutory and universal exemptions offered by all companies to TUBs and Drought Orders.

The types of exemptions that companies can offer can be defined as follows:

- Statutory - as defined in the legislation and granted by all water companies
- Discretionary Universal Exemptions - offered by all water companies:
  - on the grounds of disability granted to those holding a Blue Badge
  - customers using an approved drip or trickle irrigation system fitted with a PRV and timer
  - commercial customers who use hosepipes as part of their business for some TUB categories (e.g. hand car washing, window cleaning and graffiti removal).
- Discretionary Concessional Exemptions - offered at the discretion of each water company on an individual basis. Customers must make representations to receive this exemption.

Annex 3 provides details of the exemptions that the company proposes for both Temporary Use Bans and Non-Essential Use Ban Drought Orders.

Representations

Our approach to handling representations, after having giving notice of restrictions, is set out in **Annex 3: Demand interventions**. Our approach accords with section 76B (3) of the WIA1991, which states that “The notice must give details of how to make representations about the proposed prohibition”.

We will publish a public notice in regional newspapers and the London Gazette as part of the process to introduce Temporary Use Bans. The notice will specify the method and timescale for customers to make representations and will normally be in writing to a named individual identified on the public notice. The timescale for responses, will be a minimum of seven days (which is the time period allowed for under a Drought Order to restrict water use, as set out in Schedule 8 of the WRA 1991). This notice will also be published on the company's website and in publications local to the area

where restrictions will be introduced.

Savings

For the purposes of this Drought Plan, we have carried out analysis of the impact of the demand restrictions which were applied by Southern Water during the 2005-06 drought and estimated how this may have changed as a result of increased water metering. The assessment has accounted for the universal metering programme the company implemented between 2010 and 2015. The results of this analysis are presented in **Annex 3: Demand interventions.**

The models were able to assess the impact of restrictions on demand during the 2005-06 drought event and estimate how this is likely to have changed as a result of increased metering. The estimated profile for the effectiveness of demand restrictions for the Western area (excluding the Isle of Wight) and Central area are now in the order of 1%, rising to 5% for TUBs (winter to summer profiles), and 3%, rising to 8% for TUBs plus Non-Essential Use Ban (NEUB) Drought Orders. The Eastern area is expected to have a much lower response, at 0% rising to 3% for TUBs and 1% rising to 4% for TUBs plus NEUB, this is explained further in Annex 3. The results of this modelling work are shown in Table 6.5 below.

Table 6.5: Estimated demand savings in July and August arising from restrictions

	Restriction type	
Supply area	**Temporary Use Bans**	**Drought Order (NEUB) to reduce demand**
Western	5%	3%
Central	5%	3%
Eastern	3%	1%

Further Reading: Annex 3: Demand interventions

6.2 Supply interventions

As well as interventions to reduce demand, the company has reviewed a number of interventions to increase available supplies in a drought to maintain a supply-demand balance. This section describes all the supply interventions that the company plans to implement to increase the volume of water resources available during a drought event. Table 6.5 lists all the options available as well as an indicative order in which they would be used. It does not necessarily mean all these options would be required in a drought. The supply interventions are summarised below, and described in more detail in **Annex 4: Supply interventions.**

Operation of the company's own sources

As a drought is threatened and develops, we will review the operation of our sources, and, where appropriate, ensure they are operated in an appropriate 'drought mode', for example, by conserving storage in reservoirs. This would normally involve changing the balance of groundwater and surface water abstraction to protect future supplies in the event of drought conditions becoming more serious.

Inter-company bulk transfers

The company has a number of bulk supply agreements with neighbouring water companies which cover bulk imports and exports. The terms and conditions of these transfers are set out in the bulk supply agreements, but under drought conditions the quantities of water available for transfer under an agreement may not be appropriate. The company is in discussions to update some of its existing supply agreements, including the addition of drought clauses. During a drought the company will ensure it maintains close communication with its neighbouring water companies to ensure the drought situation is understood by all parties. If there is a need to change a bulk import or export, this approach ensures that Southern Water can make a decision in a timely manner in accordance with this Drought Plan.

Re-commissioning of unused sources

It may be feasible to re-commission unused sources during a drought. The company has a limited number of sources that, for a variety of reasons, were never commissioned or have since been decommissioned. We maintain a list of these sources and site plans and, during the course of a drought, we would consider options for re-introduction of these sites. These options are also reviewed as part of the development of the WRMP.

Enhancing abstraction at existing sources

The company uses industry standard methodologies to determine the deployable output of each of its sources. In most cases the amount of water that can be abstracted is limited either by the abstraction licence or the hydrological yield of the source. However, in some cases, the constraint may include the treatment capacity of the works or the capacity of the distribution system. Where there is a physical constraint, then the company will consider further investment in the source to improve its yield. In other cases, where the output of the source is limited by the abstraction licence, then the company may seek to increase the output by applying for a Drought Permit or Order.

Distribution network modifications

Modifications to the distribution network, including re-zoning of district metering areas (DMAs) so they are supplied by different sources, can allow us to rest some sources and abstract more water from others. This approach can be particularly useful in areas where there are few other intervention strategies. However, the actual impact on resource availability over the course of a drought may be limited.

Tankering

The tankering of water from adjacent WRZs and from other companies into WRZs that are most affected by drought would be considered in a Severe Drought. The feasibility of this option depends on the availability of water in neighbouring WRZs, as well as practical issues such as tanker capacity and road access. On the basis of past drought events, however, there is likely to be limited resource availability across the supply area and neighbouring companies could be similarly affected and seeking to conserve their own resources. Tankering has been used by the

company historically to address specific localised issues and therefore remains a measure in our Drought Plan.

Table 6.6 lists all the options available as well as an indicative order in which they would be used. It does not necessarily mean all these options would be required in a drought.

Table 6.6: Drought management options

Actions	Maximise river abstractions	Maximise pumping from groundwater sources	Intra-company transfers	Enhancing abstraction at existing sources	Inter-company transfers	Re-commission unused sources	Drought Orders and Permits	Drought Orders and Permits	Emergency tankering	Emergency desalination
Trigger	Impending drought	Impending drought	Impending drought	Drought	Drought	Drought	Drought	Severe drought	Severe drought	Severe Drought
DO (Ml/d)	No additional Deployable Output (DO) (optimising abstraction within licence to ensure groundwater can recharge)	No additional DO (optimising abstraction within licence to ensure groundwater can recharge)	No additional DO (optimising transfers to manage available water resources)	Benefit dependent on status of assets at time of drought	31.74*	14.36	Up to ~140**	Up to ~131	~1 (DO dependent upon certified potable water tanker fleet size)	30 (can be scaled to meet deficit)
Location	Company wide	Company wide	HR, HSW HSE,HW, SN, SW,SB, SH, KME, KMW WRZs	Company wide	Imports from Portsmouth Water, Affinity Water, South East Water and Wessex Water	Site in the Test Valley, Stourmouth (severe drought trigger)	HSW, IoW, SN, SW, KMW and SH WRZs	IoW, HR, HSW, HSE, SN, SW, KME, KMW, KT and SH WRZs	Company Wide	Coastal zones
Timeline from trigger to implementation	Undertaken during winter months when river flows are higher to allow groundwater levels to recover	Undertaken during summer months	1 week	Dependent upon infrastructure required typically between 1-3 months	1 month	Dependent upon infrastructure required typically between 1-3 months	Up to 3 months after TUBS depending on season	7 days of notice after Secretary of State approves.	1 month	12-18 months
Permissions needed / constraints	None (all within licence)	None (all within licence)	None	None (all within licence)	Constant contact with the water companies in the South	Consult with the EA and NE.	Liaison with the EA and NE on impacts to SPA, SAC, SSSI or	Liaison with NE on impacts to SAP, SAC, SSSI or Ramsar	Liaise with DWI plus local authorities, highways agency and	Liaison with the EA and NE

Actions	Maximise river abstractions	Maximise pumping from groundwater sources	Intra-company transfers	Enhancing abstraction at existing sources	Inter-company transfers	Re-commission unused sources	Drought Orders and Permits	Drought Orders and Permits	Emergency tankering	Emergency desalination
					East		Ramsar sites.	sites.	police	
Risk associated	Environmental (uncertainty on the volumes of water available for additional abstraction. Rivers may already experience lower flows and a minimum ecological flow needs to be maintained)	Environmental (lower groundwater levels). Careful assessment needed when determining which aquifers are less vulnerable.	None	Environmental	- Cost - This option depends on the drought status of the other water companies. - Not all bulk supply contracts have pain share clauses	- Water quality - Environmental (lower groundwater levels) - Costs to asset investment	Environmental risks as set out in the associated Environmental Assessment Report for each Drought Permit and order.	Environmental risks as set out in the associated Environmental Assessment Report for each Drought Permit and Order.	- Cost per Ml/d Environmental and Public disturbance due to increased tanker traffic.	- Environmental -Infrastructure (both power and water distribution network)

* Includes new 15Ml/d transfer from Portsmouth Water to South Hampshire

**Includes River Test surface water source and Candover augmentation scheme drought options available at earlier drought triggers

Drought Permits and Orders (supply)

Under drought conditions, where a serious deficiency of supplies is threatened or exists which has been caused by an exceptional shortage of rainfall, the company may require recourse to Drought Permits and/or Drought Orders to increase abstraction and/or conserve water storage to help maintain essential water supplies to our customers. The likelihood of needing to resort to Drought Permits and Orders for each of our areas is set out in Table 6.7 below.

Table 6.7: Likelihood of requiring Drought Permit and Orders

	Likelihood of use	
Drought actions	**Sussex and Kent**	**Hampshire and the Isle of Wight**
Drought Permits and Orders to increase supplies	Applying for permission to take more water from rivers and aquifers – once in 20 years on average	Applying for permission to take more water from rivers and aquifers – up to four times every 10 years on average.

It should be noted that the company will need to commence preparation of applications for Drought Permits and Orders more frequently than it would actually need to submit the applications. Equally, the application for a Drought Permit or Order will be more frequent than the need to implement a Permit or Order when granted. In all cases the company actions will reflect the prevailing and forecast environmental conditions.

It is very likely that we will need to introduce drought measures more often in Hampshire and the Isle of Wight. This relates to abstraction licences changes on the Rivers Test and Itchen and the s20 agreement we have entered into with the Environmen Agency. The Environment Agency commits to procedural reassurances around how we can utilise the Drought Permit and Drought Order process to maintain public water supplies pending the implementation of new reliable water supplies to replace the water resource lost by the licence changes. This is therefore a short to medium term solution for the duration of the s20 agreement. It is not a permanent arrangement and is referred to within the s20 agreement as the "interim abstraction scheme". These drought options have been incorporated into the revised draft WRMP19.

For existing licensed sources, Drought Permits and/or Orders are used to temporarily change abstraction licence conditions to maintain or increase the amount of water that can be abstracted, help conserve reservoir storage or aid winter reservoir refill. The types of abstraction licence changes that may be sought under Drought Permits or Orders comprise one, or a combination of, the following:

- reductions in reservoir releases to support downstream abstraction
- relaxation to Minimum Residual Flow (MRF) conditions
- increases in the abstraction volumes authorised in the licence
- reductions in reservoir compensation flows
- variations to groundwater abstraction licence conditions.

Drought Orders can also be used to authorise the abstraction of water from a specified water source

where there is no existing abstraction licence.

Application for Drought Permits and/or Drought Orders in winter may be sought to:

- reduce the risk of Drought Orders/Permits in the following summer
- assist the recovery of water supply resources which have been excessively depleted as a result of drought
- maintain water supply in drought affected areas.

Table 6.8 summarises the sources where we would seek a Drought Permit or Order and the trigger conditions for these.

Maximum supply side benefits of Drought Permits and Orders have been reassessed for WRMP19 and the revised figures are included in Table 6.8. Detailed environmental assessments have been carried out in support of the Drought Plan.

Environmental assessments

Water companies are required to undertake environmental assessments of actions they might need to implement during drought which could impact upon the environment. These assessments should assess the potential impact of the action on flows, water levels and water quality and how this could impact fish, ecology and environmentally designated sites over and above the impact of natural drought.

We have prepared Environmental Assessment Reports (EARs) for all our Drought Permit and Order options to accompany any applications we might need to make for a Drought Permit or Order. Having prepared EARs in advance of a drought event will make the application process for a Drought Permit or Order more efficient by ensuring that environmental issues, monitoring and mitigation requirements will have been considered, and baseline monitoring undertaken where needed, in advance of the application.

The Environment Agency published updated Drought Plan guidance in December 2015 and subsequent technical guidance was issued in 2016, including information relating to the preparation of EARs and assessing drought management measures in relation to the Habitats Regulations, SEA and WFD.

This guidance has informed preparation of our EARs; specifically, Section 3 of the Environment Agency's 'Drought Plan Guideline Extra Information: Environmental Assessment for Water Company Drought Plans'. The environmental assessment, associated mitigation actions and monitoring requirements form the basis of our EARs. The guidance has also informed development of our SEA, HRA and WFD assessments.

In accordance with the Environment Agency's guidance, the environmental assessment reports comprise the following:

- an assessment of the hydrological or hydrogeological effects of the proposed Drought Order
- an assessment of the environmental sensitivity of the identified affected areas
- identification of mitigation or compensation measures for impacted features
- development of an environmental monitoring plan, where required.

The environmental assessment focuses on the potential changes to water availability (levels and

flows) and any consequent implications for geomorphology, water quality, ecology and other relevant environmental receptors, for example, landscape, navigation, recreation and heritage.

The development of the EARs has been discussed with the Environment Agency and Natural England. A final set of EARs for each Drought Permit/Order has been provided to the Environment Agency and Natural England to accompany the final Drought Plan.

The EARs would be updated before any application is made for a Drought Permit or Order to take account of any new monitoring or other evidence, and to reflect the prevailing drought conditions and the antecedent effects of the drought on the environment. We will update all of the EARs again during 2020-2021 taking account of the Drought Plan baseline monitoring findings and any other new evidence as part of our programme of updating the Drought Plan in 2021.

In view of the potential higher frequency of needing to apply for the Test surface water Drought Permit compared with other Drought Permits / Orders, we have agreed with the Environment Agency as part of the Section 20 Agreement that we will provide updated application documents (including the EAR) on a twice-yearly basis in every September and February. The Environment Agency has agreed to review these application documents on each occasion and provide feedback to Southern Water on any actions required to ensure they are 'application ready'.

We have also agreed to share the documents with interested stakeholders every 6 months and will invite these stakeholders to a meeting to discuss any comments or concerns in order to ensure the need for the Drought Permit and its impact are understood.

Further Reading:

Annex 4: Supply interventions

Annex 9: Options Appraisal

Annex 11: Habitats Regulation Assessment

Annex 12: Strategic Environmental Assessment

Annex 13: Water Framework Directive Assessment.

Table 6.8: Drought Permit and Order option

Option & Source Type	WRZ	Drought Trigger	Maximum Benefit Ml/d
Western Area			
Lukely Brook groundwater source	Isle of Wight	Drought conditions	4.0
Caul Bourne groundwater source	Isle of Wight	Severe drought conditions	1.8
Shalcombe groundwater source	Isle of Wight	Severe drought conditions	0.65
Eastern Yar Augmentation Scheme surface water source	Isle of Wight	Severe drought conditions	1.0
Site in the Test Valley groundwater source	Hampshire Rural	Severe drought conditions	4.36
River Test surface water source (Drought Permit)#	Hampshire Southampton West & Hampshire Southampton East	Drought conditions	Up to 80.0
River Test surface water source (Drought Order)#	Hampshire Southampton West & Hampshire Southampton East	Severe drought conditions	Up to 80.0 (continuation of above not addition)

Option & Source Type	WRZ	Drought Trigger	Maximum Benefit Ml/d
Candover Augmentation Scheme groundwater source#	Hampshire Southampton East	Drought conditions	Up to 27.0
Lower Itchen# (Southern Water and Portsmouth Water) groundwater and surface water sources	Hampshire Southampton East	Severe drought conditions	Up to 30.0 from the Portsmouth Water surface water source; and 38.0 from Southern Water's Lower Itchen sources
Central			
Pulborough (1) surface water source	Sussex North	Drought conditions	10.0
Pulborough (2) surface water source	Sussex North	Drought conditions	20.0
Pulborough (3) surface water source	Sussex North	Severe drought conditions	23.0
Weir Wood reservoir surface water source	Sussex North	Severe drought conditions	3.6 (winter) 5.4 (summer)
East Worthing groundwater source	Sussex Worthing	Drought conditions	2.5 (Oct to Dec only)
North Arundel groundwater source	Sussex Worthing	Severe drought conditions	2.5

Option & Source Type	WRZ	Drought Trigger	Maximum Benefit Ml/d
Eastern			
Stourmouth surface water source	Kent Thanet	Drought conditions	6.5
North Deal groundwater source	Kent Thanet	Severe drought conditions	1.27
Faversham groundwater sources	Kent Medway East	Severe drought conditions	15.0
Bewl Water reservoir / River Medway Scheme## Stage 1 surface water source	Kent Medway West	Drought conditions	3.0
Bewl Water reservoir / River Medway Scheme Stage 2 surface water source	Kent Medway West	Severe drought conditions	4.0
Bewl Water reservoir / River Medway Scheme Stage 3 surface water source	Kent Medway West	Severe drought conditions	1.0

Option & Source Type	WRZ	Drought Trigger	Maximum Benefit Ml/d
Bewl Water reservoir / River Medway Scheme Stage 4 surface water source	Kent Medway West	Severe drought conditions	16.2
Powdermill reservoir surface water source	Sussex Hastings	Severe drought conditions	1.8
Darwell reservoir (1) surface water source	Sussex Hastings	Severe drought conditions	2.5
Darwell reservoir (2) surface water source	Sussex Hastings	Severe drought conditions	3.8

the operation of the Section 20 Agreement governs the Test surface water Drought Permit and Drought Order and the Candover Augmentation Scheme and Lower Itchen sources Drought Orders.

Southern Water will continue to work with the Environment Agency on lessons learned from the 2018 Bewl Water / River Medway Scheme Drought Permit application.. We have carried out environmental monitoring subsequent to the 2018 Drought Permit application as baseline monitoring and will continue wider discussions to ensure we develop and maintain application readiness of the permit in all it stages.

6.3 Regional droughts

Droughts can affect whole regions and thus a number of water companies simultaneously. Regional drought management and co-ordination of drought actions across water companies in a region is therefore important. During the last drought in 2011-12, water companies worked with Water UK to ensure a consistent source of information for all water company customers in the area affected by the drought. Water companies also work closely with the Environment Agency to ensure a collaborative regional approach is taken to drought management and communications.

Water companies will also collaborate on a regional basis through the discussion and negotiation of bulk supply agreements. This is discussed in greater detail in **Annex 4: Supply interventions.**

6.4 Emergency droughts

As a drought develops, a range of supply-side and demand-side actions are available including Drought Permits and Drought Orders to improve the supply-demand balance. We will make full use of all other measures before considering whether the severity of drought conditions mean that Emergency Drought Orders might be required. The actions that would be taken in advance of the application for Emergency Drought Orders are summarised as follows:

- applications for Drought Permits or Drought Orders to abstract water from the environment through a further reduction in MRFs and/or compensation release
- applications for Drought Orders to prohibit or limit the abstraction of water by third parties, in order to allow the company to maintain or increase its authorised abstractions
- applications for Drought Orders for various authorisations associated with discharges to the environment; and
- applications for Drought Orders to limit or restrict the use of water for certain activities as stated in the Drought Direction 2011.

It should be noted that some of the measures above may also need other consents, such as discharge consents and planning permission.

An Emergency Drought Order, of necessity, requires authorisations that could lead to additional environmental impacts. The scope of monitoring and other environmental work that might be required under such circumstances will be reviewed with the Environment Agency as drought conditions become more severe.

Emergency Drought Orders allow water companies to restrict supplies to customers through the imposition of rota cuts and/or the introduction of standpipes. These measures exist to deal with the very remote possibility of a drought much worse than any seen in the last century or more in the UK. The type of restrictions which would be introduced under today's Emergency Drought Orders have not been in place in the UK since 1976. Ministers have made it clear that such measures should be avoided at all costs and introduced only as a last resort. It should be noted that, due to the investments that have been made since then, if similar conditions to those experienced in 1976 were to occur again, there would not actually be the need for such drought actions.

The full range of measures available under Emergency Drought Order include powers:

- to limit the use of water for such purposes as it considers necessary (i.e. further measures not specified in the Drought Direction 2011)
- to introduce rota cuts

- to set up and supply water by means of standpipes or water tanks.

In the event of such Emergency Drought Orders being authorised and implemented, we would give as much warning as possible (a minimum of 72 hours) to the local Fire Authority before an Emergency Drought Order is enacted. The London Fire and Emergency Planning Authority and Fire Authorities will also receive formal notice in writing. We take all reasonable measures to secure adequate supplies of water for the Authority's use in the event of fire and consult closely during all stages of a given drought.

6.5 Implementation sequence of Drought Permits and Orders

We have taken account of the findings of the environmental assessments of each Drought Permit and Drought Order, along with the Water Resource Zone source characteristics and discussions with the environmental regulators, to develop the prioritised sequencing of Drought Permit / Order implementation. Taking account of our statutory supply duties, we plan to implement those Drought Permits / Orders which have been assessed as having the least environmental impact ahead of those assessed as having greater environmental impact in the applicable Water Resource Zones. Table 6.9 sets out the sequencing of Drought Permit / Order implementation in each Water Resource Zone.

The criteria for the sequence of implementation of the Test surface water, Candover Augmentation Scheme and Lower Itchen sources Drought Orders for the Southampton West and Southampton East Water Resource Zones is set out in Annex 1 of the Section 20 Agreement signed in March 2018 between Southern Water and the Environment Agency. This establishes that Southern Water will take account of ecological considerations in deciding the order of application for these Drought Orders. In particular, "the company will take into account the potential greater vulnerability of fish seasonally because of their migration patterns". To assess the potential ecological implications, Southern Water will review and assess the most up to date data from the monitoring installed pursuant to the Environmental Monitoring Plan, and the latest up to date information on macrophytes and invertebrates, before deciding on the most appropriate Drought Order.

Table 6.9: Sequencing of Drought Permit/Order Implementation

Option & Source Type	WRZ	Drought Trigger	Sequencing of implementation in the WRZ
Lukely Brook groundwater source	Isle of Wight	Drought conditions	1
Caul Bourne groundwater source	Isle of Wight	Severe drought conditions	2
Shalcombe groundwater source	Isle of Wight	Severe drought conditions	3
Eastern Yar surface water source	Isle of Wight	Severe drought conditions	4
Test Valley groundwater source	Hampshire Rural	Severe drought conditions	1
Test surface water Drought Permit surface water source	Hampshire Southampton West Hampshire Southampton East	Drought conditions	1
Test surface water Drought Order surface water source	Hampshire Southampton West	Severe drought conditions	2#

	Hampshire Southampton East		
Candover Augmentation Scheme groundwater source	Hampshire Southampton East	Severe drought conditions	2#
Lower Itchen Sources groundwater and surface water sources	Hampshire Southampton East	Severe drought conditions	2#
Pulborough (1) surface water source	Sussex North	Drought conditions	1
Pulborough (2) surface water source	Sussex North	Drought conditions	2
Pulborough (3) surface water source	Sussex North	Severe drought conditions	3
Weir Wood reservoir surface water source	Sussex North	Severe drought conditions	4
East Worthing groundwater source	Sussex Worthing	Drought conditions	1
North Arundel groundwater source	Sussex Worthing	Severe drought conditions	2
North Deal groundwater source	Kent Thanet	Severe drought conditions	1
Stourmouth surface water source	Kent Thanet	Severe drought conditions	2
Faversham groundwater source	Kent Medway East	Severe drought conditions	1
Bewl Water reservoir / River Medway Scheme Stage 1 surface water source	Kent Medway West	Drought conditions	1
Bewl Water reservoir / River Medway Scheme Stage 2 surface water source	Kent Medway West	Severe drought conditions	2
Bewl Water reservoir / River Medway Scheme Stage 3 surface water source	Kent Medway West	Severe drought conditions	3
Bewl Water reservoir / River Medway Scheme Stage 4 surface water source	Kent Medway West	Severe drought conditions	4
Powdermill surface water source	Sussex Hastings	Severe drought conditions	1
Darwell (1) surface water source	Sussex Hastings	Severe drought conditions	2
Darwell (2) surface water source	Sussex Hastings	Severe drought conditions	3

sequencing will be in accordance with the provisions set out in the s20 agreement

6.6 Environmental monitoring and mitigation

The Environmental Monitoring Plan (EMP) that accompanies this Drought Plan **(Annex 5)** contains a monitoring framework to differentiate the impacts of implementing the drought plan measure from those caused by environmental drought conditions.

It also sets out the framework and principles for baseline monitoring to improve understanding of the baseline environment without drought intervention measures in place. Additionally, the EMP sets out the mitigation measures to be considered during implementation of a Drought Plan measure.

This Drought Plan sets out the various measures which will be considered for implementation during drought conditions. The EMP considers those measures that may have adverse effects on the environment, setting out the baseline, within-drought and post-drought environmental monitoring requirements and potential mitigation (and/or compensation) measures. It also includes details of the survey methodologies to be used and the exchange of data between Southern Water, the Environment Agency, Natural England and other relevant organisations.

The EMP can be considered as a 'live' working document and subject to an annual review to ensure that it remains fit for purpose, especially where new data/evidence becomes available.

The EMP has been prepared in compliance with the requirements for environmental monitoring and mitigation set out in the Environment Agency's Drought Plan guidance documents (2015 and 2016).

The detailed EMP and our Drought Plan should be viewed in conjunction with the relevant Environment Agency Drought Plans, which aim to reconcile the interests of public water supplies, other abstractors and the environment during a drought, at both national and regional/ local levels. Like water company Drought Plans, the Environment Agency's Drought Plan is also reviewed on an annual basis.

6.7 Environmental consultation

As described earlier in this document, we consulted with the Environment Agency and Natural England during the preparation of the draft Drought Plan and during the subsequent revised draft Drought Plan and preparing this final Drought Plan. The EMP reflects these discussions and understanding with regard to monitoring methodologies, survey locations and considerations as to which organisations are best placed to carry out identified surveys and mitigation measures. Whilst Southern Water retains responsibility for ensuring monitoring and mitigation takes place it may be that other organisations are better placed to physically deliver this.

The precise location of monitoring sites and the acceptability of monitoring methods and mitigation measures will be agreed with the Environment Agency and, where applicable, Natural England. The timetable for further refinement of monitoring and mitigation measures is set out in Annex 5.

We also have additional monitoring commitments under the Section 20 Agreement with the Environment Agency in respect of Rivers Test and Itchen. The package of measures is documented in Annex 5.

Further reading: **Annex 5: Environmental monitoring plan**

Annex 11: Habitats Regulations Assessment

Annex 12: Strategic Environmental Assessment

Annex 13: Water Framework Directive Assessment

7. Testing the plan

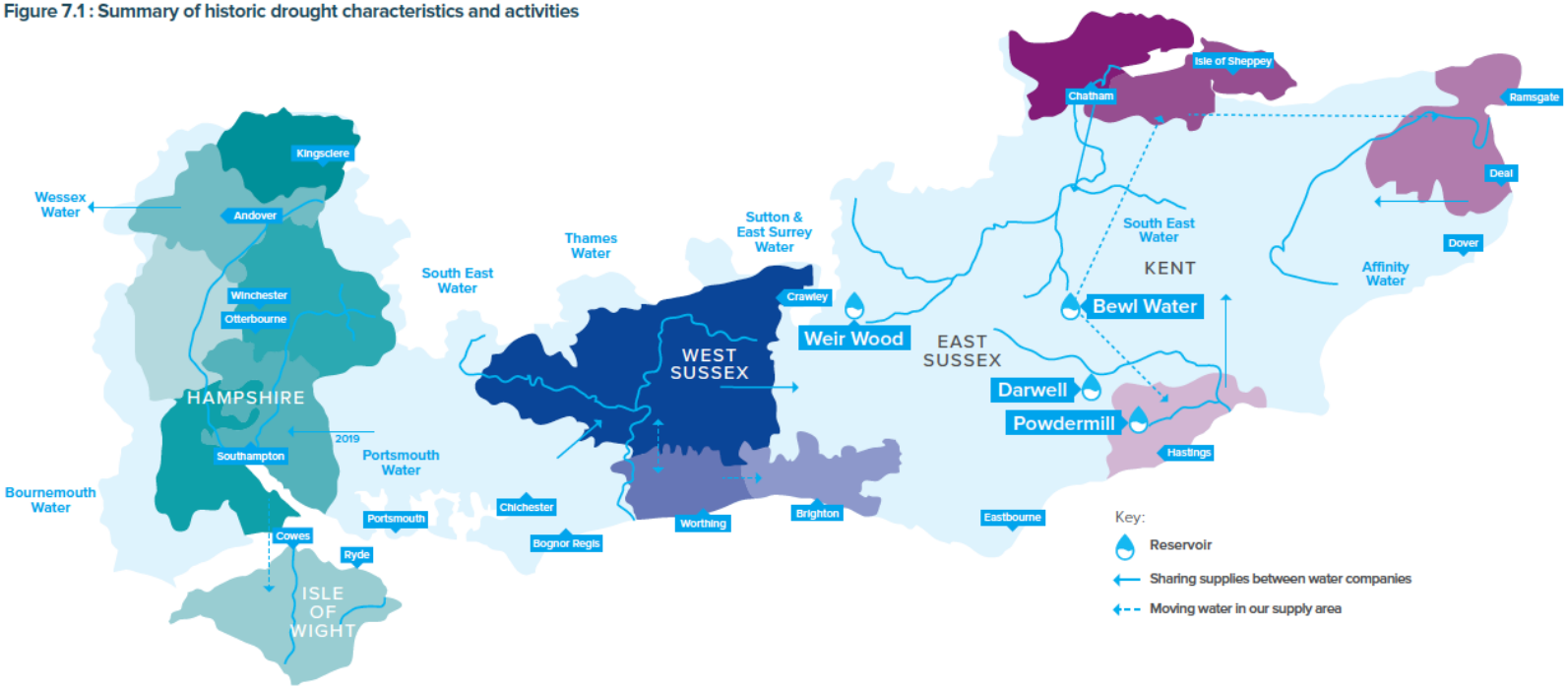
This plan has been tested using historic and stochastic drought patterns under current supply system capability and customer demand patterns. This has been presented using a mixture of tables and descriptions and figures to explain the overall process and timing, and reflects the inclusion of the overall supply-demand analysis as a key part of the drought decision process.

However, the timing of actions and breaching of respective trigger levels are broadly based on analyses of historic conditions against the trigger values and charts presented in **Annex 1: Drought monitoring and trigger levels.**

A summary of key historic droughts is shown on Figure 7.1. Due to the fragmented nature of our supply area and the mix of source types in each supply area there are a number of different historical droughts that have been selected for the Eastern, Central and Western water supply areas.

More detailed information, including results of testing the plan against severe stochastic droughts, can be found in **Annex 2: Scenario testing and what ifs.**

Figure 7.1 : Summary of historic drought characteristics and activities



Western area

1921-22 type drought event

- Add wording to explain the context

1976 type drought event

- Lead-in to the drought, actions and timelines very similar to the 1921-22 style drought
- Interventions curtailed as a result of the drought breaking in September

2011-12 type drought event

- Least severe of the three historical droughts presented
- Driven by the low rainfall in 2011

Central area

1921-22 type drought event

- Two year drought, with 1921 being more severe than 1922
- 1921 represents a very severe 'whole season' single year drought- dry winter followed by summer and autumn with very little rainfall
- 1922 also very dry, but summer rainfall kept Pulborough flows higher and provided much larger inflows to Weir Wood reservoir

1976 type drought event

- One year drought
- Extremely dry period from winter 1975-76 through to September 1976, combined with extremely high demand
- Actions and timelines similar to the 1921-22 style drought - interventions curtailed by drought breaking in September

Eastern area

1900-1903 type drought event

- Length of drought makes it the most severe drought in historic record
- Very limited refill from winter 1900-1901 until the spring 1903
- Continuous recession over an extended period and persistent and very low groundwater levels

1921-22 type drought event

- Two year drought, with 1921 being more severe than 1922
- 1921 represents 'whole season' single year drought - dry winter followed by summer and autumn with very little rainfall
- Rainfall deficits less severe than those experienced further west

8. Management and communications

Effective management is vital during a drought to ensure timely and efficient steps can be taken to mitigate the impact on customers, safeguard the environment, agree and carry out monitoring and communicate with customers and stakeholders internally and externally.

It is also important to ensure we are in an informed position to contribute positively to regional and national activities and collaborate with other water companies, regulators and the government. Our plan is designed to deliver the most cost beneficial level of communication and management, to ensure we meet our obligations and customers' expectations, while also ensuring value for money within an overall drought budget.

Communication is critical and **Annex 6: Management and communications** includes updates to reflect the lessons learnt during the most recent droughts in the South East in 2005-06, 2011-12 and 2016-18 and the UKWIR Code of Practice document 'Managing Through Drought' (2014).

We also have a drought communications plan and the phasing of activities in this are captured in Annex 6. These include:

- media and customer awareness campaigns
- water efficiency actions and promotions
- customer communication through online channels, print and letters
- stakeholder engagement and communication
- internal engagement.

The plan also identifies the aims, key messages and target audiences and how we would collaborate with other water companies in drought conditions and industry bodies such as Water UK and Waterwise to co-ordinate messages and actions.

There are also specific commitments and actions with respect to stakeholder communication in our Section 20 Agreement with the Environment Agency. This reflects the possible need for more frequent Drought Permits on the River Test whilst longer term water resources are developed.

We will focus communication and water efficiency initiatives in this area in 'normal' years to raise awareness of the potential impacts upon customers and the environment of the timetable and interventions within the Section 20 Agreement. This will include a clear explanation of the current water resources situation, the predicted frequency of supply and demand actions (including for example application for a Test surface water Drought Permit) and the actions customers and stakeholders can take to both conserve resources now, and during drought conditions.

This will include activities, such as:

- Providing information online on water efficiency and the water resource situation in Hampshire and the Isle of Wight
- Sharing leaflets and talking to customers at community events
- Sharing information and water-saving opportunities as part of the school and community talks programme
- Sharing information through regional newspapers, radio, social media sites and community

websites

- Offering stakeholder and retailer briefings
- Including information in stakeholder letters and e-bulletins.

In view of the potential higher frequency of needing to apply for the Test surface water Drought Permit compared with other Drought Permits / Orders, we have committed, in the s20 agreement, to provide the Environment Agency with updated application documents (including the Environmental Assessment Report (EAR)) on a twice-yearly basis in every September and February. We have also agreed to share the application documents (including the EAR) with interested stakeholders and arrange to meet with the stakeholders to discuss any comments or concerns to ensure the need for the Drought Permit and its impact are understood.

Further Reading: Annex 6: Management and communications

9. End of a drought

It is important to recognise when a drought event has ended and there can then be a safe and considered de-escalation of drought-related activities, whereby any temporary impacts upon customers and the environment are reduced and finally removed in a timely manner. It is important to recognise that there is a difference between the end of a drought purely in relation to low rainfall and when it is acknowledged that water resources have recovered back to within the normal range of conditions.

As previously stated, drought events are characterised by a cumulative deficit of rainfall. When a drought 'breaks', it often does so with events which lead to a period of much higher than normal rainfall. However, it may take some time for water resources to recover fully, and so until there has been sufficient excess rainfall to remove the soil moisture deficit, to restore river flows and begin recharge to groundwater, drought restrictions may still be required.

The recovery and a return to normal water resource conditions can take some time, especially for groundwater, where there can be over-season effects. This is because summer rainfall rarely leads to significant groundwater recharge and so it is normally a surplus of winter rainfall that leads to a recovery to normal or above normal groundwater conditions.

Following a drought, we will undertake a post drought review and would work with the Environment Agency and neighbouring water companies to inform this. This includes environmental monitoring to determine any adverse effects arising from implementation of drought management measures as set out in the Environmental Monitoring Plan. Table 9.1 below sets out a high-level timeline for the production of this.

Table 9.1: Post Drought Actions

Month after normal conditions have returned	Post drought review activities
1 Month	■ Appoint author of post drought review. ■ Hold internal workshop and interviews to collect summary of experiences of drought interventions.
2 Month	■ Meet with the Environment Agency and any affected neighbouring water companies and other stakeholders, as appropriate, to discuss lessons learnt
3 Month	■ Publish post drought review report internally and to the Environment Agency
3-18 Months	■ Continue collecting environmental monitoring data ■ Update Environmental Assessment Reports as appropriate ■ Consider updating the WRMP and Drought Plan if necessary

Further reading: **Annex 5: Environmental monitoring plan**

Annex 7: Post-drought actions

Frequently asked questions

Annex 10: Restrictions: FAQs sets out common questions we were asked about the first phase of Temporary Use Bans when they were introduced for the first time in 2012 for customers in Kent and Sussex.

The aim of this Annex is to provide further information for customers and stakeholders on our position on restrictions and exemptions during this first phase, to help them consider feedback during consultation on this draft plan.

The Frequently Asked Questions (FAQs) have been updated to reflect our alignment with exemptions in the UKWIR Code of Practice (2013).

Glossary

Term or acronym	Explanation or definition
Abstraction licence	The authorisation granted by the Environment Agency to allow the removal of water from a source, either permanently or temporarily
Control curves	A diagram or graph presenting drought trigger levels
DO or deployable output (Ml/d)	Deployable output is the output of a commissioned source or group of sources or a bulk supply, as constrained by: the environment, licence, pumping plant, well or aquifer properties, raw water mains, aquifer, transfer and/or output main, treatment, water quality
Drought	A drought happens when a period of low rainfall creates a shortage of water for people, the environment, agriculture, or industry (EA, Managing drought in England and Wales, March 2008)
Drought Order	An authorisation granted by the Secretary of State under drought conditions which imposes restrictions upon the use of water and/or allows for abstraction/impoundment outside the schedule of existing licences on a temporary basis
Drought Permit	An authorisation granted by the Environment Agency under drought conditions which allows the abstraction/impoundment outside the schedule of existing licences on a temporary basis
Drought Plan	“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” WIA1991, 39B(2)
EA	Environment Agency
Emergency Drought Order	An authorisation granted by the Secretary of State under drought conditions which allows water companies to restrict supplies to customers through the imposition of rota cuts and/or the introduction of standpipes
FWMA	Flood and Water Management Act 2010

Habitats Regulations Assessment	Assessment to consider the potential effects of alternative options and strategies on designated European nature conservation sites
HRA	Habitats Regulations Assessment
Level of Service (LoS)	"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" (EA Mar 2011)
Ml	Megalitres
Ml/d	Megalitres per day
MRF	Minimum residual flow
Ramsar site	Internationally important wetland site
SAC	Special Area of Conservation – designated under the European Habitats Directive (1991)
SEA	Strategic Environmental Assessment – made under the SEA Directive, which aims to ensure that significant environmental effects arising from proposed plans and programmes are identified, assessed, subjected to public participation, taken into account by decision makers, and monitored
SPA	Special Protection Area – classified under the European Birds Directive (1979)
SSSI	Site of Special Scientific Interest – a site given statutory designation by Natural England (or the Countryside Council for Wales) because it is important on account of its nature conservation value
Section 20 Agreement	Operating agreement between Southern Water and the Environment Agency under Section 20 of the Water Resources Act 1991 for the River Itchen and River Test following licence changes to these sources
Stochastic	Modelling tool estimating probability of potential outcomes, allowing for fluctuations observed in historical data over time
Temporary Ban on water use	Restriction on customer water use under powers provided in the Water Industry Act 1991. These can be introduced by water companies without the need to apply to the Secretary of State under conditions where it is experiencing, or may experience, a serious shortage of water for distribution.

	They replace what was formerly called ‘hosepipe bans’
Triggers	Drought triggers are used to identify when a company should consider implementing specific drought actions to reduce demand and/or obtain extra resources. Triggers are used as a tool to aid to decision making, as part of wider drought management considerations, which includes professional judgement and the availability of information and data relevant to each specific drought event.
UKWIR	UK Water Industry Research
WIA	Water Industry Act 1991
WRA	Water Resources Act 1991
WFD	EU Environmental Legislation committing all EU member states to achieving good quality and good quantitative status of all water bodies
WRMP	Water Resource Management Plan – a water company long-term strategic plan for water supply and demand over a 25-year period
WRZ	Water resource zone – 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

List of annexes

Below is a full list of the Annexes which support this Technical Summary of Southern Water's final Drought Plan:

Annex 1: Drought monitoring and trigger levels

Annex 2: Scenario testing and what ifs

Annex 3: Demand interventions

Annex 4: Supply interventions

Annex 5: Environmental monitoring plan

Annex 6: Management and communications

Annex 7: Post-drought actions

Annex 8: Engagement and consultation

Annex 9: Options appraisal approach

Annex 10: Restrictions: FAQs

Annex 11: Habitats Regulation Assessment (Non-Tech Summary)

Annex 12: Strategic Environmental Assessment (Non-Tech Summary)

Annex 13: Water Framework Directive assessment (Non-Tech Summary)

Annex 14: Draft drought permit / order application pack

These are either available online at southernwater.co.uk/our-drought-plan or by contacting us at wrmp@southernwater.co.uk