FINAL DROUGHT PLAN 2013

Nick Sheeran
Finance and Regulation Director
Portsmouth Water Ltd
PO Box 8
West Street
Havant
Hampshire
PO9 1LG

APRIL 2013

Foreword

The Water Act (2003) made it a statutory requirement for water companies to produce and maintain a Drought Plan, and update it every three years. In accordance with this we prepared our draft Drought Plan in October 2011 and published it for consultation on Friday 27th January 2012. The consultation period closed on Friday 9th March 2012, during which time 21 stakeholders were contacted and 8 responded. Our statement of response to these comments is included in Appendix F of this document. Where we have made changes to the content of this Plan as a result of stakeholder comments a cross reference to these changes is given as a supplement to the Statement of Response in Appendix G.

The Secretary of State approved our Draft Final Plan in February 2013 and this has now become the Final Drought Plan 2012 (Approved 2013).

FINAL DROUGHT PLAN

APRIL 2013

CONTENTS

Appendices

EXECUTIVE SUMMARY

Introduction

Portsmouth Water provides an average of 182 million litres of drinking water per day to around 305,300 domestic and commercial customers in south east Hampshire and part of West Sussex.

Throughout the Company's long history, it has paid particular attention to ensuring that it meets its statutory obligations to maintain supplies, despite many drought periods such as those during the 1890s and 1900s, 1921, 1934, 1973, 1976 and the early 1990s.

Statutory Drought Plans

Section 63 of the Water Act 2003 imposed the requirement for water companies to prepare statutory drought plans as well as the requirement to conduct consultations in their preparation.

Portsmouth Water's previous Drought Plan was published in December 2008. This Final Drought Plan has been prepared following the introduction of the Flood and Water Management Act 2010 and the Water Use (Temporary Bans) Order 2010. This legislation covers temporary restrictions which can be introduced during a drought and the Drought Direction 2011 covers additional measures that can be introduced in more severe droughts.

Basis of Portsmouth Water's Drought Plan

The Company's water sources are all groundwater based, with 50% of water supplied from boreholes and wells, 35% from natural springs at Havant & Bedhampton, and 15% from Gaters Mill, a river abstraction above the tidal limit of the groundwater-dependent River Itchen.

Portsmouth Water currently has no surface water storage reservoirs and hence its ability to maintain supplies during a drought relies upon balancing demands with the yield from its sources. The greatest challenge is therefore likely to be during dry summers when peak demands are usually experienced.

Portsmouth Water's Resources and Transfers

Portsmouth Water has nineteen water sources and the yield of many of these sources diminishes as ground water levels and river flows decline.

Since the publication of the 2008 Drought Plan, Portsmouth Water has revised our view of resource zones. This means there is only one "resource zone" as defined by the Water Resources Management Plan.

Portsmouth Water has a bulk supply agreement with Southern Water to supply up to 15 Ml/d to Southern Water's Sussex North Zone. The bulk supply agreement, which ends in 2013, does not guarantee that water will be available to Southern Water in extreme conditions. This includes a drought and Portsmouth Water's Drought Plan does not allow for a provision for the bulk supply.

Drought Management Areas

The whole Company supply area is little more than 50 km x 30 km with reasonably well developed 'connectivity' between its sources and service reservoirs. The sources are not isolated and the connecting links enable transfers between areas if required. As a result, the Company will treat the whole of its supply area as a single Drought Management Area.

Habitats Regulations Review of Consents

This Final Drought Plan takes account of licence variations that have been made since the last Plan as a result of the Habitats review of consents by the Environment Agency.

The Impacts of Drought for Portsmouth Water

The Flood and Water Management Act 2010 defines drought as a significant period without rainfall. This Plan is likely to be required only during prolonged periods of low rainfall that impact on groundwater supplies since the Company's Water Resources Management Plan makes provision for balancing supplies with demand under normal weather conditions. A wide range of drought scenarios has been considered so that the Plan can cope with repeats of historical levels of drought and also future droughts that may be more severe as a result of global warming.

Drought Indicators

The yield of the Company's groundwater sources is entirely dictated by groundwater levels, which are principally dependent upon aquifer recharge from rainfall during the winter period. The Company therefore monitors both rainfall and groundwater levels to enable it to estimate the expected output from its sources during the months ahead.

The Company has monitored groundwater levels at Idsworth Well, an observation borehole near Rowlands Castle, for over seventy years. It is centrally located within the Company's area, is unaffected by abstraction and therefore provides a good indication of groundwater resources for the Company.

The spring source at Havant & Bedhampton has been used for public supply since 1860; and a long record exists of daily rainfall measured at Havant which, due to its location, is representative of the whole Company area.

When in graphical form, these two factors provide the key information required to enable forecasts to be made of resources during forthcoming seasons given different rainfall scenarios.

Critical Drought Scenarios

Portsmouth Water's groundwater sources in the South Downs chalk are dependent upon recharge from winter rainfall and there have been several drought periods over the last 80 years where little or no winter recharge has taken place. In such circumstances, source yields in the following summer reduce although, since the Company's records began, there have never been two successive winters without any significant aquifer recharge.

In drawing up this plan, the Company has considered the national and more localised droughts in South East England. For Portsmouth Water drought events of 1973 and 1976 were the most severe.

Notwithstanding those events, the Environment Agency Guideline suggests that a Drought Plan should be able to cope with a range of droughts based on: a range of single season dry summers; a range of single season dry winters; and a range of multi-season droughts.

The Company in the preparation of this Final Drought Plan has also utilised groundwater level data from Chilgrove Well provided by the Environment Agency. The data from this observation borehole dates back to 1836 and has enabled the Company to investigate whether more severe droughts had been experienced in the past. The analysis found no evidence that more severe events had occurred historically than those already considered.

Drought Impacts upon Source Yields

The critical drought years with lowest recorded groundwater levels for Portsmouth Water are:

- 1973, 1976 and 1989 for Hampshire sourceworks and
- 1976, 1989 and 1990 for Sussex sourceworks.

The Minimum Drought Output (MDO) of the Company's sources in the autumn of a two-season drought (based upon 1973 data) is expected to occur in November and December. However the most critical period for balancing supplies with demand occurs for the Company during May to July since there is no raw water storage on which to draw during peak demands at that time of year.

Dry Year and Drought Impacts upon Demand

The Company's 2009 Water Resources Management Plan balances yield assessments for a drought year with demand forecasts for dry years through to 2035. A 'dry year' for demand purposes is defined as a year with below average rainfall and above average temperatures during the critical peak demand period of May to July and with no restrictions on demand. The stated Level of Service in the Water Resources Management is “1 in 20 years”, consequently the Company does not expect to employ drought measures more frequently than 5% of years.

Potential Drought Scenarios Considered

The Company's groundwater monitoring records from Idsworth Well date back to 1932 and provide a significant record of the most critical conditions for single and multi-season droughts over a period of more than seventy years.

Single Season Droughts

Portsmouth Water has no significant raw water storage but the South Downs chalk aquifer is very resilient to drought. A 'Single Season Summer Drought' is considered unlikely to have a critical effect on the supply/demand balance for Portsmouth Water. Experience from the dry summers of 1995, 2003 and 2006 amply demonstrates the Company's capability to cope with single season dry summers.

Multi-Season Droughts

Multi-Season Droughts, i.e. two or more consecutive seasons of below average rainfall, have a much greater impact upon the Company's ability to balance demands with available supplies, especially if they are combined with a dry summer.

In assessing the impacts of such droughts, the Company has used the most recent thirty year rainfall record rather than the complete 120 year record to take account of recent effects. Four scenarios for multi-season droughts based upon past experience have been developed in detail in this Plan (refer section 2.5). However, it should be noted that Scenarios B, C and D are more severe than the Company has experienced in the past seventy-five years:-

Scenario “A” is largely based upon the Company's experience of 1972 - 1974 when a dry autumn/winter of the first year was followed by some recovery in year two. (1 in 40)

Scenario “B” is a multi-season drought based on the dry autumn/winter of 1975/76, the dry summer of 1976, which is then extended into the autumn as occurred in 1973. (1 in 80)

Scenario “C” models the effect of applying an eighteen month period encompassing two dry summers based on conditions in 1990, and a dry winter using recession curves from the winter of 1975 and 1976. (1 in 120)

Scenario "D" is a three year drought based on 1973 but with no groundwater recovery until the end of the third winter (1 in 200).

A graph illustrating the indicative groundwater levels at Idsworth Well that might be experienced for the above scenarios is shown in the following section.

Drought Management

Portsmouth Water's customers have high expectations of its ability to manage supplies during a range of drought scenarios. The options for managing a drought comprise:-

- Demand Management options - measures which influence customer demand.
- Supply enhancement - measures taken to enhance supply availability.

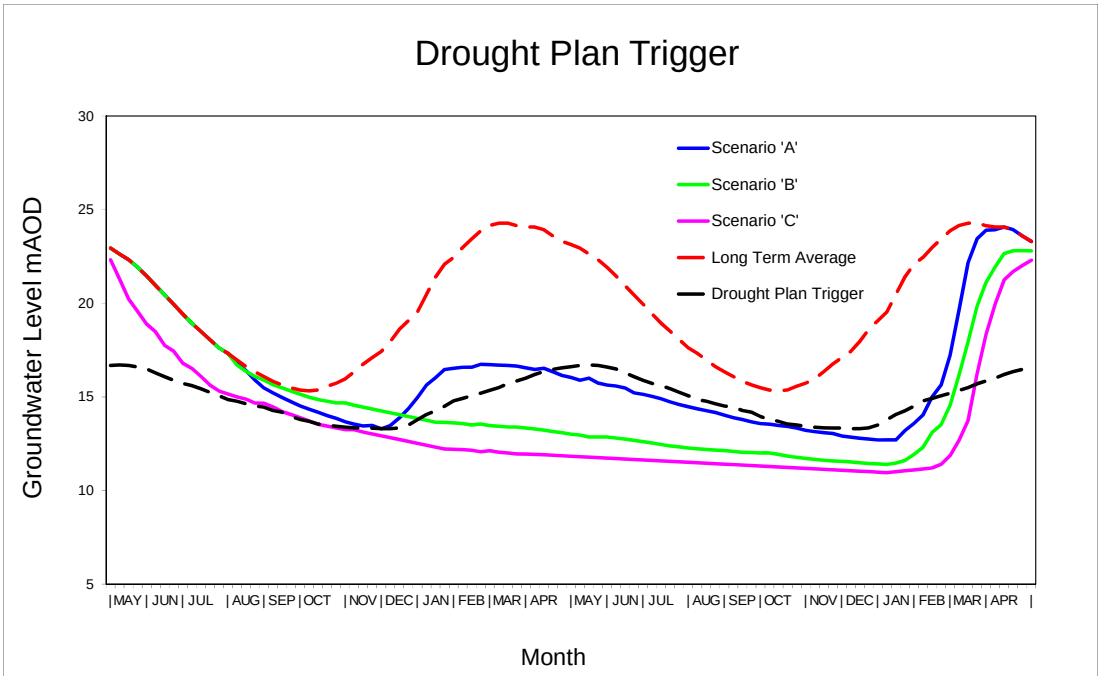
The Company anticipates that it will only need to implement its Drought Plan during a multi-season drought. This will ensure that adequate time is available for planning any actions during the first season; to be implemented in the subsequent season; if the dry weather continues. During the period from September to April each year, it is anticipated that there will be sufficient supply to meet demand as this is not a critical demand period. It will be principally the peak demand months of May to July in a two season drought when actions might be required to ensure that supplies balance demand. The Company currently has no storage available in winter to retain water for use in the summer. As the Company's resource situation is unaffected by abstraction, the Company does not plan to apply demand restrictions during the winter period.

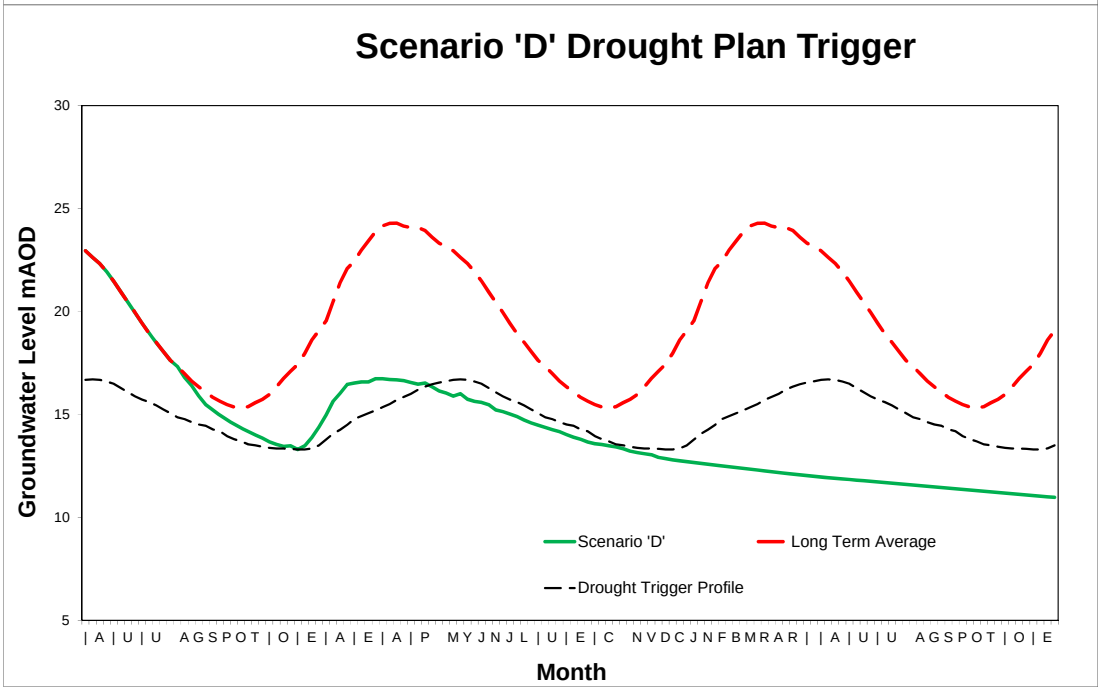
A drought trigger profile (refer to figure below) has been generated so that in any week of the year the profile can be compared against current groundwater levels at Idsworth Well and if 'breached' an early warning given that drought actions may need to be considered. This will be the trigger for the Drought Management Team to be convened.

Drought Management Control

The Company's Drought Management Team will be convened when the drought trigger profile is breached. Meetings will be held as required, usually monthly, but if necessary weekly and the Team will report upon the actions taken to the Executive Team and Company Board.

The relationship between the graphs below outlines the indicative groundwater recession curves for Scenarios "A", "B", "C" and ''D'' at Idsworth Well and the relationship to the drought trigger profile and the long term average. The first graph is plotted over two years to show the effect of multi season droughts. The second graph is plotted over three years to show the effect of a rarer multi season drought.





The Company is expected to participate in the Environment Agency's Regional Drought Co-ordination Groups should other water companies be similarly affected.

Potential Demand Management Actions

The Company has identified a number of key actions that might be used to suppress overall demand in order to balance supplies with demand during a drought.

- Appeals to customers for voluntary restraint in their use of water
- Enhanced leakage control by the Company including pressure reduction
- The imposition of temporary bans on certain activities
- The application of further restrictions under a Drought Order

A key element of this Final Drought Plan is how the Company has proposed to implement the temporary use ban powers afforded to it under the Floods and Water Management Act 2010. The powers allow the Company to choose which activities to ban and when it is appropriate to do so.

Potential Supply Enhancements

Potential supply side options are considered in the Plan on a 'twin-track' basis. Most supply side options would be used in response to local water resource problems. Several are largely untested and some are constrained by the need to obtain environmental data.

The options that have been considered in the Plan are:

- Drought Permits or Orders
- Lowering of borehole pumps to maintain source yields
- Recommissioning unused sources
- Commissioning unused Portsmouth Water boreholes
- Commissioning unused licence from private boreholes
- Increasing drought yields at existing sources

Impact of Drought Management Actions

With no surface water storage, the necessity for Drought Control Actions is principally to ensure that, during the peak demand period of May to July; sufficient supplies will be available to balance demand.

Monitoring Drought Impacts

In the autumn of 1973, at the end of a dry eighteen month period, groundwater levels fell to an all time low. As a result chalk streams and wetlands dried out and plants and animals were put under stress for a considerable period of time. It is believed that there are no historical records of the environmental impacts from that period. Climate change may increase the natural impact of droughts.

It may not be possible or politically acceptable to always protect the environment during extreme droughts. A balanced view will need to be engaged, taking into account the statutory duties to supply water for public health.

Environmental Monitoring to Support Drought Order/Permit Applications

To date, Portsmouth Water has not previously required Drought Orders or Permits. As a result, the Company has little experience of conducting the relevant environmental monitoring.

The Company anticipates that it will develop the requirements for such monitoring by dialogue with the Environment Agency, Natural England and Southern Water. At this point in time it anticipates the following:

- **Additional abstraction from the Eastergate Group of sources –** environmental monitoring points have been established in the vicinity of Swanbourne Lake, Arundel, by the Environment Agency. The Environment Agency Groundwater Model can be calibrated to the latest monitoring data and then used to predict the impact of additional abstraction from the Eastergate Group and more specifically the source at Slindon, information for which can be found in Appendix C. Portsmouth Water has a commitment to work with Southern Water over any potential impacts that additional abstraction could have on Swanbourne Lake and the neighbouring Arundel Wildlife and Wetland Centre SSSI. This includes working on mitigation measures to prevent environmental damage and will include a high level plan outlining these measures.

Proposed Drought Management Actions

The sequence of Drought Actions will be determined by the Company's Drought Management Team, but will be largely dictated by the severity of the drought and the particular drought scenario that applies. The critical period for maintaining supplies will be the peak demand months of May to July. Company actions may therefore only be required for relatively short durations.

The Company has chosen not to implement temporary bans at different times but to prohibit all activities at the same time in the interests of clarity of messages and equitable application of restrictions to customers. The proposed phasing is set out below.

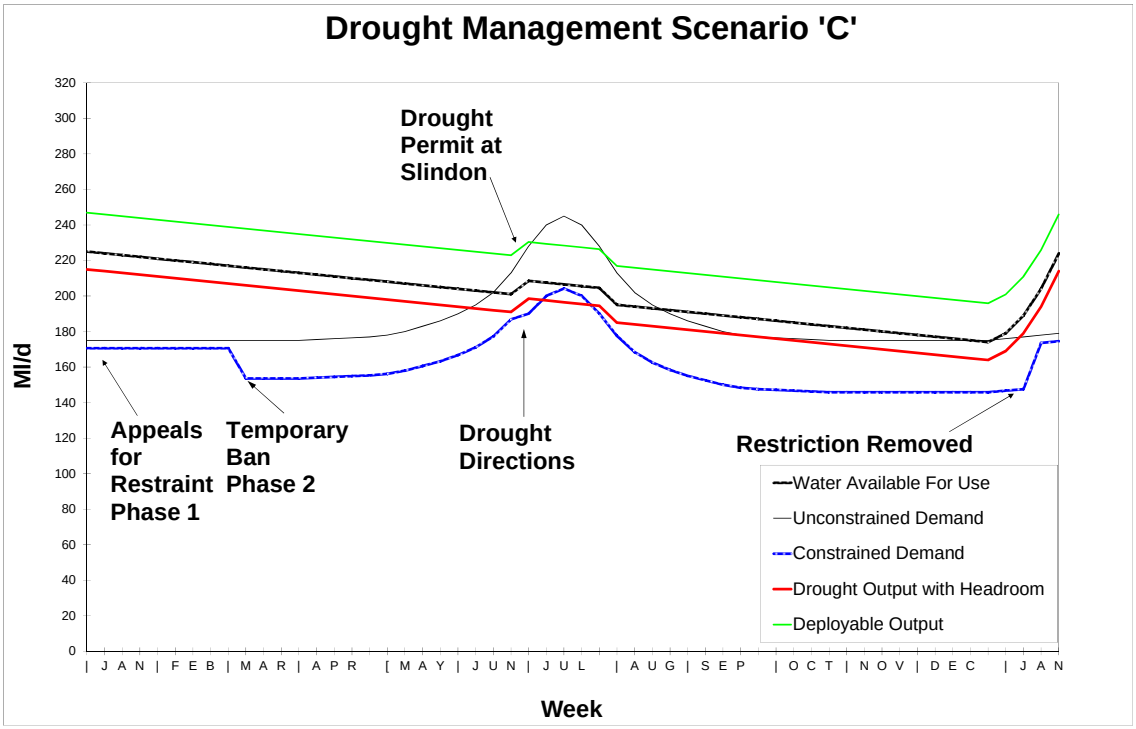
- Phase 1 – Appeals for voluntary restraint and enhanced leakage control
- Phase 2 – Temporary Bans
- Phase 3 – Drought Directions

The timetable for implementing the different phases is dependent if the drought being experienced is Scenario "A", "B", "C" or ''D''. It is possible to provide an indicative timetable for likely timings; however, the actual decisions on the date of application of each phase will be taken by the drought management team during the drought.

The figure below is an indicative example of how the drought management actions could be implemented in a Scenario "C" type drought.

The indicative set of actions demonstrates that the Company believes it can maintain supplies throughout the most severe drought scenario with only recourse to one Drought Permit at the Company's Slindon source. There are other potential supply side options which may be needed if conditions occur that are more severe than a Scenario D Drought, this is considered highly unlikely.

Phase	Drought Measure	Timing
1	Appeals for restraint and enhanced leakage control	January
2	Imposition of a Temporary Ban and application for a Drought Order	March
3	Imposition of Drought Directions and a Drought Permit for the Slindon (Eastergate Group) Licence	June



Assessment of Drought Management Actions

The Company is expected to rely upon a high profile campaign with measures applied consecutively if there is a likelihood of demand exceeding available supplies. The Drought Management Team will assess the impact of each of its actions before applying further measures, in order to ensure that water supply is balanced with demand throughout the peak period.

Drought Permits or Orders may be needed to supply additional water from sources but these will only be considered when all other available options have been exhausted. The Company recognises environmental data will be needed to support any applications made by the Company.

Minimising Impacts upon the Environment

Droughts are extreme events and, regardless of abstraction, they will inevitably have an effect on the environment. Plants and animals, as well as humans, have adapted to cope with very dry conditions occurring from time to time. Nature has a remarkable resilience which enables it to recover from even the most extreme events and adapt to new conditions.

The Environment Agency and Portsmouth Water have a responsibility under the Water Resource Act and the Habitats Directive to minimise the impact upon habitats and species. During a drought it may not be possible to protect every wetland or section of river from the impacts of drought; the need for monitoring and mitigation will have to be agreed with the Agency, Natural England and other conservation bodies where there is the likelihood that a Drought Order may be required.

Drought Communication Strategy

Communication will play a key part in any Drought Management Actions and will involve the Company, customers and the Regulators. It will not be feasible to work to a fixed communication plan since any plan will need to be tailored to the circumstances of a particular drought.

Drought Co-ordination with Environment Agency and Companies

The Company anticipates that it is unlikely that a drought will affect Portsmouth Water solely and it is expected that members of the Drought Management Team will develop a co-ordinated communications strategy with the Environment Agency and other Companies.

Key Public Messages

The messages used and the method of delivery will be dependent upon the severity of the developing situation. Throughout the campaign, the Company would develop information messages setting out:

- The key reasons for the poor water resource situation
- The actions taken by the company to date
- The potential for future actions if the situation worsens
- The contact point for further advice
- The actions customers can undertake to help

The Drought Management Team will develop the strategy needed to manage communications using some, or all, of the following delivery methods:

- Regular Press Releases to Local Press, Radio and TV Stations
- Regular Stakeholder Briefing Sheets to the Environment Agency, Natural England, Local Authorities, Consumer Council for Water, Members of Parliament and Trade Associations
- Website messages
- E-mail postscripts
- Social media
- Van-side messages
- Briefing Notes for Customer Services and Distribution staff
- Letters to sprinkler licence holders
- Official notices in the local press

1. INTRODUCTION

1.1 History of Drought Planning

Portsmouth Water provides an average of 182 million litres of drinking water per day to around 305,300 domestic and commercial customers in south east Hampshire and part of West Sussex.

Throughout the Company's long history, it has paid particular attention to ensuring that it meets its statutory obligations to maintain supplies Drought planning prior to the Water Act 2003 had been informal, but nevertheless a key part of the Company's operational activity for many years.

The most recent drought in the Company's area of supply was in 1976.

At the Water Summit in May 1997, the Government stated its expectation that 'water companies agree a detailed and publicly available Drought Contingency Plan'. Following the circulation of the Environment Agency's 'Drought Contingency Planning Guideline' in 1999, the Company produced its first formal Drought Contingency Plan in 2000. Following comments made by the Agency on a number of aspects the Plan was updated in 2004.

In January 1999, the Government confirmed that legislation would be brought forward to require water companies and the Environment Agency to maintain a plan which includes a full range of demand measures.

1.2 The Development of Statutory Drought Plans

Section 63 of the Water Act 2003 imposed the requirement for water companies to prepare statutory plans as well as the requirement to conduct consultations in their preparation.

Portsmouth Water's previous Drought Plan was published in December 2008 following a consultation on the draft plan where representations were received from the following:

- Consumer Council for Water
- Natural England
- Environment Agency
- OFWAT
- Southern Water

1.3 New Legislation

Since the publication of the first Statutory Drought Plan in 2008, the Government has introduced new legislation to the Flood and Water Management Act 2010 and the Water Use (Temporary Bans) Order 2010. This legislation covers temporary restrictions which can be introduced during a drought and the Drought Direction 2011 covers additional measures that can be introduced in more severe droughts.

The new legislation includes a requirement to consult with customers on demand management measures. The Industry has produced a Code of Practice and Guidance on Water Use Restrictions. This Final Drought Plan sets out the proposed measures as a result of a pre-consultation exercise carried out before the Draft Drought Plan was written. Following the receipt of representations on the Draft Plan, a Statement of Response has been prepared and this Final Plan has been submitted to the Secretary of State. A copy of the Statement of Response has been sent to each of the Consultees as will a document of the changes made as a result of the Statement of Response,

which can be found in Appendix G. Following directions from the Secretary of State, this Final Plan will be published in 2013.

1.4 Basis of this Draft Drought Plan

The Company's public water supply sources are all groundwater based with approximately 50% of water supplied from boreholes and wells, 35% from natural springs at Havant & Bedhampton, and 15% from Gaters Mill, a river abstraction close to the tidal limit on the groundwater dependent River Itchen.

Portsmouth Water currently has no surface water storage reservoirs and hence its ability to maintain supplies during a drought relies upon balancing peak week demands (normally during May to July) with the yield from its sources. The Company has no facility to 'store' water and conserve it during the winter to enable supplies to be maintained during the summer peaks.

A key element of the Company's Water Resources Management Plan is the provision of sufficient source yields to meet peak week demand during a dry summer. The Plan however anticipates that there may be infrequent occasions when demands are likely to exceed the availability of supplies and that the Company will need to take action to ensure that essential supplies are maintained. It is on these occasions that the measures set out in this Drought Plan are likely to be used. Such occasions are likely to occur during periods of drought and their expected frequency is referred to as the Company's Level of Service in the Water Resources Management Plan. For example, if the Level of Service is stated as "1 in 20 years", then on average the Company expects to employ drought measures no more frequently than 5% of years.

In October 2007, the Environment Agency notified the Company of the outcome of the Habitats Regulations Review of Consents. The Company has agreed voluntary licence reductions of the following sites to ensure compliance with the Habitats Regulations:

- Havant and Bedhampton
- Walderton
- Woodmancote
- Funtington
- Fishbourne
- Brickkiln
- Lavant
- Gaters Mill (River Itchen)

1.5 Portsmouth Water's Resources

The table below shows the current licence and yield assessment for each of the Company's water sources following a number of recent variations agreed with the EA to ensure compliance with the Habitats Regulations. The figures reflect the recent licence variations which were set out in the EA's Site Action Plans in 2008.

In a drought, the yield of many of the sources diminishes as groundwater level and flow decline. The most significant decline for the Company is that which occurs at Havant and Bedhampton Springs, where the abstraction licence is 137 Ml/d, but the Peak Drought Output (PDO) is 75 Ml/d and the Minimum Drought Output (MDO) is 53 Ml/d.

Yield Assessment Summary

Source	Abstraction Licences (Ml/d)		2012 Assessment (Ml/d)	
	Average	Peak	Minimum (MDO)	Peak (PDO)
Northbrook and Lower Upham*	20.51	31.50	20.51	31.50
West Meon	0.46	0.46	0.46	0.46
Soberton and Newtown*	9.02	15.00	9.00	13.30
West Street*	9.12	13.60	9.12	9.12
Maindell*	6.83	8.00	3.00	6.50
River Itchen	45.50	45.50	35.40	41.10
Worlds End*	22.73	25.20	12.00	16.00
Lovedean	11.37	14.00	11.40	12.10
Havant and Bedhampton	98.0	137.00	53.00	75.00
Walderton Group	65.04	94.60	64.20	81.39
Eastergate Group	28.38	41.00	28.38	41.00
Company Total	**316.96**	**425.86**	**246.47**	**327.47**

Abstraction Licences yet to be amended, confirmed or revoked as required by the Habitats Regulations Review of Consents

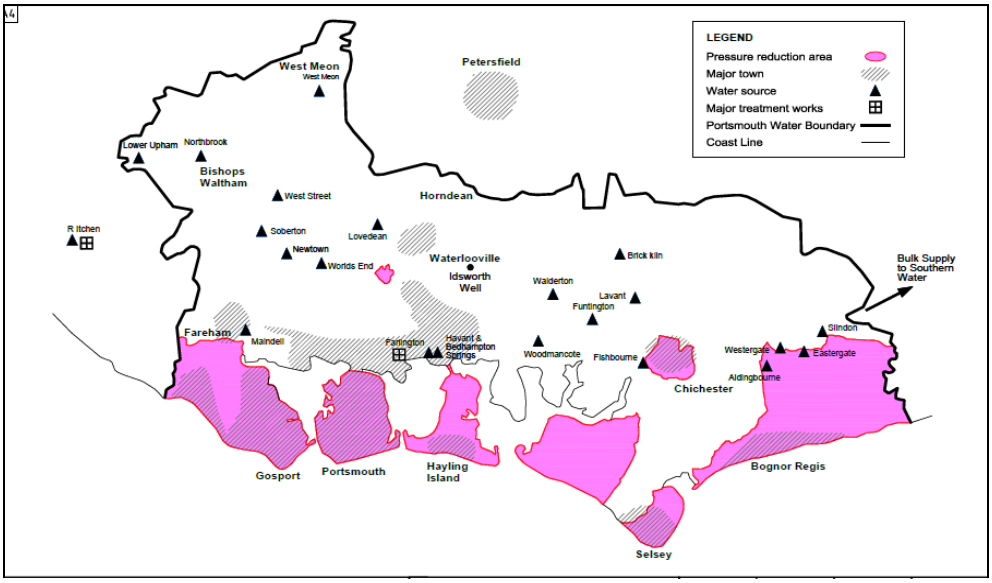
Five licences are the subject of Post Implementation Monitoring Work which is required by the Environment Agency's National Environment Programme to enable amendments, resolutions or confirmation as required by the Habitats Regulations.

The Company anticipates that work on the National Environment Programme (NEP) which is driven by the Water Framework Directive, has the potential to reduce abstraction licence further. It anticipates that these decisions will be available for the next Water Resources Management Plan which is due to be published in 2014.

1.6 Bulk Supply to Southern Water

Since publication of the 2008 Drought Plan, Portsmouth Water has revised its capability to transfer water within the Company Area of Supply. This means that there is only one "Resource Zone" as defined by the guidance for the Water Resources Management Plan.

Company's Area of Supply



In 2003, Portsmouth Water agreed that it would make available a bulk supply of up to 15 Ml/d to Southern Water's *Sussex North Zone* until 2013. This transfer capability was commissioned in 2004 and has already helped meet demand deficits within Southern Water's area of supply in 2005 and again in 2006. There is an additional connection into Southern Water's Sussex Coastal zone, although the total volume to be supplied to Southern Water cannot exceed 15 Ml/d.

The bulk supply agreement does not guarantee that water will be available to Southern Water in extreme conditions. This includes a drought and Portsmouth Water's Drought Plan does not guarantee provision for the bulk supply.

Following the imposition of Temporary Bans, Portsmouth Water will inform Southern Water of its plans to apply for Drought Permits. It will provide Southern Water with reasonable notice that the Bulk Supply will be suspended when the Drought Permits are implemented in drought conditions as defined by the Water Industry Act 1991.

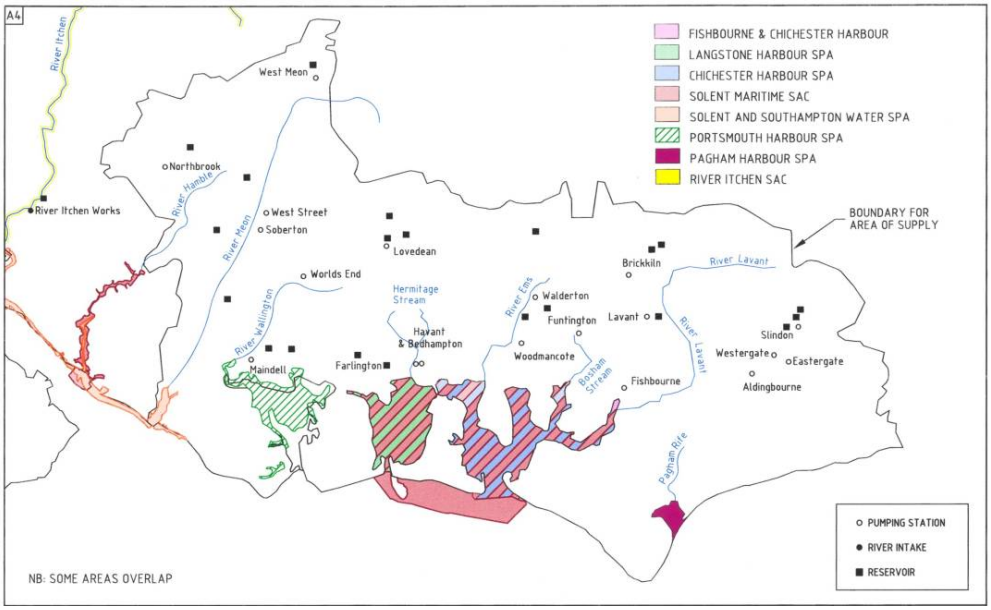
1.7 Drought Management Areas

The whole Company supply area is little more than 50 km x 30 km with reasonably well developed 'connectivity' between its built up areas. The sources are not isolated and the connecting links enable transfers between areas if required. As a result, the Company anticipates that it will treat the whole of its supply area as a single Drought Management Area.

1.8 Habitats Regulations

The Drought Plan Guidance (EA, March 2011) states that Companies should produce plans that are informed by Habitats Regulations Assessments. Portsmouth Water's Area of Supply is heavily influenced by Habitats Regulations designated sites. The map below shows the current designations which include all the harbours and the River Itchen.

Designated Areas



The Drought Plan is based on the licences and the yield assessment included in Section 1.5. Many of the sources are "Licence Constrained" where the drought deployable output is the same as the abstraction licence. Several recent licence variations that were informed by the Habitats Regulations Review of Consents are now constrained by flow conditions which provide environmental protection to key habitats. These flow conditions are based on scientific data and will be imposed during extreme events such as dry or drought conditions. It is unlikely that the flow conditions will be overturned by a "Drought Permit" application. This is because the evidence shows that the Designated Sites would be damaged by abstraction at this time. The Environment Agencies response to the previous Drought Plan raised some doubts about the use of Drought Permits on designated rivers.

Post Implementation Monitoring (PIM) and further studies for the Water Framework Directive (WFD) are being carried out by Portsmouth Water and by the Environment Agency. These could influence future Drought Plans but they do not represent an Appropriate Assessment under the Habitats Regulations. The Drought Plan is an "operational" plan and Portsmouth Water does not consider that a Habitats Regulation Assessment (HRA) is required. The Company considers that the conditions in the abstraction licences are already sufficient to protect the designated sites. The studies are due to be completed in March 2013 and until then; the Company is not in a position to conclude what the likely impact of abstractions on these water bodies are. However, once the studies have concluded, the Company will review the conclusions and possible implications on drought management and will use the new evidence in the preparation of the next Drought Plan.

1.9 Sites of Special Scientific Interest (SSSI)

During the course of a pre-consultation exercise, Natural England raised the issue of impacts on SSSI under the Countryside and Rights of Way Act 2000. Conservation and enhancement of a SSSI may still be possible even if it is impacted by a Drought Permit. This depends on the specified features and the timing of the impact. The Environment Agency states in its Draft South East Drought Plan, that the impact of abstraction on an already dry lake may be insignificant. Such as in the case of the potential drought permit for the Slindon source and its potential impact on the already likely dry Swanbourne Lake.

1.10 Statutory Process

1.10.1 Pre-Consultation

As required by the Secretary of State prior to the preparation of the Draft Drought Plan, Portsmouth Water undertook a pre-consultation with the relevant statutory bodies to inform the preparation of the plan. Responses to the pre-consultation exercise were received from:

Organisation	Representation
DEFRA	• Give consideration to the phasing of temporary bans and priorities for saving water • Types of concessions made • Plans for communicating to stakeholders, customers and working with other water companies • The handling of representations made when giving notice of restrictions
OFWAT	• Set out clearly what a drought is and what the management steps are • Set out the levels of service with regards to temporary use restrictions on customers • Demonstrate the proposed drought management actions to strike a balance between meeting customers needs and protecting the environment • Set out the companies liabilities for compensation associated with drought permits • Take the impact of drought permits on our bulk supply agreements into account • Make the plan easily accessible to customers • Include OFWAT in the communications plan
Environment Agency	• Decide if an SEA is required if any of the drought management actions have an impact on a Habitats Directive site • Incorporation of the Flood and Water Management Act 2010 • Inclusion of all possible options for drought permits and the order in which they would be implemented • Inclusion of the post drought actions intended to be used
Natural England	• Habitats Regulations • Strategic Environmental Assessment (SEA) • Sites of Special Scientific Interest (SSSIs) • Biodiversity and Protected Species • Communications Plan

A more detailed description of the requests made by the organisations who were contacted for the pre-consultation can be found in Appendix D and all points have been considered when writing the Plan.

1.10.2 Consultation

Once the Draft Drought Plan was written, this was then sent for consultation as a requirement by Section 39B of the Water Industry Act 1991, as introduced by the Water Act 2003 and a Statement of Response to the representations made can be found in Appendix F, while the individual consultation responses can be found in Appendix E.

In this Draft Final Plan any major changes to the text have been highlighted in yellow.

1.12 Strategic Environmental Assessment Directive

Portsmouth Water did not carry out a Strategic Environmental Assessment (SEA) of the 2013 Drought Plan. The letter that Portsmouth Water sent to the Regulators, as part of the pre-consultation process, stated that an SEA would **not** be carried out. Natural England set out the regulatory background to the SEA process in their reply and stated its view that assessments were mandatory for:

- Framework for future development consents
- Plan that was likely to affect protected sites

The Company considers that the Drought Plan is not a framework for development and changes to the number and location of potential drought permits means that impacts on protected sites are not "likely". This is confirmed by comments included in the Draft South East Drought Plan published by the Environment Agency in July 2011.

1.13 Future Statutory Drought Plans

Portsmouth Water will start the cycle to review its Drought Plan if there is either a material change in circumstances or if directed to do so by the Secretary of State. In any event, a review will be conducted no later than 3 years after the date that the Final Plan is published.

2. THE IMPACTS OF DROUGHT FOR PORTSMOUTH WATER

Drought is simply defined as a significant period without rainfall. As public water suppliers, water companies anticipate that drought periods will occur from time to time and they must prepare for such shortages of rainfall. It is only during prolonged and sustained periods of low rainfall principally during winter periods which impact upon groundwater supplies that this Plan is likely to be required.

The Environment Agency Guideline (March 2011) suggests that a wide range of drought scenarios should be considered so that the Plan is flexible enough to have coped with historical droughts and future droughts that may be more severe than those previously experienced as a result of climate change.

The Plan attempts to balance the source yields expected during these theoretical drought scenarios with the maximum likely demands from its customers. The greatest challenge to maintaining supplies is likely to be during the peak demand period of a dry summer. On occasions where the demands are likely to exceed the available yields, the Plan sets out the measures the Company expects to use to maintain essential supplies.

The Company continually monitors rainfall, groundwater level, spring yield and demand data in order to manage the provision of supplies to meet customer demand. The information derived is provided to Senior Managers and Directors on a regular basis. Much of it is also publicly available in the 'Water Supply News' section of its website at www.portsmouthwater.co.uk

2.1 Drought Indicators

As outlined in Section 1, the yield of the Company's groundwater sources is entirely dictated by groundwater levels. Since groundwater levels are dependent upon aquifer recharge during the winter period, the Company monitors both rainfall and groundwater levels to enable it to forecast the level of output from its sources during the months ahead.

The Environment Agency Guideline suggests that triggers such as groundwater levels should be built into 'control curves' which can be used to influence drought management actions. These have been developed principally to manage the use of water from surface water storage reservoirs. As Portsmouth Water does not have any significant surface water storage, it has not developed any reservoir control curves but it has developed a groundwater drought trigger which enables it to identify the time when yields from sources may be insufficient to meet customer demands.

In developing a Drought Plan, it is important to identify triggers which are of practical benefit to those managing the supply/demand balance on a daily basis. In recent years, Portsmouth Water has not had to implement any water use restrictions. Water use restrictions were last imposed in 1976.

The Company anticipates that it will continue to monitor both rainfall and groundwater levels which will enable it to calculate its supply availability during the critical peak demand period of May to July in each year.

2.1.1 *Groundwater Level Monitoring*

Groundwater levels have traditionally been used by Portsmouth Water to indicate the likely yield of springs, wells and boreholes. A former private estate well now used as an observation borehole at Idsworth near Rowlands Castle, has been monitored for over eighty years and a thirty year average profile is used to monitor seasonal variations from average conditions.

Levels are also compared with those from previous drought years in order to provide an early indication of a developing drought situation. The eighty year record covers all of the most significant droughts for Portsmouth Water.

The Idsworth Well, as it is known, is not affected by abstraction and hence is a very good indication of groundwater resource availability from the South Downs Chalk. All of the Company's sources are situated within the same overall chalk aquifer and the well is situated centrally within the Company's supply area, and the Hampshire / West Sussex border. None of the Company's sources, both East and West, are more than 25km from Idsworth.

The Idsworth Well is upstream of the Havant and Bedhampton Springs which are Portsmouth Water's largest source. Groundwater levels in the well are an excellent indicator of the springs yield as well as being representative of levels at the majority of the other groundwater sources which are based on similar chalk aquifers.

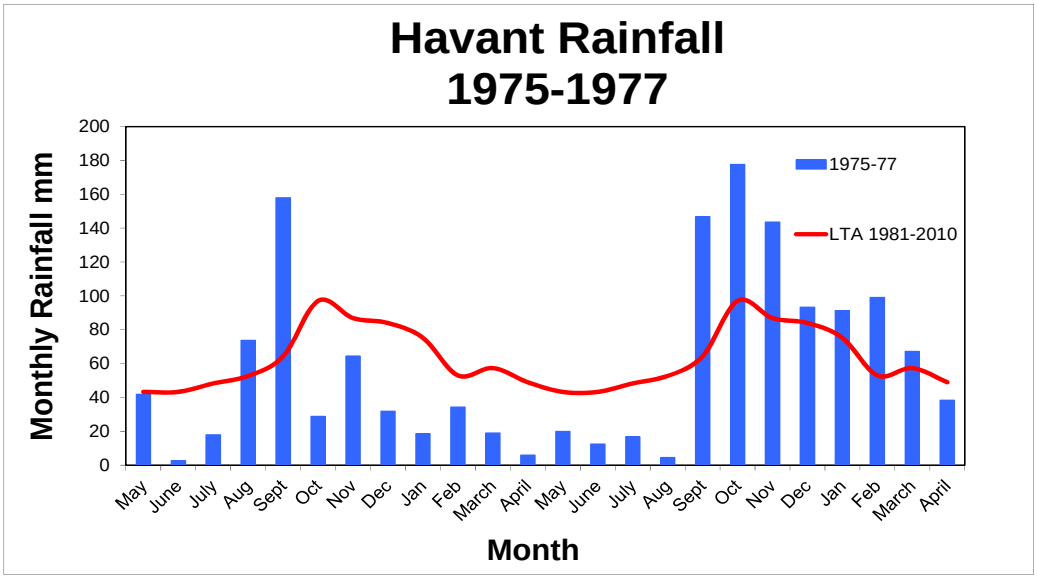
The Environment Agency has an alternative groundwater monitoring site at Chilgrove in West Sussex. This site has a long record of levels beginning in 1836 and is situated in the same chalk aquifer. Although the measured groundwater levels Above Ordnance Datum (AOD) are different from Idsworth Well, the slope of the curves and the relationship of critical years to the Long Term Average (LTA) remain similar.

For the purpose of developing this Drought Plan the Company has utilised the records from the Chilgrove Borehole to consider the possibility that more severe droughts might have been experienced than those in the eighty-year record from Idsworth.

2.1.2 *Rainfall at Havant*

The Company's spring source at Havant & Bedhampton has been in use for public water supplies since 1860. In recognition of the importance that winter rainfall plays in the recharge of the aquifer and the influence that this has on the springs yield, the Company has been recording the daily rainfall at Havant since 1886.

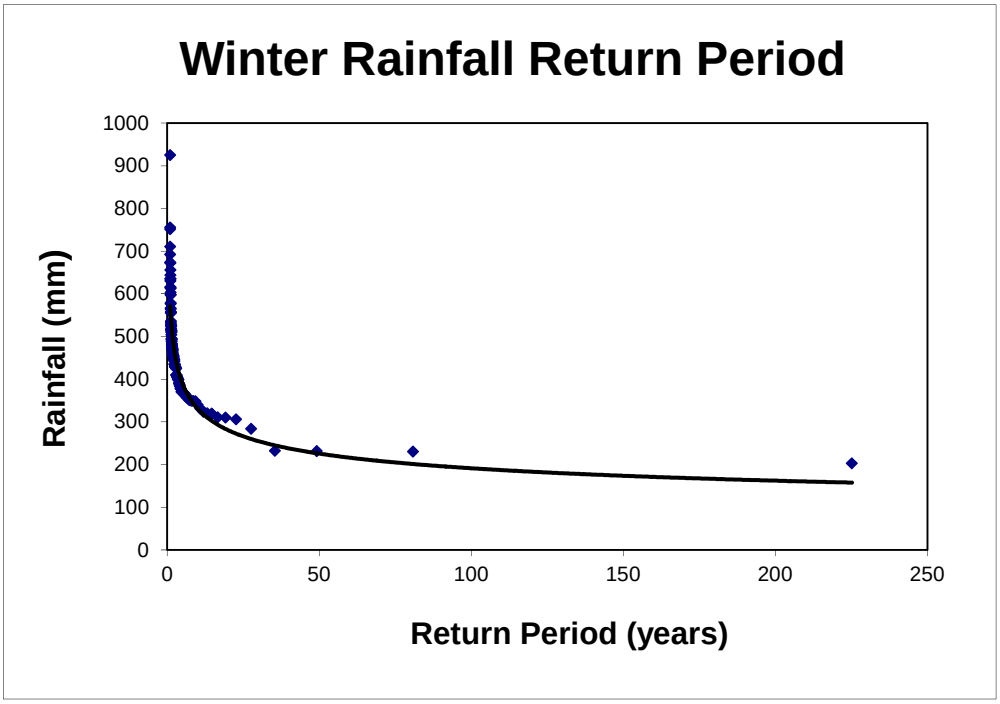
Havant is situated conveniently centrally in the Company's area of supply, thus providing a useful indicator of the status of groundwater conditions for the whole of the Company' area. It is also just 5km south of the divide between the overlying tertiary layer and the unconfined chalk to the north which supports the Company's principal source at Havant & Bedhampton Springs.



The groundwater of the chalk aquifer of the South Downs is principally dependent upon annual recharge from winter rainfall.

For Portsmouth Water it is not just the amount of rainfall but also the time of year that rain occurs which influences our water resource situation. The graph above shows the Long Term Average (LTA) rainfall for Havant and compares this with actual rainfall in 1975-1976 this being the last year Portsmouth Water introduced demand restrictions. The LTA is currently 748mm per year. In 1975, rainfall was 95% of the LTA and in 1976 it was 93% of LTA. This demonstrates that for Portsmouth Water the percentage of LTA rainfall is not a good indication of a drought. Winter rainfall (October-April) is a better measure and for 1975-1976 the total was 203mm and this resulted in low groundwater levels in the summer of 1976. (See Appendix A)

The probability of this winter rainfall occurring can be calculated by looking at the historical data. The following graph shows one possible relationship which fits the data relatively well.



Analysis undertaken on historical rainfall data allows a relationship to be developed between the amount of rainfall experienced in the winter period and the likelihood of this occurring in a given year.

This relationship implies that the low winter rainfall in 1975-76 was a rare event with a return period of around 1 in 80 years. In practical terms this means that there is around a 1% risk of this drought occurring in any given year. The Company's WRMP is based upon a Level of Service (LOS) of 1 in 20 years meaning that on average the Company will have insufficient resources to meet customer's demands and as a result the Drought Plan will be implemented to maintain essential supplies.

2.2 Critical Drought Scenarios

Portsmouth Water's groundwater sources in the South Downs chalk are dependent upon winter recharge and there are several drought periods which have occurred where little or no winter recharge has taken place, e.g. 1854-55, 1897-98, 1920-21, 1933-34, 1972-73 and 1975-76. In such circumstances source yields in the following summer are reduced and groundwater levels reach their lowest levels at the end of the

second year. Since 1836, these droughts have always ended with rainfall and recharge during the following spring.

The Environment Agency Guideline suggests that a Drought Plan should be able to cope with a range of droughts appropriate to the water resources plans. These should include:

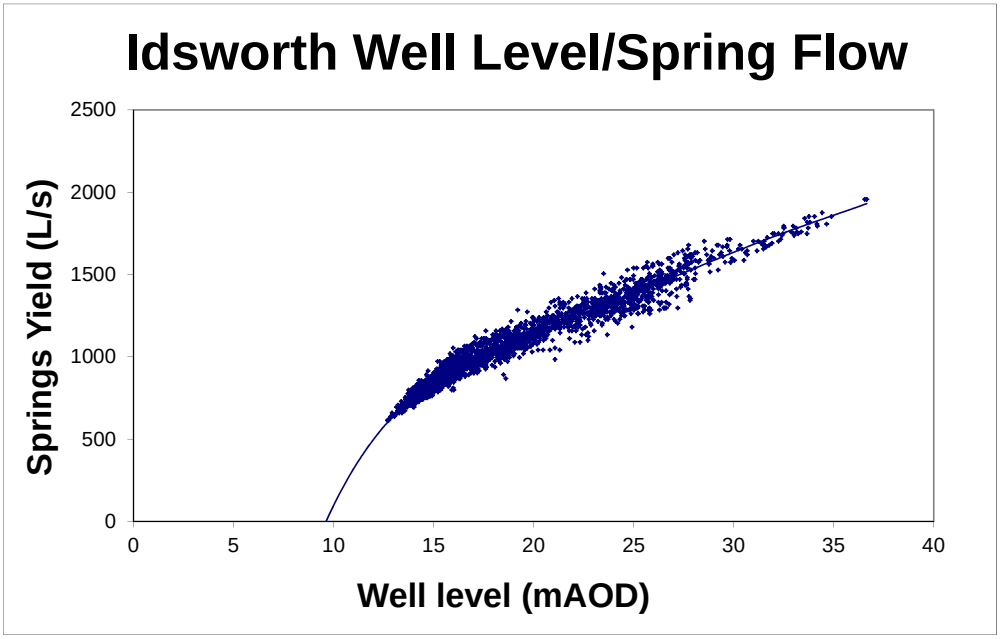
- Short duration one season droughts (6-12 months)
- Medium duration multi-season droughts (1-2 years)
- Long term droughts (2-3 years)

Portsmouth Water's Draft Drought Plan allowed for drought caused by two dry winters. The recent drought has raised the prospect of three dry winters or at least two dry winters followed by a dry summer. Portsmouth Water has reconsidered this scenario and it is discussed in Section 2.5.3 to cover a long term drought of three dry winters.

2.3 Drought Impacts Upon Source Yields

The Company's Yield Assessment conducted in conjunction with the preparation of Water Resources Management Plan for 2009 considered the operational experiences of 1973, 1976 and 1989 for Hampshire sourceworks and 1976, 1989 and 1990 for Sussex sourceworks. These years were selected on the basis of low groundwater levels rather than rainfall or demand although low groundwater levels were inevitably the result of below average winter rainfall. The Minimum Deployable Output (MDO) of most sources was identified from source output data in the late autumn of 1973 because the lowest ever groundwater levels in the Company's principal groundwater monitoring borehole at Idsworth Well were recorded at that time.

The relationship between groundwater levels at Idsworth and the Havant and Bedhampton Spring Flow is very strong. The following graph shows a polynomial trend fitted to the historical data from 1969-2009.



The lowest recorded spring yield of 53.5 Ml/d occurred in 1973 and coincided with the lowest recorded groundwater level and the spring yield for that year exhibited a similar sloped curve to that of the groundwater recession. The deployable output has now been reduced to 53.0 Ml/d because of the implementation of a Minimum Residual Flow (MRF) condition at Havant.

The yield of the remaining sources from the latest assessment totals 192.5 Ml/d. That yield assessment was based upon lowest recorded yields in the autumn of 1973. This provides an overall minimum supply availability of 245.50 Ml/d in the autumn of a two season drought.

The MDO coincides with minimum groundwater levels which have been recorded in the autumns of previous drought years. At the critical peak demand period, the groundwater levels are normally higher, as are the source yields; these have been called Peak Deployable Output (PDO). At Havant & Bedhampton, the Peak Deployable Output was recorded as 75 Ml/d in 1973. The yield of the remaining sources from the latest assessment is 253.5 Ml/d giving a total PDO of 328.5 Ml/d.

Peak Drought Output may not be the same as Peak Deployable Output as defined in the Water Resources Management Plan. The drought output will vary depending on the severity of the event and the starting point in terms of groundwater level.

2.4 Drought Impacts upon Demand

The Company's previous Water Resources Management Plan, published in September 2011, was based on balancing yield assessments for a drought year with demand forecasts for dry years through to 2035. A 'dry year' for demand purposes is now related to the Level of Service (LOS) that customers receive for the imposition of demand restrictions. Since the last Drought Plan was published in 2008, Portsmouth Water has revised its Level of Service for restrictions. Demand restrictions will, on average, be introduced once in every 20 years. This represents a 5% risk of restrictions occurring in any given year.

The Level of Service is also used to determine the return period for the Peak Week. At a return period of 1 in 20 peak demand is expected to be 35% higher than average demand. As drought related demand restrictions are imposed, the amount of water used becomes constrained. This suppression of demand is the main mechanism that Water Companies use to balance supplies in a drought.

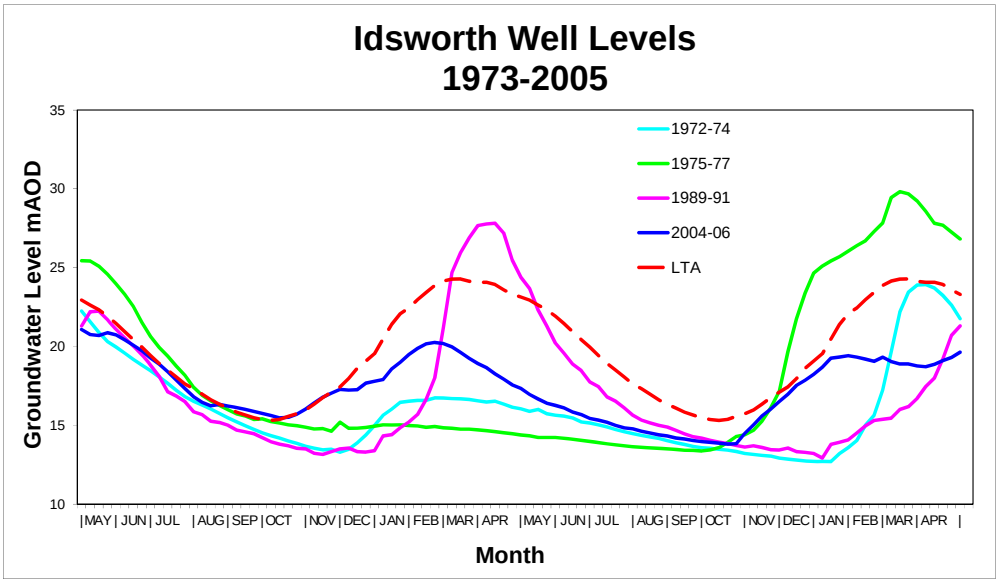
The Company's Water Resources Plan forecasts a range of twin track demand management and resource development options to ensure sufficient resource availability to meet expected demands in dry years throughout the planning horizon to 2040.

2.5 Potential Drought Scenarios

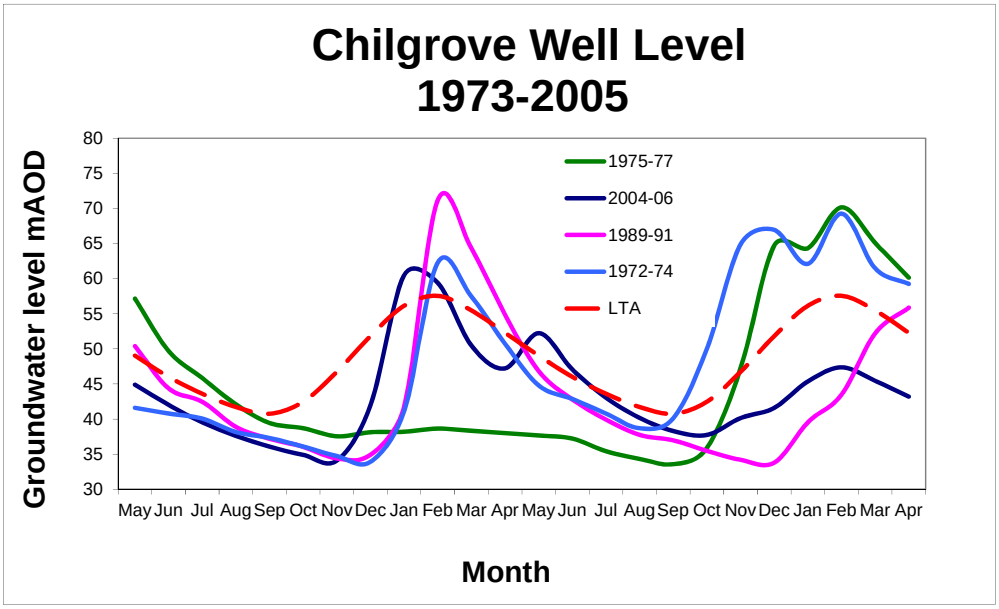
The Company's record from its groundwater monitoring borehole centrally located at Idsworth, near Rowlands Castle, dates back to 1932. As a result, it provides the Company with a significant record of the most critical conditions for single and multi-season droughts recorded in more than seventy years.

Due to the strategic location of this borehole and the availability of a long term record, the Company has based its drought planning scenarios upon the likely effects of drought sequences on groundwater levels and the consequent impact upon source yields.

The record showing most of the key drought years from the past eighty years is shown on the plot below.



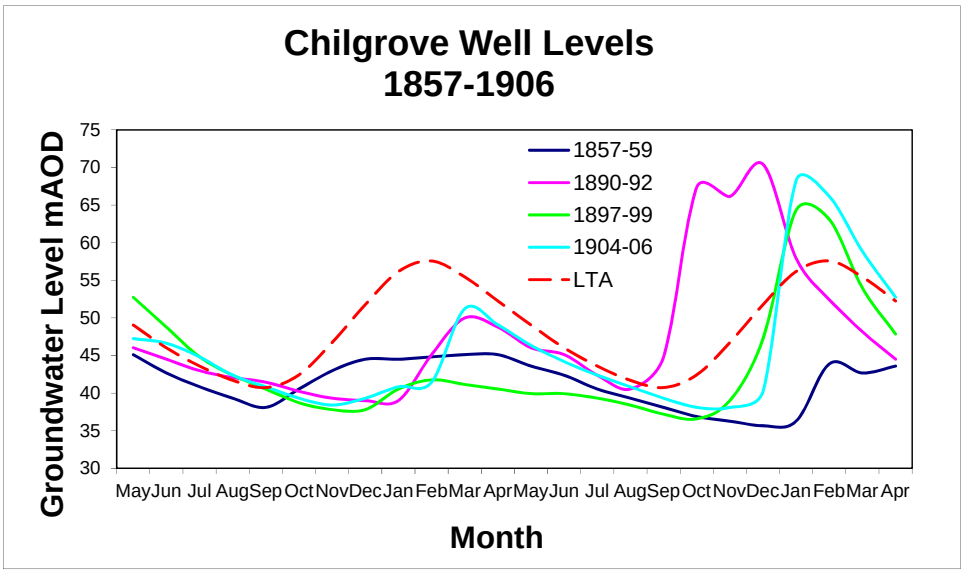
In the preparation of this plan, Portsmouth Water has undertaken further analysis of groundwater levels to test if more severe events occurred prior to 1932 when Idsworth Well records began. To extend the groundwater level record it is possible to use an Environment Agency observation borehole at Chilgrove. Records of groundwater level at this site are available from 1836 until the present day.

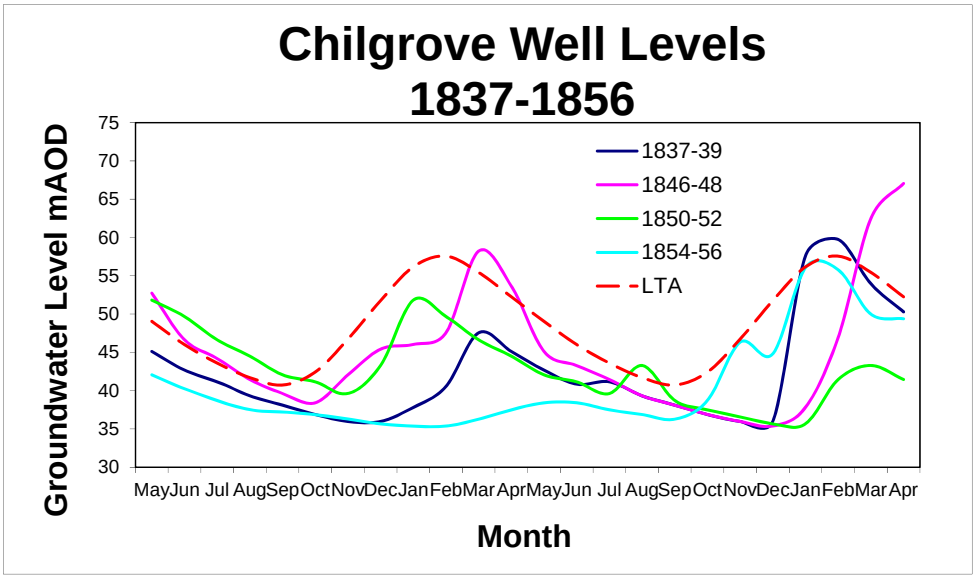


Comparison of the Idsworth Well Levels and the Chilgrove Well Levels shows that for the same years the shape of the curve is similar. For example, 1975-1977 shows groundwater levels above the LTA in May, June and July. Levels then stay almost flat until the groundwater recovery in November of 1976. In 1989 -1991, groundwater levels fell to a minimum in the first dry winter, rise above the LTA, and then fall again to a minimum in the second dry winter.

In 1972-1974, groundwater levels fell to a minimum in the first dry winter, rise significantly during the spring, and then fall again to a second low. Chilgrove does not replicate Idsworth exactly with a much earlier recovery in 1973. This gives the Company confidence that groundwater levels recorded at the Chilgrove Well are

correlated to those at Idsworth Well and it is appropriate to consider Chilgrove data in determining possible drought scenarios.





The data shows that minimum groundwater level is influenced by winter rainfall and the timing of the recovery. However, the aquifer is very resilient to drought and all the events tend towards a minimum groundwater level of around 33m AOD for Chilgrove and around 13m AOD for Idsworth.

The data set contains long periods of low groundwater levels such as 1989-1991 and 1904-1906. In these cases, winter recharge was just enough to prevent a year on year fall in groundwater level. Both these events produced groundwater levels well above the critical level at Idsworth of 12.7m AOD, which is based on Idsworth Well levels at the end of the recession in 1973.

The above analysis of the Chilgrove Well data demonstrations that although low periods of rainfall and groundwater have been experienced in the past these have not led to more severe drought scenarios than the Company had previously considered.

2.5.1 *Single Season Droughts*

Portsmouth Water has no significant raw water storage, but the South Downs chalk aquifer is very resilient to drought. The most significant single season dry summer (i.e. not associated with a preceding dry winter) occurred in 1990. The summer of 1990 was very dry but groundwater levels did not reach the critical level of 12.7m AOD which was recorded at the end of 1973. Groundwater levels were below average throughout the summer and autumn without significantly impacting upon source yields. Levels recovered early in 1991, following average rainfall in the winter. A 'Single Season Drought' is considered unlikely to have a critical effect on the supply/demand balance for Portsmouth Water. Further experience from the dry summers of 1995 and 2003 when, again, drought measures were not required, demonstrates the Company's capability to cope with single season dry summers.

Although Portsmouth Water has no raw water storage and is reliant on groundwater sources and one groundwater fed river abstraction, the previous Water Resources Management Plan published in September 2011 indicates that Portsmouth Water will be in a position to meet the demand of their customers over the planning period. This plan includes the development of a winter storage reservoir at Havant Thicket at the end of the next planning period. Portsmouth Water is in the process of preparing the next Water Resources Management Plan which will include a detailed assessment on the impacts of climate change based on the UKCP09 data.

2.5.2 *Multi-Season Droughts*

Multi-Season Droughts, i.e. two or more consecutive seasons of below average rainfall, have a much greater impact upon the Company's ability to balance demands with available supplies, especially if they are combined with dry summer peak demand.

The most severe drought years of 1973, 1976 and 2005 all started with groundwater levels close to the LTA at the end of the summer of the preceding year. As a result of low rainfall during the first winter, limited recharge occurred and groundwater levels were well below average at the beginning of the summer period. Below average rainfall was recorded during the summer and groundwater levels continued to fall, albeit at a much slower rate, due to water was 'drawn from storage' in the chalk. As the second dry winter developed, groundwater levels reached their lowest levels. In each of these years, groundwater recharge occurred in the spring of the third year following a return to wetter conditions.

The Company believes that the use of the last thirty year record for determining long-term averages will ensure that recent climate change effects will be recognised in its modelling rather than using much longer records which might not be representative of current climate conditions to date.

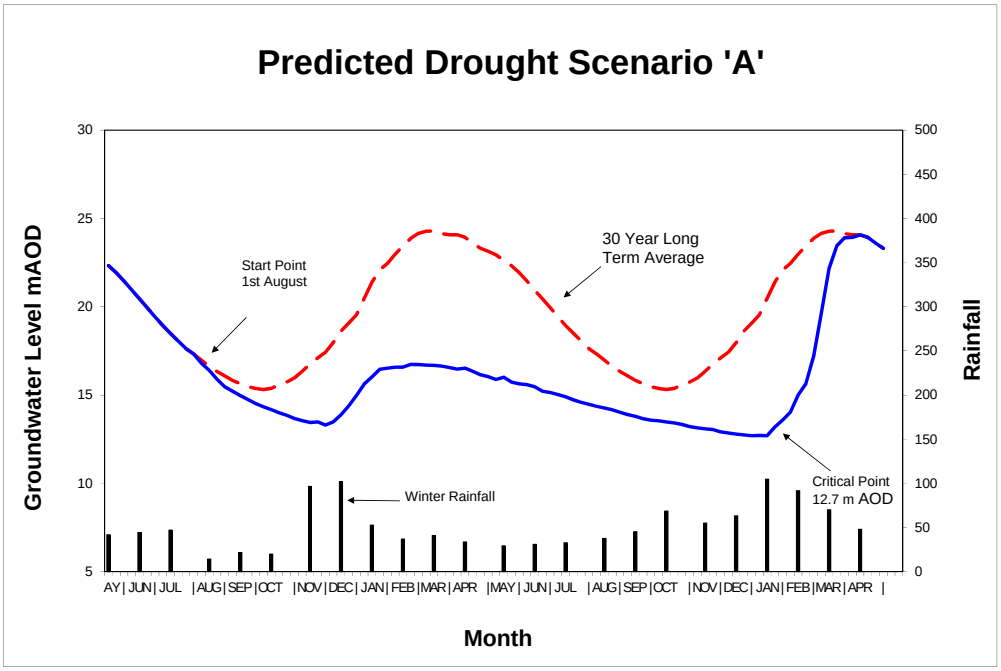
The Drought Plan is an operational document and is regularly updated. Future climate change impacts are specifically excluded from the plan in the guidance produced by the Environment Agency.

The Company has developed four different scenarios for multi-season droughts, three of which are more critical than have been experienced in the last 176 years. Portsmouth Water have considered drought scenarios which are more extreme than have been experienced to date (Scenario D) and has set out indicative measures of how this drought could be managed. Emergency planning will be used if the Company experienced an unprecedented event such as loss of a major treatment works from a pollution incident, combined with an extreme drought.

2.5.2.1 Scenario "A"' Droughts (1 in 40)

Scenario 'A' is largely based upon the Company's experience of 1972 - 1974 when a dry autumn was followed by a dry year with 70% of LTA rainfall.

Groundwater levels initially fell from the LTA in the summer of the first year with limited recharge occurring during the winter period as a result of below average rainfall. Groundwater levels which were well below the LTA at the beginning of summer in the second year continued to recede, albeit at a slower rate as a result of continued low levels of rainfall. As the second dry winter developed, groundwater levels reached their lowest levels. Groundwater levels recovered in the spring of the third year as rainfall recharged the chalk aquifers.

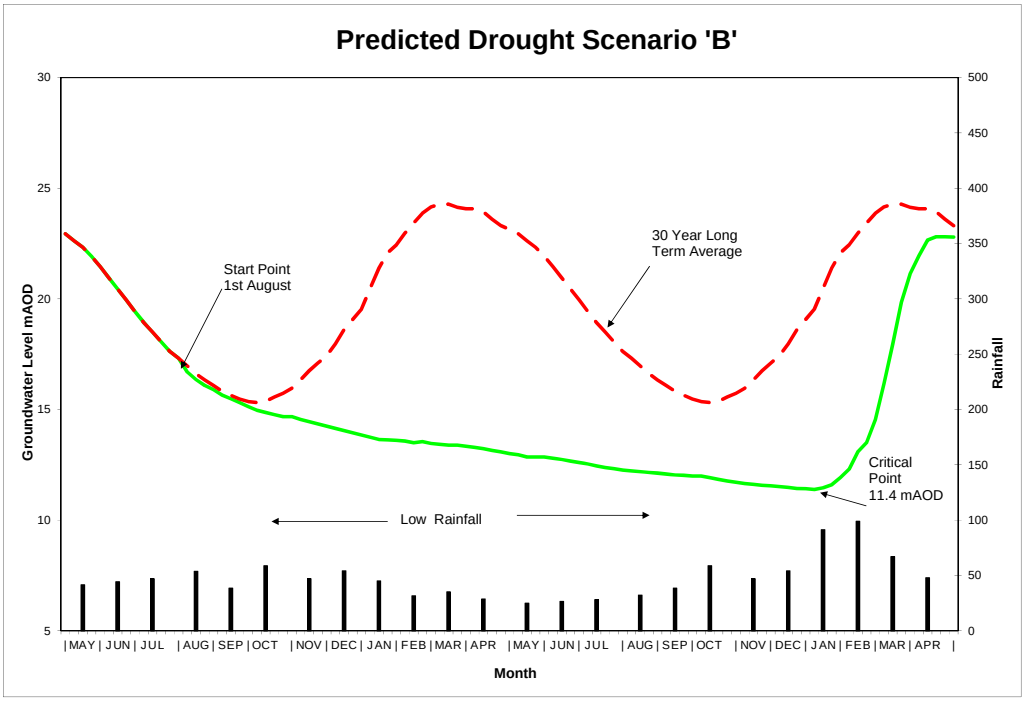


Considering the shape of the historical groundwater level curves, from Chilgrove and Idsworth, the following years appear to have been consistent with Scenario "A" type Droughts; 1838, 1847, 1851, 1852, 1858, 1905, 1922, 1973, 1992 and 2005. The same data indicates that 1973 was the most severe of these droughts with a minimum groundwater level of 12.7m AOD recorded at Idsworth.

In nearly all of the drought years, recovery commences before the start of the third year. Recovery was often rapid with the long term average groundwater level reached within one or two months.

2.5.2.2 *Scenario "B" Droughts (1 in 80)*

Scenario 'B' is a multi-season drought based on the experiences of autumn/winter of 1975 followed by the dry summer of 1976. It is then extended further into the autumn and winter by applying the experience of 1973. This combination of a dry winter followed by a dry year (60% LTA) is expected to result in a lower groundwater level than those recorded in 1973 or 1976. In fact these would be the lowest groundwater levels for 176 years. Based on rainfall data, this scenario has a return period of around 1 in 80. The setting of return periods for groundwater events is difficult and it is possible that the return period is even longer than this.



It is important to note that the slope of the groundwater recession reduces as the level falls. This 'recession' profile is governed by the properties of the chalk aquifer. In simple terms, when the aquifer is full the water runs out into springs, streams and the sea quickly and the slope of the groundwater recession curve is steep. As groundwater levels fall, the driving head on the system reduces and the slope of the recession curve reduces. At very low groundwater levels the recession is very shallow because of the vast volume of underground chalk at that level. In flow terms this means that the minimum flows are very resistant to drought.

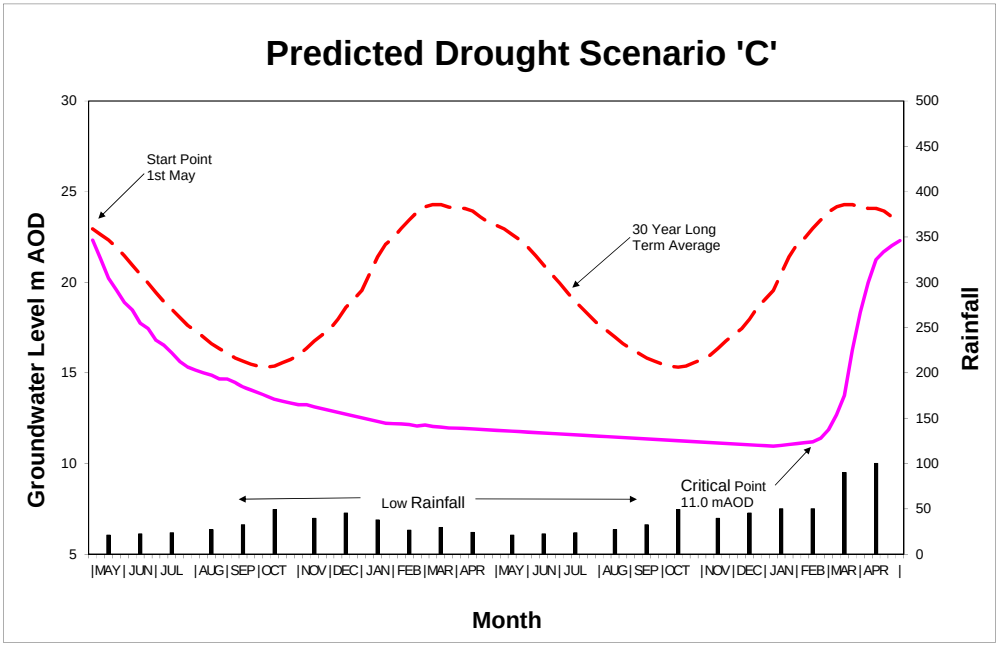
In 1973 the Havant & Bedhampton spring flow reduced to 53.5 Ml/d in December. This was only 9.5 Ml/d less than the figure recorded five months previously in August 1973.

Considering the shape of the historical groundwater level curves, for Chilgrove and Idsworth, the following years appear to have been consistent with Scenario “B” type droughts: 1855, 1898, 1934 and 1976. However, the Scenario “B” drought predicts that groundwater levels at Idsworth Well could fall to 11.4m AOD, which are lower than those experienced in 1976. This groundwater level is unlikely to have occurred in the last 180 years. Source yields at this groundwater level can only be estimated although the EA’s “East Hants and Chichester Chalk Groundwater Model” could be used to simulate these conditions once it has been updated.

2.5.2.3 Scenario “C” Droughts (1 in 120)

Scenario 'C' models the effect of applying an eighteen month period encompassing two dry summers either side of a dry winter. It has been developed from the groundwater profiles recorded in the dry summer of 1990 and then applies the recession curves from the winter of 1975 and the following dry summer of 1976. It is extended further by a dry autumn as experienced in 1973 before recharge occurs at the beginning of the next year.

The assumption is that during the first dry summer, groundwater levels fall much lower than the LTA. Low winter rainfall of 50% of the LTA is experienced and as a result there is no recharge of groundwater recorded and levels continue to recede throughout the winter, albeit at a much slower rate. A further dry year recording 50% of LTA rainfall is experienced and the groundwater level continues to recede below the lowest ever recorded. The level at Idsworth might fall as low as 11.0m AOD, well below the Company's previous minimum recorded level of 12.7m AOD.



2.5.3 Severe Droughts

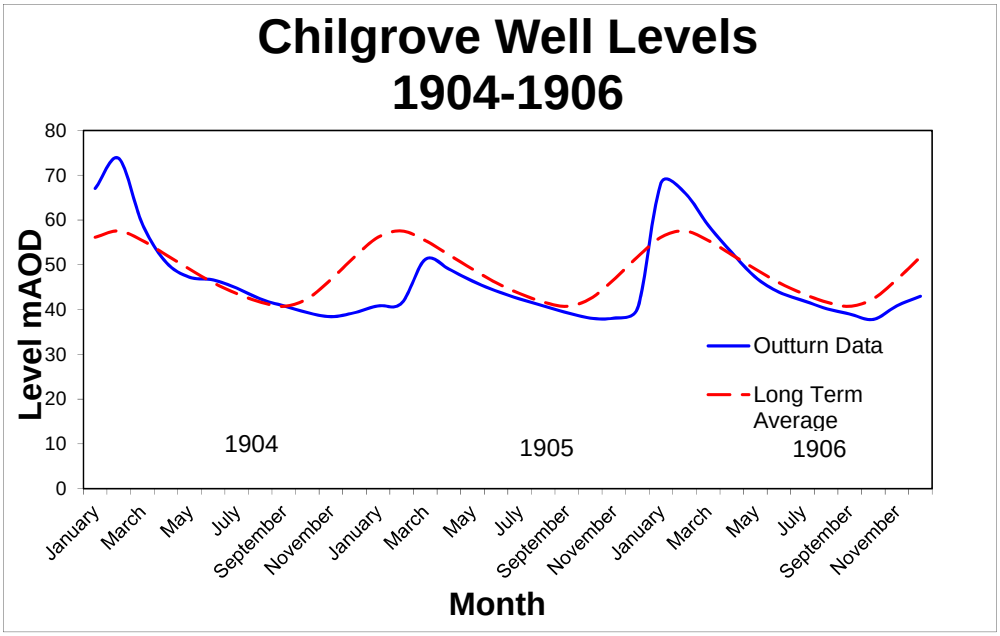
Looking at rainfall data since 1886 indicates that the conditions in 1976 had a return period of around 1 in 80 years. This means that there is about a 1% risk of this drought occurring in any given year. The Scenario "B" drought is actually more severe than 1976 and is expected to have an even longer return period.

The Drought Planning Guidance, published by the Environment Agency, requires companies to consider the "longest drought on record". Portsmouth Water used groundwater level records from Idsworth and Chilgrove which extend back to 1836. This data indicates that 1976 was the most severe drought in Portsmouth Water's area of supply and that over that period Scenario "B" represents the most severe drought on record.

Portsmouth Water has also considered the possibility of a three year drought. Several times in the last hundred years there have been dry periods that extended into three and even four years. During these periods enough rainfall was experienced to provide some aquifer recharge. The amount of aquifer recharge was sufficient to avoid a drought effectively resulting in a series of "dry years" with lower than average groundwater levels but not drought conditions.

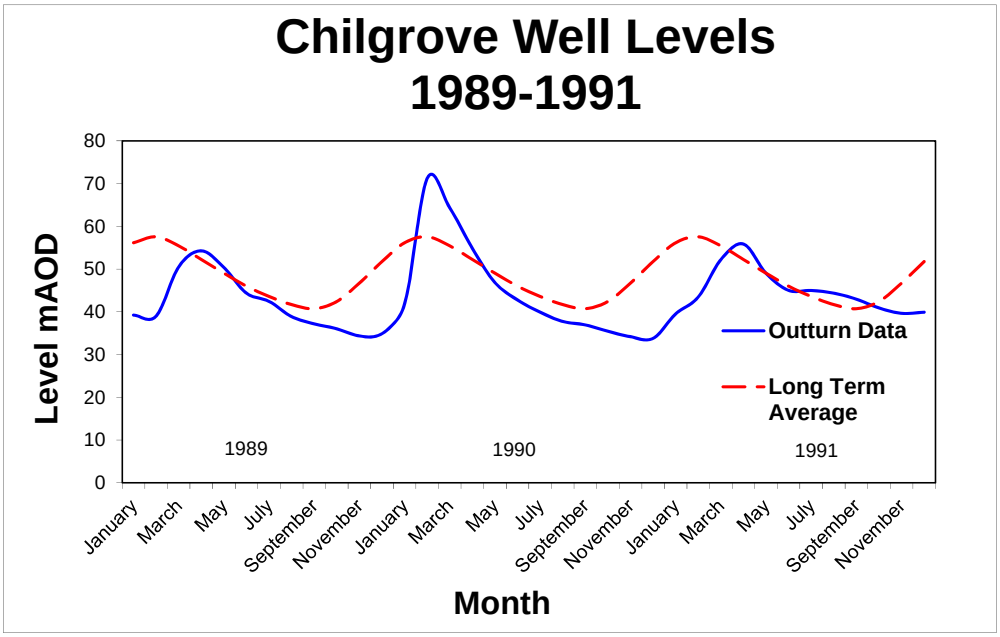
1904-1906

The prolonged dry period from 1904-1906 prompted Portsmouth Water to start recording Springs flows at Havant and Bedhampton. The overall rainfall for this period is so low that it has a return period of around 1 in 200 which is very rare. However, the groundwater response was less extreme as what rain was received enabled some winter recharge which would have been crucial to maintaining spring supplies.



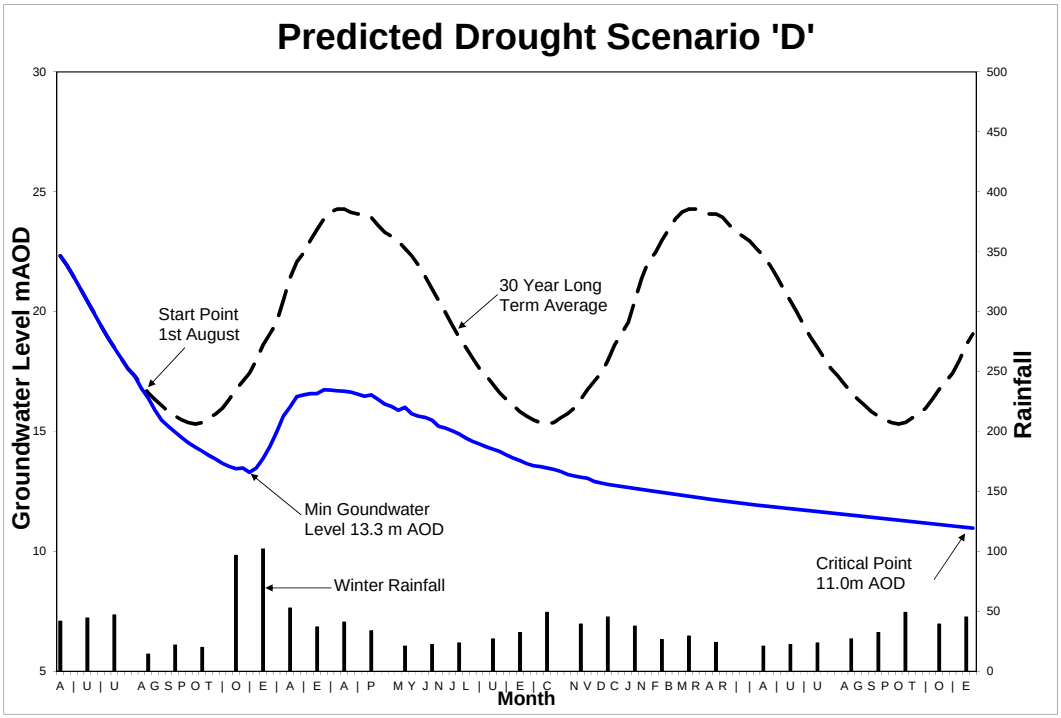
1989-1991

Another period that has been referred to is 1989-1991, which contained a dry winter followed by a dry summer followed by a dry winter. Once again the groundwater response was moderated by the timing of the winter recharge in 1990.



2.5.3.1 Scenario "D" Drought (1 in 200)

Following drought conditions in some parts of the country in 2011, the Environment Agency expressed concerns about a third dry winter. Portsmouth Water has covered the prospect of two dry winters in Scenarios "A", "B" and "C". Scenario "D" extends Scenario "A" into a third year with very low rainfall.



Scenario “D” is based on 1972-1974 when a dry autumn was followed by a dry year with 70% of LTA rainfall. Instead of recovering in the spring, this scenario assumes that a further dry year with 70% of LTA rainfall follows. As explained in Section 2.5.2.2, the slope of the recession reduces as the level falls. Scenario “D” predicts that groundwater levels could fall to 11.0m AOD, which is 1.7m lower than the lowest ever recorded in 1973.

This scenario has a return period in excess of the length of the groundwater record and has been nominally set at 1 in 200. As shown in Section 2.5.3 three year “dry” periods have occurred in the groundwater record but not three year “droughts”.

3. POTENTIAL DROUGHT MANAGEMENT ACTIONS CONSIDERED

As a result of the Company's past experience, Portsmouth Water's customers have high expectations of its ability to manage supplies during a range of drought scenarios.

Media perception too is that the Company may have failed to make adequate provision in its water resource planning activities. However, Government and Regulators expect companies only to ensure that sufficient resources are provided to meet their Level of Service and that from time to time Drought Management Action might be needed.

The options for managing a drought can be divided into demand side options and supply side options. In general, the demand options involve measures which are intended to influence customer demand and the supply options involve measures taken by the Company to enhance supply availability. Portsmouth Water has no recent direct experience of the impacts of drought demand management since the last hosepipe ban in the area was implemented in 1976.

The Company believes that it's stated Level of Service of "1 in 20 years" for managing demands with the need for implementation of the Drought Plan in its Water Resources Management Plan will be sufficient for dealing with the majority of single season dry years without the need for specific drought actions. The Company only anticipates the implementation of the Drought Plan for multi-season droughts and this should ensure that adequate time is available for planning any actions that are necessary.

3.1 Drought Triggers

Over 75 years experience has shown that sufficient resources are available within the aquifer across the Company's area when ground water levels at the Idsworth Well monitoring borehole are above 13.3m AOD. Whilst in the past 30 years groundwater levels have fallen below 14.0m AOD on no less than 15 occasions, it is only on 3 occasions that water levels have fallen below 13.3m AOD:

- 12.70m AOD Dec 1973
- 12.95m AOD Dec 1990
- 13.15m AOD Nov 1989.

Thus, although groundwater levels fall below 14.0m on average 1 in 2 years, levels have only continued to decline beyond 13.3m on average 1 in 10 years. On all occasions the careful management of water resources ensured supply matched demand, without the need for supply restrictions.

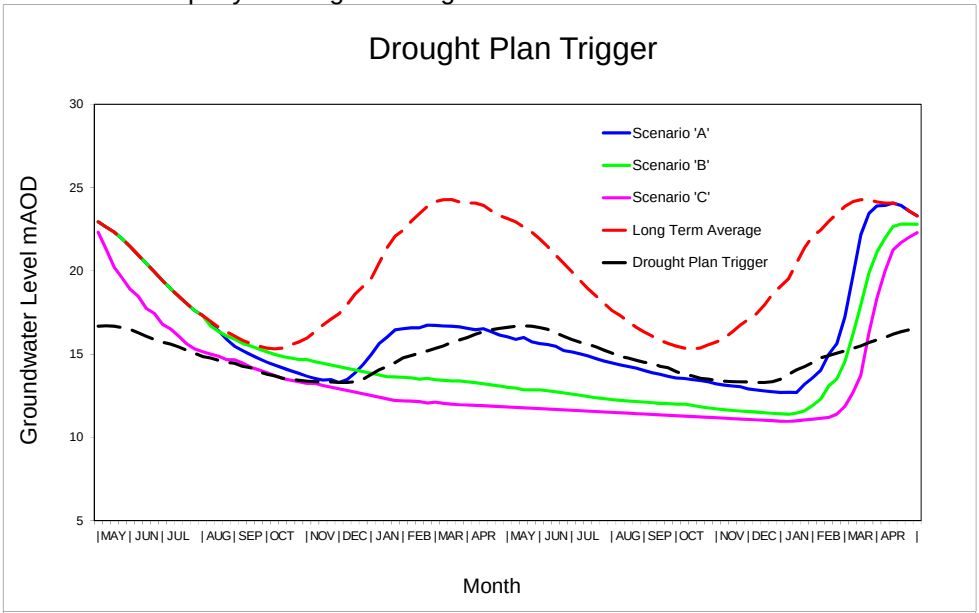
Dry autumns result in the continued recession of groundwater levels into the winter period. Records show that the lowest yearly groundwater level can be anticipated to occur during December or early January. The lowest groundwater level ever recorded was 12.70m AOD in the winter of 1973.

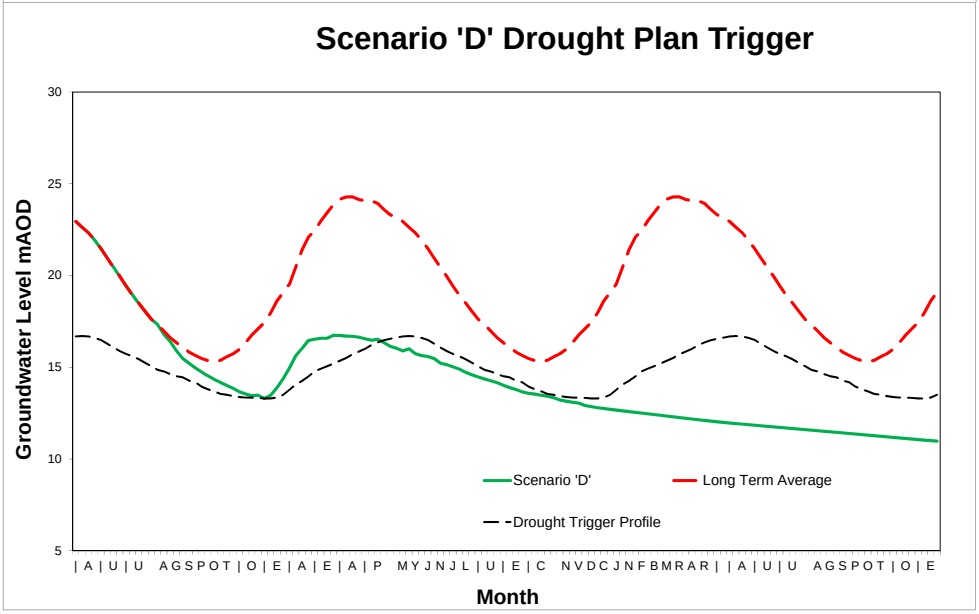
In the 12 months preceding the 12.70m AOD groundwater low in December 1973, below average winter rainfall resulted in minimal recharge from an already low groundwater level of 13.3m AOD in November 1972. Groundwater levels rose to 16.7m AOD in February 1973 before declining to an all time low.

A Trigger profile has been generated based on the Company's 75 years of groundwater level records. The profile is derived from the minima of weekly average groundwater levels, excluding the 5% most extreme events (1 in 20) i.e. the drought years. Not surprisingly, the minimum trigger point is 13.3m AOD in early December, with a maximum trigger point of 16.7m AOD in mid May. The benefit of the Trigger Profile is that in any week of the year it can be compared against current groundwater levels and an early warning given that drought actions may need to be considered.

3.2 Drought Management Control

Ground water levels are monitored weekly, with figures reported and considered by senior staff at the Company's Monday morning Operations Meeting. Depending on the rate of recession of groundwater levels, the drought Trigger Profile may be breached in which case the Company's Drought Management Team will be convened.





A forecast of groundwater profile based on various rainfall scenarios will be prepared for the Drought Management Team. Serious consideration will be given to the need for various drought measures to be prepared.

As the drought develops, or if the drought Trigger Profile continues to be breached, serious consideration will be given to the need to seek Drought Permits/Orders, and when implementation might be needed.

If following a breach of the Trigger Profile, aquifer recharge occurs but is insufficient for groundwater levels to rise above the Profile**,** the Drought Management Team will continue to meet, and the retention of drought measures will be considered.

When groundwater levels rise above the Trigger, the Drought Management Team will no longer be required to meet. Although the decision will be for the Team itself to make taking into account rainfall, long range weather forecasts, source outages, and bulk transfers.

3.2.1 *Drought Management Team Membership and Internal Reporting*

The Drought Management Team will consist of the following personnel:

Personnel	*Responsibility*
Engineering Director	Overall responsibility for technical issues, including Water Quality, Supply, and Capital Works And Distribution Network and for external communications.
Distribution Manager	Manages water main distribution network, including responsibilities for leak repair.
Customer Services Manager	Manages customer billing and Company call centre.
Personnel Manager	Responsibility for co-ordinating water efficiency actions.
Water Quality Manager	Ensures water quality standards are achieved.
Investment Manager	Plans and implements asset management plan; responsible for capital works improvements.
Supply Manager	Monitors groundwater levels and rainfall, responsible for the operation of sources, water treatment works and service reservoirs and feeds information to Team as required.

The Drought Management Team will meet at least once a week. The Team will report upon actions taken at least once a week to the Company's Executive Team and once a month to the Full Company Board.

3.2.2 *External Reporting*

The Company anticipates that when the Drought Management Team is convened, it will immediately open dialogue with the Environment Agency. If there are other companies experiencing similar conditions, it anticipates that the Agency will set up its Regional Co-ordination Group and, if so, one member of the Team will be the designated Company representative on that Group.

Since there will be the need for both communications with the Media and possibly other Company/Agency Media contacts, the Team will designate a representative for communications issues.

3.2.3 *Customer Drought Awareness*

At an early stage, informal contact will be made with Southern Water, with whom the Company has a bulk supply agreement, with a view to sharing information and understanding their needs for continuing with water transfer during an impending drought.

Contact will also be made with other agencies / customers who may be affected by the proposed drought measures. These could include:

- Environment Agency
- Natural England
- English Heritage
- Local Authorities, including residential care homes
- West Sussex County Council

- Hampshire County Council
- OFWAT
- Consumer Council for Water
- Health Authorities
- Police
- Fire Authorities
- Representative bodies such as CBI NFU HTA Chambers of Trade & Commerce
- Age UK
- Hospitals
- Schools
- Special needs customers
- Customers generally
- Horticultural Trades Association
- Citizens Advice Bureau
- Window Cleaners Trade Associations
- National Farmers Union

3.2.3.1 Early Engagement

The Company recognises that none of the scenarios considered require drought management actions that have the potential to impact the provision of water for fire fighting supplies. It would take an unprecedented event such as a major pollution event combined with a drought to pose such a risk. In this case, communication would take place with the Fire Brigade under the auspicious of the Emergency Plan.

It has also been recognised that communications are required with the agricultural sector and although the Environment Agency have total control over agri-abstraction, Portsmouth Water will engage with stakeholders such as the National Farmers Union to agree early and managed reductions in demand in this sector. Hence the National Farmers Union has been added to the list of agencies that may be affected by drought measures.

3.3 Potential Supply and Demand Management Actions

This section sets out the potential supply and demand management options that are available to the Company. It does not necessarily follow that these options listed below will be required in our drought scenarios. The purpose of setting out the potential drought options is to demonstrate the assessment and screening of all drought management options the Company has considered. This will make it clear to the stakeholders how the Company has sought to balance the needs of their customers, as well as minimising the impacts these options may potentially have on the environment.

The Company has identified a number of key actions that might be used to suppress overall demand in order to balance supplies with demand during a drought:

- Appeals to customers for voluntary restraint in their use of water
- Enhanced leakage control by the Company including pressure reduction
- The imposition of temporary bans on certain activities
- The application of further restrictions under a Drought Order

Since drought actions are only likely to be needed for multi-season droughts, it has been assumed that additional promotion of water efficiency measures would have taken place by the time that drought actions are considered. No significant reductions in demand are anticipated from additional water efficiency promotion but the coverage in the local Media is likely to set the context for further appeals for restraint.

The range of activities likely to be used by the Company will be determined by the Drought Management Team and they are detailed in the following sections of this Plan.

3.3.1 *Appeals for Voluntary Restraint and Leakage Reduction*

Continued low rainfall and reducing source yields would require more direct appeals for voluntary restraint in the press and, if possible, local TV, Newspaper Advertisements, Radio Commercials and Notices on Vans.

As customers are asked to curb demand, it is important that the Company is seen to be minimising leakage levels. This could involve additional leakage detection resources and a higher priority for repairing leaks. It is essential that visible leaks are repaired as quickly as possible, if necessary by the use of contract labour. Bad publicity caused by lost water can undermine the impact of calls for customer restraint. In warmer and drier weather, ground movement occurs as the soil dries out. Additional leakage can be anticipated, and thus without additional manpower for detection and repair, leakage could be expected to rise in drought years.

Pressure Management is already carried out for 60% of Portsmouth Water's customers and this has a significant impact on overall demand and leakage. Sophisticated controls are applied to the Distribution Network to enable the Company to vary pressures in the network at different times of the day. During a drought it may be possible to further reduce day time pressures to suppress demand and leakage. The 'Abnormal Demand' allowances in Ofwat's DG2 Pressure Reporting Requirements allow pressures below the reference level of 15 metres for up to 25 days in a rolling five year period.

The combined impact of calls for voluntary restraint and additional active leakage control is expected to reduce demand by 2.5%.

3.3.2 Temporary Bans

Since the last Drought Plan was published in 2008, the legislation that covers demand management during a drought has changed. Sprinkler and Hosepipe Bans have been replaced by “Temporary Use Bans” as set out in Section 36 of the Flood and Water Management Act 2010. The statutory instrument for imposing bans is the Water Use (Temporary Bans) Order 2010.

In addition, the legislation for Ordinary Drought Orders has been updated as detailed in the Drought Direction 2011. The description “Non Essential Use” is no longer used and demand management for commercial customers is covered by the Drought Direction.

The Environment Agency “Drought Plan Guideline” 2011 sets out how the new legislation works. In addition the Water Industry has produced a “Code of Practice and Guidance on Water Use Restrictions” UKWIR 2011. The Code is intended to ensure that water restrictions are:

- Consistent and transparent
- Proportionate
- Communicated clearly
- Considers representations in a fair way

Any representations made on temporary restrictions will be recorded and the exact method of response will depend on the number and nature of representations that are made.

The legislation and the guidance produced by the Environment Agency, calls for representations to be taken into account in determining the implementation and application of restrictions. Following comments by Defra, Portsmouth Water has assumed that the Draft Drought Plan 2011 represents the first stage of this public consultation. Representations on the Draft Plan have been considered by Portsmouth

Water and set out in "Statement of Response" (Appendix F). These have informed this Final Drought Plan 2012 which sets out the proposed demand management actions. Having determined the strategy for implementing restrictions in this Drought Plan, the Company will notify its customers through Public Notices in local newspapers press releases and its website to advise of the implementation programme.

The Environment Agency Guidance states that companies should consider phasing of temporary water use restrictions. They also suggest that temporary use restrictions should be fully implemented before any applications for "Drought Permits" are made. Drought permits allow companies to abstract more than the licensed quantity from a river or from an aquifer.

3.3.2.1 Phasing of Temporary Bans

Portsmouth Water has considered the phasing of temporary water use restrictions and concluded that this would make the plan less acceptable to the public and is difficult as the Company does not have any raw water storage. Having raw water storage would mean that the Company would be less likely to have to implement a hosepipe ban as the storage would act as the resilience the Company would need during a drought. The Company is considering the building of Havant Thicket Winter Storage Reservoir which could resolve this. Research has been carried out by Thames Water as part of their Drought Plan consultation. Since restrictions are only expected to be needed occasionally (1 in 20 years) it considers that restrictions should be applied across all types of discretionary use.

In Section 2.5.1, it was shown that Portsmouth Water is unlikely to be affected by a single season drought. Once the drought trigger has been crossed and the Drought Plan implemented, then the initial actions will take place in the early part of the second year.

The legislation sets out the following uses which can be included in a Temporary Ban:

a. Watering a garden using a hosepipe
b. Cleaning a private motor-vehicle using a hosepipe
c. Watering plants on domestic or other non-commercial premises using a hosepipe
d. Cleaning a private leisure boat using a hosepipe
e. Filling or maintaining a domestic swimming or paddling pool
f. Drawing water, using a hosepipe, for domestic recreational use
g. Filling or maintaining a domestic pond using a hosepipe
h. Filling or maintaining an ornamental fountain
i. Cleaning walls, or windows, of domestic premises using a hosepipe
j. Cleaning paths or patios using a hosepipe
k. Cleaning other artificial outdoor surfaces using a hosepipe

Garden watering could be included in an initial phase of a temporary ban because the biggest impacts would apply in early spring. This is when bedding plants are being watered and lawns are starting to grow. The Company considers that if garden watering were targeted in this way it might appear to be unfair to a significant proportion of its customer base, especially if hosepipes could continue to be used to wash private cars and fill ponds.

3.3.2.2 Justification of a Temporary Ban

Although no customer research was undertaken for this plan, research for the 2009 Business Plan (see Appendix H) showed that customers accepted the need of hosepipe bans and were prepared to have them imposed more frequently. Portsmouth Water has reduced its level of service for restrictions from 1 in 50 to 1 in 20 in line with these findings. Portsmouth Water also took part in a working group with other water

companies in the South East to agree a common approach to temporary bans, making use of research carried out by other companies.

Imposing temporary bans on garden and plant watering is consistent with previous plans. It is clear in that reducing garden watering and plant watering by hosepipe has a demand management benefit in the early months of a drought. Communicating the need to reduce garden watering and ways in which the impacts can be mitigated is an important message.

The imposition of garden sprinkler bans and hosepipe bans in 1976 resulted in a significant fall in demand. In the previous Drought Plan, the combined saving was estimated to be 10% the majority of which was garden watering.

Other activities such as cleaning cars, boats and domestic windows use smaller volumes of water. They are also likely to be impacted by general calls for restraint as the drought develops. Using water for recreational purposes such as paddling pools, ponds and water play has increased in recent years but restricting use is more an issue of fairness rather than the savings that are likely to result.

Restricting garden watering will have an impact on the horticultural trades but the effects are proportionate. The Company believes that the timetable for a developing drought would allow trades to modify their purchasing decisions and time to develop drought mitigation alternatives. The Company considers that horticultural trades should develop "Drought Contingency Plans" in the same way as the Water Industry.

The legislation for temporary use bans allows companies to specify exceptions or concessions to groups so they can remain unaffected by the ban. For clarity set out below are the circumstances where we believe concessions are appropriate and not appropriate.

3.3.2.3 Concessions to be Permitted

Concessions will be permitted for elderly and disabled residents based on Portsmouth Water's Special Needs Register or by written application. Portsmouth Water will write to all those on the register to explain the situation. This information will also be published on the website and other communications with customers would enable customers to apply for exemption. The concession will be for that residence only and will be for the use of a hose (both handheld and adapted for irrigation) for watering plants and gardens but not lawns, though we would ask customers to apply constraint. Application can be made in advance to go on the register. Customers applying for this exemption will be considered on a case by case basis.

The Company will use the Special Needs Register to identify vulnerable customers so the Company can put in place the necessary actions to ensure customers are protected. As part of the communications strategy, the Company will work with various organisations to seek advice on how to protect vulnerable customers.

Following representations from the Horticultural Trades Association (HTA), Portsmouth Water has decided to allow the use of micro irrigation systems in a drought. These must be fitted with a pressure reducing valve; a timer; must not be handheld and are exempt from all but the most severe drought scenario.

A concession will also be given to the use of drip irrigation systems where possible. This concession will be given in a scenario A and a scenario B drought, however, this concession would not be given in a more severe drought such as scenario C drought with a nominal return period of greater than 120 years or a scenario D drought (1 in 200 years). If an exemption is offered in the most extreme events for drip irrigation, it will require further drought permits that have the potential to impact designated Habitats sites. A recent review of these sites has lead to a variation of abstraction licences to protect the sites. In the Company's opinion, it would not be appropriate to apply for

drought permits at designated sites while continuing to allow the use of these drip irrigation systems during a more severe drought.

3.3.2.4 Concessions Not to be Permitted

Concessions will **not** be permitted for newly landscaped gardens. Customers and developers will need to heed the early publicity about potential drought conditions. The Company considers it is proportionate that new homes should be sold without plants or turf in drought conditions.

Concessions will **not** be permitted for newly laid turf. The Company states that policing this type of concession would not be practical.

Concessions will **not** be permitted for allotments which are defined as "gardens" under the legislation.

Concessions will **not** be permitted for cleaning domestic windows. Portsmouth Water is aware of the impact this will have on commercial window cleaners. For health and safety reasons, many window cleaners now use pole mounted hose systems. In a drought window cleaners would have to revert to using a bucket and may be restricted to cleaning the lower floors of buildings. If this has an impact on local window cleaner businesses then Portsmouth Water will offer temporary positions within the Company to those window cleaners who have lost work to help with leakage control efforts and other drought related positions within the Company.

Concessions will **not** be permitted for sports or recreation grounds which are defined by the regulations as "gardens". Public Authorities such as District Councils and Parish Councils have a duty under the Water Act 2003 to promote water conservation. Portsmouth Water will expect Authorities to fulfil this commitment by developing their own "Drought Contingency Plans". These will include plans to reduce or modify municipal planting in the run up to the imposition of restrictions for domestic customers. This will set a similar precedent to leakage control by Water Companies in sharing the burden of responding to a drought.

Local Authorities are responsible for many sports and recreation grounds and these should not be watered once the Temporary Ban is introduced. If the sports ground is deemed to be "unsafe" due to the hardness of the ground, then it should be closed. This will avoid the need for "Health and Safety" exemptions under the Water Use (Temporary Bans) Order 2010.

Temporary bans do not cover the watering of plants at commercial premises or the cleaning of windows at commercial premises.

Concessions will **not** be permitted for small businesses such as window cleaners.

3.3.2.5 *Impact on Demand of a Temporary Ban*

Portsmouth Water does not have any recent experience of drought management and the new legislation is likely to change the way which customers behave. In 1976, the hosepipe ban and national publicity surrounding the Drought Act caused demand to fall significantly over a prolonged period. The Company's weekly average demand of 200 Ml/d in May 1976 fell to about 170 Ml/d by August 1976. This represented about a 15% reduction which is consistent with the figures published in the 1998 UKWIR Report on the impacts of drought measures. The significant reduction in demand was, however, in the context of an overwhelming "national situation" and publicity was sustained over a long period. The Company does not believe that a 15% reduction was entirely the result of hosepipe restrictions as a number of other initiatives were promoted such as putting bricks in toilet cisterns.

During the recent drought in parts of the south east, a number of water companies imposed hosepipe bans for prolonged periods which ran from 2005 through to 2006. The bans were associated with a concerted media campaign, and one company also imposed a non-essential use ban. The reduction in demand varied but the hosepipe ban is believed to have reduced peak demand by up to 15% although the precise effect of the ban may have been masked by other actions.

In light of the recent changes in legislation, Portsmouth Water believes that conservative figures should be used to estimate demand reductions. The Temporary Ban is expected to deliver a 5% reduction in overall distribution input. This has been reduced following the introduction of the concession for micro irrigation systems.

3.3.2.6 *Policing of Temporary Bans*

Although policing of temporary bans will be difficult and has not generally been discussed in past Drought Plans, the Company have considered some options of policing temporary bans and will require co-operation from customers, and observations from Portsmouth Water operational staff. Although a penalty could be issued of £1000 (level 3 of the standard scale of fines as outlined in section 32 of the Criminal Justice Act 1982), the response to those who have flouted the temporary ban will be one of education of the public to ensure they are aware of the current water resources situation and of peer pressure to follow the temporary restrictions whilst they are in place. Further details of which are found in the Flood and Water Management Act 2010.

3.3.3 Drought Directions

In the previous Drought Plan, published in 2008, the legislation included "Non Essential Use Bans" which were part of the Drought Order process. This covered uses such as watering public parks, filling swimming pools and washing commercial vehicles. With the recent changes in legislation, some of the non essential uses have been transferred to the Temporary Ban category.

Portsmouth Water has never had to impose any restrictions on "Non Essential Use" but voluntary restraint from both domestic and commercial customers was evident in 1976 and through 1977. A water company in the south-east imposed a non essential use ban in 2006 which appears to have suppressed peak demand by up to 30% compared with their 2003 peak.

The current legislation is set out in the Drought Direction 2011. This still requires an Ordinary Drought Order under the Water Resources Act 1991 which is related to an "exceptional shortage of rain".

3.3.3.1 Phasing of Drought Directions

Portsmouth Water envisages that a Drought Order that would restrict the use of water in some commercial activities would be arranged as the other control measures were implemented. This is due to the fact that the process for obtaining a Drought Order is likely to require a public consultation and a public inquiry/hearing. The individual restrictions would only be implemented if demand continued to rise towards the drought yield curve.

If Drought Direction Restrictions were imposed following appeals for restraint and temporary bans, then demand would reduce. This reduction would remain for the length of the drought unlike temporary bans which are only likely to be effective during dry weather.

The Drought Direction 2011 allows Water Companies to restrict the use of water for the following purposes:

- Watering outdoor plants on commercial premises using a hosepipe

- 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 using a hosepipe
- Cleaning non-domestic premises using a hosepipe
- Cleaning a window of a non-domestic building using a hosepipe
- Cleaning industrial plant using a hosepipe
- Suppressing dust using a hosepipe
- Operating cisterns in an unoccupied building

It is envisaged that some or all of these purposes will be covered by each Drought Order application.

3.3.3.2 Impact on Demand of Drought Directions

Drought Orders are only required for more severe droughts and the additional demand effect is assumed to be a 5% reduction in distribution input. This saving will be the subject of review as operational experience of the new legislation is obtained.

3.3.3.3 Concessions Permitted

If imposed as Phase 3 of drought restrictions, there are unlikely to be exceptions. By this stage the drought is already severe and the environment is likely to be suffering impacts. These commercial uses of water are not essential and more labour intensive options are often available.

3.3.3.4 Concessions Not Permitted

Concessions will **not** be permitted for commercial watering of outdoor plants. There is little evidence that "water efficient" apparatus gives significant savings. Micro irrigation has the potential to increase consumption through the use of timers rather than observation of water need. Pop up sprinklers are popular for commercial premises but are unlikely to provide efficient watering. More labour intensive options such as using a watering can are available and could increase the income of small businesses.

Concessions will **not** be permitted for commercial swimming pools (public pools are not included). In a severe drought it is proportionate to restrict commercial pools. In many cases, the pool is not the primary source of income. Hotel and sports club customers are expected to understand the need for restrictions and alternatives are available.

Concessions will **not** be permitted for commercial building cleaning. As with domestic property, small businesses have the option to use more labour intensive options such as a bucket and a sponge. Commercial customers are expected to understand if the upper stories are not cleaned in a drought and there are exceptions in the legislation for health and safety issues. Commercial buildings are expected to set an example in a severe drought.

Concessions will **not** be permitted for mechanical vehicle washers. Vehicle washers with water recycling should be encouraged for day to day use but do not give the right "water conservation" message in a severe drought. Car washes are not considered to be the primary source of income at garages and supermarkets. Staff employed at hand held jet wash establishments could transfer to hand washing which would be permitted. Hand washing establishments could see an increase in trade due to transfers from mechanical car washers and domestic customers unable to use pressure washers at home.

Concessions will **not** be permitted for cleaning vehicles, boats or rolling stock. It is anticipated that Local Authorities will voluntarily reduce vehicle washing at the start of a drought as part of their commitment to water conservation. Bus and train cleanliness is very apparent to customers but is also a good example of the impact of a severe

drought and the need for shared pain. The cleaning of aircraft is likely to be permitted on health and safety grounds.

Dust suppression will only be permitted on health and safety grounds and to reduce environmental pollution but the use of alternative or recycled water should be considered.

The restriction on operating cisterns in any building that is "unoccupied and closed" is difficult to interpret. The legislation specifically refers to "automatically-operated" cisterns that are connected to toilets or urinals. Unoccupied and closed is assumed to mean at night or out of term time for educational establishments. This is the very time when automatic PIR type controllers provide the greatest savings. They only operate when people are present and for an occasional hygiene flush. It is possible that the legislation was aimed at old style siphon operated cisterns that filled and emptied continuously. These could be considered to be "automatic".

If the system is continuous it should be replaced with a PIR Controller to ensure water efficiency. If it is not replaced then the building would need to be isolated from the water supply at night or out of term time to comply with the direction. Educational establishments are often empty at the most critical times for public water supply in the summer.

3.3.4 Levels of Service

Portsmouth Water has no surface water storage and thus has no ability to manipulate supplies to meet a given level of service. However, to date demand restrictions have only been applied once during the drought of 1976.

The previous Water Resources Management Plan 2009 was based on a nominal level of service of 1 in 20 years. This means that there is a 5% risk of restrictions in any given year.

Having established a drought trigger curve it was possible to calculate the impact of this on historical groundwater level data. Using Idsworth Well levels from 1932 until 2011, it appears that the drought plan would have been implemented on seven occasions in 80 years. Temporary Bans would have been needed on four occasions and Drought Orders sought on two occasions.

This "outturn" data would appear to show that Portsmouth Water will achieve a level of service comparable to 1 in 20 for Temporary Bans and 1 in 50 for Drought Orders.

This analysis indicates that the drought trigger which has been prepared is appropriate and consistent with Portsmouth Water's stated level of service.

3.4 Potential Supply Enhancements

The Company has also considered various supply side options and these are detailed in Appendix B. Included is an estimate of the additional resource the might be available and the environmental monitoring to take place. Most supply enhancements would be used in response to local water resource problems. Several are largely untested and some are restrained by the need to obtain environmental data.

The Company recognises the need to obtain environmental data is important, especially for supply side options such as drought permits, recommissioning boreholes and increasing drought yields. Therefore the Company will start reviewing the necessary monitoring data for each supply related option well in advance of application for implementation (More details can be found in Appendix B).

The options considered were:

- Lowering of borehole pumps to maintain source yields
- Recommissioning unused sources
- Commissioning unused Portsmouth Water boreholes
- Commissioning unused licence from private boreholes
- Internal transfers
- Drought Permits or Orders
- Increasing drought yields at existing sources
- Reduction or cessation of bulk supply to Southern Water Services

3.4.1 *Lowering of Borehole Pumps to Maintain Source Yields*

The majority of the Company's sources rely upon submersible pumps which are located in wells and boreholes. Since aquifer levels are lower during drought years, the Company maintains a small stock of additional 'rising mains' which may be needed to lower the level of pump intakes. This will ensure that pumps can continue to operate despite reduced groundwater levels.

3.4.2 *Recommissioning Unused Portsmouth Water Sources*

Hoe

The abstraction licence for the Company's source at Hoe (Bishop's Waltham) was surrendered in 2003 due to environmental concerns affecting the Moors SSSI. The site has now been decommissioned and permanent plant removed. Provision has been made to enable the installation of temporary pumps, power supplies and disinfection equipment in the event that the source is needed.

Prior to surrender of the licence, the PDO of the source was 7.5 Ml/d. It is possible that limited yield at less than the original PDO might be achievable without serious impact upon the local environment.

However, detailed environmental monitoring, modelling and testing would be required to determine the likely drought yield. The Environment Agency has recently agreed to update the East Hampshire and Chichester Chalk groundwater model. It is anticipated that the Agency will provide access to the model in order to identify the possible drought yield.

It should be noted that the requirements of the Drinking Water Inspectorate must be met before any source is returned to supply. This procedure typically takes a minimum of 3 months, although the regulations make provisions for the process to be undertaken more quickly in exceptional circumstances. It is highly unlikely that this source would be recommissioned and would only be considered in an extreme event for which more information would be included in the emergency plans.

Hayling Island

Portsmouth Water has one source at Hayling Island which has not been used since the 1920s when up to 0.3 Ml/d was abstracted. Recommissioning would require new or spare pumps, disinfection plant and power supply and a reconnection to the distribution system. The extent of treatment required is unknown as are the likely yield and water quality.

Water quality investigations will need to take place by the DWI before any source can be used for public water supply, which can take up to 3 months, and the installation of temporary pumps, power supplies and disinfection equipment will also add time to the process, so 3 – 6 months would be a likely time period.

3.4.3 *Commissioning Unused Portsmouth Water Boreholes*

Some of the existing source works contain shafts and boreholes that are not currently used. In a severe drought it might be possible to increase the yield of a source by installing temporary pumping plant in these unused boreholes. The yield from such boreholes is largely untested and although the proposal remains possible, no significant volume can be identified without further work and water quality assessments.

As mentioned previously, given access to the Environment Agency's recently completed East Hampshire and Chichester Chalk Block model might help identify possible further yields from existing sources.

It should be noted that any activity is subject to complying with the constraints of relevant abstraction licences.

However, there is a presumption against further groundwater abstraction as confirmed by the Environment Agency's CAMS assessment. Drought Orders / Permits would be required before increased pumping of these sources could be implemented.

As stated in 3.4.2, the Company must undertake assessments of the water quality from the source as set down by the DWI before water is supplied to customers. This will take up to 3 months as defined by the DWI and would only be used as a last resort, however constraints such as access to land are not an issue as we own the land and we currently have boreholes on these sites.

3.4.4 *Commissioning Unused Licence from Private and Commercial Boreholes*

There are a number of private boreholes within the Company's area which might have spare licence capacity to augment public water supply sources.

The Company has obtained a list of these sites from the Environment Agency and, in the event of a developing drought, will make contact with site owners to prepare plans to make use of any spare capacity for public water supplies. In the case that a private water supply is dry due to the drought, the Company will endeavour to provide the owner with a supply of water from our own supplies.

Any source must have DWI approval before being used to supply customers.

There is also a commercial borehole at Southwick Estates which can supply 0.1137 Ml/day which could also be considered. Other commercial boreholes have existed in the past but have since been back filled to make way for future developments. Permission would have to be sought from the site owners and therefore any derogation associated with this source can then be mitigated against. Water quality investigations would also need to be undertaken and this can take up to 3 months by the DWI. Possible constraints, such as access to land are to be considered when permission to potentially use this source has been sought and whether the yield would be enough to suit our needs.

3.4.5 *Internal Transfers*

In general Portsmouth Water has a well-connected supply system with the ability to transfer water between different parts of the Company's area.

The Company does not anticipate the need for additional transfers even in a severe drought. However, when operational problems occur at a particular site, it may be possible to add new transfers or reverse the flow of existing transfers by emergency temporary works.

3.4.6 *Drought Permits or Orders*

The Environment Agency has powers under the Environment Act 1995 to authorise modifications or suspend conditions contained in abstraction licences. The Company is expected to apply for a Drought Permit to request the Agency to suspend conditions. Alternatively, the water company can apply to the Secretary of State for a Drought Order under the Water Resources Act 1991. All of the permits are potential drought options and therefore do not necessarily form part of the plan, the only permit which would be required to manage a drought would be the Slindon permit.

3.4.6.1 West Street

At West Street, the licensed output is constrained when the flow in the adjacent River Meon falls below a certain level. In a severe drought, the Company could apply for a Drought Permit to suspend the flow condition. The Company is currently undertaking a post implementation monitoring study on the part of the SPA Solent and Southampton Water that may be impacted by flows in the River Meon.

3.4.6.2 Walderton

The licence for the Walderton Source incorporates a condition requiring the Company to provide a compensation discharge to the nearby River Ems of 1.14 Ml/d when the flow in the river is below a set level at Hampshire Farm, Westbourne. It would be possible for the Company to apply for a Drought Permit to suspend this condition. Following the publication of the Water Framework Directive River Basin Management Plan, Portsmouth Water has been asked to study the impact of abstraction on the River Ems. The river also discharges into a harbour which is designated under the Habitats Regulations. A full Appropriate Assessment would be required to show that the drought permit did not damage the harbour.

3.4.6.3 *Havant and Bedhampton*

Havant and Bedhampton Springs are Portsmouth Water's largest source and the abstraction licence has recently been modified to comply with the outcome of the Habitats Directive Review of Consents. The licence now has Minimum Residual Flow (MRF) conditions on the Langstone Mill Stream and the Brockhampton Mill Lake.

The Company could apply for a Drought Permit to suspend these conditions. However the flow conditions were explicitly set to protect the environment under dry or drought conditions. The conditions are based on scientific research and the habitats are protected under European legislation. A full Appropriate Assessment would be required to show that the drought permit did not damage the harbour.

3.4.6.4 Eastergate Group (Slindon)

The Peak Deployable Output (PDO) of the Eastergate Group of sources at Eastergate, Westergate, Slindon and Aldingbourne is currently limited by the abstraction licence to 41 Ml/d. The Group licence is also constrained by a requirement not to abstract more than 2,100 Ml in any period of 60 days.

Only the most severe drought scenarios (Scenario C and D) require a drought permit. A Drought Permit could be considered to enable the licence limit to be exceeded. Although abstractions from some of the Eastergate Group sources are believed by the Environment Agency to impact upon Swanbourne Lake at Arundel, it is essential to bear in mind that a Drought Permit application would only be made in severe drought conditions when the Lake is already likely to be empty, and thus irrespective of any water path between the lake and the aquifer, there is unlikely to be additional effect on the water environment. Environmental monitoring requirements are set out in Appendix C.

Slindon Source was originally licensed to 11 Ml/d in 1991 but this was then reduced to 2.5 Ml/d due to its assumed impact on Swanbourne Lake in 1996. The Lake is an artificial feature and relies on groundwater flows to maintain its level. In an extreme drought, even with the dredging carried out in 2002, the lake dries out, the last occurrence being in 2005. Under such extreme conditions, it may be acceptable to abstract additional quantities, up to 8.5 Ml/d, at Slindon following a Drought Permit to increase the licensed capacity.

In the Environment Agency's Draft South East Drought Plan July 2011, there is an acknowledgement that Swanbourne Lake may not be impacted. The site is an SSSI, further investigations will be required and Portsmouth Water seeks to work with the Environment Agency and Southern Water. The Environment Agency has been carrying out additional field work in the area and the East Hants and Chichester Chalk (EHCC) Groundwater Model is currently being updated. The Groundwater Model can be used to predict the impact of additional abstraction at Slindon under dry or drought conditions.

The Eastergate Group abstraction licence also has a condition that during June, July and August in any 60 day period, abstraction should not exceed 2,100,000 cubic metres. It is unlikely that this condition will cause a constraint during a drought however it may be necessary to apply for a drought permit to suspend this condition.

On this basis, Portsmouth Water propose to include the provision of a drought permit to increase the daily abstraction limit at Slindon by 8.5 Ml/d to 11.5 Ml/d and to increase the daily peak of the group licence to 49.5 Ml/d in their Drought Plan.

It should be recognised that this drought permit could pose a potential risk to the historic environment as lowering the water table from increased abstraction at this group of sources may cause 'dewatering' on archaeological deposits, though at present there are no records of any archaeological deposits in the area. English Heritage notes that they will be able to provide further advice on this matter in the future. Portsmouth Water intends to contact English Heritage as part of the process for applying for a drought permit at the Eastergate group.

Potential derogations relating to this permit have already been considered during the application for the licence as part of the original licensing process. People with concerns had the opportunity to express their issues during the application process and mitigation measures such as lining of ponds has been carried out to prevent derogation to people's private water supplies and features. As the source was originally licensed for a higher quantity than it is currently being used, any derogation for the quantity of the permit would have already been assessed.

Possible constraints, such as access to land are not an issue as this permit relates to a borehole on our own land and therefore we have the access to it and can access it when necessary.

3.4.6.5 Gaters Mill (River Itchen)

The River Itchen has been the subject of a detailed sustainability study under the Habitats Regulations. The Site Action Plan, published in October 2008, set out a Minimum Residual Flow (MRF) condition of 194 Ml/d at Riverside Park. This condition is included in a Licence Variation that Portsmouth Water has now implemented.

The MRF is designed to protect the ecology of the river between Gaters Mill and the tidal limit at Riverside Park. This protection specifically applies to dry or drought conditions.

3.4.6.6 Walderton Group (Fishbourne)

A group licence has recently been established for six West Sussex sources, the largest of which is Walderton. One of the conditions of the new licence is for reduced abstraction at Fishbourne between August and November. This condition is designed to protect freshwater flows into the harbour at this location. The group licence and the abstraction limits are the outcome of the Habitats Directive Review of Consents.

Portsmouth Water could apply for a Drought Permit to exceed the abstraction limits. The limits are specifically designed to protect the environment in dry or drought conditions.

3.4.7 *Bulk Supply to Southern Water*

The current Bulk Supply to Southern Water delivers water from Portsmouth Water's Littleheath Service Reservoir via Whiteways Lodge reservoir to Hardham Treatment Works on the River Rother. It was completed in 2004 and is capable of supplying up to 15 Ml/d at periods of peak demand. It is the subject of a ten year agreement signed in 2003 and due for re-negotiation in 2013.

In 2006, a link was provided near Southern Water's Madehurst source to enable up to 50% of the bulk supply to be delivered direct to their Sussex Coast zone.

It is possible that in severe circumstances the volume of supply made available to Southern Water Services could be reduced in order to secure sufficient supplies for Portsmouth Water's customers. Such circumstances are provided in the Agreement with Southern Water, although the Company is expected to use its best endeavours to maintain the supply if it is requested.

3.5 Anticipated Drought Management Actions

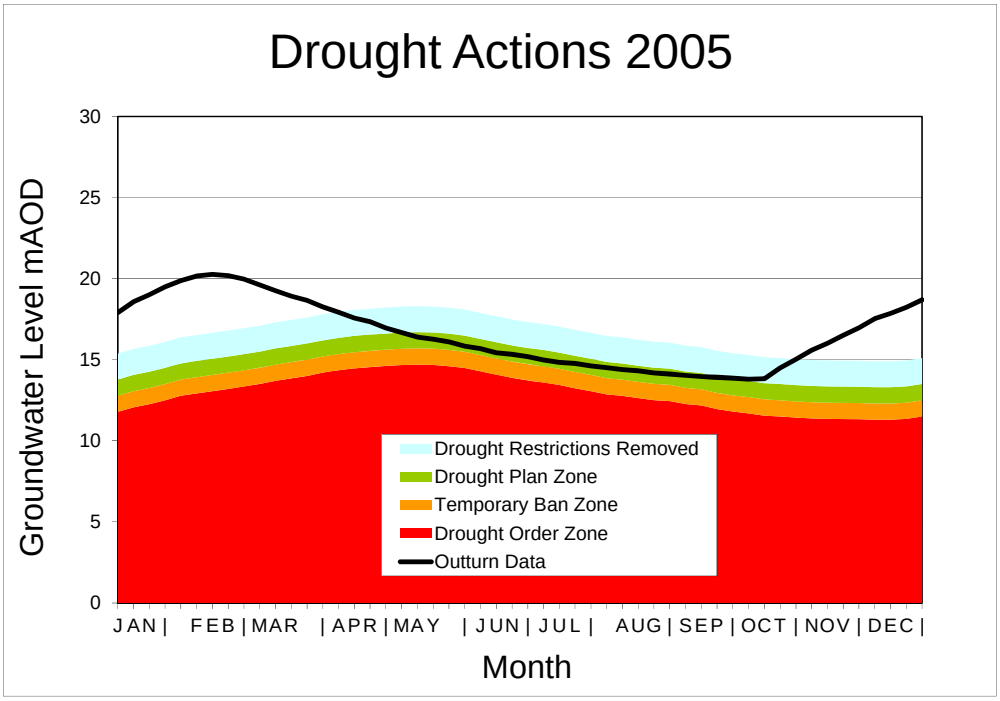
Portsmouth Water does not have any surface water storage reservoirs and therefore do not have any conventional control curves for drought contingency use. Historically the Company have used groundwater levels to monitor the water supply situation and to compare trends with critical years.

With no surface water storage, the necessity for Drought Management Actions is principally to ensure that during the peak demand period of May to July sufficient supplies will be available to balance demand.

Groundwater levels remain the key drought indicator since these levels affect springs, well and borehole yields. They also provide the base flow in the River Itchen which supports the Company's Gaters Mill abstraction. The following figures show groundwater control curves with triggers for:

- Implementing the Drought Plan
- Introducing Temporary Bans
- Introducing Drought Orders
- Removing drought restrictions

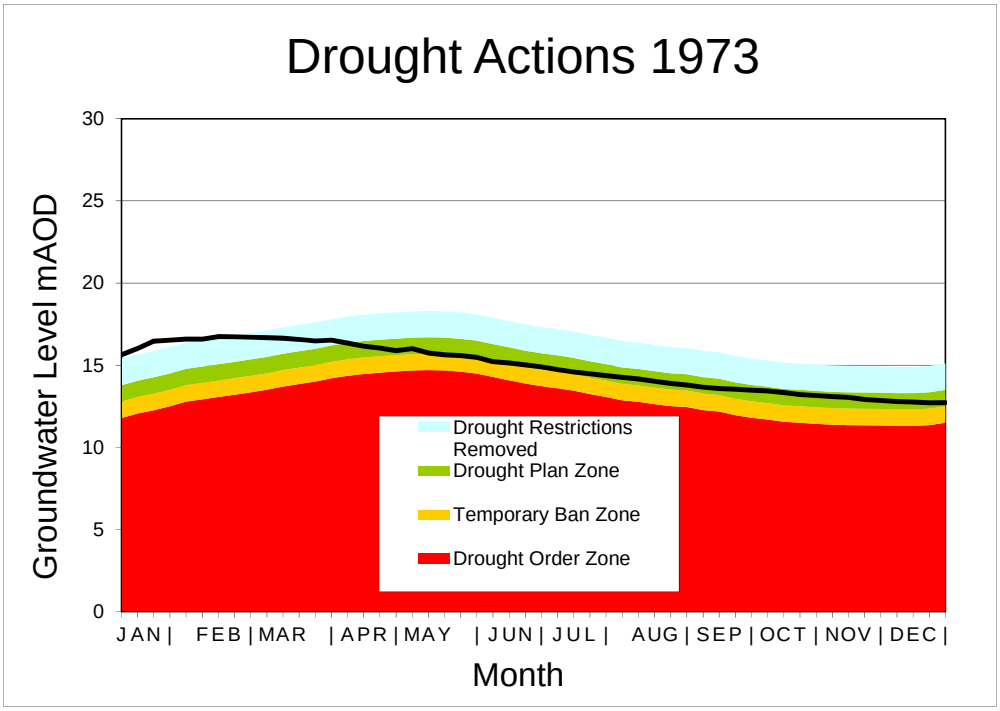
Between these triggers are "Zones" which represent the possible time period over which the drought actions are implemented.



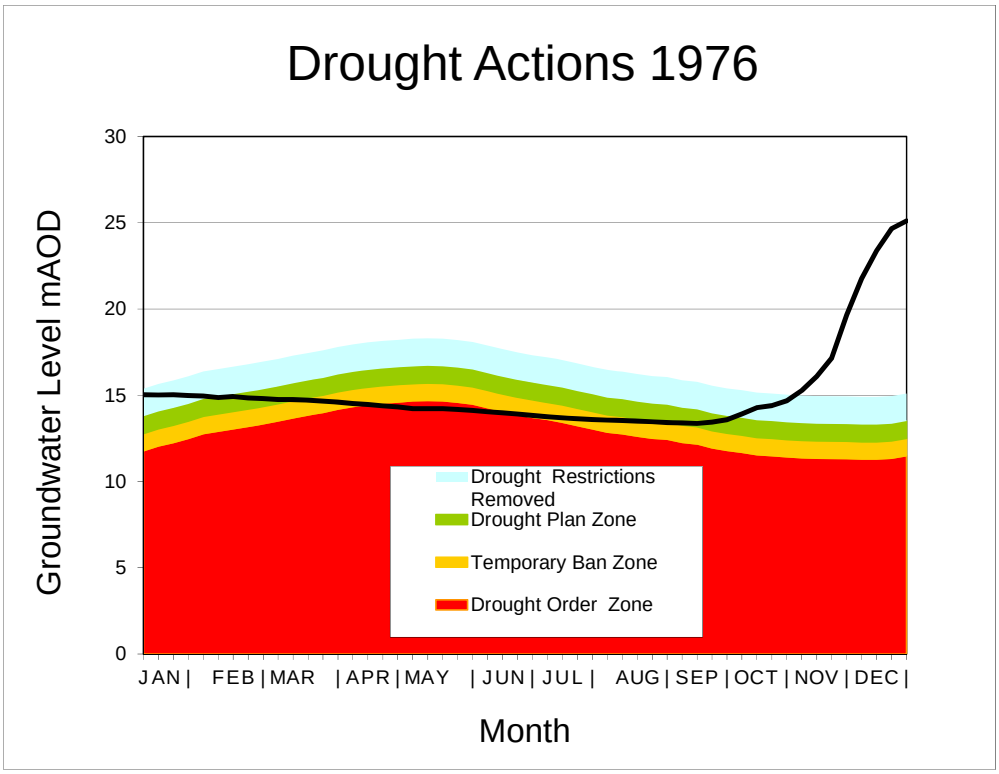
The initial "Drought Plan Trigger" is used to determine the start of the drought planning process. In some years, such as 2005, no further actions would have been required. Calls for restraint and additional leakage control would have been sufficient to meet the supply/demand balance. Temporary bans would not have been needed.

In years such as 1972, the Drought Plan would have been triggered in December but implementing a temporary ban at that time would not be effective. Another trigger is required for the Temporary Ban and a third trigger is required for the imposition of Drought Orders/Drought Permits.

The Environment Agency Drought Plan Guideline (2011) gives examples of control curves for surface water. Portsmouth Water has developed a similar approach for groundwater levels using the same colour coding system. To test the robustness of the groundwater control curves developed, historical data has been tested against the curves to establish if the appropriate actions would have been triggered. This figure shows the actions that would have developed under the new plan in 1973.



The triggers define the start and end of different "zones" of activity. The first zone is blue and represents normal operations before the Drought Plan is required. This zone also represents the end of a drought when the removal of restrictions is being considered. Portsmouth Water has defined the point at which restrictions are removed with a final trigger. This is based on a groundwater level of 15m AOD in November.



As a further illustration of how the triggers and zones work, the figure above shows outturn data for 1976. This was a Scenario "B" Drought with little or no recharge in the winter months. The outturn data indicates that a temporary ban would have been introduced in March. The Drought Order would need to be in place for the peak demand period in June/July. In 1976, the drought ended with significant rainfall and recharge in September and October. The blue zone shows that removal of the Temporary Ban and Drought Orders would have taken place in November when recharge was confirmed.

These three figures illustrate what would have happened in three actual years but each drought is different. There is a danger if the triggers and zones are too prescriptive that this will hamper the efficient management of a future drought. Triggers and zones can be modified in future plans if experience shows change is required.

To enable the Drought Management Team to ensure that supplies are maintained, the Company has developed outline drought management actions which will be used to ensure that demands will not exceed available supplies. These cover the four critical drought scenarios previously outlined in section 2 and are discussed in sections 3.5.1 to 3.5.3 below.

Supply availability has been determined using the source yields outlined in Section 1.4. It should be noted that these source yields are derived from operational experience during the last thirty years. This Drought Plan has to provide for more severe drought events and thus 'Outage' is applied to yields to provide for shutdowns and the impact of short term source pollution.

The drought management actions will be implemented in three phases depending on the severity of the drought.

Phase 1 Appeals for restraint and enhanced leakage control.

Phase 2 The imposition of a Temporary Ban which restricts domestic consumption. Application for a Drought Order which would allow restrictions on commercial demand and possible additional abstraction.

Phase 3 Imposition of the Drought Direction with restrictions on commercial demand. Additional abstraction as a result of the issuing of a Drought Permit.

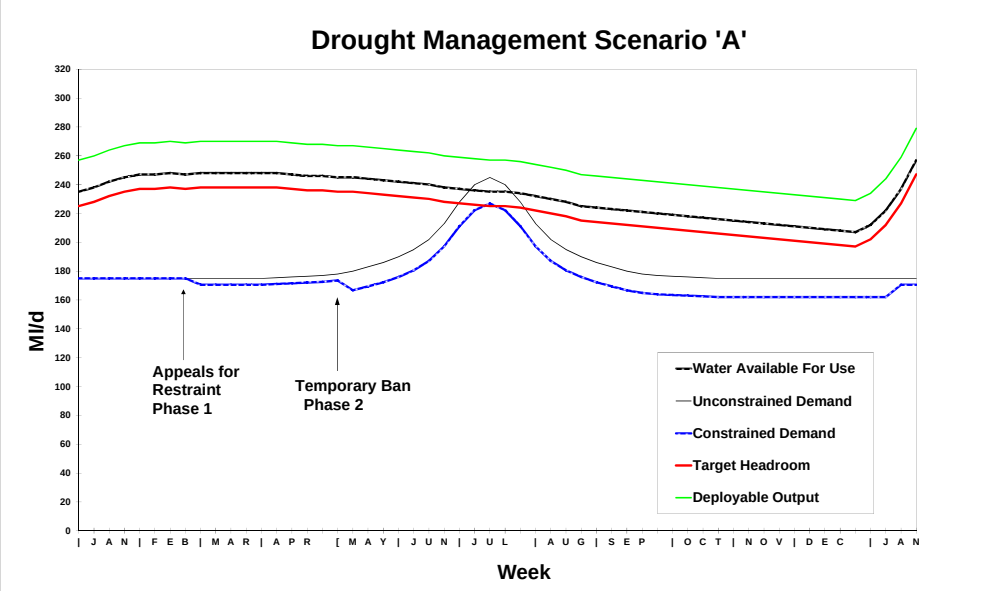
3.5.1 *Scenario "A" Indicative Drought Management Options*

Scenario "A" is based on 1973 with a dry autumn followed by limited winter recharge. In the spring of the second year, the Drought Plan trigger is crossed and the Company would make appeals for restraint. In reality it may be possible, by monitoring rainfall and groundwater levels, to implement the first action of the plan in January. The Drought Management Team would be working with the Environment Agency and neighbouring Water Companies.

Phase	Drought Measure	Timing
1	Appeals for restraint and enhanced leakage control	End February
2	Imposition of a Temporary Ban	End April
3	Application for a Drought Order and Permit but without the need to implement them (allowing time to review the necessary environmental data well in advance of application).	End March

The following figure shows one possible sequence of events and their impact on demand. It should be noted that these drought measures are implemented in the second year. Appeals for restraint and enforced leakage control would result in a 2.5% reduction on demand and bring "dry" year demand back towards minimum demand.

It should be noted that the profile above is indicative of a possible scenario. The range of measures employed would be based upon the extent of the projected deficit in supplies as compared to forecast demands, together with the level of effectiveness of each stage of measures. These would be determined by the Drought Management Team as the drought develops.



Notification of the possible need for a Temporary Ban would be made by the end of March with the aim of introducing restrictions by the end of April. Restrictions imposed in early summer would be expected to reduce demand by 5% allowing for the concessions that have now been made.

It can be seen from the indicative demand profile that these interventions initially flatten out any peaking effects. After the end of May, demand will rise with warmer weather and the impacts of additional personal washing. When the peak week occurs at the middle of July deployable output will be falling again. The profile shows a peak week demand of 227 Ml/d compared with an unconstrained demand of 245 Ml/d. Under Scenario 'A' some headroom is maintained in the summer between supply and demand.

Headroom is required to allow for the inaccuracies of the demand forecasts and uncertainties about the source yields. Loss of works due to pollution or mechanical failure is already allowed for in the Water Available for Use (WAFU) figure.

Under Scenario 'A' the trigger for Drought Orders is not crossed and Phase 3 of the demand restrictions is not required. Drought Permits are not required and so there is no increase in the amount of water available in the peak week.

When the peak week has passed, demand is expected to fall away rapidly. The final drought trigger is then used to determine when to remove the Temporary Ban. Under Scenario 'A' this would be around January as winter rainfall caused groundwater levels to rise rapidly.

Even under Scenario 'A' Portsmouth Water would continue to monitor rainfall and groundwater levels after the drought had ended.

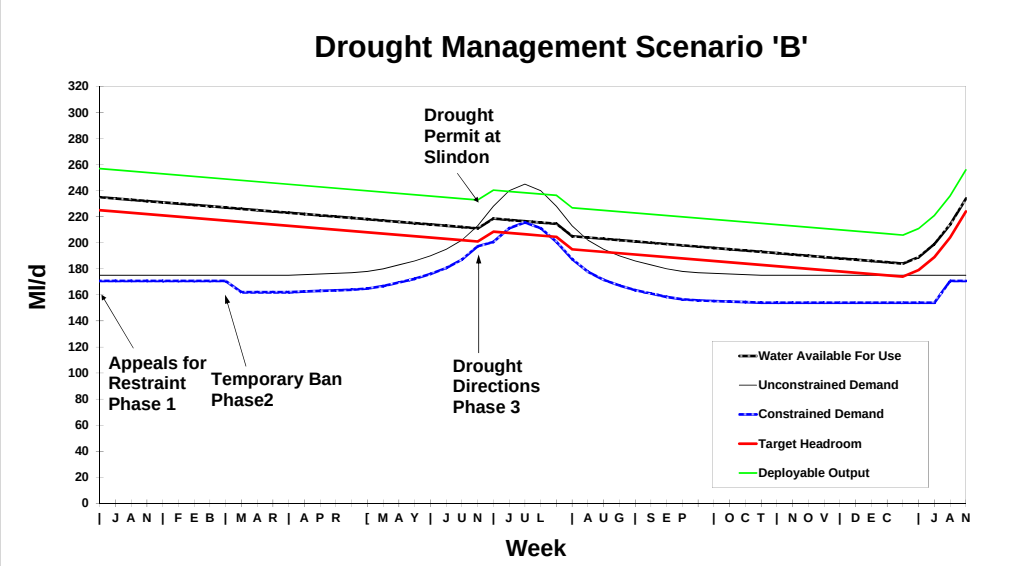
3.5.2 *Scenario "B" Indicative Drought Management Actions*

As outlined in Section 2.3, Scenario "B" assumes a dry winter following average conditions in the preceding summer. Scenario "B" anticipates insufficient rainfall to provide any recharge during the winter and this is followed by a dry summer and autumn through to December. It is anticipated that the Trigger Profile will be crossed in January and that groundwater levels remain below the trigger until the following spring.

Scenario "B" would require a similar time sequence of drought management actions to Scenario "A". There would be more time to prepare temporary bans and drought orders than for Scenario 'A'. The lack of winter recharge makes the need for restrictions more obvious.

Phase	Drought Measure	Timing
1	Appeals for restraint and enhanced leakage control	January
2	Imposition of a Temporary Ban and Application for a Drought Order (allowing time to review the necessary environmental data well in advance of application).	End February
3	Imposition of Drought Directions but not the Drought Permit	End June

The following illustrates the possible sequence of actions needed to balance supplies with demands. The period illustrated on the graph begins at the start of the year following a dry autumn and a dry winter.



It should be noted that the profile above is indicative and the actual drought management actions will be different for each actual event.

Notification of the need for a Temporary Ban would be made by the end of January with the aim of introducing restrictions by the end of February. Restrictions are expected to reduce demand by 5%.

With falling groundwater levels in the spring, an application would be made for a Drought Order with further restrictions on demand and the possibility of relaxed licence conditions at Slindon Source. It is unlikely that any of the other drought permit sites included in the previous plan would be feasible given the constraint of the Water Framework Directive.

Although included in this plan, and the Environment Agency's Draft South East Drought Plan, it is unlikely that the Drought Order would be signed before June. The Drought Management Scenario shows a hypothetical introduction of the Drought Directions at the end of June. This is assumed to give a further saving of 5% in demand. In this illustration supply just meets demand but with no allowance for headroom.

In addition to these actions, it would be prudent to consider the supply side options which might be available at relatively short notice such as:

- Lowering of borehole pumps
- Reducing the Bulk Supply to Southern Water

Should this case arise for these options or any other potential supply side options to be considered, the Company believes it would be sensible to consider the monitoring required other options well in advance of the event (Scenario C Drought for example) occurring to make the application process easier.

When the peak demand period is past, the Drought Permit at Slindon could be relaxed. The lowest groundwater levels would be reached in December with recovery starting in January or February. The Temporary Ban would remain in force in case the drought continued into a third year. The upper trigger would be used to help decide when to remove the remaining restrictions. This decision would be taken by the Drought Management Team but would also be influenced by the national situation and the actions of neighbouring companies.

As groundwater levels recovered and the Drought Permit for Slindon Source was relaxed, Swanbourne Lake would be allowed to refill naturally and the ecology of the area will recover gradually.

3.5.3 *Scenario "C" Indicative Drought Management Actions*

The most severe two year drought is outlined as Scenario 'C' where in the first year a dry summer is experienced, leading to below average groundwater levels in autumn. This is followed by a dry winter with no groundwater recharge and a subsequent dry summer in the second year.

Assuming the Drought Trigger Profile would be breached in the autumn, this would enable the Drought Management Team to put in place the actions needed to balance supplies with demand in the following summer.

Due to the serious nature of this Drought Scenario, no concession would be offered for micro irrigation. Impacts on the environment mean that as little water should be used on gardens as possible, even at night.

With a lower yield expected from sources than previously recorded due to lower groundwater levels, and in addition to the measures outlined in 3.4.1, it might be necessary to apply for a Drought Permit for Slindon. This would produce an additional 8.5 Ml/d of supply for a short time during the critical period.

In addition to the demand side drought actions, and a Drought Permit for Slindon it might be necessary to apply for further supply side options, such as:

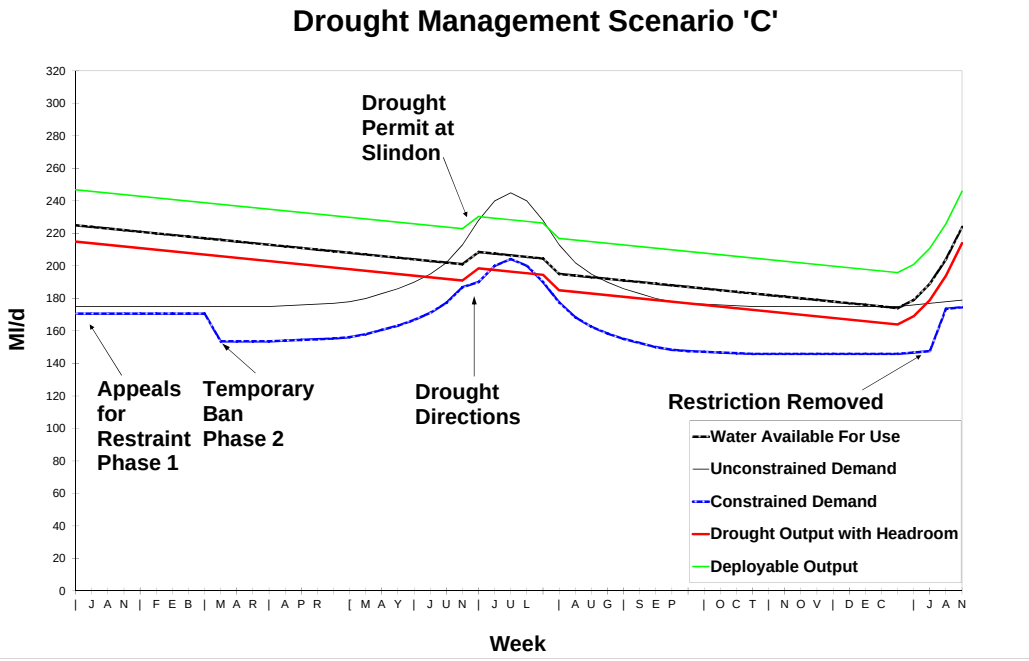
- Commissioning unused licences from private boreholes
- Increasing drought yields at existing sources

As with the previous Scenarios it would be for the Drought Management Team to make the appropriate decisions as the drought develops, including the use of other supply side actions in preference to or in combination with increased output from Slindon.

Phase	Drought Measure	Timing
1	Appeals for restraint and enhanced leakage control	January
2	Imposition of a Temporary Ban and application for a Drought Order (allowing time to review the necessary environmental data well in advance of application).	End February
3	Imposition of Drought Directions and a Drought Permit at Slindon	End June

The graph below shows the lower drought output predicted for the lower groundwater levels, albeit that such levels have not been experienced in the last seventy-five years.

The source yields at lowest groundwater levels are unknown. It is possible that the Environment Agency's groundwater model will allow these rainfall scenarios to be explored and for groundwater yields to be estimated. This will enhance the accuracy of future Drought Plans and may highlight other management options.



As demand falls in January, the output of Slindon would be reduced. It would be prudent not to remove the demand restrictions until groundwater levels rise above the upper Trigger Profile.

The Environment Agency groundwater model will help to predict what the source yields will be under such low rainfall conditions. The lowest historical rainfall period, 1921/22, did not produce the lowest recorded spring yields in Portsmouth Water's area of supply. This was probably due to the pattern of rainfall through the year; an important factor affecting groundwater recharge.

3.5.4 Scenario 'D' Indicative Drought Management Actions

As outlined in Section 2.5.3.1 the Environment Agency has asked water companies to consider very rare three year droughts. Scenario 'D' is based on Scenario 'A' but with the groundwater recession extended into a third year with very low rainfall.

Portsmouth Water would already have been working closely with the Environment Agency and other stakeholders, during the first two years of the drought. By the spring of the third year, the Drought Management Team would be publicising the prospects of a third dry summer. This would involve the extension of the existing temporary bans and the removal of some concessions.

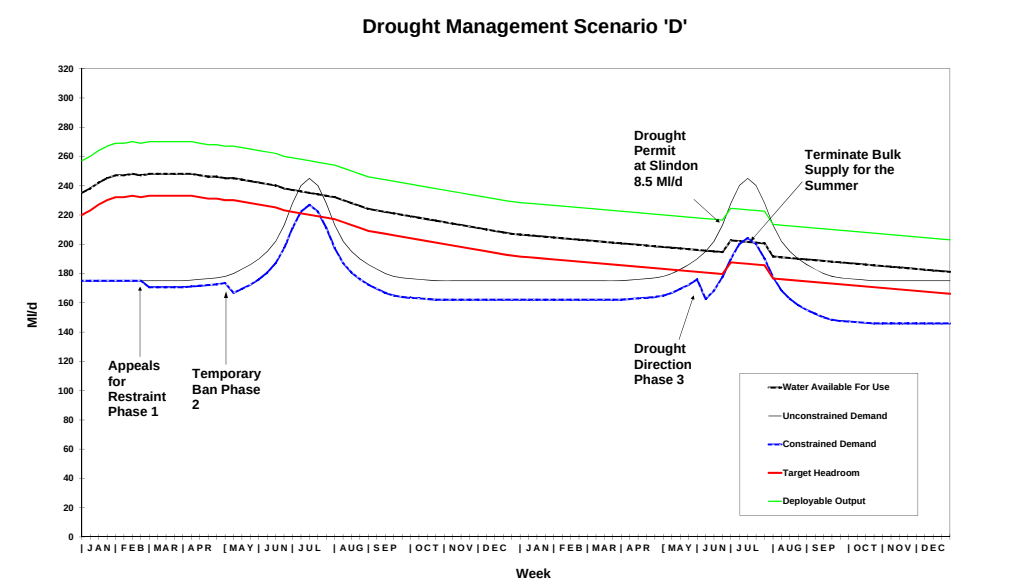
By the end of May, the danger of rising demand would require the introduction of the full Drought Directions. These would impact on commercial customers such as window cleaners, gardeners and vehicle washers (see Section 3.3.3.1). Portsmouth Water thinks that in the third year of a drought the response to a Drought Direction would be a 10% reduction in demand.

With lower groundwater levels than ever recorded before and lower yields, it might be necessary to apply for a Drought Permit for the Slindon source. This would produce an additional 8.5 Ml/d of supply for a short time during the critical period of June and July. The Slindon source will be the only source for which a drought permit will be required during a severe drought.

As with previous scenarios it would be for the Drought Management Team to make the appropriate decisions as the drought develops. The possible phasing of drought measures in a Scenario "D" drought is as follows:

Phase	Drought Measure	Timing
1	Appeals for restraint and enhanced leakage control	End February
2	Imposition of a Temporary Ban	End April
3	Application for a Drought Order and Permit but without the need to implement them (allowing time to review the necessary environmental data well in advance of application).	End March
4	Continuation of the Temporary Ban and imposition of Drought Directions	End May (Third Year)
5	Implementation of Drought Permit at Slindon	Mid June
6	Potential termination of the bulk supply to Southern Water	Mid June

The graph below shows the lower drought yields predicted for the exceptionally low groundwater levels. This scenario is assumed to have a return period of around 1 in 200 years. With no historical data to base the yields on this graph is highly uncertain. It only represents an indication of what the Company might do under the influence of a severe drought.



As demand falls the output of Slindon would be reduced but it would not be prudent to remove demand restrictions until groundwater levels rose above the upper trigger profile.

The Environment Agency groundwater model will help to predict what the source yields will be at the end of a three year drought. The results will be uncertain because there is not a direct link between rainfall levels and spring yields. The pattern of rainfall is as important as the annual averages for groundwater levels.

3.6 Application of Drought Management Actions

The sequence of Drought Actions will be determined by the Company's Drought Management Team, but will be largely dictated by the severity of the drought situation together with the particular drought scenario being followed.

It must be recognised that the critical period for the Company to maintain supplies because of its lack of raw water storage, will be the peak demand months of May to July. These will be the prime periods for Company actions and they may only be required for relatively short durations.

On a monthly basis, the Company will assess the impacts of the theoretical scenarios in the following seasons and apply them to current groundwater levels in order to determine the need for possible actions. In the event that the Trigger Profile is breached, or likely to be breached during the following season, the Company's Drought Management Team will be convened in order to determine the necessary actions to be taken.

The actions will also be very dependent upon the lead-in time needed for development of the options which can vary due to numerous constraints.

3.6.1 *Assessment of Drought Management Actions*

It is anticipated that the Company is expected to rely upon a high profile campaign with measures applied consecutively if there is a likelihood of demand exceeding available supplies.

The Company anticipates that the Drought Management Team will assess the impact of each of its actions before applying further measures in order to ensure that a 'Supply/Demand Balance' is maintained throughout the peak period. An indicative

smoothed demand curve is shown for each scenario with the impact of each measure notionally shown. Real fluctuations in demand will, however, be much more severe, but are not expected to exceed the smoothed demand curve shown.

When the Drought Management Team anticipates that the 'Supply/Demand Balance' is unlikely to be maintained by demand management actions, it is anticipated that a Drought Permit will be issued for the Slindon Works.
In the event that a Drought Permit is required by the Company to increase the source yield, then environmental data will be collected to support the Company's applications.

4. MINIMISING IMPACTS UPON THE ENVIRONMENT

By definition droughts are extreme events and regardless of abstraction they will inevitably have an effect on the environment. Plants and animals, as well as humans, have adapted to cope with very dry conditions occurring from time to time. Nature has a remarkable resilience which enables it to recover from even the most extreme events. When nature is unable to recover, it will adapt to the new conditions to which it is exposed.

The Environment Agency and Portsmouth Water have a responsibility under the Water Resources Act and the Habitats Directive to minimise the impact upon habitats and species. However, during a 'natural' drought it may not be possible to protect every wetland or section of river from the impacts of low groundwater levels and low flows. Priorities must be established and possible monitoring and mitigation discussed with the Environment Agency, Natural England and other conservation bodies.

The various Habitats Directive sites relating to the Company's activities are shown in Section 1.

4.1 Monitoring Drought Impacts

In the autumn of 1973, groundwater levels fell to an all time low. There was little winter recharge and the aquifer stayed below the normal level for over eighteen months. Under these conditions, chalk streams and wetlands would have dried out and plants and animals were put under stress for a considerable period of time. Portsmouth Water does not have any environmental impact assessments from this period and have not seen any published data. Whilst groundwater modelling can predict the impact upon groundwater levels and river flows for such conditions, it is probably not accurate enough to identify environmental impacts which may have occurred during such droughts. It is therefore difficult to quantify the possible environmental impact of drought conditions in Portsmouth Water's area.

Portsmouth Water has recently started a major investigation into the impact of abstraction on river flows. This is part of the Water Framework Directive (WFD) and will provide valuable flow and ecological data. When relationships have been developed for this work they can also be used to look at drought impacts.

Further work to update the East Hants and Chichester Chalk (EHCC) Groundwater Model will allow drought scenarios to be modelled. This is particularly important for Scenarios “C” and “D” which are more severe droughts that have been experienced in recent history.

Recent licence variations are designed to protect flows into the harbours which are designated under the Habitats Regulations. Minimum Residual Flow (MRF) conditions and data collected for compliance will be useful for monitoring impacts. Portsmouth Water has responded to these licence variations ensuring that all other options are exhausted before drought permits are considered at these sites.

Climate change may increase the natural impact of droughts and it will also be necessary for the Environment Agency to monitor these effects. The potential effect of climate change is built into the Supply/Demand Balance in Water Resources Plans but the impact is not included in the short term Drought Plan.

It may not be possible or politically acceptable to always protect the environment during extreme drought events. A balanced view will need to be taken which includes the statutory duty to supply water for public health.

4.2 Environmental Monitoring to Support Drought Order/Permit Applications

To date, Portsmouth Water has not required Drought Orders or Permits. As a result, the Company has little experience in conducting the relevant environmental monitoring. It is likely that the Environment Agency will assist the Company in providing advice and sharing any relevant monitoring data with the Company, with the overall responsibility being on the Company to provide the adequate baseline monitoring information as outlined in section 7.2.1 of the EA's Drought Plan guidance. This, along with collaborative work with Natural England, would be beneficial to the Company when applying for Drought Orders and Permits.

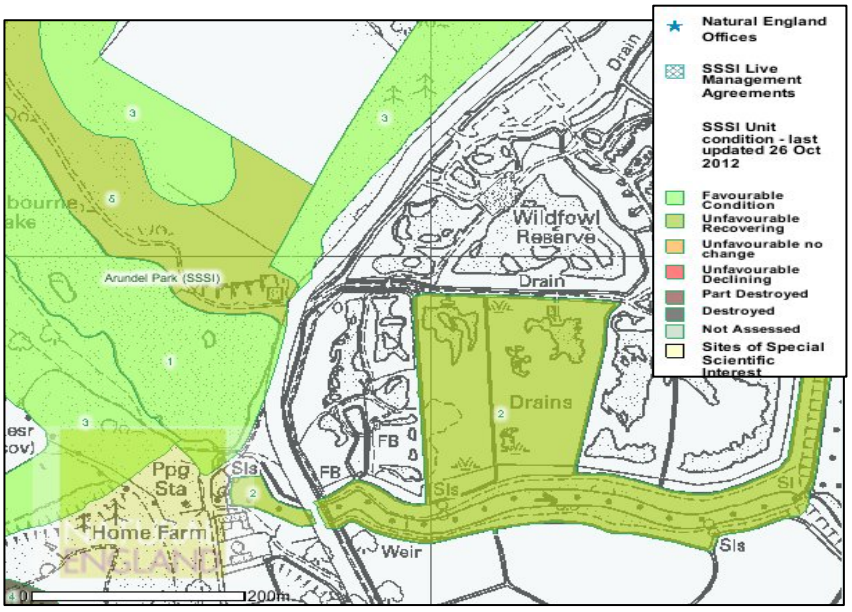
The Company anticipates that it will develop the requirements for such monitoring by dialogue with the Environment Agency, Natural England and Southern Water. At this point in time it anticipates the following:

4.2.1 *Slindon Source*

A Drought Permit for the Slindon Source would be principally to increase the output from its current 2.5 Ml/d licence up to 11 Ml/d. When the second borehole at Slindon was developed in 1990, the site was test pumped and sustained a long term yield of 11 Ml/d. The source was licensed at this figure in 1991, although it was subsequently reduced to 2.5 Ml/d due to its assumed impact on Swanbourne Lake, Arundel.

The Lake is an artificial feature and relies on groundwater flows to maintain its level. In an extreme drought, even with the dredging carried out in 2002, the lake is expected to dry out. Prior to dredging, Swanbourne Lake the Environment Agency set up a network of groundwater monitoring boreholes. Flow gauging was also carried out on the Black Rabbit Stream, Mill Stream and Park Bottom Stream. Environmental studies were carried out by the Environment Agency in 1995 and again in 2005.

Prior to completion of the dredging, Natural England classified the lake as 'unfavourable recovering'. The adjoining Mill Stream and Wetland and Wildlife Centre were classified as 'unfavourable declining'. The condition of the sites was last updated by Natural England in October 2008 and the lake is now classified as "favourable" and the Mill Stream as "unfavourable recovering". The condition assessment for the lake now states that it is not a qualifying feature of the SSSI. Favourable condition is linked to the fact that the lake did not dry out in 2008. Unfortunately that year had close to the Long Term Average rainfall and therefore did not represent dry or drought conditions (See map taken from nature on the map, Natural England).

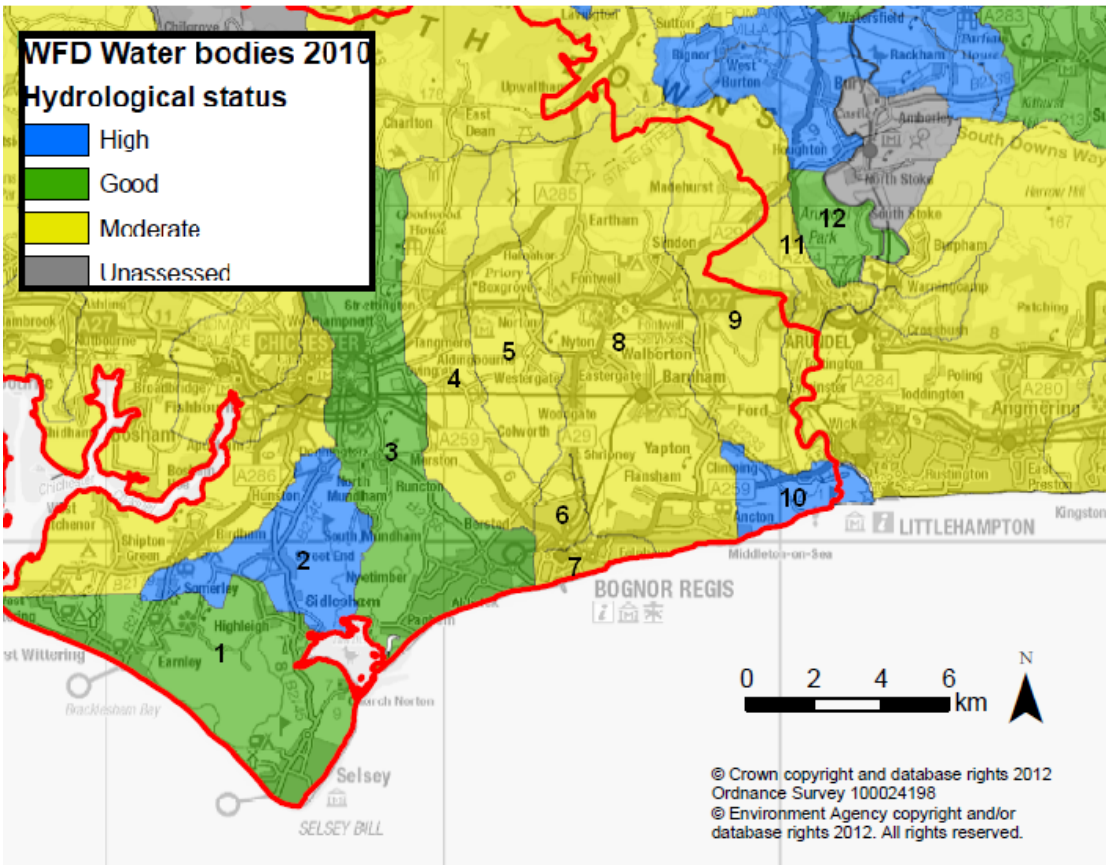


The Environment Agency (EHCC) Groundwater Model is being updated with the latest monitoring data and will then be used to predict the impact of additional abstraction at Slindon on water bodies.

It should be noted that Southern Water's Madehurst source is also perceived to have an impact on Swanbourne Lake. Portsmouth Water has proposed joint studies with Southern Water to identify the Environmental Issues surrounding the water body. These studies are likely to include:

- Groundwater & Surface Hydrology
- Water Quality
- Biological Receptors
- Designated Habitats

The modelling and, ecological work will determine if; when Swanbourne Lake is dry abstraction has no further impact on the qualifying features. Appendix B and C of the Company's Drought Plan clearly states the environmental issues related to the Slindon source and the existing monitoring taking place and other monitoring options. Co-operation with Southern is needed on this. Although according to the Environment Agency's South East Drought Plan of July 2011, the Appendix H (Drought permits and orders section) states that a drought permit for the Eastergate group licence will only be required in a severe drought when Swanbourne Lake is already likely to be empty and thus irrespective of any water path between the lake and the aquifer, therefore there is not expected to be any effect on the water environment. However, the concerns are on the potential delay in recovery of Swanbourne Lake, the monitoring set out in Appendix C will help to determine these requirements.



Number	Water Body
1	Easton Rife
2	Bremere Rife
3	Pagham Rife
4	Elbridge Rife
5	Upper Aldingbourne Rife
6	Middle Aldingbourne Rife
7	Lower Aldingbourne Rife
8	Lidsey Rife
9	Binstead Rife
10	Ryebank Rife
11	Park Bottom Stream
12	Black Rabbit Stream

The map (Environment Agency, 2012) and table above identify the water bodies (including those out of the Company area, indicated by a red boundary line) which could potentially be affected by a drought permit at Eastergate. The status of these bodies is varying with most being in moderate condition. The likelihood of the implementation of the drought permit is minimal. On the information available to Portsmouth Water, a drought permit at Slindon is unlikely to cause deterioration in status of these water bodies. Portsmouth Water are committed to working with Southern Water with regards to potential impacts caused by this drought permit and will produce a high level plan to include the mitigation measures needed to prevent any potential environmental damage. Portsmouth Water has made a commitment to review and update it's Drought Plan as necessary once the collaborative work with Southern is complete.

4.2.2 *Assessment of environmental impacts*

Portsmouth Water's area of supply includes a significant number of protected sites. The Company took into account the potential impact on drought management options when choosing which of the potential drought management options would be implemented. This information is based on evidence collected through numerous environmental studies carried out on designated sites.

Portsmouth Water has undertaken analysis to demonstrate that even in the most severe drought scenario, the Company only requires a single drought permit to maintain their supplies to customers. The Eastergate group licence was chosen as it has the least likely impact upon the environment and is the only drought permit proposed.

As the proposed drought management options do not impact designated sites, a HRA is not required. An SEA is also not required as the plan is operational and sets out potential temporary options to manage a drought. The Company has not carried out any further detailed studies of all the potential drought permit options as they will not be required to manage a drought.

A screening exercise was undertaken by the Company to comply with Habitats Directive to inform the selection of drought management options and showed the Slindon sources as least likely to cause environmental impacts; this is mentioned in section 3.4.6 and the screening table can be found in Appendix J.

The potential impacts of drought permits on the environment can vary throughout the year. The critical period for the environment tends to be the autumn during the lowest groundwater levels. This has been considered when developing drought management options. Environmental monitoring information will be found in Appendix C.

5. PROPOSED DROUGHT ACTIONS AND DROUGHT COMMUNICATION STRATEGY

Communication will play a key part in any Drought Management Actions and will involve the Company, customers and the Regulators. It will not be possible, or even desirable, to work to a fixed communication strategy since the plan will need to be tailored to the circumstances of that particular drought situation.

It is anticipated that if drought monitoring outlined in Section 3.5 is likely to be projecting the possibility of a future breach of a Drought Trigger, surrounding companies might also be in a similar situation and that co-ordinated activity by both companies and the Environment Agency will be needed. In addition, the Company anticipates developing stronger links with the Consumer Council for Water, Local Authorities and other public organisations in order to maximise the impact of its drought management actions.

The communication strategy includes liaising with other water companies to develop a coordinated set of actions, including actions on temporary bans. It is important to measure the effectiveness of the communication strategy, however this will depend on what the communication plan is as the exact details are only determined during a drought. Nonetheless, the success of the communication strategy will need to be monitored to ensure it is effective.

5.1 Drought Co-ordination with Natural England, the Environment Agency and Water Companies

After the initial convening of the Drought Management Team, the Company's communications representative will make contact with Natural England and the Environment Agency, Local Authorities such as West Sussex County Council (WSCC) and the surrounding water companies, in order to develop a co-ordinated communications strategy.

Key to the success of the communications strategy will be regular interaction with Water Resources in the South East communications group to coordinate messages and to discuss the potential implementation of restrictions

The Company anticipates that there will be an element of Company-specific publicity/media coverage as well as that which will be promoted in a collaborative campaign with the water companies and the Environment Agency.

5.1.1 *Regional Drought Data*

The Company receives monthly data from the Environment Agency relating to rainfall, river flows and groundwater levels. The Company anticipates that this information will continue to be supplied during a drought and that a Regional Situation Report will also be produced on a monthly basis.

The Company will contribute its Havant rainfall and Idsworth Well data at the request of the Agency and/or other water companies.

5.1.2 *Regional Drought Co-ordination*

The Company anticipates that it will become involved with the Environment Agency's Regional Drought Co-ordination Group and that a member of the Drought Management Team will act as the Company's representative.

The Company will share its data and proposed actions within that Group and, where possible, share resources.

Actions and data shared will cover all aspects of drought communication, including a decision on when the drought is over, including liaison with the EA to make this decision.

In order to decide on what lessons have been learnt from the drought, a post drought review will be undertaken when the drought is over to determine how a drought will be managed in the future and what changes can be made to future drought plans as a result of this review.

5.1.3 *Regional Drought Communications*

Given the importance of communications, the Company anticipates that a member of the Drought Management Team will also be nominated as the Company's representative to join the Environment Agency's Regional Communications Group.

5.2 Key Public Messages

The messages used and the method of delivery will be dependent upon the severity of the developing situation as well as the resources available to the Company to deliver its messages. Where there are joint opportunities to deliver messages then the Company will maximise their use.

Throughout the campaign the Company would develop information messages setting out:

- The key reasons for the poor water resource situation
- The actions taken by the company to date
- The concessions available
- The potential for future actions if the situation worsens
- The contact point for further advice
- The actions customers can undertake to help

Regular briefings will be made available to the media, stakeholders and customers by use of the Company website.

5.2.1 *Promotion of Water Efficiency*

As a potential drought situation developed with low rainfall, falling groundwater and spring yields, Portsmouth Water anticipates extra promotion of the water efficiency message.

Delivery of the message might be through:

- Regular Press Releases to Local Press and Radio
- Regular Stakeholder Briefing Sheets to the:
    - Environment Agency
    - Natural England
    - Local Authorities
    - Consumer Council for Water
    - Members of Parliament
    - Trade Associations
    - OFWAT
- Website messages
- Social media tools
- E-mail postscripts
- Van-side messages
- Briefing Notes for Customer Services and Distribution staff

5.2.2 *Appeals for Voluntary Restraint*

As a follow on from water efficiency promotion, stronger appeals for water conservation would be encouraged. As with the promotion of water efficiency measures, a similar delivery vehicle would be used:

- Regular Press Releases to Local Press and Radio
- Regular Stakeholder Briefing Sheets to the Environment Agency/Local Authority/Consumer Council for Water/Members of Parliament/Trade Associations
- Website messages
- E-mail postscripts
- Van-side messages
- Briefing Notes for Customer Services and Distribution staff

In addition, the Company might seek to place posters in public buildings, doctors' surgeries, etc.

5.2.3 *Enhanced Leakage Control*

In the event that enhanced leakage control would be needed, the Company anticipates that it will ask customers to aid its efforts to reduce leakage levels by promptly reporting leaks. The same methods of delivery message as those above are likely. Where pressure reduction is deemed necessary, the Company would again use similar delivery messages to those outlined above for advising customers that network pressure reductions are to be implemented. The Company anticipates that such measures will be published prior to their implementation.

5.2.4 *Temporary Ban*

When a temporary ban is thought to be required, the Company will follow the statutory notice requirements. Portsmouth Water will also use the Code of Practice and Guidance on Water Use Restrictions published by the Water Industry. The initial notice is likely to be given in April for a Scenario “A” Drought and in February for a Scenario “B” and “C” Drought. Portsmouth Water has allowed four weeks for “representations”. However the consultation on the draft Drought Plan has already provided an opportunity for interested parties to make representations on the proposed restrictions. Any representations received by the Company at the time of implementation of the temporary bans will be duly considered by the Company.

It is anticipated that in the initial period following the publication it might be necessary to extend the opening hours of its Customer Service telephone lines to deal with customer enquiries. Detailed briefings for staff would be prepared outlining the details of the application of the ban.

The legislation requires the notice to be published in at least two newspapers circulating in the area and on the Company website. In addition Portsmouth Water would issue a Press Release and use local radio, television and newspapers to explain the need for the ban and the details of its implementation.

Representations to the temporary ban are outlined in section 3.3.2, to reiterate, any representations made on temporary restrictions will be recorded and the exact method of response will depend on the number and nature of representations that are made.

5.2.5 Drought Directions

Under the new legislation most restrictions on commercial water use are covered by the Drought Direction 2011. The Company would still require an application to the Secretary of State for a Drought Order and it is possible that a public inquiry might be

required in advance of its granting. In the event that there is likelihood that the other measures are unlikely to enable the Company to balance demands with the available supplies, the Company would advertise its intention to apply for such a Drought Order in the local press. In addition, it will utilise:

- Press Releases to Local Press, Radio and TV
- Stakeholder Briefing Sheets
- Website Messages

Following the granting of the Order, the Company would then implement designated actions principally by Public Notice and Press Release. Where there are selected commercial users which are likely to be affected, the Company would communicate with these organisations and/or their trade associations directly.

5.2.6 Compensation

Water companies normally have a duty to provide a constant supply of water that is sufficient for domestic purposes. However, if there is (or if there is a danger of) a serious supply shortage because of exceptionally low rainfall, then a drought order may be sanctioned by the Secretary of State for Environment, Food and Rural Affairs. A drought order can change a water company's water supply obligations including quantity pressure and the means of supply.

There is no statutory requirement for any customers of water companies to be compensated when water use restrictions are in force through drought orders. Therefore, commercial users who are dependent on mains water supplies for their business operations should consider taking steps to protect themselves from the effects of water use restrictions which are imposed under drought measures. It may be that a number of businesses need to consider pooling resources and if possible accessing alternative supplies from, say, an area outside that affected by drought.
The Company does not envisage the need to make compensation payments as a result of the implementation of any drought measure. The imposition of restrictions is likely to be the result of a natural event outside the Company's control.

5.3 Supply Side Enhancements

Supply side options, such as commissioning unused sources, could be pursued on a 'twin track' basis. They could only be introduced with the co-operation of the Environment Agency and would require a Drought Permit to licence temporary abstraction.

The Company anticipates that communication with environmental groups and other licence holders would be undertaken in advance of the Company's formal application for a Drought Order or Permit.

5.3.1 *Interactions of Water Supplies*

The Company notes that due to improved connectivity between various sources, the Company now has a single water resource zone rather than the three the previous Plan was based on. This improvement provides greater operational flexibility increasing the ability of the Company to maintain supply in the event of a loss of a supply site. The amount of detail relating to individual sources that is placed in the public domain is restricted on grounds of national security.

5.4 Emergency Plan

Portsmouth Water's Emergency Plan is principally designed to handle short-term extreme events. Detailed planning to maintain water supplies in an emergency and actions are detailed in the Emergency Plans which due to national security reasons cannot be in the public domain but are easily accessible to the Company should such an issue arise. The key principles incorporated in the Emergency Plan would be utilised for managing the most severe actions outlined in this Drought Plan. The guidance for preparing the Drought Plan states that the drought management actions should include "Emergency Drought Orders". For Portsmouth Water, Emergency Drought Orders are only likely to be required for the most extreme events (greater than 1 in 200 year return period). They are most likely to be used as part of an emergency plan when a drought is combined with a pollution incident of the loss of a large works.

During an emergency it may be necessary to override any environmental constraints on abstraction licences. These could be "Minimum Residual Flows" (MRF) in rivers or restrictions on the volume of water pumped over a given time period.

APPENDIX A

RAINFALL DATA

APPENDIX A

Rainfall Data
1981-210

Long Term Average Rainfall

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	%LTA
1981	40.2	40.5	147	39.4	78	24.9	16.3	18.4	156.7	102.2	37.5	93.3	794.4	105.34%
1982	33.3	38.5	79.7	19.5	43.9	69.7	18.1	54.5	53.1	133.1	102.6	91.4	737.4	97.78%
1983	71.7	28.9	44.4	85.3	75.9	37.3	49.1	25.7	62.1	44.4	44.5	82.7	652	86.46%
1984	119.3	30.2	77.6	0.9	75.9	13	96.4	21	57.4	94.8	110.2	98.1	794.8	105.39%
1985	62.7	34.9	60	33.3	35.8	69.2	48.9	110.8	24.9	20.9	49.4	73.9	624.7	82.84%
1986	141.4	6	77.2	59.3	69.6	25.1	33.6	107.8	28.7	93.8	117	109.2	868.7	115.19%
1987	5.9	41.2	87.8	61	28.4	60.5	52.6	36.8	31.8	213.1	76.6	35.1	730.8	96.91%
1988	158.4	44.2	77.3	51.2	26.3	20.7	71.2	45.7	42.2	82.3	24.6	20.2	664.3	88.09%
1989	33.7	76.9	54.7	56.5	4.7	23.3	12.8	19.3	31.5	89.4	41.3	152.4	596.5	79.10%
1990	97.4	141.1	3.6	40.5	8.1	60.7	12.4	22.8	35.3	114.4	44.7	54.2	635.2	84.23%
1991	89.8	32.9	77.2	43.1	5.8	125.3	110.3	24.5	47	51.5	54.2	20.6	682.2	90.46%
1992	13.4	33.3	49.8	87.2	15.1	18.9	103.1	79.5	56.7	65	134.7	70.7	727.4	96.45%
1993	89.3	4.5	35.6	78.5	35.3	51.3	74	29.7	131.7	161.1	54.3	182.5	927.8	123.03%
1994	105.7	69.9	50	82.8	81.9	30.1	12.5	39.8	90.1	101.1	79.4	112.2	855.5	113.44%
1995	148.1	101.3	46.8	13.9	15.4	10.7	34	5.3	149.8	33.6	52.9	72.03	683.83	90.68%
1996	71.4	76.1	38.65	35.2	52.5	15.2	28.5	51.7	25.6	56	146.7	22.4	619.95	82.21%
1997	15.8	99.7	17.5	10.9	39.7	94.1	43.15	95.26	7.6	92.1	156.5	93.5	765.81	101.55%
1998	107.9	6.2	60.9	84.9	22.1	89.2	60.3	12.9	83.7	126.7	0	113.2	768	101.84%
1999	98	32.6	36.1	41.7	18.2	67.6	1.5	93.3	151.5	77.3	29.8	146	793.6	105.23%
2000	22.9	63.5	18.8	112.2	99.2	34.9	37.3	48.7	185.8	212	195.7	144.1	1175.1	155.82%
2001	102.1	72.3	144.5	53.8	22.7	10	52	74.8	73.4	168.4	24.8	28	826.8	109.63%
2002	72.7	105	43.7	30.9	74.8	44.3	60.9	36.1	45.1	76.7	195.3	127.1	912.6	121.01%
2003	85.9	31.8	25.1	34.4	35.6	34.5	60.6	19.9	4.7	63.8	144.2	99.1	639.6	84.81%
2004	87.6	18.9	39.9	69.3	37.5	27.7	36.9	128.9	29.9	117.5	34	70.2	698.3	92.60%
2005	42.6	12.9	51.5	62.1	25	49.1	70.8	86.4	58.3	137.4	59.4	66.9	722.4	95.79%
2006	19.80	43.00	69.00	33.40	72.10	8.00	17.20	37.20	74.10	119.60	79.20	96.40	669	88.71%
2007	52.10	118.40	47.80	0.60	83.50	110.20	88.20	45.80	24.20	32.40	95.80	54.00	753.00	99.85%
2008	81.60	21.20	64.50	75.00	69.90	23.80	56.40	65.60	74.60	54.40	90.50	31.50	709.00	94.01%
2009	84.60	58.40	35.80	47.60	34.60	18.40	70.10	16.90	34.10	69.40	220.40	116.00	806.30	106.92%
2010	99.4	105	57.6	24.2	9.8	30.4	19	126.8	58	108	109.8	41.2	789.20	104.65%
30 Year LTA:	75.16	52.98	57.34	48.95	43.24	43.27	48.27	52.73	64.32	97.08	86.87	83.94	754.14	30 Year LT

Drought Years

1920	91.18	13.72	49.78	59.44	28.45	52.32	123.19	28.96	54.10	98.04	40.64	61.47	701.29	92.99%
1921	90.93	5.59	26.92	24.89	34.54	4.06	11.94	47.75	17.78	13.72	56.64	41.91	376.67	49.95%
1933	52.07	83.31	71.62	31.24	61.21	46.22	40.89	17.27	74.93	44.70	15.49	17.27	556.22	73.76%
1934	48.76	0.76	61.97	42.16	22.60	32.25	25.65	59.69	50.54	40.38	75.94	207.77	668.47	88.64%
1972	91.00	83.30	52.70	58.90	57.50	25.90	24.60	14.20	21.80	19.90	96.60	102.00	648.40	85.98%
1973	35.70	23.10	17.90	44.30	67.00	43.10	32.80	28.70	66.50	46.20	27.30	52.10	484.70	64.27%
1975	107.00	23.50	100.60	61.50	41.70	2.50	17.75	73.60	157.90	28.70	64.40	31.80	710.95	94.27%
1976	18.6	34.2	18.9	5.9	19.8	12.4	16.7	4.4	146.8	177.6	143.5	93.3	692.10	91.77%
1989	33.7	76.9	54.7	56.5	4.7	23.3	12.8	19.3	31.5	89.4	41.3	152.4	596.50	79.10%
1990	97.4	141.1	3.6	40.5	8.1	60.7	12.4	22.8	35.3	114.4	44.7	54.2	635.20	84.23%

APPENDIX B

DEMAND AND SUPPLY SIDE DROUGHT MANAGEMENT ACTIONS

Appendix B – Demand-side drought management actions

1.	**Option Name PHASE ONE**	Appeals for Restraint and Enhanced Leakage Control
	Trigger(s) (or preceding actions)	Groundwater Level
	Demand Saving Ml/day unless stated otherwise	4.3 Ml/d
	Demand Saving Percentage reduction on peak week demand	2.5%
	Location Area affected or whole supply zone	Whole Company Area
	Implementation timetable Preparation time, time of year effective, duration	One week/spring/six months
	Permissions required and constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	Liaison with CCWater and the EA
	Risks associated with option	Depends on Customer behaviour. Co-operation with other Water Companies required. Negative press coverage can reduce savings. Need to plan enhanced leakage reductions.

Appendix B – Demand-side drought management actions

2.	**Option Name PHASE TWO**	Temporary Ban
	Trigger(s) (or preceding actions)	Following consultation on Temporary Ban
	Demand Saving Ml/day unless stated otherwise	8.7 Ml/d
	Demand Saving Percentage reduction on peak week demand	5%
	Location Area affected or whole supply zone	Whole Company Area
	Implementation timetable Preparation time, time of year effective, duration	Minimum of 8 weeks after Appeal for Restraint
	Permissions required and constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	Temporary Ban CCWater EA
	Risks associated with option	Consultation and appeals process untried. Large number of responses. Legal challenges

Appendix B – Demand-side drought management actions

3.	**Option Name** **PHASE THREE**	Drought Order
	Trigger(s) (or preceding actions)	Follows Temporary Ban Headroom breached
	Demand Saving Ml/day unless stated otherwise	8.7 Ml/d
	Demand Saving Percentage reduction on peak week demand	5%
	Location Area affected or whole supply zone	Whole Company Area
	Implementation timetable Preparation time, time of year effective, duration	Minimum of 12 Weeks from Temporary Ban
	Permissions required and constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	Temporary Ban, CCWater, EA
	Risks associated with option	Objections from commercial water users. Calls for compensation.

Appendix B – Supply-side drought management actions

Option Implementation Assessment	**Option Name**	**DROUGHT PERMITS**
	Trigger(s) (or preceding actions)	Follows Temporary Ban Headroom breached
	Deployable Output of action Ml/day unless stated otherwise	8.5Ml/d
	Location Area affected of whole supply zone	Slindon Works (Others considered but Slindon will be the only one to be implemented if necessary)
	Implementation timetable Preparation time, time of year effective, duration	12 Weeks
	Permissions required and constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	Drought Order EA/DEFRA Liaison with Natural England on SSSI
	Risks associated with option	Source currently running at 2.5 Ml/d Water Quality
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or Unknown)	Low
	Summary of likely environmental impacts Include details for features of moderate and major sensitivity and minor sensitivity features from designated sites	Swanbourne Lake would likely be dry before drought permit is implemented and thus irrespective of any water path between the lake and the aquifer, so low impacts are expected.
	Baseline information used	Environment Agency Modelling Data
	Summary of additional baseline monitoring requirements	Due to possible delay in recovery, monitoring of weekly groundwater levels and the ecology of Swanbourne lake at numerous locations in conjunction with Southern Water. Monitoring to begin when permit applied for, during drought and two months after the drought to determine natural drought impacts and those caused by the drought actions. Portsmouth Water are committed to work with Southern Water on this matter.
	Mitigation measures	Compensation water to SSSI (Arundel WTW pumped into SSSI)
	Impacts on Other Activities e.g. fisheries, industry etc	Wetland and Wildlife Trust

Option Implementation Assessment	**Option Name**	**LOWERING OF EXISTING PUMPS**
	Trigger(s) (or preceding actions)	Twin-track with Drought Order
	Deployable Output of action Ml/day unless stated otherwise	Maintaining existing yield
	Location Area affected of whole supply zone	Whole Company area
	Implementation timetable Preparation time, time of year effective, duration	12 weeks, summer, one year
	Permissions required and constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	None
	Risks associated with option	Depends on borehole depth and groundwater level
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or Unknown)	Low
	Summary of likely environmental impacts Include details for features of moderate and major sensitivity and minor sensitivity features from designated sites	Reduced groundwater level
	Baseline information used	None
	Summary of additional baseline monitoring requirements	None
	Mitigation measures	None
	Impacts on Other Activities e.g. fisheries, industry etc	Need to plan the outage required to lower the pumps

Option Implementation Assessment	**Option Name**	**RECOMMISSION UNUSED COMMERCIAL BOREHOLES**
	Trigger(s) (or preceding actions)	Twin track with demand management
	Deployable Output of action Ml/day unless stated otherwise	113.7 m3/day
	Location Area affected of whole supply zone	Southwick Estates (Southwick). (EA contacted and no other boreholes available all have been backfilled for future developments.)
	Implementation timetable Preparation time, time of year effective, duration	3 months/Summer/6months
	Permissions required and constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	Drought Permit
	Risks associated with option	Water Quality
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or Unknown)	Low
	Summary of likely environmental impacts Include details for features of moderate and major sensitivity and minor sensitivity features from designated sites	Lower groundwater levels
	Baseline information used	None
	Summary of additional baseline monitoring requirements	Groundwater levels and river flows
	Mitigation measures	Limited period of abstraction
	Impacts on Other Activities e.g. fisheries, industry etc	Derogation of other abstraction

Option Implementation Assessment	**Option Name**	**MAINTAIN DEPOLYABLE OUTPUT**
	Trigger(s) (or preceding actions)	Twin-track with demand management
	Deployable Output of action Ml/day unless stated otherwise	Up to 22Ml/d
	Location Area affected of whole supply zone	Worlds End (Two boreholes)
	Implementation timetable Preparation time, time of year effective, duration	3 months/Summer/6 months
	Permissions required and constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	None – existing licensed capacity
	Risks associated with option	Water Quality Yield from new boreholes
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or Unknown)	Low
	Summary of likely environmental impacts Include details for features of moderate and major sensitivity and minor sensitivity features from designated sites	Reduced groundwater levels
	Baseline information used	PIM/WFD Investigations
	Summary of additional baseline monitoring requirements	None
	Mitigation measures	None
	Impacts on Other Activities e.g. fisheries, industry etc	None

Option Implementation Assessment	**Option Name**	**RECOMMISSION UNUSED PORTSMOUTH WATER BOREHOLES**
	Trigger(s) (or preceding actions)	Temporary Ban
	Deployable Output of action Ml/day unless stated otherwise	Unknown – Requires further work and water quality assessments. The EA's East Hampshire and Chichester Chalk Block model may give an estimate.
	Location Area affected of whole supply zone	Northbrook, Soberton, West Street, Maindell, Funtington, Slindon, West Meon.
	Implementation timetable Preparation time, time of year effective, duration	3 months/Summer/6months
	Permissions required and constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	Drought Permit
	Risks associated with option	Water Quality
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or Unknown)	Low
	Summary of likely environmental impacts Include details for features of moderate and major sensitivity and minor sensitivity features from designated sites	Lower groundwater levels
	Baseline information used	None
	Summary of additional baseline monitoring requirements	Groundwater levels and river flows
	Mitigation measures	Limited period of abstraction
	Impacts on Other Activities e.g. fisheries, industry etc	Derogation of other abstraction

APPENDIX C

ENVIRONMENTAL MONITORING REQUIRED FOR DROUGHT PERMIT

Drought Permit: Eastergate Group (Slindon Source)

Key Environmental Issues	Existing Monitoring / Surveys	Monitoring options
Groundwater and Surface hydrology		
<u>Groundwater</u> The boreholes at Madehurst abstract water from the Chichester Chalk block aquifer which generally has low specific yields and high transmissivity. DO/DP conditions may result in short-term derogation of other springs and boreholes in the Chichester Chalk block aquifer. Previous studies have also indicated a link between pumping at Madehurst and Swanbourne Lake levels. It should be noted that a separate DO/DP could potentially be pursued by Portsmouth Water at Slindon Borehole, which also abstracts from the Chichester Chalk aquifer and is also thought to affect Swanbourne Lake levels. The potential event of both DO/DPs operating at the same time will need to be considered in terms of combined effects on groundwater, surface flows and standing water levels when analysing data. The proposed monitoring regime has been chosen to capture these.	• Ongoing level monitoring in public water supply boreholes: o Madehurst (SW) o Eastergate (PW) o Westergate (PW) o Slindon (PW) o Aldingbourne (PW) o Arundel (SW) • Private groundwater abstractions are also obliged to monitor levels and return data to the Environment Agency • Ongoing level monitoring in Observation boreholes, including: o Madehurst Stammers o Madehurst Punchbowl o Madehurst Lower Farm o Slindon Courthill o Swanbourne Copyhold o Tortington Test	Monitoring will continue before and during the DO/DP. The regime chosen may be influenced by any mitigation methods proposed (e.g. lake augmentation). • Continue to monitor groundwater levels in public water supply boreholes: Portsmouth Water's Eastergate, Westergate, Slindon and Aldingbourne boreholes and the Southern Water Arundel and Madehurst boreholes. • Also obtain an up-to-date list of vulnerable private licensed groundwater abstractions from the EA and monitor if appropriate. The most vulnerable abstractions will be the shallower wells. Private licenses over 20 cubic metres per day that may be affected include Baycombe Wood, Dale Park; Point A at Gaston Farm, Slindon; Point A at Woodlands Farm, Slindon; Madehurst Lodge, Arundel; Whiteway Lodge; Houghton Lodge and Havenwood Caravan park. • Monitor groundwater levels in observation boreholes. Suggested observation boreholes are Madehurst Stammers, Madehurst Punchbowl, Madehurst Lower Farm, Slindon Courthill, Swanbourne Copyhold and the Tortington Test observation boreholes. These have been chosen due to their location and length of record for the establishment of baseline conditions.

Key Environmental Issues	Existing Monitoring / Surveys	Monitoring options
<u>Surface Flow</u> There is a groundwater component to flows in the River Arun derived from the Chichester Chalk aquifer, although the river is heavily tidally influenced from its mouth upstream to the weir at Pallingham Quay. DO/DP effects on flows in the River Arun below those normally observed in drought conditions would only occur at low tide and would not be observable. The Mill Stream, downstream of Swanbourne Lake is thought to be independent of groundwater but monitoring is recommended as this is uncertain. The Park Bottom tributary, which joins the River Arun downstream of the confluence with the Mill Stream, may also be affected by the DO/DP. Possible effects include a decrease in flows and associated wetted width and depth below those normally observed in drought conditions. The rifes situated to the south of the Tortington are known to only interact with groundwater during the wettest winters. These therefore do not need to be included in the monitoring regime.	• Park Bottom flow gauging station (EA)	• The tidal influence on the River Arun means that monitoring of flows on the river is not feasible despite the possible effects of the DO/DP at low tides. • Obtain and interrogate existing spot gauging data on Mill Stream. • Monitor flows in the Mill Stream during DO/DP. • Obtain and interrogate data from the EA flow gauge at Park Bottom. Continue to monitor during the DO/DP.

Key Environmental Issues	Existing Monitoring / Surveys	Monitoring options
<u>Standing water</u> Swanbourne Lake is to the south-east of the Chichester Chalk aquifer. Lake level closely follows local groundwater levels, and studies have demonstrated a link between pumping at Madehurst and the lowering of lake levels. DO/DP conditions may result in the lowering of Swanbourne Lake level below that normally observed, although the lake has also been known to dry up on occasions during drought, irrespective of increased groundwater abstraction. In the case of the lake already being 'dry' increased groundwater abstraction from the Chichester Chalk aquifer will have no effect on the lake. As the lake would not be expected to be spilling during normal drought conditions the DO/DP effect of lowering lake levels is not expected to impact on the downstream Mill Stream. The WWT reserve near to Swanbourne Lake is largely spring-fed and has some hydrological continuity with Swanbourne Lake. Previous surveys have indicated that water levels in the reserve are maintained by spring flow even when lake levels are at their lowest, however, monitoring should be carried out before, during and post DO/DP to establish any influence, especially in the event of the Slindon DO/DP occurring in combination with the DO/DP at Madehurst.	• Swanbourne Lake level monitoring station (EA). • WWT has previously monitored input from the springs, but it is not clear whether this is ongoing and it is understood that it was only undertaken annually. • The East Hampshire and Chichester Chalk Modelling Project (ongoing), Entec, aims to characterise the impacts of groundwater abstraction at current, licensed and possible future rates on the rivers, rifes, springs and harbour groundwater discharges that drain the aquifer.	• Lake level monitoring and data collection will continue before and during the DO/DP. • Combined effects of the Portsmouth Water Slindon Borehole DO/DP will also need to be considered in data collection and analysis. • Monitor levels and/or flows at the WWT Reserve before and during the DO/DP.

Key Environmental Issues	Existing Monitoring / Surveys	Monitoring options
Mitigation The various possible mitigation measures (for example lake augmentation) that may be used need to be established (SW) and considered. This may influence the monitoring regime chosen and subsequent data analyses.		
Water Quality	**Chemical Monitoring**	
Groundwater Abstraction at full proposed DO/DP rate may result in higher turbidity of abstracted water.	Test pumping and groundwater analysis of Madehurst borehole October 1994.	Monitor quality of abstracted groundwater before and during the DO/DP.
Swanbourne Lake Decrease in dissolved oxygen due to lower levels and algal blooms triggered by sunny warm still weather conditions typical of summer drought periods, although the lake has also been known to dry up on occasions during drought, irrespective of increased groundwater abstraction. In the case of the lake already being 'dry' increased groundwater abstraction from the Chichester Chalk aquifer will have no effect on the water quality of the lake.	None.	If the lake contains water, confirm dissolved oxygen is a problem if fish are seen to be distressed.

Key Environmental Issues	Existing Monitoring / Surveys	Monitoring options
River Arun Significant effects on the water quality of the River Arun are not anticipated as a result of the DO/DP since the tidal flux is likely to be the dominant factor determining local water quality.	The nearest routine EA Chemical GQA location is on the River Arun upstream of the tidal limit (TQ 0358 2130).	Chemical GQA will continue at this site under EA routine monitoring procedures, before during and post DO/DP.
Other Surface Water Features The water quality of various springs will not be impacted by increased abstraction.	Springs identified in various reports listed in Appendix A.	None.
Biological Receptors	**Biological Monitoring**	
Swanbourne Lake / Mill Stream Invertebrates: The primary ecological interest of Swanbourne Lake according to Natural England is its invertebrate fauna. Previous studies for the EIA of the 2002/3 dredging scheme noted a reasonable invertebrate fauna.	There is no regular biological monitoring of Swanbourne Lake, although various bodies (e.g. Arundel Estate, Natural England) may hold copies of previous ad hoc reports. The following reports are known of: • The Coleoptera of Arundel Park (Peter Hodge, not dated, pre-1990); • 1995 Invertebrate Surveys of Swanbourne Lake (Andy Godfrey, 1995); • ES for Dredging Swanbourne Lake (Adams Hendry 2001, for Southern Water). Studies in 1995 indicated that at least eight Nationally Scarce and one RDB3 invertebrate species were associated with the lake or its wetland margins.	Surveys of the aquatic invertebrate fauna of the lake and Mill Stream during and after the DO/DP to provide indication of long-term effects of recent drought periods and lake drying on the invertebrate fauna.

Key Environmental Issues	Existing Monitoring / Surveys	Monitoring options
Fish: Swanbourne Lake supports a small coarse fish population but it is not fished. The adjacent Fountain Pond supports a trout fishery run by Arundel Estates.	• ES for Dredging Swanbourne Lake (Adams Hendry 2001, for Southern Water).	No fisheries studies (beyond those undertaken in 2001) are considered necessary to support the drought permit application, although consideration should be given alongside an assessment of possible water quality changes. Weekly watch for distressed fish in the lake during DO/DP if operating while the lake contains water. Post signage informing recreational users of EA emergency contact number should they notice fish in distress.
Biological Receptors	**Biological Monitoring**	
Other biological receptors: aquatic macrophytes and associated habitat are important in supporting amphibians, bats and breeding birds.	• ES for Dredging Swanbourne Lake (Adams Hendry 2001, for Southern Water).	
<u>The River Arun</u> The River Arun receives freshwater from Swanbourne Lake via the Mill Stream. However, it is considered unlikely that a reduction in flow from the lake due to the operation of the Madehurst or Slindon sources will have a significant impact on the nature conservation interest of the Arun downstream of this point since the tidal flux is likely to be the most notable factor.	The nearest routine EA Biological GQA location is on the River Arun upstream of the tidal limit (TQ 0358 2130).	Biological GQA will continue at this site under EA routine monitoring procedures, before during and post DO/DP.
Designated Habitats	**Habitat Surveys**	

Key Environmental Issues	Existing Monitoring / Surveys	Monitoring options
The following units of the Arundel Park SSSI could potentially be affected by the drought permit operation: • Unit 1 (Swanbourne Lake) – currently in 'unfavourable recovering' condition. Likely to be affected primarily in respect of its invertebrate fauna; • Unit 2 (Reed bed and Mill Stream) – currently in 'unfavourable declining' condition due to inappropriate scrub control. Effects due to operation of DO/DP likely to be limited, probably related to impacts on invertebrates.	Natural England has a hard-copy SSSI site file, which details historical surveys of the Arundel Park SSSI. However, the only specific surveys of Units 1 & 2 are understood to be: • The Coleoptera of Arundel Park (Peter Hodge, not dated, pre-1990); • 1995 Invertebrate Surveys of Swanbourne Lake (Andy Godfrey, 1995); • ES for Dredging Swanbourne Lake (Adams Hendry 2001, for Southern Water).	• Check Arundel Park SSSI site file directly for further information on the ecological value of Swanbourne Lake / additional surveys not previously noted. • Invertebrate surveys, as noted above.

Previous surveys and investigations include:

i) Water Resources Source Filing: Sussex Coast Resource Zone. Madehurst 101265. Hydrogeological Services Ltd/ Southern Water; 2001

ii) Conceptual Model of the hydrogeology of Swanbourne Lake in relation to possible dredging operations. Water Management Consultants Ltd/ Southern Water; 2000

iii) Assessment of options to restore Swanbourne Lake. Entec/Environment Agency; 1997

iv) Slindon Borehole Study; Swanbourne Lake Investigation and Field Tests at Swanbourne Lake. WS Atkins/Portsmouth Water; 1994

v) Report on Hydrogeological Investigation of Swanbourne Lake Arundel. Rofe, Kennard & Lapworth; 1992

APPENDIX D

PRECONSULTATION RESPONSES

Water Availability and Quality
2nd Floor, Area 2C
Ergon House
Horseferry Road
London SW1P 2AL

Telephone: 020 7238 5125
Email: carol.skilling@defra.gsi.gov.uk
Web: www.defra.gov.uk

Neville Smith
Finance and Regulation Director

by email **Date:** 7th July 2011

Dear Neville,

Portsmouth Water's Drought Plan

Thank you for your letter of 17th June to the Secretary of State, seeking views on the preparation of Portsmouth Water's Drought Plan.

In developing your Plan, we would like you to give consideration to the phasing in of restrictions and your priorities for saving water, together with some thought to the types of concessions you might make. We would also expect you to include your plans for communicating with stakeholders and customers and how you will work with neighbouring water companies to try and avoid confusion for your customers in the event of restrictions being put in place. You might also provide some clarity around how you will handle representations made when you give notice of restrictions.

You will also be aware that the Environment Agency has published guidance on drought planning. The Guideline is available to download from the Environment Agency's website: http://publications.environment-agency.gov.uk/PDF/GEHO0311BTOJ-E-E.pdf.

Your letter also refers to the impending decision by the Secretary of State on Portsmouth Water's Draft Final Water Resources Management Plan; we expect that Portsmouth Water will be notified of the decision on the Draft Final Plan later this month.

I am copying this letter to Trevor Bishop at the Environment Agency and Paul Hope at Ofwat.

Yours sincerely

CAROL SKILLING
Water Resources Management Policy

Mr. N Smith
Finance & Regulation Director
Portsmouth Water Ltd
PO Box 8
West Street
Havant
Hampshire PO9 1LG

Our ref: KL/PWDPpre-consultation
Your ref: GS/ja

Date: 4 August 2011

Dear Neville

Response to drought plan pre-consultation request for information.

Thank you for consulting us for information and advice on your draft drought plan. This letter is our formal response. We will be pleased to continue discussions as you develop your draft drought plan.

In your letter to us dated 17th June you highlighted the areas that you will consider when reviewing your drought plan. When preparing your draft drought plan you should follow the water company drought plan guideline. This is available from: http://www.environment-agency.gov.uk/business/sectors/123024.aspx. I would like to draw your attention to section 3.7.2 of the guideline, regarding Strategic Environmental Assessment (SEA). If any of your drought actions are likely to have a significant effect on a Habitats Directive site then the plan is likely to require an SEA. I trust you bear this in mind during your Habitats Regulation Assessment, which might find a SEA is necessary.

Please refer to Section 5 within our guideline when you look to take account of the recent Flood and Water Management Act 2010 as it provides guidance on how to incorporate this new legislation. The UKWIR *Code of Practice and guidance on water use restrictions* (11/WR/33/3) also provides detailed guidance.

Your draft drought plan should include all possible options for drought permit and order applications and the order they will be implemented in a drought. One possible way to present this could be to present different tiers of options to reflect drought severity. Those options that are the most environmentally damaging could be grouped together in the final tier, allowing you to list them separately from the options you are more likely to use.

I would also like to see in your draft plan the post drought actions you intend to do, including work to mitigate the environmental impacts caused by your drought actions. Details of the monitoring you will do in addition to our routine monitoring must also be included. I am happy to share the location of our sampling points and the data we collect with you during the preparation of your draft plan.

Defra/Welsh Government/Environment Agency has recently published updated guidance on drought permits and orders. The approach outlined in this guidance should be incorporated into the draft drought plan. This is available from
http://www.defra.gov.uk/publications/files/drought-permits-drought-orders.pdf

Environment Agency, Kings Meadow House, Kings Meadow Road, Reading RG1 8DQ
Contact no: 01189 535153
Email: jim.barker@environment-agency.gov.uk

As you know, we are reviewing and updating our own drought plan and will be consulting you on our draft plans in September 2011. Further information and existing plans are available from the site below, however we have informally sent you our draft plan for the South East so you have sight of it when preparing your own plans.
http://www.environment-agency.gov.uk/homeandleisure/drought/31771.aspx

For further discussion on any of the information in this letter, please contact Kate Lane on 01189 535204 or kate.lane@environment-agency.gov.uk. We will continue to liaise with you on technical drought planning issues over the coming months and Kate will be the lead contact.

I understand that your team have discussed a potential meeting with Kate regarding your draft drought plan. This would be an ideal opportunity to review our data sharing arrangements and ensure they are up to date.

Yours sincerely

Jim Barker
Water Planning Manager
Environment Agency South East

Date: 29 July 2011
Our ref: 26092
Your ref: GS/ia

Victoria House
London Square
Cross Lanes
Guildford
Surrey
GU1 1UJ

T 0300 060 2610

Neville Smith
Portsmouth Water Ltd
PO Box 8
Havant
Hampshire
PO9 1LG

By email only, no hard copy to follow

Dear Mr Smith

Portsmouth Water Drought Plan: Consultation prior to preparation of the draft plan

Thank you for inviting Natural England to submit comments at this early stage in preparation of your revised draft Drought Plan. We welcome the opportunity to work with Portsmouth Water to ensure that sustainable solutions to drought are planned for, which meet the requirements for the protection and enhancement of the natural environment.

Natural England provides advice to landowners and public bodies about the requirements for delivering objectives for European protected sites (Natura 2000 sites) and for achieving and managing favourable or recovering condition for Sites of Special Scientific Interest (SSSI). Natural England also seeks to ensure that there is a coordinated approach across England to meet the Government's wider Biodiversity Action Plan (BAP) commitments.

There are a number of issues and principles which we consider to be of key importance during the review of the Drought Plan which are detailed below.

Habitats Regulations

We are pleased that Portsmouth Water is considering the requirement of a Habitats Regulations Assessment (HRA) of the Drought Plan. Water Companies have a statutory duty to prepare, consult, publish and maintain a Drought Plan and so they are the competent authority for the necessary HRAs.

Natural England considers that Statutory Drought Plans are strategic level plans which, whilst themselves are not subject to permission, are influential in the decision-making process on water resource management actions in a drought situation. This includes subsequent drought permit/order applications that a company may need to make to deliver the Drought Plan.

In accordance with Regulation 61 of the Habitats Regulations, a Habitats Regulations Assessment of the effects on European sites needs to be completed before any plans or projects are implemented. In accordance with Government Circular: *Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System* (ODPM 2005), the Habitats Regulation Assessment should also consider the potential effects on Ramsar sites.

Given the influence that Portsmouth Water's abstractions may have on flows in the River Itchen Special Area of Conservation (SAC), and to flows into Solent Maritime SAC, Solent and Southampton Water Special Protection Area (SPA) and Ramsar site, Portsmouth Harbour SPA/Ramsar and Chichester and Langstone Harbour SPA/Ramsar, Natural England advises that the Drought Plan should be subject to a Habitats Regulations Assessment. The Drought Plan should not defer a decision on any plans or projects contained in it which do not have an acceptable level of uncertainty about the impacts of those plans or projects on the integrity of any European site. That is to say, where this is the case, the HRA decision should not be deferred to the subsequent Drought Permit/Order application stage. Assessing levels of uncertainty in any strategic plan is often very difficult. As part of its service, Natural England would advise you in making this assessment.

The HRA of the Statutory Drought Plan will need to make a statement on any Likely Significant Effect on European sites and where there is a Likely Significant Effect, an Appropriate Assessment needs to be carried out to inform the final decisions in the Plan. We would particularly stress that the HRA must include an assessment, alone and in-combination, with other plans and projects. As part of the in-combination assessment, this must include the combined effects of the drought plan with existing licensed abstractions as well as other relevant plans and projects.

HRA will be required at every relevant stage of the Drought Plan process and so it will need to be updated with increasing specificity on the detail of direct plans or projects arising from the Drought Plan itself. Most notable examples of these will be any proposed Drought Permits or Orders. However, all aspects of the Drought Plan will need to be considered where relevant to the protection of European sites and it is the responsibility of Portsmouth Water to supply sufficient information for the purposes of the HRA.

It is therefore strongly advised that a Habitats Regulations Assessment process underpins the development of the Drought Plan, in consultation with Natural England and the Environment Agency. A full report on this should be included within the Drought Plan so that compliance with the Habitats Regulations can be demonstrated.

Strategic Environmental Assessment (SEA)

The objective of the 'SEA directive' is "*to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with the view to promoting sustainable development, by ensuring that... an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment."*

In your letter, you state that Portsmouth Water's Drought Plan will not be subject to an SEA. ODPM (2005) *A Practical Guide to the Strategic Environmental Assessment Directive* states that Article 3(2) makes SEA mandatory for plans and programmes:

a) which are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use **and** which set the framework for future development consent for projects listed in Annexes I and II to the Environmental Impact Assessment (EIA) Directive (85/337/EEC); or

b) which, in view of the likely effect on sites, have been determined to require an assessment pursuant to Article 6 or 7 of the Habitats Directive (92/43/EEC).

The Directive defines "environmental assessment" (Article 2(b)) as a procedure comprising:

- preparing an Environmental Report on the likely significant effects of the draft plan or programme;
- carrying out consultation on the draft plan or programme and the accompanying Environmental Report;

- taking into account the Environmental Report and the results of consultation in decision making; and
- providing information when the plan or programme is adopted and showing how the results of the environmental assessment have been taken into account.

Natural England will be happy to work with Portsmouth Water and provide advice on any SEA assessment, if required. However, if you maintain the view that an SEA is not required during the development of the Drought Plan, the reasons for this should be explained within the plan.

Sites of Special Scientific Interest (SSSIs)

Section 28G of the Wildlife and Countryside Act 1981, as inserted by Section 75 of and Schedule 9 to the Countryside and Rights of Way Act 2000, places a duty on public authorities, including water companies, to take reasonable steps consistent with the proper exercise of their functions to further the conservation and enhancement of SSSIs. The Drought Plan (and SEA, if required) should record this duty amongst the principles underpinning the Plan. The Plan should make it clear how protection and enhancement issues affecting SSSIs have been taken into account in the process of reviewing, selecting and assessing drought options.

Biodiversity and Protected Species

Under Section 40 of the Natural Environment and Rural Communities Act 2006 every public authority, including statutory undertakers, must in the exercise of its functions have regard so far as is consistent with the proper exercise of those functions to the purpose of conserving biodiversity. Conserving biodiversity in this context includes restoring or enhancing a population or habitat. The Plan (and SEA, if required) should record this duty amongst the principles underpinning the Plan and set out how it has been achieved. In addition the Plan assessment should address any potential impacts on species protected under UK legislation or European legislation.

Communications plan

It would be useful to review communication and application procedures generally for drought and pre-drought situations to ensure we maximise the effectiveness and efficiency of joint working during the inevitably tight timescales.

Natural England will be pleased to continue to work closely with Portsmouth Water throughout the preparation of the Drought Plan. I hope these comments have been helpful at this stage, but please don't hesitate to contact me if I can provide further advice and information.

Yours sincerely

Rachel Crabbe
Land Use Lead Advisor
Operations Delivery Team

Direct line: 0300 060 2610
email: rachel.crabbe@naturalengland.org.uk

Protecting consumers, promoting value and safeguarding the future

Centre City Tower
7 Hill Street
Birmingham
B5 4UA

N Smith
Finance and Regulation Director
Portsmouth Water Ltd
PO Box 8
West Street
Havant
Hampshire
PO9 1LG

20 June 2011

Dear Neville

Portsmouth Water's Drought Contingency Plan

Thank you for your letter to Regina Finn of 17 June inviting comments on the issues that we would like you to consider when preparing your new draft drought plan.

We expect your drought plan to:

- set out clearly what a drought is and what steps will be followed to manage it;

- set out clearly what levels of service, in terms of restrictions on use, customers can expect to receive, and for these to be consistent with those funded in your 2009 Final Determination;

- demonstrate that the proposed drought management actions strike a balance between meeting the needs of consumers, those of the environment and shareholders;

- set out your company's liability for payments of compensation associated with drought permits, ordinary drought orders and emergency drought orders;

- take account of the impact of drought on your bulk imports of water and exports of water between zones;

…/…

- be easily accessible to customers; and

- include Ofwat in your company's communications plan.

I appreciate that these are general points, so if there are any issues specific to your plan that you feel that you would like more detailed views on, please contact me at david.mcgrath@ofwat.gsi.gov.uk or on 0121 644 7598.

Yours sincerely

David McGrath
Senior Analyst Water Resources

APPENDIX E

CONSULTATION RESPONSES

Date: 8 March 2012
Our ref: 44575
Your ref: ARN/ja

Secretary of State,
Department for Environment, Food and
Rural Affairs
Drought Plan Consultation
Water Availability and Quality Programme
Area 2C Ergon House
Horseferry Road
London SW1P 2AL
water.resources@defra.gsi.gov.uk

2nd Floor
Cromwell House
15 Andover Road
Winchester
Hampshire
SO23 7BT

By email only, no hard copy to follow

Dear Secretary of State

Portsmouth Water Ltd – Draft Drought Plan
Natural England received a Drought Plan consultation from Portsmouth Water Ltd dated 27 January 2012. We have considered the Drought Plan and accompanying documents against the full range of Natural England's interests in the natural environment, and make the following comments:

Assessment of environmental impacts
It is important to understand the potential environmental impacts of all drought options, including potential impacts on Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites. This will enable Portsmouth Water Ltd to identify appropriate mitigation and monitoring measures which will protect the integrity of designated sites, and inform future drought management planning.

Portsmouth Water Ltd has not undertaken an HRA or SEA in support of its draft Drought Plan. The Drought Plan should demonstrate how the environmental impacts of drought management options were considered, justify the proposed approach, and provide the evidence base and thought process behind these decisions. As it stands, the Drought Plan does not provide such information, or demonstrate how this has informed the drought planning process.

Portsmouth Water refers to the Environment Agency's assessment of the potential impact of Eastergate group drought permit option on Swanbourne Lake. However, the potential impacts of other drought permit options have not been considered. Neither has the potential impact on The Moors SSSI of re-commissioning the abstraction licence at Hoe.

HRA/SEA Screening
As a minimum, a screening exercise should be undertaken and included within the Drought Plan to demonstrate compliance with the Habitats Regulations. This would inform the decision about whether an appropriate assessment and full Strategic Environmental Assessment is required. For each drought management option, Natural England would like to see a list of designated sites which are likely to be impacted by its operation (sites which are hydrologically linked). A map would also be helpful. It should explain where any uncertainty lies, what mitigation would be required to prevent any adverse impact on site integrity, and what monitoring will be required before, during and after the operation. This should be summarised in the main Drought Plan

document. Any information gaps will delay the application process at a later date, should a drought permit be required.

Further detail could be provided in Appendix tables, with reference to supporting analysis where relevant (e.g. Review of Consents, WFD/PIM investigations). Where sites have been considered and screened out this should be stated. At the moment, where designated sites are not mentioned, it is not clear whether potential impacts on those sites have been considered or not.

Prioritisation of drought options
It is not clear how consideration of designated sites have informed decisions about the prioritisation of drought management options within the Drought Plan. Options with a low risk of impact should be implemented first. If this is not the case, justification should be provided in the Drought Plan. Where an impact on a designated site is anticipated or uncertain, that option should be avoided unless mitigation can be secured or further monitoring provides reassurance that the risk of impact is low.

Natural England would also support some flexibility about the timing of drought management options if the environmental impacts would be greater at certain times of the year. For instance, some options may have a greater impact on river flows or water quality if they are operated in the summer rather than the winter. If the water company anticipates that such a drought option will be required later in the year, the overall environmental impact could be reduced by introducing the option before the drought trigger has actually been reached.

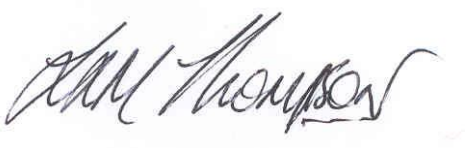
Monitoring
Natural England would like to see more detail about the environmental monitoring that Portsmouth Water intends to undertake before, during and after a drought event. There should be an ongoing monitoring programme in place for each designated site that is likely to be affected by drought action. This should monitor hydrology, water quality and appropriate ecological indicators, and will provide the baseline data against which the impacts of drought action can be measured.

Natural England would be happy to provide assistance in determining the appropriate monitoring required in order to minimise the impacts on designated sites.

Liaison with Natural England
Natural England welcomes the opportunity to work with Portsmouth Water on drought planning and management, to ensure that requirements for the protection and enhancement of the natural environment are met and that the most sustainable solutions are developed. We therefore recommend that the Drought Plan outlines how Portsmouth Water will liaise with Natural England and ensure we are involved in discussions about potential drought permits at a very early stage to allow enough time to consider the environmental implications.

If you have any queries relating to this response, please do not hesitate to contact me.

Yours sincerely



Simon Thompson
Land Use Operations Team
Tel: 0300 060 4625 Email: simon.thompson@naturalengland.org.uk

Representation on Portsmouth Water's draft drought plan

9 March 2012

We are the Environment Agency. We protect and improve the environment and make it **a better place** for people and wildlife.

We operate at the place where environmental change has its greatest impact on people's lives. We reduce the risks to people and properties from flooding; make sure there is enough water for people and wildlife; protect and improve air, land and water quality and apply the environmental standards within which industry can operate.

Acting to reduce climate change and helping people and wildlife adapt to its consequences are at the heart of all that we do.

We cannot do this alone. We work closely with a wide range of partners including government, business, local authorities, other agencies, civil society groups and the communities we serve.

Published by:

Environment Agency
Horizon house, Deanery Road
Bristol BS1 5AH
Email: enquiries@environment-agency.gov.uk
www.environment-agency.gov.uk

Further copies of this report are available from our publications catalogue: http://publications.environment-agency.gov.uk or our National Customer Contact Centre: T: 03708 506506

Email: enquiries@environment-agency.gov.uk.

Contents

1 Introduction

This is the Environment Agency's review of Portsmouth Water's draft drought plan.

A water company drought plan sets out the short-term operational actions that a company will take in a range of drought situations to maintain public water supplies without causing unnecessary risk or damage to the environment. These plans should be flexible, consider the needs of customers and other stakeholders and be aligned to Government and Environment Agency objectives.

We have a statutory duty to manage water resources in England and Wales and we aim to make sure there is enough water for people and the environment in a drought. We have reviewed and reported to Ministers on water companies' previous statutory drought plans in 2006-07 and voluntary drought plans since 1999.

We are a statutory consultee and provide advice to Government on the content of these statutory plans. Government expects the company to follow the recommendations outlined in this report.

1.1 Structure of this representation

We have carefully assessed all the information set out in Portsmouth Water's draft drought plan. We have assessed the plan against the guidance in our drought plan guideline[1], legislation and objectives set by Government. This representation sets out the issues or concerns we have with the draft plan following our assessment. It does not provide information on areas of the draft plan for which we had no comment.

Section two of this representation sets out our recommendations for the draft plan. These recommendations focus on the most significant issues we have identified from our technical assessment of the draft plan.

The report in appendix one outlines the evidence to support these recommendations. Links are made between the recommendations and the evidence report for ease of reference. The evidence report also logs less significant issues we have identified that would further improve the plan.

Section three outlines our view of how Portsmouth Water has met relevant legislation and Government Directions.

Section four gives our view of Portsmouth Water's public consultation on its draft drought plan.

[1] Environment Agency water company drought plan guideline, June 2011. http://publications.environment-agency.gov.uk/pdf/GEHO0311BTOJ-E-E.pdf

2 Recommendations

2.1 Summary

Portsmouth Water's draft drought plan presents some risk to public water supplies and the environment in a drought. Some aspects of the draft plan do not follow the guidance set out in our water company drought plan guideline, do not meet legislation and/or do not meet Government objectives.

Information presented in the draft plan indicates that there is an appropriate balance between demand and supply-side drought management actions, and that these actions have been tested against appropriate triggers in the draft plan. The company has assessed these actions against a number of different drought scenarios. However, it has not set out the action it would take in a long-term drought lasting over two dry winters.

A number of Portsmouth Water's drought management options would affect Habitats Directive sites. However, Portsmouth Water has decided that a Habitats Regulations Assessment and a Strategic Environmental Assessment are not required as these options are unlikely to be needed. The company has only presented environmental monitoring information about one of its drought permit options.

2.2 Improvements made to the draft plan

Since the publication of its last plan in 2008 Portsmouth Water has updated it to reflect the outcome of Habitats Directive Review of Consents and the change from three resource zones to one. Note that the company was previously managed as one Drought Management Area so this has not changed. The main change to the draft plan is the inclusion of temporary restrictions.

As a result of pre-consultation responses to the company, Portsmouth Water has made some improvements to its draft drought plan. It has included additional information on levels of service of 1 in 20 years for demand restrictions and provided additional rainfall analysis in Section 2.1.2. The company has added further analysis of groundwater level data before 1932 using our monitoring site at Chilgrove.

2.3 Recommendations for changes

Below we have set out our recommendations that cover the key issues we have identified with Portsmouth Water's draft plan, together with the changes that it should make to its drought plan. Less significant and minor issues that could result in further improvements to the plan are detailed in the evidence report in appendix one.

Recommendation 1 - Habitats Regulation Assessment and Strategic Environmental Assessment

Portsmouth Water has decided that a Habitats Regulations Assessment (HRA) and a Strategic Environmental Assessment (SEA) are not required, even though a number of its drought permit options would affect Habitats Directive sites. Portsmouth Water says that these options are unlikely to be needed. The company should determine whether it is likely to need these options. For example, it could consider the possible sequencing

of drought permit options in a long-term drought that includes two dry winters. The company should undertake an HRA of its drought plan, if necessary, to show whether there is an impact or not. If appropriate, the company should also complete an Appropriate Assessment of its plan and an SEA. See issues 1 and 2 in the evidence report for further details of changes we recommend to address this issue.

Recommendation 2 - environmental assessment and monitoring

Portsmouth Water has not identified all the features that might be impacted by drought permit options. In addition, the environmental monitoring plan in the draft plan is not sufficient to satisfactorily monitor environmental conditions before, during and after a drought. Without this, the effects of any drought management actions on the environment in a drought cannot be determined. Portsmouth Water should present more detailed information in its drought plan on the potential impacts of its supply-side drought measures and of its proposed monitoring plan. The monitoring plan should include details of the location, frequency, timing and duration of proposed monitoring during and after a drought, and who will carry it out. See issues 3, 4 and 5 in the evidence report for further details of changes we recommend to address this issue.

3 Compliance with relevant legislation

The first part of this section looks at compliance with the Drought Plan Direction 2011 and outlines where we consider Portsmouth Water has not complied with these Directions. In this assessment, we consider that a Direction has not been complied with where the draft plan does not meet the principles of the Direction.

The second part of this section looks at the approach Portsmouth Water has taken regarding recent changes to legislation regarding temporary water use restrictions.

3.1 The Drought Plan Direction 2011

Section 4 of the Drought Plan Directions 2011 specifies additional matters that should be addressed in water company drought plans. We have assessed the draft plan for compliance against these Directions.

Portsmouth Water has not presented sufficient evidence in its draft plan to demonstrate compliance with all Directions. The company should provide more details to show how it complies with the following Directions.

Direction not compiled with	Recommended changes to ensure compliance with Direction
(b) the permits and approvals that the water undertaker may need in order to implement the drought management measures.	Portsmouth Water has only given some details of permits needed for each option. There is a risk that some consents may have been overlooked and lead-in time for options could be underestimated. The company should provide details to show additional consents and constraints have been considered, for example, land access and rights of way.
(e) the measures that may be needed to mitigate any adverse effect on the environment resulting from the implementation of a drought management measure.	The company has not provided sufficient information on environmental mitigation. The company states that mitigation will need to be agreed with the Environment Agency, Natural England and other conservation bodies (section 4). Delays to issuing permits could be caused by not having information on mitigation measures in advance. The company should provide more detail of the mitigation required for drought permit options in advance of requiring them.
(f) the permits and approvals that may be needed in order to implement those mitigation measures.	The company has not stated what permits or approvals will be needed to implement any mitigation measures. The company should provide details of the approvals needed to implement mitigation measures.

3.2 Legislation relevant to demand-side drought management actions (temporary restrictions)

Section 36 of the Flood and Water Management Act 2010 (inserted into the Water Industry Act 1991) allows water companies to implement a wider range of temporary water use restrictions during a drought. The Water Use (Temporary Bans) Order 2010 gives further information and requirements on the implementation of this legislation.

We have assessed how the company has approached this legislation and incorporated the principles of the UKWIR Code of Practice (11/WR/33/3) into its draft plan.

Portsmouth Water has considered how this new legislation could affect its management of a drought and has incorporated the principles of it into its drought plan. The draft plan clearly sets out the changes in legislation that have occurred and how this has led to changes in the company's approach to demand management measures in a drought.

Portsmouth Water states that it will introduce all the temporary restrictions in a single phase. The company says that a single phase is more acceptable to the public. However, the company has a later phase of restrictions outlined in Section 3.3.3 which fall under the temporary restrictions legislation. These focus on commercial activities and include watering outdoor plants on commercial premises using a hosepipe, filling or maintaining a non-domestic swimming or paddling pool and operating a mechanical vehicle washer. This could be viewed as two phases.

The company states that it will notify customers that temporary restrictions are being implemented through public notices in newspapers, press releases and information on its website. The company has not made it clear in the plan how customers can make representations or how long they would have to do so.

Portsmouth Water proposes two exemptions, for elderly and for disabled customers, based on the company's special needs register or by written application. This exemption is for the residence only and for the use of a hose or micro-irrigation system for watering plants but not lawns. The company gives reasons why a number of other exemptions will not be permitted.

4 Our view of the public consultation

Portsmouth Water began its public consultation on 27 January 2012. The consultation was run for six weeks and ends on 9 March 2012.

The company published its draft drought plan on its website. It is reached by following a clear link on its homepage or via its news section. On the drought plan consultation page, the company says that representations can be made by email or by post to Defra, and a paper copy is available at its head office in Havant. The company wrote to key stakeholders to notify them of the consultation on 27 January 2012.

In summary, we consider that the consultation gave satisfactory opportunities for customers to make representations.

Appendix 1 Evidence report

In this table we detail the issues we have raised in this representation and the evidence behind these.

- Issues categorised as 'major' are those that we consider highly significant to the draft plan that may result in an unnecessary risk to public water supplies and/or major risk to the environment in a drought. These issues may also contribute to issues raised in section three, Compliance with relevant legislation.
- Issues categorised as 'moderate' are those that we consider significant to the draft plan and may reduce the effectiveness of drought actions, stakeholder/customer understanding and/or present a moderate risk to the environment.
- Issues categorised as 'minor' are those that we consider would further improve the draft plan.

Moderate issues				
Issue ref.	Area of issue	Issue and reference	Implications	Information or changes required
1	Scenario testing	Portsmouth Water has considered the impact of three drought scenarios in its drought plan (Section 2.5). The company has not considered the impact of a long-term drought including two dry winters as it says the return period for this sort of event would be very rare. Long-term droughts are rare but have occurred. Given the company's dependency on groundwater, a long-term drought including two dry winters would be a good test of its plan.	Portsmouth has not shown how its drought plan would cope under this extreme situation. It would be beneficial for customers to understand how a very severe multi-season drought would be managed.	Portsmouth Water should include a multi-season drought scenario that includes two dry winters. This should help the company show how likely it is that it would need its drought permit options and under what circumstances it would need to implement them. Portsmouth Water should show the potential sequencing and lead-in times for these drought permit options.
2	Habitats Regulations Assessment	Portsmouth Water has decided that an HRA and an SEA are not required. Some of the justification of this is in	Although the text is misleading in Portsmouth Waters drought plan, it makes it clear when considering	Portsmouth Water should amend the text in Section 1.12 to specify that the low risk to designated sites relates to

Moderate issues				
Issue ref.	Area of issue	Issue and reference	Implications	Information or changes required
	(HRA) and Strategic Environmental Assessment (SEA)	Section 1.12. It states that the Environment Agency South East Drought Plan confirms that changes to the number and location of potential drought permits means impact on protected sites is not likely. In the plan Portsmouth Water lists six options for drought permits and re-commissioning of its revoked abstraction licence at Hoe. All but one of these sites are linked to the Restoring Sustainable Abstraction programme. In our drought plan we only refer to the Eastergate group (Slindon) drought permit option as unlikely to impact on an already dry Swanbourne Lake (page 42 of Appendices). The other drought permit options are likely to impact on Habitats Directive Sites. Portsmouth Water surrendered its abstraction licence at Hoe due to environmental concerns affecting the Moors SSSI.	drought permit options (Section 3.4) that other options would be considered before applying for drought permits in locations other than Eastergate.	Eastergate's impact on Swanbourne lake only. Portsmouth Water should consider the likely impacts of all of its drought management options, including the use of currently unused sources and drought permit options, on Habitats Directive sites. The company should undertake an HRA of its drought plan, if necessary, to show whether there is an impact or not. If appropriate, the company should also complete an Appropriate Assessment of its plan and an SEA. The company should clearly state whether it would need to use its potential drought permit options under normal drought planning scenarios.
3	Water Framework Directive (WFD)	The plan does not show how it will prevent or mitigate against temporary deterioration in WFD water body status due to its drought management actions.	The company may not invoke its supply-side drought management actions in the least damaging order, environmentally.	The company should consider the impact of its drought management actions on all water bodies that may be affected. The company should set out where

Moderate issues				
Issue ref.	Area of issue	Issue and reference	Implications	Information or changes required
				temporary deterioration in status is likely and aim to prevent this where possible via appropriate mitigation measures. The company should use this to inform its sequencing of drought management actions. Some drought management actions may be required due to over-riding public interest. However, the company needs to justify why this may be the case.
4	Environmental assessment	Portsmouth Water has not identified all the features that might be impacted by drought permit options. Portsmouth Water has not presented sufficient environmental assessment information to allow drought permits and orders to be 'permit ready'.	Some (less likely) options may take longer to assess than the company has planned for. Unforeseen impacts may develop, and avoidable damage result. Permits may not be implemented in the optimal order.	Portsmouth Water should provide as much information as possible on the potential impacts of its supply-side drought measures in advance. If permits or orders are only likely to be needed in severe drought conditions, the company should do sufficient work to show how it would use these options and a plan for producing any missing information with sufficient lead in time to implement them.
5	Environmental monitoring	Portsmouth Water has only presented environmental monitoring information for Eastergate (Slindon) in its drought plan. This information is missing for all other supply options. If other drought management options	Time will need to be spent finalising monitoring arrangements when a permit is applied for. Otherwise monitoring arrangements may be	(a) The company needs to show the location of monitoring sites. (b) The company needs to specify where, what and when it is monitoring, prior to, during and after a drought permit for at least the most likely permit

Moderate issues				
Issue ref.	Area of issue	Issue and reference	Implications	Information or changes required
		might be needed under normal drought planning scenarios the company should provide associated monitoring information. There is no specific information provided on when and where monitoring will take place and who will carry out the monitoring.	inadequate, potentially leading to environmental damage and incidents. There may be confusion about who is monitoring what, where and when. Essential monitoring may be omitted, or introduced only at the last minute.	options, in order to be able to distinguish between the natural impacts of the drought and those caused by drought actions and to ensure monitoring sites incorporated are up to date, appropriate and consistent. c) The company should identify clearly specific sensitive and relevant features of each site. d) The company should clearly state what data it is relying on from the Environment Agency. The monitoring plan should set out who is doing the monitoring and where. Data exchange should be formally agreed and presented in the plan. e) The Environment Agency's routine monitoring should be updated in the plan. Frequency of routine monitoring should be specified using up to date information.
6	Potential derogation	The company has not fully considered the potential derogation of other abstractors. For example, the drought action summaries (Appendix B) for re-	Abstractions may be derogated.	Portsmouth Water should investigate potential derogation further for all the supply side options.

Moderate issues				
Issue ref.	Area of issue	Issue and reference	Implications	Information or changes required
		commissioning boreholes mentions the derogation of abstractors as a potential impact but does not how these impact could be mitigated. The plan also states the Slindon option may result in short-term derogation of springs and boreholes in the Chichester Chalk block aquifer.		
7	Supply side options	There are three options (increased deployable output, reduced compensation flows and desalinisation plant) that appear in Appendix B but are not discussed in the main document.	It is unclear if these options are part of the plan.	Portsmouth Water should ensure the options lists are consistent in the document and the appendices. If these missing options are to be in the plan they need to be included in the scenarios.
8	Supply side options	Portsmouth Water has listed unused commercial boreholes that could be re-commissioned in the event of a drought (Appendix B). We are aware that some of these sites may have been re-developed.	It is possible some of these boreholes may have been filled in or are inaccessible.	Portsmouth Water should check that this list is still correct and remove any boreholes that would not be available any more for use in a drought. The company should provide lead-in times and quantities that could be achieved by these options.

Minor issues				
Issue ref.	Area of issue	Issue and reference	Implications	Information or changes required
9	Pre-consultation	Portsmouth Water has not made it clear how all pre-consultation comments have been included in the draft plan. However, there is reference to Natural England's comments on whether a Strategic Environmental Assessment is needed. It is also not clear if the company consulted customers and interest groups on their approach to temporary restrictions before this draft plan consultation.	Customers may be unclear whether pre-consultation comments have been taken on board. By not making it clear whether consultation on temporary restrictions has taken place there is a risk that customers and interested groups may not be happy with the approach in the plan.	The company could provide a summary of pre-consultation comments along with any actions taken to address them. The company should provide information in the plan of consultation on temporary restrictions if it has taken place.
10	Temporary restrictions	Portsmouth Water has not explained how it will liaise with other companies in relation to temporary use bans.	Portsmouth Water's approach may not be in line with neighbouring companies	Portsmouth Water should set out how it will liaise with other companies in relation to temporary use bans.
11	Demand management	Portsmouth Water has not clearly set out the assumptions it has made to estimate demand reductions (section 3.3). For example, it states demand reductions of 5% for a Drought Order and 2.5% for an appeals for restraint and additional active leakage control.	Portsmouth Water relies on its demand management actions to achieve demand reductions. If these savings do not materialise the company will need to bring forward other actions sooner than planned. We cannot check the methodology that Portsmouth Water has used to derive its	The company should set out the assumptions it used to derive its demand reduction figures.

Minor issues				
Issue ref.	Area of issue	Issue and reference	Implications	Information or changes required
			figures.	
12	End of a drought	The plan does not indicate that the company will contact the Environment Agency to discuss and confirm the water situation before declaring that the drought is over.	It is not clear from the plan that discussion will occur.	The company should include reference to discussions with the Environment Agency.
13	End of a drought	Portsmouth Water has not outlined how and when a post-drought review of the effectiveness of the plan would take place, or what reports will be produced and released as a result.	By not considering what post-drought reporting it will do after a drought, there may be a delay in the company in learning lessons from a drought.	The company should set out what information it will review post drought.
14	Representations on temporary restrictions	There are no details of how the company will consider and record any representations on temporary restrictions.	Customers may not be aware of how the company will assess any representations.	The company should present details of how it will consider and record any representations on temporary restrictions.
15	Drought Communications	The plan does not demonstrate how the company will monitor the effectiveness of its communication activities during a drought.	Without this information, the company may not use the most effective method or timing of communication for its customers.	Portsmouth Water should demonstrate how it will monitor the effectiveness of different methods and timings of communications during a drought.

Would you like to find out more about us, or about your environment?

Then call us on

03708 506 506 (Mon-Fri 8-6)

Calls to 03 numbers cost the same as calls to standard geographic numbers (i.e. numbers beginning with 01 or 02).

email

enquiries@environment-agency.gov.uk

or visit our website

www.environment-agency.gov.uk

incident hotline 0800 80 70 60 (24hrs)
floodline 0845 988 1188

Environment first: Are you viewing this on screen? Please consider the environment and only print if absolutely necessary. If you are reading a paper copy, please don't forget to reuse and recycle if possible.

Limb, Kate

From: SMALL, Martin [Martin.Small@english-heritage.org.uk]
Sent: 08 March 2012 16:57
To: Water resources (WSR)
Subject: PORTSMOUTH WATER LTD - CONSULTATION ON DRAFT DROUGHT PLAN

Dear Sir or Madam,

As the Government's statutory adviser on the historic environment, English Heritage is keen to ensure that the protection of the historic environment is fully taken into account when devising plans and programmes. English Heritage therefore welcomes the consultation on Portsmouth Water Ltd's Draft Drought Plan.

Having only just started with English Heritage I have not had the chance to read the draft Plan as thoroughly as I would have liked, nor have I had the chance to discuss it with my archaeological colleagues. With the first of these caveats in mind, I did not find any reference to the historic environment in the draft Plan, which is disappointing. However, the only potential impact on the historic environment from the proposed drought measures appears to me to be from the potential increased abstraction from the Eastergate Group of sources. Any consequent lowering of the water table could affect archaeological deposits, although (subject to the second of my caveats above), I have found no record of any known deposits in the locality. Nevertheless, when considering abstraction, the effects of dewatering on known or potential archaeological deposits should be considered. English Heritage may be able to provide further advice at this time.

Thank you.

Yours faithfully,

Martin Small

Martin Small | Planning Advisor
Direct Line: 01483 252040
Facsimile: 01483 252001

English Heritage | South East
Eastgate Court | 195-205 High Street
Guildford | GU1 3EH

www.english-heritage.org.uk

LONDON FIRE BRIGADE

London Fire Brigade Headquarters
169 Union Street London SE1 0LL
T 020 8555 1200 **F** 020 7960 3602
Minicom 020 7960 3629
www.london-fire.gov.uk

Department for Environment, Food and Rural Affairs (Defra),
Drought Plan Consultation,
Water Availability and Quality Programme,
Area 2C, Ergon House,
Horseferry Road
London. SW1P 2AL

London Fire Brigade is run by the London
Fire and Emergency Planning Authority

Date 20 February 2012

WATER COMPANY DROUGHT PLANS

I am in receipt of correspondence from London's Water Undertakers who have provided me with sight of their Drought Plans and invited the submission of comments to you.

I have no observations beyond the request for early consultation through normal engagement channels in relation to any drought response measures that that may affect the provision of water for operational fire fighting.

Yours sincerely

Reply to
T 020 8555 1200 ext
E @london-fire.gov.uk

Hampshire County Council

Economy, Transport and Environment Department
Elizabeth II Court West, The Castle
Winchester, Hampshire SO23 8UD

Tel: 0845 603 5638 (General Enquiries)
0845 603 5633 (Roads and Transport)
0845 603 5634 (Recycling Waste & Planning)
Textphone 0845 603 5625
Fax 01962 847055

www.hants.gov.uk

Department for Environment Food & Rural Affairs Drought Plan Consultation
Water Availability and Quality Programme
Area 2C, Ergon House
Horseferry Road
London SW1P 2AL

Enquiries to Stephen Blyth

Direct Line 01962 846777

Date 9th March 2012

My reference

Your reference

Email stephen.blyth@hants.gov.uk

Dear Sir

Consultation on Portsmouth Water Draft Drought Plan 2011

Hampshire County Council has been consulted by Portsmouth Water on its Draft Drought Plan, October 2011. As an important service provider to the community the County Council welcomes the opportunity to comment on all water company draft drought Plans affecting Hampshire.

The South East of England is identified by the Environment Agency (EA) as an area of 'serious water stress'. Indeed the EA's current monthly water situation report for the Solent/ South Downs/South East indicates that whilst groundwater level sites are rising they range from normal to exceptionally low status, an indication of the ongoing seriousness of the water situation in the region and the need to plan robustly for drought events.

The County Council has the following officer comments in respect to Portsmouth Water's Draft drought Plan:

It is noted that all the company's water sources are groundwater based, of which 50% comes from boreholes and wells. The company has no surface water storage reservoirs. This raises a question as to whether such an approach will be sustainable in the long term, particularly when factoring in the predicted impact of climate change over the coming decades. According to the UK Climate Change Risk Assessment for the water sector (Defra January 2012), there may be a significant decrease in the number of abstraction sites with sustainable levels of water by 2050 and this is likely to become severe by the 2080's. Should this prove correct it may impact on the water company's options to enhance supply in drought situations for example through increasing drought yields from existing sources. Consequently, the County Council would advise that the water sector climate change risk assessment is

taken into account in the next round of water management plans scheduled to commence in 2014 and inform the planning process for significant periods without rainfall in drought plans.

Ponds and wetlands that form part of a residential or commercial developments Sustainable Drainage System (SuDS), rely on water that flows slowly through the features over an extended period of time in order to remove any remaining pollution. It would be helpful to have clarification as to what implications or not the drought plan would have on measures to maintain the successful functioning of SuDS in the event of drought.

Finally as part of its drought management control (customer drought awareness) it is welcomed that Portsmouth Water is proposing to establish early informal contact with the local authorities. This is viewed as important given that the County Council provides a wide range of crucial services and facilities particularly to the young, vulnerable and elderly e.g. at care homes and schools. Overall the County Council would wish to develop further its links with Portsmouth Water.

Yours faithfully

Linda Tartaglia-Kershaw
Head of Strategic Environmental Delivery.

Limb, Kate

From: Gary Scroby [gary.scroby@the-hta.org.uk]
Sent: 05 March 2012 15:11
To: Water resources (WSR)
Subject: Portsmouth Water Drought Plan

Dear Secretary of State

I write in response to Portsmouth Water's invitation to comment on their draft Drought Management Plan.

The Horticultural Trades Association (HTA) is the leading trade association for the UK ornamental horticulture and gardening industry. The HTA firmly believes in the need to conserve water and believes it is incumbent on all society to take a responsible view on the use of water.

Specifically, we would like to see all water companies provide for two exemptions/concessions in their Drought Management Plans. These are;

i) An exemption for drip irrigation systems in the garden. Drip systems are extremely water efficient when compared with hosepipe or spray guns, and by promoting their use now, water companies would help introduce new technology that will reap water savings every year, not just in 2012.
ii) A concession to enable newly-laid turf to be watered in for a period of 28 days. This will help protect the landscape and turf growing industries from the damaging effects of water restrictions.

More generally, since the widespread hosepipe bans of 2006, the HTA has worked with Waterwise to promote a system of phased water restrictions in the garden at times of water shortage. This would provide a vital and pre-emptive phase of communication to consumers before hosepipe bans are imposed. We have done so for the following reasons:

Water Efficiency: our common objective. Waterwise, the HTA, Defra, EA and the water companies all share the desire to use water sensibly during times of shortage. As system of phased restrictions in the garden would provide for an effective and equitable way to manage water shortages. It is a model widely used in other countries, e.g. Australia, New Zealand, Canada and the USA;

Communication/Consumer Engagement: phased restrictions would receive the support of the UK garden retail industry. We could mobilise our 2,000+ garden centres to communicate water efficiency measures to the UK's 20 million gardeners. This would generate increased public compliance and achieve greater water savings whilst maintaining the enormous social, economic and environmental benefits of gardening;

Corporate reputation: our proposed phased approach would help water companies engage more constructively with one third of their customer base by helping them to continue with their favourite pastime for as long as possible, and deflecting criticism on leakage etc;

GDP Protection: in 2006, garden centres in the South East reported a loss of up to 30% in sales during the 2006 bans, with a total industry loss of £12 million, many redundancies and some lost production businesses. Our proposals would help mitigate this kind of economic damage, and thereby protect jobs at a time when the UK economy is extremely fragile.

The HTA was pleased to see its proposals included at Appendix 5 of the recently revised UKWIR Code of Practice and Guidance on Water Use Restrictions (11/WR/33/3). We strongly urge all water companies

to adopt this approach in their final Drought Management Plan.

Regards

Gary Scroby
Policy Manager
The Horticultural Trades Association
Horticulture House - 19 High Street - Theale - Berks - RG7 5AH
Tel: +44 (0)118 930 3132 Mob: +44(0)7730 529910 Fax: +44 (0)118 932 3453
A company registered by guarantee. Established 1899. Registered in London (No. 169606)
The HTA - www.the-hta.org.uk

Alan Jones
Head of Emergency Management
Emergency Management
(01243) 777917 (Direct)
(01243) 777264 (Fax)
email: alan.jones@westsussex.gov.uk
www.westsussex.gov.uk

County Hall
Chichester
West Sussex
PO19 1RQ

west sussex county council

09 March 2012

Dear Mr Smith

Portsmouth Water – Drought Plan Consultation

Thank you for your letter inviting representations on your draft Drought Plan.

There are a number of areas we would welcome further amplification in the plan, in particular to reflect the arrangements in place across the Sussex Resilience Forum, the include;

• Communications strategy

WSCC believes there is benefit in establishing a multi-agency approach to demand reduction, and communications strategy. The Sussex Resilience Forum drought plan includes messages for businesses on continuity planning in respect of water supplies highlighting HSE's minimum standards for sanitary, washing and drinking water. The joined up dissemination of information especially with regards to increased public health risks, and to the vulnerable if drought coincides with heatwave is we believe critical.

• Emergency drought order – supply strategy.

In support of the water company's duties under the Security & Emergency Measures Direction 1998, The Sussex Resilience Forum have pre-identified sites potential for drinking water distribution or bulk storage. WSCC would like to see the detailed strategy for water supply in event of emergency drought order set out, including the plans for standpipes, bowsers, bottled water distribution sites and bulk storage.

• Identify Vulnerable

The plan should describe the strategies Portsmouth Water would use to assist in identifying and supporting the supply of water to vulnerable people. WSCC seeks assurance that baseline data on population numbers being used, reflects changing demography / elderly and increasing numbers likely to be vulnerable and requiring support.

• Interaction of Water Sources

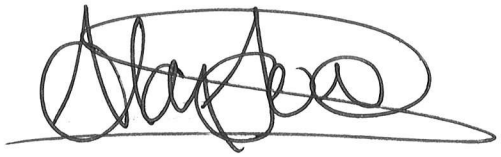
Further information regarding the interaction between the various water sources would be helpful, particularly where hydro-logically linked.

• Agricultural Economy

Given the regional prevalence of the agricultural economy, it would be helpful to set out in detail the strategies to agree early and managed reductions in demand with this sector.

West Sussex County Council will be pleased to continue to work with Portsmouth Water in the development of the drought plan, and to discuss how we can ensure an effective response for our residents needs. If you should have any questions please contact me.

Yours sincerely,



Alan Jones

APPENDIX F

UPDATED STATEMENT OF RESPONSE

UPDATED STATEMENT OF RESPONSE TO THE REPRESENTATIONS ON THE DRAFT DROUGHT PLAN 2012

N J Sheeran
Finance and Regulation Director
Portsmouth Water Ltd
PO Box 8
West Street
Havant
Hants
PO9 1LG

December 2012

CONTENTS

Statement of Response to Representations on Draft Drought Plan 2012

This document is the Company's formal Statement of Response, as required by Section 39B of the Water Industry Act 1991, as introduced by the Water Act 2003 to the representations received on its Draft Drought Plan which was published for consultation on Friday 27 January 2012.

The Statement of Response was initially published in May 2012 and took account of the seven representations that Defra received on our Draft Drought Plan and one further representation from the Consumer Council for water that was sent directly to Portsmouth Water. The document set out where the Company intended to make changes to their Draft Drought Plan to reflect the representations made.

Defra wrote to the Company in September 2012 advising that further information was required before Defra could recommend to the Secretary of State that the plan should be published. The letter set out the details of where this further work was required. The Company has undertaken further work to address the concerns set out in the letter from Defra.

The Company has now updated the Statement of Response to describe the changes it has made to the plan as a result of the Defra letter. This information has been included in Section 2.9 of the Updated Statement of Response. The Company has also published at the same time as the Updated Statement of Response, a Draft Final Drought Plan. This Draft Final Drought Plan incorporates all the changes set out in the Updated Statement of Response and to assist the user in identifying where the Plan has been updated, these sections have been highlighted in yellow.

1 INTRODUCTION

1.1 Representations Received and Format of Response

The Consultation period for the Draft Drought Plan closed on Friday 9 March 2012 and Defra received a total of seven representations. The Consumer Council for Water submitted comments on the Draft Drought Plan directly to the Company and this has been included in the Statement of Response.

In light of the low number of representations, the Company has decided to outline each of the key issues raised by each respondent and has then provided its response to the issue followed by changes it has made to its Draft Plan.

1.2 List of Organisations making Representations

Representations on the Draft Plan were received from the following organisations:-

No.	Organisation
1.	Consumer Council for Water
2.	English Heritage
3.	Environment Agency
4.	Hampshire County Council
5.	Horticultural Traders Association
6.	London Fire Brigade
7.	Natural England
8.	West Sussex County Council
9.	Defra

2 RESPONSE TO INDIVIDUAL REPRESENTATIONS

2.1 Consumer Council for Water (CCW)

CCW is the independent organisation representing water and sewerage customers in England and Wales.

2.1.1 Accessibility of Document

CCW note that the Company has not produced a customer friendly summary of the Draft Drought Plan. CCW also note that the Executive Summary does not discuss the impacts of the Draft Drought Plan until pages 8 and 9.

2.1.1.1 Company Response

The Company recognises the concerns raised by CCW about the potential for customers to be 'put off' the document as information relating to customers is not readily accessible.

2.1.1.2 Changes for the Draft Final Plan

The Company proposes to produce a Key Points Summary to accompany the final Draft Plan. This document will seek to provide key information on the Draft Drought Plan in an easily accessible format for customers.

2.1.2 Impacts of Climate Change and Unprecedented Conditions

CCW recognise that the Company has utilised historic data for deriving the drought scenarios used in their Plan. However, they note that the Company makes reference to events resulting from unprecedented conditions and the possible impact of climate change but provides little evidence of the mechanism for managing these events.

2.1.2.1 Company Response

The Company recognises and accepts the need to provide further clarity on these issues. The Company notes that plan includes the impact of climate change experienced to date as the plan is based on actual data. The Company notes that it believes the guidance for preparing the Drought Plan states a forward looking assessment of the impacts of climate change should not be included in the Plan. The Company in their Draft Drought Plan has considered drought scenarios that are more extreme than have been experienced to date and has set out indication measures of how this drought could be managed. If the Company experienced an unprecedented event such as loss of a major treatment works from a pollution incident, combined with an extreme drought, then this would be dealt with under the emergency planning scenario.

2.1.2.2 Changes for the Draft Final Plan

The Company will update the Draft Final Plan to provide further clarity on the scope of the Drought Plan.

2.1.3 Presentation of the Graphs

CCW comments that the graphs included in the document are useful but the axis and keys are hard to read.

2.1.3.1 Company Response

The Company agrees with the CCW observation.

2.1.3.2 Changes for the Draft Final Plan

The Company will amend the graphs to ensure that the axis and keys are easier to read.

2.1.4 Technical Language - not explained

CCW note the Company uses the technical 'The precautionary principle' without adequate explanation.

2.1.4.1 Company Response

The Company agree that the term requires explanation.

2.1.4.2 Changes for the Draft Final Plan

The Company will amend the Draft Plan to provide an explanation of this term.

2.1.5 Communication Plan

CCW advise that under the Key Public Messages section in the Executive Summary it should be made clear that the bullet point, actions taken to date relate to Company actions. CCW also suggest a further bullet should be included relating to what customers can do to help.

2.1.5.1 Company Response

The Company support these recommendations.

2.1.5.2 Changes to Draft Final Plan

The Company has amended the Draft Final Plan accordingly.

2.1.6 Process for Communicating the Statement of Response

CCW asks for clarification on the process for communicating the Company's Statement of Response to those who have made representations.

2.1.6.1 Company Response

The Company intends to provide a copy of the Statement of Response to all those who made representations. The Statement of Response will set out a clear response to each issue raised by each organisation.

2.1.6.2 Changes to Draft Final Plan

The Company will update the Draft Final Plan so it is clear on how the Statement of Response is communicated to those who made representations.

2.1.7 Bulk Supply to Southern Water

CCW have requested clarification on the condition under which the bulk supply of water from Whiteways Lodge to Southern Water can be suspended.

2.1.7.1 Company Response

The Company notes that the commercial agreement between the two companies allows Portsmouth Water to suspend the bulk supply under a number of conditions. In relation to drought, Portsmouth Water may suspend the bulk supply after giving Southern Water reasonable notice in drought conditions as defined by the Water Industry Act 1991.

2.1.7.2 Changes to Draft Final Plan

The Company will amend the Draft Final Plan to provide further clarity on the operation of the bulk supply.

2.1.8 Drought Management Team Responsibilities

CCW note that the plan does not explicitly give responsibility to any members of the Drought Team for external communications.

2.1.8.1 Company Response

The Company notes that overall responsibility for external communications is the responsibility of the Engineering Director.

2.1.8.2 Changes to Draft Final Plan

The Company has updated the text in the Draft Final Plan so it states that the Engineering Director has overall responsibility for the external communications.

2.1.9 Agencies the Company will seek to Communicate with During a Drought

CCW suggests that Horticultural Trades Association, Age UK, Citizens Advice Bureau and Window Cleaners Trade Associations should be included on the list of agencies the Company would seek to engage with during a drought.

2.1.9.1 Company Response

The Company welcomes the recommendation but notes that the list in the Draft Plan is not an exhaustive list and envisage further additions being made by the Drought Management Team.

2.1.9.2 Changes to Draft Final Plan

The Company will update the list to include the organisations listed above.

2.1.10 Customer Research

CCW would like to know what, if any, customer research was undertaken to inform the Company's Draft Drought Plan.

2.1.10.1 Company Response

The Company did not undertake any specific customer research in preparing the Draft Drought Plan. However, customer research in the past has shown that customers found it acceptable for hosepipe bans to be imposed at a frequency of 1 in 20 years rather than 1 in 50 years. The Company also took part in a working group with other water companies in the South East to agree a common approach to temporary bans. This working group made use of research carried out by other companies.

2.1.10.2 Changes for the Draft Final Plan

The Company will update the Final Draft Plan to provide further clarity on the information considered for the justification of temporary bans.

2.1.11 Concessions to be Permitted

CCW request further details on how the concessions for elderly and disabled residents would be administered and further clarity on what activities would be exempt.

2.1.11.1 Company Response

The Company proposes to write to all of their customers on the special needs register prior to the imposition of a temporary ban informing customers of the exemption. The Company would also publish the exemption on their website and other communications with customers which would enable customers to apply for the exemption. Customers applying for the exemption would be considered on a case by case basis.

The proposed exemption would allow the customers to use a hose or irrigation system as they would do normally, though we would ask customers to apply restraint.

2.1.11.2 Changes for the Draft Final Plan

The Company will update the Draft Final Plan to provide further detail how the concessions will be administered and clarity on what the concessions permit.

2.1.12 Concessions Not to be Permitted

CCW note that our plan has not allowed concessions for small businesses such as window cleaners and an exemption for micro-irrigation systems.

2.1.12.1 Company Response

The Company does not propose to offer exemptions for small businesses such as window cleaners. However, the Company following representations from the Horticultural Trades Associations, has decide to exempt micro irrigation systems from all but the most severe drought scenario.

2.1.12.2 Changes for the Draft Final Plan

The Company will update the Draft Final Plan to reflect its revised position on the temporary bans relating to micro irrigation systems and to provide further information relating to small businesses.

2.1.13 Communications Plan

CCW suggest that the plan would be improved if the Company provided further information on the following points.

- How the Company will coordinate messages and potential implementation of restrictions with the Water Resources in the South East Group
- How the Company will respond to representations
- Details of how the emergency planning arrangements might work if unprecedented conditions are experienced
- How restrictions and concessions will be policed and enforced if necessary

2.1.13.1 Company Response

The Company considers the communications of drought issues to their stakeholders to be key to the success of the Drought Plan and welcome the suggestions made by CCW to improve this aspect of their plan.

2.1.13.2 Changes for the Draft Final Plan

The Draft Final plan will be updated to provide details of the coordination with WRSE, provide further detail of how the Company would respond to unprecedented situations. The Company will also include a further section in the Draft Final Plan outlining how concessions will be policed.

2.2 English Heritage

English Heritage is the Government's Statutory Advisor on the historic environment.

2.2.1 Impact on Historic Environment from Abstraction at the Eastergate Sources

English Heritage note that the plan does not contain any reference to the historic environment in the plan nor how it may be impacted by the proposed drought management actions. English Heritage note that the only potential impact on the historic environment appears to arise from the drought permit at the Eastergate group of sources. This risk arises from the lowering of the water table from increased abstraction at this group of sources, causing 'dewatering' on archaeological deposits, though at present there are no records of any archaeological deposits in the area. English Heritage note they will be able to provide further advice in the future.

2.2.1.1 Company Response

The Company recognises it has not considered the potential impact on the historic environment in the Draft Drought Plan. The information provided on the potential impacts of the drought permit at the Eastergate group is useful and the Company will consider this when deciding on their drought management options.

2.2.1.2 Changes to Draft Final Plan

The Company will update their Draft Final Drought Plan to recognise the potential risk to the historic environment and set out the intention to contact English Heritage as part of the process for applying for a drought permit at the Eastergate group.

2.3 The Environment Agency (EA)

The EA provided the Company with a comprehensive representation which included a summary. The Company has sought to respond to each of the detailed issues rather than those that have been highlighted in summary form.

2.3.1 Scenario Testing

The EA would like Portsmouth Water to consider including a further scenario that demonstrates how Portsmouth Water would manage a multiseason drought and what possible drought permits Portsmouth Water may require.

2.3.1.1 Company Response

Portsmouth Water in their Draft Drought Plan carried out historical analysis based on data going back to 1836. This analysis demonstrates that the scenario 'C' drought included in the Draft Plan is an extreme event with a nominal return period greater than 120 years. However, in response to the EA representation, the Company have considered a further scenario consisting of two dry winters and two dry summers and the required actions necessary to manage this situation.

2.3.1.2 Changes to Draft Final Plan

The Draft Final Plan will include a further scenario of two dry winters and two dry summers and set out the indicative action required to manage the drought.

2.3.2 Habitats Regulations Assessment and Strategic Environmental Assessment

The Environment Agency believes Portsmouth Water's Drought Plan may require an HRA and SEA as the plan lists potential drought permits that may impact Habitats Directive Sites. The EA would like Portsmouth Water to clearly state what drought permit options it would require under normal drought planning scenarios.

2.3.2.1 Company Response

The Company set out in their Plan all the potential supply side options that were considered, this included a number of options that have the potential to impact habitat designated sites. The plan then goes on to set out indicative actions required to manage a drought for the drought scenarios in the plan. The plan indicates that only the most severe scenario requires a drought permit and this permit is proposed to relate to the Eastergate group licence. The Company has also now considered a further scenario as described in section 2.3.1 of this document, the analysis shows the indicative actions required to manage this scenario requires a drought permit at the Eastergate group during the second summer. Therefore the Company believes that under all normal drought planning scenarios that the only drought permit required would relate to the Eastergate group licence.

2.3.2.2 Changes to Draft Final Plan

The Company will update the Draft Final Plan to clearly state that under normal drought scenarios the Company believes that the only drought permit required relates to the Eastergate group licence.

2.3.3 Water Framework Directive (WFD)

The EA state that the Drought Plan does not consider how the potential drought management options may impact WFD bodies.

2.3.3.1 Company Response

The Company recognises that the Environment Agency believes that the Company's abstractions may impact a number of bodies classified under the WFD. The Company is currently studying a number of sites with these studies due to conclude in March 2013, the Company is also aware that the EA is studying a number of sites. Until these studies conclude, the Company believes it is not in a position to make a judgement on the likely impact of abstractions on these water bodies. However when the studies conclude, the Company will review the conclusions and possible implications on managing a drought. This new evidence can then be used in the preparation of the next Drought Plan.

2.3.3.2 Changes to Draft Final Plan

The Company will update the Draft Final Drought Plan to describe how the evidence from the WFD studies will be considered when the studies conclude.

2.3.4 Environmental Assessment

The EA believe the Company has not presented sufficient environmental assessment information to allow drought permits and orders to be 'permit ready'.

2.3.4.1 Company Response

The Company notes that the only drought permit required to manage the drought scenarios outlined in the plan is the permit relating to Eastergate group licence. The Company intends, as set out in Section 2.3.2 of the Statement of Response, to amend the Final Drought Plan to clearly state that none of the other potential drought permits are required under normal drought planning scenarios. The Company will review the environmental monitoring requirements for the drought permit relating to the Eastleigh group.

2.3.4.2 Changes to Draft Final Plan

The Company will amend the Draft Final Plan as stated in Section 2.3.2.2.

2.3.5 Environmental Monitoring

The EA note that Portsmouth Water has only presented environmental monitoring information for Eastergate (Slindon) in its Drought Plan. The EA believes that if other permits are required under normal drought scenarios, further environmental monitoring information is required.

2.3.5.1 Company Response

The Company notes has set out in Section 2.3.2 of the Statement of Response the only drought permit required under the normal drought planning scenarios is for the Eastergate group licence. The Company will provide further information on the proposed environmental monitoring relating to the proposed drought permit for the Eastergate group and how they intend to cooperate with Southern Water.

2.3.5.2 Changes for the Draft Final Plan

The Company will update the Draft Final Plan to provide further information on the Environmental Monitoring to be carried out relating to the drought permit for the Eastergate source.

2.3.6 Potential Derogation

The Environment Agency note that the Company has not fully considered the potential derogation of other abstractions.

2.3.6.1 Company Response

The Company believes that this forms part of the original licencing process and does not need to be re-visited as part of the Drought Plan. Existing abstractions have been provided with free supplies and ponds have been lined to mitigate the impacts of abstraction by Portsmouth Water.

2.3.6.2 Changes to Draft Final Plan

The Company does not propose to make any changes.

2.3.7 Supply Side Options

The Environment Agency note that there are inconsistencies between Appendix B and the main document relating to potential supply side options.

2.3.7.1 Company Response

The Company recognise the inconsistency between the main document and Appendix B. This was an oversight in the preparation of the Plan and these options should have been removed from Appendix B.

2.3.7.2 Changes for the Draft Final Plan

The Company will update the Draft Final Plan and remove the reference to supply side options that are no longer part of the Plan.

2.3.8 Supply Side Options

The EA note that the list of unused commercial boreholes in the plan that have the potential to be recommissioned is out of date. The EA recommend that the list is updated and further information should be included relating to lead in time and potential quantities.

2.3.8.1 Company Response

The Company agree with the EA that it is important to have the most up to date information in the Drought Plan for all potential drought management options.

2.3.8.2 Changes for the Draft Final Plan

The Company have requested further information from the Environment Agency relating to the commercial boreholes listed in the Plan. This updated information will be included in the Draft Final Plan.

2.3.9 Pre-Consultation

The EA note that Portsmouth Water has not made it clear how comments received as a result of the pre-consultation have been included in the Draft Drought Plan. The EA also state that the Plan is not clear if the Company consulted customers and other interest groups on the proposed approach to temporary restrictions.

2.3.9.1 Company Response

The Company recognises that they have not provided detailed information on the responses they received to the pre-consultation undertaken. The Company will provide a summary of the issues raised in the pre-consultation and how they have been taken into account in the preparation of the Plan. In the preparation of the Plan the Company did not undertake any direct customer research, however Portsmouth Water took part in a working group with other water companies with the aim of developing a consistent approach to temporary bans.

2.3.9.2 Changes for the Draft Final Plan

The Company will amend the Draft Final Drought Plan to provide details of the pre-consultation responses received and state how they considered the responses in the preparation of the Draft Drought Plan.

2.3.10 Temporary Restrictions

The EA believe that the Draft Drought Plan does not give details about how the Company will liaise with other companies in relation to temporary bans.

2.3.10.1 Company Response

The Company sets out in Section 5 of the Draft Drought Plan the drought communication strategy, noting that it is not possible to work to a fixed communication strategy since the plan will need to be tailored to meet the needs of the circumstances of the particular drought. The strategy includes communication with other companies to develop a coordinated set of actions, though temporary bans are implicit in this coordination, the Company does not explicitly state this.

2.3.10.2 Changes for the Draft Final Plan

The Company will update the Draft Final Plan to explicitly state that temporary bans will be discussed with other companies as part of the communication strategy.

2.3.11 Demand Management

The EA comment that Portsmouth Water have not set out the assumptions it has made to estimate demand reductions from its drought management options.

2.3.11.1 Company Response

Portsmouth Water note that the Company has not imposed restrictions on their customers since 1976 and as a result, there is no recent Company specific data on the impact of demand restrictions. The Company has used a conservative estimate based on historic data and other data published in the industry. It is also worth noting that the uncertainty inherent in drought management actions is allowed for by including a headroom allowance in the plan.

2.3.11.2 Changes for the Draft Final Plan

The Company will update the Final Draft Water Resources Management Plan to provide further information on the assumptions relating to demand management figures.

2.3.12 End of a Drought

The EA state that the Company has not included in the plan a commitment to discuss and confirm the water situation before declaring that the drought is over.

2.3.12.1 Company Response

The Company, in Section 6 of the Draft Drought Plan, set out the communication strategy which includes communication with EA through the Regional Drought Coordination Group. The Company believes this implicitly covers all aspects of drought communication including the decision of when a drought is over. However, the Company accepts that it would be clearer if this was made explicit.

2.3.12.2 Changes for the Draft Final Plan

The Company will update the Draft Final Drought Plan to explicitly state the Company will discuss with the EA when they are considering stating a drought is over.

2.3.13 End of a Drought

The EA note that the Company has not provided any details on if they intend to undertake a post drought review. The EA are concerned that if the Company do not undertake such a review then lessons may not be learned from a drought.

2.3.13.1 Company Response

The Company agree with the EA that it is important that lessons are learnt from the experience of managing a drought. Although the Plan does not explicitly state this.

2.3.13.2 Changes for the Draft Final Plan

The Company will include a section in the Draft Final Plan giving a commitment to undertake a post drought review.

2.3.14 Representations on Temporary Restrictions

The EA note that the Company has not given any details of how the Company will consider and record any representations on temporary restrictions.

2.3.14.1 Company Response

The Company agrees it is important that customers understand how the Company will consider and respond to any representations made on proposed temporary restrictions. The Company notes that the exact method of response will depend on the number and nature of representations that are made. The Company believe they can set out the potential methods they will use in dealing with a representation they receive.

2.3.14.2 Changes for the Draft Final Plan

The Company will update the Draft Final Drought Plan to include details of the potential methods of communication when responding to representations received on temporary bans.

2.3.15 Drought Communications

The EA note that the Plan does not demonstrate how the Company will monitor the effectiveness of its communication activity during a drought.

2.3.15.1 Company Response

The Company agrees that it is important to monitor the effectiveness of their communication strategy during a drought. The Company believes it is implicit in any communication strategy to monitor the success of the strategy. The Company believes it is not possible to specify how the effectiveness of the communication plan will be assessed as this will depend on what the communication plan is, the exact details of which are only determined in a drought. However, the Company can emphasise the importance of assessing the effectiveness of the communication plan.

2.3.15.2 Changes for the Draft Final Plan

The Company will update the Draft Final Plan to include a commitment to assessing the effectiveness of the communication plan.

2.4 <u>Hampshire County Council (HCC)</u>

2.4.1 Long Term Sustainability of Water Resources

HCC note that the Company has no surface water storage reservoirs and question if this approach is sustainable over the longer term, especially considering the impacts of climate change. HCC go on to note that the predicted impact of climate change in the UK Climate Change Risk Assessment for the water sector notes that by 2050 there may be an impact on the number of sites with sustainable abstractions and advise this risk

assessment is taken into account in the preparation of their next water resources management plan.

2.4.1.1 Company Response

The Company note that they do not have significant raw water storage and are reliant on groundwater sources and one river abstraction, which is also groundwater fed. However, the Company would advise that the Water Resources Management Plan published in September 2011 indicates that Portsmouth Water will be in a position to meet the demand of their customers over the planning period. The Plan includes the development of a winter storage reservoir at Havant Thicket at the end of the planning period.

The Company is currently preparing their next Water Resources Management Plan which will include a detailed assessment on the impact of climate change based on the UKCP9 data.

2.4.1.2 Changes for the Draft Final Plan

The Company will update the Draft Final Drought Plan to provide further information on how the Drought Plan relates to the Water Resources Management Plan and when the Water Resources Management Plan will be updated.

2.4.2 Sustainable Drainage Systems (SuDS)

HCC state it would be useful to understand the potential implications of the Drought Plan on the successful functioning of the SuDS.

2.4.2.1 Company Response

The Company notes that they do not provide services for sewerage and consequently have no responsibility for the functioning of SuDS. The Company has not received any representations from organisations responsible for SuDS which would indicate that the proposed actions on the Drought Plan are unlikely to impact SuDS.

2.4.2.2 Changes for the Draft Final Plan

The Company does not propose to amend their Draft Final Drought Plan.

2.4.3 Communications with HCC

HCC welcome the communication plan from Portsmouth Water which proposes early contact with HCC. HCC see this is very important as they are responsible for a number of crucial services. HCC also think it would be useful to further develop their links with Portsmouth Water.

2.4.3.1 Company Response

Portsmouth Water welcomes the comments relating to the communication plan and reaffirms its commitment to monitoring effective communications with HCC. The Company also welcomes the opportunity to develop further links with HCC and will contact HCC in due course.

2.4.3.2 Changes for the Draft Final Plan

The Company does not propose to amend the Draft Final Plan.

2.5 Horticultural Trades Association (HTA)

The HTA is the leading trade association for the UK ornamental horticultural gardening industry.

2.5.1 Concessions for Temporary Bans

The HTA would like the Company to include two concessions in the Drought Plan for drip irrigation systems and newly laid turf to be watered for a period of 28 days. The HTA sets out the reasons it believes that drip irrigation should be exempted from temporary bans which is, that compared to a hosepipe, they believe the irrigation system is far more efficient. The reason for exempting turf growers is to protect the turf growing and the related industries from the damaging impacts of restrictions.

2.5.1.1 Company Response

The Company recognises the concerns of the HTA to the potential damaging effects that restrictions can have on the Horticultural Trades. The Company has always sought to balance the needs of all of their customers and the environment in developing their Drought Plan.

The Company has carried out further analysis and as a result of this analysis has decided to offer a concession to drip irrigation systems where possible. The Company proposes to offer the concession in a scenario A and scenario B drought. However, the Company would not offer this concession in a more severe drought such as scenario C drought which has a nominal return period of greater than 120 years. If an exemption is offered in the most extreme events for drip irrigation it will require further drought permits that have the potential to impact designated Habitats sites. The Company has recently completed a review of these sites and varied their abstraction licences to protect these sites and believes it is not acceptable to permit an exemption which would result in potential damage to these sites.

The Company has also carefully considered a concession for newly laid turf. However, the Company believes that policing such an exemption would not be practical and therefore has decided not to allow this concession.

2.5.1.2 Changes for the Draft Final Plan

The Company will update the Draft Final Plan to include an exemption on drip irrigation for a scenario A and scenario B drought and explain why no exemption is allowed for the watering of newly laid turf.

2.5.2 Phasing of Temporary Bans

The HTA highlight the benefits they believe that can be achieved from phasing restrictions such as water efficiency, improved customer engagement, corporate reputation and a reduced impact on the economy. The HTA believe that the Company should give further consideration to the phasing of temporary bans.

2.5.2.1 Company Response

The Company understands the potential benefits of phasing restrictions, the Company has given further consideration to the possibility of phasing restrictions. However, analysis has shown that it is not possible to phase restrictions due to the Company having no raw water storage.

2.5.2.2 Changes for the Draft Final Plan

The Company will update the Draft Final Plan to provide further information on how they have arrived at the decision not to phase restrictions.

2.6 London Fire Brigade

2.6.1 Request for Early Consultation

The London Fire Brigade state they have no observations apart from the request for early engagement should any of the proposed drought measures impact the provision of water for firefighting.

2.6.1.1 Company Response

The Company note that none of the drought scenarios considered require drought management actions that have the potential to impact the provision of water for firefighting supplies. The Company believe that it would require an unprecedented event to occur, such as a major pollution event combined with a drought to pose such a risk. In this instance communication would take place with the Fire Brigade under the auspicious of the Emergency Plan.

2.6.1.2 Changes for the Draft Final Plan

The Company will update the Draft Final Plan to provide further information on the risk to the provision of water for fire fighting.

2.7 Natural England

2.7.1 Assessment of Environmental Impacts

Natural England state that it is important to consider the impact of all drought options on Sites of Special Scientific Interest, Special Areas of Conservation, Special Protection Areas and Ramsar Sites. This will allow identification of appropriate mitigation and monitoring measures to protect the designated sites.

Natural England note that the Company has not undertaken an SEA or HRA in support of its Draft Drought Plan. Natural England believe that the Company should demonstrate why it is appropriate not to undertake an SEA and HRA and the plan currently does not do so.

Natural England also note that the Company has considered the environmental impact of the drought permit for the Eastergate group licence but have not done so for other potential drought permits such as the one at Hoe which could impact the Moors SSSI.

2.7.1.1 Company Response

The Company notes that their area of supply includes a significant number of protected sites, the Company took into account the potential impact of drought management options when choosing which of the potential drought management options would be implemented. The Company based this assessment on the evidence collected through numerous environmental studies carried out on the various designated sites.

The Company in their Draft Plan, list a number of potential drought permit options which have the potential to impact designated sites. However, the analysis undertaken by the Company demonstrates that even in the most severe drought scenario the Company only requires a single drought permit to maintain their supplies to customers. The drought permit proposed relates to the Eastergate group of sources, this permit was selected as it is the least likely to impact the environment.

The Company believes that as their proposed drought management options do not impact designated sites that a HRA is not required. However, the Company accepts that a clearer distinction is required between potential drought options that the Company has identified that do not form part of the plan and drought options that may be required to manage a drought.

The Company does not consider that an SEA is required for their Drought Plan as it is an operational plan setting out potential temporary options to manage a drought.

The Company has not carried out further detailed studies of all the potential drought permit options as the plan shows they will not be required to manage a drought.

2.7.1.2 Changes for the Draft Final Plan

The Company will update the Draft Final Plan go give further details on the screening process used to prioritise the drought permits.

The Company will also make it clear that the plan only proposes one drought permit relating to Eastergate Source and the other potential drought permits do not form part of the plan.

The Company will also provide further detail in the Plan explaining why it believes a HRA and SEA is not required.

2.7.2 HRA/SEA Screening

Natural England note as a minimum they would expect a screening exercise to be undertaken in the Drought Plan to demonstrate compliance with Habitats Regulations. This process should include which designated sites are linked to which options and the inclusion of a map to demonstrate this would be useful.

2.7.2.1 Company Response

The Company undertook a screening exercise similar to that outlined to Natural England to inform the selection of drought management options. However, the Company accept that this was not described in the Draft Drought Plan in sufficient detail to give stakeholders confidence that we had taken account of the potential impact of drought options on designated sites. The Company accepts that they need to provide evidence of the process undertaken to identify appropriate options.

2.7.2.2 Changes for the Draft Final Plan

The Company will amend the Draft Final Plan to provide further details on the screening process undertaken.

2.7.3 Prioritisation of Drought Options

Natural England note that it is not clear how the Company have considered the designated sites when considering the prioritisation of drought options in the Drought Plan.

Natural England also note that environmental impacts of drought options vary throughout the year. Natural England encourage the Company to consider the timing of each individual drought permit to minimise the environmental impact.

2.7.3.1 Company Response

The Company in reviewing the potential options considered the potential impact of drought permits on designated sites. However, we accept that the details of this process were not clearly set out in the Draft Drought Plan and this is required for stakeholders to be confident that we have assessed the options appropriately.

The Company agree with Natural England that the potential impact of drought permits on the environment varies through the year. The Company notes in the case of Portsmouth Water the critical period for the environment tends to be the Autumn during the lowest groundwater levels. The Company again considered this aspect when developing their drought management options. However, we did not provide details of this in our Plan. The Company agree that it would be useful to include this detail in the Plan.

2.7.3.2 Changes for the Draft Final Plan

The Company will update the Draft Final Plan to include details of how the timing of drought permits have been considered and the impact of drought permits on designated sites.

2.7.4 Monitoring

Natural England state they would like the Company to provide the monitoring Company intends to undertake at each designated site.

2.7.4.1 Company Response

The Company note that they have included some detail on the proposed monitoring for the drought permit relating to the Eastergate source. The Company accepts that they need to provide further clarity in the Plan that the other potential drought permits do not form part of the Plan. The Company will also review the monitoring information provided relating to the Eastergate drought permit.

2.7.4.2 Changes for the Draft Final Plan

The Company will update the Draft Final Plan to reflect any further monitoring requirements for the Eastergate group and as stated previously to provide further clarity on the drought permits which are not part of the Plan.

2.7.5 Liaison with Natural England

Natural England state they welcome the opportunity to work with Portsmouth Water on drought management and planning. Natural England recommend that the Drought Plan outlines how Portsmouth Water will liaise with Natural England.

2.7.5.1 Company Response

The Company agrees that it is important that we work with Natural England in the development of drought management options that have the potential to impact the environment.

2.7.5.2 Changes for the Draft Final Plan

The Company will update the Draft Final Plan to include details on how they propose to liaise with Natural England.

2.8 West Sussex County Council (WSCC)

2.8.1 Communications Strategy

WSCC note that they believe there is benefit in establishing a multi-agency approach to demand reduction and communications strategy.

2.8.1.1 Company Response

The Company support a multi-agency approach to communications strategy and note in their Draft Plan they refer to their collaborative approach to communicate with other agencies. This identifies a list of organisations that the Company would envisage working with, though this list is not intended to be exhaustive.

2.8.1.2 Changes for The Draft Final Plan

The Company will update the Draft Final Plan to explicitly include WSCC in the list of organisations they would work with to develop a communications strategy.

2.8.2 Emergency Drought Order - Supply Strategy

WSCC would like further detail provided in the Plan on the emergency deployment of bowsers and standpipes.

2.8.2.1 Company Response

The Company recognise the importance of detailed planning to maintain water supplies in an emergency situation and those actions are detailed in our Emergency Plan. The Company notes that the Drought Plan demonstrates that none of the emergency measures that WSCC outline are required to manage any of the drought scenarios in the Plan. However, the Company believes that it would be useful to stakeholders to give a full explanation of this matter in the Plan.

2.8.2.2 Changes for the Draft Final Plan

The Company will update the Draft Final Drought Plan to provide further clarity on the relationship between drought and emergency plans.

2.8.3 Identify Vulnerable

WSCC state that the Plan should describe the strategies used to identify vulnerable people and reflect the demographic changes of the increasing number of elderly/vulnerable people.

2.8.3.1 Company Response

The Company maintains a special needs register which is a log of vulnerable customers. This document will be used to identify vulnerable customers so the Company can put in place the necessary actions to ensure customers are protected. The Company, as part of their communications strategy, will seek to work with various organisations which will advise the Company on how to protect vulnerable customers.

2.8.3.2 Changes to Draft Final Plan

The Company will revise the Draft Final Plan to provide further details of the strategies used to identify and protect vulnerable customers.

2.8.4 Interaction of Water Sources

WSCC request that further information be provided regarding the interaction of water sources and especially where hydrologically linked.

2.8.4.1 Company Response

The Company notes that due to improved connectivity between various sources the Company now has a single water resource zone rather than three the previous Plan was based on. This improvement provides greater operational flexibility increasing the ability of the Company to maintain supply in the event of a loss of a supply site. The Company also advises that the amount of detail relating to individual sources that is placed in the public domain, is restricted on grounds of national security.

2.8.4.2 Changes for the Draft Final Plan

The Company will update the Final Draft Plan to provide a more detailed explanation of the single supply zone and the implications for drought planning.

2.9 Department for the Environment, Food and Rural Affairs (Defra)

Defra wrote to the Company in September 2012 advising that further information was required before Defra could recommend to the Secretary of State that the plan should be published. The letter set out the details of where this further work was required. The Company has undertaken further work to address the concerns set out in the letter from Defra.

The issues raised by Defra are detailed below along with the response set out by the Company.

2.9.1 Environmental Monitoring

Defra requested that the Company provides evidence that we have adequately addressed environmental monitoring requirements for HRA and SEA and provide the further information and level of detail undertaken to provide in the Statement of Response. This should include details of the process used to prioritise permits.

2.9.1.1 Company Response

The Company recognises the importance of environmental monitoring and that the HRA and SEA process is an integral part of the drought planning process. However, as our Drought Plan does not set out a framework for future developments as stated by Natural England when setting out the regulatory background for the SEA process, an SEA was not carried out for the Drought Plan.

The Company has considered the environmental monitoring required for the potential implementation of their drought permit and detailed the screening process involved in selecting this permit.

2.9.1.2 Changes to the Draft Final Plan

The Company will update the Draft Final Plan to provide further evidence of the assessment of environmental monitoring and provide further detail of the screening process used.

2.9.2 Identification of Water Bodies potentially affected by Eastergate Permit

Defra requested that the Company should identify the water bodies which may be potentially affected by the Eastergate drought permit option and describe their current status and assess whether the drought permit is likely to cause a deterioration in status.

2.9.2.1 Company Response

The Company realise that it is important to identify which bodies could be potentially affected by the Eastergate drought permit and to outline their current status. Although a drought permit at this source is unlikely to cause a deterioration in status, the Company are committed to working with Southern Water with regards to the potential impacts caused by this drought permit.

2.9.2.2 Changes to the Draft Final Plan

The Company will update the Draft Final Plan and include a map of the water bodies which could potentially be affected by the drought permit and identify the current status of these water bodies. Further details will also be provided with regards to assessing the potential deterioration in status.

2.9.3 Potential Derogation

Defra request that the Company consider the potential derogation associated with the supply side options including the Slindon sources and unused commercial boreholes.

2.9.3.1 Company Response

The Company realises the importance of derogation to prevent any damage to the environment and derogation was considered when application for the licence was carried out. People with concerns had the opportunity to make their concerns known and mitigation measures such as lining of ponds had been carried out.

2.9.3.2 Changes to the Draft Final Plan

The Company will update the plan to make more explicit the fact that derogation measures have been considered.

2.9.4 Identification of lead in times for recommissioning boreholes

Defra request that the Company identify the lead in times for recommissioning boreholes and provide information on the quantities of water expected to be obtained from them.

2.9.4.1 Company Response

The Company realises that it has not explicitly detailed the lead in times for recommissioning these unused boreholes, however it is difficult to quantify this as investigations by the DWI and temporary plant installation can make these lead times vary. The Company have stated estimates for the potential yields of these sources but as they remain largely untested this is another aspect which is difficult to quantify. The Company also notes that the commercial boreholes are included as potential options but are not expected to form any part of the drought management options.

2.9.4.2 Changes to Draft Final Plan

The Company will update the Draft Final Plan to include estimates of lead times for the potential recommissioning of unused boreholes.

2.9.5 Addressing of Monitoring Requirements

Defra request that evidence is provided that monitoring requirements have been adequately addressed in relation to drought permits and that further information is provided for the Eastergate group.

2.9.5.1 Company Response

The Company realises the importance of outlining the environmental monitoring requirements needed for the Eastergate licence and have included these details. Appendix B discusses a wide range of monitoring requirements to be implemented should the permit be applied for.

2.9.5.2 Changes to Draft Final Plan

The Company will update the Draft Final Plan to discuss further the monitoring requirements needed for the Eastergate licence and reiterate the fact that these requirements are included in the relevant appendix.

2.9.6 Identification of Droughts and Approvals for Drought Measures

Defra requested that the Company identify the permits and approvals that may be needed to implement drought measures and show the potential constraints, such as access to land, have been considered.

2.9.6.1 Company Response

The Company notes that the only drought permit to be considered would be the Eastergate permit, then the Company will apply for the correct permits and approvals if necessary. Constraints such as access to land are not an issue as we own the land for which drought measurement actions are identified. However, in terms of making use of commercial boreholes we would need to seek the necessary permissions if necessary, though again the Company does not require any commercial boreholes in any of the drought scenario.

2.9.6.2 Changes to Draft Final Plan

The Company will update the Draft Final Plan to discuss the constraints such as access to land which may affect the drought management actions.

2.9.7 Mitigation against adverse impacts on the Environment

Defra want the Company to provide more detail on the measures that may be needed to mitigate any adverse impacts on the environment from the options and permits or approvals that may be needed to implement these measures.

2.9.7.1 Company Response

The Company recognises that it is important to identify these measures that may be needed to mitigate any adverse impacts on the environment. These measures are detailed in an appendix relating to environment monitoring related to the drought management options.

2.9.7.2 Changes to Draft Final Plan

The Company notes that the Draft Final Plan has been updated and details these measures in Appendix C.

2.9.8 Working with the Agricultural Sector

Defra would like the Company to show how they have addressed representations of West Sussex County Council regarding strategies to work with the agricultural sector.

2.9.8.1 Company Response

The Company recognises the importance of working with the agricultural sector during a drought situation as they are large users of water and the Company will endeavour to engage with important stakeholders such as the National Farmers Union to agree early and measured reductions in demand and so will be added to the list of customer affected by drought measures.

2.9.8.2 Changes to Draft Final Plan

The Company will update the Draft Final Plan to discuss early engagement with the National Farmers Union should drought measures need to be implemented.

3 NEXT STEPS

The Company will submit this Updated Statement of Response to the Secretary of State for the Department of Food and Rural Affairs on the 21 December 2012.

A copy will also be published on the Company website. A copy will also go to each organisation who made representations to Defra on the Company's Draft Drought Plan.

The Company has also published a draft Final Drought Plan alongside the Updated Statement of Response which incorporates the changes highlighted in this Updated Statement of Response.

The Secretary of State will consider Portsmouth Water's response to the letter sent in September setting out areas where further work is required.

The Secretary of State will then advise Portsmouth Water to either publish the plan, provide further information to the Secretary of State on the plan or that an examination in public will be required.

ANNEX A

CCWater comments on Portsmouth Water's Draft Drought Plan

General

Other companies have produced a customer friendly summary version of their plan which highlights why this consultation is important for customers to take note of (we recognise that this is because it was a more immediate prospect) but may encourage more engagement.

Your document could be a bit off putting as even the Executive Summary takes until Page 8/9 to mention the bits that have direct impact on customers and then only in general terms.

The Executive Summary, particularly Pages 5 and 6 references the historic data used for modelling purposes and how you have included worse than experienced scenarios based on historic extremes. However on Page 8 (monitoring Drought Impacts) you acknowledge that Climate Change may have an impact on the nature of drought but don't appear to consider this further. It could give the impression that the Plan or the company has not considered unprecedented conditions like the "third dry winter" etc. On Page 28 you conclude that longer droughts "..would be managed by the use of additional powers as part of a National Emergency." No indication is given of what this might entail. It begs a number of "what if" types of question.

The graphs are helpful but quite small so the axis and keys are hard to read.

Executive Summary

Page 8, Monitoring Drought Impacts: Not sure what the second para actually means. The precautionary principle is not explained so could do with clarification. We presume that you are referring to the need to balance the provision of public supplies with the impact abstraction is having on the environment.

Page 10, Key Public Messages: Would suggest 2nd bullet should be "by the company" and a fifth bullet should be added to say – What customers can do to help

Main Plan

Page 12, 1.3 Will you provide individual responses to those who have made representations or just point them to your statement of response?

Page 15, last paragraph of 1.6 – do the extreme conditions apply to you or Southern and what is the definition of "extreme"?

Page 28. See comments above about 3rd dry winter and National emergency.

Page 30, Drought Management Team - Who has the responsibility for External Communications?

Page 31, 3.2.3 - This should include other trade bodies like HTA and window cleaners etc who you acknowledge will be impacted when you cover concessions later. Also Age UK and CABx.

Page 33, 3.3.2.1, Para 1: Did you ask your customers this question? Did you do any research in relation to concessions and exemptions?

Page 34, 3.3.2.3 – How would this work? We would like more details. Does the term "hose" mean a hand held hosepipe or a hose adapted for irrigation at ground level?

Page 34, 3.3.24 – You have chosen not to give concessions for small window cleaning businesses etc. As they were not on your list of consultees have they made representations? You will be aware that the companies that have already announced TUBs have now aligned their plans for implementation to allow certain small businesses to continue during the first stage of drought. Is this something you are now considering?

Micro irrigation is also not permitted in your plan but now generally included in exemptions by other companies. Are you basing your view that it leads to over watering on any research you can point us to, or an absence of conclusive supporting evidence that it is more efficient?

Communications Plan

You don't mention specifically the WRSE Group/coms team and coordination not only of messaging but also on potential implementation of restrictions.

Page 53, Key messages, as before add fifth bullet: what customers can do to help.

Page 54, 5.24: Could go on to explain how you will deal with representations.

Page 55, 5.4 You have given no details of your emergency planning arrangements, not even the key principles so this gives limited reassurance to the reader. Where are the "most severe actions" outlined?

Missing

How will restrictions, and concessions be "policed" and if necessary enforced.

APPENDIX G

SUMMARY OF CHANGES

SUMMARY OF CHANGES TO REPRESENTATIONS MADE TO THE DRAFT FINAL DROUGHT PLAN 2011.

1.0 Introduction

This document accompanies Portsmouth Waters Statement of Response as required in Section 38B of the Water Industry Acts as introduced by the Water Act 2003 to serve as a reference to the representations made by organisations to the companies Draft Drought Plan which was published for consultation between Friday 27 January 2012 and Friday 9th March 2012. In order to respond to each individual representation by the eight organisations, the topic of representation is outlined with a response from the company and the amended text within the Draft Final Plan. Portsmouth Water intend on sending a copy of its Draft Final Plan to the Secretary of State incorporating the changes highlighted for publication as the Final Drought Plan 2012. All responses to representations are clearly outlined in a table at the end of the document.

2.0 Response to Individual Representations

2.1 Consumer Council for Water (CCW)

2.1.1 Accessibility of Document

A Customer Friendly Key Points Summary has been produced as a separate document to accompany the final Draft Plan to make it more readily accessible to the public (Can be found attached).

2.1.2 Impacts of Climate Change and Unprecedented Conditions

Section 2.5.2 relating to multi season droughts has now been updated to clarify that the company has used climate change data to date and that the Environment Agency guidance states that future climate change impacts are excluded from the plan. It also reiterates that the Company have considered drought scenarios which are more extreme than previously encountered and how emergency plans will be used in the event of an unprecedented situation.

The Company believes that the use of the last thirty year record for determining long-term averages will ensure that recent climate change effects will be recognised in its modelling rather than using much longer records which might not be representative of current climate conditions to date.

The Drought Plan is an operational document and is regularly updated. Future climate change impacts are specifically excluded from the plan in the guidance produced by the Environment Agency.

The Company has developed four different scenarios for multi-season droughts, three of which are more critical than have been experienced in the last 176 years. Portsmouth Water have considered drought scenarios which are more extreme than have been experienced to date (Scenario D) and has set out indicative measures of how this drought could be managed. Emergency planning will be used if the company experienced an unprecedented event such as loss of a major treatment works from a pollution incident, combined with an extreme drought.

2.1.3 Presentation of the Graphs

The graphs will be amended so that the axes and keys are easier to read. The graphs have also been expanded to a full page to aid with this (Appendix I).

2.1.4 Technical Language – not explained

The section related to monitoring drought impacts in the executive summary has been updated so as to use better language than the 'precautionary principle' and now refers to protecting the environment.

It may not be possible or politically acceptable to always protect the environment during extreme droughts. A balanced view will need to be taken, taking into account the statutory duties to supply water for public health.

2.1.5 Communication Plan

The bullet points in the executive summary have been updated so they now include the actions taken by the company and what the customers can do to help and reads as;

- *The actions taken by the company to date*
- *The actions customers can undertake to help*

2.1.6 Process for Communicating the Statement of Response

This document provides the process in which we communicate the changes made to our plan in response to the statement of representations. It outlines the representation made and a clear response to each issue raised by each organisation (which will appear as Appendix G). This has also been made clear in paragraph 1.3 relating to new legislation.

The new legislation includes a requirement to consult with customers on demand management measures. The Industry has produced a Code of Practice and Guidance on Water Use Restrictions. This Draft Plan sets out the proposed measures and customers are encouraged to comment on these proposals. Following the receipt of representations on this Draft Plan, a Statement of Response will be prepared and the Draft Final Plan will be submitted to the Secretary of State. A copy of the Statement of Response will be sent to each of the Consultees as will a document of the changes made as a result of the Statement of Response, which can be found in appendix G. Following directions from the Secretary of State the Final Plan is likely to be published in 2012.

2.1.7 Bulk Supply to Southern Water

More clarity has been given in section 1.6 on the condition of the bulk supply of water from Whiteway's Lodge to Southern can be suspended and it reads as follows*;*

Following the imposition of Temporary Bans Portsmouth Water will inform Southern Water of its plans to apply for Drought Permits. It will provide Southern Water with reasonable notice that the Bulk Supply will be suspended when the Drought Permits are implemented in drought conditions as defined by the Water Industry Act 1991

2.1.8 Drought Management Team Responsibilities

The engineering director is responsible for external communications and this has been made explicit in the communication section of the plan.

2.1.9 Agencies the Company will seek to communicate with During a Drought

The Horticultural Trades Association, Citizens Advice Bureau and Window Cleaners Trade Association have been added to the list of agencies the company will seek to engage with during a drought. The National Farmers Union has also been added to the list as a result of a representation made by the West Sussex County Council and made prevalent by DEFRA.

- *Environment Agency*
- *Natural England*
- *English Heritage*
- *Local Authorities, including residential care homes*
- *West Sussex County Council*
- *Hampshire County Council*
- *OFWAT*
- *Consumer Council for Water*
- *Health Authorities*
- *Police*
- *Fire Authorities*
- *Representative bodies such as CBI NFU HTAChambers of Trade & Commerce*
- *Age UK*
- *Hospitals*
- *Schools*
- *Special needs customers*
- *Customers generally*
- *Horticultural Trades Association*
- *Citizens Advice Bureau*
- *Window Cleaners Trade Associations*
- *National Farmers Union*

2.1.10 Customer Research

The paragraph relating to customer research has now been updated to make the fact that no customer research was undertaken and that taking part in the working group with water companies in the South East is more explicit.

Although no customer research was undertaken for this plan, research for the 2009 Business Plan (see Appendix H) showed that customers accepted the need of hosepipe bans and were prepared to have them imposed more frequently. Portsmouth Water has reduced its level of service for restrictions from 1 in 50 to 1 in 20 in line with these findings. Portsmouth Water also took part in a working group with other water companies in the South East to agree a common approach to temporary bans, making use of research carried out by other companies.

2.1.11 Concessions to be permitted

The paragraph relating to concession for elderly and disabled residents has been updated to reiterate that customers can apply for exemption, that restraint must be used when watering and how exemption cases are considered.

Concessions will be permitted for elderly and disabled residents based on Portsmouth Water's Special Needs Register or by written application. Portsmouth Water will write to all those on the register to explain the situation. This information will also be published on the website and other communications with customers would enable customers to apply for exemption. The concession will be for that residence only and will be for the use of a hose (both handheld and adapted for irrigation) for watering plants and gardens but not lawns, though we would ask customers to apply constraint. Application can be made in

advance to go on the register. Customers applying for this exemption will be considered on a case by case basis.

2.1.12 Concessions not to be permitted

The paragraph relating to concessions not to be made has been updated to allow for the use of micro irrigation systems and that no concession is to be made for small businesses such as window cleaners.

Following representations from the Horticultural Trades Association (HTA) Portsmouth Water has decided to allow the use of micro irrigation systems in a drought. These must be fitted with a pressure reducing valve and a timer and not handheld and are exempt from all but the most severe drought scenario.

*Concessions will **not** be permitted for small businesses such as window cleaners.*

2.1.13 Communication Plan

The paragraph in section 5.1 relating to the communications strategy has now been updated to discuss how Portsmouth Water will liaise with Water Resources in the South East.

Key to the success of the communications strategy will be regular interaction with Water Resources in the South East communications group to coordinate messages and to discuss the potential implementation of restrictions.

The section on 3.3.2 has been previously updated to allow for how representations will be dealt with, this has been further reiterated in section 5.2.4.

Representations to the temporary ban are outlined in section 3.3.2, to reiterate, any representations made on temporary restrictions will be recorded and the exact method of response will depend on the number and nature of representations that are made.

The last section on emergency planning in 5.4 has been updated to state that the details of the emergency plan are set out in separate documents.

Portsmouth Water's Emergency Plan is principally designed to handle short-term extreme events. Detailed planning to maintain water supplies in an emergency and actions are detailed in the Emergency Plans which due to national security reasons cannot be in the public domain but are easily accessible to the Company should such an issue arise*. The key principles incorporated in the Emergency Plan would be utilised for managing the most severe actions outlined in this Drought Plan. The guidance for preparing the Drought Plan states that the drought management actions should include "Emergency Drought Orders". For Portsmouth Water Emergency Drought Orders are only likely to be required for the most extreme events (greater than 1 in 200 year return period). They are most likely to be used as part of an emergency plan when a drought is combined with a pollution incident or the loss of a large works.*

Finally a new section on policing of temporary bans has been introduced to discuss how temporary use bans will be policed and the repercussions for fleeting these bans.

3.3.2.6 <u>Policing of Temporary Bans</u>

Although policing of temporary bans will be difficult and has not generally been discussed in past Drought Plans, the Company have considered some options of policing temporary bans and will require co-operation from customers, and observations from Portsmouth Water operational staff. Although a penalty could be issued of £1000 (level 3 of the standard scale of fines as outlined in section 32 of the Criminal Justice Act 1982), the response to those who have flouted the temporary ban will be one of education of the public to ensure they are

aware of the current water resources situation and of peer pressure to follow the temporary restrictions whilst they are in place. Further details of which are found in the Flood and Water Management Act 2010.

2.2 English Heritage

2.2.1 Impact on Historic Environment from Abstraction at the Eastergate Sources

The paragraph relating to the Eastergate sources has been updated to make an allowance for the potential impacts on the historic environment.

It should be recognised that this drought permit could pose a potential risk to the historic environment as lowering the water table from increased abstraction at this group of sources may cause 'dewatering' on archaeological deposits, though at present there are no records of any archaeological deposits in the area. English Heritage notes that they will be able to provide further advice on this matter in the future. Portsmouth Water intend on contacting English Heritage as part of the process for applying for a drought permit at the Eastergate group.

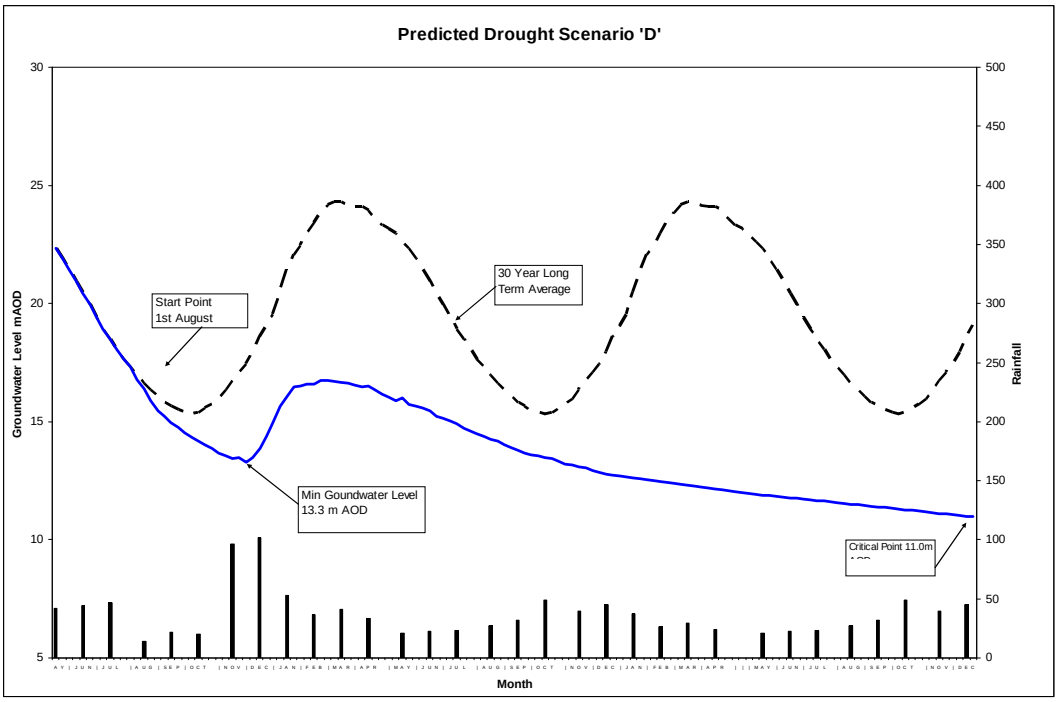
2.3 Environment Agency

2.3.1 Scenario Testing

In response to the point made by the Environment Agency regarding considering two dry winters and two dry summers and the required measures necessary to manage this scenario, Portsmouth Water have developed another scenario, Scenario D and included this in the plan.

Scenario "D" Drought (1 in 200)

Following drought conditions in some parts of the country in 2011 the Environment Agency expressed concerns about a third dry winter. Portsmouth Water has covered the prospect of two dry winters in Scenarios "A", "B" and "C". Scenario "D" extends Scenario "A" into a third year with very low rainfall.



Scenario "D" is based on 1972-1974 when a dry autumn was followed by a dry year with 70% of LTA rainfall. Instead of recovering in the spring this scenario assumes that a further dry year with 70% of LTA rainfall follows. As explained in Section 2.5.2.2 the slope of the recession reduces as the level falls. Scenario "D" predicts that groundwater levels could fall to 11.0m AOD which is 1.7m lower than the lowest ever recorded in 1973.

This scenario has a return period in excess of the length of the groundwater record and has been nominally set at 1 in 200. As shown in Section 2.5.3 three year "dry" periods have occurred in the groundwater record but not three year "droughts".

Scenario 'D' Indicative Drought Management Actions

As outlined in Section 2.5.3.1 the Environment Agency has asked water companies to consider very rare three year droughts. Scenario 'D' is based on Scenario 'A' but with the groundwater recession extended into a third year with very low rainfall.

Portsmouth Water would already have been working closely with the Environment Agency and other stakeholders, during the first two years of the drought. By the spring of the third year the Drought Management Team would be publicising the prospects of a third dry summer. This would involve the extension of the existing temporary bans and the removal of some concessions.

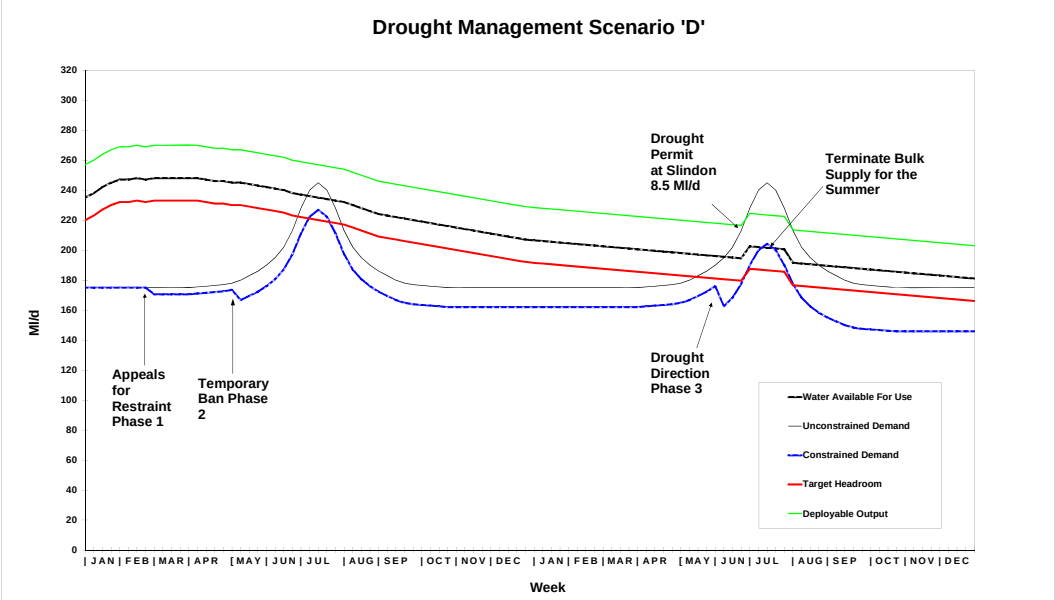
By the end of May the danger of rising demand would require the introduction of the full Drought Directions. These would impact on commercial customers such as window cleaners, gardeners and vehicle washers (see Section 3.3.3.1). Portsmouth Water thinks that in the third year of a drought the response to a Drought Direction would be a 10% reduction in demand.

With lower groundwater levels than ever recorded before and lower yields, it might be necessary to apply for a Drought Permit for the Slindon source. This would produce an additional 8.5 Ml/d of supply for a short time during the critical period of June and July.

As with previous scenarios it would be for the Drought Management Team to make the appropriate decisions as the drought develops. The possible phasing of drought measures in a Scenario "D" drought are as follows:

Phase	***Drought Measure***	***Timing***
1	*Appeals for restraint and enhanced leakage control*	*End February*
2	*Imposition of a Temporary Ban*	*End April*
3	*Application for a Drought Order and Permit but without the need to implement them*	*End March*
4	*Continuation of the Temporary Ban and imposition of Drought Directions*	*End May (Third Year)*
5	*Implementation of Drought Permit at Slindon*	*Mid June*
6	*Potential termination of the bulk supply to Southern Water*	*Mid June*

The graph below shows the lower drought yields predicted for the exceptionally low groundwater levels. This scenario is assumed to have a return period of around 1 in 200 years. With no historical data to base the yields on this graph is highly uncertain. It only represents an indication of what the Company might do under the influence of a severe drought.



As demand falls the output of Slindon would be reduced but it would not be prudent to remove demand restrictions until groundwater levels rose above the upper trigger profile.

The Environment Agency groundwater model will help to predict what the source yields will be at the end of a three year drought. The results will be uncertain because there is not a direct link between rainfall levels and spring yields. The pattern of rainfall is as important as the annual averages for groundwater levels.

2.3.2 Habitats Regulations Assessment and Strategic Environmental Assessment

The paragraph relating to the drought permit for the Eastergate licence has been updated to indicate that it will only be necessary during a severe drought scenario and will be the only permit potentially required.

Only in the most severe drought scenario (Scenarios C and D) require a drought permit. A Drought Permit could be considered to enable the licence limit to be exceeded. Although abstractions from some of the Eastergate Group sources are believed by the Environment Agency to impact upon Swanbourne Lake at Arundel, it is essential to bear in mind that a Drought Permit application would only be made in severe drought conditions when the Lake is already likely to be empty, and thus irrespective of any water path between the lake and the aquifer, there is unlikely to be additional effect on the water environment. Environmental monitoring requirements are set out in Appendix C.

Paragraph 3.5.4 indicates the actions required to manage a Scenario D drought, stating increasing the licence at the Eastergate source and this is the only source for which the licence will be increased under a drought permit.

With lower groundwater levels than ever recorded before and lower yields, it might be necessary to apply for a Drought Permit for the Slindon source. This would produce an additional 8.5 Ml/d of supply for a short time during the critical period of June and July The *Slindon source will be the only source for which a drought permit will be required during a severe drought.*

2.3.3. Water Framework Directive (WFD)

The paragraph in section 1.8 relating to WFD bodies has been fully updated to identify that WFD water bodies are being studied by Portsmouth Water and the Environment Agency and that the studies will not be completed until March 2013. It also states that until then the company are in no position to judge whether WFD bodies will be impacted by a drought and can make better judgement for this in preparation for the next Drought Plan.

Post Implementation Monitoring (PIM) and further studies for the Water Framework Directive (WFD) are being carried out by Portsmouth Water and by the Environment Agency. These could influence future Drought Plans but they do not represent an Appropriate Assessment under the Habitats Regulations. The Drought Plan is an "operational" plan and Portsmouth Water does not consider that a Habitats Regulation Assessment (HRA) is required. The Company considers that the conditions in the abstraction licences are already sufficient to protect the designated sites. The studies are due to be completed in March 2013 and until then; the company is not in a position to conclude what the likely impact of abstractions on these water bodies are. However, once the studies have concluded, the Company will review the conclusions and possible implications on drought management and will use the new evidence in the preparation of the next Drought Plan.

2.3.4. Environmental Assessment

Reply refers to reply in section 2.3.2. and makes reference to appendix C whish sets out environmental monitoring requirements relating to the Slindon permit.

2.3.5. Environmental Monitoring

The section relating to environmental monitoring has been updated to identify potential issues relating to Swanbourne Lake and the proposed joint studies with Southern regarding this water body. It also states the environmental monitoring taking place with regards to the Slindon Source.

It should be noted that Southern Water's Madehurst source is also perceived to have an impact on Swanbourne Lake. Portsmouth Water has proposed joint studies to identify the Environmental Issues surrounding the water body. These studies could include:

- *Groundwater & Surface Hydrology*
- *Water Quality*
- *Biological Receptors*
- *Designated Habitats*

The modelling and, ecological work will determine if abstraction when Swanbourne Lake is dry has no further impact on the qualifying features.

Appendix B and C of the Companys Drought Plan clearly states the environmental issues related to the Slindon source and the existing monitoring taking place and other monitoring options. Co-operation with Southern is needed on this. Although according to Environment Agencies South East Drought Plan of July 2011, the Appendix H – Drought permits and orders section states that a drought permit for the Eastergate group licence will only be required in a severe drought when Swanbourne Lake is already likely to be empty and thus irrespective of any water path between the lake and the aquifer, therefore there is not expected to be any effect on the water environment.
However, the concerns are on the potential delay in recovery of Swanbourne Lake, the monitoring set out in the appendices will help to determine this

2.3.6. Potential Derogation

The Company believes that potential derogation of other abstractor's forms part of the original licensing process and does not need to be re-visited as part of the Drought Plan. Existing supplies have been provided with free supplies and ponds have been lined to mitigate the impacts of abstraction by Portsmouth Water. So the Company has not proposed any changes to the Drought Plan.

2.3.7. Supply Side Options

The Appendix B has been fully updated and the supply side actions which are no longer part of the plan have been removed.

2.3.8. Supply Side Options

A new paragraph has been added to section 3.4.4 regarding the use of commercial boreholes (for which there is only one). The EA have been contacted regarding the commercial boreholes listed in the plan and the updated information will be included in the Draft Final Plan.

There is also a commercial borehole at Southwick Estates which can supply 0.1137Ml/day which could also be considered. Other commercial boreholes have existed in the past but have since been back filled to make way for future developments. Permission would have to be sought from the site owners and therefore any derogation associated with this source can then be mitigated against. Water quality investigations would also need to be undertaken and this can take up to 3 months by the DWI. Possible constraints, such as access to land are to be considered when permission to potentially use this source has been sought.

2.3.9 Pre-Consultation

A table has been included which refers to responses as a result of the pre-consultation process and reference has been made to the incorporation of these comments into the Plan.

Organisation	***Point to take into account***
DEFRA	• *Give consideration to the phasing of temporary bans and priorities for saving water* • *Types of concessions made* • *Plans for communicating to stakeholders, customers and working with other water companies* • *The handling of representations made when giving notice of restrictions*
OFWAT	• *Set out clearly what a drought is and what the management steps are* • *Set out the levels of service with regards to temporary use restrictions on customers* • *Demonstrate the proposed drought management actions to strike a balance between meeting customers needs and protecting the environment* • *Set out the companies liabilities for compensation associated with drought permits* • *Take the impact of drought permits on our bulk supply agreements into account* • *Make the plan easily accessible to customers* • *Include OFWAT in the communications plan*

Environment Agency	• *Decide if an SEA is required if any of the drought management actions have an impact on a Habitats Directive site* • *Incorporation of the Flood and Water Management Act 2010* • *Inclusion of all possible options for drought permits and the order in which they would be implemented* • *Inclusion of the post drought actions intended to be used*
Natural England	• *Habitats Regulations* • *Strategic Environmental Assessment (SEA)* • *Sites of Special Scientific Interest (SSSIs)* • *Biodiversity and Protected Species* • *Communications Plan*

A more detailed description of the requests made by the organisations who were contacted for the pre-consultation can be found in Appendix D and all points have been considered when writing the Plan.

This document provides a summary of the issues raised as a result of consultation and how they have been taken into account in the preparation of the final plan.

Once the Draft Drought Plan was written, this was then sent for consultation as a requirement by Section 39B of the Water Industry Act 1991, as introduced by the Water Act 2003 and a Statement of Response to the representations made can be found in Appendix F, while the individual consultation responses can be found in Appendix E.

The paragraph relating to justification of a temporary ban now clearly states that no customer research was undertaken, however the Company took part in a working group with other water companies to propose a clear approach to temporary bans.

Although no customer research was undertaken for this plan, research for the 2009 Business Plan (see Appendix H) showed that customers accepted the need of hosepipe bans and were prepared to have them imposed more frequently. Portsmouth Water has reduced its level of service for restrictions from 1 in 50 to 1 in 20 in line with these findings. Portsmouth Water also took part in a working group with other water companies in the South East to agree a common approach to temporary bans, making use of research carried out by other companies.

2.3.10 Temporary Restrictions

Section 5 has been updated to include communication with other water companies to develop a co-ordinated set of actions and to discuss temporary bans.

The communication strategy includes liaising with other water companies to develop a coordinated set of actions, including actions on temporary bans. It is important to measure the effectiveness of the communication strategy, however this will depend on what the communication plan is as the exact details are only determined during a drought. Nonetheless, the success of the communication strategy will need to be monitored to ensure it is effective.

2.3.11 Demand Management

Portsmouth Water note that the company has not imposed restrictions on its customers since 1976 and as a result, there is no recent Company specific data in the impact of demand restrictions. The Company has used a conservative estimate based on historic data and other data published in the industry. It is also worth noting that the uncertainty inherent in drought management actions is allowed for by including a headroom allowance

in the plan. The Company will update its Final Water Resources Management Plan to provide further information on the assumptions relating to demand management figures.

2.3.12 End of a Drought

The paragraph relating to regional Drought Co-ordination has been updated to include how the data shared will inform a decision on how a drought is decided to be over.

Actions and data shared will cover all aspects of drought communication, including a decision on when the drought is over including liaison with the EA to make this decision.

2.3.13 End of a Drought

The previous mentioned paragraph has been further updated to include that a post drought review will take place and why.

In order to decide on what lessons have been learnt from the drought, a post drought review will be undertaken when the drought is over to determine how a drought will be managed in the future and what changes can be made to future drought plans as a result of this review.

2.3.14 Representations on Temporary Restrictions

Section 3.3.2 now contains a paragraph relating to how the company will deal with any potential representations it receives as a result of temporary restrictions.

Any representations made on temporary restrictions will be recorded and the exact method of response will depend on the number and nature of representations that are made.

2.3.15 Drought Communications

Section 5 also includes updates on how the effectiveness of the communication strategy is to be monitored and states that although this will depend on the type of communication strategy as the exact details are only determined during a drought, it will be monitored nonetheless.

It is important to measure the effectiveness of the communication strategy, however this will depend on what the communication plan is as the exact details are only determined during a drought. Nonetheless, the success of the communication strategy will need to be monitored to ensure it is effective.

2.4 Hampshire County Council (HCC)

2.4.1 Long Term Sustainability of Water Resources

The section in 2.5.1 relating to single season droughts now contains a paragraph describing how the Water Resources Management Plan is related to the Drought Plan and when the Water Resources Management Plan will be updated.

Although Portsmouth Water has no raw water storage and is reliant on groundwater sources and one groundwater fed river abstraction, the Water Resources Management Plan published in September 2011 indicates that Portsmouth Water will be in a position to meet the demand of their customers over the planning period. This plan includes the development of a winter storage reservoir at Havant Thicket at the end of the next planning period. Portsmouth Water is in the process of preparing the next Water Resources Management Plan which will include a detailed assessment on the impacts of climate change based on the UKCP09 data.

2.4.2 Sustainable Drainage Systems (SuDS)

The Company notes that they do not provide services for sewerage and consequently have no responsibility for the functioning of SuDS. The Company has not received any representations from organisations responsible for SuDS which would indicate that the proposed actions on the Drought Plan are unlikely to impact SuDS. The Company does not propose to amend the draft Final Drought Plan.

2.4.3 Communication with HCC

Portsmouth Water welcomes the comments relating to the communication plan and reaffirms its commitment to monitoring effective communications with HCC. The Company also welcomes the opportunity to develop further links with HCC and will contact HCC in due course. The Company does not propose to amend the draft Final Plan.

2.5 Horticultural Trades Association (HTA)

2.5.1 Concessions for Temporary Bans

The section of 3.3.2.3 on concessions to be permitted has now been updated to allow for the use of drip irrigation systems under particular conditions.

A concession will also be given to the use of drip irrigation systems where possible. This concession will be given in a scenario A and a scenario B drought, however this concession would not be given in a more severe drought such as scenario C drought with a nominal return period of greater than 120 years or a scenario D drought (1 in 200 years). If an exemption is offered in the most extreme events for drip irrigation it will require further drought permits that have the potential to impact designated Habitats sites. A recent review of these sites has lead to a variation of abstraction licences to protect the sites and will not permit an exemption which would result in potential damage to these sites. In the Company's opinion it would not be appropriate to apply for drought permits at designated sites while continuing to allow the use of these drip irrigation systems during the more severe drought.

The section of 3.2.2.4 on concessions not to be permitted has now been updated to make explicit that a concession will not be permitted for newly laid turf due to policing issues.

*Concessions will **not** be permitted for newly laid turf. The Company states that policing this type of concession would not be practical.*

2.5.2 Phasing of Temporary Bans

The section 3.3.2.1 relating to the phasing of temporary bans now makes explicit the fact that Portsmouth Water have considered phasing temporary water use restrictions and concluded that this is not practical due to the company not having raw water storage.

Portsmouth Water has considered the phasing of temporary water use restrictions and concluded that this would make the plan less acceptable to the public and is difficult as the Company does not have any raw water storage. Having raw water storage would mean that the company would be less likely to have to implement a hosepipe ban as the storage would act as the resilience the Company would need during a drought. The company is considering the building of Havant Thicket Winter Storage Reservoir which could resolve this. Research has been carried out by Thames Water as part of their Drought Plan consultation. Since restrictions are only expected to be needed occasionally (1 in 20 years) it considers that restrictions should be applied across all types of discretionary use.

2.6 London Fire Brigade

2.6.1 Request for Early Consultation

Section 3.2.3 contains another section entitled Early Engagement which refers to potential impacts on water for fire fighting and that an unprecedented event would pose such a risk. It also states that communication would take place with the Fire Brigade under the Emergency Plans.

3.2.3.1 Early engagement

The Company recognises that none of the scenarios considered require drought management actions that have the potential to impact the provision of water for fire fighting supplies. It would take an unprecedented event such as a major pollution event combined with a drought to pose such a risk. In this case, communication would take place with the Fire Brigade under the auspicious of the Emergency Plan.

2.7 Natural England

2.7.1 Assessment of Environmental Impacts

A new section called 4.2.1 Assessment of environmental impacts has been added to section 4.2 of the Plan to account for the potential impacts of drought management options when choosing which drought management option would be implemented.

4.2.1 Assessment of environmental impacts

Portsmouth Water's area of supply includes a significant number of protected sites. The company took into account the potential impact on drought management options when choosing which of the potential drought management options would be implemented. This information is based on evidence collected through numerous environmental studies carried out on designated sites.

Portsmouth Water has undertaken analysis to demonstrate that even in the most severe drought scenario, the company only requires a single drought permit to maintain their supplies to customers. The Eastergate group licence was chosen as it has the least likely impact upon the environment and is the only drought permit proposed.

As the proposed drought management options do not impact designated sites, a HRA is not required. An SEA is also not required as the plan is operational and sets out potential temporary options to manage a drought. The Company has not carried out any further detailed studies of all the potential drought permit options as they will not be required to manage a drought.

A screening exercise was undertaken by the Company to comply with Habitats Directive to inform the selection of drought management options and showed the Slindon sources as least likely to cause environmental impacts; this is mentioned in section 3.4.6 and the screening table can be found in Appendix J.

The potential impacts of drought permits on the environment can vary throughout the year. The critical period for the environment tends to be the autumn during the lowest groundwater levels. This has been considered when developing drought management options. Environmental monitoring information will be found in Appendix C.

It has also been made clearer in section 3.4.2 that the Hoe source would only even be considered in an extreme event and information regarding this is held in the Emergency Plans.

It should be noted that the requirements of the Drinking Water Inspectorate must be met before any source is returned to supply. This procedure typically takes a minimum of 3 months, although the regulations make provisions for the process to be undertaken more quickly in exceptional circumstances. It is highly unlikely that this source would be recommissionsed and would only be considered in an extreme event for which more information would be included in the emergency plans.

Finally the paragraph on Drought permits/ orders has been updated to state that the options present are not required to manage a drought and that Slindon is the only permit which would be required.

All of the permits are only potential drought options and do not form part of the plan, the only permit which would be required to manage a drought would be the Slindon permit.

2.7.2 HRA/SEA Screening

As previously explained a new section relating to assessment of environmental impacts has been added and this will discuss the screening exercise undertaken by the company to comply with the Habitats Regulations.

A screening exercise was undertaken by the Company to comply with Habitats Regulations to inform the selection of drought management options.

2.7.3 Prioritisation of Drought Options

Also in the new section relating to assessing environmental impacts, it has been made more explicit that the company has considered the timing of drought permits to minimise environmental impact.

The potential impacts of drought permits on the environment can vary throughout the year. The critical period for the environment tends to be the autumn during the lowest groundwater levels. This has been considered when developing drought management options.

2.7.4 Monitoring

Again under the new section, it has been made aware that the Eastergate permit is the only permit to be considered in an extreme event and that further monitoring information relating to the Eastergate drought permit is found in appendix C.

2.7.5 Liaison with Natural England

The Company have made reference to liaising with Natural England in the development of drought management options which have the potential to impact the environment as they have never had to implement Drought Orders or permits and lack the experience required to deal with environmental monitoring.

The Company anticipates that it will develop the requirements for such monitoring by dialogue with the Environment Agency, Natural England and Southern Water. At this point in time it anticipates the following:

- ***Additional abstraction from the Eastergate Group of sources –*** *environmental monitoring points has been established in the vicinity of Swanbourne Lake, Arundel, by the Environment Agency. The Environment Agency Groundwater Model can be calibrated to the latest monitoring data and then used to predict the impact of additional abstraction from the Eastergate Group and more specifically the source at Slindon, more information for which can be found in Appendix C.*

2.8 West Sussex County Council (WSCC)

2.8.1 Communication Strategy

Section 5.1 makes it clear that the WSCC have been added to the agencies in which Portsmouth Water will make contact with in order to develop a co-ordinated communication strategy.

After the initial convening of the Drought Management Team, the Company's communications representative will make contact with Natural England and the Environment Agency, Local Authorities such as West Sussex County Council (WSCC) and the surrounding water companies, in order to develop a co-ordinated communications strategy.

2.8.2 Emergency Drought Order – Supply Strategy

Section 5.4 on Emergency Plans has now been updated to provide further clarity on the relationship between drought planning and emergency plans.

Portsmouth Water's Emergency Plan is principally designed to handle short-term extreme events. Detailed planning to maintain water supplies in an emergency and actions are detailed in the Emergency Plans which can be found on the company's website. The key principles incorporated in the Emergency Plan would be utilised for managing the most severe actions outlined in this Drought Plan. The guidance for preparing the Drought Plan states that the drought management actions should include "Emergency Drought Orders". For Portsmouth Water Emergency Drought Orders are only likely to be required for the most extreme events (greater than 1 in 200 year return period). They are most likely to be used as part of an emergency plan when a drought is combined with a pollution incident of the loss of a large works.

During an emergency it may be necessary to override any environmental constraints on abstraction licences. These could be "Minimum Residual Flows" (MRF) in rivers or restrictions on the volume of water pumped over a given time period.

2.8.3 Identify Vulnerable

The section on concessions to be permitted of 3.3.2.3 has now been updated to identify how the Company will identify and protect vulnerable customers.

The Company will use the Special Needs Register to identify vulnerable customers so the Company can put in place the necessary actions to ensure customers are protected. As part of the communications strategy, the Company will work with various organisations to seek advice on how to protect vulnerable customers.

2.8.4. Interaction of Water Sources

A new section under 5.3 supply side enhancements has been added entitled 5.3.1 Interactions of Water Supplies to identify that the company has improved interconnectivity between various sources to improve operational flexibility in the event of a loss of supply.

5.3.1 Interactions of Water Supplies

The Company notes that due to improved connectivity between various sources the company now has a single water resource zone rather than three the previous Plan was based on. This improvement provides greater operational flexibility increasing the ability of the company to maintain supply in the event of a loss of a supply site. The amount of detail relating to individual sources that is placed in the public domain is restricted on grounds of national security.

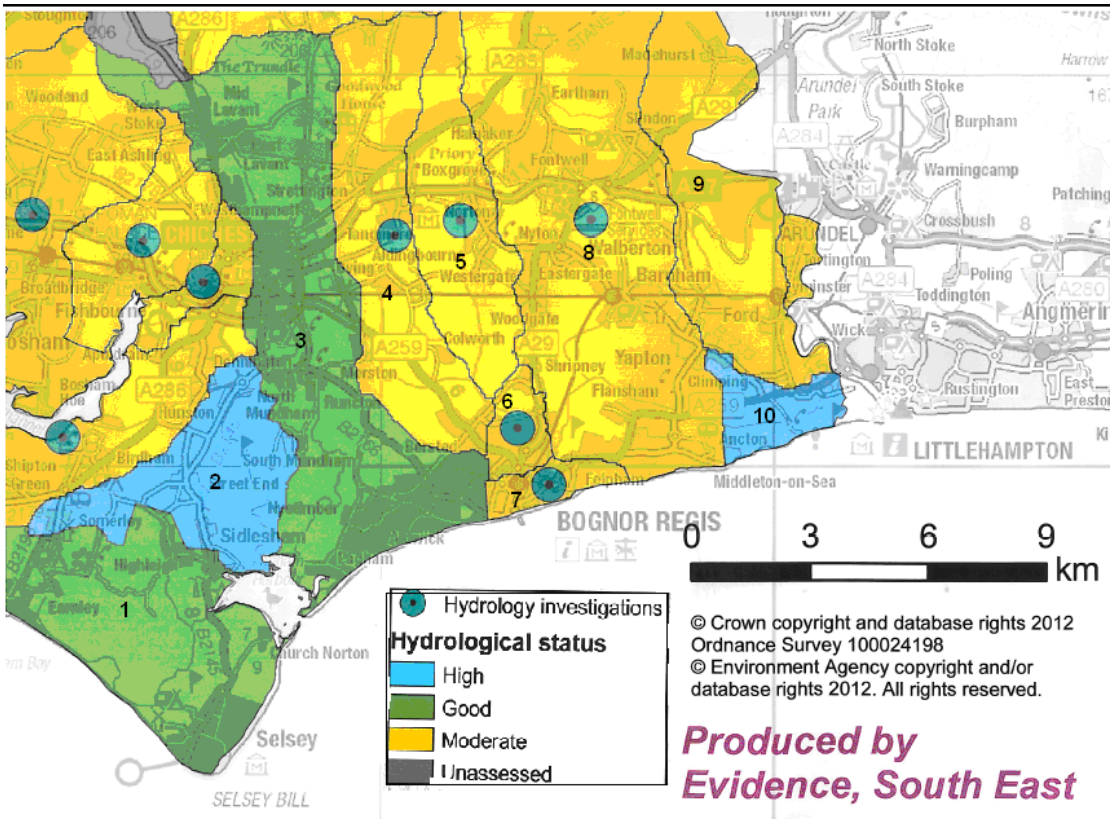
3.0 Response to representations made by DEFRA via letter on 21st September 2012.

3.1 Provide evidence that you have adequately addressed environmental monitoring requirements including HRA and SEA and provide the further information and level of detail you have undertaken to provide in your statement of response. This should include details of the screening process used to prioritise permits.

Further to a point made by Natural England regarding the potential impacts of drought management options, a new paragraph entitled 4.2.2. Entitled *Assessment of environmental impacts* has been added to address the environmental monitoring requirements and to give further information relating to the screening process used.

3.2 Identify the water bodies that could be affected by the Eastergate drought permit option, describe their current status and assess whether the drought permit in likely to cause a deterioration in status.

A map was found which shows the water bodies in the vicinity of the Eastergate permit and an explanation as to the assumptions made on the effct a permit has on these bodies was made



Number	Water Body
1	Easton Rife
2	Bremere Rife
3	Pagham Rife
4	Elbridge Rife

5	Upper Aldingbourne Rife
6	Middle Aldingbourne Rife
7	Lower Aldingbourne Rife
8	Lidsey Rife
9	Binstead Rife
10	Ryebank Rife

The map (Taken from an Environment Agency publication) and table above identify the water bodies which could potentially be affected by a drought permit at Eastergate. The status of these bodies is varying with most being in moderate condition. The likelihood of the implementation of the drought permit is minimal. On the information available to Portsmouth Water a drought permit at Slindon is unlikely to cause a deterioration in status of these water bodies and Portsmouth Water are committed to working with Southern Water with regards to potential impacts caused by this drought permit.

3.3 Consider the potential derogation associated with your supply side options including the Slindon source and unused commercial boreholes.

The potential derogation to these two options has now been considered and is now highlighted in the relevant sections.

Slindon source

The potential derogation relating to this permit has already been considered during the application for the licence. People with concerns had the opportunity to express their issues during the application process and mitigation measure such as lining of ponds has been carried out to prevent derogation to people's private water supplies and features.As the source was originally licensed for a higher quantity than it is currently being used, then derogation for the quantity for the permit would have already been assessed.

Unused commercial boreholes

There is also a commercial borehole at Southwick Estates which can supply 0.1137Ml/day which could also be considered. Other commercial boreholes have existed in the past but have since been back filled to make way for future developments. Permission would have to be sought from the site owners and therefore any derogation associated with this source can then be mitigated against. Water quality investigations would also need to be undertaken and this can take up to 3 months by the DWI. Possible constraints, such as access to land are to be considered when permission to potentially use this source has been sought and whether the yield would be enough to suit our needs.

3.4 Identify the lead in times for recommissioning boreholes and provide information on the quantities of water you expect to obtain from them.

Lead times for recommissioning boreholes are difficult to quantify due to quality constraints, water quality investigations and installation of new equipment. An estimate will be 3 months as work could be carried out whilst water quality investigations are being made and this has been made more explicit in the plan.

Water quality investigations will need to take place by the DWI before any source can be used for public water supply, which can take up to 3 months and the installation of temporary pumps, power supplies and disinfection equipment will also add time to the process, so 3 – 6 months would be a likely time period.

Possible yields from recommissioning boreholes are also difficult to quantify as most are largely untested. However using previous values from past usage can be used as an estimate.

3.5 Recommissioning unused Portsmouth Water source Hoe = 7.5 Ml/d
3.6 Recommissioning unused Portsmouth Water source Hayling Island = 0.3Ml/d
3.7 Commissioning unused Portsmouth Water boreholes = Requires further work and Water Quality investigations
3.8 Commissioning unused licence from Private and Commercial boreholes. Private borehole yields are unknown. The only commercial source would be Southwick Estates = 0.1137Ml/d (estimate)

3.5 Provide evidence that you have adequately addressed monitoring requirements in relation to drought permits and provide the further information you have committed to provide for the Eastergate group.

Monitoring requirements have been addressed and the other relevant information can be found in Appendix C of the plan.

It should be noted that Southern Water's Madehurst source is also perceived to have an impact on Swanbourne Lake. Portsmouth Water has proposed joint studies to identify the Environmental Issues surrounding the water body. These studies could include:

- *Groundwater & Surface Hydrology*
- *Water Quality*
- *Biological Receptors*
- *Designated Habitats*

The modelling and, ecological work will determine if abstraction when Swanbourne Lake is dry has no further impact on the qualifying features.
Appendix C of the Companys Drought Plan clearly states the environmental issues related to the Slindon source and the existing monitoring taking place and other monitoring options. Co-operation with Southern is needed on this. Although according to the Environment Agencies South East Drought Plan of July 2011, the Appendix H – Drought permits and orders section states that a drought permit for the Eastergate group licence will only be required in a severe drought when Swanbourne Lake is already likely to be empty and thus irrespective of any water path between the lake and the aquifer, therefore there is not expected to be any effect on the water environment.
However, the concerns are on the potential delay in recovery of Swanbourne Lake, the monitoring set out in Appendix C will help to determine these monitoring requirements

3.6 Identify permits and approvals that may be needed to implement drought measures and show that potential constraints, such as access to land have been considered.

The answer to question 3 states the measures used to mitigate against the drought management options and question 7 refers to appendix C relating to mitigation measures on the adverse impacts to the environment.

Most of the constraints which relate to these measures are of access to land and in most cases we own the land for which the measures are related to. Therefore there are no issues. However, for the commercial borehole at Southwick Estates, we would need to seek permission from the owners to use their source. This has been updated in the plan as previously mentioned under point 3.

3.7 Provide more detail on the measures that may be needed to mitigate any adverse impacts on the environment from the drought options and permits or approvals that may be needed to implement these measures.

Appendix C relates to the measures which may be needed to mitigate any adverse impacts on the environment from the drought options and permits.

3.8 Show how you have addressed the representations of West Sussex County council regarding strategies to work with the agricultural sector.

The final representation by West Sussex County Council regarding strategies to work with the agricultural sector has been addressed and a new paragraph to the section 3.2.3.1 on early engagement has been added to explain the early engagement required with the National Farmers Union.

It has also been recognised that communications are required with the agricultural sector and although the Environment Agency have total control over agri-abstraction, Portsmouth Water will engage with stakeholders such as the National Farmers Union to agree early and managed reductions in demand in this sector. Hence the National Farmers Union has been added to the list of customers who may be affected by drought measures.

APPENDIX H

MARKET RESEARCH

Valuing Customers

Supplementary Customer Research for PR09

Report for Portsmouth Water

December 2008

mvaconsultancy

Document Control

Project Title:	Supplementary Customer Research for PR09
MVA Project Number:	C3763800
Document Type:	Report
Directory & File Name:	N:\Contracts\C37638_Portsmouth Water\Reports\Portsmouth Water Customer Research 2008_FINAL REPORT.Doc

Document Approval

Primary Author:	Laura Hunt
Other Author(s):	Paul Le Masurier
Reviewer(s):	Paul Le Masurier
Formatted by:	Leticia Rodriguez

Distribution

Issue	Date	Distribution	Comments
1	27/11/2008	PML	Draft report for internal review
2	28/11/2008	Portsmouth Water	Client Draft
3	09/01/2009	Portsmouth Water	Final Report

Contents

mvaconsultancy

Tables

Figures

Appendices

Summary

Background

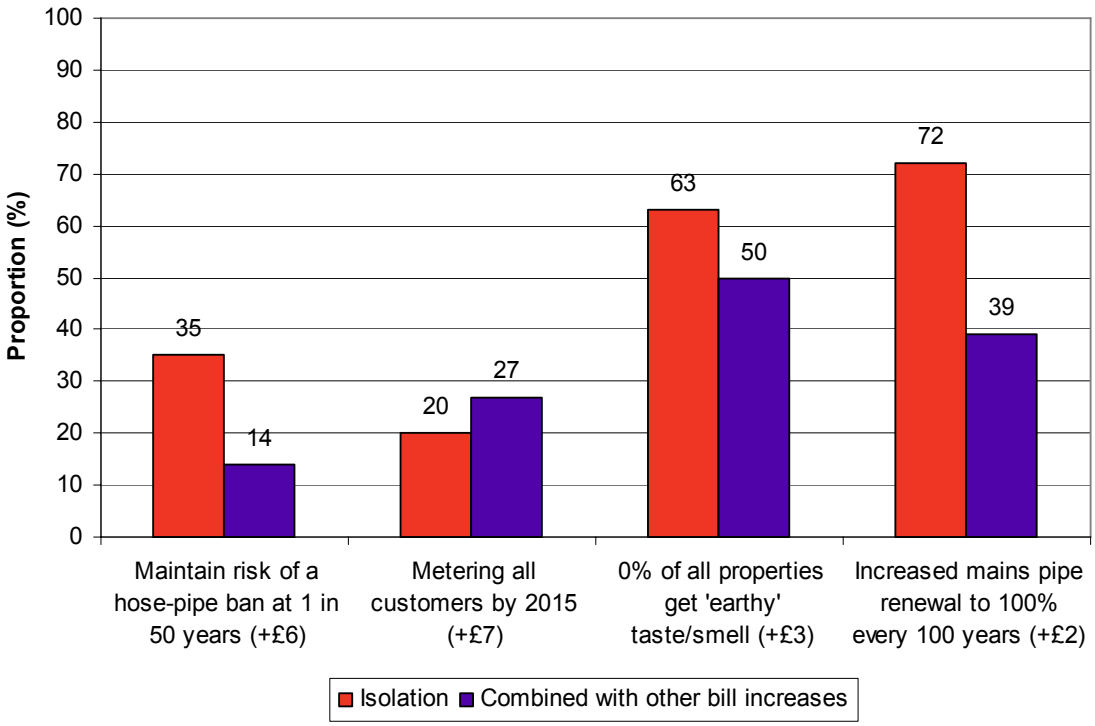
Portsmouth Water wishes to have a better understanding of customer perceptions about specific elements of service provision. This research examined views on the occurrences of hose-pipe bans, differences in the taste or smell of water supplies, the introduction of metering for all customers and the frequency at which mains pipes should be renewed.

To meet these objectives, a face-to-face interview was carried out with a representative sample of 206 Portsmouth Water customers between 27th October and 4th November 2008. Each interview lasted approximately ten minutes and respondents were asked to complete a series of trade-off exercises relating to each of the topics described above. Respondents were then asked to consider the combined bill impact if all improvements were introduced.

Key Findings

Customers stated that they were satisfied with the overall service provided by Portsmouth Water, and also believe that they are getting 'good' value for money. However, customers also noted the importance of preventing bills from increasing too much; this is especially important in light of the current economic climate.

Perceptions on the service improvements differed according to whether customers were stating their preference in isolation, or against other bill increases. This is shown in the following graph.



mvaconsultancy

Respondents were firstly asked whether they are willing to pay extra on their bill to maintain **hose pipe bans** at the current planned service level of 1 in 50 years, or accept a 1 in 20 frequency with a lower bill level. Less than four in ten respondents preferred to maintain the 1 in 50 level, decreasing to less than one fifth when considering the combined bill impact of other service improvements.

Almost two-thirds of respondents would prefer to pay an extra £3 on their bill so that 20% of properties avoid occasionally experiencing an **'earthy' taste or smell** to their water. Even when other bill increases were considered, 50% of customers showed support for this improvement.

Respondents were asked to choose between different timescales for compulsory **metering**, each with an associated bill increase. Results show that customers who are already metered would prefer to pay an average bill increase of £7 per year so that metering can be introduced quickly (i.e. by 2015). In comparison, non-metered customers are more supportive of an average bill increase of £1, and introducing meters over the longer-term (by 2035). Overall customer support for compulsory metering by 2015 is around one in every four customers (c. 25%).

Almost three-quarters (72%) of respondents stated that they are willing to pay an average increase in bill of £2 so that 100% of **mains pipes** are renewed every 100 years, rather than every 134 years. However, support for this option drops to below half (38%) when considered against the overall bill impact if all improvements were introduced.

Conclusions

The survey results suggest that the majority of customers would support two of the four proposed improvements:

- an improvement in taste and odour (to eradicate the 'earthy' taste/smell for the 20% of customers that occasionally experience it); **and**
- an improvement in mains renewal (from 134 years to replace 100% to 100 years) at a cost of up to +£5.

These views support Portsmouth Water's plans to reduce the number of complaints about the appearance, taste or smell of tap water from approximately 214 per year. These findings also suggest that customers are willing to pay an additional £2 to increase mains pipe renewal so that the current service and maintenance of equipment is maintained, if not improved, as outlined in the service level proposed by 2015.

1 Introduction

1.1 Background

1.1.1 Portsmouth Water require customer feedback to provide additional insight into customer preferences regarding the taste of their water, the risk of a hose-pipe ban, increased customer metering; and whether customers are willing to pay for improvements.

1.1.2 The findings from this research will complement those already obtained from previous customer research, and inform Portsmouth Water's future business planning.

1.2 Research Objectives

1.2.1 The overall aim of this research was to examine customer perceptions on specific aspects of the services being provided by Portsmouth Water.

1.2.2 Specific objectives were to obtain customers':

- attitudes towards a **hose-pipe ban** every 1 in 20 years, compared with 1 in 50 years;
- willingness to pay to have improved **taste & odour** for the 20% of customers whom occasionally suffer from increased impurity levels;
- willingness to pay to increase the pace of **mains renewal**: and
- views on the speed at which **metering** should be introduced.

1.3 Report Structure

1.3.1 This report is structured as follows:

- Chapter Two outlines the methodology we adopted to meet these objectives, and provides a profile of the sample obtained;
- customer's perceived value for money, now and in 2007, is reported in Chapter Three;
- customer's preferred combination of hose-pipe ban risk and bill impact (everything else as now) is reported in Chapter Four;
- customer's willingness to pay for improved taste & odour (everything else as now) is reported in Chapter Five;
- customer's attitudes towards increased customer metering (everything else as now) is reported in Chapter Six;
- customer's preferred combination of level of mains renewal and bill impacts (everything else as now) is provided in Chapter Seven;
- Chapter Eight presents customer's preferred combination of all the above and bill impacts; and
- Chapter Nine provides our conclusions.

2 Methodology

2.1 Introduction

2.1.1 A quantitative survey was undertaken to examine customer attitudes towards hose-pipe bans, taste/odour, metering and mains renewals.

2.1.2 Face-to-face interviews were conducted with Portsmouth Water customers who are responsible for paying their household water bill (including the spouse of the bill payer).

2.1.3 This chapter sets out the research process and provides details about the profile of the achieved sample.

Sampling

2.1.4 We randomly selected ten sampling points within the Portsmouth Water area and set demographic quotas for age, gender and employment status to ensure a representative sample was obtained at each sampling point. The achieved sample was in line with the quotas.

2.1.5 Interviewers were provided with a list of addresses for each of the ten randomly selected areas and were only allowed to visit these locations. Between 18 and 22 interviews were obtained in each sample area. A total of 206 interviews were obtained in all.

2.1.6 This sample size means levels of precision of around ±6% at the 95% level of statistical significance. That is if, say, 75% of our randomly selected sample of respondents considered Portsmouth Water's existing service and bill levels to offer good value for money, then there is a 95% probability that the true percentage for the customer population lies in the range 69% to 81%.

Questionnaire

2.1.7 The questionnaire was designed in consultation with Portsmouth Water and aimed to provide insight into customer preferences regarding the taste and odour of water, the risk of a hose pipe ban and willingness to pay for improvements to their water supply.

2.1.8 Interviewers firstly asked respondents a set of screening questions to ensure that quotas were met in each of the ten sampling points.

2.1.9 The main interview questions were divided into the following sections:

- overall satisfaction and value for money with the existing service;
- hose-pipe ban preferences;
- taste and odour preferences;
- metering preferences;
- mains renewals preferences; and
- combined improvements and bill impact preferences.

2.1.10 Respondents were asked to complete a series of trade-off exercises relating to improvements to each of the above services and varying impacts on customer bills.

2.1.11 A copy of the questionnaire, and showcards presenting the trade-off exercises, can be found in Appendix A.

Pilot

2.1.12 A pilot survey of ten interviews was completed prior to the main fieldwork. The pilot was conducted in the Hayling Island sample point.

2.1.13 Each of the pilot interviews were observed by a member of the project team. The pilot showed that respondents understood the interview questions and were able to participate in the trade-off exercises. The questionnaire was amended slightly after the pilot to ensure the aims of the trade-off exercises were clear; we made several changes to the introductory text and removed a third option from the first trade-off exercise.

Main fieldwork

2.1.14 The main fieldwork took place between 27th October and 4th November 2008. Interviews were carried out by the fieldwork agency, Quality Fieldwork, and conducted between the hours of 2pm and 8pm, on weekdays and weekends.

2.1.15 All of the interviews were completed in respondent's homes to ensure privacy and confidentiality.

Data analysis and reporting

2.1.16 Interview data were cleaned and analysed using Statistical Package for the Social Sciences (SPSS).

2.1.17 Percentages and base counts have been calculated for each question. In addition, data has been cross-tabulated by different customer segments and reported where appropriate in order to highlight differences.

2.1.18 Findings are presented for bill-paying consumers generally, and also compared to the previous willingness to pay survey (2007).

2.2 Demographic information

2.2.1 The demographic profile of the sample is presented in Table 2.1.

Table 2.1 Profile of respondents

	Frequency	% of respondents
Gender		
Male	102	50%
Female	104	51%
Age Group		
18-34 years	60	29%
35-59 years	78	38%
60+ years	68	33%
Working status		
Employed full time (30+ hrs)	85	41%
Employed part time (9-29 hrs)	28	14%
Retired	54	27%
Not working and not looking for work	22	10%
Student	10	5%
Not working and looking for work	6	3%
Household income		
Less than £10,000	23	11%
£10,000 - £19,999	41	20%
£20,000 - £29,999	23	11%
£30,000 - £39,999	15	7%
£40,000 - £49,999	20	10%
£50,000 - £59,999	4	2%
£60,000 or more	6	3%
Don't know/refused	74	36%
Social Economic Group		
AB	41	20%
C1	82	40%
C2	51	25%
DE	32	16%

*Please note that where percentages do not add up to 100 % this is because of rounding

2.2.2 We also asked respondents if they had a water meter at their home. As Table 2.2 shows, the majority of respondents did not have a water meter.

Table 2.2 Whether respondents are charged via a water meter

Charged via a water meter	Frequency	% of respondents
Yes	27	13%
No	172	84%
Don't know	7	3%

2.3 Data Analysis

2.3.1 The results reported in the next six chapters are based on un-weighted data.

3 Current perceptions of service provision

3.1 Introduction

3.1.1 This chapter examines customer satisfaction with existing services provided by Portsmouth Water. The analysis in this chapter reports customers':

- satisfaction with the overall water supply; and
- perceived value for money.

3.2 Satisfaction with overall water supply

3.2.1 Respondents were asked the following question:

"Can you tell me how satisfied you are with your water supply overall, on a scale from 1 to 5, where 1 means 'very dissatisfied' and 5 means 'very satisfied'"

Customers' satisfaction overall

3.2.2 Table 3.1 shows that the majority (84%) of respondents were fairly or very satisfied with their water supply overall. Only 7% were fairly or very dissatisfied.

Table 3.1 Satisfaction with your water supply overall

	% of respondents
Very dissatisfied	2%
Fairly dissatisfied	5%
Neither satisfied nor dissatisfied	9%
Fairly satisfied	40%
Very satisfied	44%
Base: 205	100%

3.2.3 This level of satisfaction with the service provided by Portsmouth Water was lower than was reported in a survey of Portsmouth Water customers last year (93% fairly/very satisfied in 2007).

Customer satisfaction by customer segment

3.2.4 Table 3.2 presents results by gross household annual income and whether respondents have a water meter.

Table 3.2 Satisfaction with your water supply overall by gross Household income

		Gross HH Income p.a.			
	Total	Less than £10,000	£10,000-£19,999	£20,000-£29,999	£30,000+
Very dissatisfied	2%	0%	0%	0%	7%
Fairly dissatisfied	5%	0%	0%	4%	4%
Neither satisfied nor dissatisfied	9%	13%	10%	0%	11%
Fairly satisfied	40%	35%	43%	30%	49%
Very satisfied	44%	52%	48%	65%	29%
TOTAL	100%	100%	100%	100%	100%
Base: 205	205	23	40	23	45

3.2.5 Aggregating results for 'very dissatisfied' and 'fairly dissatisfied', we find that those on lowest income were most likely to be very satisfied (52%) and those with higher incomes were least likely to be very satisfied (29%). The small sample sizes must be noted here and the results treated as indicative only.

3.3 Perceived Value for Money

3.3.1 Respondents were asked the following question:

"The average bill for water services in your area is £85. This is the cheapest bill level in the country. How do you rate your water supply in terms of Value for Money, using a scale of 1 to 5 where 1 means 'poor value for money' and 5 means 'good value for money'"

Overall value for money

3.3.2 Table 3.3 shows that most respondents considered that the service provided by Portsmouth Water offered (fairly/very) good value for money (86%).

Table 3.3 Overall Value for money offered by Existing Service

	% of respondents
Very poor value for money	1%
Fairly poor value for money	3%
Neither poor nor good value for money	10%
Fairly good value for money	49%
Very good value for money	37%
Base: 196	100%

3.3.3 This is a higher percentage than was reported by Portsmouth Water customers in last year's survey (78% fairly or very good value for money) – possibly because it has been highlighted that it is the cheapest bill level in the country. So, customers now are less satisfied with the service provided by Portsmouth Water and consider it better value for money, than a year ago, yet the service and bill levels have remained the same. It is possible that this change in perceived value is an indication of a changed perception during the current credit crunch.

3.3.4 Respondents were asked whether there were any other current issues that had been in their mind during the interview. Although the majority of respondents (92%) did not mention anything, those that did provide an answer, highlighted the following:

- the need to keep costs low (3%);
- that price increases can not be justified (2%);
- that the provision of water should be seen as a public service rather than merely a profit making exercise for shareholders (1%); and
- other (2%).

Customer value for money by customer segment

3.3.5 Table 3.4 shows comparisons by different customer segments. These results confirm that even customers on very low income (below £10,000 p.a.) considered the existing service to offer good value for money (88% fairly/very good, and only 4% fairly/very poor value for money).

Table 3.4 Value for money by gross Household income and metered/unmetered

		Gross HH Income p.a.				Metering	
	Total	Less than £10,000	£10,000-£19,999	£20,000-£29,999	£30,000+	Metered	Not metered
Very poor value for money	1%	0%	3%	0%	0%	0%	1%
Fairly poor value for money	3%	4%	3%	0%	5%	4%	3%
Neither poor nor good value for money	10%	9%	5%	0%	14%	8%	9%
Fairly good value for money	49%	44%	49%	44%	55%	38%	50%
Very good value for money	37%	44%	41%	57%	27%	50%	37%
TOTAL	100%	100%	100%	100%	100%	110%	100%
Base:	196	23	39	23	44	24	167

3.3.6 When we aggregate responses for 'fairly good' and 'very good' value for money and consider results by those customers who are metered/unmetered, we see that similar proportions of both groups generally considered the service to offer fairly or very good value for money. There is an indication though, that metered customers considered the service more positively than unmetered customers (50% metered were very satisfied compared with 37% unmetered).

4 The risk of hose-pipe bans

4.1 Introduction

4.1.1 In this chapter, we consider customer views on the risk of hose-pipe bans in the Portsmouth Water area, in isolation to other services.

4.1.2 Each respondent was informed of the following:

"Portsmouth Water customers have not had a hose pipe ban since 1976. The Company has, for many years, planned on the basis of bans being required no more than 1 in 50 years. As a result of increasing demand on water supplies, and a reduction in the amount Portsmouth Water take from local water supplies because of environmental concerns, the Company will need to make future investment in order to maintain this level of service. The impact on bills of maintaining this level of service, compared to offering a lower level of service, is shown here".

4.1.3 Respondents were asked which future service option they would prefer out of the following:

Option A	Option B
Ban: once every **20 years**	Ban: once every **50 years**
Bill level in 5 years time: *+£4*	Bill level in 5 years time: *+£6*
Bill level in 20 years time: *+£8*	Bill level in 20 years time: *+£10*

4.2 Results for customers overall

4.2.1 Table 4.1 shows that almost two-thirds (65%) of customers preferred to have a more frequent ban, once every 20 years, and a lower bill level (option A).

Table 4.1 The risk of hose-pipe bans

	% of respondents
Ban once every 20 years, bill level in 5 years time is +£4, bill level in 20 years time is +£8 (Option A)	65%
Ban once every 50 years, bill level in 5 years time is +£6, bill level in 20 years time is +£10 (Option B)	35%
Base: 201	100%

4.3 Results by customer segments

4.3.1 Table 4.2 presents results by gross annual household income, location of property and metered/unmetered customers.

4.3.2 Most respondents (82%) living in a town or city were supportive of the lower bill levels associated with a ban every 20 years. Respondents earning less than £10,000 were also particularly supportive of this option (73%). Again, the small sample size means that the result is indicative only.

Table 4.2 The risk of hose-pipe bans by income, location of property and metering

		Gross HH Income p.a.				Location of property			Metering	
	Total	Less than £10,000	£10,000 - £19,999	£20,000 - £29,999	£30,000 +	Rural	Suburb	Town /City	Metered	Not metered
Ban every 20 years (Option A)	65%	73%	56%	55%	70%	62%	60%	82%	54%	67%
Ban every 50 years (Option B)	35%	27%	44%	46%	30%	39%	41%	18%	46%	33%
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Base	201	22	41	22	43	78	79	44	26	168

4.3.3 In comparison, almost half (46%) of customers who currently have a water meter favoured a ban every 50 years, and therefore were prepared to pay a higher bill level in 5 and 20 years.

5 Differences in the taste and odour of water

5.1 Introduction

5.1.1 This chapter reports on perceptions about the taste and odour of the drinking water supplied by Portsmouth Water, in isolation to other services.

5.1.2 Each respondent was informed of the following:

"A minority of Portsmouth Water customers occasionally experience differences in the taste/smell of their water. The impact of improving the taste and odour of water on customer bills are shown below."

5.1.3 Respondents were asked which future service option they would prefer out of the following:

Option A	Option B
20% of properties get "earthy" taste/smell occasionally average bill level: *£85*	**0%** of properties get "earthy" taste/smell occasionally average bill level: *£88*

5.2 Results for customers overall

5.2.1 Table 5.1 shows that over half (63%) of respondents would be willing to pay to avoid any properties within the Portsmouth Water region occasionally getting an 'earthy' taste/smell.

Table 5.1 Differences in the taste and odour of water

	% of respondents
20% of properties get 'earthy' taste/smell occasionally, average bill level is £85 (Option A)	37%
0% of properties get 'earthy' taste/smell occasionally, average bill level is £88 (Option B)	63%
Base: 206	100%

5.3 Results by customer segments

5.3.1 When we consider results by specific customer segments, notable differences are apparent according to income and location of property. Customers living in more urban environments are more supportive of eradicating the earthy taste/odour than those in rural areas. Fewer that one in two (48%) customers on low income would prefer to pay a higher bill so that 20% of properties avoid occasionally getting an 'earthy' taste/smell.

Table 5.2 Differences in the taste and odour of water by income, location of property and metering

		Gross HH Income p.a.				Location of property		
	Total	Less than £10,000	£10,000-£19,999	£20,000-£29,000	£30,000+	Rural	Suburb	Town/City
20% "earthy" taste/smell £85 (Option A)	37%	52%	29%	35%	29%	41%	37%	30%
0% "earthy" taste/smell £88 (Option B)	63%	48%	71%	65%	71%	59%	63%	71%
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%
Base	206	23	41	23	45	83	79	44

6 Introducing metering for all customers

6.1 Introduction

6.1.1 This chapter examines attitudes towards metering, in isolation to other services, within the Portsmouth Water region.

6.1.2 Each respondent was informed of the following:

"Portsmouth Water plan to maintain uninterrupted supplies to customers, whilst protecting the environment. In order to achieve this aim, they intend to meter all customers, where practical, over time. Typically, metered customers use 10% less water than un-metered customers. They are considering three options for metering. The faster the company fits meters the quicker that the environmental benefits are achieved. But metering comes at a cost, and the speed of the installation has an impact on bills. Also, metering means that bills relate directly to usage, rather than historic rateable values".

6.1.3 Respondents were asked which future service option they would prefer out of the following:

Option A	**Option B**	**Option C**
All customers are Metered between **2010-2015** Impact on average bill: +£7 *per year*	All customers are Metered between **2010-2025** Impact on average bill: +£2 *per year*	All customers are Metered between **2010-2035** Impact on average bill: +£1 per year

6.2 Results for customers overall

6.2.1 Table 6.1 shows that almost half (47%) of customers preferred a lower average bill of +£1 per year and for compulsory metering to be introduced slowly between 2010 and 2035. This is consistent with results from the 2007 research which showed that less than one-third (30%) of customers were in favour of metering for all.

6.2.2 One in five customers (20%) would be willing to receive a larger average bill and for metering to be introduced more quickly between 2010-2015.

Table 6.1 When metering should be introduced

	% of respondents
All customers are metered between 2010-2015, impact on average bill is +£7 per year (Option A)	20%
All customers are metered between 2010-2025, impact on average bill is +£2 per year (Option B)	33%
All customers are metered between 2010-2035, impact on average bill is +£1 per year (Option C)	47%
Base: 204	100%

6.2.3 Respondents who preferred Option C were then asked why they felt this way. Responses highlighted that many customers did not want to be metered at all:

- I don't want metering (so the longer the better) (57%);
- It keeps the costs low and I don't mind the environmental improvements being introduced gradually (36%); and
- Other (7%).

6.3 Results by customer segments

6.3.1 Levels of support for compulsory metering differs amongst metered and unmetered customers, as one might expect. Metered customers would prefer to have meters introduced in all properties sooner, therefore by 2015. This is shown in Table 6.2.

Table 6.2 When metering should be introduced by metered or not

		Metering	
	Total	Metered	Not metered
All customers are metered between 2010-2015, impact on average bill is +£7 per year (Option A)	20%	30%	19%
All customers are metered between 2010-2025, impact on average bill is +£2 per year (Option B)	33%	37%	31%
All customers are metered between 2010-2035, impact on average bill is +£1 per year (Option C)	47%	33%	49%
TOTAL	100%	100%	100%
Base	204	27	170

7 The renewal of main pipes

7.1 Introduction

7.1.1 In this chapter, we consider customers' attitudes towards mains renewals in the Portsmouth Water region, in isolation to other service improvements.

7.1.2 Each respondent was informed of the following:

"Portsmouth Water operates through a network of 3,200km of pipes. Between 1989 and 2005, it operated a policy which, on average, renewed these pipes every 100 years on a rolling basis. During this time, leakage, interruptions to supply and burst rates have fallen. In 2005, the Company reduced its mains renewal activity to an average of once in every 140 years. On reflection, the Company believes this approach will result in a deterioration in the network over the long term, resulting gradually in increasing leakage and causing a greater number of interruptions to supply. Portsmouth Water could, therefore, revert to its policy of renewing mains every 100 years which will mean a higher length of mains being renewed each year. This will put bills up by approximately £2 per annum."

7.1.3 Respondents were asked which future service option they would prefer:

Option A
Existing level of mains pipe renewal (100% renewed every **134 yrs**) average bill level: *£85*

Option B
Increased level of mains pipe renewal (100% renewed every **100 yrs**) average bill level: *£87*

7.2 Results for customers overall

7.2.1 Table 7.1 shows that almost three quarters of the total sample (72%) indicated a preference for a more frequent mains renewal, therefore every 100 years rather than 134 years.

Table 7.1 The renewal of mains pipes

	% of respondents
Existing levels of mains pipes renewal (100% renewed every 134 yrs), average bill level is £85 (Option A)	28%
Increased levels of mains pipe renewal (100% renewed every 100 yrs), average bill level is £87 (Option B)	72%
Base: 206	100%

7.3 Results by customer segments

7.3.1 Table 7.2 presents results by different market segments.

7.3.2 Although the overall sample indicated a preference for renewing 100% of mains pipes every 100 years, respondents aged 18–34 years were less supportive of this policy and those aged 35–59 years were more supportive. Most (78%) of the customers who are metered were also supportive of paying a larger bill to enable mains pipes to be renewed every 100 years.

7.3.3 Almost two in every three customers on low income (65%) preferred to pay the additional £2 to ensure increased mains renewal. The small sample sizes must be noted here and the results treated as indicative.

Table 7.2 The renewal of mains pipes by age, income and metering

		Gross HH Income p.a.				Metering	
	Total	Less than £10,000	£10,000-£19,999	£20,000-£29,999	£30,000+	Metered	Not metered
Mains renewal every 134 yrs, £85 (Option A)	28%	35%	20%	17%	27%	22%	28%
Increased renewal every 100yrs, £87 (Option B)	72%	65%	81%	83%	73%	78%	72%
TOTAL	100%	100%	100%	100%	100%	100%	100%
Base	206	23	41	23	45	27	172

8 Combined bill impacts

8.1 Introduction

8.1.1 Each of the previous chapters have considered customer attitudes towards services in isolation, but in this chapter we consider customers' preferences regarding the changes in service level of the four attributes in combination, and in the context of the implied aggregate bill increase.

8.2 Results

8.2.1 Each respondent was informed of the following:

"So far, we have looked at a number of improvements that Portsmouth Water could make to their service that would each impact on bill levels. Bearing in mind the combined bill impact of having a number of improvements, which one or more improvements from this list would you like to see introduced? (Note that if all were introduced tomorrow, the average bill would increase by £18)"

8.2.2 Respondents were presented with the following list of improvements and asked to state which ones they would most like to see introduced:

- Maintain risk of a hose-pipe ban at 1 in 50 yrs (+£6);
- Metering all customers by 2015 (+£7);
- 0% of properties get 'earthy' taste/smell (+£3);
- Increased mains pipe-renewal to 100% every 100 yrs (+£2); and
- None of these.

8.3 Results for customers overall

8.3.1 Table 8.1 shows results for customers overall.

8.3.2 Overall, respondents would be most willing to pay for the improvement in 'earthy' taste/smell (50% willing to pay +£3). Respondents were least keen to ensure the risk of a hose pipe ban was maintained at 1 in 50 years (only 16% willing to pay +£6).

Table 8.1 Combined bill impacts

	% respondents
Maintain risk of a hose-pipe ban at 1 in 50 years (+£6)	14%
Metering all customers by 2015 (+£7)	27%
0% of all properties get 'earthy' taste/smell (+£3)	50%
Increased mains pipe-renewal to 100% every 100 years (+£2)	38%
None of these	16%
Base: 206	-

8.3.3 When we compare 2008 results in the above table with the data from the previous sections of this report, we see some notable differences in opinion when respondents consider improvements in the context of other improvements and bill increases.

8.3.4 As discussed in Chapter four, slightly over one-third (35%) of customers preferred to pay an additional £6 to maintain the risk of hose-pipe bans at once every 50 years; however, this falls to 14% when other improvements and bill increases are introduced.

8.3.5 Almost two-thirds (63%) of customers would like to see 0% of properties get an 'earthy' taste or smell when considering this issue alone. This level of support reduces to 50% when other bill increases are introduced.

8.3.6 Almost three quarters (72%) of customers were willing to pay +£2 for increased mains renewal to 100% every 100 years, when considered in isolation (see chapter seven). Fewer than two in every five customers (38%) supported this initiative when asked to consider other service changes and bill impacts.

8.3.7 Strangely, there was an increase in support for speeding up compulsory metering for all customers by 2015 (27% compared to 20% when considered in isolation from other bill increases). This inconsistent viewpoint is, perhaps, an indication that compulsory metering is not an 'improvement' and has confused some respondents.

8.4 What does it all mean?

8.4.1 The difference in support levels, depending upon whether the change in service and bill level is in isolation or part of a number of others, is presented in Figure 8.1. The red bar gives the level of support when considered in isolation of other changes; the blue bar in combination.

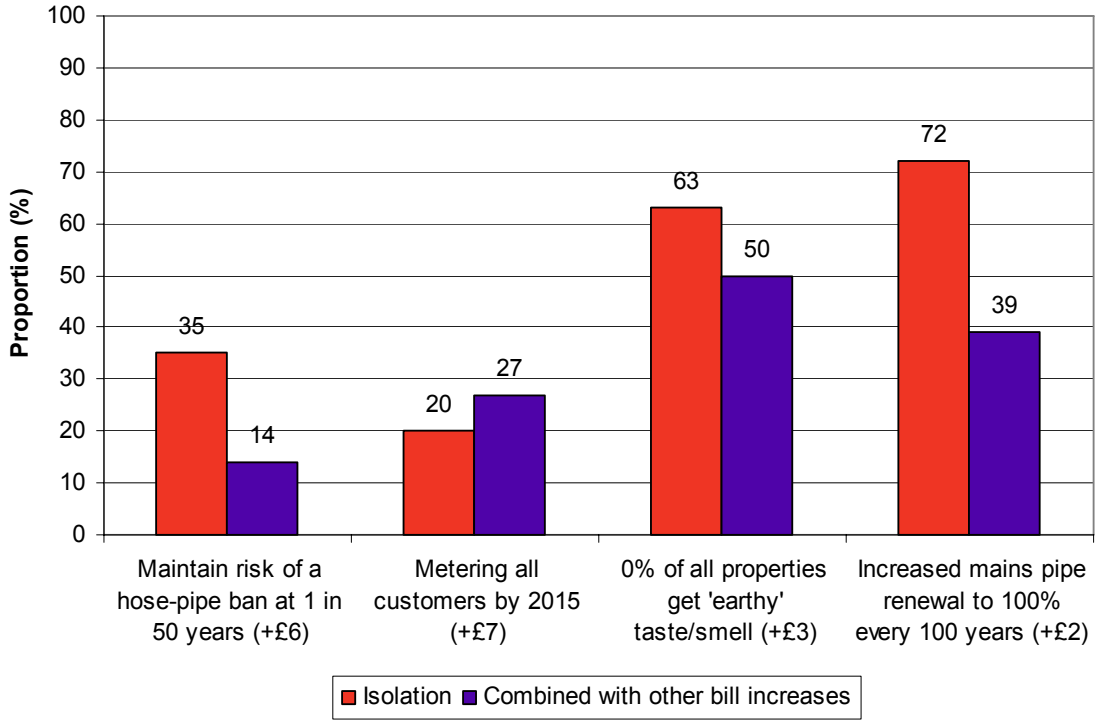


Figure 8.1 Customers perception when improvements are viewed in isolation or against other bill increases

8.4.2 When we consider improvements in isolation, the majority of customers are supportive of two of the four aspects of service provision (0% of properties getting an 'earthy' taste/smell and increased mains pipe renewal to 100% every 100 years).

8.4.3 When considered in the context of the overall bill impact (of +£18), majority support reduces to (just) one service improvement – improved taste and smell.

8.4.4 However, if Portsmouth Water was to eradicate the 'earthy' taste/smell for the 20% of customers that occasionally experience it **and** increase the rate of mains renewal the bill impact would be +£5 – much nearer the 'in isolation' (red) context than the '+£18' (blue) context. Indeed, one might infer from the above graph that, should we have offered this specific paired-combination to customers, around 60% would have preferred it.

9 Conclusions

9.1 Introduction

9.1.1 This final chapter summarises the main findings from the research and presents recommendations based on customer preferences for improving the service provided by Portsmouth Water.

9.2 Key Findings

9.2.1 The findings from this research have shown that overall, customers are satisfied with the service provided by Portsmouth Water, and half of metered customers are 'very satisfied'. This is consistent with the findings from 2007 survey.

9.2.2 Also similar to 2007, customers overall consider that they are getting value for money.

9.2.3 When considered in isolation, customers prefer:

- a **hose-pipe ban** once every 20 years rather than paying more for a ban once every 50 years, especially customers living in an urban area or on a low income;
- to pay an additional £3 to ensure that none of the properties within the Portsmouth Water region experience an **'earthy' taste or smell**, especially living in an urban area or on a low income;
- NOT to be **metered until 2010-2035** and pay a £1 bill increase per year. Metered customers believe it is preferable to introduce metering at a quicker rate;
- to pay an additional £2 to increase **mains pipe renewal** to 100% renewed every 100 years rather than every 134 years, particularly customers who are metered or aged between 35-59 years. Lower income customers are the least supportive of this option.

9.2.4 Customers' support reduced considerably if asked to consider all together. Drawing inferences from the survey findings, we consider that the majority of customers would support the proposed improvements in taste and odour (to eradicate the 'earthy' taste/smell for the 20% of customers that occasionally experience it) **and** in mains renewal (from 134 years to replace 100% to 100 years) at a cost of up to +£5.

9.3 Implications for the Business Plan

9.3.1 Evidence from this research supports the introduction of two service improvements: mains pipe renewal to be increased to 100% every 100 years; and that no properties should experience an 'earthy' taste or smell.

9.3.2 These views support Portsmouth Water's plans to reduce the number of complaints about the appearance, taste or smell of tap water from approximately 214 per year. These findings also suggest that customers are willing to pay an additional £2 to increase mains pipe renewal so that the current service and maintenance of equipment is maintained, if not improved, as outlined in the service level proposed by 2015.

Appendices

Appendix A – Survey Materials

Serial number:_____

Portsmouth Water Customer Survey

Sample Point from Quota Sheet [WRITE IN]: _____

READ OUT: Good morning/afternoon/evening. My name is .... from MVA Consultancy, an independent research company. I am carrying out a survey on behalf of Portsmouth Water. Would you mind answering a few questions; it should take about 15 minutes? **[SHOW ID]**

Can I just check – as far as you know, are you connected to the Mains water supply? Thank you. (Close if not connected to main water or sewer system.)

And are you, or your husband/wife/partner, responsible for paying your household's water bill? Thank you. (Close if not pay water bill.)

I'd just like to ask a few basic questions about you so that we collect the views of a representative group of people:

S1 Which age group are you in [SHOWCARD S1]?

18-34 yrs 1
35–59 yrs 2
60+ yrs 3

S2 Gender [DO NOT ASK]?

Male..... 1
Female 2

S3 What is your current working (or non-working) status? [SHOWCARD S3]

Employed Full-time (30+ hrs) 1
Employed Part-time (9-29 hrs) 2
Retired 3
Not working and not looking for work..... 4
Student 5
Not working and looking for work 6
Other 7

[CHECK QUOTAS AND THAT RESPONDENT IS AGED 18 OR OVER]

QUOTA

Age		**Gender**		**Working Status**	
18-34 yrs	1	Male	1	Employed (full-time)	1
35 – 59 yrs	2	Female	2	Retired	2
60+ yrs	3			Other	3

mvaconsultancy

Overall satisfaction with existing service

READ OUT: Portsmouth Water is interested to hear your views about how satisfied you are with their existing service and whether it is value for money.

Q1 Can you to tell me how satisfied you are with your water supply overall, on a scale from 1 to 5, where 1 means 'very dissatisfied' and 5 means 'very satisfied' **[SHOWCARD A]**

Very Dissatisfied 1
Fairly Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Fairly Satisfied 4
Very Satisfied 5
Don't Know/Can't say 6

Q2 The average bill for water services in your area is £85. This is the cheapest bill level in the country. How do you rate your water supply in terms of Value for Money, using a scale of 1 to 5 where 1 means 'poor value for money' and 5 means 'good value for money' **[SHOWCARD B]**

Very Poor Value for Money 1
Fairly Poor Value for Money 2
Neither Poor nor Good Value for Money 3
Fairly Good Value for Money 4
Very Good Value for Money 5
Don't Know/Can't say 6

Hose-pipe bans

READ OUT: Portsmouth Water customers have not had a hose pipe ban since 1976. The Company has, for many years, planned on the basis of bans being required no more than 1 in 50 years. As a result of increasing demand on water supplies, and a reduction in the amount Portsmouth Water take from local water supplies because of environmental concerns, the Company will need to make future investment in order to maintain this level of service. The impact on bills of maintaining this level of service, compared to offering a lower level of service, is shown here. **[SHOWCARD C]**

Q3 Which future service option would you prefer? (All other service aspects as now)

CODE:

A.....1 **B.....2**

Taste and odour

READ OUT: A minority of Portsmouth Water customers occasionally experience differences in the taste/smell of their water. The impact of improving the taste and odour of water on customer bills are shown below.

Q4 Which future service option would you prefer? (All other service aspects as now) **[SHOWCARD D]**

CODE:

A.....1 **B.....2**

Metering

READ OUT: Portsmouth Water plan to maintain uninterrupted supplies to customers, whilst protecting the environment. In order to achieve this aim, they intend to meter all customers, where practical, over time. Typically, metered customers use 10% less water than un-metered customers.

They are considering three options for metering. The faster the company fits meters the quicker that the environmental benefits are achieved. But metering comes at a cost, and the speed of the installation has an impact on bills. Also, metering means that bills relate directly to usage, rather than historic rateable values.

Q5a Which of the following options do you think Portsmouth Water should take? (All other service aspects as now) **[SHOWCARD E]**

CODE:

A.....1 **B.....2** **C.....3**

IF Q5a=C OR RESPONDENT REFUSED TO ANSWER, ASK:

Q5b What is the reason for this?

It keeps costs low and I don't mind the environmental improvements being introduced gradually 1
I don't want metering (so the longer the better) 2
Other (please specify)..... 3

_____

_____

_____

Mains renewals

READ OUT: Portsmouth Water operates through a network of 3,200km of pipes. Between 1989 and 2005, it operated a policy which, on average, renewed these pipes every 100 years on a rolling basis. During this time, leakage, interruptions to supply and burst rates have fallen. In 2005, the Company reduced its mains renewal activity to an average of once in every 140 years.

On reflection, the Company believes this approach will result in a deterioration in the network over the long term, resulting gradually in increasing leakage and causing a greater number of interruptions to supply. Portsmouth Water could, therefore, revert to its policy of renewing mains every 100 years which will mean a higher length of mains being renewed each year. This will put bills up by approximately £2 per annum.

Q6 Which future service option would you prefer? (All other service aspects as now) **[SHOWCARD F]**

CODE:

A.....1 **B.....2**

Combined bill impacts

READ OUT: So far, we have looked at a number of improvements that Portsmouth Water could make to their service that would each impact on bill levels. Bearing in mind the combined bill impact of having a number of improvements, which one or more improvements from this list **[SHOWCARD G]** would you like to see introduced? (Note that if all were introduced tomorrow, the average bill would increase by **£18**).

Q7 Looking at the list, which ones would you most like to see introduced. **[PLEASE CIRCLE ALL THAT APPLY]**

Maintain risk of a hose-pipe ban at 1 in 50 yrs (+£6) 1
Metering all customers by 2015 (+£7) 2
0% of properties get 'earthy' taste/smell (+£3)..... 3
Increased mains pipe-renewal to 100% every 100 yrs (+£2)..... 4
None of these..... 5

Demographic information

READ OUT: Finally, some questions to help us analyse the results of this survey. To confirm again, all your answers will be kept strictly confidential and not linked to your name and address.

Q8 Are you currently charged for water via a water meter installed at your home?

Yes 1
No 2
Don't Know/Can't say 3

Q9 What is the total annual income of your household (before tax)? Please tell me which of these bands best represents your income.
[SHOWCARD H]

Less than £10,000 1
£10,000 - £19,999 2
£20,000 - £29,999 3
£30,000 - £39,999 4
£40,000 - £49,999 5
£50,000 - £59,999 6
£60,000 or more 7
Don't Know/Can't say/refused 97

Q10 How many people are there in your household?
Adults_____
Children_____

Q11 Do you know the category band your house is in for Council Tax?

A 1
B 2
C 3
D 4
E 5
F 6
G 7
H 8
Don't Know 97

[INTERVIEWER TO COMPLETE]
Q12 [CODE IN LOCATION OF PROPERTY]

Rural/in a village 1
On the edge of town or in a suburb 2
In a town or city 3

[INTERVIEWER TO COMPLETE]

Q13 [CODE IN TYPE OF PROPERTY]

Detached 1
Semi-detached 2
Terraced 3
Bungalow 4
Flat/maisonette 5
Other 6

Q14 What is the occupation of the chief income earner in your household?
[ONLY ASK SUFFICIENT QUESTIONS TO CODE SOCIAL GRADE BELOW]

Occupation title

_____

Position/Rank/Grade and No. of Staff Responsible for:

_____

Industry/Type of Company:

_____

Qualification/Degrees/Apprenticeships:

_____

[CODE SOCIAL GRADE]:

1 ..... AB 2 ..... C1 3 ..... C2 4 ..... DE

Q15 Thank you very much for taking part in this survey. On reflection, were there any current issues not already discussed relating to water or sewerage, or paying your bill that you may have had in mind when answering these questions?

_____

_____

_____

[NOW RECORD DETAILS BELOW]

READ OUT: For quality control reasons a proportion of respondents are contacted after fieldwork to check that the interview was carried out properly. Therefore can I take down your name and telephone number, which will not be linked to your answers?

Respondent's Full Name: _____

Telephone Number: _____

IF NOT PREVIOUSLY READ OUT: Your responses will remain anonymous, and as part of the wider customer research results will be reported back to the group that has commissioned this work, to be used to inform final decisions on the taste of water supplied and the risk of a hose pipe ban. While other issues may arise to affect water companies' priorities, the aim is to ensure that customer views are represented and that water companies take into account the issues prioritised by customers.

READ OUT: Thank you for your time today, your input is much appreciated by MVA and the group that has commissioned this work. If you have any further questions about the research, please contact Laura Hunt at MVA Consultancy on 0161 236 0282.

COMPLETE MRS DECLARATION

I declare that this interview has been carried out strictly in accordance with your specification and has been conducted within the MRS Code of Conduct with a person unknown to me.			
Interviewer's name	**Interviewer's signature**	**Date/Time**	**Checked by supervisor**

SHOWCARD S1

Which age band applies to you?

18-34 yrs 1

35-59 yrs 2

60+ yrs 3

SHOWCARD S3

What is your current working (or non-working status)?

Employed full-time (30+ hrs) 1

Employed part-time (9-29 hrs) 2

Retired 3

Not working and not looking for work 4

Student 5

Not working and looking for work 6

Other 7

SHOWCARD A

Very Dissatisfied.....1

Fairly Dissatisfied.....2

Neither Satisfied nor Dissatisfied.....3

Fairly Satisfied.....4

Very Satisfied.....5

SHOWCARD B

Very Poor Value for Money 1

Fairly Poor Value for Money 2

Neither Poor nor Good Value for Money 3

Fairly Good Value for Money 4

Very Good Value for Money 5

SHOWCARD C (hose-pipe bans)

Option A

Ban: once every **20 years**

Bill level in 5 years time: *+£4*

Bill level in 20 years time: *+£8*

Option B

Ban: once every **50 years**

Bill level in 5 years time: *+£6*

Bill level in 20 years time: *+£10*

SHOWCARD D (taste and odour)

Option A	**Option B**
20% of properties get 'earthy' taste/smell occasionally	**0%** of properties get 'earthy' taste/smell occasionally
average bill level: *£ 85*	average bill level: *£ 88*

SHOWCARD E (metering)

Option A	Option B	Option C
All customers are Metered between **2010-2015**	All customers are Metered between **2010-2025**	All customers are Metered between **2010-2035**
Impact on average bill: *+£7 per year*	Impact on average bill: *+£2 per year*	Impact on average bill: *+£1 per year*

SHOWCARD F (mains renewals)

Option A

Existing level of mains pipe renewal
(100% renewed every **134 yrs**)

average bill level: *£ 85*

Option B

Increased level of mains pipe renewal
(100% renewed every **100 yrs**)

average bill level: *£ 87*

SHOWCARD G

Maintain risk of a hose-pipe ban at 1 in 50 years (+£6) ……1

Metering all customers by 2015 (+£7)……2

0% of properties get 'earthy' taste/smell (+£3)……3

Increased mains pipe-renewal to 100% every 100 years (+£2)……4

None of these……5

SHOWCARD H

What is the total annual income of your household (before tax)? Please tell me which of these bands best represents your income.

Less than £10,000 1

£10,000 - £19,999 2

£20,000 - £29,999 3

£30,000 - £39,999 4

£40,000 - £49,999 5

£50,000 - £59,999 6

£60,000 or more 7

MVA Consultancy provides advice on transport and other policy areas, to central, regional and local government, agencies, developers, operators and financiers.

A diverse group of results-oriented people, we are part of a 350-strong team worldwide. Through client business planning, customer research and strategy development we create solutions that work for real people in the real world.

For more information visit www.mvaconsultancy.com

Abu Dhabi
Suite 118
The Avenue Business Centre, Emirates Tower
P.O. Box 33763, Abu Dhabi, UAE
T: +971 (0)2 412 4118

Birmingham
Second Floor, 37a Waterloo Street
Birmingham B2 5TJ United Kingdom
T: +44 (0)121 233 7680 F: +44 (0)121 233 7681

Dubai
Office 402, Building 49, Dubai Healthcare City
PO Box 123166, Dubai, UAE
T: +971 (0)4 433 0530 F: +971 (0)4 423 3613

Dublin
First Floor, 12/13 Exchange Place
Custom House Docks, IFSC, Dublin 1, Ireland
T: +353 (0)1 542 6000 F: +353 (0)1 542 6001

Edinburgh
Stewart House, Thistle Street, North West Lane
Edinburgh EH2 1BY United Kingdom
T: +44 (0)131 220 6966 F: +44 (0)131 220 6087

Glasgow
Seventh Floor, 78 St Vincent Street
Glasgow G2 5UB United Kingdom
T: +44 (0)141 225 4400 F: +44 (0)141 225 4401

London
Second Floor, 17 Hanover Square
London W1S 1HU United Kingdom
T: +44 (0)20 7529 6500 F: +44 (0)20 7529 6556

Lyon
11, rue de la République, 69001 Lyon, France
T: +33 (0)4 72 10 29 29 F: +33 (0)4 72 10 29 28

Manchester
25th Floor, City Tower, Piccadilly Plaza
Manchester M1 4BT United Kingdom
T: +44 (0)161 236 0282 F: +44 (0)161 236 0095

Marseille
76, rue de la République, 13002 Marseille, France
T: +33 (0)4 91 37 35 15 F: +33 (0)4 91 91 90 14

Paris
12-14, rue Jules César, 75012 Paris, France
T: +33 (0)1 53 17 36 00 F: +33 (0)1 53 17 36 01

Woking
Dukes Court, Duke Street, Woking
Surrey GU21 5BH United Kingdom
T: +44 (0)1483 728051 F: +44 (0)1483 755207

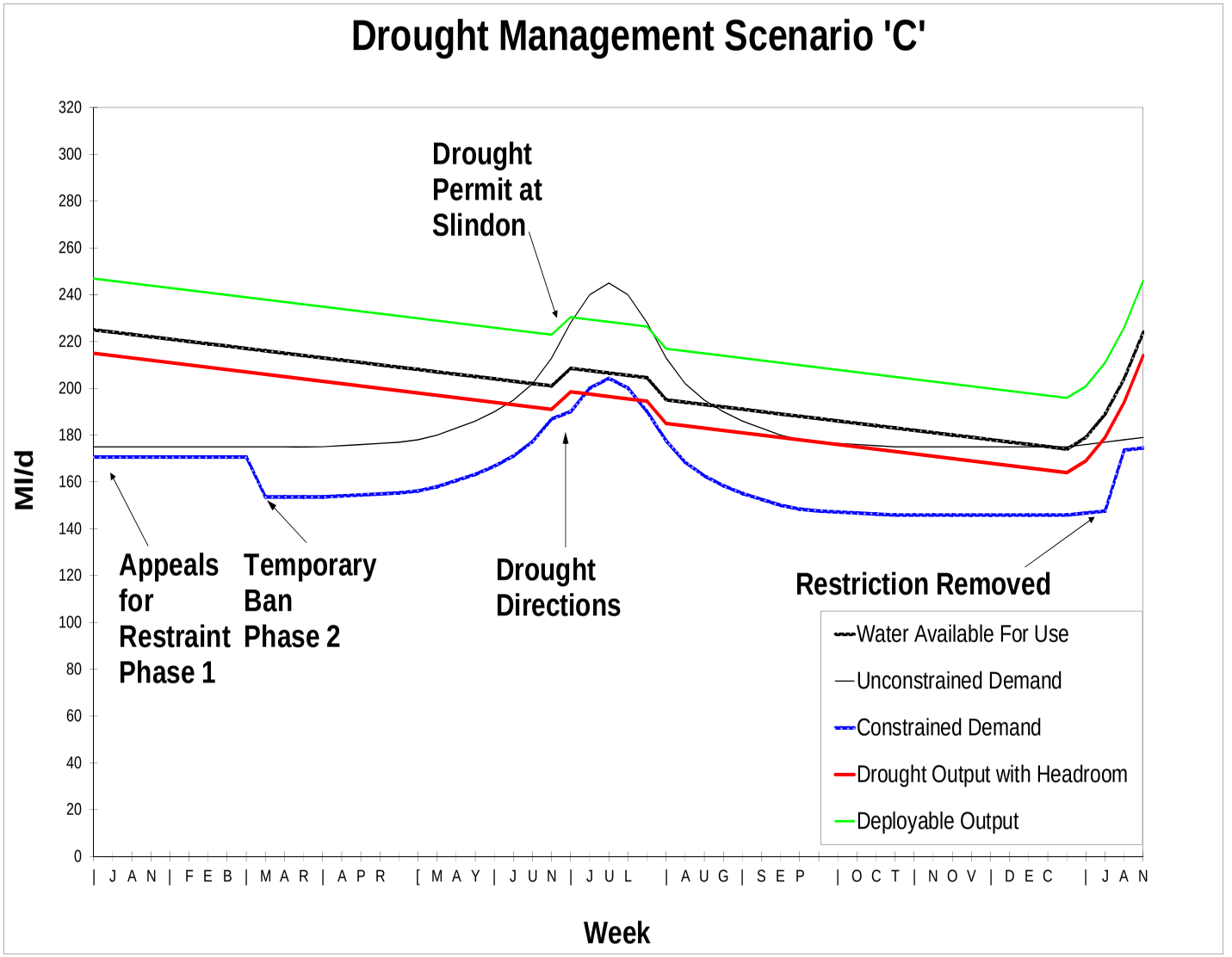
Email: info@mvaconsultancy.com

Offices also in
Bangkok, Beijing, Hong Kong, Shenzhen and Singapore

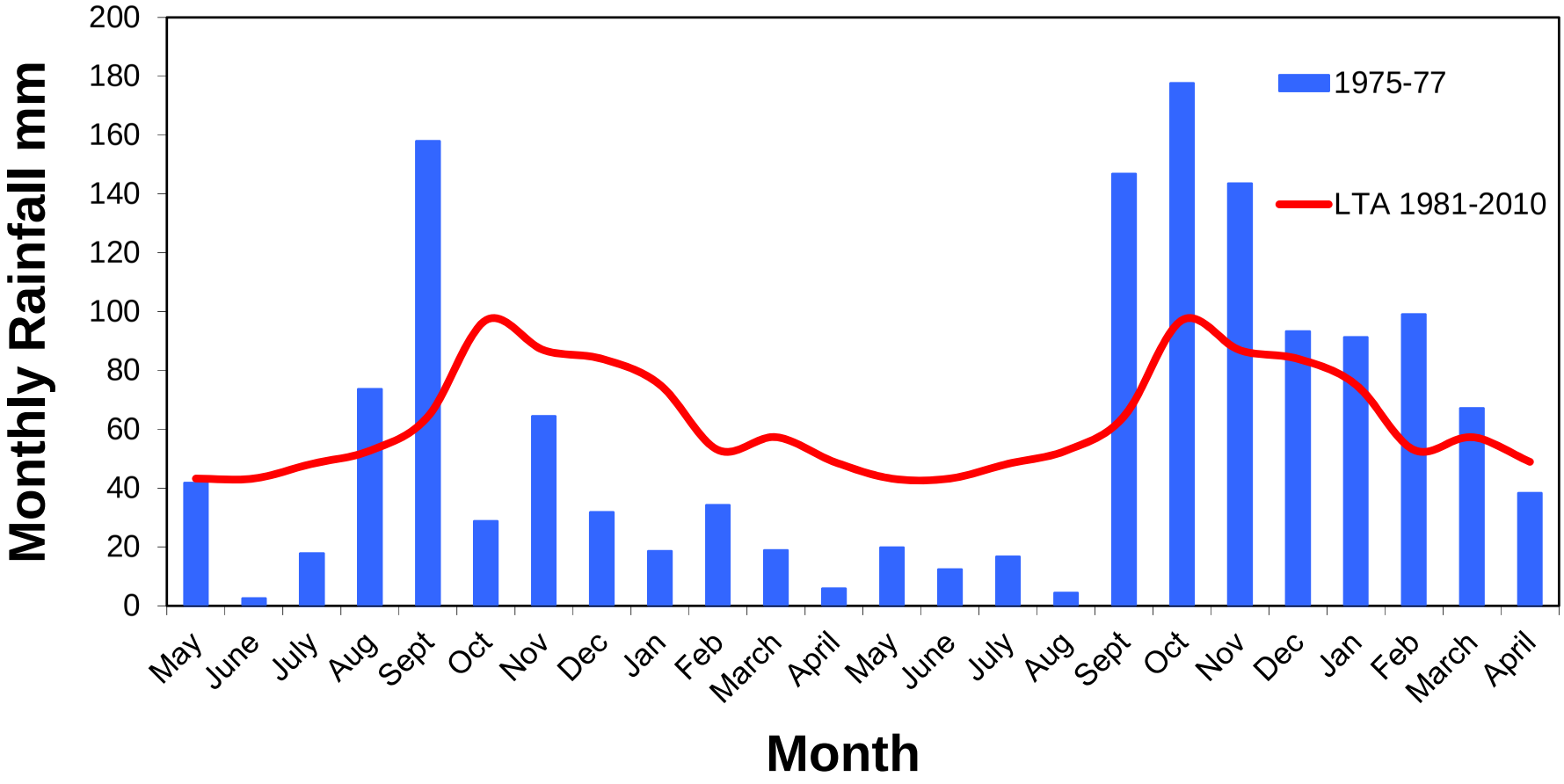
mvaconsultancy

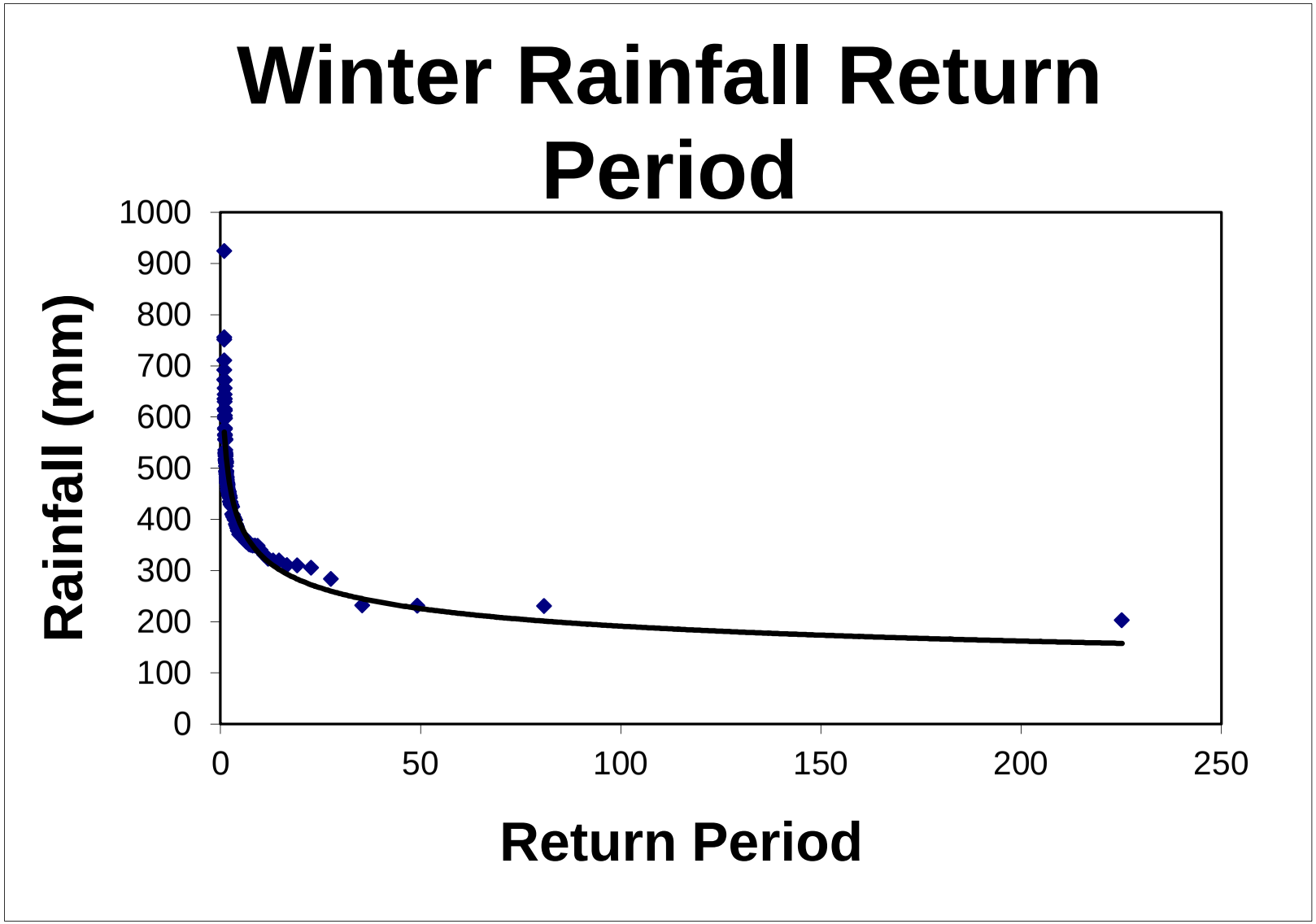
APPENDIX I

LARGE VERSIONS OF GRAPHS

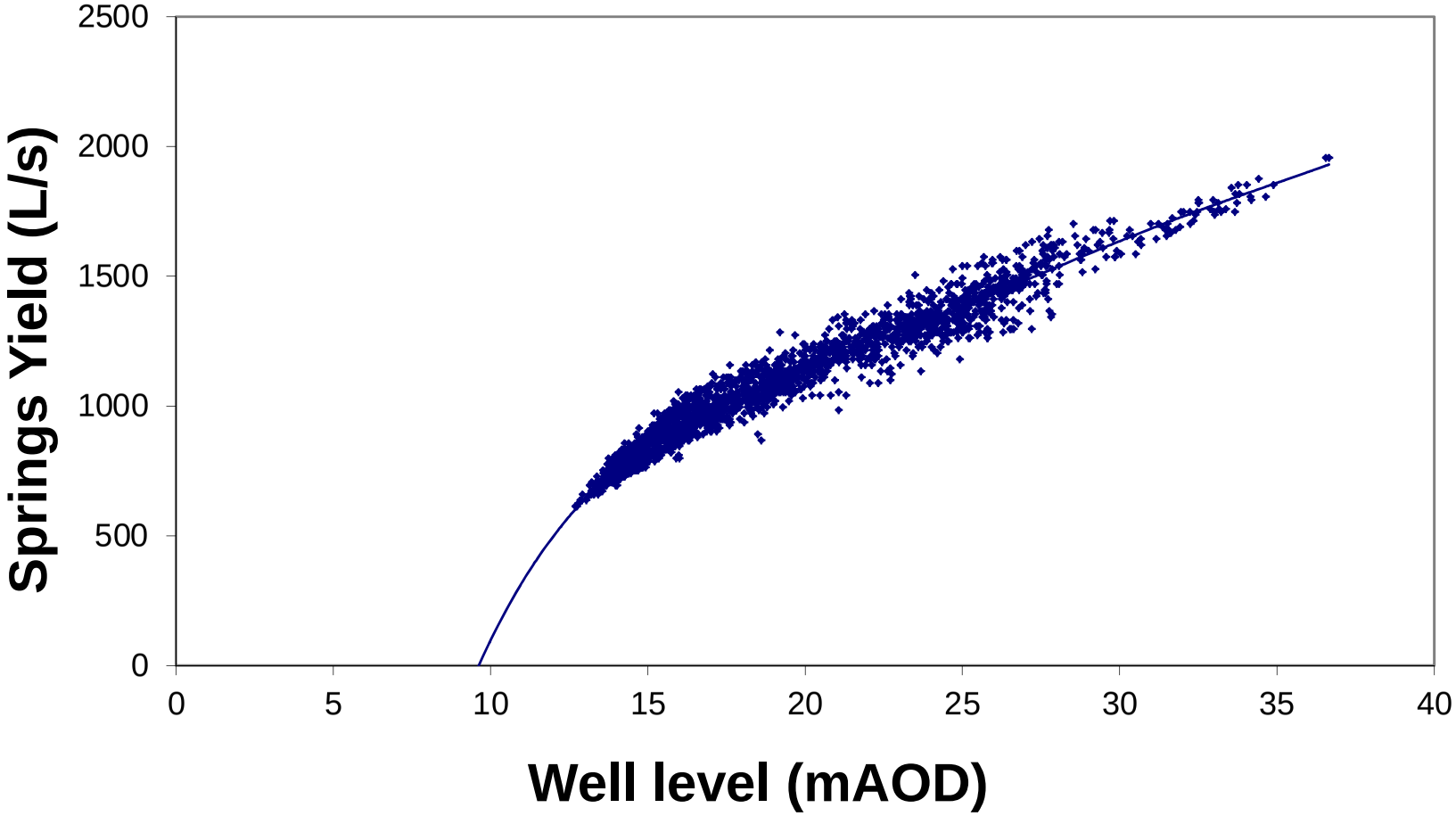

Drought Management Scenario 'C'
Drought Permit at Slindon
Appeals for Restraint Phase 1
Temporary Ban Phase 2
Drought Directions
Restriction Removed
Water Available For Use
Unconstrained Demand
Constrained Demand
Drought Output with Headroom
Deployable Output
Ml/d
Week
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
| J A N | F E B | M A R | A P R [M A Y | J U N | J U L | A U G | S E P | O C T | N O V | D E C | J A N

Havant Rainfall
1975-1977

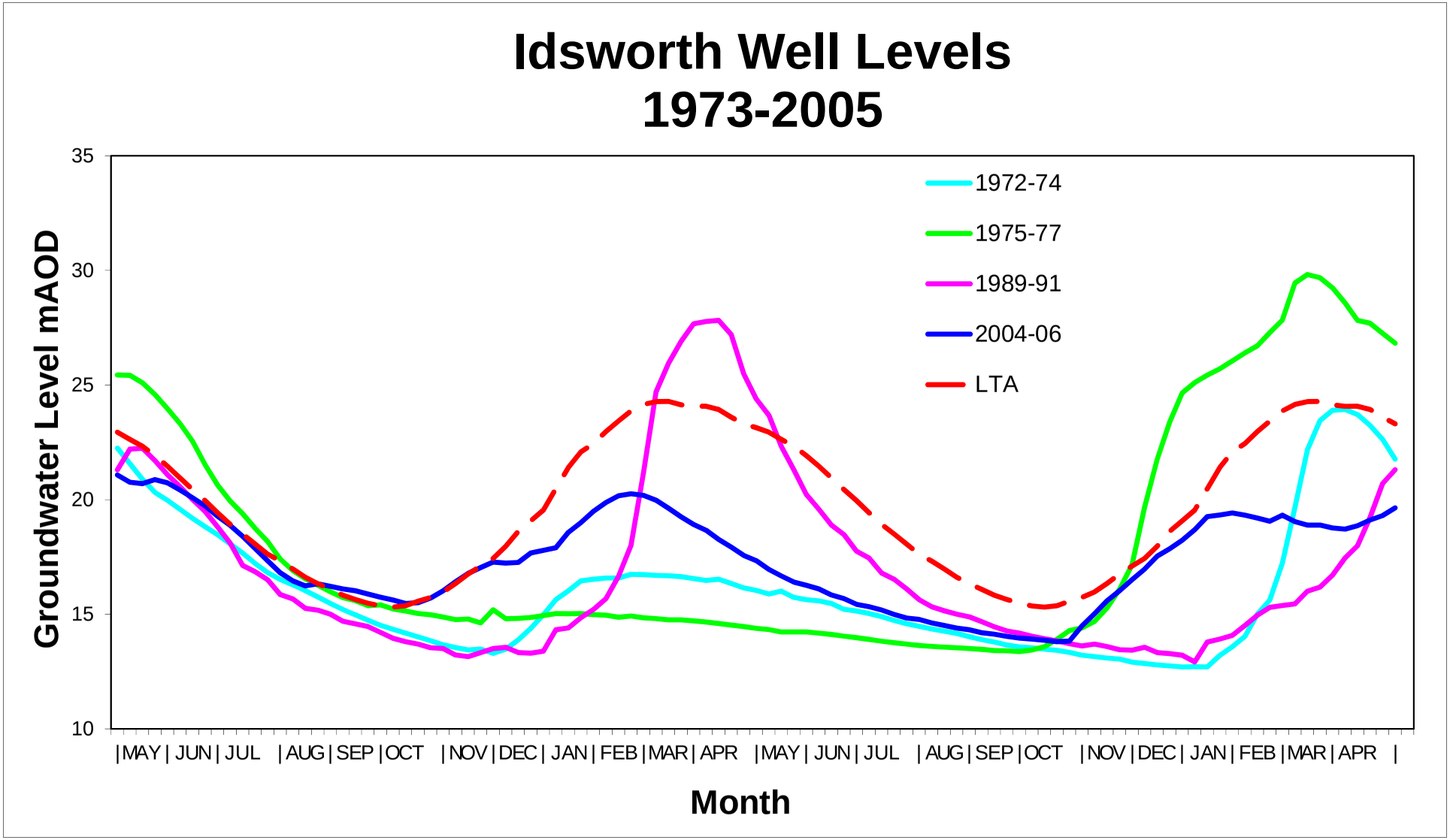



Winter Rainfall Return Period
Rainfall (mm)
1000
900
800
700
600
500
400
300
200
100
0
0
50
100
150
200
250
Return Period

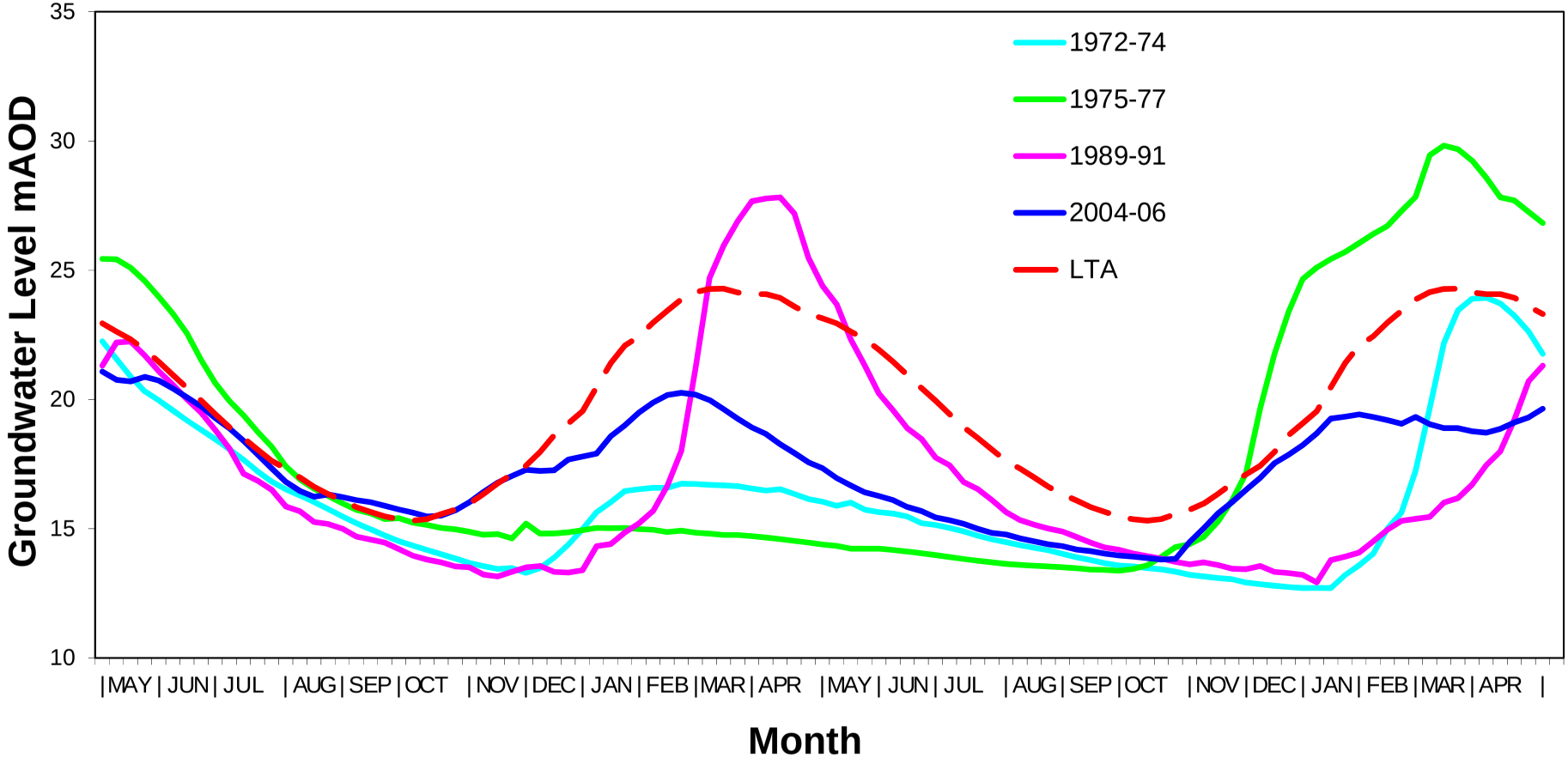
Idsworth Well Level/Spring Flow



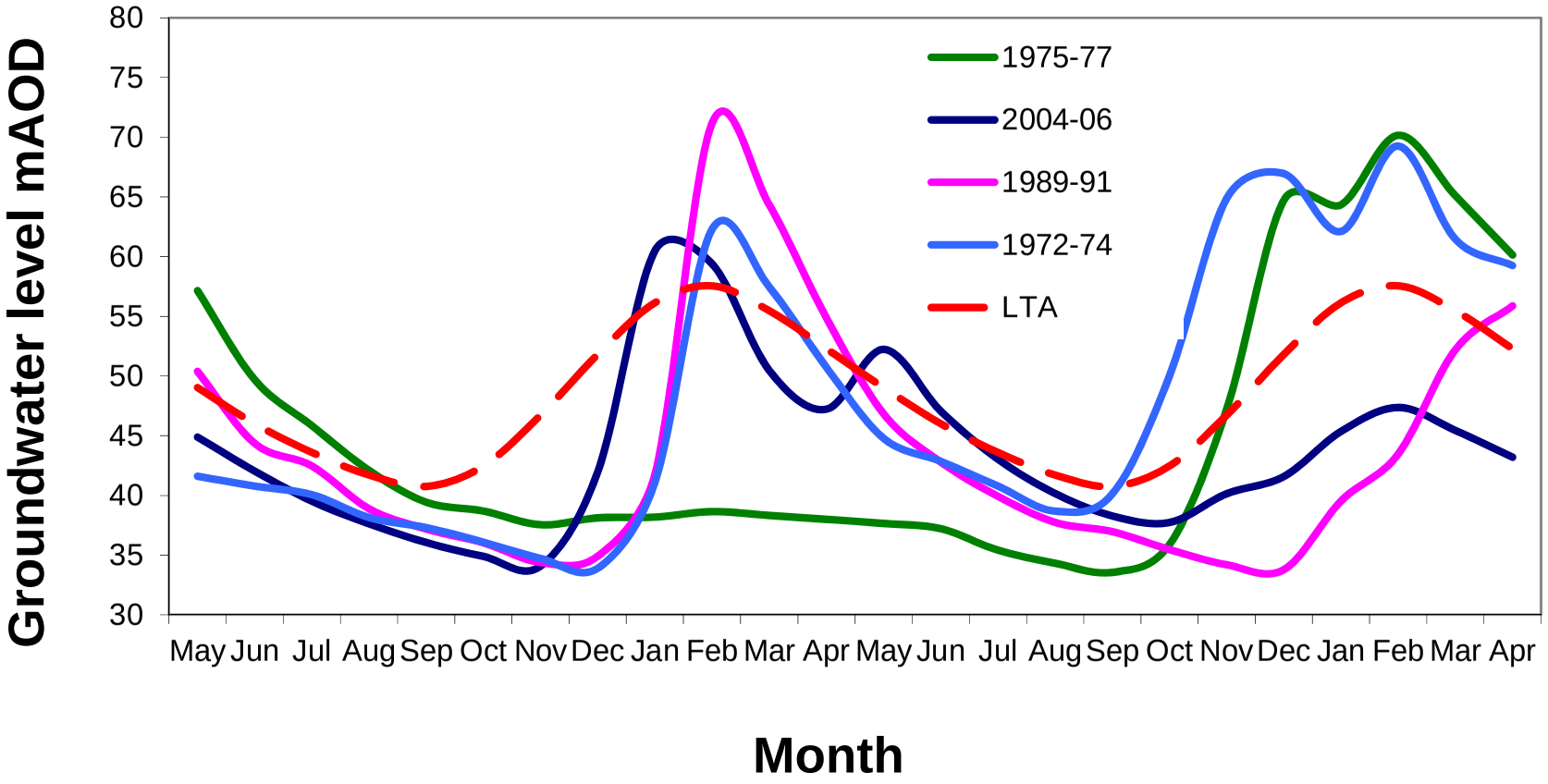
Idsworth Well Levels
1973-2005



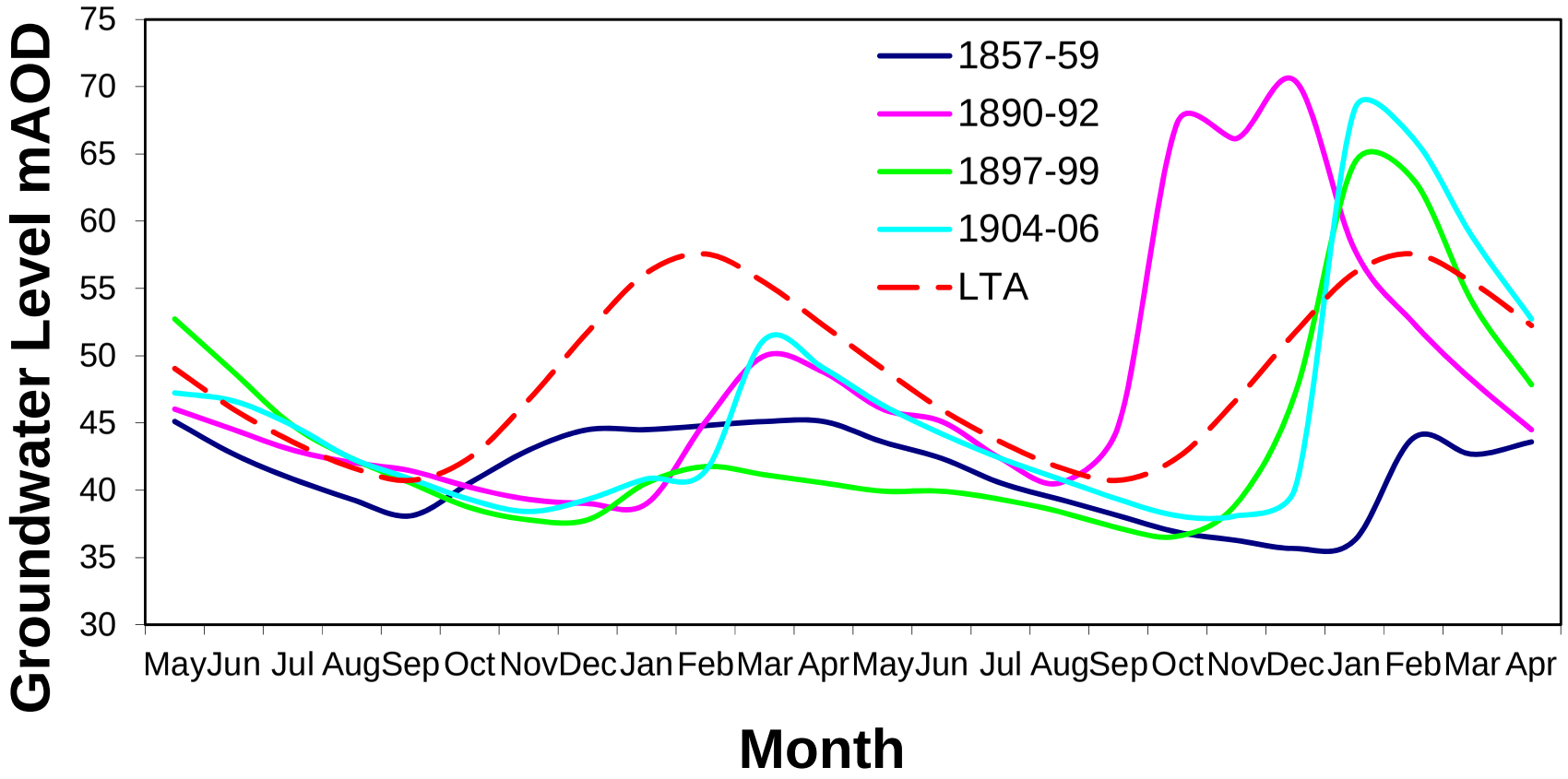
Idsworth Well Levels
1973-2005

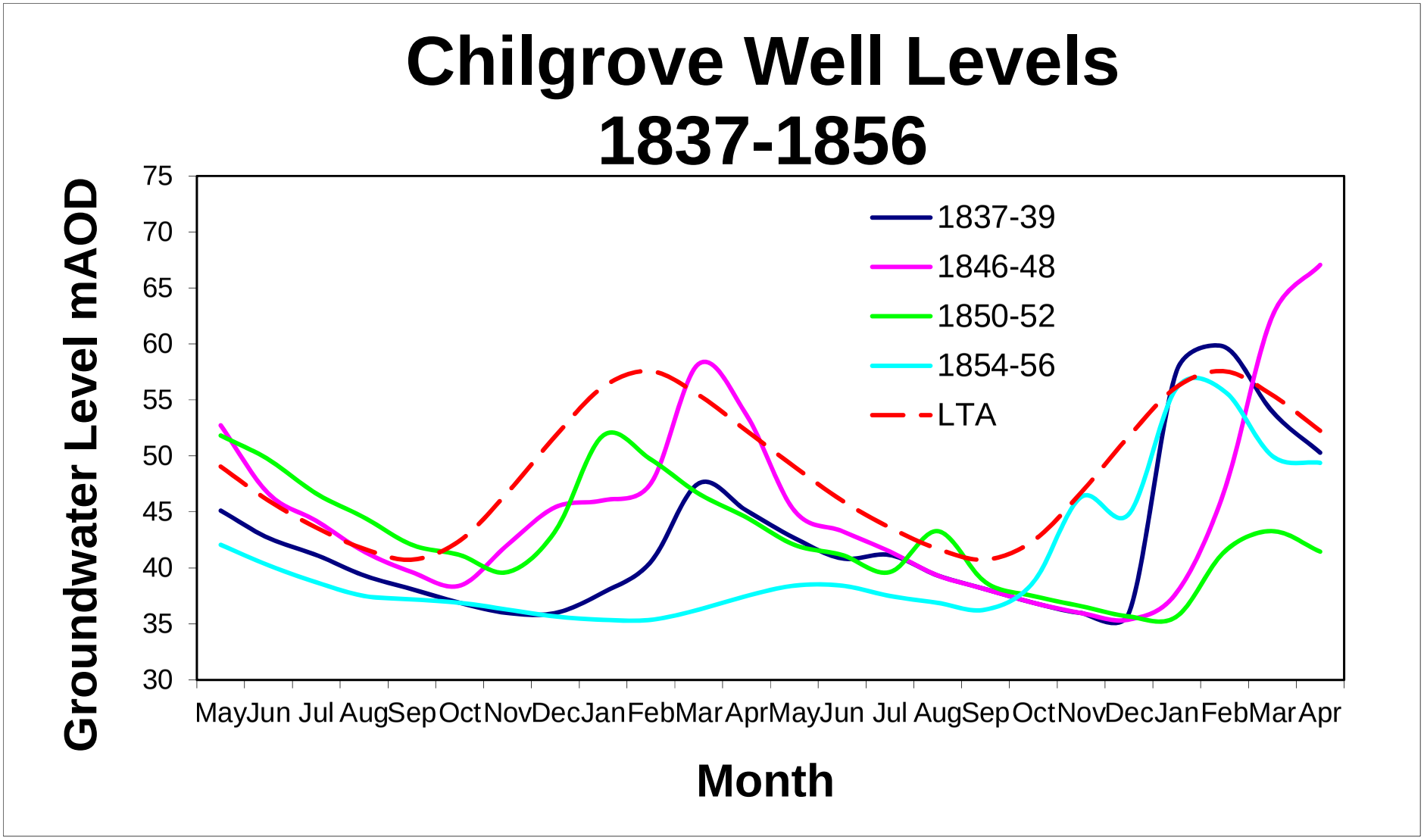


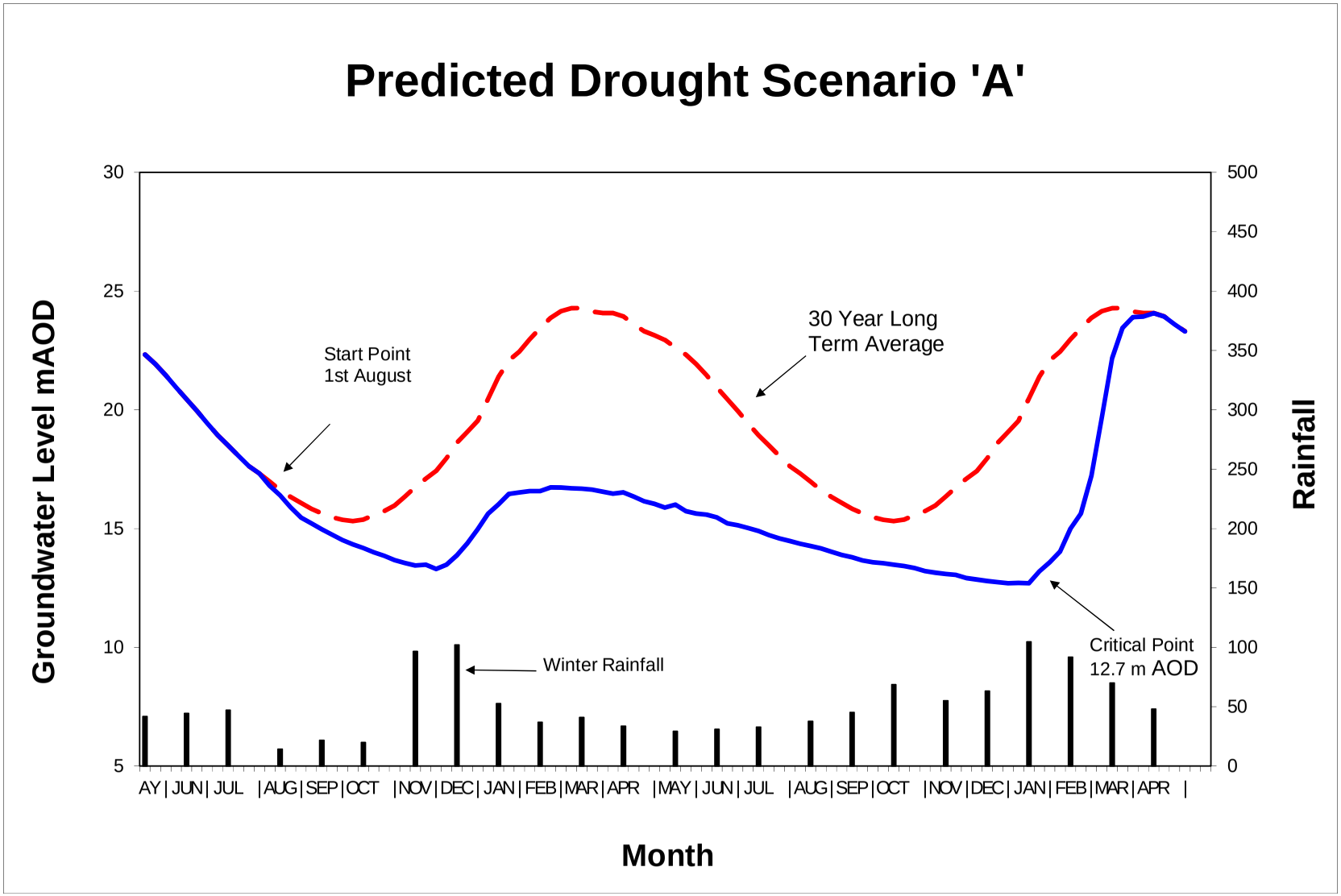
Chilgrove Well Level 1973-2005

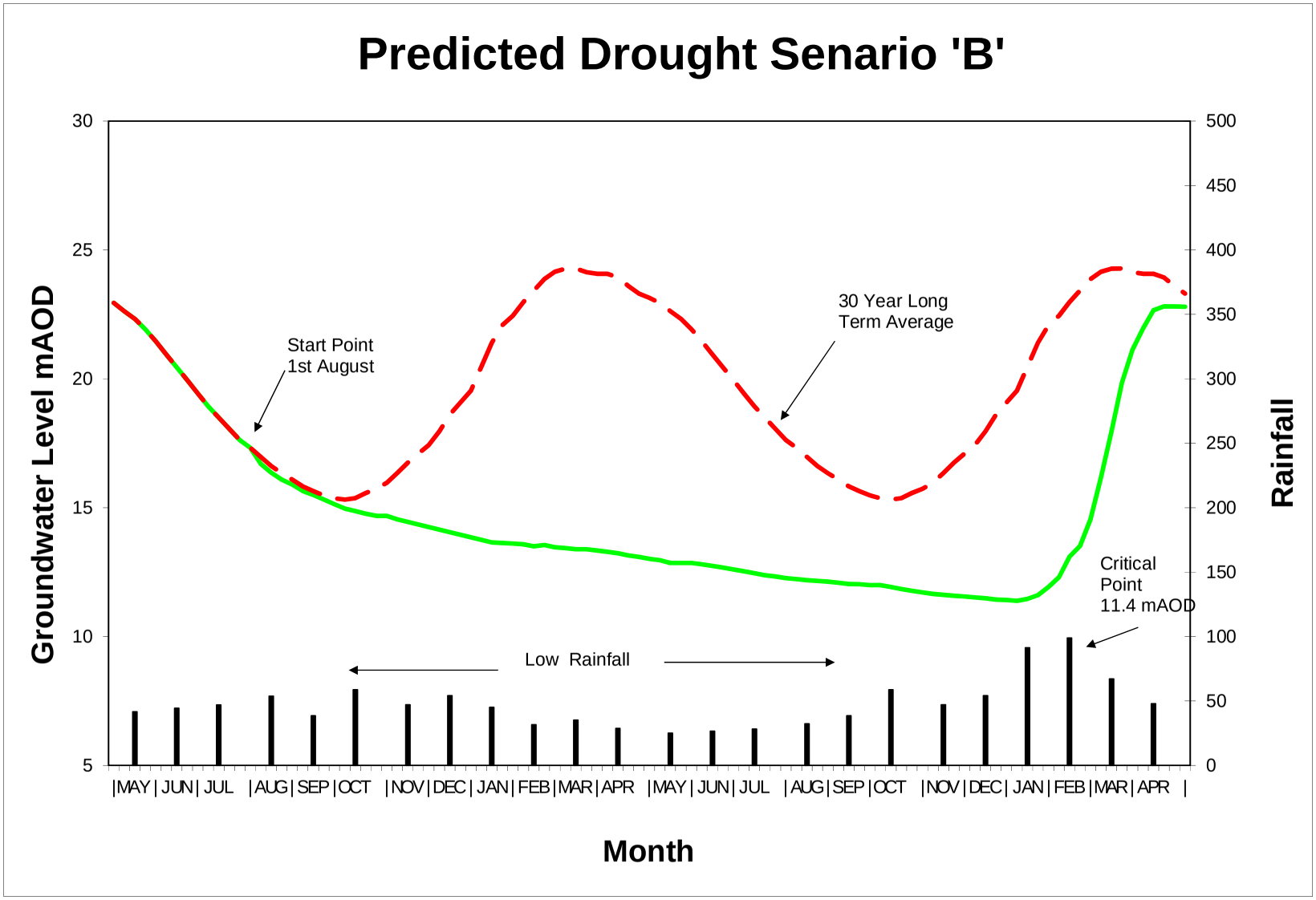


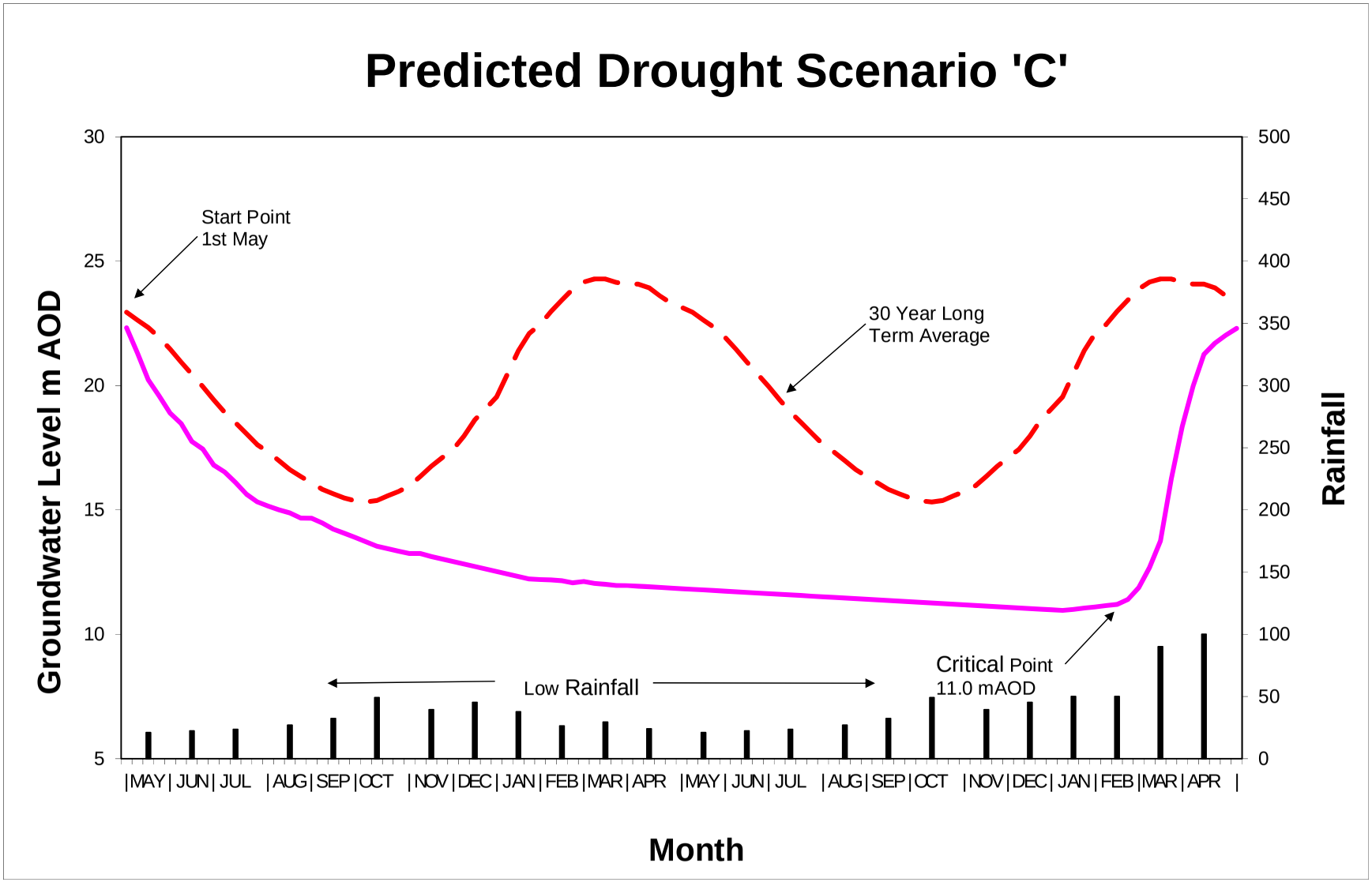
Chilgrove Well Levels
1857-1906

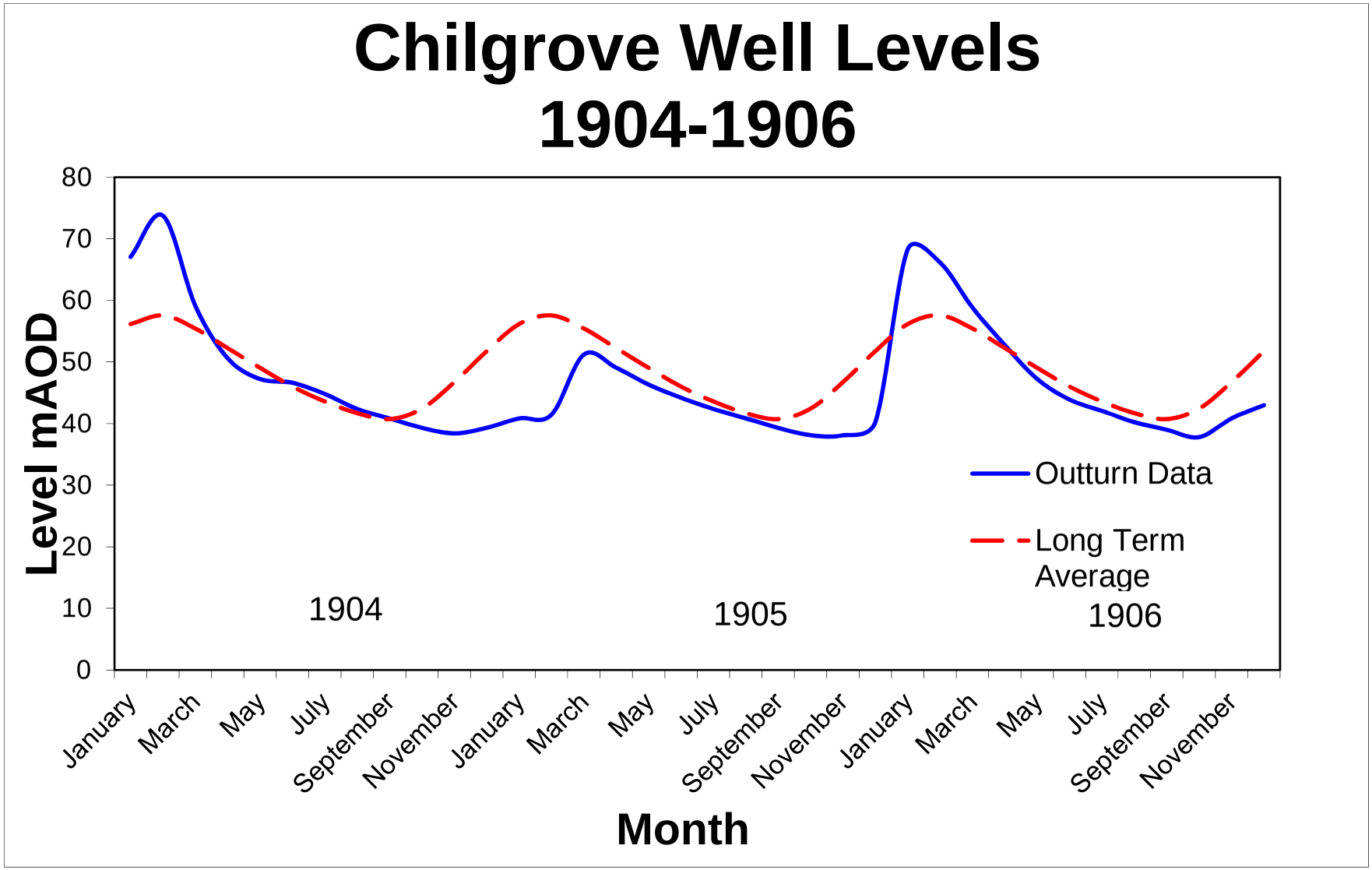


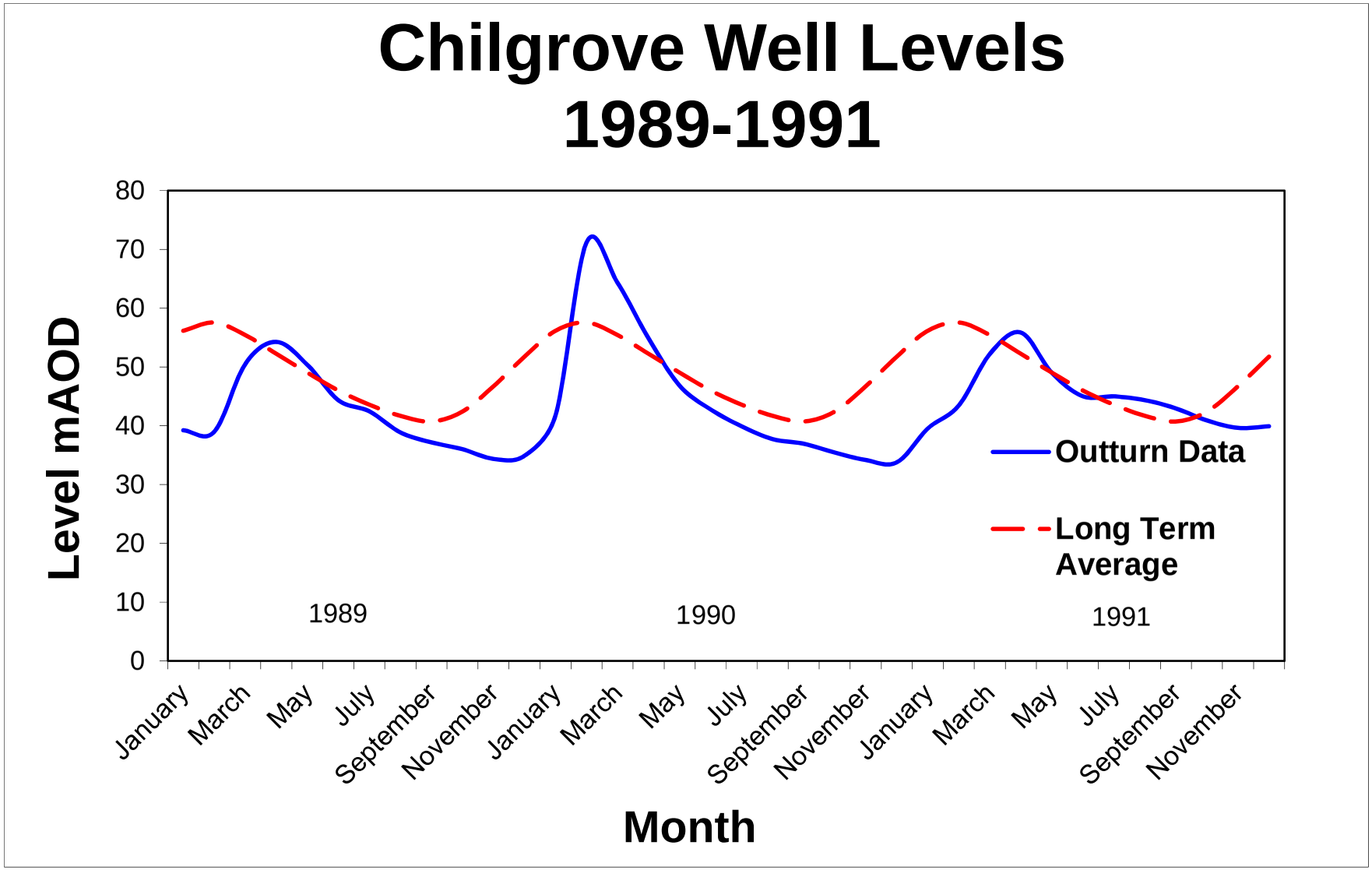

Chilgrove Well Levels
1837-1856
Groundwater Level mAOD
75
70
65
60
55
50
45
40
35
30
1837-39
1846-48
1850-52
1854-56
LTA
MayJun Jul AugSep Oct NovDecJanFebMarAprMayJun Jul AugSep Oct NovDecJanFebMarApr
Month

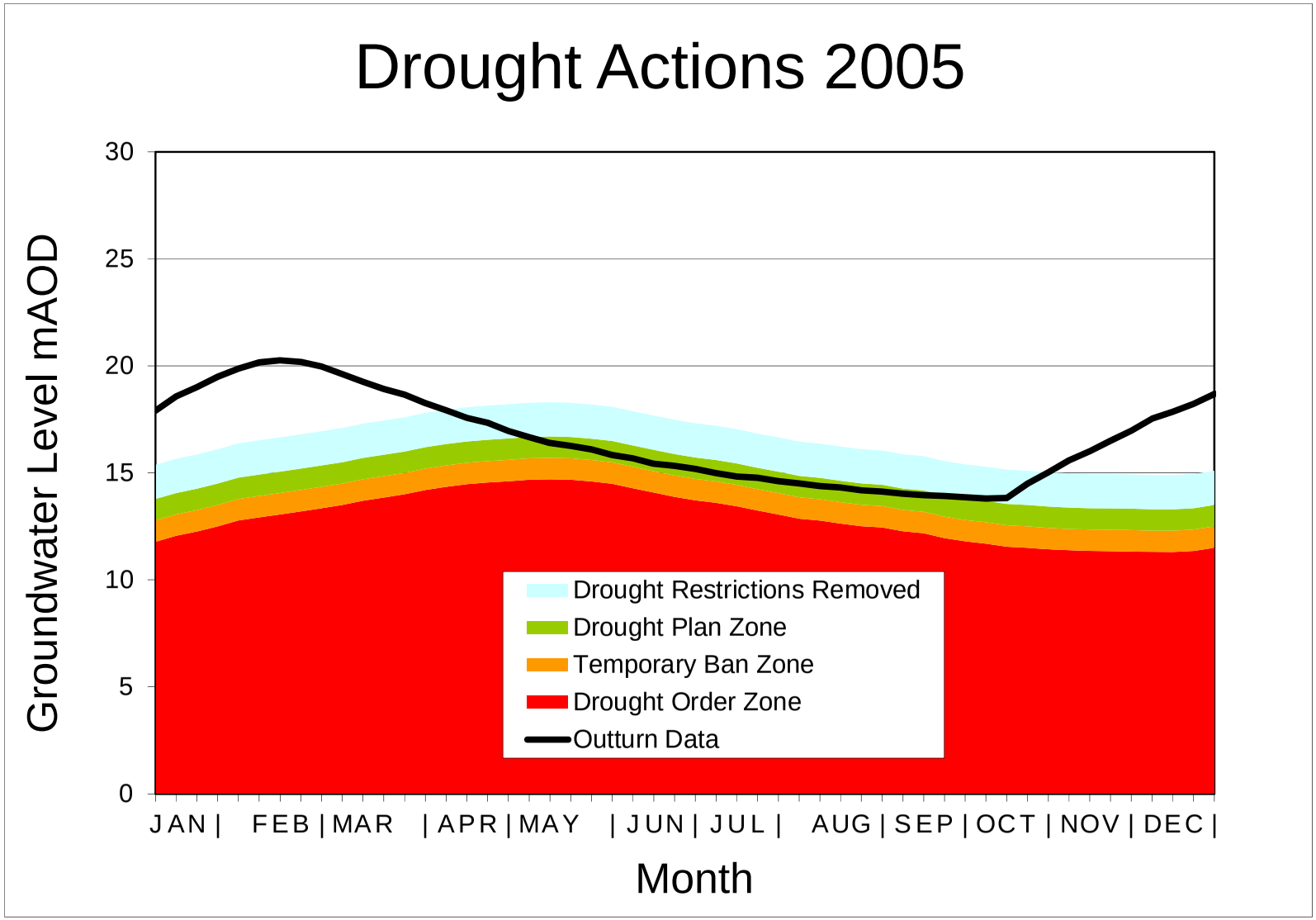

Predicted Drought Scenario 'A'
Groundwater Level mAOD
Rainfall
Month
30
25
20
15
10
5
500
450
400
350
300
250
200
150
100
50
0
Start Point
1st August
30 Year Long
Term Average
Winter Rainfall
Critical Point
12.7 m AOD
AY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR |

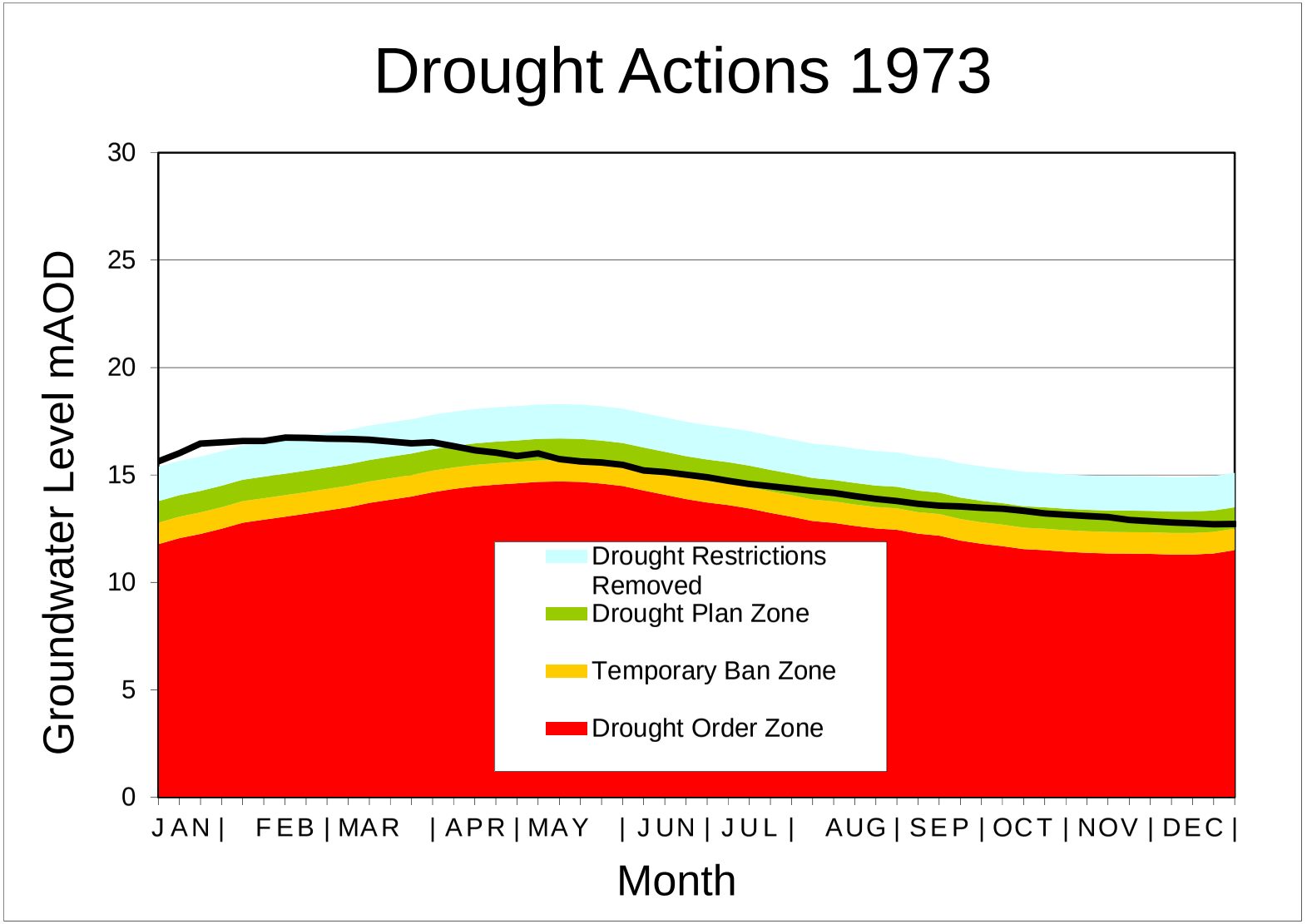

Predicted Drought Senario 'B'
Groundwater Level mAOD
Rainfall
Month
30
25
20
15
10
5
500
450
400
350
300
250
200
150
100
50
0
Start Point
1st August
30 Year Long
Term Average
Critical
Point
11.4 mAOD
Low Rainfall
|MAY|JUN|JUL|AUG|SEP|OCT|NOV|DEC|JAN|FEB|MAR|APR|MAY|JUN|JUL|AUG|SEP|OCT|NOV|DEC|JAN|FEB|MAR|APR|

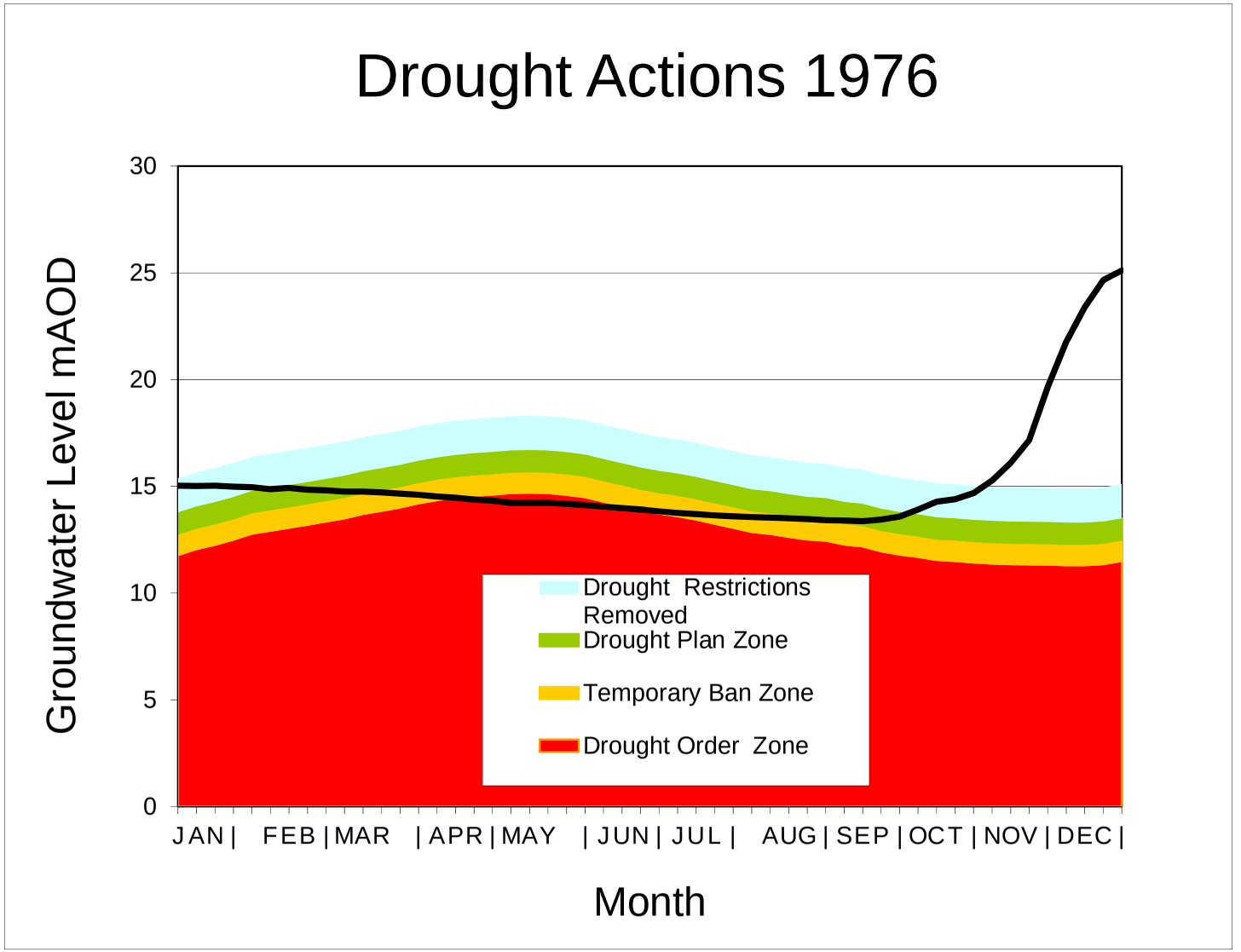

Predicted Drought Scenario 'C'
Groundwater Level m AOD
Rainfall
Month
Start Point
1st May
30 Year Long
Term Average
Low Rainfall
Critical Point
11.0 mAOD
30
25
20
15
10
5
500
450
400
350
300
250
200
150
100
50
0
|MAY|JUN|JUL|AUG|SEP|OCT|NOV|DEC|JAN|FEB|MAR|APR|MAY|JUN|JUL|AUG|SEP|OCT|NOV|DEC|JAN|FEB|MAR|APR|


Chilgrove Well Levels
1904-1906
Level mAOD
80
70
60
50
40
30
20
10
0
1904
1905
1906
Outturn Data
Long Term Average
January
March
May
July
September
November
January
March
May
July
September
November
January
March
May
July
September
November
Month

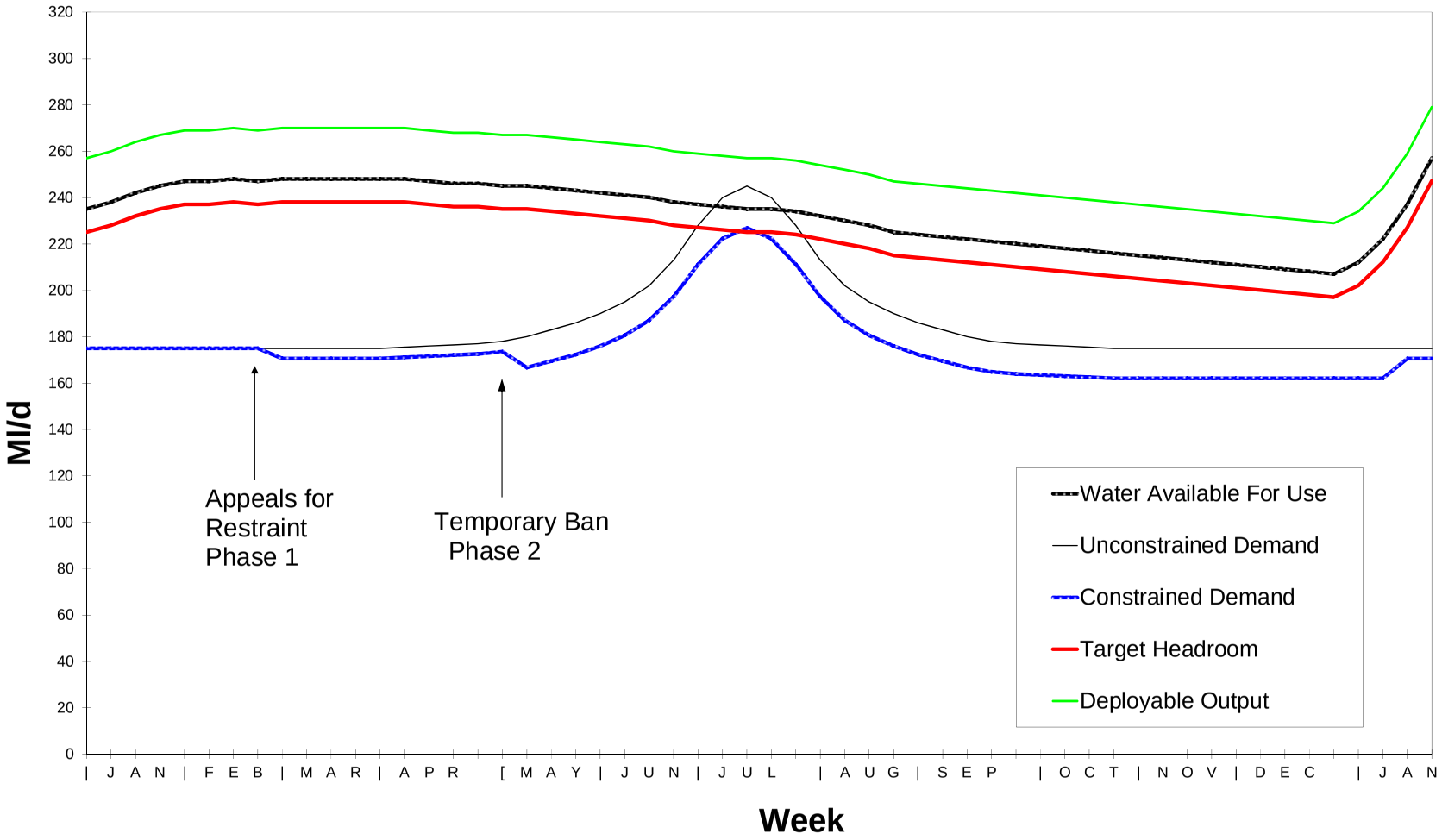

Chilgrove Well Levels
1989-1991
Level mAOD
80
70
60
50
40
30
20
10
0
1989
1990
1991
Outturn Data
Long Term Average
January
March
May
July
September
November
January
March
May
July
September
November
January
March
May
July
September
November
Month


Drought Actions 2005
Groundwater Level mAOD
30
25
20
15
10
5
0
JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
Month
Drought Restrictions Removed
Drought Plan Zone
Temporary Ban Zone
Drought Order Zone
Outturn Data

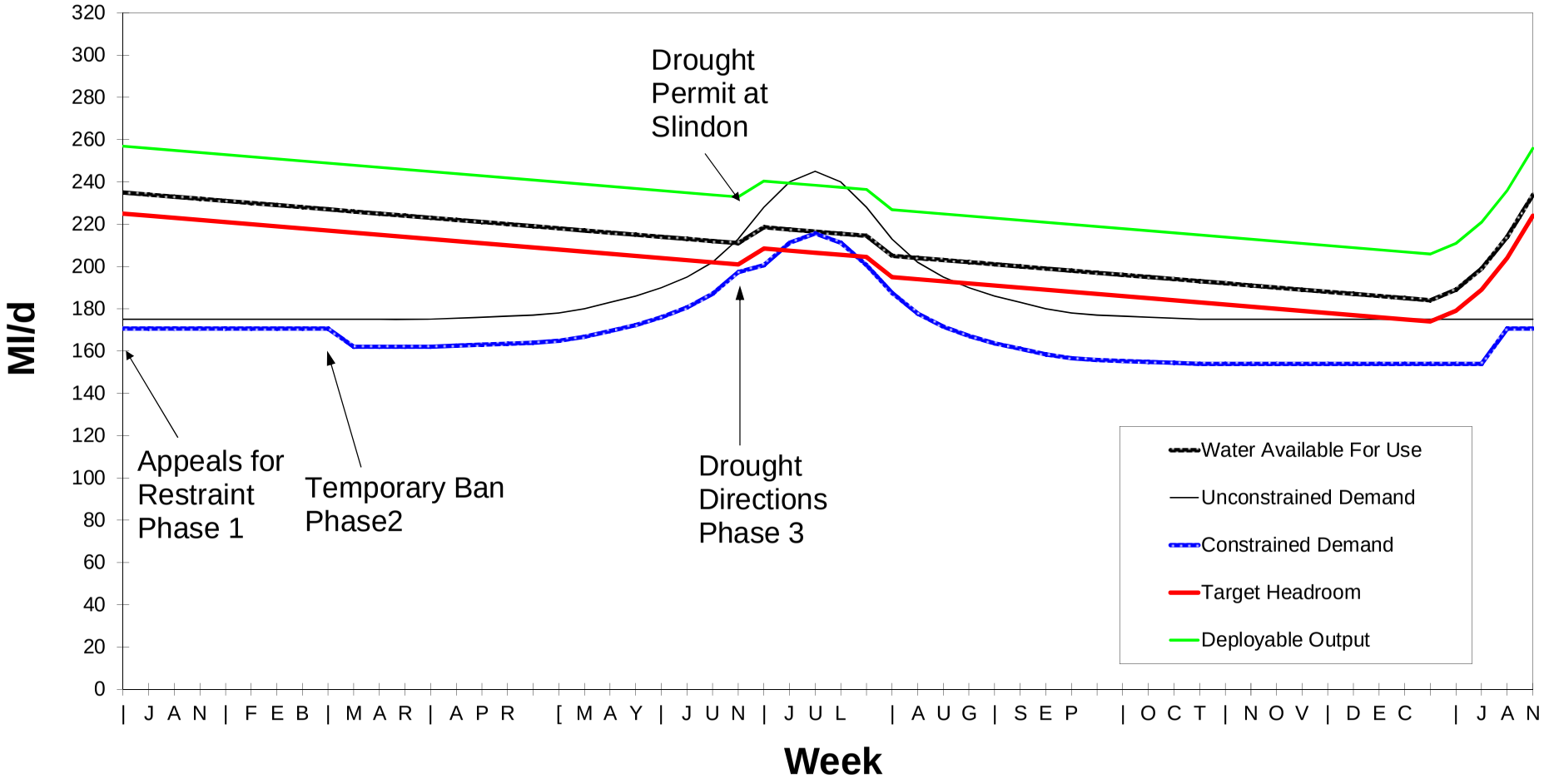

Drought Actions 1973
Groundwater Level mAOD
30
25
20
15
10
5
0
JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
Month
Drought Restrictions Removed
Drought Plan Zone
Temporary Ban Zone
Drought Order Zone


Drought Actions 1976
Groundwater Level mAOD
30
25
20
15
10
5
0
JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
Month
Drought Restrictions Removed
Drought Plan Zone
Temporary Ban Zone
Drought Order Zone

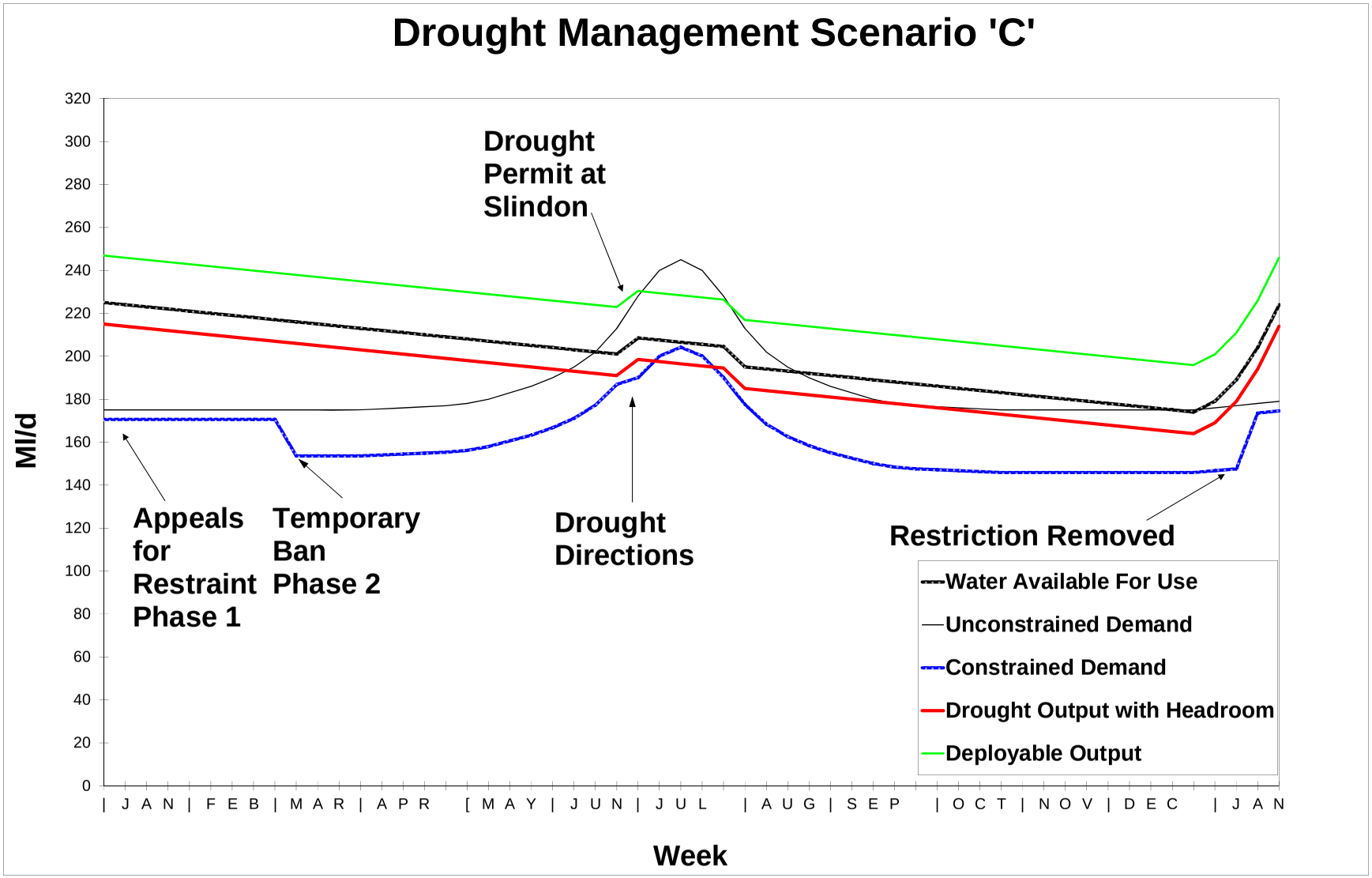
Drought Management Scenario 'A'



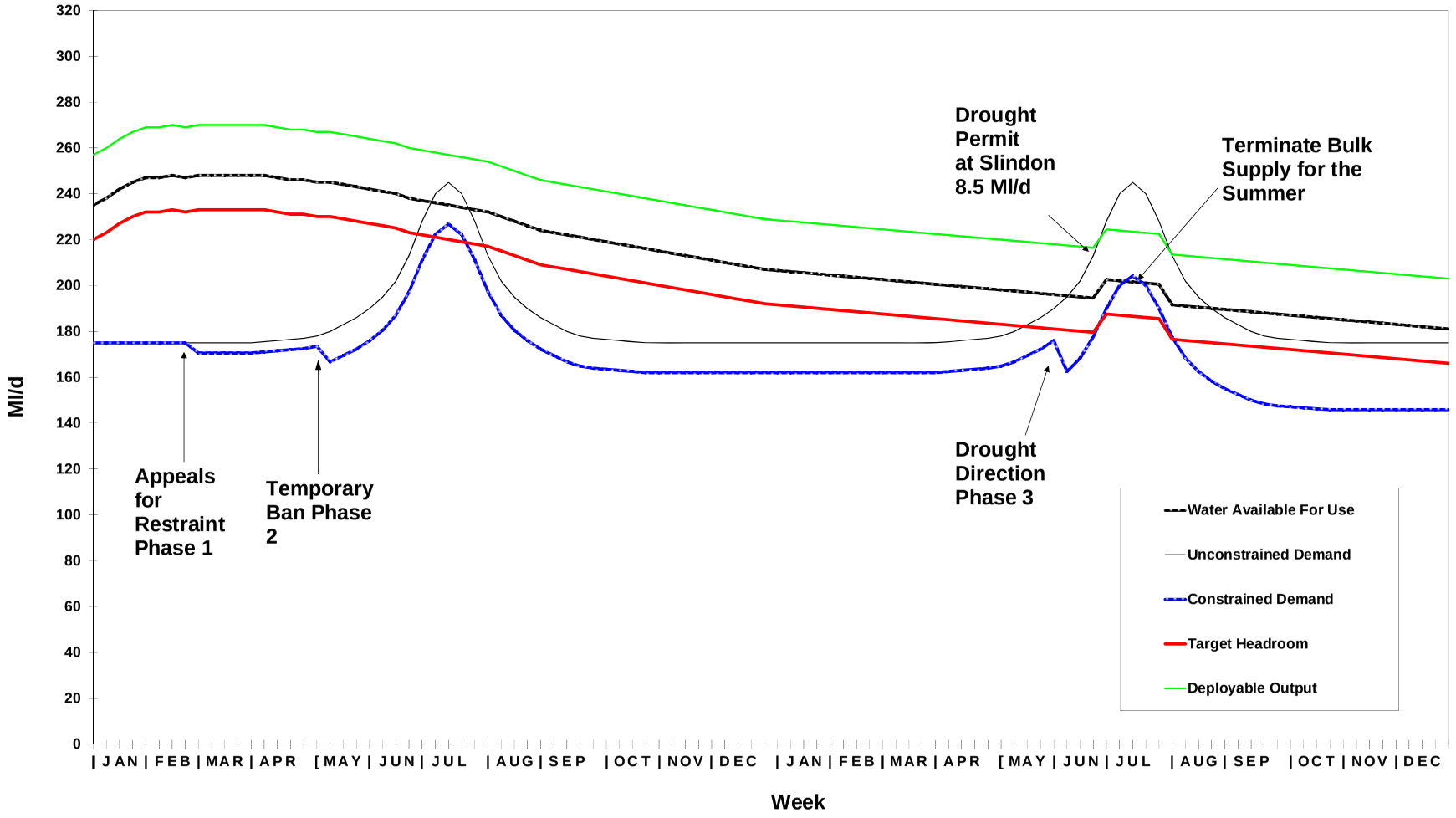
Drought Management Scenario 'B'



Drought Management Scenario 'C'



Drought Management Scenario 'D'



APPENDIX J

DROUGHT PERMIT SCREENING PROCESS

Drought Permit Screening Process Summary Table							
	Conditions						
Drought permit/order option	RAMSAR Site potentially affected?	SSSI potentially affected?	SAC potentially affected?	SPA potentially affected?	Potential WFD impacts?	Minimum residual flows (MRF) in place?	Overall
West Street	Yes	Yes	Yes	Yes	Currently being studied, to be concluded by March 2013	MRF conditions at River Meon	A Drought permit is likely to impact the RAMSAR, SSSI. SAC. SPA and MRF's
Walderton Group	Yes	Yes	Yes	Yes	Currently being studied, to be concluded by March 2013	MRF condition in place at Westbourne	A Drought permit is likely to impact the RAMSAR, SSSI. SAC. SPA and MRF's
Havant and Bedhampton	Yes	Yes	Yes	Yes	Currently being studied, to be concluded by March 2013	MRF conditions in place at Langstone Mill Stream and Brockhampton Mill Lake	A Drought permit is likely to impact the RAMSAR, SSSI. SAC. SPA and MRF's
Eastergate Group (Slindon)	No	Yes	No	No	Not being studied	No restrictions	Most feasible option due to no impacts on a RAMSAR site, SAC, SPA or MRF's and not being studied as part of WFD.
Gaters Mill (River Itchen)	Yes	Yes	Yes	Yes	Currently being studied, to be concluded by March 2013	MRF conditions in place at Riverside Park	A Drought permit is likely to impact the RAMSAR, SSSI. SAC. SPA and MRF's
Walderton Group (Fishbourne)	Yes	Yes	Yes	Yes	Currently being studied, to be concluded by March 2013	A stepped licence is in place.	A Drought permit is likely to impact the RAMSAR, SSSI. SAC. SPA and MRF's

CUSTOMER FRIENDLY KEY POINTS SUMMARY.

Introduction

Portsmouth Water provides an average of 182 million litres of drinking water per day to around 305,300 customers in south east Hampshire and part of West Sussex.

During the Company's long history, particular attention has been paid to ensuring it doesn't breach its legal obligations to maintain a supply of water, despite drought periods such as those experienced during the 1890s, 1900s, 1921, 1934, 1973, 1976 and the early 1990s.

Basis of Portsmouth Water's Drought Plan

The Company's water sources are all groundwater based, with 50% of water supplied from nineteen boreholes and wells, 35% from natural springs at Havant & Bedhampton, and 15% from Gaters Mill, a river abstraction above the tidal limit of the groundwater-dependent River Itchen all in one water resource zone over an area little more than 50 km x 30km (See figure 1). However as the groundwater levels and flows decline, so does the amount of water we can take from them.

Figure 1: The Company's area of supply including all sources and reservoirs.

Portsmouth Water currently has no surface water storage reservoirs and hence its ability to maintain supplies during a drought relies upon balancing demands and using the well developed connectivity between sources and reservoirs.

A drought is defined as a significant period without rainfall. This Plan is likely to be required only during prolonged periods of low rainfall that impact on groundwater supplies. A wide range of drought scenarios has been considered so that the Plan can cope with repeats of historical levels of drought and also future droughts that may be more severe as a result of climate change.

Drought Indicators

The Company has monitored groundwater levels at Idsworth Well borehole for over seventy years. It is centrally located within the Company's area, is unaffected by abstraction and therefore provides a good indication of groundwater resources for the Company. This combined with a long record of daily rainfall measured at Havant provide key information to enable forecasts to be made of the water resources situation.

Critical Drought Scenarios

In drawing up this plan the Company has considered the national and more localised droughts in South East England. For Portsmouth Water drought events of 1973 and 1976 were the most severe.

The Environment Agency suggests that a Drought Plan should be able to cope with a range of droughts based on: a range of single season dry summers; a range of single season dry winters; and a range of multi-season droughts. The most critical period for balancing supplies with demand occurs for the Company during May to July since there is no raw water storage and this is when demand is at its highest.

Potential Drought Scenarios Considered

Single Season and Multi-season Droughts

A 'Single Season Summer Drought' is considered unlikely to affect supplies for Portsmouth Water. Experience from the dry summers of 1995, 2003 and 2006 demonstrates the Company's capability to cope with single season dry summers.

A ‘Multi-Season Drought’ i.e. two or more consecutive seasons of below average rainfall, has a much greater impact upon the Company's ability to balance demands with available supplies, especially if they are combined with a dry summer.

Scenario “A” is largely based upon the Company's experience of 1972 - 1974 when a dry autumn/winter of the first year was followed by some recovery in year two. **(1 in 40 probability)**

Scenario “B” is a multi-season drought based on the dry autumn/winter of 1975/76, the dry summer of 1976, which is then extended into the autumn as occurred in 1973. **(1 in 80 probability)**

Scenario “C” models the effect of applying an eighteen month period encompassing two dry summers based on conditions in 1990, and a dry winter using statistics from the winter of 1975 and 1976. **(1 in 120 probability)**

Scenario “D” is a three year drought based on 1973 but with no groundwater recovery until the end of the third winter **(1 in 200 probabilities)**

<u>Drought Management</u>

The options for managing a drought comprise:-

- Demand Management - measures which influence customer demand.
- Supply enhancement - measures taken to enhance supply availability.

The Company anticipates that it will only need to implement its Drought Plan during a multi-season drought. During the period from September to April each year, it is anticipated that there will be sufficient supply to meet demand as this is not a critical demand period. It will be principally the peak demand months of May to July in a two season drought when actions might be required.

A drought trigger profile (see figure 2) has been generated so that in any week of the year the profile can be compared against current groundwater levels at Idsworth Well and if 'breached' an early warning will be given and drought actions may need to be considered.

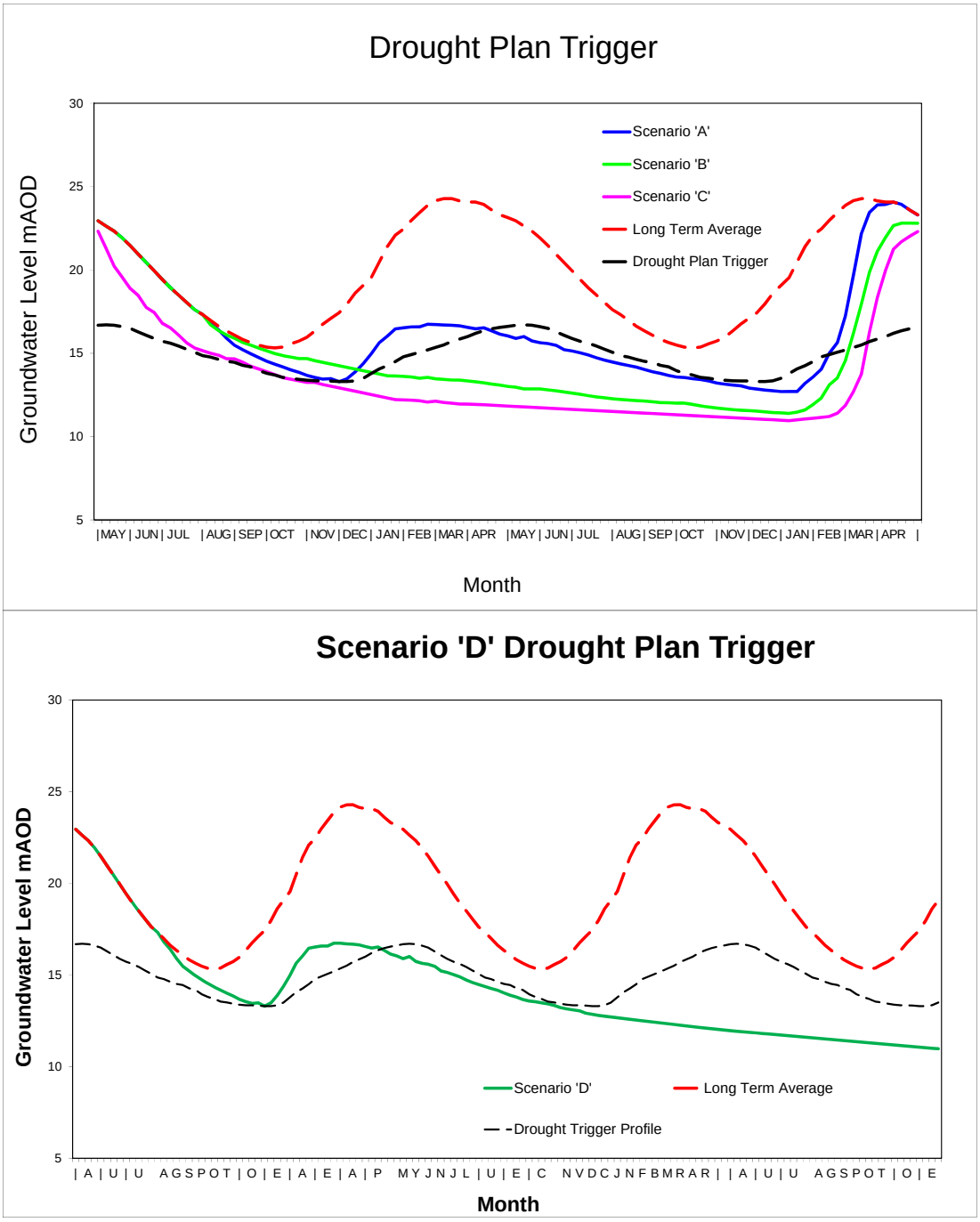


Figure 2: the Drought Trigger Profile's, containing all Scenarios, the drought plan trigger and the long term average

Drought Management Control

The Company's Drought Management Team will convene when the drought trigger profile is breached. Meetings will be held as required, usually monthly, but if necessary weekly to decide on further actions.

Potential Demand Management Actions

The Company has identified a number of key actions that might be used to hold back overall demand in order to balance supplies with demand during a drought.

- Appeals to customers for voluntary restraint in their use of water
- Enhanced leakage control by the Company including pressure reduction to reduce the level of leakage
- The imposition of temporary bans on certain activities

- The application of further restrictions under a Drought Order

Legislation allows the company to choose which activities to ban temporarily and when.

Potential Supply Enhancements

The options that have been considered in the Plan are:

- Drought Permits or Orders
- Lowering of borehole pumps to maintain source yields
- Recommissioning unused sources
- Commissioning unused Portsmouth Water boreholes
- Commissioning unused licence from private boreholes
- Increasing drought yields at existing sources

Monitoring Drought Impacts

It may not be possible to always protect the environment during extreme droughts as companies have a legal duty to supply water for public health, so a balanced view is needed. However, as the company has never had to impose drought permits or orders, it will need to seek the help of the Environment Agency, Natural England and companies which have applied for drought permits before such as Southern Water to assess the impacts on the environment.

Proposed Drought Management Actions

The severity of the drought and the drought scenario which applies will determine which drought actions will need to take place. The critical period for maintaining supplies will be the peak demand months of May to August, therefore actions may only be required for short periods.
The proposed phasing is set out below in Table 1

Table 1: An indicative timetable of timings of phases during a Scenario C type drought (Timings will vary dependant on the situation and decisions made).

Phase	Drought Measure	Approx Timing
1	Appeals for restraint and enhanced leakage control	January
2	Imposition of a Temporary Ban and application for a Drought Order	March
3	Imposition of Drought Directions and a Drought Permit for the Eastergate Group Licence	June

The suggestive set of actions demonstrates that the Company believes it can maintain supplies throughout the most severe drought scenario with only reference to one Drought Permit at the Company's Slindon source (See figure 3). There are other potential supply side options which may be needed if conditions occur that are more severe than a Scenario C Drought, this is considered highly unlikely.

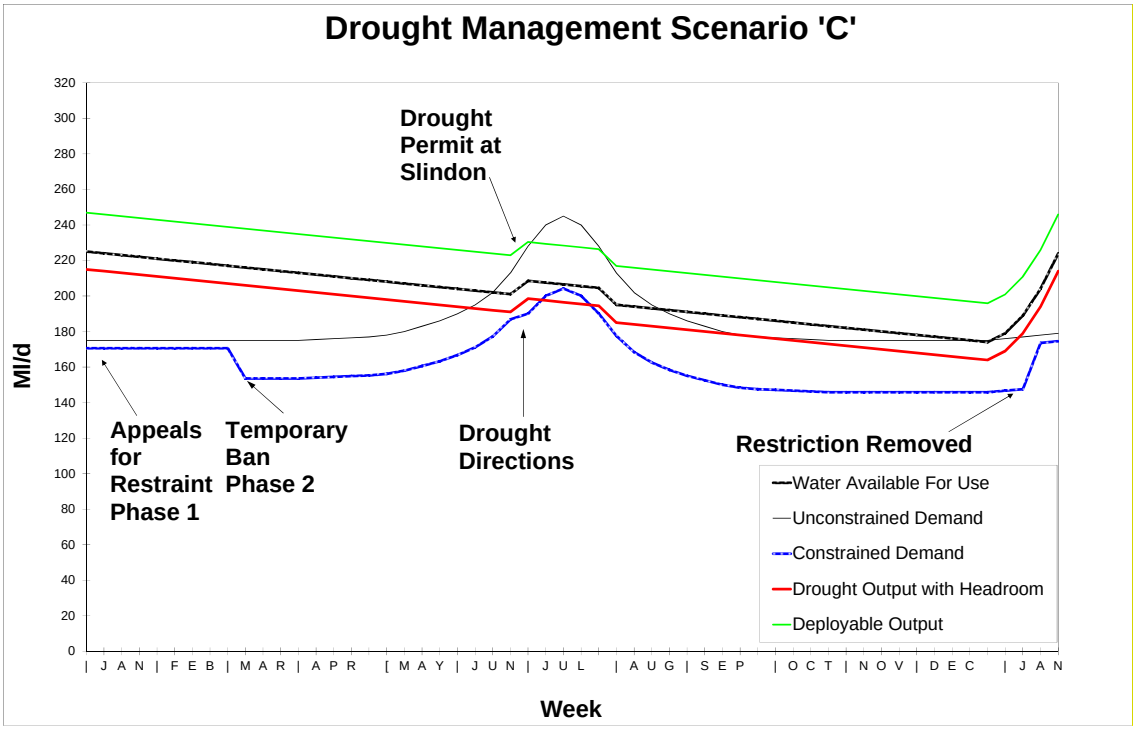


Figure 3: A graph of Drought Management Scenario 'C' including potential timeframes of when phases will be implemented.

Assessment of Drought Management Actions

The Drought Management Team will assess the impact of each of its actions before applying further measures.

Minimising Impacts upon the Environment

Droughts are extreme events and, regardless of abstraction, they will inevitably have an effect on the environment. The Environment Agency and Portsmouth Water have a responsibility to minimise the impact upon habitats and species. During a drought it may not be possible to protect every wetland or section of river from the impacts of drought; the need for monitoring and mitigation will have to be agreed with the Agency, Natural England and other conservation bodies where there is the likelihood that a Drought Order may be required.

Drought Communication Strategy

Communication will play a key part in any Drought Management Actions and the Drought Management Team will develop a communications strategy with the Environment Agency and other water companies.

Key Public Messages

The messages used and the method of delivery will be dependent upon the severity of the situation. Throughout the campaign the Company would develop messages setting out:

- The key reasons for the poor water resource situation
- The actions taken by the company to date
- The potential for future actions if the situation worsens
- The contact point for further advice
- The actions customers can undertake to help

The Drought Management Team will develop the strategy needed to manage communications using some, or all, of the following delivery methods:

- Regular Press Releases to Local Press, Radio and TV Stations
- Regular Stakeholder Briefing Sheets to the Environment Agency, Local Authorities, Consumer Council for Water, Members of Parliament and Trade Associations
- Website messages
- E-mail postscripts
- Social media
- Van-side messages
- Briefing Notes for Customer Services and Operational staff
- Official notices in the local press