



**WATER RESOURCE ZONE  
INTEGRITY  
WRMP 2019**

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## **WATER RESOURCE ZONE INTEGRITY – EXECUTIVE SUMMARY**

Water Resource Zones are a key building block for the Water Resource Management Plans. They are defined as:

*The largest possible zone in which all resources, including external transfers, can be shared and hence the zone in which all customers will experience the same risk of supply failure from a resource shortfall.*

Portsmouth Water has an integrated supply system with a strategic spine main that links the largest treated water storage reservoirs. This system has been tested for its resilience and it has been concluded that the Company only has one Water Resource Zone.

The zone is made up from smaller Water Quality Sampling Zones and Strategic Meter Areas but is suitable for reporting levels of service because customers experience the same overall risk of supply failure.

It is unlikely that climate change will change the designation of the zone because the impacts, and the wetlands affected, are spread evenly across the Company area.

Growth in demand is unlikely to change the designation of the zone because the rate of change is very low and the impacts are spread across the Company area.

## 1. Introduction and Background

### 1.1 Introduction

Water Resource Zones are a key building block for the Water Resource Management Plans. They provide water companies with a strategic framework for assessing supply and demand and for planning investment.

The definition of a Water Resource Zone comes from the UKWIR Report, Water Resources Planning Tools (WR27 2012):

*The largest possible zone in which all resources, including external transfers, can be shared and hence the zone in which all customers will experience the same risk of supply failure from a resource shortfall.*

The Environment Agency published a supporting document for the Water Resources Management Plan process in July 2016. This sets out the process to follow to define and test the number of zones that a company has. The assessment process has two stages:

- Stage 1 – Assessment
- Stage 2 – Review

Portsmouth Water have followed this process and built on previous work for resilience and water resource planning.

### 1.2 Background

Prior to the 2004 Water Resources Plan submission, Portsmouth Water had seven Water Resource Zones (WRZ). The Company identified a number of inter-zonal transfers and when these were compiled the Environment Agency agreed to reduce the number of zones to three:

- Zone 1 – Gosport & Waterlooville
- Zone 2 – Portsmouth & Havant
- Zone 3 – Chichester & Bognor Regis

Following further work in preparation for the development of Havant Thicket Winter Storage Reservoir, this was reduced to one zone in 2009. The assessment included a comparison with other water company zones and a MISER network model. The reservoir was intended to maintain the supply/demand balance across the whole of the Company's supply area.

#### Company Area of Supply



## 2. Supply Zone Integrity

Water Resource Zones tend to have the following features:

- They represent the largest area in which all resources can be shared effectively.
- Customers within the WRZ receive the same overall risk to public supply so there is no significant number of people at a higher risk of supply failure
- They are essentially self-contained – defined by infrastructure connectivity and geographic or physical boundaries.
- They are built up from smaller water balance units used for supply management. These will vary from company to company but could comprise for example District Metered Areas, Water Quality Zones, Control Groups, Accountability Zones or Planning Zones.
- They contain an integrated supply network, providing secure supplies to meet demand under defined levels of service.

Portsmouth Waters distribution system is now based on a spine main and a series of large treated water storage reservoirs. Perfect integration is not possible, but outlying areas, such as West Meon, have had links provided to improve security of supply.

### Strategic Distribution System

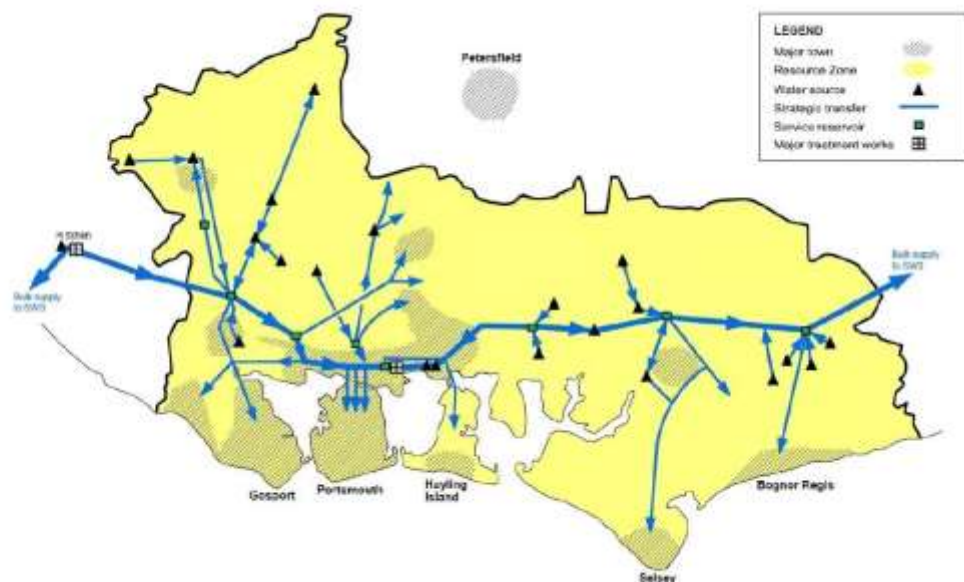


Figure 3: Strategic Resource Zone Map

There are always limitations to a supply system but further work has been done to identify vulnerable sections and to provide additional resilience. In the past, resilience in the form of duplicate mains was provided because of the strategic importance of Portsmouth Naval Dockyards.

### 2.1 Resilience Investigations

In response to the Government focus on 'resilience', Portsmouth Water have been engaged in a Resilience Study with the consultant, Tynemarch. A new MISER model has been set up to reflect the key elements of the supply and distribution system. The study has been looking at the resilience of the system to:

- Droughts
- Floods
- Source Outages

- Pipe Failures
- Oil Pollution
- Nitrate Pollution

Complex combinations of events have been considered and critical sections of infrastructure identified. The network schematic included in Appendix 1 shows the key elements in blue and the emergency links in red.

The resilience study does identify some mains, such as river crossings, that require duplication. The Water Resource Zone definition is based on dry year annual average demand and does not deal with short term supply losses caused by unforeseen events.

## 2.2 Key Transfers

The distribution system contains several key transfers and these were identified in the 2009 report. An additional bulk supply is now under construction to Southern Water from the Gaters Mill source.

• Bulk Supply to Southern	10.0 MI/d
• Hoads Hill to Nelson	30.0 MI/d
• Hoads Hill to Portsmouth	15.0 MI/d
• Nelson to Portsmouth	32.0 MI/d
• Portsmouth to Gosport	10.0 MI/d
• Racton to Portsmouth	18.0 MI/d
• Racton to Waterloo	4.0 MI/d
• Waterloo to Racton	10.0 MI/d
• Racton to Lavant	34.0 MI/d
• Lavant to Littleheath	30.0 MI/d
• Bulk Supply to Southern	15.0 MI/d

The transfer capacity allows water to be moved from West to East and from East to West depending on the particular outage. The bulk supplies and the outage events need to take account of the water quality requirements of the system. Nitrate blending is used at Shedfield Reservoir, in the west, and at Littleheath Reservoir in the east.

## 3. Water Resource Zone Assessment

The Environment Agency guidance for Water Resource Zone assessment sets out a process diagram to follow. The Agency expects all water companies to complete this process before each statutory review of the Water Resources Management Plan (2019). Portsmouth Water consider that only the first two steps are required for the next plan.

Portsmouth Water produce an annual review of the WRMP which is published on the Company website. This review states that Portsmouth Water still has only one Water Resource Zone. This statement has not been challenged by the Environment Agency or by Defra.

### 3.1 Stage 1 Water Resource Zone Assessment

The guidance suggests that a detailed Water Resource Zone assessment takes place early as possible within the WRMP planning process. Portsmouth Water has produced this report at the 'pre-consultation' phase of the WRMP. This ensures that the Environment Agency can confirm that the Water Resource Zone meets the definition prior to the production of detailed plans.

### 3.2 Stage 2 Water Resource Zone Review

The Environment Agency recommends that companies hold internal workshops involving key staff to test and challenge the Water Resource Zone. This process has been carried out as part of the 'Resilience Study' where staff from across the business identified risks and potential solutions. The study looked at water quality, distribution systems, source works and outage.

The MISER model was used to systematically remove key mains to see if the network could cope with dry year demands. Under drought conditions demands are expected to be significantly lower and the network less vulnerable to failure.

The Water Resource Zone is made up from Water Quality Sampling Zones and Strategic Meter Areas. Water Quality reporting and leakage reporting are not affected by the fact that Portsmouth Water only has one WRZ.

The EA guidance asks Companies to consider climate change impacts on water dependent environmental sites. It is not clear what impact climate change is having on chalk aquifers and the waterbodies associated with them. The coastal features, such as the harbours, will be affected by sea level rise. This would not necessarily impact on abstraction licences and if it did, the impact would be spread across the whole of Portsmouth Waters area of supply.

Portsmouth Water current Water Resources Management Plan (WRMP14) does not forecast any growth in demand. Commercial demand is falling and increasing population is offset by falling per capita consumption. Growth in housing is difficult to predict, but is likely to be spread evenly across the area of supply.

## 4. Conclusions

Portsmouth Water has moved, with time, from seven Water Resource Zones to three and finally to one. This reflects improvements to the distribution system and to the way that the Company manages abstraction and supply.

The Water Resource Zone has distinct geographic boundaries but links have been provided to the East and the West. These bulk supplies benefit Southern Water but they could be reversed in an emergency. They contribute to the overall resilience of the system.

All the customers within the zone receive the same levels of service. This applies under normal, dry year and drought conditions.

