



Water Resources Planning Tables - Instructions

Supporting document for the Water Resources Planning Guidelines

Version 15

July 2016

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:

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Further copies of this report are available from our publications catalogue:

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Executive summary

A company's water resources management plan (WRMP) is supported by a series of data tables at water resource zone level. These tables present the supply-demand balance of the plan and some of the key supporting information. The water resource planning tables (WRP tables) are used to help regulators, water company customers and other organisations understand and appraise the plan. It does this by setting out the information in a consistent format, based on pre-agreed definitions.

The information required from water companies is set out in 10 tables, which are summarised below:

WRP Table	Content
Title page	Requires basic company, resource zone, and planning scenario details
Resource zone summary	Requires no input but displays graphical information taken from the rest of the tables. There are two graphs showing the baseline and final planning components of demand, and supply-demand balance.
1. BL Licences	Baseline licensed abstraction quantities and associated deployable outputs.
2. BL Supply	Baseline supply components.
3. BL Demand	Baseline demand components (including micro-components and the baseline customer base - measured and unmeasured population and property numbers).
4. BL SDB	Baseline supply-demand balance. This is mostly calculated from the baseline supply and demand inputs.
5. Feasible options	List of all feasible water management options together with cost and WAFU/savings in demand profiles under planning scenario conditions based on the capacity of the options.
6. Preferred options	Planned WAFU/savings profile of preferred water management options (planning scenario conditions) allocated to the relevant components of the supply-demand balance.
7. FP Supply	Final planning supply components. This is automatically populated. This sheet shows the final planning supply-demand balance.
8. FP Demand	Final planning demand components (including micro-components). This table is partly automated. Includes customer base (measured and unmeasured population and property numbers)
9. FP SDB	Final planning supply demand balance. This is mostly calculated from the final plan supply and demand inputs.
10. Drought plan links	This table shows the links between the companies' deployable output calculation and their drought plan.

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1. Introduction

A company's water resources management plan (WRMP) is supported by a series of data tables at water resource zone level. These tables present the supply-demand balance of the plan and some of the key supporting information. The water resource planning tables (WRP tables) are used to help regulators, water company customers and other organisations understand and appraise the plan. It does this by setting out the information in a consistent format, based on pre-agreed definitions. It also enables the Environment Agency to provide nationally consistent advice to Defra.

This document explains to companies how to fill in their WRP tables and replaces the 2014 table instructions.

Changes to the previous WRP tables' guidance

Section 3 (Line definitions and guidance) provides definitions and guidance on the new WRMP tables. There have been some changes to the WRP tables since WRMP14 data submissions, in response to feedback from stakeholders. These changes include:

- Removing all the automated calculations (operated through excel Macros) and named cell ranges (formulae have been retained where possible, as this helps to show the flow through of information)
- Removing the QA sheet and the conditional formatting that provided automated data checks
- Removing the weighted annual average demand baseline and final plan demand information, as it is no longer needed. In addition, there is now just one table for feasible options, instead of three.
- Renaming the tables and reordering some components, so they follow a more logical order and grouping.
- Removing or merging some components based on a joint review by the Environment Agency, Natural Resources Wales and water industry representatives (see appendix A).
- Adding two new tables (10 and 11) to help companies demonstrate their Deployable Output

In addition, in their next plan, water companies have the flexibility to choose the decision making method that is appropriate to their circumstances. So that we can compare the outputs of any new methods used, companies will be required to submit some data obtained both through its chosen complex method (if applicable), as well as through the usual method (Economics of Supply and Demand - EBSD). Further information is provided in section 2 (General instructions).

WRP Tables summary

Table 1 gives a summary of the content of all the WRP tables.

The WRP tables required will vary according to supply-demand circumstances and the planning scenarios required. The WRP tables needed for each situation are explained in section 2.

Table 1 Summary of WRP tables contents

WRP Table	Content
Title page	Requires basic company, resource zone, and planning scenario details
Resource zone summary	Requires no input but displays graphical information taken from the rest of the tables. There are two graphs showing the baseline and final planning components of demand, and supply-demand balance.
1. BL Licences	Baseline licensed abstraction quantities and associated deployable outputs.
2. BL Supply	Baseline supply components.
3. BL Demand	Baseline demand components (including micro-components and the baseline customer base - measured and unmeasured population and property numbers).
4. BL SDB	Baseline supply-demand balance. This is mostly calculated from the baseline supply and demand inputs.
5. Feasible options	List of all feasible water management options together with cost and WAFU/savings in demand profiles under planning scenario conditions based on the capacity of the options.
6. Preferred options	Planned WAFU/savings profile of preferred water management options (planning scenario conditions) allocated to the relevant components of the supply-demand balance.
7. FP Supply	Final planning supply components. This is automatically populated. This sheet shows the final planning supply-demand balance.
8. FP Demand	Final planning demand components (including micro-components). This table is partly automated. Includes customer base (measured and unmeasured population and property numbers)
9. FP SDB	Final planning supply demand balance. This is mostly calculated from the final plan supply and demand inputs.
10. Drought plan links	This table shows the links between the companies' deployable output calculation and the drought plan.

2. General instructions

2.1. How to complete the tables

Each WRP table provides a **unique row reference** for each component (e.g. 42BL). Use section 3 of this document to find definitions for individual components. All row references in the baseline tables are suffixed with BL, and all row references in the final plan tables are suffixed with FP.

Cells in the table are **colour-coded** to indicate the type of content.

Clear cells - indicate an **input is required**

If there are no data to input e.g. no imports or exports, enter zeros, do not leave blank.

Companies should insert all data to the number of **decimal places** specified in the tables. If in doubt, companies should assume 2 decimal places. The exceptions are PCC related components, occupancy rate, consumption driven by climate change (all 1dp), and data given as percentages (0dp).

It is worth noting that in the next round of plans companies may choose to use a **probabilistic approach** to develop certain components of their supply demand balance, and therefore hold more than one figure for each component for each year. Companies will need to choose which data to include in the WRP tables and to explain their choice in the commentary.

Yellow shaded cells - indicates a **formula**.

Some cells in the WRP tables contain formulas. The calculations used in the tables are given in this document, as well as under the derivation column in the tables. In the tables the formula uses the row number. In this document both the row number and the input description are given.

Blue shaded cells - indicate **base year** data.

The plan will need to include a base year for supply and demand data. This could be based on outturn data for the latest year available before draft plan production, which is then adjusted for a dry year forecast. The company should clearly explain how it has done this. If a company wishes to use a different year or an average of multiple years, it can do so, providing it gives a clear explanation. If a company changes its base year between the draft and final plan, the company should explain its reasons and detail the impacts on the plan. The expectation is that the effect of differences between recent years will be minimal.

Light grey shaded cells - indicate **preceding years**.

These are not mandatory but are designed to provide context and data for the calculations which require data from a preceding year (e.g. property and population numbers). Where a company presents data within these columns it must state which year the data is for.

Dark grey cells - indicate that **no data entry** is required.

2.2. Which tables to complete

The tables that a company needs to submit will depend on its planning scenarios, and also the decision making tool(s) that it has chosen.

Planning scenarios

The number of WRP workbooks (sets of tables) that should be submitted as part of the water resources management plan will vary depending on the supply-demand situation in each resource zone.

All companies plan to the **dry year annual average** (DYAA) in their WRMP, and therefore all companies should submit one set of tables for the DYAA scenario for each water resource zone.

In addition to the dry year scenario, a water company may test other planning scenarios, such as the **critical period**. The critical period is the period when there is greatest stress on the ability of the supply system to meet demands (UKWIR 02/WR/27/3). A company plan that is influenced by a critical period should submit a second set of WRP tables to illustrate any dry year critical period scenario at the resource zone level.

Note that if a company's critical period preferred options set does not affect the final plan under the dry year scenario, it does not need to include critical period related options in the DYAA options table (table 5. Feasible options). However, if the critical period preferred options set does include options that will have an effect on the DYAA scenario water resources situation, then the company should include both sets of options in the DYAA options table. This has not changed since WRMP14 instructions.

Table 2 Workbooks to submit for each water resource zone by planning scenario

	DYAA	CP
No deficit in DYAA or CP	✓	x
Deficit in DYAA only	✓	x
Deficit in CP only	✓	✓ (one for each CP identified)
Deficit in DYAA and CP	✓	✓

Decision making tools

Through the water resources planning process, you may have identified options to resolve a deficit or for other benefits, such as increased resilience. If you have not identified any options, you do not have to complete the feasible options or preferred options tables (5 and 6).

For 2019 plans, companies who are considering options may use a decision making tool other than EBSD. Where this is the case, we are requiring companies to submit:

- A full set of tables completed using the chosen method
- A subset of tables (tables 6 and 9) completed using EBSD

This is so that we can compare the results.

If you are submitting DYAA and CP tables, you will need to do this for each of these planning scenarios.

All of this information is summarised in Table 3.

Table 3. Which WRP tables to complete

Scenario	Title page	WRZ summary	1. BL Licences	2. BL Supply	3. BL Demand	4. BL SDB	5. Feasible options	6. Preferred options	7. FP Supply	8. FP Demand	9. FP SDB	10. Drought links data	11. drought links graph
No deficit identified for dry year scenario	✓	✓	✓	✓	✓	✓	x	x	✓	✓	✓	✓	✓
All other scenarios	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Benchmarking data (DYAA and CP)	✓	x	x	x	x	x	x	✓	x	x	✓	x	x

2.3. Making changes to the WRP tables

The revised WRP tables are more flexible than previous versions. However, companies should not make changes to the tables that might compromise their transparency. For example, companies should not delete rows, use password protection, hide columns, rows or sheets, freeze panes or include links to other spreadsheets. This would adversely affect the regulators' ability to assess the data submitted.

Companies should not add completely new components or calculated fields to the WRP tables. If companies wish to submit additional components or calculations not already included within the WRP table template, they should add an extra worksheet to the WRP submission and label it clearly.

Structure

The tables are designed to be flexible to accommodate different requirements. Companies can make some structural changes or additions to any of the worksheets, if they feel the changes would promote transparency, but must clearly highlight and explain any changes.

There are no longer Macros to automatically add in extra rows, so this will need to be done manually by the water company (e.g. for import and exports). Where additional rows are inserted the company can insert appropriate row numbers within the existing numbering framework. The water company must check the impact of inserting rows on formulas, and ensure that these are still correct.

The planning period is a minimum of 25 years (plus three previous lead in years if required). Companies should add extra columns if they are planning to a longer period.

In each workbook, the WRP tables should be presented on sequential worksheets (table 1. BL licences, 2. BL supply, 3. BL demand, etc.), with each worksheet clearly labelled as the relevant table. The tables should not be renamed.

Content

Companies can overwrite the formulas in the tables but should highlight this change in the table itself and also clearly explain the reason for the change in their water resources plans. The default formulas are based on established good practice and companies that use different ones should explain what they have done, the reasons for doing so, and the impact this has had on the supply-demand data.

The final plan tables are calculated using a formula that adds together the relevant components in the baseline tables and the options tables. This is because we expect companies to first establish the baseline, then develop the options, to give the final plan. We are aware that not all companies' models work in this way. Companies can choose to remove the formulas from the final plan tables (7, 8 and 9). However, we expect that the final planning scenarios should equal baseline supply-demand components plus the effects of options. Where it doesn't, the company should clearly show the difference, and explain its reason for changing these calculations. If removing formulas you should change the colour coding of the cells, in line with the key, and highlight the change clearly in the derivation column.

2.4. Quality Assurance

Following feedback, the tables no longer highlight where data is missing, potential data errors, or unexpected data inputs. For WRMP19 it will be the water company's responsibility to ensure the accuracy of its data, for both input components and calculated cells.

2.5. How to submit the WRP tables

Companies should submit electronic copies of the WRP tables to the Secretary of State or Welsh Ministers as part of their draft and final water resources plans. You should follow the same submission process as set out for the WRMP.

Companies should submit the WRP tables for each resource zone as Microsoft Excel files.

The tables for each resource zone should be provided in separate workbooks. We are not requiring table information at a company summary level. However, this should be summarised within the WRMP.

Final tables for the draft plans should be labelled "draft plan final". Final tables for the final plans should be marked "final plan final". Workbook naming is shown below:

Scenario Name	Workbook Name
Plan Dry Year	DryYr_ResourceZoneName _DraftPlanFinal_VersionNo_ Date.xls
Plan Critical Period	CP_ResourceZoneName _DraftPlanFinal_VersionNo_ Date.xls

If you have used a complex decision making method and therefore need to submit benchmarking data, you should label these files appropriately. Make sure the essential information (planning scenario, resource zone name, plan version and date) is clear.

3. Line definitions and guidance

This section of the document provides definitions and guidance for each component in the tables. It is set out in the same order as the tables, starting with the title page and ending with table 10 (drought plan links).

Title page

The title page contains three sections:

- Water resource zone information
- A key to the cells
- A list of the tables (or worksheets)

Companies should complete the water resource zone information section, this data will then auto-complete on each WRP table.

Each set of tables presented as part of the plan should be signed off and dated by an appropriate responsible officer within the company.

WRZ summary

This worksheet contains two graphs of key supply demand balance information. The first shows the baseline position and the second shows the final plan position. All of the information is taken from the tables in the workbook. If you have made any alterations to the tables you should check and correct for any impacts on these graphs.

Table 1. Baseline (BL) licences

Table 1. BL licences is for water company licensed abstractions and deployable output (DO) information. Companies should report all current and proposed abstraction licences and sources and identify the DO figure for each source in the resource zone.

If a company needs to consider both dry year and critical period scenarios it should input the sources for the dry year scenario within table 1 (BL licences) of the dry year workbook and the sources for the critical period scenario within table 2 (BL Supply) of the critical period workbook.

The information required is grouped into four categories:

- Individual licences
- Grouped licences
- Unused licences
- Proposed new licences

For each licence, you should insert a licence number; source name; source type; a DO figure; an annual licensed quantity (except for conjunctive use); and explain the constraints on the DO.

Enter as many lines as required under each category.

Companies should only complete this table for the baseline. Changes to DO arising from all feasible options solution should be included within the options tables.

Notes on DO figures:

- You should refer to the water resources planning guidelines for further details on what should be included within the DO figure.
- In conjunctive use zones, zonal DO will be greater than the sum of the individual sources. Therefore it is acceptable to merge cells that are conjunctive use, to ensure that the table shows the DO that contributes to the WRZ DO.
- Companies should enter information for each source regarding any constraints, length of historical data record for the source, and how the critical period has been determined, e.g. a specific year, or a modelled scenario. Further information should be provided in the commentary.
- The yellow shaded DO cells have been set up to calculate the total DO/annual licensed quantity for each category, but you should check these formulae still correctly calculate DO, particularly if you insert additional rows or merge cells.
- The sum of the total DO for the four categories is used to calculate the baseline DO in row 7BL (Table 2. BL Supply).

The definitions for the calculated cells are provided below.

0.1BL	Licences for Single Sources	MI/d
Definition:	Deployable output and annual licensed quantities for all licences that are used as single sources.	
Processing rule:	Input Calculation: sum of all licences inserted within section 0.1BL	
Method:	Single source information/resource zone modelling	

0.2BL	Conjunctively used or grouped Licences	MI/d
Definition:	Deployable output for licences used conjunctively or which have a group licence limit which limits deployable output. .	
Processing rule:	Input Calculation: sum of all licences inserted within section 0.2BL	
Method:	Resource zone modelling	

0.3BL	Unused Licences	MI/d
Definition:	Deployable output and annual licensed quantity for existing licences which are unused in the baseline scenario	
Processing rule:	Input Calculation: sum of all licences inserted within section 0.3BL	
Method:	Out-turn data	

0.4BL	Proposed New Licences (first AMP)	MI/d
Definition:	Deployable output and annual licensed quantity for any new licences which are anticipated (includes applications to submit, applications awaiting issue) at any point within the first AMP of the WRMP planning period are to be considered as contributing to the baseline deployable output.	
Processing	Input	

rule:	Calculation: sum of all licences inserted within section 0.4BL
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Table 2. Baseline Supply

Table 2 BL Supply sets out the key elements of the resource base (raw water abstractions, imports, exports, deployable output) and losses (changes to deployable output arising from climate change, sustainability changes, or other causes, treatment works losses and outage allowances).

This section provides guidance on rows 1BL to 10BL (1BL to 7BL showing resources, 8BL to 10BL showing resources losses).

Table 2 - Resources

Raw water components are those between the point of abstraction and the point of production.

Potable water components are those between the point of production and the point of delivery.

Listed below are a range of considerations that should be applied equally to all transfers (imports and exports) in the tables. Existing raw/potable water exports and imports will include both inter and intra-company transfers. Details of all significant transfers should be included in Table 2. BL Supply rows 2BL and 5BL (raw water) and 3BL and 6BL (potable water).

- For all transfers, companies should indicate the donor and recipient company or resource zone in the inserted rows.
- Companies should ensure that the values used by a transfer donor match those used by the transfer recipient and vice versa. Where an agreement cannot be reached on the value to be used for an inter-company transfer both companies should clearly state their assumptions in their plans.
- Companies should show imports and exports as planned transfers per time step across the planning period.
- For the baseline scenario the volume used should be within the existing physical and operational transfer capacities (and agreed in the case of inter-company transfers). Companies should declare and explain the existing maximum transfer capacity and its limiting factors in their plans.

In Table 2. BL Supply companies should insert the relevant number of rows to list each transfer. The sum of these will be automatically calculated, but check that all your inserted rows have been picked up correctly by the formula.

For the final planning forecast, planned new potable water transfers or increases in existing potable transfers should be presented in the options tables. The tables will automatically calculate the impact of these options on the baseline scenario to generate final planning transfer volumes.

1BL	Raw water abstracted	MI/d
Definition:	Raw water abstracted is taken from the point of chargeable abstraction, and together with raw water imported less raw water exported, constitutes raw water collected, Demand Forecasting Methodology - Main Report (NRA/UKWIR, 1995a).	
Processing rule:	Input	

2BL	Total raw water imported	MI/d
Definition:	Total raw water imported from outside the forecast geographical area to the forecast geographical area (NRA/UKWIR, 1995a).	

Processing rule:	Table 2 sum(2.1BL+2.2BL+2.3BL...)
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2.1BL	Raw water imported from	MI/d
Definition:	Individual cases of raw water imported from outside the forecast geographical area to the forecast geographical area (NRA/UKWIR, 1995a).	
Processing rule:	Table 2 sum(2.1BL+...)	

3BL	Total potable water imported	MI/d
Definition:	Potable water imports from within the forecast geographical area to an area outside the forecast geographical area (NRA/UKWIR, 1995a).	
Processing rule:	Table 2 sum(3.1BL+...)	

Note: 4BL has been merged with 9BL - see definition for 9BL.

5BL	Total raw water exported	MI/d
Definition:	Raw water exported from the forecast geographical area to outside the forecast geographical area (NRA/UKWIR, 1995a).	
Processing rule:	Table 2 sum(5.1BL+5.2BL+...) Sum of individually listed raw water exports	

5.1BL	Non potable water supplied to:	MI/d
Definition:	Total non-potable water supplied to the supply area. Companies to define customer type receiving the non-potable supply, e.g. Industrial Use	
Processing rule:	Input	

5.2BL	Raw water exported from:	MI/d
Definition:	Raw water exported from the forecast geographical area to outside the forecast geographical area (NRA/UKWIR, 1995a).	
Processing rule:	Input Individual raw water exports summed to calculate 5BL.	

6BL	Total potable water exported	MI/d
Definition:	Potable water exports from outside the forecast geographical area to the forecast geographical area (NRA/UKWIR, 1995a).	
Processing rule:	Table 2 sum(6.1BL+) Sum of individually listed potable water exports	

7BL	Deployable output (baseline profile without reductions)	MI/d
Definition:	The output of a commissioned source or group of sources or of bulk supply as constrained by: environment, licence if applicable, pumping plant and/or well/aquifer properties, raw water mains and/or aquifers, transfer and/or output main, treatment, water quality	
Processing rule:	Table 1 sum of DO reconciliations	
Method:	Deployable output – see guidelines	

A water company should develop a resource zone baseline forecast without climate change, reporting its baseline deployable output without the effect of climate change in Table 2 BL Supply. Rows 0.1BL, 0.2BL, 0.3BL, and 0.4BL are to be entered excluding the impacts of climate change.

The DO which is automatically entered in row 7BL is subsequently affected by baseline forecast changes in DO (due to sustainability changes, climate change, or other factors) and may differ from the DO in the final planning tables (depending on the options that are preferred). The baseline table (Table 1 BL Supply) should show the current DO for the given period.

Companies may have different approaches to what is included within DO. DO may already have considered treatment works operational use, treatment works losses, raw water operational use and raw water losses or it may not. Information on how to deal with this is set out under the definitions of row 9BL.

Table 2 - Resource and process losses

8BL	Baseline forecast changes to deployable output	MI/d
Definition:	Changes in deployable output due to climate change or reductions required by the Environment Agency and/or Natural Resources Wales to meet statutory and/or environmental obligations.	
Processing rule:	Sum Table 2(8.1BL+8.2BL+8.3BL)	

8.1BL	Changes in deployable output due to climate change	MI/d
Definition:	Direct assessment of climate change on sources	
Processing rule:	Input (reductions must be entered as negative numbers) for onward calculation.	
Method:	Impacts of climate change on water supply – see section 3.3 The uncertainties associated with the estimating of the impact of climate change on supply should be included in the assessment of headroom uncertainty.	

Companies are required to consider the effect of climate change on supply. Climate change adjustments should be entered in row 8.1BL. This is picked up by the calculation of WAFU (own sources) (row 12BL). The plan should explain how the effect of climate change on supply has been assessed.

For water resources planning purposes it is possible only to estimate the effect of climate change on average supply rather than on the volume available in peak periods.

8.2BL	Reductions to restore sustainable abstraction	MI/d
Definition:	Specify and identify any reductions in DO that are required to meet statutory and/or environmental obligations	
Processing rule:	Input	
Method:	Sustainability changes	

Companies should insert individual rows for each sustainability abstraction affecting DO in the resource zone. Companies should use references for the sustainability changes that the Environment Agency and/or Natural Resources Wales has provided to them. These are automatically summed in row 8.2BL.

8.3BL	Total other changes to deployable output	MI/d
Definition:	Other changes to deployable output	
Processing rule:	Input	

This line is for any other categories of reduction e.g. operational decline etc. As for 8.2BL each individual cause of reduction should be specified.

9BL	Raw water losses and operational use, and treatment works losses and operational use	MI/d
Definition:	<p>Combined value for raw water losses, raw water operational use, treatment works losses and treatment works operational use.</p> <p>Raw water losses: Net loss from the resource system, comprised of mains/aqueduct (pressure system) losses, open channel/low pressure system losses, and losses from break-pressure tanks and small reservoirs (NRA/UKWIR, 1995a).</p> <p>Raw water operational use: Regular washing-out of mains due to sediment build up and poor quality of source water (NRA/UKWIR, 1995a).</p> <p>Treatment works losses: Made up of structural water loss and both continuous and intermittent over-flows (NRA/UKWIR, 1995a).</p> <p>Treatment works operational use: Treatment process water, i.e., net loss that excludes water returned to source water (NRA/UKWIR, 1995a).</p>	
Processing rule:	<p>Input</p> <p>Where a company has not included raw water losses, operational use or treatment works losses in its calculation of deployable output, these losses should be entered here. Where a company has already included these losses in its calculation of deployable output, this is zero (enter zeros – do not leave blank, and confirm in the Data QA sheet that this is reason for zeros).</p>	

The Environment Agency has combined raw water losses, raw water operational use, treatment works losses and treatment works operational use, into the same row. However, if the Environment Agency and/or Natural Resources Wales considers the values are not sufficiently explained it will request that a company provides a further breakdown.

Companies should include raw water losses, raw water operational use and treatment works losses even if they have been used to derive the estimates of DO, as they are reporting lines. If these losses have been used to derive DO then the company must amend the formula and the derivation in lines 12BL and 12FP to ensure that this is not double-counted. The company should highlight the change and provide an explanation in its plan.

Outage allowance in row 10BL should be deducted after calculating deployable output. It will apply to the entire resource zone rather than individual sources. This component is deducted in the calculation of WAFU (own sources).

10BL	Outage Allowance	MI/d
Definition:	A temporary loss of deployable output. (Note that an outage is temporary in the sense that it is retrievable, and therefore deployable output can be recovered. The period of time for recovery is variable. If an outage lasts longer than three months, analysis of the cause of the problem would be required in order to satisfy the legitimacy of the outage).	
Processing rule:	Input	
Method:	Outage allowance	

Table 3. Baseline Demand

Table 3 BL Demand sets out key elements of the demand forecast (including consumption, leakage, property, population, occupancy and metering data).

Table 3 - Consumption (rows 19-28BL)

This section of the table contains information on the main components of water delivered to and consumption of unmeasured and measured household and non-household properties.

Where companies have shown an impact of climate change on demand, the figures included within the baseline tables should show this. The plan should explain how the effect of climate change on the demand forecast has been assessed. Company policy (such as metering) can be included in the baseline. As a minimum, companies should include achievement of the savings associated with water efficiency, leakage reduction and metering activities assumed in price limits up to 2020. Beyond that, companies should assume continuation of existing policies.

19BL	Water delivered measured non-households	MI/d
Definition:	Average volume of water delivered to non-households that are supplied with measured water. This is to include supply pipe leakage.	
Processing rule:	Input	

20BL	Water delivered unmeasured non-households	MI/d
Definition:	Average volume of water delivered to non-households that are supplied with unmeasured water. This is to include supply pipe leakage.	
Processing rule:	Input	

21BL	Water delivered measured Households	MI/d
Definition:	Average volume of water delivered to households billed for measured water within the supply area. This is to include supply pipe leakage.	
Processing rule:	Input	

22BL	Water delivered unmeasured households	MI/d
Definition:	Average volume of water delivered to households billed for unmeasured water within the supply area. This is to include supply pipe leakage.	
Processing rule:	Input	

23BL	Measured non-household consumption	MI/d
Definition:	Estimated consumption of non-households that are supplied with measured water. This figure applies to billed measured non-households and excludes underground supply pipe leakage.	
Processing rule:	WRP Table 3 19BL-34BL Water Delivered measured non-households – Measured non - household USPL	

24BL	Unmeasured non-household consumption	MI/d
Definition:	Estimated consumption of non-households that are supplied with unmeasured water. This figure applies to billed unmeasured non-households and excludes underground supply pipe leakage.	
Processing rule:	WRP Table 3 20BL-35BL Water Delivered unmeasured non-households – unmeasured non - household USPL	

25BL	Measured household consumption	MI/d
Definition:	Estimated consumption of households that are supplied with measured water. This figure applies to billed measured households and excludes underground supply pipe leakage.	
Processing rule:	WRP Table 3 21BL-36BL Water Delivered measured households – Measured household USPL	

26BL	Unmeasured household consumption	MI/d
Definition:	Estimated consumption of households that are supplied with unmeasured water. This figure applies to billed unmeasured households and excludes underground supply pipe leakage.	
Processing rule:	WRP Table 3 22BL-37BL Water Delivered unmeasured households – unmeasured household USPL	

27-	Percentage of consumption driven by climate change	%
Definition:	Percentage of baseline consumption (sum of 22BL:26BL) per year that is driven by climate change. It is assumed that the forecast will include an element driven by climate change.	
Processing rule:	Input	

Line 27 is not used in the supply-demand balance calculation and so does not have a BL suffix. This line is purely for information. This line is not generated by the climate change figure in WRP Table 1 BL Licences but the two will be reviewed and questioned by the Environment Agency and/or Natural Resources Wales to ensure that the impact of climate change has been assessed appropriately.

28-	Volume of consumption driven by climate change	MI/d
Definition:	Volume of baseline consumption (sum of 22BL:26BL) per year that is driven by climate change. It is assumed that the forecast will include an element driven by climate change.	
Processing rule:	Line 27(%)*sum(23BL:26BL)	

This figure is not used in the supply-demand balance calculation and so does not have a BL suffix. This line is purely for information.

Table 3 - PCC and consumption by component (rows 29-33BL)

This part of the table sets out measured household and unmeasured household PCC and their associated micro-components. It also sets out average household PCC, water taken unbilled and distribution system operational use.

All estimates of per capita consumption (PCC) should be expressed in units of litres/head/day and exclude underground supply pipe losses.

PCC in the tables is auto-calculated from consumption divided by population, not directly from the sum of micro-components (i.e. top down). This is because company calculations of PCC may include elements of Maximum Likelihood Estimation. However, where measured PCC and unmeasured PCC do not equal the sum of micro-components you should highlight this within the tables and provide an explanation in the commentary.

A water company can develop its own sub-components that fit into the categories, components can be overtyped, and additional rows inserted but you should highlight this as a change and

explain why in the commentary. The categories should be the same for all zones and scenarios submitted.

More information about micro-components can be found in the UKWIR report (15/WR/02/9).

If a company cannot complete the table, it should state why not and outline how it will improve its data management.

29BL	Measured household - PCC	l/h/d
Definition:	Estimated per capita consumption of households that are supplied with measured water. This figure applies to billed measured households and excludes underground supply pipe leakage.	
Processing rule:	$(25BL * 1,000,000) / (WRP2a \ 51BL * 1,000)$ Measured household consumption / Measured household population	

30BL	Unmeasured household - PCC	l/h/d
Definition:	Estimated per capita consumption for households that are supplied with unmeasured water. This figure applies to billed unmeasured households and excludes underground supply pipe leakage.	
Processing rule:	$(26BL * 1,000,000) / (WRP2a \ 52BL * 1,000)$ Unmeasured household consumption / Unmeasured household population	

31BL	Average household - PCC	l/h/d
Definition:	Estimated average per capita consumption for household use, both measured and un-measured.	
Processing rule:	$((25BL + 26BL) * 1,000,000) / (WRP2a \ 49BL + 50BL * 1,000)$ Total household consumption / total household population	

32BL	Water taken unbilled	MI/d
Definition:	Water taken legally unbilled plus water taken illegally unbilled (NRA/UKWIR, 1995a).	
Processing rule:	Input	

33BL	Distribution system operational use (DSOU)	MI/d
Definition:	Water knowingly used by a company to meet its statutory obligations particularly those relating to water quality. Examples include mains flushing and air scouring (NRA/UKWIR, 1995a). This is treated as a source of demand and so is located in WRP2.	
Processing rule:	Input	

Table 3 - Leakage (Rows 34-41BL)

Companies should show total leakage and underground supply pipe leakage in this section of Table 3 BL Demand. Leakage for the base year should be the actual leakage reported to Ofwat for the same year.

In the baseline data set, the supply-demand balance should include an estimate of leakage that assumes a company will follow its current leakage policies and, where appropriate, meet any performance commitments.

34BL	Measured non-household - USPL	MI/d
Definition:	Estimated underground supply pipe leakage for non-households that are supplied with measured water. This figure applies to billed measured non-households. Underground supply pipe leakage is any loss of water from the underground supply pipe	
Processing rule:	Input	

35BL	Unmeasured non-household - USPL	MI/d
Definition:	Estimated underground supply pipe leakage for non-households that are supplied with unmeasured water. This figure applies to billed unmeasured non-households. Underground supply pipe leakage is any loss of water from the underground supply pipe.	
Processing rule:	Input	

36BL	Measured household - USPL	MI/d
Definition:	Estimated underground supply pipe leakage for households that are supplied with measured water. This figure applies to billed measured households. Underground supply pipe leakage is any loss of water from the underground supply pipe.	
Processing rule:	Input	

37BL	Unmeasured household - USPL	MI/d
Definition:	Estimated underground supply pipe leakage (USPL) for households that are supplied with unmeasured water. This figure applies to billed unmeasured households. Underground supply pipe leakage is any loss of water from the underground supply pipe.	
Processing rule:	Input	

38BL	Void properties (all) - USPL	MI/d
Definition:	Estimated underground supply pipe leakage for void households and non-households. Underground supply pipe leakage is any loss of water from the underground supply pipe.	
Processing rule:	Input	

39BL	Distribution losses	MI/d
Definition:	Made up of losses on trunk mains, service reservoirs, distribution mains and communications pipes. Distribution losses are distribution input less water taken (NRA/UKWIR, 1995a). This is treated as a source of demand and so is located in Table 3 BL Demand.	
Processing rule:	Input	

40BL	Total leakage	MI/d
Definition:	The sum of distribution losses underground and supply pipe losses (NRA/UKWIR, 1995a).	
Processing rule:	sum(34BL:39BL) Distribution losses + unmeasured household USPL + measured household USPL + unmeasured non-household USPL + measured non-household USPL + void properties USPL	

41BL	Total leakage	l/prop/d
Definition:	The sum of distribution losses underground and supply pipe losses (NRA/UKWIR, 1995a), apportioned per property.	
Processing rule:	$(40BL * 1,000,000) / (WRP \text{ Table 3 } 48BL * 1,000)$ Total leakage / total properties	

Table 3 - Customer properties, population, occupancy and metering (Rows 42-57BL)

This section of the table sets out information on the customer base for potable water demand and provides guidance on Rows 42-57BL. The Environment Agency and/or Natural Resources Wales requires the information to assess the demand forecasts. Companies should include a breakdown of population, properties and occupancy rates for the measured and unmeasured customer base. Companies should complete Table 3 (BL Demand) for the dry year baseline scenario. This information is required for all resource zones.

Companies should provide a full explanation of how they have derived customer data (customer properties, population, occupancy and metering) in their plan. They should clearly set out the assumptions, methods and information used to determine them.

Table 3 (BL Demand) should reflect any adjustments to the breakdown of the customer base into measured and unmeasured as a result of implementing any existing metering policies. Any further changes to metering policies or programmes that are defined as a selected option in Table 6. (Preferred options) will need to be accounted for manually in Table 8 (FP Demand).

If there is no data to enter for a component enter 0.00. Do not leave cells blank.

If a company cannot complete the table, it should state why not and outline how it will improve its data management.

Note that some components require a cumulative total (over time) whereas some require an 'in year' figure for each year.

The measured household property figures are required as an 'in year' figure. The purpose is to clearly show how companies will achieve metering forecasts over the planning period.

The table below sets out the property data and what information we require companies to submit. The column on the right gives further explanation of what the information shows.

Ref	Component	Derivation	Comments
42BL	Measured non-households - properties (excl voids)	Input (total)	= total number of non-household properties (excluding voids)
43BL	Unmeasured non-households - properties (excl voids)	Input (total)	
44BL	All void non-households - properties	Input (voids in each year)	= number of non-household void properties in each year
45BL	Total measured households - properties	Pre-plan year = input. Forecast years = Previous year 45BL + sum(45.1BL:45.6BL)	= Total measured household properties (excluding voids). This is calculated by adding together all of the new measured household properties in that year (see below), excluding voids, to the previous year's total.
45.1BL	New build properties - properties	Input (new builds in each year)	This information is inserted as an 'in year' figure and the sum of them = the number of new measured household properties in that year. This is then used as the starting point for the next year, upon which all the new measured properties in that year are added.
45.2BL	Meter optants - properties	Input (meter optants in each year)	
45.3BL	Compulsory metering - properties	Input (compulsory meters in each year)	
45.4BL	Metering on change of occupancy - properties	Input (change of occupancy meters in each year)	
45.5BL	Selective metering - properties	Input (selective meters in each year)	
45.6BL	Other changes to existing metering - properties	Input (other changes to meters in each year)	
45.7BL	Measured void households - properties	Input (voids in each year)	= number of measured void household properties in each year
46BL	Unmeasured households - properties (excl void)	Input (total)	= total number of unmeasured households excluding voids
47BL	Unmeasured void households - properties	Input (voids in each year)	= number of unmeasured void households in each year
48BL	Total Resource Zone Properties	SUM(42BL:45BL)+45.7BL+46BL+47BL	=total non household properties (including voids) + total measured household properties (including voids)

			+total unmeasured household properties (including voids)
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The line definitions are given below.

42BL	Measured non-households - properties	000s
Definition:	Number of non-households billed for measured water within the supply area.	
Processing rule:	Input	

43BL	Unmeasured non-households - Properties	000s
Definition:	Number of non-households whose water supply is not measured.	
Processing rule:	Input Row 43BL requires a value for total population in at least one of the lead in years. The subsequent totals per type of measured property then accumulate from this basis.	

44BL	All void non-households - Properties	000s
Definition:	Number of non-household properties within the supply area, connected to the distribution system but do not receive a charge as there are no occupants.	
Processing rule:	Input - annual not cumulative	

45BL	Total measured households - properties (excl voids)	000s
Definition:	Number of households billed for a water supply that is measured. Row 42BL is (Measured Household – Properties) auto calculated as the sum of the component measured household categories. This line is used to calculate occupancy and metering levels and in the calculation of the supply-demand balance. Voids are not included in this calculation.	
Processing rule:	Table 3 sum (45.1BL to 45.6BL)	

45.1BL	New properties - properties	000s
Definition:	Number of new properties connected to the supply system per year.	
Processing rule:	Input - annual not cumulative	

45.2BL	Optants - properties	000s
Definition:	Number of existing properties opting to have a meter and a metered charge.	

Processing rule:	Input - annual not cumulative
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45.3BL	Compulsory metered - properties	000s
Definition:	Number of existing properties metered compulsorily.	
Processing rule:	Input - annual not cumulative	

45.4BL	Metered on change of occupancy - properties	000s
Definition:	Number of existing properties metered upon change of occupancy.	
Processing rule:	Input - annual not cumulative	

45.5BL	Selective metering - properties	000s
Definition:	Number of existing properties metered as a result of a selective metering programme.	
Processing rule:	Input - annual not cumulative	

45.6BL	Other changes to existing metering - properties	000s
Definition:	Number of existing properties metered as a result of other metering programmes.	
Processing rule:	Input - annual not cumulative	

45.7BL	Measured void households - properties	000s
Definition:	Number of measured household properties within the supply area, connected to the distribution system but do not receive a charge as there are no occupants. This value is used within the meter penetration calculations.	
Processing rule:	Input - annual not cumulative	

46BL	Unmeasured households (excl voids) - properties	000s
Definition:	Number of households billed for a water supply that is not measured.	
Processing rule:	Input Row 46BL requires a value for total population in at least one of the lead in years. The subsequent totals per type of measured property then accumulate from this basis.	

47BL	Unmeasured void households - properties	000s
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Definition:	Number of unmeasured household properties within the supply area, connected to the distribution system but do not receive a charge as there are no occupants. This value is used within the meter penetration calculations.
Processing rule:	Input - annual not cumulative

48BL	Total Resource Zone - Properties	000s
Definition:	The sum of total household and non-household properties including void properties.	
Processing rule:	Table 3 SUM(42BL:45BL)+45.7BL+46BL+47BL Measured and unmeasured non household properties and voids + Measured household properties + measured household voids + unmeasured household properties and voids	

49BL	Measured non-household - population	000s
Definition:	Resident population in non-households supplied with measured water.	
Processing rule:	Input	

50BL	Unmeasured non-household - population	000s
Definition:	Resident population in non-households whose water supply is not measured.	
Processing rule:	Input	

51BL	Measured household - population	000s
Definition:	Resident population in billed households supplied with measured water.	
Processing rule:	Input	

52BL	Unmeasured household - population	000s
Definition:	Resident population in billed households whose water supply is not measured.	
Processing rule:	Input	

53BL	Total resource zone - population	000s
Definition:	The sum of total household and non-household population.	

Processing rule:	Sum(49BL:52BL)
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54BL	Measured household - occupancy rate (average)	000s
Definition:	Population per household property supplied with measured water (excluding voids)	
Processing rule:	51BL/45BL Measured Household – Population / Measured Household – Properties (45BL does not include voids)	

55BL	Unmeasured household - occupancy rate	000s
Definition:	Population per household property whose water supply is not measured - based on cumulative property and population data.	
Processing rule:	52BL/46BL Unmeasured Household – Population / Unmeasured Household – Properties (46BL does not include voids)	

56BL	Total household metering penetration (excl. voids)	000s
Definition:	The percentage of total households that are measured with a water meter. This excludes void properties as no-one is present to use water.	
Processing rule:	45BL/(45BL+46BL) Measured household properties/(Measured household properties (which does not include voids) + Unmeasured household properties) Cell format set to %	

57BL	Total household metering penetration (incl. voids)	000s
Definition:	The percentage of total households that are measured with a water meter. This includes void properties.	
Processing rule:	45BL/(45BL+45.7BL+46BL+47BL) Measured household properties/(Measured household properties + Measured household property voids + Unmeasured household properties + unmeasured void households)	

Table 4. Baseline Supply-demand Balance

Rows 11BL to 18BL present the baseline supply-demand balance. This is the final part of the baseline process.

The baseline scenario (Table 4 BL SDB) should reflect known changes to WAFU (planned and approved changes to abstraction licences) and the continuation of current policies in demand management (including the committed leakage levels and implementation of companies' water efficiency plans).

Where companies have included existing, non-potable supplies in deployable output, this quantity should be subtracted from Total WAFU to avoid double counting. Where this is the case the derivation cell should be amended and highlighted.

Water available for use (own sources) in row 12BL is the sum of deployable output plus or minus any changes, minus raw water losses, treatment works losses, and outage.

11BL	Distribution input	MI/d
Definition:	The amount of water entering the distribution system at the point of production (NRA/UKWIR, 1995a). For this row this must be the average for the planning scenario (dry year annual average or critical period).	
Processing rule:	Table 3 BL Demand 19BL+20BL+21BL+22BL+32BL+33BL+38BL+39BL	

12BL	Water available for use (own sources)	MI/d
Definition:	The value calculated by deducting allowable outages, sustainability changes, raw water losses, and treatment works losses from deployable output in a resource zone.	
Processing rule:	Table 2 (7BL+8BL)-(9BL+10BL) (DO + changes to DO +ve or -ve) minus (raw water losses+ treatment works losses + outage)	

13BL	Total available for use	MI/d
Definition:	The value calculated by the deduction from deployable output of sustainability changes and outages. To this imports are added and exports deducted.	
Processing rule:	12BL+(2BL+3BL)-(5BL+6BL) WAFU (own sources) + (raw and potable water imports) – (raw and potable water exports)	

Companies are required to include the uncertainty associated with climate change within headroom. Row 14BL specifically requires the volume of target headroom required to cover this uncertainty. All other uncertainties contributing to target headroom should be input to row 15BL.

The total available headroom in row 17BL is the difference between the distribution input (row 11BL) and Total WAFU (row 13BL) for the relevant scenario. Supply deficits are shown as a negative value.

14BL	Target headroom (climate change component)	MI/d
Definition:	Target headroom – the threshold of minimum acceptable headroom that would trigger the need for total water management options to increase water available for use or decrease demand. Row 14BL requires the component of target headroom that is driven	

	by climate change.
Processing rule:	Input
Method:	Target headroom methodology (UKWIR, 02/WR/13/2)

15BL	Target headroom (All other components)	MI/d
Definition:	Target headroom – the threshold of minimum acceptable headroom that would trigger the need for total water management options to increase water available for use or decrease demand. Row 14BL requires the component of target headroom that is driven by all other non-climate change related uncertainties.	
Processing rule:	Input	
Method:	Target headroom methodology	

16BL	Target headroom	MI/d
Definition:	Target headroom – the threshold of minimum acceptable headroom that would trigger the need for total water management options to increase water available for use or decrease demand.	
Processing rule:	14BL+15BL Target headroom (climate change) + target headroom (all other components of uncertainty)	

17BL	Available headroom	MI/d
Definition:	Available headroom – the difference between water available for use (including imported water) and demand at any given point in time.	
Processing rule:	13BL-11BL Total Water Available For Use – Distribution Input	

18BL	Supply Demand Balance	MI/d
Definition:	The difference between available headroom and target headroom. A deficit drives the need for options to restore a secure supply-demand balance in a final planning scenario.	
Processing rule:	17BL-16BL	
Method:	Available Headroom – target headroom	

Table 5. Feasible options

This section provides guidance on rows 58 to 61. Rows in this section are neither baseline nor final planning and so have neither the BL or FP suffix. If there are no feasible options (i.e. the zone does not have a deficit in the baseline) then there is no need to enter anything into this sheet. To confirm that this is not an oversight, state the reason (i.e. no deficit) in an available cell.

The options tables should be completed at resource zone level. The plan should make it clear when a solution is proposed at company level.

Companies are required to enter all the feasible water management options into Table 5 Feasible options. Where an option is listed in Table 5 Feasible options it should be given a unique option reference number so that it can be identified and cross-referenced in the plan where there should be a more detailed explanation and option appraisal.

Table 5 Feasible options requires basic option information (name, option reference number, type of option, start date) plus a detailed cost profile and annual WAFU gains forecast for economic analysis. Companies are required to identify which component of supply or demand will be affected by the option and to enter the data into the relevant section. Net present value (NPV) and Average incremental cost (AIC) will be automatically calculated from the information entered into the cost profile. There is also a formula for average incremental social and environmental costs, but this will only differ from AIC if a social and environmental NPV is entered.

Selected options (i.e. those identified as 'Preferred' within table 5) must be entered into Table 6 Preferred Options, manually, under the relevant components of the supply-demand balance. The gains in WAFU/savings in demand should be set out for each option as those to meet the full deficit of the scenario under consideration, and not utilisation.

Some options might supply more than one resource zone. Where this is the case, in Table 5 Feasible options and Table 6 Preferred Options, companies should allocate the cost and yields of the option proportionally between those resource zones. The basis of the allocation of costs is for a company to determine, as unit costs might differ from one zone to another. Companies should explain this allocation in the option description and assessment section of the plan. Companies should use the total cost of an option where it is not possible to split the cost; for example a large resource development may cost the same no matter how many resource zones will benefit from it.

There are no longer any macros in this table, so you must insert rows manually. You must make sure that any formulas linked to these new rows are correct.

Data in this file will be derived from existing water company economic tools used to generate data for the Business Plan submission to Ofwat. The content of Table 5 Feasible Options is more high-level than the detail that is included in the business plan tables but will provide the Environment Agency and/or Natural Resources Wales with economic information on which to determine the relative costs of options and the whole solution.

You should submit complete tables, including cost information, to the secretary of state. If you think your tables contain commercially sensitive information then you should notify the secretary of state and provide an explanation. When you publish your WRMP and tables you should highlight any information you have redacted and include an explanation.

Line definitions

58a	Resource management
Definition:	A list of actions that affect deployable output (DO), for example new reservoirs or resource transfers
Processing rules:	Input as appropriate

59a	Distribution-side management
Definition:	A list of options targeted at activities between distribution and the point of consumption

60a	Production-side management
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Definition:	A list of options targeted at activities between abstraction and distribution input.
Processing rules:	Input as appropriate

61a	Customer-side management
Definition:	A list of options that affect customer use and supply pipe losses
Processing rules:	Input as appropriate

Column Notes

Companies should use the definitions from The economics of balancing supply and demand (UKWIR and Environment Agency, 2002) in completing these columns and explain where they have not.

Table 5 Column C	Option name
Notes:	Each option should be given a name. The name is up to the company but it should be consistent throughout the plan and tables.
Processing rules:	Input

Table 5 Column D	Option reference number
Notes:	Each option should be given a unique reference number. The reference is up to the company but it should be consistent throughout the plan and tables.
Processing rules:	Input

Table 5 Column E	Type of option
Notes:	Choose the type of option from a dropdown list.
Processing rules:	Select from drop down

Table 5 Column F	Preferred option	(Y/N)
Notes:	Yes/No option to confirm whether or not the feasible option has been selected for the final planning scenario (i.e. is listed in Table 6 Preferred options). Companies are required to confirm which options have been selected.	
Processing rules:	Select from drop down	

Table 5 Column G	Earliest potential option start date	Year
Notes:	The earliest year that the option can be fully implemented.	
Processing rules:	Select from drop down	

Table 5 Column H	Costs based on capacity
Notes:	This column is automatically filled in to confirm that all costs presented in Table 5 are based on the capacity of the option, not its expected utilisation. This is an Ofwat requirement. This can be overwritten to 'Utilisation' but this will demand an explanation in the plan.
Processing rules:	Automatic set as default

Table 5 Column I	WAFU on full implementation	(MI/d)
Notes:	Water available for use on full implementation of the option described. This should be the maximum possible WAFU for the option. Where companies do not include maximum WAFU (for example, metering could have a range of possible WAFU), they should state what is included in the option description section of the plan.	
Processing rules:	Automatically selected from the WAFU projection.	

Table 5 Column J	NPV of WAFU	(MI)
Notes:	Net present value of water available for use of the option described. As defined in The economics of balancing supply and demand (UKWIR/Environment Agency, 2002).	
Processing rules:	Auto calculated from data in the cost profile. Assumes an 80 year cost profile. =NPV(DiscountRate, Gains in WAFU/Demand savings Year 2 to 80,Year 1)	

Table 5 Column K	CAPEX NPV	(£000)
Notes:	Net present value of capex of the option described. As defined in The economics of balancing supply and demand (UKWIR/Environment Agency, 2002).	
Processing rules:	Auto calculated from data in the cost profile. Assumes an 80 year cost profile. =NPV(DiscountRate, Fixed Capex Year 2 to 80,Variable Capex Year 2 to 80,Fixed +Variable Year 1)	

Table 5 Column L	OPEX NPV	(£000)
Notes:	Net present value of opex of the option described. As defined in The economics of balancing supply and demand (UKWIR/Environment Agency, 2002).	
Processing rules:	Auto calculated from data in the cost profile. Assumes an 80 year cost profile. =NPV(DiscountRate, Fixed Opex Year 2 to 80,Variable Opex Year 2 to 80,Fixed +Variable Year 1)	

Table 5 Column M	NPV of OPEX SAVINGS	(£000)
Notes:	Net present value of opex savings for the option described. As defined in The economics of balancing supply and demand (UKWIR/Environment Agency, 2002).	
Processing rules:	Auto calculated from data in the cost profile. Assumes an 80 year cost profile. =NPV(DiscountRate, Opex savings Year 2 to 80, Year 1)	

Table 5 Column N	NPV of Carbon	(£000)
Notes:	Two carbon prices have been developed: a traded price of carbon for emissions covered by the WU Emissions Trading Scheme (includes grid electricity use); and a non-traded price of carbon for emissions outside of the EU ETS. Companies should use the appropriate carbon price depending on the origin of the fixed emissions (e.g. construction) and variable emissions (e.g. operational use).	
Processing rules:	Auto calculated from data in the cost profile. Assumes an 80 year cost profile. =NPV(DiscountRate, Fixed Carbon costs Year 2 to 80, variable carbon costs Year 2 to 80, Fixed, Fixed +Variable Year 1)	

Table 5 Column O	SOCIAL & ENV. NPV	(£000)
Notes:	Social and environmental net present value of the option described. This also includes customer willingness to pay. As defined in The economics of balancing supply and demand (UKWIR/Environment Agency, 2002).	
Processing rules:	Auto calculated from data in the cost profile. Assumes an 80 year cost profile. =NPV(DiscountRate, Fixed Social and Environmental costs Year 2 to 80, variable Social and Environmental costs Year 2 to 80, Willingness to Pay Year 2 to 80, Fixed, Fixed +Variable Year 1)	

Table 5 Column P	TOTAL NPV	(£000)
Notes:	Total net present value of the option described. As defined in The economics of balancing supply and demand (UKWIR/Environment Agency, 2002).	
Processing rules:	Auto calculated as sum of columns L to P	

Table 5 Column Q	AIC	(p/m3)
Notes:	Average incremental cost of the option described. As defined in The economics of balancing supply and demand (UKWIR/Environment Agency, 2002).	

Processing rules:	$=(\text{SUM}(\text{Columns L:N}) * 100000) / (\text{Column K} * 1000)$
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Table 5 Column R	AISC	(p/m3)
Notes:	Average incremental social cost of the option described. As defined in The economics of balancing supply and demand (UKWIR/Environment Agency, 2002).	
Processing rules:	$=(\text{Column Q}) * 100000 / (\text{Column K} * 1000)$	

Table 5 Column S	Scope Confidence	#
Notes:	Level of confidence in the scope of the option (1-5)	
Processing rules:	Select from drop down list	

Table 5 Column T	Cost confidence	#
Notes:	Level of confidence in the cost of the option (1-5)	
Processing rules:	Select from drop down list	

Table 6. Preferred Options

This section provides guidance on rows 58-61.10 (related to rows 58a – 61.10a on Table 5).

Companies are required to complete Table 6 Preferred Options manually. Companies are required to identify which component of the supply-demand balance the option is aimed at and to insert the option name, reference number, and dry year planned gains in WAFU or savings across the planning horizon.

Rows can be entered manually but must be entered above the cell containing 'insert row above'. This line must not be deleted. This should ensure that all option WAFU or savings will be correctly calculated in each headlining component row. However, it is prudent to check formulas if you have inserted additional rows.

There may be options which will impact on more than one component, e.g. metering will change the volume of water delivered to the unmeasured customer base (as unmeasured property/population levels change), as well as the total volume delivered to the measured customer base. It may also change USPL levels. In such cases water companies should enter the option in each component section and allocate the expected impact on each. Companies should not enter the total impact of the option (Ml/d) in each component as that will lead to double counting.

The gains in WAFU/savings in demand for each option in Table 6 should be set out as those to meet the full deficit of the scenario under consideration, and not utilisation.

Line Definitions

58	Resource management
Definition:	Preferred list of resource management options.
Processing rules:	=sum(58.1:58.7) Automatic calculation of options entered within this section

58.1	Increase raw water abstractions
Definition:	Preferred list of options to increase raw water abstractions.
Processing rules:	Insert row for each option and input data. Line 58.1 will automatically sum the impact of options entered within this section

58.2	Raw water imports
Definition:	Preferred list of options to increase raw water imports.
Processing rules:	Insert row for each option and input data. Line 58.2 will automatically sum the impact of options entered within this section.

58.3	Potable water imports
Definition:	Preferred list of options to increase potable water imports
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 58.3 will automatically sum the impact of options entered within this section.

58.4	Reduce raw water losses and operational use
Definition:	Preferred list of options to reduce water losses and operational use.
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 58.4 will automatically sum the impact of options entered within this section.

58.5	Reduce raw water export (including non potable supplies)
Definition:	Preferred list of options to reduce the volume of raw water exported from the resource zone. Options within this section can include reductions in non potable supplies, such as those to industrial uses.
Processing rules:	Automatic calculation of options entered within this section. Any options resulting in reductions should be entered as a negative number. Line 58.5 totals the impact of options within section 58.51 and 58.52.

58.51	Reduce raw water export
Definition:	Preferred list of options to reduce the volume of raw water exported from the resource zone.
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 58.51 will automatically sum the impact of options entered within this section.

58.52	Reduce non potable supplies
Definition:	Preferred list of options to reduce the volume of non potable water supplied to customers (i.e. industrial uses).
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 58.52 will automatically sum the impact of options entered within this section.

58.6	Reduce potable water exports
Definition:	Preferred list of options to reduce the volume of potable water exported from the resource zone.
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 58.6 will automatically sum the impact of options entered within this section.

58.7	Other options to increase deployable output
Definition:	Preferred list of any other options that will increase deployable output the resource zone (options that are not better accounted for by other components such as increasing capacity at a treatment works).
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 58.7 will automatically sum the impact of options entered within this section.

59	Distribution-side management
Definition:	Preferred list of distribution-side management options.
Processing rules:	=sum(59.1:59.2) Automatic calculation of options entered within this section. This row must be copied into line 59FP (WRP6b Weighted FP Demand)

59.1	Reduce distribution losses
Definition:	Preferred list of options to reduce distribution losses (mains leakage).
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 59.1 will automatically sum the impact of options entered within this section.

59.2	Reduce distribution system operational use (DSOU)
Definition:	Preferred list of options to reduce DSOU.
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 59.1 will automatically sum the impact of options entered within this section.

60	Production-side management
Definition:	Preferred list of production-side management options.
Processing rules:	=sum(60.1:60.2) Automatic calculation of options entered within this section.

60.1	Reduce treatment works losses
Definition:	Preferred list of any options to reduce treatment works losses (mains leakage).
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 60.1 will automatically sum the impact of options entered within this section.

60.2	Reduce outages
Definition:	Preferred list of options to reduce outages.
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 60.2 will automatically sum the impact of options entered within this section.

61	Customer-side management
Definition:	Preferred list of customer-side management options.
Processing	=sum(61.1:61.10)

rules:	Automatic calculation of options entered within this section. This row must be copied into line 61FP (WRP6b Weighted FP Demand)
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61.1	Change volume delivered to measured non-households
Definition:	Preferred list of options to that will change the volume delivered to measured non households.
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 61.1 will automatically sum the impact of options entered within this section.

61.2	Change volume delivered to unmeasured non-households
Definition:	Preferred list of options to that will change the volume delivered to unmeasured non households.
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 61.2 will automatically sum the impact of options entered within this section.

61.3	Change volume delivered to measured households
Definition:	Preferred list of options to that will change the volume delivered to measured households.
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 61.3 will automatically sum the impact of options entered within this section.

61.4	Change volume delivered to unmeasured households
Definition:	Preferred list of options to that will change the volume delivered to unmeasured households.
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 61.4 will automatically sum the impact of options entered within this section.

61.5	Options to reduce water taken unbilled
Definition:	Preferred list of options to reduce water taken unbilled.
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 61.5 will automatically sum the impact of options entered within this section.

61.6	Options impacting on measured non-household - USPL
Definition:	Preferred list of options to reduce measured non household USPL.
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 61.6 will automatically sum the impact of options entered within this section.

61.7	Options impacting on unmeasured non-household - USPL
Definition:	Preferred list of options to reduce unmeasured non household USPL.
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 61.7 will automatically sum the impact of options entered within this section.

61.8	Options impacting on measured household - USPL
Definition:	Preferred list of options to reduce measured household USPL.
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 61.8 will automatically sum the impact of options entered within this section.

61.9	Options impacting on unmeasured household - USPL
Definition:	Preferred list of options to reduce unmeasured household USPL.
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 61.9 will automatically sum the impact of options entered within this section.

61.10	Options impacting on void properties - USPL
Definition:	Preferred list of customer-side management options.
Processing rules:	Insert row for each option and input data. Options resulting in reductions should be entered as a negative number. Line 61.10 will automatically sum the impact of options entered within this section.

Column notes

Table 6 Column D	Option reference number
Notes:	Each option should be given a unique reference number. The reference is up to the company but should be consistent throughout the plan and tables.
Processing rules:	Input

Table 6 Column H to J	Pre-plan year
Notes:	These fields are not mandatory. They are purely there as a support where previous years' data are required at the start of a forecast.
Processing rules:	These columns are not mandatory.

Table 6 Column G	Base year	Year
Notes:	This could be based on outturn data for the latest year available before draft plan production, which is then adjusted for a dry year forecast. The company should clearly explain how it has done this. If a company wishes to use a different year or an average of multiple years, it can do so, providing it gives a clear explanation.	

	See section 2.14 for more information on the base year.
--	---------------------------------------------------------

Table 6 Column K to AI	Planned gains in WAFU or savings in demand	Ml/d
Notes:	<p>Companies should complete the relevant columns for all preferred options to show the volume and timing of WAFU gains or savings. Years when an option will not be active should be left blank.</p> <p>WAFU gains or savings in demand for each year are individual year gains and not cumulative gains.</p> <p>Baseline gains or demand savings should not be included within this table but included in the option description section of the plan.</p>	

Table 7. Final Planning Supply

Tables 7 (FP Supply) and 8 (FP Demand) are structurally identical to Table 2 (BL Supply and 3 BL Demand). Tables 2 and 3 are for reporting baseline data and all numbers are suffixed BL. Tables 7 and 8 present data for the final planning scenario and all numbers are suffixed FP.

Tables 7 and 8 do not include details such as the names of transfers etc as this information should be clear from the baseline tables and Table 6 (Preferred options).

Companies should refer to tables 2 and 3 for general instructions and line definitions for tables 7 and 8.

Tables 7 (FP Supply) and 8 (FP Demand) are set up with formulae to calculate the impact of the preferred options in table 6 (Preferred options) on the baseline. This creates a more transparent flow of data. Companies can choose to remove the formulae from the final plan tables (7, 8 and 9). However, we expect the final plan to equal the baseline plus options, and where it doesn't, the company should clearly show the difference, and explain the reason. If removing formulas you should change the colour coding of the cells, in line with the key, and highlight the change in the derivation column.

Companies should not add to, or delete, any of the reporting lines in tables 7 and 8.

Specific information relating to tables 7 and 8 (and not 2 and 3) is included below.

Raw Water

For the final planning scenario, planned new raw water transfers or increases in existing raw water transfers should be listed in table 6 (Preferred options) as part of the total water management options.

Deployable Output

If preferred options have been chosen to address the supply-demand balance, the DO entered in the baseline and final planning scenarios will differ. The baseline table (table 2) should show the current DO for the given period. The final planning table (table 6 Preferred options) will show the DO in the final planning scenario.

Row 7FP in table 6 is a calculated row, and is derived from the addition of baseline DO entered in table 2 (BL Supply) (including changes forecast in the baseline) and the WAFU gains from the implementation of resource management options in Table 6 (Preferred options).

WAFU gains from customer, distribution and production-side management will be automatically accounted for and adjusted in the relevant sections of the final planning tables 7 (FP Supply) and 8 (FP Demand).

If no preferred options are entered in table 6 (Preferred Options) then the baseline and final planning DO will be the same.

Table 8. Final Planning Demand

Companies should explain any significant changes between the baseline and the final planning scenario data.

Potable water delivered

Changes to the potable water delivered components from the baseline will be shown in table 8 FP Demand.

Leakage

Changes to leakage from the baseline will be shown in 8 FP Demand. In the final planning scenario, the supply demand balance will reflect the information of the preferred options for reducing leakage presented in table 6 (Preferred options).

The final planning scenario tables are set up to automatically reflect the impact of the chosen options for reducing leakage. This in turn impacts on the final planning scenario supply-demand balance.

Final Planning Customer Base

Table 8 (FP Demand) is partly automated but requires inputs to show the breakdown of population and property categories. This should reflect any adjustments to the breakdown of the customer base into measured and unmeasured as a result of implementing any existing metering policies.

Table 8 FP Demand is a Final Plan version of table 3 (BL Demand). Companies should populate this table in the same way, but the totals represent the final planning, rather than the baseline scenario. Companies should explain in their plan if there are any significant changes to this data in the final planning scenario.

In the pre-plan/for information date columns (H to K) in table 8 FP demand, voids should be excluded from the manual calculations of rows 45BL and 45FP. Voids must be excluded to ensure cumulative totals do not double count voids.

Table 9. Final Planning Supply-Demand Balance

The final planning forecast (Table 9 FP SDB) should reflect changes to both supply and demand as a result of the implementation of the company's preferred or optimum solution. Target headroom for the final scenario should also reflect the implementation of the company's preferred or optimum solution.

Table 10. Drought plan links

This is a new table for the current round of plans. The aim of this table is to further clarify and understand companies' DO calculation and its links to the company drought plan.

Further information about how to fill in this table can be found in the "Drought plan and WRMP links" supporting document. For water companies operating wholly or mainly in Wales, before populating table 10, please discuss how you intend to include (or exclude) supply-side drought measures with Natural Resources Wales and/or the Environment Agency.

General points:

- These tables should be based on final plan data

- The table should be completed once for the base year scenario, and if seeking drought resilience investment, completed again for the critical year in the planning horizon.
- It is up to companies to decide whether to include emergency storage in the DO calculations of the most severe droughts. Explain your assumptions in the summary report.

Table 10.1 Planning scenarios

The purpose of table 10.1 is to demonstrate the drought scenarios that you have considered. The table is divided into historic droughts and additional drought scenarios. It should include your design drought, your worst historic drought (if different to your design drought) and any other drought scenarios you have considered. The expectation is that your design drought is worse than or equal to the worst historic drought. You can insert rows to enter further drought scenarios.

Your drought plan and WRMP may have been produced at different times and therefore may contain different planning scenarios. You should use your judgement to fill in the table, stating where planning scenarios are covered by both your drought plan and WRMP, and any differences between them.

Column C	Drought description	(N/A)
Notes:	Description of drought events you have planned to in your scenarios (eg year of the drought or method used to synthesise)	
Processing rules:	input	

Column D	Drought Severity	%
Notes:	The severity of the drought scenarios you have chosen. A percentage chance of recurrence in any given year is the preferred format.	
Processing rules:	input	

Column E and F	Plan in which scenario is used (highlights overlaps)	Y/N
Notes:	Yes or no depending on whether the relevant scenario is used in the WRMP or the drought plan	
Processing rules:	Y or N	

Table 10.2 Water resources management plan

The purpose of table 10.2 is to show the benefits in MI/d of demand restrictions (eg TUBs) and drought supply measures (eg drought orders and drought permits) on your DO in each of your scenario rows.

You should fill in this table for each scenario presented in 10.1. In the 'description column' you should explain what supply measures or demand restrictions have been assumed. As space is limited, you may find it helps to use a key (eg abbreviations), with a fuller explanation in the final box of the summary report.

If the restrictions have no impact on DO (e.g. some demand restrictions) complete the table to show this.

Where a drought action is included within the water resources management plan columns of the table it should not be presented in the drought plan column as well as this will double count the benefit.

Column G	WRMP DO of sources	(MI/d)
Notes:	Combined yield of all sources in WRMP without restrictions applied for each drought event (scenario)	
Processing rules:	Numeric input	

Column H	Description	N/A
Notes:	Description of supply side measures used	
Processing rules:	Text input	

Column I	Marginal benefit	(MI/d)
Notes:	The benefit of the supply side measures used in the WRMP for each drought event (scenario)	
Processing rules:	Numeric input	

Column J	DO	(MI/d)
Notes:	The yield of non-drought sources (column G) plus drought measures (column I). This may be achieved through simple summation or other methods.	
Processing rules:	Numeric input	

Column K	Description	N/A
Notes:	Description of demand side measures used	
Processing rules:	Text input	

Column L	Marginal benefit	(MI/d)
Notes:	Column I plus the benefit of the demand side measures used in the WRMP for each drought event (scenario)	
Processing rules:	Numeric input	

Column M	Deployable output	(MI/d)
Notes:	Impact on DO of demand restrictions from the WRMP only.	
Processing rules:	Numeric input	

Column N	Deployable output (preferred levels of service)	(MI/d)
Notes:	Impact on DO of demand restrictions with preferred levels of service applied	
Processing rules:	Numeric input	

Table 10.3 Drought plan

The purpose of table 10.3 is to show the impact of the supply measures and demand restrictions that are set out in your drought plan, on DO, under each of the drought scenarios you have listed (in 10.1).

Where a drought action is included within the water resources management plan columns of the table it should not be presented in the drought plan column as well because this will double count the impact.

For completion of the drought plan columns, the benefit of both additional supply measures and benefits of demand restrictions are tested by combining them with the company preferred level of service column (column N).

Column O	Description	N/A
Notes:	Description of supply side measures used	
Processing rules:	text input	

Column P	Marginal benefit	(MI/d)
Notes:	The benefit of the supply side measures from the drought plan used for each drought event (scenario)	
Processing rules:	Numeric input	

Column Q	DO	(MI/d)
Notes:	The yield of further supply side supply measures used in the drought plan combined with the drought actions (supply and demand) used in the deployable output assessment for the WRMP (column N) i.e. the “Company Preferred Levels of Service” scenario.	
Processing rules:	Numeric input	

Column R	Description	N/A
Notes:	Description of demand side measures used	
Processing rules:	Text input	

Column S	Marginal benefit	(MI/d)
Notes:	The benefit of the demand side measures on the drought plan supply measures used for each drought event (scenario)	
Processing rules:	Numeric input	

Column T	DO	(MI/d)
Notes:	The yield of further demand restrictions used in the drought plan combined with the drought actions (supply and demand) used in the deployable output assessment from the WRMP (column N) i.e. the “Company Preferred Levels of Service” scenario.	
Processing rules:	Numeric input	

Table 10.4 Demand analysis

The 'demand' column in the table is used to clarify assumptions on the unrestricted demand used to calculate the effects of levels of service. It is important that in this column the difference between the unrestricted and restricted demands is represented for each row in the table in a consistent way. Companies should select demand that is representative of the drought scenario in each row for each water resource zone. If your choice of unrestricted/restricted demand is different from the scenario it should be clearly marked, justified and explained in the commentary

Column U	Unrestricted demand	(MI/d)
Notes:	The unrestricted demand for each drought event (scenario)	
Processing rules:	Numeric input	

Column V	Restricted demand	(MI/d)
Notes:	The restricted demand for each drought event (scenario)	
Processing rules:	Numeric input	

Table 10.5 Summary Report

A company should provide some high level reporting on its DO assessments to accompany and clarify the presented information. A template summary report has been produced within the reporting table.

Further commentary may be included in the main WRMP where necessary, for example, if the drought scenarios have been used to supply investment for drought resilience schemes.

Appendix A - changed components

Table 1. Changed components in the baseline and final planning tables

Table	Component	Column Ref	Change from previous WRP tables
WRP1 BL Licences	Annual impact of climate change on source (% change)	Row K	Remove
	Period of record (years of data)	Row L	Remove but provide in commentary
	Critical event (year)	Row M	Remove but provide in commentary
WRP1 BL Supply and WRP5 FP Supply	Raw water abstracted	1BL & 1FP	Remove
	Raw water losses and operational use	4BL & 4FP	Merge with 9BL & 9FP
	Treatment works losses and operational use	9BL & 9FP	Merge with 4BL & 4FP
	Calculated (summed) DI	New	Add
WRP2a BL Customers and WRP6a FP Demand	New properties - occupancy	54.1 BL & 54.1 FP	Remove
	Meter optants - occupancy	54.2 BL & 54.2 FP	Remove
	Compulsory metering - occupancy	54.3 BL & 54.3 FP	Remove
	Metering on change of occupancy - occupancy	54.4 BL & 54.4 FP	Remove
	Selective metering properties - occupancy	54.5 BL & 54.5 FP	Remove
	Other changes to existing metering - occupancy	54.6 BL & 54.6 FP	Remove
	Unmeasured Household- Occupancy Rate	55 BL & 55 FP	Remove
	WRP 2b Weighted BL Demand and WRP 6b Weighted FP Demand	Whole table	

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