

SECTION A

BASE INFORMATION

ANNUAL RETURN 2009-10**EDITION CHANGES – SECTION A**

<u>Edition</u>	<u>Description of Change</u>
8	Table A2 <u>Line Title A2.30 updated</u>
8	Table A2 and Definitions A2 New Lines A2.39-A2.45 added
8	<u>Guidance Document</u> Chapter A2 Additional advice concerning lines A2.39-A2.45 added to page 8 (of 14) of this document. Guidance to the Reporter extended to included new information on page 14 (of 14)

**SECTION A
CHAPTER A1**

CONNECTED AND BILLED PROPERTIES

Edition 8

SECTION A

CHAPTER A1

CONNECTED AND BILLED PROPERTIES

This table requires information about billed and connected properties for each of the main primary services that SW provides. It includes a breakdown of all metered and unmetered household and non-household properties to which SW provides services.

Specific Terms

To ensure consistency of information returns the following regularly used terms are defined below: -

Household Properties: These are properties that are on the Council Tax register, used as single domestic dwellings (normally occupied), receiving water or sewerage services for domestic purposes. These properties may be charged on the basis of council tax bands through Local Authorities' billing systems or with a measured supply.

Non-household Properties: These are all properties that are not on the Council Tax register. These properties may receive water either for domestic or non-domestic purposes but which are not occupied as domestic premises, or where domestic dwellings are combined with other properties.

Domestic: This refers to where the use of the water is akin to the use of a household (cooking, cleaning, etc.) and not, for example, industrial use.

Non-domestic: This is where the use of water is not like the use of a household but is of an industrial nature.

Billed properties: These are properties that are connected to either water or sewerage services and receive a bill (including where that bill is zero as the property is exempt).

Connected properties: Properties that are connected to either water or sewerage services irrespective of whether they receive a bill or are exempt.

Properties: Building premises or structure or other permanently connected supply separately identified for billing purposes.

A void property is a property that is connected, but does not receive a charge, as there are no occupants.

An exempt property is a property defined as exempt for Council Tax liability purposes by Statutory Instrument 1992/133: The Council Tax (Exempt Dwellings) (Scotland) Order 1992; or from non-household water and sewerage charges by Scottish Statutory Instrument 2006/72 by The Water

And Sewerage Charges (Exemption And Reduction) (Scotland) Regulations 2006.

Population should include the population served by bulk supplies received and exclude bulk supplies exported. The population should be obtained from most recent ONS (Office for National Statistics) or local authority estimates, or SW's updates of these estimates.

Meter Sizes – Actual: are those water meters actually in place, which may or may not generate revenue though a fixed charge for networks and/or customer services.

Meter Sizes – “Tariff” Meters are those water meters that generate revenue though a fixed charge. For any property, the actual meter size and the “Tariff” meter size may or may not be the same.

Rateable Values records the property rateable values that are used for the purposes of water supply tariffs and charging. They should therefore be shown at that value which generates revenue, which would in effect be net of abatements required under section 41 – 43 of the Water (Scotland) Act 1980, now repealed, or any other abatement or relief that applies.

Guidance to SW

SW should explain annual variations in its reported billed and connected properties. In particular, SW should comment on any work carried out through the year to validate void premises.

SW should ensure that information presented in this table is consistent with the information in Table A2 and Section P.

SW should ensure that no input cell is left blank. If the information is unknown or not applicable, then a zero should be entered in the cell with an appropriate CG.

Guidance to the Reporter

The Reporter should comment on the basis of SW's estimates for connected and billed property numbers, and the methodology used by SW to derive its estimates.

Specific comments are required on consistency with reports of billing records and other billing information (e.g. information provided to SW by Local Authorities).

Specific comments are required on previous WIC Return data and any trend (or lack of trend) noted. The Reporter should check for consistency between the information in Table A1 and Table A2 and Section P.

**SECTION A
CHAPTER A2**

POPULATION, VOLUMES AND LOADS

Edition 8

CHAPTER A2

POPULATION, VOLUMES AND LOADS

Population

This records the population within each of the measured and unmeasured household categories.

Water Balance and Water Delivered Components

These blocks record the assumptions which SW has made in determining its water balance. These blocks also includes those parameters, which together with water delivered volumes, make up SW's whole water balance.

SW should ensure that its reporting of its Water Balance is fully consistent with the joint Arup/WRC "Report On Proposed Methodology for SW To Measure And Report Leakage".

SW is expected to follow the methodologies for estimating the water balance set out in the Demand Forecasting Methodology report produced by NERA on behalf of UKWIR. The report covers acceptable approaches to determining the various components of the water balance.

Water delivered quantities are those measured or estimated at their "point of delivery". *Point of delivery* is the point at which water is transferred from mains or pipes which are vested in SW (distribution system), into the supply pipes, which are the responsibility of the customers. For the permanently connected customers this is the point on the service pipe, at or close to the external stop-tap (usually the highway curtilage), where the supply pipe commences. For this reason all supply pipe leakage must be included in the water delivered figures. For temporarily connected customers the point of delivery is the hydrant of building water connection.

Water delivered forms the majority of the water balance. SW's approach to Table A2 can validate any assumptions used to estimate water delivered components. WIC encourages SW to estimate each component of distribution input and compare the sum of these with measured distribution input. Where there is a small discrepancy (say less than 1 or 2%) this can be accepted. A large discrepancy suggests that a review of an SW's estimating process is required, as it is clearly not satisfactory for SW to be unable to account fully for its major product.

SW should give an explicit explanation of any imbalance in the analysis. Where SW's estimating process has been reviewed SW should provide a full briefing, outlining the degree of the discrepancy, which components were reviewed, what assumptions were altered, and if so why, and which water balance components needed improvement.

Section A, Chapter A2

To estimate distribution losses (MI/d), SW should use the Integrated Flow Method. The resultant leakage level should then be checked against monitored night flows. SW should therefore use the Integrated Flow Method and the Minimum Night Flow Method in conjunction, as a means to substantiate their estimation of leakage.

WIC would also encourage SW to support estimates with effective data monitoring systems; an example would be a domestic consumption monitor to support their estimate of unmeasured domestic property per capita consumption.

A2.32, A2.34 and A2.36 ask for an estimate of supply pipe leakage on void & exempt properties. SW should explain in the commentary the basis for this estimate and set out its policy to minimise losses from void & exempt properties.

For line A2.30, SW should clearly set out in the accompanying commentary the calculation used to derive this figure. For clarity this line is now updated as the estimated leakage 'top-down'.

New lines A2.39-A2.45 have been added to record bottom-up leakage assessment. This allows WIC and SW to move towards a reporting methodology now more commonly used by comparator companies in England and Wales. The unadjusted (Pre-MLE) leakage is derived from the addition of DMA leakage, Trunk Mains Leakage and that arising from Service Reservoirs. SW shall clearly document the basis for its approach behind each of these components. For the avoidance of doubt A2.40 (DMA leakage) includes underground supply pipe losses.

The MLE adjustment re-assigns any difference between the water balance determination of total leakage (top-down) and the estimate from component analysis of DMA nightlines (bottom up); it is based around the expected uncertainty of each component. A2.44 captures the product of that adjustment. SW is required to record its MLE reconciliation adjustment in line A2.43 using the following table:

Line	Component	Uncertainty (95% CI)	Information Source	Value (MI/d)	MLE adjustment (MI/d)
Total MLE Reconciliation Adjustment (A2.43)					

WIC would also expect to see the impact of metering on some water delivered components:

Supply pipe leakage: Where properties are externally metered, WIC would expect supply pipe leakage to be lower than that found on unmeasured or internally metered properties.

Per capita consumption: Measured domestic property per capita consumption would normally be expected to be lower than unmeasured domestic property consumption, assuming similar occupant profiles. This is supported by the findings of the National Metering Trials, where the installation of a meter reduced demand on average by around 10 - 15%. For non-household property water delivered we would expect the impact of the metering programme to be explained.

Bulk Supplies: the volume of water imported or exported in bulk to another water operator, should be recorded in this part of the table.

WIC also expects SW to explain any material changes between report years.

Confidence Grades

WICS' main concern is to ensure that the water balance as a whole is robust. Those components which account for the largest proportion of the water balance are also those in which we have the least confidence, the emphasis has therefore shifted towards estimated unmeasured components. WIC will also focus on parameters which have varied greatly year on year or where unexplained adjustments have been made.

There are four key confidence grades for the water delivered components on Table A2, relating to unmeasured household property per capita consumption, distribution losses, unmeasured non-household property water delivered and distribution input. There is also an additional confidence grade dealing with the water balance as a whole. This represents varying degrees of confidence in the robustness of the water balance. For example a reliability grading of A would represent SW in control of its water balance, understanding the characteristics of each separately estimated component through comprehensive data monitoring systems.

The confidence grades follow the existing format with reliability and accuracy bands, however reliability bands focus on methodologies. Each separate water delivered component has specific requirements for each of the reliability bands A - D. The emphasis is no longer on data quality, that is the soundness and age of records, but concentrates more on methodologies which underpin the component estimates. Accuracy bands remain as before.

Reliability Bands

Unmeasured household property per capita consumption (l/head/d)

Reliability Grade A Unmeasured household property per capita consumption is estimated from SW's own consumption monitor, covering a minimum of 1000 properties individually monitored.

Reliability Grade B Unmeasured household property per capita consumption has been estimated from SW's own consumption monitor data which is over two years old but the monitor covers 1000 properties individually monitored; or 2000 properties monitored within 40 zones; or SW's own monitor covers 500 properties individually monitored. Alternatively, unmeasured domestic property per capita consumption is estimated from a zonal monitor covering over 10,000 properties in 50 zones, or is SW wide.

Reliability Grade C Unmeasured household property per capita consumption is estimated not from a consumption monitor, nor is it assumed to be the residual component of the water balance, but is estimated using an alternative method, e.g. from a sample of measured household properties; or estimated from monitoring 1000 properties over 20 zones.

Reliability Grade D Unmeasured household property per capita consumption is estimated from the residual of the water balance once all other components have been estimated.

Unmeasured non-household property water delivered (l/prop/d)

Reliability Grade A Unmeasured non-household property water delivered is estimated from SW's own consumption monitor of different SIC (Standard Industrial Classifications).

Reliability Grade B Unmeasured non-household property water delivered has been derived from SW's own monitor where the consumption data is over two years old; or is based on the consumption of comparable measured non-household property properties.

Reliability Grade C Unmeasured non-household property water delivered has been estimated using none of the above methods and is not assumed to be the residual component of the water balance; it is estimated using an alternative method, e.g. based on property rateable values.

Reliability Grade D Unmeasured non-household property water delivered is either estimated from the residual of the water balance once all other components have been separately estimated.

Total Leakage (Ml/d)

Reliability Grade A Total Leakage is estimated using the Minimum Night Flow Method, the resulting leakage level should then reconcile to within 5% of the residual using the Integrated Flow Method. The data should represent the average for the year. The night line data should be estimated with Continual Night Flow Monitoring covering over 80% of properties, recorded more than 20 times a year, in addition to sample surveys on service reservoirs and trunk mains.

Reliability Grade B Total Leakage is estimated using either the Integrated Flow Method or the Minimum Night Flow Method where the data represents the average for the year. The night line data should be estimated from a coverage of either Continual Night Flow Monitoring or waste/district zone metering covering over 60% of properties, recorded less than 20 times a year.

Reliability Grade C Total Leakage is derived solely from a software package, which uses SW's own data, national estimates or default input values. The resulting leakage figure should be supported by leakage levels estimated using the Integrated Flow Method or the Night Flow Method. The night line data should be estimated from a coverage of either Continual Night Flow Monitoring or waste/district zone metering covering under 60% properties, recorded less than 20 times a year.

Reliability Grade D Total leakage is assumed to be either the residual of the water balance once all other components have been estimated; or is derived solely from a software package, which uses national estimates or default input values, and the resulting leakage figure is not supported by leakage levels estimated using the Integrated Flow Method or the Night Flow Method; or is estimated on the basis of drop tests alone.

Distribution input (M/d)

Reliability Grade A The sum of the separately estimated water balance components reconcile with the measured volume of distribution input to within 1-2%. There has been no adjustment made to measured distribution input other than as a result of the aforementioned reconciliation; that is, the sum of the water balance components with measured distribution input. Measured distribution input has been estimated from water-into-supply meters which record 95% of the volume of distribution input, and the meters have been used and regularly recalibrated in accordance with the manufacturer's recommendations.

Reliability Grade B The sum of the separately estimated water balance components reconcile with the measured volume of distribution input to within 5% but not to within 2%. There has been no adjustment made to measured distribution input, other than as a result of the aforementioned reconciliation; that is, the sum of the water balance components with measured distribution input. Measured distribution input has been estimated from water-into-supply meters which record 90% of the volume of distribution input, and the meters have been used and regularly recalibrated in accordance with the manufacturer's recommendations.

Reliability Grade C Distribution input is taken from water-into-supply meter readings only and does not reconcile to within 5% of the sum of the separately estimated water balance components. There has been no adjustment made to measured distribution input, other than as a result of the aforementioned reconciliation; that is, the sum of the water balance components with measured distribution input. Measured distribution input has

been estimated from water-into-supply meters that record 85% of the volume of distribution input, and the meters have been used and regularly recalibrated in accordance with the manufacturer's recommendations.

Reliability Grade D Distribution input is taken as either the sum of the components of the water balance, or is taken from water-into-supply meters only, where there has been adjustments made to measured distribution input, which are not as a result of any reconciliation between the sum of components and measured distribution input.

Overall water balance

Reliability Grade A The water balance components reconcile with measured distribution input, to within 2%. Water-into-supply meters have been used and recalibrated in accordance with the manufacturers recommendation. The water balance components have been separately estimated and reconcile with the equivalent residual of the water balance. 90% of the volume of distribution input (not including distribution input) has been awarded a reliability band of A or B within the separately estimated water balance components.

Reliability Grade B The water balance components reconcile with measured distribution input to within 5%. Water-into-supply meters have been used and recalibrated in accordance with the manufacturer's recommendation. The water balance components have been separately estimated and reconcile with the equivalent residual of the water balance. 90% of the volume of distribution input should have been awarded a reliability band of A or B within the separately estimated water balance components.

Reliability Grade C The water balance components have not been reconciled with measured distribution input. The water balance components have been separately estimated and reconcile with the equivalent residual of the water balance. 90% of the volume of distribution input should have been awarded a reliability band of C or better within the separately estimated water balance components.

Reliability Grade D There has been no reconciliation across individual components or between the sum of components and measured distribution input. 90% of the volume of distribution input should have been awarded a reliability band of C or D within the separately estimated water balance components.

Sewage Volumes and Loads

PPP Data should be included in all information in this table. Scottish Water should confirm in the commentary that PPP data has been included and explain any assumptions required to do this.

Sewage Volumes

This records the sewage volumes collected from measured and unmeasured household properties and non-household properties, together with the volumes of trade effluent, and septic tank waste.

Sewage collected is considered to be the most appropriate output measure of quantity for the waste water service. The information in this table is used for calculating the unit costs of sewage collected.

Sewage – Loads

This part of the Table includes a breakdown of the pollution loads arising from the domestic population, trade effluent and tankered (i.e. septic tank and industrial liquid waste) loads being treated by SW. Treatment types are defined in table E6.

SW must also state in the commentaries any COD to BOD conversion factor that it has used in completing the table.

Sewage Sludge Disposal

Records the volume of sludge disposed of via the various possible disposal routes.

Guidance to the Reporter

The Reporter is required to make informed judgements about the validity of estimates on the basis of both industry documents and SW's water balance as a whole. These judgements should be fully explained and supported by explicit evidence. Reference should also be made to previous Annual return data and any trend noted. There are also a number of specific requirements of which the Reporter should be aware.

An overall analysis of the water balance should be presented at the beginning of the assessment. This should include comments on the robustness of estimates made and should highlight and explain any water balance adjustment: a discrepancy between the sum of each component of distribution input and measured distribution input. The Reporter should also comment on any significant year on year change of the water balance imbalance, positive or negative. Where an imbalance has changed significantly then an explanation as to why should be offered. Where an imbalance has worsened, any action plan to improve the imbalance by SW should be highlighted.

The Reporter should strongly encourage SW to implement data monitoring systems that would improve their confidence grading and minimise the need for adjustments. In addition, the Reporter is required to comment on whether industry standard methodology has been followed in calculating the water balance.

Scottish Water can try to improve its estimates of the water balance through studies and research. Data that goes into the completion of a water balance such as nightlines, legitimate night use, unmeasured pcc, water taken unbilled etc. may be updated to produce more favourable results. The Reporter should ensure that the impact any such change is quantified, i.e. what difference there would have been if previous assumptions had been used.

The Reporter should comment on the methodology and assumptions used to convert night flow data into daily flow, noting any changes in the methodology/assumptions. The Reporter should also comment on whether the hour/day factor used is appropriate, having regard to changes in diurnal pressure control.

The Reporter should examine the linkage between properties, population, volumes and the respective output measures, i.e. litres/property/hour or litres/head/day. Any change in output measures should be followed through into the water balance denominators, which will include cross-reference with table A1.

The Reporter should comment on the methodology and assumptions used to develop leakage forecasts.

The Reporter is asked to confirm how SW has accounted for void and exempt property or underground supply pipe leakage in the water balance.

The Reporter should comment on the approach and assumptions used in the unadjusted Bottom Up leakage assessment. It should also comment on the strength and validity of the reconciliation that has been applied to establish an adjusted leakage assessment. It should provide an opinion on the outturn reconciliation error.

The Reporter should comment on the robustness of the systems and methodologies used to estimate the various components within the sewage volumes and loads tables, including the accuracy with which sewage loads can be measured and calculated, and how this compares with the confidence grades assigned by SW. The Reporter should also comment on whether all assumptions have been revealed, and on the reasonableness of any assumptions made.