



**SCOTTISH WATER**  
**WIC ANNUAL RETURN**  
**Commentary**  
**June 2019**

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## **A Tables Base Information**

### **Table A1 Connected and Billed Properties**

#### **Data Sources and Confidence Grades**

Property numbers are for the report year as at 30 September 2018.

A confidence grade of A2 has been applied to the figures reported in Table A1 for household properties. Following the conclusion of the gap site and SAA Projects in March 2018, we have increased the confidence grade to B3 for non-household properties, reflecting the steady improvement in the completeness of market data in recent years.

The non-household figures have been sourced from settlement reports supplied by the CMA, which are loaded into Scottish Water's reconciliation datamart. The vacancy status, used to determine whether the property is 'Occupied' or 'Void', has been sourced from the Market Data Set (MDS) files which are also published by the CMA. This is consistent with previous Annual Returns.

The September 2018 2nd Reconciliation (R2), the latest available at the end of March 2019, along with the MDS file published at the same time were used to populate the A Tables.

The disaggregated settlement reports include all premises which are in settlement at the CMA. When new supply points are created, via either the New Connection or the Gap Site processes, there are a number of steps to be followed, starting with the supply point being requested by Scottish Water and finishing with it being accepted into charge by the Licensed Provider. Between these two points, the supply points have a status of 'New' or 'Partial' and are held in the Central Systems but are not in settlement and therefore not reflected in the A Tables.

As of 1 April 2019, there were 142 water and 518 sewerage 'New' and 'Partial' supply points registered at the CMA. The current balance of 'New' and 'Partial' supply points consists of an on-going run-rate of new connections, gap sites and change of use properties.

#### **Data improvement programmes**

Scottish Water has taken part in a number of market initiatives in recent years to improve the completeness of market data. In addition a number of measures were implemented to enable Scottish Water to pro-actively maintain the alignment of market data with external data sources. Following completion of a number of market projects, 99.44% of supply points are now matched to an SAA reference or have a valid absence code (meaning there is no SAA reference available).

Multi-tenancy properties, such as office blocks or retail parks, are often served by a single metered water supply, billed to the landlord and represented by a 'landlord' Supply Point, with the tenant of each individually rated unit billed separately for surface water charges via a series of 'tenant' Supply Points. A project to match c. 35,000 'tenant' drainage supply points to their corresponding c. 6000 bulk metered 'landlord' supply points was undertaken and completed this year. This data has been made available at the CMA and enables Scottish Water and Licenced Providers to see the relationship between related Supply Points in multi-

tenancy properties. The data also assists in the understanding of property splits/merges and gap sites more effectively, and provides Licensed Providers with improved visibility of supply set-ups for customer billing and switching of sites.

**Wholesale Charging of Vacant Premises**

The Scottish Government introduced water, sewerage and drainage charges for vacant premises from 1 April 2017. This has implications for the reported data in the A Tables as reported ‘billed’ properties have historically related to occupied properties whilst the entire base including vacant properties has been reported as ‘connected’ properties. This year the Commission updated the line definitions to include vacant properties in the “billed” numbers as all connected properties are now billed. This has resulted in large increases in the billed data below, when compared with last year’s Annual Return data.

This market change has continued to drive a reduction in the number of vacant properties for a number of reasons:

- Licensed Providers being made aware of a previously unidentified occupier when starting to bill a landlord for a vacant property, resulting in the Supply Point’s status being corrected to occupied;
- De-registration of incorrect Supply Points (e.g. a duplicate Supply Point relating to a property already registered and in charge on a separate Supply Point) which have been flagged as vacant and are identified as a result of the application of charges for the first time; and
- Landlords choosing to permanently disconnect unwanted supplies due to the application of charges at vacant properties.

As of March 2019, 9.8% of tradable supply points were flagged as vacant; this is a 0.6% decrease from last year and a considerable reduction from 20.4% in 2012. The table below shows the net occupancy changes by year since 2012. Compared with previous years the numbers of supply points changing status has greatly decreased; this is likely due to the introduction of charging at vacant properties.

<b>Occupancy status changes in 12 months prior to Annual Return data cut</b>	<b>Occupied to Vacant</b>	<b>Vacant to Occupied</b>	<b>Net change in occupied SPIDs</b>
2012	33,938	27,896	-6,042
2013	23,334	30,722	7,388
2014	22,433	19,806	-2,627
2015	25,507	22,713	-2,794
2016	24,235	26,796	2,561
2017	21,855	25,241	3,386
2018	14,232	14,805	573

In order to further support the implementation of these market charges, the Commission published a revised disconnections regime, effective from 1<sup>st</sup> April 2018, allowing Licensed Providers to request the permanent disconnection of water supplies in cases of non-payment. In addition, in cases of persistent non-payment, Licensed Providers can apply for vacant properties to be temporarily transferred from the contestable market to Scottish Water where the LP has secured a court decree for the unpaid charges and registered an inhibition

on the premises title for the debt. The retail debt is assigned to Scottish Water to recover and following payment of the debt or a change of circumstances, the property will be transferred back to a Licensed Provider via the gap site process.

Further details relating to these market changes are included in the commentary for lines 1.27-1.46 below.

**Forecast data for 2019/20**

The SR15 Business Plan assumes zero growth in non-household revenue and with no further data or market projects planned which will have a material impact on property numbers, we are forecasting zero growth for 2019/20.

**Non-household connected properties**

The number of connected non-household properties taking water services has decreased by 701 to 152,451. Non-household properties taking sewerage services have similarly decreased by 642 to 125,190.

Line ref.	Non-household connected properties	2017/18 Annual Return	2018/19 Annual Return	Variance
A1.8	Unmeasured non-household connected properties – water	25,913	24,598	-1,315
A1.9	Measured non-household connected properties – water	127,239	127,853	614
A1.10	<b>Total connected non-household connected properties – water</b>	<b>153,152</b>	<b>152,451</b>	<b>-701</b>
A1.18	Unmeasured non-household connected properties – sewerage	22,813	21,645	-1,168
A1.19	Measured non-household connected properties – sewerage	103,019	103,545	526
A1.20	<b>Total connected non-household connected properties – sewerage</b>	<b>125,832</b>	<b>125,190</b>	<b>-642</b>

These decreases are the net effect of changes in the property base which have been applied via the final stages of the market’s SAA matching projects, the new process of regular reconciliation with SAA data as well as routine requests from Licensed Providers. Across the annual return period over 7,100 properties have been deregistered from the market but this has been offset by around 5,200 gap sites (including change of use premises) being added.

Measured properties have increased slightly whereas unmeasured properties have decreased; this is due to the majority of gap sites and new connections to the network being measured and a high proportion of the deregistered properties being unmeasured supplies.

Unmeasured supply points have also decreased as a result of meters being installed at unmeasured properties and the removal of unmeasured charges where they are being wrongly applied. This typically relates to multi-tenancy premises where it is identified that water and foul sewerage charges are already being applied to the entire premises on a metered basis (landlord/tenant set-ups).

Other factors affecting the totals include changes to services recorded at properties and premises changing their status (change of use), namely from Council Tax banded to business rated and the reverse, for example holiday chalets or houses for short term lettings, leading to some churn in this sector.

The tables below provide a further breakdown of the movements by reason.

## Non-household connected properties

### Changes to Unmeasured Connected Properties

Removed

	<b>Total</b>	Deregistered/ Permanently Disconnected	Remove Unmeasured Service Element	Unmeasured to Measured
Water	<b>2663</b>	1967	2	694
Sewerage	<b>2383</b>	1329	396	658

Added

	<b>Total</b>	Gap Site/ New Connection/Chan ge of Use	Unmeasured Service Element Added	Measured to Unmeasured
Water	<b>1348</b>	1113	0	235
Sewerage	<b>1215</b>	985	0	230

### Changes to Measured Connected Properties

Removed

	<b>Total</b>	Deregistration/ Permanent Disconnection	Remove Metered Service Element	Measured to Unmeasured
Water	<b>2628</b>	2390	3	235
Sewerage	<b>2157</b>	1757	170	230

Added

	<b>Total</b>	Gap Site/ New Connection/Change of Use	Metered Service Element Added	Unmeasured to Measured
Water	<b>3242</b>	2475	73	694
Sewerage	<b>2683</b>	1944	81	658

## Non-household void properties

The number of void non-household properties taking water services has decreased by 1,724 in the report year and the number taking sewerage service has decreased by 1,433.

The movements are mainly due to data cleansing related to the completion of SAA Follow-on Project, properties' status being corrected to occupied and properties being de-registered from the market following the introduction of charging at vacant properties. De-registrations

are generally weighted towards unmeasured, void properties; duplicate supply points have been found to be more prevalent for unmeasured properties and historically sites have often been flagged as vacant to stop charges prior to being deregistered.

The 12 months prior to the September 2018 R2 settlement report used to populate this year's Annual Return saw a very small net movement in supply points turning from vacant to occupied at the CMA. The numbers of supply points moving between statuses has greatly decreased compared with previous years, as mentioned above, this is thought to be linked to the application of charges at vacant properties and the new market arrangements to support this.

<b>Void properties</b>	<b>2017/18 Annual Return</b>	<b>2018/19 Annual Return</b>	<b>Variance</b>
Unmeasured void properties – water	5,147	4,360	-787
Measured void properties – water	9,660	8,723	-937
<b>Total void properties – water</b>	<b>14,807</b>	<b>13,083</b>	<b>-1,724</b>
Unmeasured void properties – sewerage	4,726	4,017	-709
Measured void properties – sewerage	8,495	7,771	-724
<b>Total void properties – sewerage</b>	<b>13,221</b>	<b>11,788</b>	<b>-1,433</b>

### **Non-Household billed properties (including vacant)**

As set out above, following changes to the Commission's line definitions for this year's Annual Return, vacant properties are now being included in the 'billed' properties table lines, due to the introduction of charging at vacant properties in April 2018.

The table below shows a large increase in billed properties since last year's Annual Return, this is mainly due to vacant properties being included in the billed numbers. The remaining change in property numbers is the net effect of supply points being processed into settlement, the de-registration of properties found to be incorrectly in the market (for example duplicates, domestic and demolished properties) and disconnection activity.

<b>Line ref.</b>	<b>Water services – billed</b>	<b>2017/18 Annual Return</b>	<b>2018/19 Annual Return</b>	<b>Variance</b>
A1.3 + 4	Total billed Non-household properties – water	138,345	152,451	14,106
A1.13 + 14	Total billed Non-household properties - sewerage	112,611	125,190	12,579

### **Movement of Properties between Void and Occupied**

	<b>Void to Occupied</b>	<b>Occupied to Void</b>
Water	3195	2857
Sewerage	2892	2638

## A1.1 & 1.6 Household properties (connected and billed)

The data for these lines has been sourced directly from the WIC4 reports of September 2018 for report year. Report year +1 household growth is obtained directly from the final determination forecast.

The growth in billed properties (including exempt) was 26,584. The growth in connected properties of 22,599 differs to the growth in billed properties as we are now billing properties which were previously connected but not billed.

Line ref.		2017/18 Annual Return	2018/19 Annual Return	Variance
A1.1	Unmeasured household billed properties - potable water (including exempt)	2,455,306	2,481,891	26,584
	Number of void properties	59,799	55,813	-3,985
A1.6	Unmeasured household connected properties	2,515,105	2,537,704	22,599

### A1.1-5 Billed Properties – Water

### A1.2 Measured household billed properties

The number of measured households has decreased by 41 customers compared with 7 customers in the previous year. This reduction is principally due to customers determining that Council Tax based charging is more economic for them. The confidence grade of A2 is consistent with previous year. The forecast of 377 measured households for 2019/20, a reduction of 22, is based on the average movement over the last 2 years.

### A1.3-4 Unmeasured and Measured non-household billed properties – water

The recorded number of billed non-household properties has increased by 14,106 to 152,451 compared with the 2017/18 Annual Return. The increase in the reported number is mainly due to vacant properties being included in this years billed counts. The remaining movement in property numbers resulted from the combined effect of meters being installed at unmeasured supply points, gap sites, change of use properties and new connections processed into settlement, and de-registrations and disconnections as set out above.

Line ref.	Water services - Billed Properties	2017/18 Annual Return	2018/19 Annual Return	Variance
A1.3	Unmeasured non-household billed properties – potable water (including exempt)	20,766	24,598	3,832
A1.4	Measured non-household billed properties - potable water	117,579	127,853	10,274
	<b>Total billed non-household properties</b>	<b>138,345</b>	<b>152,451</b>	<b>14,106</b>



**A1.6-10 Connected Properties – Water**

**A1.6 Unmeasured Household Connected Properties**

The figure of 2,537,704 is the cumulative total of billed properties, exempt properties and void properties which is sourced directly from the WIC4 reports and therefore given a confidence grade of A2. For the current report year, the void property total is 55,813.

**A1.7 Measured household connected properties**

The number of measured household connected properties is described in the commentary to line A1.2.

**A1.8-9 Unmeasured and Measured non-household connected properties**

The recorded number of connected non-household properties receiving water services has decreased by 701 to 152,451 compared with the 2017/18 Annual Return. As set out earlier, this is primarily due to the de-registration of supply points at the tail end of the SAA data project and those found to be incorrectly in the market (generally duplicates, domestic and demolished properties) via business-as-usual activity.

Line ref.	Water Services - Connected Properties	2017/18 Annual Return	2018/19 Annual Return	Variance
A1.8	Unmeasured non-household connected properties	25,913	24,598	-1,315
A1.9	Measured non-household connected properties	127,239	127,853	614
	<b>Total connected non-household properties</b>	<b>153,152</b>	<b>152,451</b>	<b>-701</b>

**A1.11-15 Billed Properties – Foul Sewerage**

**A1.11 Unmeasured household billed properties**

There has been growth of 26,488 unmeasured household billed properties for sewerage in the report year. The confidence grade remains unchanged at A2

**A1.12 Measured household billed properties**

A decrease of 13 measured household properties is directly linked to the reduction in Measured Household properties having a measured water service. The confidence grade of A2 has not altered.

**A1.13-14 Unmeasured and Measured non-household billed properties**

The recorded number of billed non-household properties receiving sewerage services has increased by 12,579 to 125,190 compared with the 2017/18 Annual Return. This movement is primarily due to vacant properties now being included in the billed counts. The remaining increase is due to the combined effect of gap sites and new connections processed into

settlement, de-registrations, disconnections and the removal of foul sewerage services from the supply point.

Line ref.	Billed Properties	2017/18 Annual Return	2018/19 Annual Return	Variance
A1.13	Unmeasured non-household billed properties – sewerage	18,087	21,645	3,558
A1.14	Measured non-household billed properties – sewerage	94,524	103,545	9,021
	<b>Total billed non-household properties</b>	<b>112,611</b>	<b>125,190</b>	<b>12,579</b>

## **A1.16-20 Connected Properties – Foul Sewerage**

### **A1.16 Unmeasured Household Connected Properties**

Please refer to the commentary for line A1.6. For the current report year, the void property total is 53,785. The number of voids is calculated by subtracting A1.11 from line A1.16.

### **A1.17 Measured Household Connected Properties**

Please refer to the commentary for line A1.12. The confidence grade of A2 has not altered.

### **A1.18-19 Unmeasured and Measured Non-household connected properties**

The recorded number of connected non-household properties taking sewerage services has decreased by 642 to 125,190 compared with the 2017/18 Annual Return. As set out earlier, this is primarily due to the de-registration of supply points from the market via the completion of the market's SAA matching projects and BAU work (generally duplicates, domestic and demolished properties). This has been offset by gap sites, change of use premises and new connections being processed into the market. The removal of foul sewerage services, where found to be wrongly applied to supply points at the CMA, has also contributed to the decrease.

Line ref.	Connected Properties	2017/18 Annual Return	2018/19 Annual Return	Variance
A1.18	Unmeasured non-household connected properties	22,813	21,645	-1,168
A1.19	Measured non-household connected properties	103,019	103,545	526
	<b>Total connected Non-household properties</b>	<b>125,832</b>	<b>125,190</b>	<b>-642</b>

**A1.21-27 Billed Properties – Surface Drainage**

**A1.21 Unmeasured Household Billed Properties (including exempts) not billed for Property Drainage**

Due to our tariff structure, there are zero unmeasured billed properties not billed for property drainage.

**A1.23-24 Measured and Unmeasured Billed Properties not billed for Property Drainage**

The number of properties not billed for property drainage has increased by 806 to 5,216 since 2017/18. Vacant properties now included in the billed numbers account for around half of the increase, the remainder is the result of gap sites and change of use properties entering the market which are not liable for property drainage and the removal of property drainage charges where properties are found not to drain to the public sewer following requests to verify the drainage services. This is offset by de-registrations and addition of property drainage charges to existing Supply Points where found to be missing.

Line ref.	Properties not billed for Property Drainage	2017/18 Annual Return	2018/19 Annual Return	Variance
A1.23	Unmeasured non-household billed properties not billed for property drainage	2,341	3,019	678
A1.24	Measured non-household billed properties not billed for property drainage	2,069	2,197	128
	<b>Total billed non-household properties</b>	<b>4,410</b>	<b>5,216</b>	<b>806</b>

**A1.25 Household Billed Properties billed for Surface Drainage only**

Due to our tariff structure, there are zero unmeasured billed properties not billed for surface drainage.

**A1.26 Non-household properties billed for surface drainage only**

The number of non-household properties billed for surface drainage only has increased by 12,356 to 42,981 since 2017/18. The addition of vacant properties to the billed number accounts for just under half of the increase. The remainder is mainly due to the disaggregation of sites at the CMA to reflect the property configuration at the SAA via the market’s final SAA matching project as well as the registration of gap sites into the market. The largest proportion of these sites are charged for surface drainage only because they are part of a multi-tenancy premises where water and foul sewerage charges are applied to the entire premises on a metered basis. Some data corrections have also been made which have resulted in changes to services on supply points; either at multi-tenancy premises where unmeasured water and foul sewerage charges on individual rated components are removed, leaving only surface drainage charges, or where drainage charges are added when found to be missing.

## **A1.28-32 Connected Properties – Surface Drainage**

### **A1.30-31 Non-household Connected Properties – Surface Drainage**

The recorded number of non-household properties connected for surface drainage has increased by 4,959 to 164,537 compared with the 2017/18 Annual Return. As set out earlier, this relates to the disaggregation of sites via the SAA matching projects and the registration of gap sites, offset by de-registrations.

<b>Line ref.</b>	<b>Properties connected for Surface Drainage</b>	<b>2017/18 Annual Return</b>	<b>2018/19 Annual Return</b>	<b>Variance</b>
A1.30	Unmeasured non-household connected properties	62,075	67,602	5,527
A1.31	Measured non-household connected properties	97,503	96,935	-568
	<b>Total connected non-household properties</b>	<b>159,578</b>	<b>164,537</b>	<b>4,959</b>

### **A1.33 Number of Billed Properties**

The number of billed properties has remained almost static at 1,321 from 1,325 reported in 2018.

The forecast number of billed properties has increased slightly from 1,309 in AR18 to 1,312. This is the number of properties that existed at P6 that were also billed at P12.

The confidence grade for the report period and forecast is A2 and A3 respectively.

### **A1.34 Connected Properties**

The number of billed and connected properties has increased from 3,268 to 3,399. This reflects the fact that Scottish Water continues to issue an increasing proportion of “Letters of Authorisation” to small dischargers, rather than full consents.

The forecast number of billed and connected properties is 3,444.

The confidence grade for the current and forecast years remains at A2 and A3 respectively.

### **A1.35 Trade Effluent load receiving secondary treatment**

The total BOD load receiving secondary treatment reported has increased from 15,567T/yr to 16,414T/yr.

The forecast figure is somewhat lower at 15,618T/yr.

The confidence grade remains at B4 as it is reliant on Licensed Providers reading meters in order for the volume calculations to be correct.

### **A1.36 Trade Effluent load receiving secondary treatment**

The reported total COD load receiving secondary treatment has also increased from 32,614T/yr to 34,856T/yr.

The forecast is 33,516T/yr.

The confidence grade remains at B4 as it is reliant on Licensed Providers reading meters in order for the volume calculations to be correct.

### **A1.37-46 Vacant Charging and Disconnections**

#### **A1.37 Non-household permanent disconnections**

The number of non-household properties which have undergone permanent disconnections in the annual return period is 179. 173 were requested by customers and 6 were requested by the Licensed Provider due to non-payment at vacant premises following the changes to the Disconnections Document and Operational Code made in March 2018.

#### **A1.38-40 Non-household water properties de-registered from the market**

The total number of non-household supply points deregistered from the market in the annual return period was 9,107. The breakdown by reasons, mirroring those in Form O of the Operations Code, is displayed in the table below. The total for Wastewater includes supply points with foul sewerage and those with surface drainage only i.e. the 'Drainage Only' column of the table below is a subset of the 'Wastewater' column.

<b>De-registered Properties</b>			
<b>Categories</b>	<b>Water</b>	<b>Wastewater</b>	<b>Drainage Only</b>
Bulk (landlord) Meter	294	55	3
Demolished	338	469	180
Domestic (change of use)	1108	870	74
Duplicate SPID	248	403	207
Merged Property	1058	1732	835
No Drainage		158	123
No Sewerage Connection		237	37
No Water Connection	294		
Other	838	1005	513
<b>Grand Total</b>	<b>4178</b>	<b>4929</b>	<b>1972</b>

### **A1.41-43 Non-household properties under successful temporary transfer to Scottish Water**

As at 31<sup>st</sup> March 2019, 4 non-household properties have transferred to Scottish Water following successful applications under the temporary transfer provision, outlined in the Market Code and WICS' consultation on Measures to support Wholesale Charging of Vacant Premises - March 2018. These properties are subject to water and waste water services, no surface drainage only properties have been transferred.

### **A1.44-46 Non-household water properties pending temporary transfer to Scottish Water**

As at 31st March 2019, no non-household properties were pending temporary transfer to Scottish Water.

### **A1.47 Discontinuation of Trade Effluent services**

This line is intended to capture disconnections due to non-payment of TE charges. As the only way of achieving this would be to physically block the sewer, this is not a process undertaken by Scottish Water.

## **Table A2 Population, Volumes and Loads (Water)**

### **A2.1 Population Water – Winter**

Population data is based on National Records of Scotland (NRS) Population Projections for this year. Current year and future population projections are derived from the published NRS 2016 based Population Projections, being the latest data available. Historic populations figures remain based on the NRS 2014 based Population Projections in order to maintain consistency between Annual Returns. The winter tourist population has been included in the winter population total using business classifications from Address Based Premium (ABP). The lowest winter visitor month (January) according to Visit Scotland statistics was used. A derived number for winter visitors of 79,683 was calculated. The confidence grade has been changed from A2 to B2 to reflect the inclusion of the winter tourist population.

### **A2.2 Population Water – Summer**

To determine the increment of the summer population (above the winter population), business classifications from Address Based Premium (ABP) were used to identify properties which offer accommodation to visitors and to which was applied the average bed space supplied by Visit Scotland. A derived number for summer visitors of 252,289 was reached. This figure has increased from AR18. This could be in part due to the more complete matching between Address Points and Address Based Premium and the more accurate accommodation classifications used in ABP. No change in the confidence grade has occurred in the year.

### **A2.3 Population of unmeasured household properties**

The population of unmeasured household properties connected to our networks has increased by 59,672 for water, reflecting the NRS 2016 projection. The confidence grade remains the same at A2.

### **A2.4 Population of measured household properties**

The population of measured household properties taking water services has decreased by 88, reflecting the decrease of 41 in the number of measured household properties reported in line A1.2. The confidence grade remains the same at A2.

## Water Balance

### **A2.6 Net Distribution input treated water (water put into supply)**

The net Distribution input (DI) has increased from 1,796.0 MI/d. to 1806.2 MI/d in AR19.

### **A2.7 Unmeasured household volume of water delivered (including losses)**

The unmeasured household volume of water delivered has increased from 903.8 MI/d to 986.1 MI/d. The confidence grade for this line remains at B2, reflecting the continued confidence associated with the Scottish Water unmeasured household volume calculated using data reported from Scottish Water's Continuous Area Per Household Consumption (PHC) Monitor. The forecast reflects an increased property count using the same PHC value.

### **A2.8 Measured household volume of water delivered (including losses)**

The measured household volume of water delivered is 0.3 MI/d. The percentage of meter under-registration has remained at 4.1%, taken as a mean from the 2008/09, 2009/10 and 2010/11 supporting information documents for the OFWAT Service and Delivery report. The confidence grade reported for this line remains at B2.

### **A2.9 & 10 Unmeasured & Measured non-household volume of water delivered (including Losses)**

The calculation of non-household consumption follows the same method as used for the 2017/18 Annual Return. Consumption data calculated by the Central Market Agency (CMA) has been used to populate lines A2.9 and A2.10.

For each settlement run, the CMA provides an aggregated settlement report which is used by Scottish Water for billing purposes, and a disaggregated settlement report to enable reconciliation of wholesale charges by market participants. The data reported in lines A2.9 and A2.10 has been derived from these disaggregated settlement reports.

Table A2 has been populated using the latest available data at the time of reporting. For April to July 2018 inclusive, the R3 report has been used; for August 2018 to January 2019 the R2 report has been used; and for February and March 2019, the R1 report has been used.

### **A2.11 Water taken unbilled – legally**

The volume reported as water taken legally unbilled (WTLU) has increased from 62.1 MI/d in 2017/18 to 62.2 MI/d in this report year. The confidence grading remains at C4 due to the nature and estimation of the volume reported. The methodology has remained the same for the each of the components making up WTLU.

A summary of changes to the individual components which make up WTLU is provided below:



- Increase in fire service use (from 7.9 MI/d to 8.6 MI/d).
- Increase in licensed standpipe use volumes from 20.0 MI/d to 21.8 MI/d.
- Decrease in Waste Water Treatment Works (WWTW) and Waste Water Pumping Station (WWPS) potable water use from 16.0 MI/d to 15.3 MI/d.
- No significant change in Scottish Water Offices and Depot which remains at 0.2 MI/d.
- Increase in Scottish Water jetting volumes from 0.8 MI/d to 1.1 MI/d.
- No significant movement in unbilled field trough usage (from 10.9 MI/d to 11.2 MI/d).
- No significant movement in temporary building connections which remains at 2.3 MI/d
- Unbilled water use by non-household users has decreased from 3.9 MI/d to 1.8 MI/d.

### **A2.12 Water taken unbilled – illegally**

The volume of water reported as water taken illegally unbilled (WTIU) has decreased from 2.3 MI/d to 1.9 MI/d.

The confidence grade has remained at C4 due to the nature and estimation of the volume reported. The data sources and methodology used to calculate this component have remained the same:

- Void property use – the volume has remained at 0.9 MI/d.
- Hydrant misuse - the volume has remained at 0.2 MI/d.
- Illegal standpipes - the volume has decreased from 1.1 MI/d to 0.8 MI/d.

### **A2.13 Water take unbilled – Distribution System Operational Use (DSOU)**

The volume of water reported as distribution system operational use (DSOU) has decreased from 6.9 MI/d 2017/18 to 5.8 MI/d in this reporting year. The confidence grade remains at C3 due to the nature and estimation of the volume reported. The changes in volumes can be explained as follows:

- Service Reservoir Cleaning – the volume has decreased from 0.9 MI/d to 0.5 MI/d.
- Proactive Flushing & Swabbing - the volume has decreased from 5.2 MI/d to 4.4 MI/d in this reporting year.
- Burst Repairs / Other Network Interruptions –volume remains constant at 0.3 MI/d.
- Reactive Water Quality Incidents – no significant movement at 0.3 MI/d.
- Planned Water Quality Sampling – volume remains constant at 0.1 MI/d.

## **A2.14 Net Consumption (including supply pipe losses)**

Net consumption has increased from 1,376.4 MI/d to 1,458.8 MI/d .The confidence grade remains at B3.

## **A2.15 Distribution losses (including trunk mains and reservoirs)**

Distribution losses have decreased from 419.6 MI/d in AR18 to 347.4 MI/d. The confidence grade for this line remains B3.

## **A2.16 Customer supply pipe losses**

Customer supply pipe losses (SPL) have been calculated using the same method as in AR18. SPL losses have increased slightly from 123.2 MI/d to 124.2 MI/d. The confidence grade remains the same at C3.

## **A2.17 Overall water balance**

The confidence grade for the overall water balance remains at B3.

## **A2.18 Total Leakage (pre-MLE Adjustment)**

The 'Total Leakage' by definition within the guidance documentation is considered by SW to include summing the DMA reported leakage, Service Reservoir leakage and Trunk Main leakage. The Total Leakage has increased slightly from 480.4 MI/d to 481.9 MI/d this year. A summary of each of the components making up these values is given below:

- DMA leakage has increased from 422.2 MI/d in AR18 to 425.1 MI/d in the current reporting year. The coverage of reportable DMAs has decreased from 92.2% to 88.4%.
- Service Reservoir leakage has decreased from 9.1 MI/d to 8.9 ML/d this reporting year
- Trunk Main leakage has decreased from 49.1 MI/d in AR18 to 48.0 MI/d this year.

## **A2.19 Water Balance Closing Error**

The Water Balance Closing Error is the difference between the top down and bottom up leakage figures expressed as a percentage of net DI. The closing error has decreased from 3.5% in AR18 to -0.6% in AR19.

## **A2.20 MLE Adjustment**

The MLE adjustment for AR19 is -1.88 MI/d. The overall AR19 MLE calculation is associated with the appropriate MLE confidence grades (mid-point of WICS CGs), being assigned to water balance components in line with WICS own CGs. The confidence grade for this line is B3.

## A2.21 Total Leakage (post-MLE Adjustment)

Where the water balance closing error (A2.23) between top down and bottom up leakage is less than 5% of DI, this is accepted as an indicator of a robust water balance. In such circumstances, a MLE statistical calculation is undertaken to determine the leakage figure to be reported. If the closing error is > 5% of DI, then the top down leakage figure will be reported. In recent years the trend in leakage reduction is:

Report Year	Top Down Leakage (MI/d)	Bottom Up Leakage (MI/d)	MLE Leakage (MI/d)
AR11	757	693	699
AR12	661	617	629
AR13	617	561	575
AR14	608	553	566
AR15	590	531	544
AR16	531	492	500
AR17	559	480	495
AR18	543	480	492
AR19	472	482	480

The AR19 Maximum Likelihood Estimation (MLE) leakage is 480.0 MI/d and is reported with confidence grade B3. This is a reduction of 12 MI/d from the AR18 MLE leakage figure of 492.0 MI/d.

## A2.22 Volume of non-potable water delivered

Eleven non-household customers receive non-potable water supplies. In most cases there is also a separate potable supply to the premises. Several of these Supply Points are subject to Schedule 3 charging arrangements and all of the non-potable supplies are now metered.

The volume reported in line A2.26 reflects the consumption calculated by the CMA for the metered non-potable supplies in addition to a calculated consumption for one supply, Buckieburn Farm and Freshwater Research Unit. The flow data received for 2018/19 for this customer was used to calculate an average flow rate which derived a consumption of 8.252 ML/day.

The total volume of non-potable water reported is 15.626 ML/day for this Annual Return period.

## A2.23 Per Household consumption (unmeas'd h/hold–excl s/pipe leakage) PHC

The PHC figure for AR19 is 348.7 l/prop/day, compared with an AR18 reported figure of 319.7 l/prop/day. An improved methodology has been implemented this year within the calculation. This improvement relates to the calculation of company specific monthly

household night use estimates. This method provides a more accurate estimate of domestic customer demand and related reported leakage estimates. The improved methodology was developed in collaboration with the WIC appointed Leakage Auditor and was reviewed and accepted during this year's regulatory water balance audit. The confidence grade remains at B2 until the impact of these changes has been determined.

#### **A2.24 Per Household consumption (measured h/hold–excl s/pipe leakage) PHC**

The PHC figure for AR19 is 793.1 l/prop/day, compared with an AR18 reported figure of 529.8 l/prop/day. The increased volumes reported are from actual meter readings and can be attributed to the extended period of hot weather experienced over the Summer.

The confidence grade remains at B3.

#### **A2.25 Meter under-registration (measured households) (included in water delivered)**

Scottish Water has derived meter under-registration from the mean value between 2007/08 and 2009/10 from the supporting information document for the OFWAT Service and Delivery Supporting Information Reports and remains at 4.1%. When applied to the domestic metered volume the total measured household meter under-registration is 0.013 MI/d.

#### **A2.26 Meter under-registration (measured non-households) (included in water delivered)**

The 2007/8, 2008/09 and 2009/10 OFWAT 'Service and Delivery' supporting information documents have been used to derive a mean figure for non-household meter under-registration, which remains at 4.7%. When applied to the non-household metered volume total non-household meter under-registration is 17.2 MI/d.

## **Table A3 Population, Volumes and Loads (Waste water)**

### **A3.1-A3.4 Summary – Population**

#### **A3.1 Population Wastewater – Winter**

Population data is based on National Records of Scotland (NRS) Population Projections for this year. As with the water population, winter tourist population has been included in the winter population total for the first time this year, using the same method as used to derive the water tourist figures. A derived number for winter visitors of 64,615 was calculated. No change in the confidence grade has occurred in the year.

#### **A3.2 Population Wastewater – Summer**

To determine the increment of the summer population (above the winter population), business classifications from Address Based Premium (ABP) were used to identify properties which offer accommodation to visitors. The average bed space occupancy supplied by Visit Scotland was then applied. The result was a derived number for summer visitors of 152,645. This increase from AR18 is in part due to the ongoing improvements in matching between Address Points and Address Based Premium and the more accurate accommodation classifications used in ABP. We intend to review the confidence grade for next year.

#### **A3.3 Household Population connected to the wastewater service**

The population of unmeasured household properties connected to our networks has increased by 57,146 for waste water reflecting the NRS 2016 dataset and growth over the year in connected dwellings.

### **A3.4-A3.10 Sewage – Volumes**

#### **A3.4 Unmeasured household volume (including exempt)**

The unmeasured household volume has increased from 700.05 MI/d to 767.88 MI/d. The increase has been driven by the A2.23 Per Household consumption (unmeas'd h'hold - excl s/pipe leakage) PHC increase from 319.7 to 348.8 L/hd/day. The 9.10% increase has caused a corresponding 9.36% increase in this line.

#### **A3.5 Measured household volume**

The measured household volume has increased from 0.054 MI/d to 0.080 MI/d. Work has been done this year to identify the drainage operational area (sewage catchments) that measured properties are within, which has increased the total volume identified as flowing to Scottish Water wastewater treatment works. The confidence grade remains at A2.

### **A3.6 Unmeasured non-household foul volume (including exempt)**

The non-household foul volume has decreased from 13.156 MI/day to 12.776 MI/d. The confidence grade remains at B3.

### **A3.7 Measured non-household foul volume**

The total volume of foul waste from measured non-households has decreased slightly from 151.232 MI/d to 150.075 MI/d. The confidence grade remains at B3.

### **A3.8 Trade Effluent Volume**

The volume of trade effluent discharged has increased slightly from 64.285MI/d to 64.860MI/d.

The forecast is for this to decrease to 64.327MI/d. This is calculated by pro-rating the current year's volume, based on the number of DPID still active in IP12.

The confidence grades remains at B2 and B4 for the reporting and forecast years respectively.

### **A3.10 Volume septic tank waste**

The volume of septic tank waste has decreased from 32.170 MI to 30.048 MI. The confidence grade remains at A3.

### **A3.11- A3.25 Sewage Load (BOD/yr)**

#### **A3.11 Unmeasured household load**

The household load reported is based on household occupancy multiplied by 60g BOD per head per day. The increase in unmeasured household load to 109,282 from 108,030 BOD tonnes is a result of an increase in household population.

#### **A3.12 Measured household load**

The measured household load has increased to 9.323 from 8.483 tonnes. This line uses the volume reported in A3.5 to calculate the load therefore there has been a corresponding increase for the reason explained in the commentary for A3.5. There has been no change in methodology therefore the confidence grade remains the same at B4.

### **A3.13-A3.14 Unmeasured and measured non-household load**

The non-household load is derived as 300g BOD/m<sup>3</sup> applied to the volumes of sewage reported in lines A3.6 and A3.7. There has been no change in methodology therefore the confidence grade remains at B4 and B3 respectively.

### **A3.15 Trade effluent load**

The total BOD load discharged to the network has increased from 16,354T to 17,132T.

We are still forecasting a reduction to 16,337T for 2019/20 based on historic trends. The confidence grades remains at B2 and B4 for the reporting and forecast years respectively.

### **A3.17-A3.18 Private / Public Septic Tank Load**

The reported septic tank loads are derived by applying an assumed load of 6,543g/m<sup>3</sup> to the volumes removed from private and public septic tanks respectively.

#### **A3.17 Private Septic Tank Load**

The reported septic tank load has reduced from 113.561 to 96.419 tonnes.

#### **A3.18 Public Septic Tank Load**

The reported septic tank load has increased from 96.925 to 100.186 tonnes.

### **A3.19 Other Tanker Loads**

The other tanker loads has increased this year from 346.382 to 396.189 tonnes. The increase is due to an error in the calculation. Some loads were erroneously not previously included in the totals reported. This has now been corrected.

### **A3.21 Average COD concentration**

The average settled COD concentration used to calculate Trade Effluent charges continues to be 350mg/l. No significant change has occurred and the confidence grade remains B2.

### **A3.22 Average suspended solids concentration**

The average suspended solids concentration used to calculate Trade Effluent charges continues to be 250mg/l. No significant change has occurred and the confidence grade remains B2 as previous years

### **A3.23 Equivalent population served (resident)**

The figure reported is the total load divided by 60g/h/day. The equivalent population reported is 6,692,439 which is an increase from the 6,627,726 reported in the previous year. The confidence grade remains B3.

### **A3.24 Equivalent population served (resident) (numerical consents)**

The figure reported is the total load divided by 60g/h/day, (for works that have a numerical consent). The equivalent population reported is 6,287,273 which is an increase from the 6,221,483 reported in the previous year. The confidence grade remains B3.

### **A3.25 Total load receiving treatment through PPP treatment works**

We are reporting an increase from 65,841t to 66,469t. This is mainly due to an increase in the population equivalents for trade effluent sites receiving treatment through PPP treatment works. There has been no change in methodology and the confidence grade remains at B3.

### **A3.26-A3.28 Sewage Sludge Treatment and Disposal**

The reported volume of waste water treatment sludge recycled/ disposed was 122.605ttds (thousand tonnes dry solids), of which the majority (107.405ttds) came from the PPP/PFI works with the remaining 15.27ttds from Scottish Water assets. All the Scottish Water figures reported were derived from various internal data sources. We have retained the existing confidence grade of B4.

For the Scottish Water sludge a slight increase in the volume of enhanced treated sludge was noted at 1.10ttds (thousand tonnes dry solids). This is mainly attributable to Troqueer sludge treatment centre (STC) producing an enhanced treated product in the last two quarters of the reporting period.

Conventional sludge treatment reported a small decrease of 0.059ttds from the previous year.

Land restoration facilities in Scotland (normally former open cast mine sites) are used extensively for the disposal of sewage sludge materials that do not meet conventional or enhanced treated standards. Both Scottish Water and PPP/PFI utilised these facilities for untreated material during the reporting period. Two Sludge Treatment Centres in the central belt, which historically produced a conventionally treated product, have been utilising land restoration capacity due to not maintaining a consistent pathogen quality product.

The de-watered sludge cake on the Shetland Islands continues to be the only site where local landfill is used for disposal purposes at the Shetland Islands Council site at Rova Head. The reported volume landfilled was 0.35ttds which is broadly consistent with the 0.37ttds reported the previous year.

Scottish Water maintained compliance with the Water UK Biosolids Assurance Scheme following a successful 3 day surveillance audit held in March 2019. The majority of the PPP/PFI operators have made significant strides to comply with the scheme with some about to embark on their initial external audit.



## **D Tables – Activities**

### **Table D5 Activities – Water Service**

#### **D5.1-11 Mains – Asset Balance**

Lines D5.1-D5.11 report the water mains asset balance at March 2019 and the number of communication pipes replaced in this Reporting Year.

The closing balance for water mains on line D5.8 is 48,639.42 km, 0.2% higher than the opening value reported on line D5.1 (which is consistent with the 48,536.56 km reported in line H3.4 in 2017/18).

#### **D5.2 & D5.3 Mains renewed and mains relined**

Lines D5.2 and D5.3 report mains replaced as part of our Mains Rehabilitation Programme in 2018/19, lengths replaced by reactive operations, capital maintenance lines and lengths from named projects. 45.7 km of water mains have been renewed and 4.7 km of water mains have been relined in this reporting year. This is an increase from 2017/18 of 1% and 88% respectively.

#### **D5.4 Mains cleaned (Total)**

The length of total mains cleaned this year is 2,090.3 km. This is a 24% increase from last year. The reported length has been derived from the length of flushing of 1,560.8 km plus 529.5 km through the capital programme. This is an increase from last year of 17% and 50% respectively. These increases are due to our focus on preventative maintenance.

#### **D5.5 Distribution mains cleaned for quality**

The reported length this year is 1,979.1 km, an increase of 116% from last year. This is due to our focussed increase in preventative maintenance.

The reported length includes 1,449.5 km reported against routine flushing and swabbing, as these works are carried out for water quality reasons, plus the 529.5 km reported against capital programme work packages in D5.4 above. The length contributed to by flushing and swabbing has increased by 158% from last year.

#### **D5.6 New mains**

Line D5.6 is a combination of the length adopted for new developments and lengths delivered as part of our capital programme. The length for this reporting year is 15 km.

## **D5.7 Mains abandoned**

The length of mains abandoned equals the length of mains renewed taken from D5.2 above less reduction in total length reported from the mains rehabilitation programme. The length for this reporting year is 43.0 km.

## **D5.7a Other Changes**

The length reported is the balancing value to bring the total changes in the year in line with the closing balance reported in D5.8. The length in this reporting year is -85.3 km.

## **D5.8 Total length of mains (closing balance)**

The total length reported is consistent with line H3.4.

## **D5.9 Lead communication pipes replaced - quality**

The total number of lead communication pipes replaced this year for quality purposes is 1,484. This is a 28% increase from last year.

## **D5.10 Lead communication pipes replaced – maintenance or other**

The total number of lead communication pipes replaced this year for maintenance and other reasons is 8. This is a 27% decrease from last year.

## **D5.11 Communication pipes replaced - other**

The total number of other communication pipes replaced this year is 76. This is a 7% increase from last year.

## Table D6 Activities – Waste water Service

### D6.1-13 Critical/Non-Critical Sewers

The total reported length of critical sewers has decreased by 5.7 km. The net length of all sewers recorded has increased by 186.0 km when compared to the 2017/18 inventory.

The table below shows the change in length of critical and non-critical sewers from 2017/18 to 2018/19.

Line Ref.	Description	AR18 Length (km)	AR19 Length (km)	Change (km)
6.3	New critical sewers added during the year	15.20	11.55	-3.65
6.4	Critical sewers inspected by CCTV or man entry during the year	10.55	48.37	37.82
6.5	Critical sewers – renovated	0.00	0.70	0.70
6.6	Critical sewers – replaced	0.00	0.00	0.00
6.7	Abandoned “critical” sewers	17.98	12.39	-5.59
6.7a	Other changes to “critical” sewers	222.38	4.82	-217.56
6.9	New “non-critical” sewers	66.22	66.26	0.04
6.10	“Non-critical” sewers – renovated	0.33	0.06	-0.27
6.11	“Non-critical” sewers - replaced	0.00	3.71*	3.71
6.12	Abandoned “non-critical” sewers	20.19	22.85	2.66
6.12a	Other changes to “non-critical” sewers	-1,979.04	-148.28	1,830.76

\*This is the total length of sewers replaced

### D6.1 Total length of sewers – opening balance

The opening balance is taken from the Annual Return 2017/18 line D6.13. This is reported to be 51,681.4 km.

### D6.2 Total length of critical sewer – opening balance

The opening balance is taken directly from both Annual Return 2017/18 line E7.13 and line D6.8 which reflects the closing balance from the previous reporting year. This is reported to be 10,929.7 km.

**D6.3 New critical sewers added during the year**

11.6 km of critical sewers were included as new in this reporting year.

**D6.4 Critical sewers inspected by CCTV or man entry during the year**

48.4 km of critical sewers were inspected in this reporting year. These are made up from 5.2 km of FMAP and PMAP surveys, and 43.2 km from the sewer rehab programme.

**D6.5 Critical sewers – renovated**

0.7 km of critical sewers were renovated as part of the sewer rehabilitation programme in this reporting year.

**D6.6 Critical sewers – replaced**

No critical sewers were replaced as part of the infrastructure programme in this reporting year.

**D6.7 Abandoned “critical” sewers**

12.4 km of critical sewers were abandoned due to operational activities in this reporting year.

**D6.7a Other changes to “critical” sewers**

This line reports the balance between the changes reported through the lines above to bring the total in line with the closing balance reported in D6.8 and in line with E7.13.

**D6.8 Total length of critical sewer (closing balance)**

The total length of 10,924.1 km is consistent with line H4.1.

**D6.9 New “non-critical” sewers**

66.3 km of non-critical sewers were included as new in this reporting year. These are calculated in the same way as new critical sewers.

**D6.10 “Non-critical” sewers - renovated**

0.1 km of non-critical sewers were renovated as part of our rehabilitation programme in this reporting year.

**D6.11 “Non-critical” sewers – replaced**

3.7 km of total sewers were replaced in this reporting year.

**D6.12 Abandoned “non-critical” sewers**

22.9 km of non-critical sewers were abandoned in this reporting year.

**D6.12a Other changes to “non-critical” sewers**

This line reports the balance between the changes reported through the lines above with the closing balance reported in D6.13.

**D6.13 Total length of sewers – closing balance**

The length of 51.867.4 km is the total length of sewers in this reporting year.

## **E Tables - Operating Costs and Efficiency**

### **General Comments**

#### **Methodology**

Cost analysis in E Tables (E4, E6, E7, E8, E9 and E10) was prepared using reports from Scottish Water's Activity Based Management (ABM) systems on a historic cost basis excluding IFRS adjustments.

ABM provides analysis of the costs of key activities and processes and links these to the factors that cause or drive the level of cost. This allows us to develop an understanding of the full cost of providing services, either internally within Scottish Water, or to our external customers.

#### **Cost Allocation**

Consistent with prior years, costs are captured or allocated in line with Regulatory Accounting Rules including modifications, agreed with the Commission, to reflect the Scottish retail market.

A more detailed commentary on ABM methodology and cost allocation is provided in support of Regulatory Accounts Tables M18 and is not repeated in this document. ABM data (financial and non-financial) is captured in various corporate systems which are also described in the M18 methodology document.

**Confidence Grades** – Confidence grades of the operating cost lines on the E Tables remain consistent with 2017/18.

Direct costs are predominantly captured in the core corporate financial system, with labour costing feeds from the core corporate works management system. A high proportion of direct costs are captured by asset or zone, hence the A2 confidence grade. A smaller proportion of costs – mainly general and support costs – remains to be allocated to asset/zone by means other than direct capture.

## Table E3 and E3a PPP Project Analysis

### Table Overview

Table E3 provides details of the 21 PPP wastewater treatment works that are managed under 9 separate PPP Concession agreements.

The following works form part of each scheme:

PPP Scheme	Wastewater Treatment Works
Highland	Fort William, Inverness
Tay	Hatton
Aberdeen	Nigg, Persley, Peterhead, Fraserburgh
Moray Coast	Lossiemouth, Buckie, Banff/Macduff
AVSE	Seafield, Newbridge, East Calder, Blackburn, Whitburn
Levenmouth	Levenmouth
Dalmuir	Dalmuir
Daldowie*	Daldowie sludge treatment centre
MSI (Ayrshire)	Meadowhead, Stevenston, Inverclyde

\* Daldowie is a sludge treatment centre only.

### TABLE E3

#### E3.0 - E3.3 Project data

##### E3.1 Annual average resident connected population

The annual average resident connected population increased by 25,944 to 2,238,330. This reflects the increase in the general population reported in Table E7.1, and a higher average occupancy factor (2.15). The confidence grade remains at B3.

##### E3.2 Annual average non-resident connected population

The annual average non-resident connected population reports an increase of 4,603 to 31,479. This reflects the increase in the general population reported in Table E7.2. The confidence grade remains at B3.

##### E3.3 Population equivalent of total load received

The population equivalent of total load received increased by 28,774 to 3,035,117 (the total on the submitted table for line E3.3 is slightly different at 3,035,118, due to rounding of individual STW p.e. to 3 D.P.). This increase is mainly due to an increase in the load received from commercial (non-domestic) premises.

The population equivalent of total load received consists of the following constituents:

- Population
- Non-domestic load
- Tourist
- Trade effluent

- Imported public septic tanks
- Imported private septic tanks
- Imported WTW sludge
- Imported WWTW sludge
- Imported other loads
- Sludge return liquors

	Population	Non-domestic load	Tourist	Trade effluent	Imported public septic tanks
AR19	2,238,330	420,729	31,459	342,868	0
% of Total	73.75%	13.86%	1.04%	11.30%	0.00%
AR18	2,212,386	424,751	26,876	333,365	272
% of Total	73.59%	14.13%	0.89%	11.09%	0.01%
Difference	25,944	31,461	4,583	9,503	-272

	Imported private septic tanks	Imported WTW sludge	Imported WWTW sludge	Imported other loads	Sludge return liquors	Total
AR19	0	0	0	0	1,731	3,035,117
% of Total	0.00%	0.00%	0.00%	0.00%	0.06%	
AR18	390	0	6,584	0	1,720	3,006,343
% of Total	0.01%	0.00%	0.22%	0.00%	0.06%	
Difference	-390	0	-6,584	0	11	28,774

### E3.4- E3.8 Scope of works

#### E3.4 Sewerage

Fort William	Includes 4 pumping stations and associated pumping mains.
Inverness	Includes 14 pumping stations and associated pumping mains/gravity sewers.
Hatton	Includes 16 pumping stations and associated pumping mains/gravity sewers.
Nigg	Includes 14 pumping stations and associated pumping mains/gravity sewers.
Persley	Includes a short section of gravity sewer.
Peterhead	Includes a short section of gravity sewer.
Fraserburgh	Includes 1 pumping station and a section of gravity sewer.
Lossiemouth	Includes 7 pumping stations and extensive pumping mains.
Buckie	Includes 12 pumping stations and extensive pumping mains.
Banff/Macduff	Includes 10 pumping stations and extensive pumping mains.
Seafield	Includes 7 pumping stations, the Esk valley trunk sewerage network with associated pumping and a number of storm water works with overflows.
Newbridge	Includes 2 pumping stations, a section of gravity sewer and a storm water works with overflow.
Whitburn	Includes 1 pumping station located within the site boundary.
Levenmouth	Includes 8 pumping stations and associated pumping mains and gravity sewers.
Daldowie	Includes 1 pumping station and a pumping main.
Inverclyde	Includes a short section of gravity sewer.

### E3.5 Sewage Treatment

Only Daldowie does not include sewage treatment as it is exclusively a sludge treatment centre.

### E3.6 Sludge Treatment

#### Permanent sludge treatment facilities

Inverness	Indigenous sludge, imports from Fort William, plus Scottish Water imports.
Hatton	Indigenous sludge plus Scottish Water imports.
Nigg	Indigenous sludge, imports from Persley, Peterhead and Fraserburgh plus Scottish Water imports.
Lossiemouth	Indigenous sludge, imports from Buckie and Banff/Macduff plus Scottish Water imports.
Seafield	Indigenous sludge, imports from Newbridge, East Calder, Blackburn and Whitburn, plus Scottish Water imports.
Newbridge	Occasional treatment of indigenous sludge, occasional imports from East Calder, Blackburn and Whitburn.
Levenmouth	Indigenous sludge plus Scottish Water imports.
Dalmuir	A new permanent sludge treatment facility has been commissioned, which centrifuges some of the indigenous sludge in order to limit the pass forward of Dalmuir sludge to Daldowie STC to a maximum ferric content of 2 tonnes/day.
Daldowie	Receives sludge from Dalmuir and Scottish Water wastewater treatment works (Daldowie, Shieldhall, Paisley, Dalmarnock and Erskine) by sludge pipeline and from SW tankered imports.
Meadowhead	Indigenous sludge plus imports from Stevenston and Inverclyde.

Persley, Peterhead and Fraserburgh are not classed as sludge treatment centres as indigenous or processed sludge is normally taken to Nigg for treatment. However, due to maintenance works, these three sites produced some thickened raw cake for onward disposal.

### E3.7 Terminal Pumping Station

This means a pumping station that is the final point on the forward flow path from a sewerage network into a wastewater treatment works and may include both pumping of all/partial 'FFT' flows or stormwater flows to storm tanks and/or storm outfalls. The Terminal Pumping Station may form part of the sewerage network (i.e. be remote from the WwTW) or may be associated with a wastewater treatment works depending on actual location and power supply source. It is not a Combined Pumping Station or a Stormwater Pumping Station.

The following works include incoming terminal pumping stations as part of the PPP scheme. Maximum capacity (l/s) of these terminal pumping stations, excluding standby capacity, is given in brackets.

Fort William	Caol Transfer (118 l/s), Fort William WwTW (590 l/s).
Inverness	Allanfearn WwTW (50 l/s) This pumping station receives flows from a small part of the catchment.
Hatton	South Balmossie (1,563 l/s), West Haven (110 l/s), Inchcape Park (241 l/s).
Fraserburgh	Fraserburgh Inlet (195 l/s).
Lossiemouth	Duffus Junction (33 l/s), Moycroft (300 l/s).
Buckie	Nook (84 l/s), Shipyard (70l/s), Buckie WwTW (13 l/s).



Banff/Macduff	Craigfauld (552l/s), Banff/Macduff WwTW (222 l/s).
Seafield	A proportion of total flow is delivered via Marine Esplanade Terminal PS (1420 l/s).
Newbridge	A proportion of total flow is delivered via the Ratho Sewer Terminal PS (196 l/s).
Whitburn	A proportion of total flow is delivered via the Harrison Sewer Terminal PS (45 l/s).
Levenmouth	All flow delivered via terminal pumping stations; Methil M2 (125 l/s), Leven (212 l/s), Buckhaven (133 l/s), Levenmouth WwTW inlet FFT flows (1,650 l/s), Levenmouth WwTW inlet storm flows (2,347 l/s).

### **E3.8 Other**

No plants in this category.

### **E3.9- E3.14 Sewage treatment - effluent consent standard**

#### **E3.9- E3.13 Effluent consent standards - Data obtained from the current SEPA consents.**

Where an effluent consent standard includes both Controlled Activities Regulations (CAR) and Urban Waste Water Treatment Directive (UWWTD) elements the stricter standard is given in the Annual Return.

#### **E3.9 Suspended solids consent – All CAR.**

#### **E3.10 BOD consent**

All UWWTD except Newbridge, East Calder, Blackburn and Whitburn which are CAR parameters.

#### **E3.11 COD consent – All UWWTD.**

#### **E3.12 Ammonia consent – All CAR.**

#### **E3.13 Phosphate consent – All CAR.**

At Newbridge, East Calder, Blackburn and Whitburn the consent is expressed as; 'Mean concentration of total phosphorous of any series of composite samples taken at regular but randomised intervals in any period of 12 months'.

**E3.14 Compliance with effluent consent standards** – Compliance for BOD, COD, SS, Ammonia, and Phosphate is reported for each works, based on the total number of sample results and exceedances (upper and lower tier) for sanitary determinands (to the exclusion of other parameters that may be included in the SEPA consent). Where effluent consent standard includes both CAR and UWWTD standards both sets of samples are used for the calculation of compliance.

Percentage compliance is calculated as:

$$(1 - (\text{total number of failures} / \text{total number of samples})) \times 100$$

The SEPA Annual Compliance Report for the period ending 31 December 2018 has been taken as the definitive data source, provided by SEPA, and as such it has been assigned a Confidence Grade of A1.

Compliance calculated under this methodology may cause conflicts with Table C4 (C4.19) "Number of discharges confirmed as failing", which considers all SEPA consent parameters.

### Failures

Site		Parameter	Exceedance (E) / Failure (F)	
Inverness	UWWTD	COD	E	20/07/18
Nigg	UWWTD	COD	E	24/01/18
Lossiemouth	UWWTD	COD	E	11/04/18
Lossiemouth	UWWTD	COD	E	27/09/18
East Calder	UWWTD	BOD	E	04/04/18
East Calder	CAR	Ammonia	E	23/05/18
East Calder	CAR	Ammonia	F	02/08/18
East Calder	CAR	Ammonia	E	16/08/18
Blackburn	CAR	BOD	E	27/03/18
Blackburn	CAR	BOD	E	19/05/18
Blackburn	CAR	Ammonia	E	27/03/18
Blackburn	CAR	Ammonia	E	19/05/18
Blackburn	CAR	Ammonia	E	12/06/18
Dalmuir	UWWTD	BOD	E	08/10/18
Dalmuir	CAR	Ammonia	E	23/05/18

### E3.15-21 Treatment works category

Information contained in these lines is extracted from the project agreements and is given a confidence grade of A1.

#### E3.15 Primary – All plants.

#### E3.16 Secondary activated sludge - Includes all plants except Blackburn.

#### E3.17 Secondary biological - Blackburn.

#### E3.18 Tertiary A1 (activated sludge process)

East Calder	Nitrifying filters.
Whitburn	Nitrifying filters.
Dalmuir	Nitrifying filters.

#### E3.19 Tertiary A2 (activated sludge process)

Persley	UV disinfection.
Fraserburgh	UV disinfection.
Banff/Macduff	UV disinfection.
Levenmouth	Densadeg lamella settlement tanks followed by UV disinfection.

Newbridge	Low head loss sand filters.
East Calder	Disc filters.
Whitburn	Low head loss sand filters.
Meadowhead	Biofors tertiary filter.

**E3.20 Tertiary B1** - No plants sit in this category.

**E3.21 Tertiary B2 (biological sludge process).**

Blackburn	Disc filters.
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### **E3.22-32 Sewerage Data**

Includes all sewerage (sewers, pumping stations, rising mains, outfalls and long sea outfalls).

Data sources: Concession Agreements, Operator O&M manuals, Operator asset inventories, SW GIS system, As built drawings and SEPA consents.

Pump capacity (kW) has been obtained from motor drive rating, not the pump duty point.

**E3.22 Total length of sewer** – Length of outfalls included in data unless noted otherwise in commentary. Where terminal pumping stations are located remote from a wastewater treatment works, the length of rising main connecting the terminal pumping station and wastewater treatment works is included.

**E3.23 Total length of critical sewer** – All PPP sewers (including relief sewers, rising mains and CSO outfalls) are deemed to be critical.

**E3.24 Number of pumping stations** – Includes stormwater, combined and terminal pumping stations. Interstage and final effluent pumping stations forming part of a wastewater treatment plant are not included.

**E3.25 Capacity of pumping stations (m<sup>3</sup>/d)** - Includes stormwater, combined and terminal pumping stations. Maximum flow pumped forward per day. This excludes capacity of standby pumps.

**E3.26 Capacity of pumping stations (kw)** - Includes stormwater and combined pumping stations, but not terminal pumping stations. Includes capacity of standby pumps.

**E3.27 Number of combined pumping stations** - Combined pumping station means a network wastewater pumping station containing a pump or pumps transferring wastewater and surface drainage within the downstream sewerage network. The transferred wastewater flow rate from the combined pumping station is the “FFT” rate, the generally accepted term used in design and SEPA consents. For the sake of clarity, where storm water storage tank returns are pumped back into the sewerage system for onward flow, this shall be classed as a combined pumping station (as such flows become part of ‘FFT’). Terminal pumping stations are not included.

The following combined pumping stations are included:

Fort William	Blar Mhor, Caol No1
Inverness	Longman
Hatton	Riverside, KGV, Stannergate, West Ferry, Broughty Castle, Fort Street, Gray Street

Nigg	Downies, Portlethen Village, Newtonhill Clifftop, Portlethen South, Backies, Cowie (3), Slughead, Bridge of Muchalls, Cammachmore, Portlethen North
Lossiemouth	Burghead, Cummington, Hopeman, Moycroft
Buckie	Portgordon West, Portgordon East, Seatown, Cluny, Cullen East, Portknockie, Findochty, Portessie
Banff/Macduff	Whitehills, Whitehills Harbour, Inverboyndie, Scotstown, Castlehill Park, Union Road, Bankhead
Seafield	Wallyford Transfer, Wallyford SWW, Portobello SWW, Harelaw SWW, Dalkeith SWW, Mayshade SWW*
Newbridge	Broxburn SWW
Levenmouth	Methil M1

\*Mayshade SWW: pumping station comprises a separate duty/standby pump set in two separate storm tanks. As only one duty pump operates at any one time (i.e. storm tank 1 emptied before commencing emptying of storm tank 2) these four pumps have been entered as a single combined pumping station on a 1 duty/3 standby basis.

**E3.28 Capacity of combined pumping stations (m3/d) - Maximum flow** pumped forward per day. This excludes capacity of standby pumps.

**E3.29 Number of stormwater pumping stations - Stormwater pumping station** means a network wastewater pumping station containing a pump or pumps transferring wastewater, containing stormwater, to a stormwater storage tank or storm overflow. The stormwater pumping station transfers wastewater in excess of “FFT”, the generally accepted term used in design and SEPA consents. For the sake of clarity, the function of the stormwater pumping station is to prevent and/or limit surcharging of the upstream sewerage system.

The following stormwater pumping stations are included:

Inverness	Longman (2)
Hatton	Riverside, KGV, Stannergate, Westhaven, Broughty Castle, Inchcape Park
Nigg	Backies (2)
Lossiemouth	Moycroft
Buckie	Portessie
Banff/Macduff	Bankhead
Levenmouth	Leven, Roundall

**E3.30 Capacity of stormwater pumping stations (m3/d) – Maximum flow** pumped forward per day. This excludes capacity of standby pumps.

**E3.31 Number of combined sewer overflows & E3.32 Number of combined sewer overflows (screened)**

CSOs that overflow within the sewerage system rather than to an outfall discharging direct to the environment are not included.

The following CSOs are included:

Fort William	Caol No1, Caol Transfer
Inverness	Longman
Hatton	Riverside, KGV, Stannergate, South Balmossie, Westhaven, Broughty Castle, Inchcape Park, Panmurefield/Balmossie Mill (2)
Nigg	Downies, Portlethen Village, Newtonhill Clifftop, Backies (2), Cowie, Portlethen North, Nigg
Fraserburgh	Fraserburgh Inlet (Watermill)
Lossiemouth	Burghead, Cummington, Hopeman, Moycroft

Buckie	Portgordon West, Portgordon East, Seatown, Cluny, Nook, Cullen East, Portknockie, Findochty, Portessie, Shipyard
Banff/Macduff	Whitehills, Whitehills Harbour, Inverboyndie, Scotstown, Castlehill Park, Union Road, Bankhead, Craigfauld
Seafield	Wallyford, Dalkeith*, Hardengreen, Harelaw, Haveral Wood, Middlemills, Newbattle, Newtongrange, Suttieslea*
Newbridge	Broxburn
Levenmouth	Buckhaven, Methil M2 CSO2**, Methil CSO1**, Leven, Roundall

\*Seafield - Dalkeith SWW consists of two separate screen overflows on two separate legs of the sewer which combine at the SWW. As each screened overflow is located on the same site and feeds one common storm water tank and outfall, this overflow has been recorded as a single CSO. Suttieslea: 'Copa Sac', (equivalent to 6 mm screen), provided on outfall from storm tank.

\*\*Levenmouth - Methil CSO1 and Methil M2 CSO2 discharge into a common outfall.

**E3.33-40 Sludge Treatment and Disposal Data** - The quantities reported are the total sludge tonnages prior to the sludge treatment process. This is in accordance with the methodology used in England & Wales.

The information is based on PPP Company records of sludge disposed to the appropriate route.

Allanfearn sludge quantities disposed of by Scottish Water are included in Table E3 and the corresponding costs are included in Table E3a to be consistent with the rest of the PPP works.

## **TABLE E3a**

This table provides operating costs for each scheme. As actual data is not available, all costs have been extracted from the relevant contractual financial models. Where the financial models do not split costs into specific categories the following has been assumed:

- Works with a Sludge Centre: 72 % Ww Treatment Costs, 28% Sludge Costs.
- All other works: 80% Ww Treatment Costs, 20% Sludge Costs. These sludge costs have been allocated to the appropriate sludge treatment centre where the sludge is treated, e.g. Fort William sludge costs appear against Inverness sludge centre.

The cost split was reviewed in detail and agreed with the WICS auditors in May 2007 and has not been subject to further discussion since that date.

### **E3a.1, 8, 16 Estimated Direct Operating Cost**

Estimated annual direct operating costs are based on the Concessionaire's financial model adjusted for actual inflation.

Where the model specifically identified sums for Rates and SEPA charges these have been deducted from that figure otherwise the actual amount charged was deducted.

No adjustments were made at AVSE (for Rates), Daldowie (for Rates), and MSI (SEPA and Rates) as charges are paid by Scottish Water and are not included in the financial model. At Dalmuir, Scottish Water pays these charges but amounts are also included in the financial model, therefore an adjustment to the model costs is made (Rates and SEPA charges included in the model are refunded to Scottish Water).

An adjustment has been made to include the direct operational expenditure of the Dalmuir NTF and sludge treatment costs. 76% of the total fee is considered direct operational expenditure. This is further broken down to account for the ammonia treatment which is 84% of the ammonia fee and is allocated to Waste Water Treatment (E3a.8). The remainder is allocated to Sludge Treatment (E3a.16).

Additional cost for the operation of the Seafield Odour Project is also included from 17/18 with Waste Water Treatment (E3a.8).

Actual costs are not known and could, in reality, vary considerably from the contractual financial model. A confidence grade of D6 has therefore been used. A confidence grade of A3 was allocated to the Dalmuir sludge treatment costs as there is some visibility of these costs.

### E3a.2, 9, 17 Rates paid by the PPP Contractor

These are based on the rateable value and poundage published on the government website ([www.saa.gov.uk](http://www.saa.gov.uk)). Rates paid by Scottish Water are also included and are based on actual charges for the year (Dalmuir, Daldowie, MSI, AVSE).

Confidence grade for total rates paid for each site is A2, but because rates have to be split to take account of the sewerage, treatment and sludge elements a lower confidence grade has been applied.

	E3a.2	E3a.9	E3a.17	
Site	Sewerage	Sewage Treatment	Sludge Treatment	Comment on confidence grade
Fort William	N	B3	N	No sludge centre at works, sludge cost moved to Inverness
Inverness	N	B3	B3	Cost distribution is estimated
Hatton	N	B3	B3	Cost distribution is estimated, based on the Financial Model
Nigg	N	B3	B3	Cost distribution is estimated, based on the Financial Model
Persley	N	B3	N	No sludge centre at works, sludge cost moved to Nigg
Peterhead	N	B3	N	No sludge centre at works, sludge cost moved to Nigg
Fraserburgh	N	B3	N	No sludge centre at works, sludge cost moved to Nigg
Lossiemouth	N	B3	B3	Cost distribution is estimated, based on the Financial Model
Buckie	N	B3	N	No sludge centre at works, sludge cost moved to Lossiemouth
Banff/Macduff	N	B3	N	No sludge centre at works, sludge cost moved to Lossiemouth
Seafield	N	B3	B3	Cost distribution is estimated, based on the Financial Model
Newbridge	N	B3	B3	Cost distribution is estimated, based on the Financial Model
East Calder	N	B3	N	No sewerage and no sludge centre at works, sludge cost moved to Newbridge
Blackburn	N	B3	N	No sewerage and no sludge centre at works, sludge cost moved to Newbridge
Whitburn	N	B3	N	No sludge centre at works, sludge cost moved to Newbridge
Levenmouth	N	B3	B3	Cost distribution is estimated
Dalmuir	N	B3	N	No sludge treatment centre in the conventional sense – intermittent sludge thickening as operational need, no imports
Daldowie	N	N	A2	No sewage treatment at works
Meadowhead	N	B3	B3	Cost distribution is estimated

Stevenston	N	B3	N	No sewerage and no sludge centre at works, sludge cost moved to Meadowhead
Inverclyde	N	B3	N	No sludge centre at works, sludge cost moved to Meadowhead

### E3a.3, 10, 18 SEPA charges paid by the PPP Contractor

Cost allocation is as per the relevant SEPA invoices for 2018/19.

The following confidence grades have been assigned:

Site	E3a.3 Sewerage	E3a.10 Sewage Treatment	E3a.18 Sludge Treatment	Comment on confidence grade
Fort William	A2	A2	N	No sludge centre at works
Inverness	N	A2	A2	No separate cost for sewerage
Hatton	A2	A2	A2	
Nigg	A2	A2	A2	Includes the cost recharged to Scottish Water for the additional SEPA charges associated with 2 parameters as detailed in the contract.
Persley	N	A2	N	No separate cost for sewerage, no sludge centre at works
Peterhead	N	A2	N	No separate cost for sewerage, no sludge centre at works
Fraserburgh	N	A2	N	No separate cost for sewerage, no sludge centre at works
Lossiemouth	A2	A2	N	No subsistence charge included in invoices
Buckie	A2	A2	N	No sludge centre at works
Banff/Macduff	A2	A2	N	No sludge centre at works
Seafield	A2	A2	A2	
Newbridge	A2	A2	N	No WML charge included in invoice
East Calder	N	A2	N	No sewerage and no sludge centre at works
Blackburn	N	A2	N	No sewerage and no sludge centre at works
Whitburn	N	A2	N	No sewerage and no sludge centre at works
Levenmouth	A2	A2	A2	
Dalmuir	N	N	A2	Only WML fees paid by the PFI Co
Daldowie	N	N	A2	Sludge treatment only
Meadowhead	N	N	A2	Only WML fees paid by the PFI Co
Stevenston	N	N	N	SEPA fees paid by SW
Inverclyde	N	N	N	SEPA fees paid by SW



### E3a.4, 11, 19, 23 Total Direct Costs

Total of E3a.1-3, 8-11 and 16-18. Confidence grade for Total direct cost is D6 as per E3a.1, 8 and 16 (Estimated direct operating cost) as this is the most significant element of Total direct cost. A confidence grade of A3 was allocated to the Dalmuir sludge treatment costs as there is some visibility of these costs.

### E3a.5, 12, 20 Scottish Water General and Support Expenditure

This includes costs such as advisors and legal costs, power, rent and insurance and the cost of the Scottish Water PPP department that administers the PPP projects which have been allocated to projects relative to the operational costs at each site. Costs are as per the P&L. In addition, Scottish Water costs of sludge disposal from Inverness, inter-site sludge tankering and terminal pumping costs (where tankering or pumping has taken place between a Scottish Water works and a PFI site) and additional support costs have been included

Confidence grade for total charges is A1, but because Scottish Water PPP department costs have to be split across all sites and all charges have to be split to take account of the sewerage, treatment and sludge elements the following confidence grades have been assigned:

A confidence grade of A3 was allocated to the Dalmuir sludge treatment costs as there is some visibility of these costs.

	E3a.5	E3a.12	E3a.20	Comment
Site	Sewerage	Sewage Treatment	Sludge Treatment	Comment on confidence grade
Fort William	CX	C4	N	Network cost very small, no sludge centre at works
Inverness	C4	C4	C4	
Hatton	C4	C4	C4	
Nigg	C4	C4	C4	
Persley	CX	C4	N	Network cost very small, no sludge centre at works
Peterhead	CX	C4	N	Network cost very small, no sludge centre at works
Fraserburgh	CX	C4	N	Network cost very small, no sludge centre at works
Lossiemouth	C4	C4	C4	
Buckie	C4	C4	N	No sludge centre at works
Banff/Macduff	C4	C4	N	No sludge centre at works
Seafield	C4	C4	C4	
Newbridge	CX	C4	C4	Network cost very small
East Calder	N	C4	N	No sewerage and no sludge centre at works
Blackburn	N	C4	N	No sewerage and no sludge centre at works
Whitburn	CX	C4	N	Network cost very small, no sludge

	<b>E3a.5</b>	<b>E3a.12</b>	<b>E3a.20</b>	<b>Comment</b>
				centre at works
Levenmouth	C4	C4	C4	
Dalmuir	N	C4	A3	No sewerage
Daldowie	C4	N	C4	No sewage treatment at works
Meadowhead	N	C4	C4	No sewerage
Stevenston	N	C4	N	No sewerage and no sludge centre at works
Inverclyde	CX	C4	N	Network cost very small, no sludge centre at works

### **E3a.6, 13, 21 Scottish Water SEPA Charges**

With the exception of Dalmuir and MSI, all CAR Licence SEPA charges are paid for by the PFI Company and are included in the tariff rates. At Nigg, Scottish Water meet the additional CAR Licence SEPA charges associated with 2 parameters as detailed in the contract. Costs are as per the P&L and reflect charges as invoiced by SEPA.

	<b>E3a.6</b>	<b>E3a.13</b>	<b>E3a.21</b>	
<b>Site</b>	<b>Sewerage</b>	<b>Sewage Treatment</b>	<b>Sludge Treatment</b>	<b>Comment on confidence grade</b>
Fort William	N	N	N	SEPA charges paid by PFI Co
Inverness	N	N	N	SEPA charges paid by PFI Co
Hatton	N	N	N	SEPA charges paid by PFI Co
Nigg	N	N	N	Treatment cost only (exotics), costs are included with E3a.26
Persley	N	N	N	SEPA charges paid by PFI Co
Peterhead	N	N	N	SEPA charges paid by PFI Co
Fraserburgh	N	N	N	SEPA charges paid by PFI Co
Lossiemouth	N	N	N	SEPA charges paid by PFI Co
Buckie	N	N	N	SEPA charges paid by PFI Co
Banff/Macduff	N	N	N	SEPA charges paid by PFI Co
Seafield	N	N	N	SEPA charges paid by PFI Co
Newbridge	N	N	N	SEPA charges paid by PFI Co
East Calder	N	N	N	SEPA charges paid by PFI Co
Blackburn	N	N	N	SEPA charges paid by PFI Co
Whitburn	N	N	N	SEPA charges paid by PFI Co
Levenmouth	N	N	N	SEPA charges paid by PFI Co
Dalmuir	N	A2	N	Treatment cost only, sludge (WML) costs are paid by the PFI Co
Daldowie	N	N	N	SEPA charges paid by PFI Co
Meadowhead	N	A2	N	Treatment cost only, sludge (WML) costs are paid by the PFI Co
Stevenston	N	A2	N	No sewerage and no sludge centre at works
Inverclyde	BX	A2	N	No sludge centre at works

### E3a.7, 14, 22 Total sewerage cost, total sewage treatment cost, total sludge treatment costs and disposal cost

Confidence grade is D6 as per E3a.1, 8 and 16 (estimated direct operating cost) as this is the most significant element of the cost.

A confidence grade of A3 was allocated to the Dalmuir sludge treatment and disposal costs as there is some visibility of these costs.

### E3a.15 Estimated terminal pumping cost

Reported costs are as incurred for the SW operated terminal pumping stations.

Where the terminal pumping station is part of the PPP scheme the costs are met by the Concessionaire and are included in the tariff rates and not reported as part of E3a.15.

### E3a.24 Total Scottish Water cost

Total of Scottish Water General and Support Expenditure, and Scottish Water SEPA Charges (E3a.5-6, 12-13 and 20-21).

Confidence grade for total charges is A1, but because Scottish Water PPP department costs and internal recharges have to be split across all sites a confidence grade of C4 has been allocated.

Site	18/19 £m	17/18 £m	Variance £m	Costs lower than previous year	Costs higher than previous year
Ft William	0.024	0.021	0.003		18/19 includes higher other Scottish Water operating costs £0.001m, and higher ABM support costs £0.002m
Inverness	0.560	0.606	-0.046	18/19 includes lower legal/consultants fees £0.007m, and lower sludge tankering and disposal costs £0.059m	18/19 includes higher other Scottish Water operating costs £0.008m, and higher ABM support costs £0.012m
Hatton	0.318	0.321	-0.003	18/19 includes lower sludge tankering costs £0.002m, and lower terminal pumping costs £0.019m	18/19 includes higher legal/consultants fees £0.001m, higher other Scottish Water operating costs £0.002m, and higher ABM support costs £0.015m
Nigg	0.870	0.829	0.041	18/19 includes lower legal/consultants fees £0.048m	18/19 includes higher other Scottish Water operating costs £0.022m, higher sludge tankering costs £0.036m, and higher ABM support costs £0.031m
Persley	0.029	0.024	0.005		18/19 includes higher other Scottish Water operating costs £0.002m, and higher ABM support costs £0.003m
Peterhead	0.035	0.028	0.007		18/19 includes higher other Scottish Water operating costs £0.003m, higher terminal pumping costs £0.001m, and higher ABM support costs £0.003m

Site	18/19 £m	17/18 £m	Variance £m	Costs lower than previous year	Costs higher than previous year
Fraserburgh	0.033	0.027	0.006		18/19 includes higher other Scottish Water operating costs £0.003m, and higher ABM support costs £0.003m
Lossiemouth	0.182	0.185	-0.003	18/19 includes lower legal/consultants fees £0.015m, lower terminal pumping costs £0.003m,	18/19 includes higher other Scottish Water operating costs £0.002m, higher sludge tankering costs £0.009m, and higher ABM support costs £0.004m
Buckie	0.034	0.031	0.003		17/18 includes higher other Scottish Water operating costs £0.001m, and higher ABM support costs £0.002m
Banff/Macduff	0.032	0.029	0.003		18/19 includes higher ABM support costs £0.003m
Seafield	1.504	0.225	1.279	18/19 includes lower sludge tankering costs £0.002m	18/19 includes higher legal/consultants fees £0.971m, higher other Scottish Water operating costs £0.023m, and higher ABM support costs £0.287m
Newbridge	0.046	0.041	0.005		18/19 includes higher other Scottish Water operating costs £0.001m, and higher ABM support costs £0.004m
East Calder	0.025	0.022	0.003		18/19 includes higher other Scottish Water operating costs £0.001m, and higher ABM support costs £0.002m
Blackburn	0.019	0.018	0.001		18/19 includes higher ABM support costs £0.001m
Whitburn	0.020	0.019	0.001		18/19 includes higher ABM support costs £0.001m
Levenmouth	0.273	0.136	0.137	18/19 includes lower legal/consultants fees £0.018m	18/19 includes higher other Scottish Water operating costs £0.116m, higher sludge tankering costs £0.002m, and higher ABM support costs £0.037m
Dalmuir	2.450	1.523	0.927	18/19 includes lower legal/consultants fees £0.005m, and lower other Scottish Water operating costs £0.195m	18/19 includes higher Scottish Water sludge disposal costs £0.855m, and higher ABM support costs £0.272m
Daldowie	2.797	1.809	0.988	18/19 includes lower legal/consultants fees £0.005m, and lower other Scottish Water operating costs £0.179m	18/19 includes higher Shieldhall centrifuging costs £0.504m, higher sludge tankering costs £0.536m, and higher ABM support costs £0.132m
Meadowhead	0.928	1.086	-0.158	18/19 includes lower legal/consultants fees £0.037m, lower other Scottish Water operating costs £0.003m, and lower terminal pumping costs £0.093m	18/19 includes higher ABM support costs £0.002m
Stevenston	0.366	0.424	-0.058	18/19 includes lower other Scottish Water operating costs £0.027m, and lower	18/19 includes higher ABM support costs £0.003m

Site	18/19 £m	17/18 £m	Variance £m	Costs lower than previous year	Costs higher than previous year
				terminal pumping costs £0.034m	
Inverclyde	0.473	0.469	0.004	18/19 includes lower terminal pumping costs £0.006m	18/19 includes higher other Scottish Water operating costs £0.007m, higher terminal pumping costs £0.038m, and higher ABM support costs £0.003m
<b>TOTAL</b>	<b>11.018</b>	<b>7.873</b>	<b>3.145</b>		

### E3a.25 Total operating cost

Confidence grade for Total operating cost is D6 as per E3a.23 Total direct cost, as this is the most significant element of Total operating cost.

### E3a.26 Annual charge

The Annual charge is based on the service fees for the year, provisions and business rates (including rebates). Expenditure is taken from the P&L.

Confidence grades for each of the schemes is A1 other than the AVSE scheme which is B3 as the charges are based on the total AVSE flows as there is no separate tariff for each scheme.

Site	18/19 £m	17/18 £m	Variance £m	Costs lower than previous year	Costs higher than previous year
Ft William	3.838	3.621	+0.217	18/19 higher release of accruals £0.05m, CRC 17/18 £0.010m	18/19 inflation £0.136m, higher flows/loads £0.076m, lower penalties £0.011m, Operator Self-Monitoring £0.009m
Inverness	6.501	6.738	-0.237	18/19 lower flows/loads £0.576m, CRC 17/18 £0.050m	18/19 inflation £0.232m, lower penalties £0.138m, Operator Self-Monitoring £0.008m, lower release of accruals £0.011m
Hatton	22.554	22.169	+0.385	18/19 lower flows £0.066m, higher release of accrual £0.046m	18/19 inflation £0.488m, Operator Self-Monitoring £0.009m
Nigg	0.990	13.140	-12.150	18/19 lower flows/loads £0.743m, higher business rates rebate £0.014m, lower SEPA recharge from KWS £0.020m, lower Operator Self- Monitoring £0.004m, lower Carbon Reduction Commitment £0.124m, income from Nigg claim £13.75m	18/19 inflation £0.410m, lower penalties £1.998m, higher electricity recharge from KWS £0.001m, lower release of accruals £0.096m
Persley	2.916	2.671	+0.245	18/19 higher business rates rebate £0.005m, lower Operator Self- Monitoring £0.004m, lower Carbon Reduction Commitment £0.015m	18/19 higher flows/loads £0.139m, inflation £0.090m, lower penalties £0.035m, lower release of accruals £0.005m
Peterhead	2.302	2.347	-0.045	18/19 lower flows/loads £0.078m, higher penalties £0.006m,	18/19 inflation £0.070m

Site	18/19 £m	17/18 £m	Variance £m	Costs lower than previous year	Costs higher than previous year
				higher business rates rebate £0.002m, lower Operator Self-Monitoring £0.004m, lower Carbon Reduction Commitment £0.016m, higher release of accruals £0.009m	
Fraserburgh	1.852	2.055	-0.203	18/19 lower flows/loads £0.222m, higher business rates rebate £0.002m, lower Operator Self-Monitoring £0.004m, lower Carbon Reduction Commitment £0.012m, lower TFM £0.009m, higher release of accruals £0.016m	18/19 inflation £0.056m, lower penalties £0.006m
Lossiemouth	4.816	4.427	+0.389	17/18 includes Lossiemouth Backflow Survey £0.012m	18/19 higher fees £0.022m, lower penalties £0.155m, inflation £0.092m, higher Operator Self-Monitoring £0.009m, lower release of accruals £0.123m
Buckie	2.878	3.063	-0.185	18/19 lower fees £0.305m	18/19 lower penalties £0.030m, inflation £0.057m, higher Operator Self-Monitoring £0.008m, lower release of accruals £0.025m
Banff/Macduff	3.199	3.434	-0.235	18/19 lower fees £0.361m	18/19 lower penalties £0.032m, inflation £0.057m, higher Operator Self-Monitoring £0.009m, lower release of accruals £0.028m
Seafeld	21.607	22.301	-0.694	18/19 lower CRC £0.270m, lower Seafeld Odour Improvement project costs £0.014m, higher release of accruals £1.326m	18/19 based on 100% compliance with the contract plus inflation £0.609m, higher business rates £0.050m, higher Operator Self-Monitoring from Jan 18 £0.042m
Newbridge	2.905	3.004	-0.099		
East Calder	1.585	1.638	-0.053		
Blackburn	0.792	0.819	-0.027		
Whitburn	1.056	1.092	-0.036		
Levenmouth	13.324	12.521	+0.803	18/19 lower flows £0.373m, lower Odour Project costs £0.040m	18/19 inflation £1.105m, higher Operator Self-Monitoring £0.022m, lower release of accruals £0.089m
Dalmuir	13.724	14.105	-0.381	18/19 lower flows £0.290m, lower New Capital Investment costs £0.018m, lower insurance £0.004m, higher release of accruals £0.023m, 17/18 includes temporary centrifuge project costs £0.286m and Capital Project Operator Forecast and Project Manager Interim Agreement Costs £0.905m	18/19 inflation £0.126m, higher Capital Project opex £0.884m, higher Annual Operations Compensation £0.099m, higher Operator Self-Monitoring £0.017m, higher business rates £0.019m
Daldowie	20.806	20.735	+0.071	18/19 lower sludge volumes £0.281m, lower necessary change costs £0.020m,	18/19 inflation £0.603m, higher excess ragging £0.070m, higher business rates £0.009m

Site	18/19 £m	17/18 £m	Variance £m	Costs lower than previous year	Costs higher than previous year
				higher release of accruals £0.310m	
Meadowhead	7.189	7.342	-0.153	18/19 lower fees £0.250m, higher release of accruals £0.185m, 17/18 includes Operator Self- Monitoring from Jan 18 £0.008m	18/19 inflation £0.141m, higher Landfill Tax & Gas cost £0.140m, higher business rates £0.009m
Stevenston	3.364	3.743	-0.379	18/19 lower flows/fees £0.297m, lower Trader Necessary Change costs £0.045m, higher release of accruals £0.075m, 17/18 includes Operator Self- Monitoring from Jan 18 £0.026m	18/19 inflation £0.056m, higher business rates £0.008m
Inverclyde	3.683	3.730	-0.047	18/19 lower flows/fees £0.129m, higher release of accruals £0.011m	18/19 inflation £0.069m, higher Operator Self- Monitoring £0.020m, higher business rates £0.004m
<b>TOTAL</b>	<b>141.881</b>	<b>154.695</b>	<b>-12.814</b>		

### E3a.27 Public sector capital equivalent values

Values were derived from the base model incorporated in a report to the Transport and Environment Committee on 21 June 2001 adjusted for inflation. At Daldowie the PPP cost was used in the absence of a PSCE value, similarly for Levenmouth and AVSE the values have been taken from the 01/02 WIC return.

### E3a.28 Contract period

The period quoted is the Contract Period as defined in the Contract.

### E3a.29 Contract end date

Contract end date is as defined in the Contract.

## Table E4 Water Explanatory Factors - Resources and Treatment

### E4.1 – E4.5 Source Types

The overall number of direct sources has remained unchanged at 282. However, within this there have been source status changes as detailed in the table below.

Details are provided in the table below:

	<b>2017/18 No. of sources</b>	<b>282</b>
Reductions	Closed sources	4
Additions	New sources	1
Additions	Emergency sources	2
Additions	Reclassified source status	1
	<b>2018/19 No. of sources</b>	<b>282</b>

Distribution input (DI) has increased by 10.205 MI/d to 1806.158 MI/d.

Changes to DI this year are detailed in the table below:

Source Type	2017/18	2018/19	Net Change
	<i>MI/d</i>		
Impounding reservoirs	1343.020	<b>1327.606</b>	-15.414
Lochs	20.268	<b>20.835</b>	0.567
River and burn abstractions	365.776	<b>388.188</b>	22.412
Boreholes	66.889	<b>69.529</b>	2.640
<b>Total</b>	<b>1795.953</b>	<b>1806.158</b>	<b>10.205</b>

As in previous years, we have completed columns 110–140 by assuming that, where multiple sources feed a WTW, the total average daily output comes only from the primary source. The primary source is therefore allocated 100% of the DI and all other sources are allocated 0%.

There are six WTWs where the primary source is already assigned as the primary source to another WTW (conjunctive use sources). In order to ensure all WTW DI totals are included, the DI volumes for these WTWs are manually re-assigned to the appropriate 'duplicate' conjunctive source entry for the WTW. For example, Megget Reservoir primarily feeds to Glencorse WTW but is also assigned as the primary source for Marchbank and Bonnycraig WTWs.

Generally, raw water supply sources catchments and the WTWs they supply are located within the same region. However, the following four WTWs are supplied from outside their region:

- Daer WTW: Source and WTW are in South Region, but a small proportion of the Daer WOA crosses over into West Region.



- Balmore WTW: Sources and WTW are in West Region, but there are 4 different WOAs supplied from Balmore; 3 of which are in the South Region (Balmore & Carron Valley WOA, Balmore South Region Nith WOA, Balmore South Region Tweed WOA).
- Afton WTW: Source and WTW are in West Region, but it supplies a small area in South Region (Afton South Region WOA).
- Turret WTW: Source and WTW are in East Region, but it also supplies areas in West Region (Turret West Region WOA).

Since Average Daily Outputs are derived from WTW's DI, the cross-boundary flow is accounted for and assigned to the region within its treatment rather than abstraction. This is consistent with the historic methodology.

The confidence grade for the number of sources remains at B2 (as per previous year). The overall reliability band remains as B. Although the asset information now held in Ellipse is sufficient to enable the number of sources to be reliably determined, we recognise that there is still work to be done in establishing a robust process for this data being maintained as business as usual. Currently it is reliant on annual checks and bulk updates. The confidence grade for columns 110-140 (the average daily output of these sources) remains at B2 (in line with reported confidence for table A2).

#### **E4.6-7 Bulk water exports and imports**

We do not have any raw water exports or imports. Accordingly, a confidence grade of AX has been entered for these lines.

#### **E4.8-12 Proportion of own source output**

There were only minor changes to the source type proportions of total distribution input (DI) this year.

#### **E4.13 Peak demand - peak to average ratio**

This line reports the ratio A: B where –

A = the average daily volume into supply in the peak seven day period in the peak year of the preceding year.

In 2018/19, Average daily volume was 1,806.16 Ml/d and the peak to average ratio was 1.101.

No changes were made to the process or methodology used to report this line. As the figure is based on weekly reported distribution input (DI), the confidence grade assigned to it is based on the confidence grade of the DI in the peak year. The confidence grade is therefore B2, the same as that used for the DI data in AR19.

#### **E4.14 Average pumping head – resources and treatment**

The reported Average Pumping head this year is unchanged at 28.3.

As limited flow and pressure data is available, the methodology used was to update last year’s figures by calculating the change to the “Work Done” (m<sup>4</sup>) at regional level based on the proportional (regional) change to DI. This figure was then divided by the Regional DI to obtain the Regional Pumping Head, which was then aggregated.

Although the definitions include a requirement to report on inter-stage pumping for this line, we have again not included any such information due to insufficient data in this area.

**Pumping head data**

We note that due to data limitations our confidence grade has remained at C4. We currently have a limited dataset from which we extrapolate an overall pumping head value across the whole of Scottish Water. We acknowledge that further work is required to improve the quality of this data.

**E4.20-26 Water Treatment Works by Process Type**

The number of water treatment works (WTW) decreased by 3 to 239; the total distribution input (DI) increased by 10.21 MI/d to 1,806.16 MI/d.

The process for completing Table E4 is the same as for previous years. Changes to the numbers of WTW by process type have arisen as a result of operational changes this year.

Note: Table E4 reports all WTWs that provided water into supply at any time during the year.

The confidence grade for the number of WTW remains at A2. The confidence grade for total DI remains at B3.

**E4.28-38 Water Treatment Works by Size Band**

Changes to the number of water treatment works (WTW) in use and proportions (%) of total distribution input (DI) this year are broken down by WTW size band in the table below:

Size Band	2017/18		2018/19		Net Change	
	No.	%	No.	%	No.	%
<= 1 MI/d	132	1.16	130	1.20	-2	0.04
>1, <= 2.5 MI/d	24	1.27	23	1.28	-1	0.01
>2.5, <= 5 MI/d	22	2.73	22	2.82	0	0.09
>5, <= 10 MI/d	19	4.93	19	4.61	0	-0.38
>10, <= 25 MI/d	18	10.58	18	10.64	0	0.06
>25, <= 50 MI/d	12	15.50	12	15.43	0	-0.07
>50, <= 100 MI/d	9	22.90	9	22.78	0	-0.12
>100, <= 175 MI/d	4	21.78	4	20.64	0	-1.14
>175 MI/d	2	19.16	2	20.61	0	1.45
<b>Total</b>	<b>242</b>		<b>239</b>		<b>-3</b>	

The confidence grade for the number of WTW is reported as A2. The confidence grade for proportion of total DI remains at C3.

#### E4.15-39 Functional costs by operational area, process and size band

##### Water Resources & Treatment E4.19

	<b>Total</b>
Functional expenditure:	£m
2018/19	64.742
2017/18	<u>61.508</u>
<b>Variance</b>	<b><u>(3.234)</u></b>

Water resources and treatment costs increased by £3.2m (5.3%) from 2017/18. The increase is analysed as follows:

- £1.4m (10.9%) increase in power costs mainly incurred through the operation of water treatment works and raw water intakes, as a result of higher tariffs (£0.8m) and greater energy consumption (£0.8m) driven by responding to dry weather conditions, partially offset by lower Carbon Reduction Commitment charges (CRC);
- £2.8m (29.0%) increase in general and support costs, largely due to a £1.7m increase in IT costs as a result of significant transition costs involved in switching IT partners, new cloud based application costs and GDPR requirements. There was also an increase of £0.8m in employment costs due to pay progression and pension cost increases, and £0.3m of other general and support increases, offset by;
- £0.7m (-14.5%) reduction in hire and contracted services, due to slightly lower overall contractor maintenance requirements at water treatment works (£0.5m), along with a £0.2m reduction in sludge treatment and disposal during the year; and
- £0.4m (-16.4%) reduction in other direct costs, due primarily to a reduction in ad-hoc tankering of water to maintain supplies not attributable to the prolonged period of dry weather (£0.5m), partially offset with an increase in insurance claim costs of £0.1m.

Water resources and treatment costs analysed by region:

	North	East	South	West	Direct	General and Support	Total
Functional expenditure:	£m	£m	£m	£m	£m	£m	£m
2018/19	11.928	14.382	10.012	15.811	52.133	12.809	64.742
2017/18	<u>11.291</u>	<u>13.284</u>	<u>9.981</u>	<u>17.178</u>	<u>51.734</u>	<u>9.774</u>	<u>61.508</u>
<b>Variance</b>	<b><u>(0.637)</u></b>	<b><u>(1.098)</u></b>	<b><u>(0.031)</u></b>	<b><u>+1.367</u></b>	<b><u>(0.399)</u></b>	<b><u>(2.835)</u></b>	<b><u>(3.234)</u></b>

Changes to the numbers of WTW by process type and size band have arisen as a result of operational changes and process re-classifications in WTW during 2018/19. Re-stating 2017/18 figures on like-for-like basis shows the following variations:

Analysis of water resources and treatment costs by process type:

	2018/19	2017/18	Variance
	£m	£m	£m
<b>Process Type</b>			
SD : Simple Disinfecton	1.457	1.330	(0.127)
W1 : SD plus simple physical or chemical treatment	0.156	0.115	(0.041)
W2 : Single stage complex physical or chemical treatment	10.158	10.698	+0.540
W3 : Multiple stage complex treatment, excluding W4	34.761	33.951	(0.810)
W4 : Very high cost treatment Process	5.601	5.640	+0.039
<b>Direct</b>	<b>52.133</b>	<b>51.734</b>	<b>(0.399)</b>
General and Support	12.609	9.774	(2.835)
<b>Total</b>	<b>64.742</b>	<b>61.508</b>	<b>(3.234)</b>

Direct costs by process type have moved in line with overall cost increases explained above with the exception of:

- Process type W2 due to a reduction in power costs as a result of reduced raw water pumping to Balmore WTW.

Analysis of water resources and treatment costs by size band:

	2018/19	2017/18	Variance
	£m	£m	£m
<b>Size band</b>			
<=1 MI/d	8.013	6.951	(1.062)
>1 to <=2.5 MI/d	3.007	3.126	+0.119
>2.5 to <=5 MI/d	3.941	3.821	(0.120)
>5 to <=10 MI/d	4.642	4.702	+0.060
>10 to <=25 MI/d	8.284	8.781	+0.497
>25 to <=50 MI/d	8.791	8.324	(0.467)
>50 to <=100 MI/d	6.980	6.414	(0.566)
>100 to <=175 MI/d	5.038	5.361	+0.323
>175 MI/d	3.437	4.254	+0.817
<b>Direct</b>	<b>52.133</b>	<b>51.734</b>	<b>(0.399)</b>
General and Support	12.609	9.774	(2.835)
<b>Total</b>	<b>64.742</b>	<b>61.508</b>	<b>(3.234)</b>

The allocation of costs by size band remained broadly consistent with 2017/18, with the exception of:

- Size band <=1 MI/d, accounting for 65% of sites, which relates to incremental increases among several sites, mostly attributable to pay progression, and increased costs associated with the prolonged dry weather conditions; and
- Size band > 175MI/d which is primarily due to the reduction in power costs attributable to Balmore WTW through reduced raw water pumping.

Costs which are directly attributable to abstraction and treatment are charged to the specific asset cost code in the General Ledger, either via direct charging, Ellipse timesheets or work orders. Of the £52.1m total direct resource and treatment costs, £46.8m of costs or 89.8% have been directly charged to assets in our corporate costing system.

Other costs have been allocated to Water Resources and Treatment through ABM support activity allocation, e.g. stores based on number of issues, IT applications based on number of users, etc. Therefore, support costs are allocated on a resource consumed basis. However, many of these costs are not specific to an asset; they are generally attributable to an employee. Consequently, the majority of these support costs have been allocated to the activities the employees have been completing.

**Confidence Grades** – Confidence grades on Table E4 are consistent with grades in the general E table commentary and remain consistent with 2017/18.

## **Table E6 Water Distribution**

The methodology used to allocate properties and population to the 4 operational regions remains unchanged from the previous year across this table.

The figure reported on Line E6.1 reports the annual average resident connected population and is based on the background data that reports line A2.1.

The total number of connected properties reported on line E6.2 is consistent with the figure reported in A1.10.

The value reported on line E6.3 reflects the volume of water delivered to households. This figure is consistent with the sum of the figures reported in A2.7 and A2.8. The volume was calculated by operational region using the property figures calculated for line E6.2, multiplied by the regional specific Per Household Consumption figure.

The volume of water reported as delivered to non-households as shown on line E6.4 is consistent with the sum of the figures reported in A2.9 and A2.10.

Measured and unmeasured non-household volumes are allocated to water operational areas and summed to regional level; the method remains unchanged from last year.

### **E6.5 Area**

There has been no change to the operational regions in the last year and the area reported on line E6.5 has remained the same at 79,799km<sup>2</sup>. The confidence grade at A1 reflects the fact that the operational region boundaries are taken directly from the corporate GIS.

### **E6.6 Number of supply zones**

The number of supply zones reported on line E6.6 has decreased by 15 to 285, was calculated using the same methodology as last year, and matches the number reported to the Drinking Water Quality Regulator. Changes in zones topology are tracked and recorded by the Water Quality Regulation Zone procedure and a full audit trail is available.

### **E6.12-16 Potable mains**

There was an increase in total length of mains; with a total increase in length of 70 km (0.14%). The majority of this increase is within Band 1, with 0.34% increase in length in Band 1 (51 km).

The inventory is reported from our corporate GIS, where 57.6km (1%) of mains length is not populated with diameter. Of this 57.6km, 68% is infilled using the GIS Infill method, and the remaining items were allocated the default infill (the median diameter for their material type). When focused on potable, public, in use mains, this translates to 35.1km (0.7%) not populated with diameter. Of this 35.1km, 79% is infilled using the GIS Infill method, and the remaining items were allocated the default infill (the median diameter for their material type).

The confidence grade is B2.

### **E6.17 Total length of unlined iron mains**

The total length of unlined iron mains as held in our corporate GIS has decreased by 58.5 km (0.4 %) to 14,815.8 km, in this reporting year.

The report relies on population of the material and lining attributes in the inventory. 30km (0.6%) of potable main length required infill for material type. Of this, 75% was infilled using the GIS Infill Method, 2.1% where infilled based on commission year, and the remaining 22.8% remained without infill due to the lack of commission year.

The information available for pipe lining is not fully complete either, with 755.16 km (40.1%) of ferrous inventory having null or unknown lining attribute.

### **E6.18 Total length of mains >320mm diameter**

The total length of mains greater than 300mm diameter has increased by 0.5 km to 3942.5 km, in this reporting year, which is a 0.01% increase.

In this instance 0.41 km (0.4%) of length is not populated with diameter. Of this 0.41 km, 100% is infilled using the GIS Infill method.

### **E6.19 Mains Bursts**

The reported number of water mains bursts is derived from both the number of customer and non-customer reported bursts for the reporting year.

The number of water mains bursts has increased by 708 to 8,358 over the report year representing an overall 9.3% increase on last year.

A general overall increasing trend in the number of bursts was evident throughout the majority of the report year.

The number of reported bursts showed a 4.6% increase during the report year compared to last year's 15.6% increase. The number of unreported bursts showed a 24% increase during the report year compared to last year's 11% increase.

The annual number of non-customer-reported bursts for the reporting year is 27% of the total number of bursts, leaving 73% being customer reported bursts. This split is comparable to previous reporting years.

The confidence grade remains at B3.

The reported top-down leakage level shown on line E6.20 is aligned with the figures on tables A2 and G3, where we report leakage in terms of Maximum Likelihood Estimation (MLE) leakage.

The overall number of low pressure properties has increased from 415 to 421. Targeted investment and operational changes have improved pressure to 1 property during 2018-19. 26 properties have been recorded as being added to the register due to asset deterioration. 20 properties have been removed due to asset Improvements. There has been 1 property added within the report year due to operational changes.

The confidence grade remains at B2.

<i>2017/18 Properties reported for low pressure</i>	<i>415</i>
Removed due to operational improvements	0
Removed due to asset improvements	-20
Removed due to better information	-1
Added due to asset deterioration	0
Added due to better information	+26
Added due to operational changes	+1
<b>2018/19 Properties reported for low pressure</b>	<b>421</b>

## **E6.22-25 Pumping Stations**

Lines E6.22 to E6.24 report the numbers and capacity of water pumping stations recorded as being operational in the asset inventory for the report year. Changes in the reported numbers are caused by additions and removals across the network to reflect operational interventions, and data improvements in the corporate systems involved.

The total number of pumping stations has increased by 9 to 613. The table below shows the change in the number of stations recorded in the corporate asset inventory as being operational during this year:

<i>2017/18 No. of pumping stations</i>	<i>604</i>
Stations removed	1
Stations added	10
<b>2018/19 No. of pumping stations</b>	<b>613</b>

The confidence grade remains at B2.

## **E6.23 Total capacity of pumping stations**

The total capacity of pumping stations has increased by 227,946 m<sup>3</sup>/d to 2,604,278 m<sup>3</sup>/d. The change recorded this year is attributed to the increase in asset stock. The confidence grade remains at C4.

Our methodology for determining the design capacity (in kW) of these pumping stations remains unchanged.

## **E6.24 Total capacity of booster pumping stations**

The total capacity of booster pumping stations has increased by 4,064 kW to 45,806 kW.

Our methodology for determining the design capacity (in kW) of stations remains unchanged.

The confidence grade remains at C3.

## **E6.25 Average pumping head**

The average pumping head is 30.14 m in this reporting year. This is a decrease of 0.2m on the previous year.

Due to limited new flow and pressure data becoming available, the previous methodology was retained to update last year's figures using the "Work Done" (m<sup>4</sup>) at regional level based on the proportional change to DI.

We currently have a limited dataset from which we extrapolate an overall pumping head value across the whole of Scottish Water.

### **E6.26-27 Service Reservoirs**

The total number of service reservoirs has decreased by 1 to 1,311. The changes reported for the total number of service reservoirs are generally the result of operational revisions across the network.

The changes reported for the total reported capacity of service reservoirs are mainly due to improvement in data quality and the result of operational revisions across the network.

### **E6.28-29 Water Towers**

The total number of water towers has remained at 18, with a corresponding retention of the total volume at 29.3 MI, reflecting the position held in our corporate asset inventory.

### **E6.7-11 Functional Cost**

#### Water Distribution E6.11

	<b>Total</b>
	£m
Functional expenditure:	
2018/19	81.259
2017/18	<u>68.310</u>
<b>Variance</b>	<b><u>(12.949)</u></b>

Water distribution costs have increased by £12.9m (19.0%), from 2017/18. The cost increase is analysed as follows:

- £7.5m (62.4%) increase in hire and contracted costs, which relates primarily to maintaining water supplies through the prolonged period of dry weather (£3.4m), recovering associated leakage levels (£3.4m) and a higher volume of reinstatements during the year (£0.7m);
- £0.9m (10.5%) increase in power costs, mainly due to a tariff increase (£0.5m) and an increase in energy consumption (£0.5m) due to pumping requirements, partially offset by lower Carbon Reduction Commitment charges (£0.1m);
- £0.8m (3.3%) increase in employment costs due to pay progression and pension rate increases; and
- £3.9m (23.3%) increase in general and support costs, primarily due to a significant increase in IT costs due to the IT partner transition and increased cost of moving to cloud based applications (£2.0m) and GDPR requirements, hire of vehicles to maintain water supplies through drought weather conditions (£1.6m) and an increase in employment costs associated with pay progression and pension cost increases.



Water distribution costs are analysed by region:

	North	East	South	West	Total	General and Support	Total
	£m	£m	£m	£m	£m	£m	£m
Functional expenditure:							
2018/19	8.040	14.952	16.362	21.358	60.712	20.547	81.259
2017/18	6.533	13.399	13.818	17.891	51.641	16.669	68.310
Variance	(1.507)	(1.553)	(2.544)	(3.467)	(9.071)	(3.878)	(12.949)

**Confidence Grades** – Confidence grades on Table E6 are consistent with grades in the general E table commentary and remain consistent with 2017/18.

Scottish Water has slightly lower confidence levels on Network cost analysis than treatment cost analysis. This is due to lower levels of direct labour capture on Networks.

## **Table E7 Wastewater Explanatory Factors - Sewerage & Sewage treatment**

Lines E7.1 to E7.2 report the annual average resident, and non-resident, connected populations, which reflect the increases in the general population and more accurate address information.

As with previous years, tourist population has been determined on the basis of average bed spaces multiplied by an average occupancy factor. Average occupancy rates are taken from Visit Scotland's latest available Tourism in Scotland report.

The daily average volume of sewage collected is reported on line E7.3.

The average daily volume collected has been calculated as the flow which arrives in a public sewer (of any type) from any source e.g. rainfall, infiltration, domestic use, industrial use, tidal flows and connected watercourses. The approach used is the same as that in previous years and has been applied consistently across the country. It uses data sets for rainfall, connected properties and sewered areas consistent with the wastewater elements of the Annual Return.

The flow has been calculated in two parts; the dry weather flow and the storm flow.

**Dry Weather Flow:** A factor has been established that relates the number of connected properties to the amount of sewer flow in periods without rainfall. To establish this figure a number of recordings of flows with a known connected population were analysed to establish a range of flow per connected population. These factors were averaged and applied to all sewered areas to establish a total dry weather flow contribution per sewered area.

**Storm Flow:** The storm flow element was calculated by using existing sewer models to establish a relationship between rainfall depth, area of the sewered area and the amount of run-off generated. A selection of models was used and an average value of run-off per millimetre rainfall per hectare of sewered area was established. This was then applied to each sewered area to establish a total storm flow contribution per sewered area.

The total sewage collected was calculated (dry weather plus storm flows) for each sewered area and a total for each operational region calculated.

This figure includes all flows that are collected by the wastewater network but does not necessarily relate to the flows that arrive at treatment sites as a proportion of flows will be discharged via overflows and other flows collected by storm sewers will be discharged without treatment.

The total number of connected properties reported on line E7.4 reflects the number of properties connected to the wastewater network as reported in A1.20.

The reported value of the drained area reported on line E7.6 is a result of on-going verification of the sewered areas in our corporate GIS.

Line E7.7 reports the annual precipitation recorded over the report year. This reflects data obtained from the Met office across the report year.

The total length of sewer reported on line E7.8 reflects values held in our corporate GIS and a statistical calculation of lateral sewer length using unit length connections by dwelling type.

The statistical calculation of the length of lateral sewers is then used to populate line E7.9. The calculation also uses the number of properties connected to the waste water network (connected properties). Similar to previous years, a statistical calculation was used however 16% of the lateral sewer length is now calculated using data from the GIS inventory.

The length of combined sewer held in our corporate GIS is reported on line E7.10.

As modern sewerage systems are constructed with separate foul and storm sewers for new builds, the length of combined sewer is generally reducing with any net impact being the result of legacy record data being added to the corporate system, and any new outfall pipe construction.

The length of separate storm sewer reported in line E7.11 reflects the construction of separate storm sewers for new build developments.

Line E7.12 reports the length of sewer greater than 1000mm diameter. The small increase reported is attributable to a more complete diameter infill approach.

The length of critical sewer reported on line E7.13 is derived from analysis of a recorded inventory with known gaps in asset stock.

The classification of critical sewers uses the WRc methodology for asset size, material, depth and proximity to particular features.

We continue to utilise an improved infill methodology which results in less default diameters (225mm), materials & depths being used. This has meant greater accuracy and an overall increase in sewers assessed correctly for criticality.

Line E7.14 reports the number of sewer collapses over the report year. We are continuing to utilise our current methodology for this line, and intend to review the confidence grade over the next couple of years.

**E7.15-19 Sewerage Costs**

Sewerage E7.19

	<b>Total</b>
Functional expenditure:	£m
2018/19	44.707
2017/18	43.148
<b>Variance</b>	<b><u>(1.559)</u></b>

	North	East	South	West	Direct	General and Support	Total
Functional expenditure:	£m	£m	£m	£m	£m	£m	£m
2017/18	3.964	7.585	9.941	10.629	32.119	11.029	43.148
2016/17	3.398	8.600	7.951	10.822	30.771	11.645	42.416
<b>Variance</b>	<b>(0.566)</b>	<b>+1.015</b>	<b>(1.990)</b>	<b>+0.193</b>	<b>(1.348)</b>	<b>+0.616</b>	<b>(0.732)</b>

Sewerage costs have increase by £1.6m (3.6%) from 2017/18. The increase is analysed as follows:

- General and support costs have increased £1.9m (17.7%) in the year relating to the significant increase in IT costs associated with the IT partner transition, cloud based applications and GDPR requirements, offset by;
- Other direct costs have reduced by £0.4m (-26.2%), primarily due to a reduction in insurance claims during the year.

Sewerage costs are analysed by region:

	North	East	South	West	Direct	General and Support	Total
Functional expenditure:	£m	£m	£m	£m	£m	£m	£m
2018/19	3.884	8.282	9.205	10.380	31.731	12.976	44.707
2017/18	3.964	7.585	9.941	10.629	32.119	11.029	43.148
<b>Variance</b>	<b>+0.100</b>	<b>(0.697)</b>	<b>+0.736</b>	<b>+0.249</b>	<b>+0.388</b>	<b>(1.947)</b>	<b>(1.559)</b>

## E7.20 – E7.27 Wastewater Pumping Stations

Lines E7.20 to E7.27 reflect the numbers and capacities of our wastewater pumping stations.

A pumping station is defined as an individual site (i.e. not an individual pump). It includes foul, combined and stormwater pumping stations situated at treatment works but excludes inter-stage pumping. Changes since the last submission are reflective of asset data improvement, changes to pump units, and additions and removals of asset locations to reflect operational revisions.

The reported m3/d capacity figure on line E7.21 is based on extrapolated corporate data as not all stations have a design capacity recorded in the corporate asset inventory. The confidence grade remains at C4, reflecting the level of extrapolation used to derive the figure. The total capacity (Kw) of pumping stations reported on line E7.22 utilises the same methodology as in previous years. The changes reported are therefore indicative of asset stock revisions over the year.

The average pumping head reported on line E7.23 has been calculated by additions, deletions and corrections to the pumping data contained in the historic annual return spreadsheets. Due to data limitations our confidence grade has remained at C5. We currently have a limited dataset from which we extrapolate an overall pumping head value across the whole of Scottish Water. We acknowledge that further work is required to improve the quality of this data.

The total number and capacities of combined pumping stations reported on lines E7.24 and E7.25 continue to utilise the same methodology as in previous years.

There has been an overall reduction in the number of combined pumping stations but an increase in volume. The volume increased due to a large combined pumping station being added to the current inventory as the result of a general data improvement.

The confidence grade has remained at C4, reflecting the level of extrapolation used to derive the reported figures.

The total number and capacities reported on lines E7.26 and E7.27 of stormwater pumping stations reflect data from our corporate asset inventory. The number of pumping stations has remained the same and there has been a slight increase in the capacity at existing pumping stations.

### **E7.28 & E7.29 Number of combined sewer overflows**

The number of combined sewer overflows (CSOs) has been confirmed using selected desktop and site surveys. Continual improvement has been undertaken to identify abandoned CSO and duplicate records. Additionally we continue to identify and record the presence and type of screens (powered/ non-powered) to report on line E7.29.

The changes reported this year are mainly due to better recording of the presence of screens at CSOs and increased numbers of powered screens.

The number of combined sewer and emergency overflows in this reporting year is 3,067 which is a decrease of 16 from the previous year. The overall decrease is due to the abandonment of unscreened CSOs and improvements of CSO records.

The number of screened CSOs has increased by 107 to 1,352; mainly due to better recording of the presence of screens at CSOs and increased numbers of powered screens.

### **E7.30 Number of sewage treatment works**

Line E7.30 reports the number of sewage treatment works (WWTW) using our corporate asset inventory. The number of sewage treatment works (STW) has remained the same at 1,843. The confidence grade remains at A3.

### **E7.31 Total load**

The total load has increased by 3,273.5 kg BOD/day to 225,858 kg BOD/day. This increase reflects the net change in the constituent components of the works loads.

The load consists of the following constituents:

- Population
- Tourist
- Non-domestic load
- Trade effluent
- Imported private septic tanks
- Imported public septic tanks

- Imported other loads
- Imported WWTW sludge
- Imported WTW sludge
- Sludge return liquors

Population (73% of total load)

The population load has increased by 1,876 kg BOD/day. The increase in population load is a reflection of the increase in population reported in line E7.1.

Tourist (2.0% of total load)

The tourist load has increased by 835.3 kg BOD/day. This increase is due to a greater occupancy rate being reported at tourist accommodation and better coverage of tourist accommodation in Address Based Premium GIS data.

Non-domestic load (10.4% of total load)

The non-domestic load increased by 217 kg BOD/day due to a decrease in the metered non-domestic volumes recorded

Trade effluent (11.4% of total load)

The trade effluent load has increased by 78.8 kg BOD/day.

Imported private septic tanks (0.1% of total load)

The imported private septic tanks load has decreased by 24 kg BOD/day.

Imported public septic tanks (0.1% of total load)

The imported public septic tanks load has increased by 25 kg BOD/day.

Imported other loads (0.5% of total load)

The imported other loads increased by 1,081.6 kg BOD/day. The increase was due to a correction to an error in the calculations that meant some loads were not being assigned to a STW correctly and thus not included in the total load.

Imported WWTW sludge (1.7% of total load)

The imported WWTW sludge load has decreased by 480 kg BOD/day.

Imported WTW sludge (0.3% of total load)

The imported WTW sludge load has decreased by 54 kg BOD/day.

Sludge return liquors (0.2% of total load)

The sludge return liquor load has increased by 151 kg BOD/day.

The confidence grade remains at B3.

## E7.32-36 Sewage Treatment Costs

### Sewage Treatment E7.36

	<b>Total</b>
Functional expenditure:	£m
2018/19	63.599
2017/18	58.731
<b>Variance</b>	<b><u>(4.868)</u></b>

Sewage treatment costs have increased by £4.9m (8.3%) from 2017/18. The main movements are as follows:

- £2.1m (14.5%) increase in employment costs due to a combination of pay progression (£0.7m), pension cost increases (£1.0m) and overtime to maintain WWTW compliance (£0.3);
- £1.0m (22.4%) increase in materials and consumables due to increasing chemical stock levels in an effort to mitigate the potential cost shock effect of Brexit; and
- General and support costs have increased £1.9m (17.8%), with £1.6m relating to an increase in IT support as a result of IT transition costs and the implementation of cloud based application and GDPR requirements, and £0.3m relating to an increase in employment costs due to pay progression and pension cost increases.

Sewage treatment costs are analysed by region:

	North	East	South	West	Direct	General and Support	Total
Functional expenditure:	£m	£m	£m	£m	£m	£m	£m
2018/19	7.364	12.329	16.779	14.217	50.689	12.910	63.599
2017/18	7.052	11.427	16.008	13.281	47.768	10.963	58.731
<b>Variance</b>	<b>(0.312)</b>	<b>(0.902)</b>	<b>(0.771)</b>	<b>(0.936)</b>	<b>(2.921)</b>	<b>(1.947)</b>	<b>(4.868)</b>

**Confidence Grades** – Confidence grades on Table E7 are consistent with grades in the general E table commentary and remain consistent with 2017/18.

Scottish Water has slightly lower confidence levels on Network cost analysis than treatment cost analysis. This is due to lower levels of direct labour capture on Networks.

## Table E8 Waste water Explanatory Factors - Sewage Treatment Works

### E8.1 – E8.7 Sewage treatment works size bands

Lines E8.1 to E8.7 report the numbers of our wastewater treatment works, split by the size bands required, across the asset inventory. Changes to the number of WWTW reflect additions and removals from our asset inventory, and the impact of capital investment activities.

The total number of sewage treatment works (STW) has remained the same at 1,843. Changes to the number of STW this year are broken down by size band and treatment category in the tables below:

Size Band	2017/18	2018/19	Net Change
0	1,119	1,116	-3
1	211	211	0
2	148	148	0
3	181	185	4
4	124	119	-5
5	39	42	3
6	21	22	1
<b>Total</b>	<b>1,843</b>	<b>1,843</b>	<b>0</b>

Treatment Category	2017/18	2018/19	Net Change
Septic Tanks	1,177	1,178	1
Primary	40	40	0
Sec Activated Sludge	177	177	0
Sec Biological	296	296	0
Tertiary A1	36	36	0
Tertiary A2	19	19	0
Tertiary B1	59	59	0
Tertiary B2	14	14	0
Sea Preliminary	8	8	0
Sea Screened	3	3	0
Sea Unscreened	14	13	-1
<b>Total</b>	<b>1,843</b>	<b>1,843</b>	<b>0</b>

The confidence grade remains at B3.

### E8.9 & E8.10 Small sewage treatment works with ammonia consent 5-10 mg/l and <= 5 mg/l

These lines report on the number of small sewage treatment works with specific ammonia consents. The numbers are sourced from our compliance database and are as agreed with SEPA under the relevant discharge consents.



The number of small sewage treatment works with ammonia consent 5-10 mg/l has decreased by 1 to 44. The confidence grade remains at A1.

The number of small sewage treatment works with ammonia consent  $\leq$  5 mg/l has increased by 2 to 65. The confidence grade remains at A1.

### E8.11 - E8.18 Average Daily Loads

These lines report on the total average daily load, excluding septic tanks, for each treatment works type noted, utilising the numbers of works reported on lines E8.1 to E8.7. The confidence grades for each line reflect the degree of calculation required to derive the reported figures.

The total average daily load, excluding septic tanks, increased by 3,431 kg BOD/day to 220,053 kg BOD/day.

Changes to the total average daily load received this year are broken down by size band and treatment category in the below tables:

Size Band	2017/18	2018/19	Net Change
	<i>Excluding septic tanks</i>		
0	458	436	-22
1	1,026	1,102	76
2	2,055	2,087	32
3	10,365	10,488	123
4	36,536	34,951	-1,585
5	33,788	36,405	2,617
6	132,394	134,584	2,190
<b>Total</b>	<b>216,623</b>	<b>220,053</b>	<b>3,431</b>

Treatment Category	2017/18	2018/19	Net Change
Primary	3,444	3,550	106
Sec Activated Sludge	147,290	148,666	1,376
Sec Biological	23,192	23,382	190
Tertiary A1	25,099	26,800	1,701
Tertiary A2	4,860	4,886	26
Tertiary B1	8,532	8,577	45
Tertiary B2	1,599	1,618	19
Sea Preliminary	1,807	1,822	15
Sea Screened	310	284	-26
Sea Unscreened	492	469	-23
<b>Total</b>	<b>216,623</b>	<b>220,053</b>	<b>3,430</b>

The confidence grade remains at B3.

### **E8.19 & E8.20 Small sewage treatment works with ammonia consent 5-10 mg/l and $\leq$ 5 mg/l**

These lines report on the loads received at our small sewage treatment works with specific ammonia consents. The numbers are sourced from our compliance database and are aligned with lines E8.9 and E8.10

The total average daily load at small sewage treatment works with ammonia consent 5-10 mg/l decreased by 748 kg BOD/day to 7,939 kg BOD/day. The confidence grade remains at B3.

The total average daily load at small sewage treatment works with ammonia consent  $\leq$  5 mg/l decreased by 7,734 kg BOD/day to 45,183 kg BOD/day. Secondary Activated Sludge and Tertiary B2 categories are mainly responsible for the decrease. The confidence grade remains at B3.

### **E8.21-30 Compliance**

The percentage compliance has been calculated on the basis of SEPA results. Our methodology for calculating compliance is the same as last year and, in the case of two-tier consents, all failures have been counted, not just upper-tier failures. STW that are not sampled are not included in the averaging process for individual treatment categories and size bands. The sampling period is the financial year 2018/19.

There are 2 failing sewage treatment works being reported for 2018/19 (Dalscone Old and Bothwellbank).

Where the cells in this section are listed as 0 and AX confidence grade, this means that there was no STW in that treatment category and size band thus there has been no sampling. The average compliance has been maintained or improved at all STW treatment categories.

The confidence grade remains at B2.

### **E8.29 & E8.30 Small sewage treatment works with ammonia consent 5-10 mg/l and $\leq$ 5mg/l**

The compliance at small sewage treatment works with ammonia consent 5-10 mg/l has been maintained at all treatment categories this year.

The compliance at small sewage treatment works with ammonia consent  $\leq$  5 mg/l has been maintained at all treatment categories this year.

## E8.31-42 Costs

Overall movements are explained in table Sewage Treatment E7.36 earlier in this commentary. The costs of treating and disposing of sludge are contained within Table E10 Sludge Treatment and Disposal.

Analysis of sewage treatment costs by process type:

Changes to the numbers of STW by process type have arisen as a result of operational changes and process re-classifications in STW during 2018/19. Re-stating 2017/18 figures on like-for-like basis shows the following variations:

	Septic tanks	Primary	Secondary	Tertiary	Sea Outfalls	Direct	General and Support	Total
Total treatment works	£m	£m	£m	£m	£m	£m	£m	£m
2018/19	2.883	1.203	35.954	10.382	0.267	<b>50.689</b>	12.910	<b>63.599</b>
2017/18	2.670	1.187	33.569	10.102	0.240	<b>47.768</b>	10.963	<b>58.731</b>
<b>Variance</b>	<b>(0.213)</b>	<b>(0.016)</b>	<b>(2.385)</b>	<b>(0.280)</b>	<b>(0.027)</b>	<b>(2.921)</b>	<b>(1.947)</b>	<b>(4.868)</b>

Costs which are directly attributable to treatment are charged to the specific asset cost code in PeopleSoft, either via direct charging, Ellipse timesheets or work orders. Of the £50.7m total direct wastewater treatment costs, £41.1m of costs or 81.2% have been directly charged to assets in our corporate costing system.

Other costs have been allocated to Wastewater Treatment through ABM support activity allocation, e.g. stores based on number of issues, IT applications based on number of users, etc. Therefore, support costs are allocated on a resource consumed basis. However, many of these costs are not specific to an asset; they are generally attributable to an employee. Consequently, the majority of these support costs have been allocated to the activities the employees have been doing.

**Confidence Grades** – Confidence grades on Table E8 are consistent with grades in the general E table commentary and remain consistent with 2017/18.

## Table E9 Large Sewage Treatment Works Information Database

### E9.0 & E9.0a Name and Operational Area

These lines report the specific large non-PPP waste water treatment works for this reporting year with their operational area noted. Changes in the reported list of assets reflect the variation in both domestic, tanker, and trade effluent loads received at these works. The number of assets reported in aligned with Line E8.7.

The number of large non-PPP waste water treatment works has increased by 1 to 22 this year.

Large waste water treatment works are defined as those that receive an average loading in excess of 1,500 kg BOD/day which is approximately equivalent to a population of 25,000.

### E9.1 Population equivalent of total load received

This line reports the overall population equivalent of the total load received. The overall population equivalent of the total load received increased by 38,996 to 2,245,559..

Changes to the population equivalent of each large waste water treatment works are detailed in the below table (due to rounding the total may not equal the sum of the individual values):

WWTW	2017/18	2018/19	Net Change	% Change
Allers	42,632	49,818	7,186	16.86%
Alloa	43,511	44,078	567	1.30%
Ardoch	58,726	61,219	2,493	4.24%
Bothwellbank	-	24,937	-	-
Carbarns	48,751	48,319	-432	-0.89%
Dalderse	91,933	91,701	-232	-0.25%
Daldowie	291,977	317,927	25,950	8.89%
Dalmarnock	268,607	232,840	-35,767	-13.32%
Dunbar	28,124	28,787	663	2.36%
Dunfermline	81,873	61,055	-20,818	-25.43%
Dunnswood	30,203	30,984	781	2.59%
Erskine	81,014	83,015	2,001	2.47%
Galashiels	28,983	30,714	1,731	5.97%
Hamilton	61,322	63,430	2,108	3.44%
Kinneil Kerse	45,019	49,458	4,439	9.86%
Kirkcaldy	62,057	61,055	-1,002	-1.61%
Laighpark (Paisley)	124,451	126,440	1,989	1.60%
Perth	100,110	100,353	243	0.24%
Philipshill	61,244	54,258	-6,986	-11.41%
Shieldhall	541,426	563,713	22,287	4.12%
Stirling	70,481	78,108	7,627	10.82%
Troqueer	44,119	43,350	-769	-1.74%
<b>Total</b>	<b>2,206,563</b>	<b>2,245,559</b>	<b>14,059</b>	<b>0.64%</b>

## **E9.2 – E9.6 Compliance**

These lines report on regulatory compliance using consent data as taken from our corporate consents database. The most onerous of CAR or UWWT parameter was used to report.

Confidence grades remain at A1, reflecting the fact that the data is obtained directly from our corporate consents database.

### **E9.2 Suspended solids content**

All consent standards remained the same.

### **E9.3 BOD consent**

There have been no changes to the BOD consent standards.

### **E9.4 COD consent**

There have been no changes to the COD consent standards.

### **E9.5 Ammonia consent**

There have been no changes to the Ammonia consent standards.

### **E9.6 Phosphate consent**

All consent standards remained the same.

## **E9.7 Compliance with effluent consent standard**

The compliance with consent percentage for E9.7 based on OSM regulatory samples from the SEPA system showed that 10 works achieved 100% compliance. The lowest compliance rate was found at Kinneil Kerse which achieved 96.5% compliance.

## **E9.8- E9.14 Treatment Works Category**

These lines report the information held in the corporate asset inventory in relation to treatment type. We are reporting 22 large waste water treatment works in Table E9; this is in line with E8.7.

## E9.15- E9.21 Works cost

Analysis of functional costs for large sewage treatment works:

	2018/19	2017/18	Variance
	£m	£m	£m
Daldowie	1.214	1.007	(0.207)
Dunbar	0.388	0.350	(0.038)
Galashiels	0.079	0.133	+0.054
<b>Tertiary treatment</b>	<b>1.681</b>	<b>1.490</b>	<b>(0.191)</b>
Allers	0.353	0.296	(0.057)
Alloa	0.377	0.446	+0.069
Ardoch	0.390	0.354	(0.036)
Bothwellbank	0.326	0.166	(0.160)
Carbarns	0.437	0.390	(0.047)
Dalderse	0.336	0.547	+0.211
Dalmarnock	1.725	1.307	(0.418)
Dunfermline	0.300	0.308	+0.008
Dunnswood	0.319	0.296	(0.023)
Erskine	0.583	0.489	(0.094)
Hamilton	0.567	0.592	+0.025
Kinneil Kerse	0.490	0.448	(0.042)
Kirkcaldy	0.675	0.631	(0.044)
Lairdpark (Paisley)	0.908	0.838	(0.070)
Perth	0.657	0.558	(0.099)
Phillipshill	0.906	0.779	(0.127)
Shieldhall	2.113	1.803	(0.310)
Stirling	0.763	0.757	(0.006)
Troqueer	0.304	0.347	+0.043
<b>Secondary treatment</b>	<b>12.529</b>	<b>11.352</b>	<b>(1.177)</b>
<b>Direct large treatment works</b>	<b>14.210</b>	<b>12.842</b>	<b>(1.368)</b>
General and Support	2.263	1.531	(0.732)
<b>Total large treatment works</b>	<b>16.473</b>	<b>14.373</b>	<b>(2.100)</b>

The Increase across our large sites is explained by:

- New treatment processes at Dalmarnock and Daldowie STWs to maintain compliance has resulted in increased chemical costs incurred at both sites;
- Bothwellbank has seen an increase in chemical spend during the year to maintain compliance;
- Perth has seen an increase in contractor costs due to an increase in sludge volumes treated during the year as a result of growth and increased chemical dosing for compliance; and
- Shieldhall and Phillipshill STW have both seen increases in direct employment costs due to greater timesheet compliance at both sites.

**Confidence Grades** – Confidence grades on Table E9 are consistent with grades in the general E table commentary and remain consistent with 2017/18.

Estimated terminal pumping station costs are graded slightly lower in confidence than treatment costs, as terminal pumps (as defined) sit in networks or are costed as part of the treatment works.

**Table E10 Wastewater Explanatory Factors - Sludge Treatment and Disposal**

**E10.1 Resident population served**

The resident population served by each sludge disposal route is reported on line E10.1. This change is consistent with the rise in population reported elsewhere in this submission. We again report the population treated at Scottish Water operated WWTW that have their sludge treated at PPP sludge treatment centres. This accounts for the anomaly in aligning a population reported against the ‘incineration’ and ‘other’ routes but no Scottish Water sludge volumes being recycled through these routes.

**E10.2 Amount of sewage sludge**

Line 10.2 reports the mass of sewage sludge across the noted disposal routes. The reported volume of 15.28ttds was derived from various internal data sources including our Gemini system. We have retained the existing confidence grade of B4. Land restoration facilities in Scotland (normally former open cast mine sites) are used extensively for the disposal of sewage sludge materials that do not meet conventional or enhanced treated standards. Both Scottish Water and PPP/PFI utilised these facilities for untreated material during the reporting period. The de-watered sludge cake on the Shetland Islands continues to be the only site where local landfill is used for disposal purposes at the Shetland Islands Council site at Rova Head. The reported volume landfilled was 0.35ttds which is broadly consistent with the 0.37ttds reported the previous year. Scottish Water maintained compliance with the Water UK Biosolids Assurance Scheme following a successful 3 day surveillance audit held in March 2019. The majority of the PPP/PFI operators have made significant strides to comply with the scheme with some about to embark on their initial external audit. There is no change to this year’s confidence grade.

**E10.3- E10.9 Sludge Treatment and Disposal Costs**

Sludge Treatment E10.9

	<b>Total</b>
Functional expenditure:	£m
2018/19	17.483
2017/18	<u>14.953</u>
<b>Variance</b>	<b><u>(2.530)</u></b>

Sludge treatment costs have increased by £2.5m (16.9%) from 2017/18. This is analysed as follows:

- £0.3m (8.9%) increase in employment costs primarily due to pay progression and increased pension costs;
- An increase in hire and contracted services of £0.8m (17.2%), due to increased tankering as a result of the Glasgow sludge main burst (£0.3m), abandonment of lime plant installation at Dunfermline STC resulting in increased disposal costs (£0.2m), and increased use of contractors to maintain compliance (£0.4m);

- £0.2m (23.2%) increase in materials and consumables, largely due to an increase in chemical costs in order maintain compliance; and
- General and support costs have increased £1.1m (31.1%), resulting from an increase in IT support costs (£0.7m) due to partner transition, IT software updates and GDPR requirements, and a £0.3m increase in employment costs as a result of pay progression and pension cost increases.

Scottish Water incurs costs associated with the transportation of sludge from its own sewage treatment works to PPP sludge treatment centres (£6.5m). These costs have been reported within E3a.20 with the corresponding sludge loads reported in E3.

The allocation of sludge treatment and disposal costs by disposal route relies on robust sludge movement data linked to financial data. Scottish Water links sludge movement data from the Gemini waste management system to ABM costs to produce E10 cost analysis.

Analysis of sludge treatment costs by disposal route:

	2018/19	2017/18	Variance
	£m	£m	£m
Farmland:			
Untreated	0.000	0.000	+0.000
Conventional	1.607	3.395	+1.788
Advanced	8.406	4.594	(3.812)
Incineration	0.000	0.000	+0.000
Landfill	1.451	0.936	(0.515)
Composted	0.000	0.000	+0.000
Land reclamation	6.019	6.028	+0.009
Other	0.000	0.000	+0.000
<b>Total</b>	<b>17.483</b>	<b>14.953</b>	<b>(2.530)</b>

The change in costs by disposal route has been affected by the following main factors:

- Farmland Conventional has reduced by £1.8m over the year. This has been a result of a transfer to Farmland Advanced as a disposal route;
- Disposal costs to Farmland Advanced have increased by £3.8m in the year as a result of increased volumes at Kinneil Kerse due to a combination of growth, sludge diversions from other sites and increased chemical dosing during the year resulting in higher sludge volumes; and
- Landfill disposal costs also increased in the year (£0.5m) due to increases in landfill tax and landfill gate fees.

**Confidence Grades** – Confidence grades on Table E10 are consistent with grades in the general E table commentary and remain consistent with 2017/18.

Sludge cost analysis by ultimate disposal route requires analysis of all sludge treatment, tankering and disposal costs by works, linked to intermediate works (where applicable) and ultimate disposal route. Certain costs are clearly captured by works with identified disposal route. However, certain costs are not fully captured directly against sludge. The main areas of difficulty are inter-site sludge tankering and sludge treatment / conditioning at dual function works (sludge / wastewater treatment). Table E10 is completed on the basis of a combination of: ABM analysis, direct cost capture by asset, and Scottish Water sludge model analysis. Confidence grades on Table E10 are lower (B2) than other E Table cost analysis due to these reasons.



## G Tables

### Tables G1 & G2

Tables G1 – G2 present a summary of Scottish Water’s investment programmes for Q&S4, Q&S3a & 3b (completion programme). The investment costs and outputs reported in these tables reflect the position at the end of March 2019. Elements reported include investment within the report year, 2018/19, and our forecasts to 2020/21.

Exceptional Capital Maintenance is included within line G1.01 and is forecast at £159.0m. This is split as follows: £27.7m for Strategic Mains Diversions and £131.3m for Ayrshire Resilience.

Total forecast gross investment shown on G1 is £4,242.8m comprising £354.8m for the completion programme (Q&S3a & Q&S3b), £30.0m for SR21 Early Start and £3,858.0m for Q&S4 and IR18 allowances. Programme risk, rebates, and contingencies have been allocated to programme areas as appropriate.

Scottish Water successfully delivered £659.9m of investment in 2018/19. Table G1 reports the total investment in the report year of £619.0m on Q&S4 and IR18 projects and £40.9m on completion (Q&S3a and Q&S3b).

The Q&S3b Unplanned Completion programme has 2 projects remaining as at March 2019. Of the 37 remaining at 31 March 2015, 35 have been delivered.

Capital maintenance investment accounts for 58.2% of the investment in 2018/19.

The table below reflects the inflation assumptions used within the G Tables. Inflation assumptions have been updated to reflect our 2018/19 Delivery Plan and actual RPI at the end of March 2019.

### Inflation Assumptions

	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Overall RPI Assumption 2012/13 = 100%	106.0%	108.3%	112.3%	115.8%	119.0%	122.4%

### Post 2020-21 Investment

The forecast post 2020-21 is £347.2m. This is the combination of:

- £170.0m SR15 Completion, and
- £163.1m for planned IR18 and £14.0m for projects started in SR15 that were always scheduled to complete post April 2021 with both these elements financed from SR21.

## Table G1 Summary - Investment

The total gross capital investment shown on table G1 is £4,242.8m. This is the forecast cost to complete the SR15 programme, including the remaining outputs from the SR10 programme, all IR18 outputs and SR21 early start. The main components of this are a SR15 programme forecast cost for 2015-21 of £3,988.9m; £46.8m Q&S4 Start Early; £14.0m of SR15 Programme to be delivered and financed post 2020-21; £163.1m of the IR18 programme to be financed post 2020-21; and £30.0m SR21 Early Start. The table below provides a reconciliation with our Delivery Plan 2019 update.

	£m
<b>Total in Delivery Plan 2019 update</b>	<b>3,994.8</b>
Actual 2018-19 Indexation Update	-5.9
<b>Revised Programme Forecast</b>	<b>3,988.9</b>
Early Start Expenditure (Pre April 2015)	46.8
IR18 Financed Post 2020-21	163.1
SR15 Financed Post 2020-21	14.0
SR21 Early Start	30.0
<b>Table G Total Gross Capital Investment (G1.54)</b>	<b>4,242.8</b>

As part of our investment planning and delivery arrangements for the 2015-21 period a strengthened risk management regime has been implemented. Under this regime sub-programme and programme risk allowances are removed from project allocations and are held and governed centrally. As projects mature, the central risk allocation can be drawn down to projects or increased as appropriate. For the purposes of Table G1, the inflation risk allowances removed from project costs have been re-instated and programme risk has been proportioned across the programme. Of the £100m identified in our 2019 Delivery Plan update for 'Additional capital maintenance and enhancement risk', £42.3m was built into the cost forecasts in our Delivery Plan total of £3,994.8m. For the purposes of Table G1 the remainder, £57.7m, has been included in Capital Maintenance Management and General (G1.05) in 2020/21 to manage emerging capital maintenance risks, noting that some of this amount may be required to manage further cost pressures in the enhancement programme.

Line G1.24 includes investment for the PFI project at Dalmuir. This has been included within the cost of the non OMG180 completion programme. The expected total cost of Dalmuir is £24.4m with £6.7m forecast in the 2015-21 period.

## G1.1- G1.6 Q&S4 Capital Maintenance

Projects containing Capital Maintenance drivers are captured in these lines. In 2018/19 expenditure of £384.3m was made on Capital Maintenance; the total expenditure for the capital maintenance programme, including the additional £57.7m highlighted above, is forecast at £2,150.6m. This includes £159.0m of Exceptional Capital Maintenance for Ayrshire Resilience and Strategic Mains Diversions. The table below shows the Capital Maintenance (CM) components:

CM Components (£m)	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	Post 2020-21	Total
CM Indexation Risk	0.0	0.0	0.0	0.0	0.0	28.9	0.0	28.9
Forecast CM Profile	256.0	303.6	347.6	364.4	335.0	298.3	0.0	1905.0
Additional CM Risk						57.7		57.7
<b>Total Capital Maintenance</b>	<b>256.0</b>	<b>303.6</b>	<b>347.6</b>	<b>364.4</b>	<b>335.0</b>	<b>384.9</b>	<b>0.0</b>	<b>1991.6</b>
Exceptional CM	5.2	37.0	49.4	19.9	2.3	7.3	37.8	159.0
<b>Total Capital Maintenance (G1.06)</b>	<b>261.2</b>	<b>340.7</b>	<b>397.0</b>	<b>384.3</b>	<b>337.3</b>	<b>392.2</b>	<b>37.8</b>	<b>2150.6</b>

## G1.7– G1.13 Q&S3b Growth Investment

Projects containing Supporting Economic Development drivers are captured in these lines. In 2018/19 expenditure of £82.3m was made against Q&S4 Growth; the total forecast to complete the growth element of the programme is shown in the tables to be £428.6m in the 2015-21 period.

G1.08 and G1.09 also holds the unutilised element of Demand risk for growth, ring-fenced and Exceptional CM projects. This is currently assessed at £11.4m.

## G1.14- G1.21 Q&S4 Enhancement Expenditure

Projects containing enhancement drivers are captured in these lines. In 2018/19 expenditure of £152.5m was made against Q&S4 enhancements; the total forecast to complete the enhancements is shown in the tables to be £1278.8m.

## G1.22: IR18 Enhancements

Investment previously shown within this line has now been assigned to the appropriate area.

## G1.23 – G1.25 Q&S3a & 3b Completion Expenditure

Projects from the completion programme are captured in these lines. In 2018/19 a total expenditure of £40.9m was made against this programme.

## G1.26: Q&S5 Early Start

In line with our published Delivery Plan Update 2019 we have included an initial £30m for early start projects for SR21. Following recent developments, we would propose that in future years this line description should be revised to remove the word 'enhancement'.

**G1.27 – G1.40: Total Additional Operating Expenditure**

Additional operating expenditure is calculated through the analysis of the proportion of capital spend allocated to quality, enhanced level of service or growth for future years. The value in the report year is based on the actual opex released as a consequence of the capital programme.

**G1.41 – G1.48: Grants and Capital Contributions**

Contributions received to the end of March 2019 have all related to Service Relocations and Infrastructure Charges. A forecast has been made based on investment run-rate.

**G1.49 – G1.57: Expenditure Totals**

These lines sum the figures provided in G1.1 to G1.48 and are automatically populated.

**Reporting of the Tier 1 and Tier 2 split of capital maintenance for 2018/19**

As outlined in the papers presented to the financial framework working group in December 2018 (Proposal for Definition of Capital Maintenance and Proposal for Tier 1) and January 2019 (Scottish Water’s Range for the Long-Term Level of Tier 2 Investment – Outline View), the current Scottish Water systems are not set up to capture the proposed Tier 1 and 2 expenditure definitions that have now received broad support from stakeholders. Work is ongoing to adapt the current and future systems to ensure greater information can be captured and reported on for future Annual Returns (in shadow form initially) as agreed with the Commission.

**Assessment of Capital Maintenance expenditure**

The expenditure for the year 2018/19 was estimated using the current maintenance investment, re-categorised to reflect the definition of Tier 1 and Tier 2 activities as outlined in the financial framework working group paper and summarised in the figure below.

Maintenance Activity	Type of response	Financial Tier
Repair	Responsive	Tier 1
Refurbish		
Replace		
Repair	Planned	Tier 2
Refurbish		
Replace		
New		
Demolish		

A review of the May 2019 capital maintenance projects dataset was used to identify the Tier 1 activities. Projects were assigned to the categories of Tier 1 as set out in the financial framework working group paper and the actual costs for 2018/19 used to calculate the expenditure.

The following areas of responsive investment, currently classed as “enhancement”, have also been included in this analysis of Tier 1 expenditure:

- Service reservoirs (Repairs to service reservoirs)
- Reservoirs (IOS working on dams)
- Sewer cleaning (work to reduce flooding issues)

The following should be noted:

- Our current systems do not allow us to extract information on responsive equipment replacement and planned repairs / refurbishment and replacements included in the project scope.
- All of what we classify as “small value” investment has been assumed to be responsive, equating to £80m of total Tier 1 expenditure (50/50 split between water and waste water). Our current systems are not configured to split small value work between planned and responsive. The estimate set out below is therefore an over-estimate.
- The assessment includes expenditure on component elements that are replaced due to reaching a performance trigger level as a result of proactive monitoring (i.e. membrane / Granular Activated Carbon replacement.).
- Planned mains flushing (under DW5 programme), all planned membrane replacement and named pipe bridges projects have all been excluded from this assessment.

Based on the above review the total Tier 1 investment for 2018/19 has been estimated at £178m (in 2017/18 prices), noting that this is an over-estimate as it includes all “small value” investment.

#### Improving our ability to categorise Tier 1 and 2 investments

The following activities are being undertaken to improve our ability to categorise Tier 1 and 2 investment for reporting purposes:

- Standardising the definitions across our asset base and across our departments;
- Undertaking an impact assessment to understand which systems and process will need to be changed and what training and documentation is required for our staff;
- The processes and systems in the areas with more significant amounts of responsive repair and refurbish investment will be prioritised for modification to allow for the appropriate information to be captured;
- Major projects will initially be broken down manually while new processes are built into the systems currently being procured and implemented. It is expected that manual workarounds will be required for 2019/20 and 2020/21 reporting; and
- The value of the data will be maximised by ensuring it feeds into the costing and analytical models used to generate future forecasts of demand.

## **Table G2 Summary – Outputs**

The following is a summary of all the output programmes included in the G2 table, the number of outputs delivered in 2018/19 and the total number of outputs being delivered in the regulatory period.

### **G2.1 – G2.4 Growth**

#### **G2.1 Strategic Capacity Water Treatment**

No further WTW Capacity projects were completed during the report year.

#### **G2.2 Strategic Capacity Wastewater Treatment**

We increased the strategic capacity of our waste water treatment sites during 2018/19 to the equivalent of 6,002 customers. We are forecasting that this will increase to 44,901 customers by the end of 2020/21.

#### **G2.3 Strategic Capacity Water Network Capacity**

This line reflects outputs delivered through the Infrastructure Charge Programme for Part 3 assets. 2,058 outputs were delivered during 2018/19. We are forecasting to provide additional network capacity to 32,592 customers by the end of 2020/21.

#### **G2.4 Strategic Capacity Wastewater Network Capacity**

This line reflects outputs delivered through the Infrastructure Charge Programme for Part 3 assets. 1 output was delivered during 2018/19. We are forecasting to deliver 682 outputs by the end of 2020/21.

### **G2.5 – G2.26 Q&S4 Enhancements**

Outputs delivered in this section reflect the forecast position on the milestone graphs provided to the Output Monitoring Group Working Group (OMGWG) in May 2019. Explanation of movement in forecasts, projects or programme specific issues are detailed within the quarterly monitoring report and graph commentary to the OMGWG.

### **G2.27 – G2.43 Drinking Water Quality Indicators (Annual Measure)**

#### **G2.27 Number of lead communication pipes replaced**

In 2018/19 we completed 1,492 lead communication pipe replacements. These were made up of 1,484 customer requested jobs and 8 reactive jobs; where we replaced lead pipes when these were found as a result of a failed sample at a customer's tap.

Please note, this has been under reported in previous years and therefore the reported value includes an adjustment in 2018/19 of 59.

## **G2.28 Assessment of levels of pressure for all customers and number of improvements if low levels of service are found**

We are reporting 0 against line G2.28 for 2018/19.

## **G2.29 Improve response times to reduce average duration of short term interruptions to supply**

We have been funded to improve speed of response & identify opportunities to control pressure and reduce bursts. We are measured on ITS response through lines G3.17, G3.17a and G3.18. In addition bursts are reported through G3.19.

## **G2.30 Number of water efficiency advice and water saving packs provided (to 2% of customer base)**

There were 18,362 water packs delivered to customers in 2018/19.

## **G2.31 Number of internal flooding improvements**

There were 101 internal properties removed from the at risk register for 2018/19, an increase of 47 from the 54 reported for 2017/18.

## **G2.32 Number of internal flooding improvements – completion programme**

There are no completion programme outputs to be delivered.

## **G2.33 Number of external flooding investigations and improvements**

There were a total of 45 external properties removed from the at risk register.

## **G2.34 % of customers covered by flood resilience assessments**

66.4% of customers are covered by flood resilience assessments, the same figure as was reported for 2017/18.

There has been no increase in coverage throughout 2018/19. However, the approach over the next two years is to improve the catchments already mapped as well as increasing overall coverage to 90%.

## **G2.35 Number of surface water management investigations**

There is only 1 Surface Water Management Investigation taking place in the 2015-21 regulatory period. This has been delivered in 2016/17.

## **G2.36 Number of connections for new households and businesses**

There were 24,459 Water Connections carried out in 2018/19 compared with 23,914 connections in 2017/18.

### **G2.37 New waste water capacity for 58,000 people**

We have committed in our Delivery Plan 2015-21 to increase waste water capacity to 58,000 people. We are currently forecasting to increase the waste water capacity by 45,583 by the end of the regulatory period.

### **G2.38 Number of developer constructed assets (Part 2&3) adopted**

There were 834 assets adopted during 2018/19.

### **G2.39 Number of first time non domestic meters installed**

There were 3,316 first time non-domestic meters installed in 2018/19. These are made up of 48 proactive and 3,268 reactive installations.

Please note, this has been over reported in previous years and there has been an adjustment made in 2018/19 of 491.

### **G2.40 Number of statutory requirements to relocate services for transport infrastructure projects**

There were 40 services relocated. The data is based on Transportation Schemes completed in year and takes into account activity for both NRSWA (New Road & Streetworks Act) and AWPR (Aberdeen Western Peripheral Route).

### **G2.41 Improved contact management and proactive communication**

There is one project in the 2015-21 period which is intended to improve Scottish Water's customer contact system, 'Promise'. This has been delivered in 2018/19.

### **G2.42 Number of wholesale meter accuracy improvements**

There were 14,918 wholesale meter accuracy improvements for 2018/19. These are made up of 12,891 proactive exchanges and 2,027 reactive exchanges.

Please note, this has been under reported in previous years and there has been an adjustment made in 2018/19 of 644.

### **G2.43 Number of strategic mains diversions**

During the course of the 2015-21 investment period, Scottish Water will be undertaking a total of 5 large scale strategic mains diversion projects. 2 of these have been delivered in 2018/19, 1 is forecast in 2019/20 and the remaining 2 are being delivered post 2020/21.

### **G2.44 – G2.46 Q&SIIIa & Q&SIIIb Delivery Projects**

This section summarises the projects remaining in the 'Unplanned' completion programme.

#### **G2.44 Q&SIIIa Projects Remaining**

Killylour was the last remaining Q&S3a project to be delivered. This achieved regulatory sign-off in 2016/17.



**G2.45 Q&SIIIb Projects Remaining**

During 2018/19 1 project has been completed within this programme leaving 2 Q&S3b projects remaining. Our forecast profile for the combined Q&S3a and 3b completion projects is presented below:

	March 2015	March 2016	March 2017	March 2018	March 2019	March 2020	March 2021
Projects due to have completed by March 2015	36	14	8	3	2	0	0

**G2.46 Q&SIIIb Km of Mains Rehabilitated Remaining**

The projects for this line are already counted in line G2.14 Drinking Water Quality ‘2010-15 outputs planned to complete in the 2015-21 period’ and it was agreed at the OMGWG that, to avoid confusion, we would no longer report these outputs separately.

## **Table G3 Monitoring Serviceability**

### **G3.1 – G3.5 Drinking Water Quality Indicators (Calendar Measure)**

#### **G3.1 – G3.2 % of compliant zones for Iron & Manganese**

The exclusion of iron from drinking water increased by 4 failing zones from 25 in 2017 to 29 in 2018.

The exclusion of manganese from drinking water also increased by 6 failing zones from 9 in 2017 to 15 in 2018.

#### **G3.3 Number of microbiological failures at water treatment works**

The number of microbiological failures at water treatment works has increased by 2 from 22 in calendar year 2017 to 24 in calendar year 2018.

#### **G3.4 – Number of Customer Contacts relating to Taste**

The total number of contacts relating to taste for calendar year 2018 was 2,224 decreasing from the 2,503 reported in calendar year 2017.

#### **G3.5 – Number of Customer Contacts relating to Discolouration**

The total number of contacts relating to discolouration for calendar year 2018 was 6,101 increasing from the 4,744 reported in calendar year 2017.

### **G3.6 – G3.15 Environment Serviceability Indicators**

#### **G3.6 Number of Failing Waste water treatment works**

The number of failing waste water treatment works is reported as 2 for 2018/19, an increase of 2 from the 2017/18 reported position.

#### **G3.7 Number of sludge treatment facilities improved to comply with safe sludge matrix**

This measure was delivered in 2015/16 but there was an extra sludge treatment facility improved in 2017/18 at Orbiston WWTW and two additional sludge treatment facilities improved in 2018/19 at Golspie and Torra WTW taking the total to 11.

#### **G3.8 The maximum number of UIDs**

This indicator is dependent on the outcome of the seven-stage process and studies which may reduce or increase the number of outputs to be delivered and the number of known unsatisfactory discharges.

At March 2019 there were 704 UIDs compared to a position of 720 UIDs in March 2018.

We no longer include a target for this measure in our Delivery Plan 2015-21 commitments. Scottish Water will continue to report of the maximum number of UIDs but we would request removing this line from the G tables to align with our Delivery Plan commitments.

### **G3.9 Number of Pollution Incidents**

Environmental Pollution Incidents occur where there is a failure at a water or waste water asset that impacts on the environment, as agreed with SEPA. These are classified by SEPA as water or waste water category 1, 2 or 3 incidents. We recorded a total of 227 water and waste water incidents in 2018/19. The number of agreed Cat 1, 2 & 3 incidents are listed below.

Water Cat 1&2	0 incidents agreed
Water Cat 3	8 incidents agreed
Sewerage Cat 1&2	9 incidents agreed
Sewerage Cat 3	210 incidents agreed

### **G3.10 Pollution incidents (sewerage)**

There were 219 pollution incidents (sewerage) during 2018/19.

### **G3.11 Serious pollution incidents (sewerage)**

There were 9 serious pollution incidents (sewerage) during 2018/19.

### **G3.12 Serious pollution incidents (water)**

There were 0 serious pollution incidents (water) during 2018/19.

### **G3.13 Discharge permit compliance**

Discharge permit compliance has decreased by 0.33% from 100% in 2017/18 to 99.67% in 2018/19.

### **G3.14 Satisfactory sludge disposal**

Satisfactory sludge disposal has remained at 100% during 2018/19.

### **G3.15 Greenhouse Gas (GHG) Emissions (ktCO<sub>2</sub>e).**

The Greenhouse gas emissions (ktCO<sub>2</sub>e) position for 2018/19 was 272, a decrease of [43] ktCO<sub>2</sub>e from 2017/18.

### **G3.16 – G3.36 Customer Service Serviceability Indicators**

#### **G3.16 Properties on the Low Pressure Register**

The number of properties on the Low Pressure Register has increased from 45 in 17/18 to 51 excluding allowable exclusions in 18/19.

#### **G3.17 Properties with Unplanned Interruptions to Supply > 12 hours**

The overall figure for 2018/19 for properties affected for more than 12 hours was 357 properties, a decrease of 195 properties from 2017/18.

#### **G3.17a Properties with Unplanned Interruptions to Supply > 6 hours**

The overall figure for 2018/19 for properties affected more than 6 hours was 4,989.

### **G3.18 Number of hours lost due to water supply interruptions for three hours or longer**

There were 0.391 hours per property lost due to water supply interruptions for three hours or longer, an increase of 0.005 from the 2017/18 position of 0.386 hours.

### **G3.19 Number of Bursts per 1,000km of mains**

There were 172 mains bursts per 1,000km during 2018/19. This was an increase of 15 from 2017/18.

### **G3.20 Properties at Risk of Internal Flooding**

The number of properties at risk of internal flooding has decreased from 373 in 2017/18 to 307 in 2018/19.

### **G3.21 Properties internally flooded due to other causes**

The figures reported here relate to flooding caused by blockages or failure of main and lateral sewers. The number of properties internally flooded in 2018/19 was 369, an increase of 23 on the previous year.

### **G3.22 Properties internally flooded due to overloaded sewers**

The number of properties internally flooded due to overloaded sewers in 2018/19 was 129, an increase of 66 properties from 2017/18.

### **G3.23 Incidents of internal sewer flooding for properties that have flooded within the last ten years**

There were 125 incidents of internal sewer flooding during 2018/19 at properties that have flooded within the last ten years, a decrease of 77 incidents on the 2017/18 position.

### **G3.24 Properties at risk of external sewer flooding**

The number of properties at risk of external sewer flooding at March 2019 was 3,698. This is based on: 1:10; 2:10; 1:10 default; 2:10 default; and holding.

### **G3.25 Incidents of external sewer flooding due to other causes**

The number of incidents of external sewer flooding due to other causes at March 2019 was 8,169.

### **G3.26 Incidents of external sewer flooding due to overloaded sewers**

The number of incidents of external sewer flooding due to overloaded sewers in 2018/19 was 116.

### **G3.27 The Overall Satisfaction level (from the customer service questionnaire)**

The Overall Satisfaction level at March 2019 was 92.32%. This was an increase of 0.82% compared to the reported March 2018 position of 91.5%.

### **G3.28 The maximum number of 'second tier' complaints referred to Scottish Public Services Ombudsman (Regulator Upheld Complaints)**

The overall number of Regulator Upheld Complaints in 2018/19 was 0 which is a decrease of 3 on the previous year.

### **G3.29 The number of telephone contacts relating to drinking water quality**

Total number of telephone contacts which related to drinking water quality in 2018 was 10,193, an increase of 884 from 2017.

### **G3.30 The Overall Performance Assessment (OPA) Score (In Year Value)**

The March 2019 OPA score was 403 a decrease of 3 points compared to our reported March 2018 position.

### **G3.31 The Overall Performance Assessment (OPA) Score (Period Average)**

The period average OPA score was 400.

### **G3.32 The average annual level of leakage**

The 2018/19 Maximum Likelihood Estimation (MLE) leakage is 480.010. This is a reduction of 11.969 from the 2017/18 MLE leakage figure of 491.979 MI/d.

### **G3.33 Household Customer Experience Measure (hCEM)**

The 2018/19 hCEM score was 87.54 compared to the 2017/18 score of 86.36.

### **G3.34 Non-Household Customer Experience Measure (nhCEM)**

The 2018/19 nhCEM score was 81.74 compared to the 2017/18 score of 77.50.

### **G3.35 High Esteem Test**

The 2018/19 high esteem test score was 78.1%.

### **G3.36 Wholesale Key Performance Indicator (KPI's)**

The 2018/19 Wholesale KPI score is reported as 98.4%, an increase of 0.8% from 2017/18.

### G3.37 to 3.38 Resilience of Supply

#### G3.37 Water Available for Supply Index (covered by 1:40 level of service) G3.38 Water Available for Supply Index (covered by 1:100 level of service)

Background on the definition and method used to calculate WASI is provided in 'Water Available for Supply Index (WASI) - Definition & Method.docx'.

A more detailed commentary on the overall AR19 Water Resources Supply-Demand balance (SDB) position is provided in the commentary for the B9 tables – SoSI (Security of Supply Index). This provides details of the major changes for the current year, focussing on the impact on SoSI. Note that % populations reported in the Table B9 SoSI commentary may vary slight from the Table G3 values because they are based on different SDB scenarios (WASI based on Dry Year Critical (DYC) whereas SoSI is based on the Dry Year Annual Average (DYAA) scenario).

The reported AR19 WASI data for Table G3 lines 32-32a is provided in Table 1 below. This provides a comparison against the equivalent figures for the previous years back to AR14.

Table 1: AR19 WASI

	<b>1 in 40</b>	<b>1 in 100</b>
<b>AR14</b>	96.5%	77.6%
<b>AR15</b>	88.9%	71.5%
<b>AR16</b>	87.3%	77.3%
<b>AR17</b>	86.8%	82.2%
<b>AR18</b>	86.7%	70.1%
<b>AR19</b>	<b>86.7%</b>	<b>71.4%</b>
<b>% Change</b>	<b>0.0%</b>	<b>+1.3%</b>

Table 1 shows that there has been no change in the % population in surplus at the 1 in 40 level of service since AR18. There has been a minor change in the % population in surplus at the 1 in 100 level of service (+1.3%).

A total population of 1.22% in 15 WRZs has gone into deficit at the 1 in 40 level of service, with a slightly smaller proportion (0.92%) of population in 8 WRZs coming out of 1 in 40 deficit. Any remaining change contributed is from zones that stay in deficit; the total effect of this churn is that the overall proportion of population in surplus is remarkably similar to AR18.

These changes at the 1 in 40 level of service are mostly made up of small WRZs with populations, with one exception this year as Black Esk & Kettleton WRZ has lapsed into a very small deficit but brings approximately 48,000 (0.91%) people into this deficit category. Conversely, the largest WRZ coming out of 1 in 40 deficit is Corsehouse & Amlaird WRZ (0.69%).

The 1 in 100 Level of Service position is also similar to last year's position, driven mainly by modest deficits in 3 relatively large WRZs at this more stringent test or supply capability. These WRZs are: Fife WRZ, Clatto & Lintrathen & Whitehillocks WRZ, and Invercannie & Mannofield WRZ.

The following two figures show the relationship between percentage Surplus (or Deficit) and Zonal population percentages for both the 1 in 40 LoS and the 1 in 100 LoS across a range spanning from +15% Surplus to -15% Deficit.

**G3.39 to 3.49 Asset Health Index**

The asset health indices use Scottish Water’s Residual Life Expectancy Index (RLEI). Currently this Index is being used over a trial period as the approach to asset health indices remains under review.

The RLEI calculates the current age of each asset and divides it by an estimate of the expected life of the asset. This score is subtracted from 1 to give a score of between 1 and 0, where 1 represents a brand new asset and 0 represents an asset at the end of its expected life span.

The current ages for infrastructure and non-infrastructure assets are sourced from Scottish Water information systems. The expected lives are estimates from models. Reservoirs are an exception as they are not covered by models.

We note that:

- Sea outfalls and sewer structures are excluded as they are not recognised as specific sites in Ellipse;
- For water resources (G3.39), the value of civil works is sourced from an internal review (2013);
- For water mains (G3.40), ARM assumes retained service standards.

Summary and comparison of indicators from WIC2018 to WIC2019

In the table below, a value of 1 as an indicator represents a brand new asset and zero represents an asset at the end of its expected life.

The values largely remain unchanged from last year.

Line Ref.	Asset Serviceability Indicators	AR18 indicators	AR19 indicators	Change	Change (%)
G3.39	Water resources	0.617	0.625	0.008	1.4
G3.40	Water mains	0.605	0.612	0.007	1.1
G3.41	Water treatment works	0.720	0.720	0.000	0.0
G3.42	Water storage	0.716	0.716	0.000	0.0
G3.43	Water pumping stations	0.718	0.718	0.001	0.1
G3.44	Wastewater sewers	0.821	0.817	-0.004	-0.5
G3.45	Wastewater sewer structures	n/a	n/a	n/a	n/a
G3.46	Wastewater sea outfalls	n/a	n/a	n/a	n/a
G3.47	Wastewater sewage pumping stations	0.532	0.533	0.001	0.2
G3.48	Wastewater sewage treatment works	0.541	0.541	0.000	0.0
G3.49	Wastewater sludge treatment facilities	0.579	0.581	0.002	0.4

## **Table G4 OMD Inputs including Q&S3a and Q&S3b completion project sign-off**

G4.1 - G4.22 show the enhancements under the Q&S4 programme by OMD grouping. The number of outputs recorded is split by the following 5 delivery milestones by quarter:

- Milestone 1: Feasibility
- Milestone 2: Approval of Financial Budget
- Milestone 3: Start on site
- Milestone 4: Scottish Water's internal acceptance of beneficial use to customers
- Milestone 5: Regulatory sign-off

The data reflects the cumulative actual and forecast position by year over the 2015-21 period. The data also reflects the position recorded in the milestone outputs graphs presented to the OMG working group in May 2019.

## **Table G5 Growth**

Lines G5.1 to G5.14 show the expenditure Scottish Water has incurred or is forecast to incur on growth for the SR15 programme. The report has been produced using the same methodology as G1 with the projects actual expenditure taken from Scottish Water's financial systems and the forecast expenditure taken from Primavera. The % allocation assigned to each project has been taken from the systems which hold Scottish Water's CAPEX gateway approval forms. Most projects are assigned 100% to growth but there is significant growth investment delivered as part of large quality schemes.

The total Growth expenditure shown on table G5 aligns with the total Growth on table G1. Table G1 shows the split between Part 3 and Part 4 assets and also the split between household and non-household for Reasonable Cost Contributions (RCC).

At the start of the SR15 period, projects were set up for each unitary authority, water/wastewater and household/non household. This allows G1.9, G1.10 and lines G5.1, G5.2, G5.4 and G5.5 to be populated from the resultant outputs.

Total Net Growth Expenditure is £59.4m in the year and is forecast to be £274.8m in SR15. IR18 investment has been assigned to the appropriate areas.

**G5.15 to G5.19** - Total Service Relocations costs in 18/19 were £9.6m and customer contributions released against these projects was £6.4m giving a net spend of £3.2m in the period. The overall forecast for SR15 is a net spend after contributions of £18.5m

**G5.20 & G5.26** – Water household infrastructure charge income for the period to March 2019 are £8.5m, which relates to 24,157 new properties being connected, or applying to be connected, to the water network.

**G5.21 & G5.27** – Water non-household infrastructure charge income for the period to March 2018 are £106k, which relates to 302 new non-household properties being connected, or applying to be connected, to the water network.

**G5.22 & G5.29** – Wastewater household infrastructure charges for the period to March 2017 are £7.8m, which relates to 22,241 new properties being connected, or applying to be connected, to the water network



**G5.23 & G5.30** – Wastewater non-household infrastructure charge income for the period to March 2016 is £18k, which relates to 51 new non-household properties being connected, or applying to be connected, to the wastewater network.

**G5.24** – Total infrastructure charge income across all activities in the period is £16.4m and is forecast to be £92.1m in SR15 from a combined 266,746 connections to the water and waste networks in SR15.

**G5.25** – Total Net Growth Expenditure after all contributions is £59.44m in the period and is forecast to be £274.8m in SR15. This forecast has increased significantly since last year's return as IR18 funding has now been allocated.

**G5.32** – For the period to March 2019 we paid RCC to developers for 14,949 household properties that are connected to our water assets (Part 2 & 3).

**G5.33** – For the period to March 2019 we paid RCC to developers for -78 non-household properties that are connected to our water assets (Part 2 & 3). This was a correction to the SR15 period to date position.

**G5.35** – For the period to March 2019 we paid RCC to developers for 12,159 household properties that are connected to our wastewater assets (Part 2 & 3).

**G5.36** – For the period to March 2019 we paid RCC to developers for 15 non-household properties that are connected to our wastewater assets (Part 2 & 3).

**G5.38** – For each new household property connected to the water network an Infrastructure charge is applicable. Therefore, for the period to March 2019, the number of household properties paying an infrastructure charge to SW for additional water strategic capacity is 24,157 (as line G5.26).

**G5.39** – For the period to March 2019, the number of non-household properties paying an infrastructure charge to SW for additional water strategic capacity is 302 (as line G5.27).

**G5.41** – For the period to March 2019, the number of household properties paying an infrastructure charge to SW for additional wastewater strategic capacity is 22,241 (as line G5.29).

**G5.42** - For each new non-household property connected to the wastewater network an Infrastructure charge is applicable. Therefore, for the period to March 2019, the number of non-household properties paying an infrastructure charge to SW for additional wastewater strategic capacity is 51 (as line G5.30).

**G5.39 and G5.40** - The data reported in these two lines represents the increase in strategic capacity delivered, or forecast to be delivered, by all relevant projects with the exception of any Infra Charge projects. In these completed tables the reported data has been intentionally matched to lines G2.1 and G2.2.

## **Table G6 Project Analysis – Actuals & Forecast – Water & Waste water**

### **General Comments**

The datasets used to create tables G1, G2 and G4 are taken from our corporate systems and are then also used to complete this table. The data in this table is consistent with Scottish Water's end of year reporting to our Board. The table analyses the 2015-21 programme by individual Project (by Row), detailing out Investment, Outputs and Dates (by Column).

**Column 1** - Contains the unique project auto code number.

**Column 2** - Contains the Project Title.

**Column 3** - Contains the Q&S Period for each project. This is a project level assessment – some projects may have split funding.

**Column 4** - Contains the group each project belongs to and is used by Scottish Water to allocate project ownership and project type.

**Column 5** - Contains a more detailed view of programme groupings.

**Column 6** - Shows the split project ID to allow projects with multiple outputs to be shown

**Column 7** – Shows the output group for the split projects

**Column 8** – Shows the split between water, waste water and general

**Column 9** - Contains the Technical Expression sign-off owner (if required).

**Column 10** - Contains the internal delivery vehicle assignment.

**Column 11** - Contains a sub set of Programme Grouping.

**Column 12** – Shows the current milestone stage.

**Column 13 - 17** Show the forecast Milestone dates.

**Column 18** – Contains the Local Authority area each project falls into if it has one location.

**Column 19 to 25** – Contain the project expenditure analysed by financial year.

**Column 26** – Contains the total actual or forecast project expenditure to March 2021.

**Column 27** - Post 2021 project expenditure

**Column 28** - Grand total project expenditure.

**Column 29** – Contains the Table K budget allocation. This is in outturn prices and reflects Table K with additional budget for contributions and allocations from elsewhere in Scottish Water. In many cases, projects that were originally identified in Table K have been split into multiple projects or aggregated to form larger projects. Although Scottish Water does assess the programme cost compared with the Table K allocation, this is generally done at sub-programme and programme level.

**Column 30 & 31** – Contain the infrastructure & non-infrastructure grants received.

**Column 32 & 33** – Contain the infrastructure & non-infrastructure contributions received.

**Column 34** – Contains the impact of projects on operating expenditure.

**Column 35** – This has not been populated as any project with a regulatory output will require regulatory signoff or equivalent.

**Column 36-55** – Contain the project's drivers and allocations as confirmed through the CAPEX approvals process.

**Column 56 – 105** – Contain the low level output groups and show the project level allocation of outputs.

## H Tables – ASSET INVENTORY

**Table H1 - Summary of Gross MEAV**

Scottish Water's reported Annual Return 2018/19 gross asset inventory valuation is £72.98 billion. The gross valuation is dominated by the infrastructure valuation of £61.23 billion, comprising 83.91% of the total. The non-infrastructure total valuation is £11.57 billion, which is 15.85% of the total valuation. Support services valuation is approximately £174.50 million representing 0.24% of the gross asset inventory valuation.

Asset Type	AR18 Gross MEAV (£m)	% of total	AR19 Gross MEAV (£m)	% of total
Water Infrastructure	17,499.12	24.81%	17,997.79	24.66%
Water Non - Infrastructure	5,401.86	7.66%	5,520.14	7.56%
Wastewater Infrastructure	41,768.23	59.21%	43,236.65	59.24%
Wastewater Non-Infrastructure	5,708.93	8.09%	6,050.35	8.29%
Support Services	161.11	0.23%	174.50	0.24%
<b>Total</b>	<b>70,539.24</b>	<b>100%</b>	<b>72,979.43</b>	<b>100%</b>

The combined gross valuation of water and wastewater infrastructure assets has increased by £1.97 billion and there has been an increase in the gross valuation for non-infrastructure assets of £459.70 million.

The total valuation of the asset stock has increased by £2.44 billion since 17/18 primarily due to the 3.06% increase in RPI indexation.

### Detailed summary of gross MEAV

Line Ref.	Asset Type	AR18 Gross MEAV (£m)	% of total	AR19 Gross MEAV (£m)	% of total	Change (£m)	% change
H1.1	Water treatment works	3,183.66	4.51%	3,235.44	4.43%	51.78	1.63%
H1.2	Water storage	1,889.47	2.68%	1,930.55	2.65%	41.08	2.17%
H1.3	Water pumping stations	328.73	0.47%	354.15	0.49%	25.42	7.73%
H1.4	Water resources	3,293.26	4.67%	3,388.18	4.64%	94.92	2.88%
H1.5	Water mains	14,205.86	20.14 %	14,609.61	20.02 %	403.75	2.84%
H1.6	Sewers	40,691.26	57.69 %	42,125.58	57.72 %	1,434.32	3.52%
H1.7	Sewer structures	627.58	0.89%	647.65	0.89%	20.07	3.20%
H1.8	Sea outfalls	449.39	0.64%	463.42	0.64%	14.03	3.12%
H1.9	Sewage pumping stations	1,014.53	1.44%	1,084.71	1.49%	70.18	6.92%
H1.10	Sewage treatment works	4,472.02	6.34%	4,739.71	6.49%	267.69	5.99%
H1.11	Sludge treatment facilities	222.38	0.32%	225.93	0.31%	3.55	1.59%
H1.12	Support services	161.11	0.23%	174.50	0.24%	13.39	8.31%
	<b>Total</b>	<b>70,539.24</b>	<b>100%</b>	<b>72,979.43</b>	<b>100%</b>	<b>2,440.19</b>	

The table above shows the change in the total gross asset valuation of Scottish Water's assets from 2017/18 to 2018/19 by asset category.

The table below summarises the changes which incorporate a variance greater than +/- £200m or +/- 30% in any one asset category.

Asset Category	Change (£m)	Change (%)
Water mains	403.75	2.84%
Sewers	1,434.32	3.52%
Sewage treatment works	267.69	5.99%
<b>Total</b>	<b>2,105.76</b>	

### Summary and comparison of net valuations from AR18 to AR19

The total net depreciated value of Scottish Water's non-infrastructure asset inventory (including support services depreciable assets) is £4.03 billion.

Line Ref.	Asset Type	AR18 Net MEAV (£m)	% of total	AR19 Net MEAV (£m)	% of total	Change (£m)	% change
H1.1	Water treatment works [101]	1,058.46	27.48%	1075.52	26.71%	17.05	1.61%
H1.2	Water storage [102]	767.14	19.92%	786.28	19.53%	19.14	2.49%
H1.3	Water pumping stations [103]	132.35	3.44%	138.79	3.45%	6.44	4.86%
H1.9	Sewage pumping stations [109]	398.04	10.34%	420.96	10.45%	22.92	5.76%
H1.10	Sewage treatment works [110]	1,322.78	34.35%	1426.60	35.43%	103.82	7.85%
H1.11	Sludge treatment facilities by disposal type [111]	64.40	1.67%	65.56	1.63%	1.16	1.80%
H1.12	Support services [112]	107.90	2.80%	113.13	2.81%	5.23	5.23
	<b>Total</b>	<b>3,851.07</b>	<b>100%</b>	<b>4,026.84</b>	<b>100%</b>	<b>175.76</b>	<b>%</b>

The table above shows the changes to the net valuation by asset category.

### **Summary of Confidence grades (MEAV)**

There has been no movement in the confidence grades for MEAV from 2017/18 to 2018/19. The MEAV confidence grade is dominated by the absence of data at certain levels within the asset inventories resulting in C4 grades for non-infrastructure assets and B4 or C4 for infrastructure.

### **Summary of Confidence grades (Asset Stock)**

There has been no movement in the confidence grades for asset stock in 2018/19. The confidence grades applied to the asset stock is a reflection of the asset inventories.

## Table H2: Water Non Infrastructure

### H2.1-2.8: Water Treatment Works

**Asset Stock:** The total number of Water Treatment Works in this reporting year is 235. This is a reduction of 3 from the 238 reported in the Annual Return 2017/18.

WTW Sites	Number
AR18 Sites Reported	238
Sites Non-Operational AR19	4
Sites Non-SW Owned AR19	0
Newly Reported AR19	1
<b>AR19 Sites Reported</b>	<b>235</b>

**Asset Valuation:** The asset valuation for water treatment works for the reporting year has increased from £3.18 to £3.24 billion. The valuation has increased due to better asset information and the RPI increase.

### H2.9-2.10: Water Storage

**Asset Stock:** The total number of Water Storage Assets in this reporting year is 1,313. This is a reduction of 6 from the 1,319 reported in the Annual Return 2017/18. The net change in the number of reported Water Storage sites is summarised in the table below.

WS Sites	Number
AR18 Sites Reported	1,319
Sites Non-Operational AR19	12
Sites Non-SW Owned AR19	0
Newly Reported AR19	6
<b>AR19 Sites Reported</b>	<b>1,313</b>

**Asset Valuation:** The asset valuation for water storage assets for the reporting year has increased from £1.89 to £1.93 billion. The valuation has increased due to the RPI increase.

### H2.11-2.13: Water Pumping Station

**Asset Stock:** The total number of Water Pumping Stations (WPS) in this reporting year is 777. This is an increase of 2 from the 775 reported in the Annual Return 2017/18.

WPS Sites	Number
AR18 Sites Reported	775
Sites Non-Operational AR19	4
Sites Non-SW Owned AR19	0
Newly Reported AR19	6
<b>AR19 Sites Reported</b>	<b>777</b>

**Asset Valuation:** The asset valuation for water pumping stations for the reporting year has increased from £328.73 to £354.15 million. The valuation has increased due to an increase in the number of assets and the RPI increase.

## **Table H3: Water Infrastructure**

### **H3.1: Water Resources – Dams & Impounding Reservoirs**

**Asset Stock:** The total number of Dams & Impounding Reservoirs in this reporting year is 210, which is a reduction of 2 from 2017/18.

**Asset Valuation:** The asset valuation for dams and impounding reservoirs for the reporting year has increased from £1.36billion to £1.40 billion. The valuation has increased due to RPI.

### **H3.2: Water Resources – Raw Water Intakes**

**Asset Stock:** The total number of raw water intakes in this reporting year is 299. This is a reduction of 1 from 2017/18.

**Asset Valuation:** The asset valuation for raw water intakes for the reporting year has increased from £33.17 to £34.05 million. The valuation has increased due to RPI.

For the MEAV methodology for Dams and Impounding Reservoirs and Raw Water Intakes, costs have been determined for a representative set of modern equivalent assets. The costs were developed by Berkeley Consultants in 2008 who estimated the structure cost on the basis of labour, plant and materials only. Included in the cost of the intake are concrete costs of the weir and the intake chamber, as well as all screens, valves and contractor preliminaries.

### **H3.3: Water Resources – Raw Water Aqueducts**

**Asset Stock:** The total length of Raw Water Aqueducts in this reporting year is 1,735.9km. This is an increase of 2.3km from 2017/18.

**Asset Valuation:** The asset valuation for this reporting year has increased from £1.9 to £1.96 billion. The valuation has increased mainly due to RPI.

### **H3.4: Water Mains – Mains Potable**

**Asset Stock:** The total length of Potable Mains in this reporting year is 48,639.4km. This is an increase of 102.9km from 2017/18. Diameters are infilled based on connected pipes' values where available, or based on an average diameter for the pipe based on its material.

**Asset Valuation:** The asset valuation for this reporting year has increased from £13.07 to £13.52 billion. The valuation has increased mainly due to an increase in the RPI.

### **H3.5: Mains Other**

**Asset Stock:** The total length of Mains Other in this reporting year is 141.4km. This is an increase of 1.1km from 2017/18.

**Asset Valuation:** The asset valuation for this reporting year has increased from £30.8 to £31.89 million. This is due to the increase in RPI.

### **H3.6: Communication Pipes (Lead)**

**Asset Stock:** The total number of Communication Pipes (Lead) in this reporting year is 57,998. This is a decrease of 2,108 from 2017/18. The reduction is due to an increase in customer requests for replacement.

**Asset Valuation:** The asset valuation for this reporting year has decreased to £32.48 from £32.67 million. The valuation has decreased due to the reduction in the number of pipes.

### **H3.7: Communication Pipes (Other)**

**Asset Stock:** The total number of Communication Pipes (Other) in this reporting year is 1,716,663. This is a decrease of 132,405 from 2017/18.

**Asset Valuation:** The asset valuation for this reporting year has decreased from £1.00 to £0.96 billion. The valuation has decreased due to the reduction in the number of pipes reported.

### **H3.8: Water Meters**

**Asset Stock:** The total number of Water Meters in this reporting year is 143,908. This is an increase of 13,283 from 2017/18.

**Asset Valuation:** The asset valuation for this reporting year has increased from £60.12 to £67.64 million. The valuation has increased mainly due to the increased number of Commercial Meters.



## **Table H.4: Wastewater Infrastructure**

### **H4.1: Sewers – Critical Sewers**

**Asset Stock:** The total length of Critical Sewers in this reporting year is 10,924.1km. This is a decrease of 5.7km from 2017/18.

**Asset Valuation:** The asset valuation for this reporting year has increased from £14.30 to £14.75 billion. The valuation has increased due to the change in RPI.

### **H4.2: Sewers – Non Critical Sewers**

**Asset Stock:** The total length of Non-Critical Sewers in this reporting year is 40,943.4km. This is an increase of 191.7km from 2017/18. Lateral sewers are included in band 1.

**Asset Valuation:** The asset valuation for this reporting year has increased from £25.9 to £26.9 billion. The valuation has increased mostly due to changes in the RPI. The change in the total length of sewers in the critical and non-critical categories has been affected by the improved infill method assigning more accurate diameter and material values to pipes.

### **H4.3: Sewers – Sewage and Sludge Pumping Mains**

**Asset Stock:** The total length of Sewage and Sludge Pumping Mains in this reporting year is 1,335.2km. This is an increase of 5.0km from 2017/18.

**Asset Valuation:** The asset valuation for this reporting year has increased from £496.08 to £514.86 million. The valuation has increased due to the change in RPI.

### **H4.4 and H4.5: Sewer Structures: CSOs and Other Sewer Structures**

**Asset Stock:** The number of combined sewer and emergency overflows in the report year is 3,687 a decrease of 18 from the Annual Return 2017/18. The number of Other Sewer Structures is 312, the same as reported in 2017/18. The overall decrease is due to the abandonment of unsatisfactory CSOs and improvements to our CSO records.

**Asset Valuation:** The asset valuation for this reporting year has increased from £627.58 to £647.65 million. The valuation has increased mainly due to better recording of the presence of screens at CSOs and increased numbers of powered screens.

### **H4.6 and H4.7: Sea Outfalls: Short and Long Sea Outfalls**

**Asset Stock:** The total number of Sea Outfalls in this reporting year is 1,427. Four new outfalls were built from 2017/18. The number of long sea outfalls remains at 28.

**Asset Valuation:** The asset valuation for this reporting year has increased from £449.39 to £463.42 million. The valuation has increased mainly due to a change in the RPI.

## Table H5: Waste Water Non-Infrastructure

### H5.1 and H5.2: Sewage Pumping Stations

**Asset Stock:** The total number of Sewage Pumping Stations (SPS) in this reporting year is 2,239. This is an increase of 3 from the 2,236 reported in the Annual Return 2017/18.

SPS Sites	Number
AR18 Sites Reported	2,236
Sites Non-Operational AR19	12
Sites Non-SW Owned AR19	3
Newly Reported AR19	18
<b>AR19 Sites Reported</b>	<b>2,239</b>

**Asset Valuation:** The asset valuation for the reporting year has increased from £1.01 to £1.08 billion. The valuation has increased mainly due to the increased number of sewage pumping stations being reported.

### H5.3 to H5.7: Sewage Treatment Works

**Asset Stock:** The total number of Sewage Treatment Works in this reporting year is 1,835. This is an increase of 1 from the 1,834 reported in the Annual Return 2017/18. The net change in the number of reported STW Sites is summarised in the table below.

STW Sites	Number
AR18 Sites Reported	1,834
Sites Non-Operational AR19	2
Sites Non-SW Owned AR19	0
Newly Reported AR19	3
<b>AR19 Sites Reported</b>	<b>1,835</b>

**Asset Valuation:** The asset valuation for the reporting year has increased from £4.47 to £4.74 billion. The valuation has increased mainly due to an increase in the RPI.

### H5.8 and H5.9: Sludge Treatment Facilities

**Asset Stock:** The total number of sludge treatment facilities in this reporting year is 19. This is the same as reported in the Annual Return 2017/18.

STC Sites	Number
AR18 Sites Reported	19
Sites Non-Operational AR19	0
Sites Non-SW Owned AR19	0
Newly Reported AR19	0
<b>AR19 Sites Reported</b>	<b>19</b>

**Asset Valuation:** The asset valuation for the reporting year has increased from £222.38 to £225.93 million. The valuation has mainly increased due to more detailed asset information allowing more accurate valuations and an increase in RPI.

## **Table H6: Support Services**

### **H6.1 – H6.3: Offices & laboratories, Depots & Workshops, Control centres**

**Asset Stock:** There was no change to the numbers of any of these building types.

**Asset Valuation:** The asset valuation for this report year has remained the same at £80.8 million. As with the previous reporting year, existing condition grades have been used to calculate the remaining life of non-operational buildings, which all have an asset design life of 60 years.

### **H6.4: Vehicle & Plant**

**Asset Stock:** We currently have 2,434 vehicles & plant listed on the Scottish Water vehicle inventory

**Asset Valuation:** The gross valuation has increase to £51.85 million from £37.67 million. Net values were calculated based on the age and design life of each vehicle or plant using the same method as previous Annual Returns.

### **H6.5: Telemetry Systems**

**Asset Stock:** The number of Telemetry sites in this reporting year is 4,863. This is an increase of 54 from 4,809 reported in 2017/18.

**Asset Valuation:** The asset valuation for this reporting year has increased to £21.9 million from £21.2 million. The process is unchanged from that explained in AR09 Commentary, Annex 1. All telemetry outstations were assigned a short (6-15 year) design life, as recommended in the WIC guidance notes.

### **H6.6: Information Systems**

**Asset Stock:** Laptops have increased to 4,444 from 3,902, desktops have increased to 721 from 695 and servers have increased to 299 from 284.

**Asset Valuation:** The asset valuation for this reporting year has increased to £5.45 million from £4.96 million.

### **H6.7: Other Non-Operational Assets**

**Asset Stock:** There are 30 properties/land reported as being owned by Scottish Water in this reporting year which is 5 fewer than in 2017/18 due to the sale of 5 properties.

**Asset Valuation:** The asset valuation for this reporting year has decreased to £14.57 million from £16.55 million. Farm and grazing land values are based on valuations carried out in 2008/09.