

Table 11 – Water Service Activities

1. Key Findings

Criteria	RAG	Assessment
Independent review of performance and reporting	Green	Performance good. Reporting process well managed
Methodology	Green	Methodology consistent with current process, control points identified and understood
Assumptions	Green	Assumptions reasonable and appropriately applied
Source data	Green	Source data is clearly identified, complete beyond material concern, well managed through to accurate systems input
Clarity of audit trails	Blue	Content with reported information but supporting data needs future improvement
Confidence grades	Green	Confidence grade appropriate and rationale clearly documented
Governance	Green	Responsibilities for integrity of data and commentary clearly defined. Good evidence of engagement and of final sign-off. (Note: Line 26&27 are considered blue as final sign off not available because the reviewer is on long term sick leave)

- There has been a large decrease in the length of mains renewed, decreasing from 165km to 66km, which the Company explained was due to 2015/16 being the first year of PC15.
- The Company has exceeded its target of 93km of new, renewed or relined mains delivered under the watermain rehabilitation programme, with 117km reported in AIR16.
- Due to the reduced mains renewal programme there has been a large decrease in the number of lead communication pipes being replaced under the mains rehabilitation programme, although this has been partially balanced by a significant increase in those replaced under the proactive lead replacement programme.
- All zonal study models were completed in 2012/13, so the Company has reported 100% completion. The Company has continued to update the models when investment is planned and requires an up-to-date model.
- The confidence grades are similar to last year, with small changes due to the balance of data from different sources with different levels of confidence.
- The number of mains bursts reported (Line 11) has reduced significantly from 84.8 to 73.8 bursts per 1000 km.
- The Company has changed to report overall compliance against all regulatory consented parameters (previously the Company was reporting Mean Zonal Compliance).
- Percentage overall compliance with drinking water regulations for the 2015 calendar year has remained static compared to 2014 (99.83% compared to 99.86% in 2014)

- Percentage compliance at customers' taps has also stable at 99.74% compared to 99.78% in 2014.
- Percentage iron compliance at customers' taps has dropped slightly from 98.95% in 2014 to 98.40% in 2015. The OPA target is 97.90% and the Overall target is 97.10%. Both targets have been achieved.
- We note a UKAS audit concluded the nitrite parameter was not fully compliant with two Quality Control measures during part of 2015. The net effect on the reported data is a negligible decrease in the compliance at consumer tap to 99.74% from 99.75%.
- The Company has improved its process for collating the data for this table from various sources, but we recommend that further improvements could be made, particularly in the supporting commentary to explain any significant year-on-year changes.
- We audited the reported data and challenged the processes on a sample basis. Except where detailed below, we consider the data reported in the table is robustly prepared using systems and process that are appropriate and in line with the reporting requirements and that are properly implemented with effective quality control and governance arrangements.

2. Audit Scope

The audit consisted of interviews with the NI Water system holders to discuss the methodology and data that has been used to populate this table as well as plans for improving the data in future years

3. Performance and significant events

Company performance has largely been in line with AIR15, except in the following areas:

- There has been a large decrease in the length of mains renewed, decreasing from 165km to 66km, which the Company explained was due to 2015/16 being the first year of PC15.
- The Company has exceeded its target of 93km of new, renewed or relined mains delivered under the watermain rehabilitation programme, with 117km reported in AIR16.
- The number of lead communication pipes replaced has fallen from 3,729 in AIR15 to 3,322, although the Company has identified significantly more through the proactive lead replacement programme (increased from 401 to 1,922).
- Although all distribution studies have been completed the Company has started the process of updating these as up-to-date information is required. Within AIR16 nine models have been updated.

- The Company has continued its educational programme to promote the efficient use of water to schools and at community events
- The burst rate has fallen significantly from previous years.

4. Compliance methodology and process controls

4.1 Compliance methodology

This information will provide a statement of activities in the Report Year relating to the water service. It includes activities and asset balance in respect of water distribution; information on water distribution zone studies and delivery of nominated outputs.

4.2 Process/methodology controls

The detail of **Lines 1 and 12** is consistent with the requirements laid out by the regulator. The Line Methodology provided by NI Water confirms that information on potable water mains includes only live NIW-owned water mains that are of type distribution, distribution trunk, trunk and scour as they are deemed as potable mains. This includes trunk mains that are marked as “Out of Service” on the Corporate Asset Register as although these mains are currently out of service they are not abandoned and thus are usable so could potentially come back into service in the future.

The entries of **Lines 2 to 17** in this table are largely a summation of values provided from Networks Water Operations (NOW) and Engineering Procurement (EP). The values are collated centrally before compilation of the commentary and table. We recommend that the data providers (EP and Networks Water or their contractors) supply a commentary with their data which discusses trends and highlights any reasons for atypical years.

For **Lines 18 to 21** the Company explained that there was no change in its methodology which we confirmed. The data source is the LIMS system which is an Oracle database interrogated using specific SQL queries. Monthly reports are produced, at month end, for ongoing monitoring of Water Quality compliance. This data is produced using the same SQL queries as used for the AIR year end information. Where the number of samples taken and analysed is greater than the number required by the DWI, the reported number is adjusted to be the number required. The Company confirmed that any exceedances are reported even if they originate from a larger number of samples than required. The Company therefore does not selectively report sample results when a greater number is available to the number required

We note, in general, that the Company’s methodology demands that the table and commentary are signed off by senior management.

The Company demonstrated the quality assurance controls they have in place to ensure the data collation process is robust.

We recommend that in future years a single spreadsheet is used to collate the data from EP and Networks Water. We further recommend that this spreadsheet includes consistency checks and trends to allow year-on-year comparisons.

For **Lines 22-24**, all relevant data is extracted directly from CPMR.

5. Summary of audit checks

Total length of mains (Lines 1 and 12)

The figure reported in Line 1 has been copied as directed from AIR15 Table 16 Line 12. The figure reported in Line 12 has been extracted from the Corporate Asset Register using a query specified within the Company's Line Methodology document. There has been no change to the methodology used from the previous years with the exception that the query is now automated rather than manually entered

Line 1 is consistent with AIR15 Table 16, line 12.

Changes during report year (Lines 2 to 11)

There have been no significant changes to the overall methodologies or commentary structures compared to last year. The commentary segregates the inputs from Networks Water Operations (NWO) and Engineering & Procurement (EP) for Lines 2 to 10. The level of detail provided for Lines 7 to 10 has been improved from the AIR15 commentary, although during the audit we discussed further improvements that could be made to improve the audit trails.

Main renewal, relining and cleaning (Lines 2-6)

In line with the Reporting Requirements, the inputs into the line totals comprise input data from EP and NWO. Mains owned and operated by PPP are correctly excluded from the line totals.

Trunk main lengths have been included in the totals, with details of trunk mains included in the commentary as required by the reporting requirements.

Line 2 - Mains Renewals

The Company reports a significant reduction in mains renewals this year from 164.91km to 65.94km, of which 64.75km were undertaken by EP. Checks were carried out against the source data provided by the Company which confirmed the contributing lengths and line total.

We undertook a detailed audit of the data provided by EP and confirm that the total length of mains renewed was 64.75km, with audit trails back to the lengths of mains renewed in individual schemes.

The Company explained that the decrease in activity is in line with Company expectations as 2015/16 is the first year of the PC15 investment programme.

Line 3 - Mains Relined

Pipes replaced by pipe bursting or structural lining methods (standard slip-lining techniques are generally considered to replace the existing main) are correctly included in Line 2 as these are deemed to replace the existing pipe. Only where a lining is applied to the fabric of the existing pipe (e.g. spray application) is it reported in Line 3. Historically, the Company does not employ any non-structural lining methods and hence the Line 3 total is zero.

Line 4 - Mains Cleaning

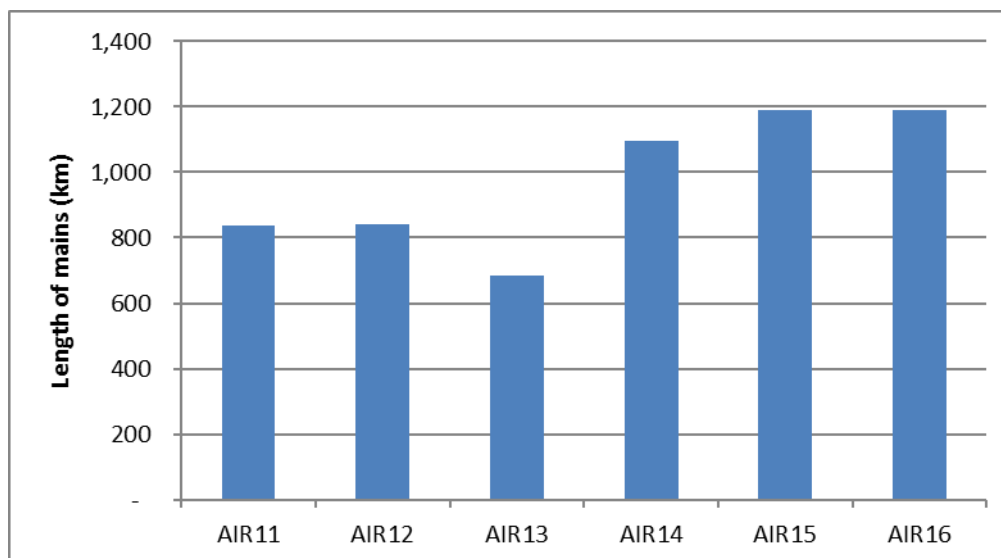
Mains cleaning is all undertaken by Networks Water under maintenance activity and hence the EP input is zero. This year, the Line 4 total of 1,191.68km for AIR16 is very

similar to the value of 1,189.50km reported for AIR15. The Company implemented a proactive mains flushing programme in 2013/14, with 2014/15 being the first full year of its operation, which has continued into 2015/16. The switch from a greater focus on planned flushing is a positive one.

We undertook a detailed audit of mains flushing activity and confirm audit trails exist to support the reported values, which indicate that there were 7,639 flushing jobs, of which 6,731 (88%) were planned.

The Company undertakes manual checks to assess the data for errors and duplication. NI Water admits that there remains a potential for some double counting (primarily of repeated one-off incidents within year or for cleaning in response to customer water quality complaints following a mains repair), but advised that these occurrences are 'minimal'. We agree that recent changes to the system through the adoption of work codes and that carrying out manual checks on the data have greatly improved the reliability and reduced the potential for error.

We are therefore satisfied that the impact of any remaining duplications is likely to be within the margin of error covered by the current B3 confidence grade.



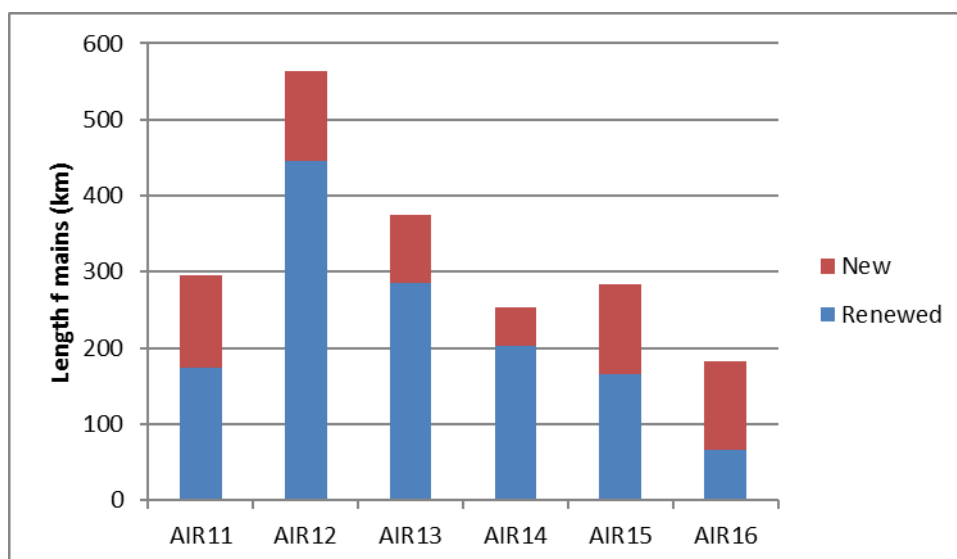
Line 6 – New mains

The reported length of new mains installed has decreased slightly from 118.24km last year to 115.81km within the Report Year. This comprises 42.37km (27.85km last year) reported by NWO and 73.44km (90.39km last year) reported by EP.

The total reported by NWO relates to new housing developments, and represents a large increase from last year's total of 27.85km, but this is balanced by a decrease in the length reported by EP.

Line 6a – New, renewed or relined mains

This is a calculated line, the sum of Lines 2, 3 and 6, which is 181.75km. The following graph presents a comparison with previous years.



Line 6b – New, renewed or relined mains delivered under the watermain rehabilitation programme

This is a calculated line, the sum of Lines 2, 3 and 6 (181.75km) minus new mains on new developments (44.51km) and nominated trunk mains (20.32km) giving a value of 116.92km.

The Company has exceeded the monitoring plan target of 93km per year in PC15 by almost 24km (25%).

Mains abandoned and other changes (Line 7)

The Company has reported a total of 105.51km of abandoned mains this year, with the majority which are reported by EP under the mains rehabilitation programme (104.32km). Lengths are based on data provided by individual project managers. The decrease is in-line with the reduction in the mains renewal programme which was explained due to 2015/16 being the first year of PC15.

Our review concluded that the lengths of abandoned mains have been correctly extracted in accordance with the Reporting Requirements. The total includes both wholly abandoned mains and those replaced by renewals as per the Line 7 definition. Due to the way the Company reports abandoned mains, it is not possible to ascertain from the data how much of this length was wholly abandoned and how much was through the process of renewal.

Communication pipes (Lines 8 to 10)

The reporting requirements for Lines 8 to 9 changed for AIR14, with greater detail requested for the reasons leading to the lead communication pipe replacement.

Line 8a – Lead communication pipes replaced as a consequence of water quality sample failures

This activity is undertaken by NWO, with an increase in the number of replacements from 15 in AIR15 to 37 in AIR16.

Line 8b – Lead communication pipes replaced as a consequence of customers notifying NI Water that they are replacing their lead supply pipe

This activity is undertaken by NWO only; we were provided with monthly totals that confirm the annual total is 703. This is consistent with previous years (566 in AIR15 and 617 in AIR14).

Line 8c – Opportunistic lead communication pipes replacement undertaken under the watermain rehabilitation programme or during burst service pipe repairs

The Company reports a significant reduction in this line from 2,747 in AIR15 to 660 in AIR16, this was comprised of 613 by EP and 47 by NWO. The decrease is a combination of AIR15 being a particularly high year (mains replacement undertaken in areas with lead communication pipes), a higher proportion of rural mains renewal in 2015/16 (fewer communication pipes per length of main) and the lower length of mains renewed.

Line 8d - Lead communication pipes replaced under the proactive lead replacement programme

This activity is undertaken by EP and relates to a new programme that started in April 2014 and has shown a significant growth over the first two years of operation. The AIR14 value was zero with 401 for AIR15 and 1,822 being reported for AIR16.

Line 9 - Lead communication pipes replaced - maintenance or other

The Company has reported a value that is the summation of 8a, 8b, 8c and 8d (3,322).

Line 10 - Communication pipes replaced - other

The Company has replaced 3,915 communication pipes, which is significantly lower than the AIR15 number of 7,469 due to a higher percentage of replacement in 2015/16 being undertaken in rural areas. This is built up from 2,736 from EP (6,312 in AIR15) and 1,179 from Networks Water (1,157 in AIR15).

Line 11 - Mains bursts per 1000km

There has been a significant reduction in the reported number of mains bursts per 1,000km this year, decreasing from 85 (84.8 to 1dp) to 74 (73.8 to 1dp) to bursts per 1,000km. As explained in the Company's commentary, this figure is derived from the total number of recorded burst events, divided by the total length of mains.

The calculation applies a total length of 26,728.83km, which is the length reported in Line 12.

The number of bursts is calculated directly from data compiled and reported primarily by the Water Business Unit and agreed with field managers within Networks Water Function.

A check against the source data confirmed the contributing total of 1,127 reported burst mains repairs by Networks Water with an additional 924 repairs were undertaken due to waste detection. Additionally, 79 repairs due to third party damage on mains were deducted from the total giving a total of 1,972 repairs in the report year. The values for the last three years are shown in the following table.

Number of bursts	AIR14	AIR15	AIR16	Change (AIR15 to AIR16)
Networks Water	1,397	1,352	1,127	-17%
Waste detection	985	996	924	-7%
Third party damage	-83	-82	-79	-4%
Total	2,299	2,266	1,972	-13%

The reduction in the number of bursts is consistent with a relatively mild winter experienced in 2015/16 which also resulted in both lower levels of leakage and a lower natural rate of rise (NRR) of leakage. It is likely that bursts levels could return to higher levels in years with harsher winter weather.

We undertook an audit of the February 2016 values and confirm the company has a robust audit trail.

NI Water confirmed that any repairs to PPP mains are not included in the totals. The line total is confirmed as the correct summation of the data obtained from the two data sources divided by 1,000km as required.

Distribution Studies (Lines 13 to 17)

NI Water's zonal model development started in 1999 leading to the adoption of a distribution zonal study programme in 2001. The programme aimed to set up models to cover all 71 water supply zones, and the final 7 models were completed by 2012-13. NI Water now has models for all 71 distribution zones, and consequently 100% of the zones studies have been completed, and 100% of the population are now covered.

Now that all models have been completed, the company has started a new programme to update the oldest models, those where significant changes may have occurred, and those covering areas where there may be operational problems or investment planned.

The Company state that nine models have been updated during 2015/16.

To retain some consistency with the reporting requirements for zonal distribution studies we recommend that in addition to listing the models updated during the report year the Company also provide an estimate of the population covered by each model. This would should enable reporting by percentage of population covered by updated models.

Water quality compliance measures (Lines 18 to 21)

The Company now reports % Overall compliance with drinking water regulations (previously Mean Zonal Compliance was reported). % Overall compliance is similar to that reported in AIR15 which indicates continued stability against drinking water regulations.

We note a UKAS audit concluded the nitrite parameter was not fully compliant with two Quality Control measures during part of 2015. The net effect on the reported data is a negligible decrease in the compliance at consumer tap to 99.74% from 99.75% (Line 19). Percentage iron compliance at customers' taps has reduced slightly from 98.95% in 2014 to 98.40% in 2015. The OPA target is 97.90% and the Overall target is 97.10%. Both targets have been achieved.

Service Reservoirs with coliforms detected in >5% of samples (line 21) is reported as zero because no service reservoir sites had more than three failures during the year (three failures = the site has failed for the year).

Nominated Water Service Outputs (Lines 22-24)

During our audit of Tables 40 and 40a of AIR16 and associated interrogation of CPMR we were able to confirm the total number of nominated Trunk Main, WTW and Reservoir improvements delivered during the year (line 22 to 24).

For AIR16, NI Water has delivered 2 nominated Trunk Main outputs against a PC15 FD profile of 1 output for Year 1, with completion of a PC13 scheme - [x] delayed to 2015/16 due to industrial action. The actual PC15 Yr1 nominated output completed during the year was [x] Phase 2B.

In terms of the WTW nominated outputs (Line 23), 1 WTW output was delivered in 2015/16 ([x]), against a PC15 Year 1 target of 1 output.

There were no nominated Service Reservoir nominated outputs forecast for delivery in Year 1 of PC15, hence the Nil return.

We note that DWI have full visibility of the programme and sign off individual outputs confirming delivery of the outputs reported in Lines 26 to 28.

Number of Catchment Management Plans (Line 25)

Company activity in the year and plans for 2016/17 are reported on in detail in the commentaries for Table 47. We reviewed Table 47 and confirmed that the CMPs for [x], [x] and [x] were completed in 2015/16 and constitute the 3 noted for the year against line 25. Thirteen of the 24 CMPs will then remain of which 2 ([x], and [x]) may qualify for InterReg funding, so may not require capital from the PC15 allowances.

Number of school visits (Line 26)

We reviewed the hard copy and spreadsheet records to confirm a total of 277 school visits during the 2015/16 year. Data includes all visits to school classes, visits made by NIW's Waterbus to schools, visits by school pupils to NIW's Heritage Centre at Bretland WWTW and school visits to Silent Valley organised by NIW.

We noted that the Company's commentary records 276 visits which requires updating.

Number of other education visits (Line 27)

This is a manual count of hard copy records which is entered on the "Community Events" spreadsheet. We confirmed 65 events in 2015/16

Service Reservoir Sample Taps (Line 28)

This is a new line this year, and reports the percentage of service reservoirs where sample taps have been assessed, and if necessary upgraded, to the appropriate standard.

The Company has reported a value of zero for this line in the Report year.

6. Confidence Grades

During the audit we discussed the confidence grades assigned and the Company's rationale and concur with the Company's assessments in all cases.

Lines 1 and 12

As in AIR15, the Company has assigned a B3 grade (5% to 10%) to Lines 1 and 12. We consider that the assigned confidence grades are reasonable. In brief, it is difficult to assess the level of accuracy/inaccuracy inherent in the datasets but we believe it is appropriate to retain the grades which relate to NI Water's underlying methodologies. We have however not undertaken any specific statistical analysis to fully verify this.

Lines 2 to 12

The Company generally apply average confidence grades for Lines 2-10 to reflect the two separate streams of information from Engineering and Procurement (EP) and Network Water Operations (NWO).

Currently, all data provided by EP for Lines 2-10 is applied a confidence grade of either A1 or A2 due to the detailed project records held and theoretical accuracy of the data. Data provided by NWO for Lines 2-10 is applied confidence grades varying from A1 to B3. Given the relative accuracy of the various data sources, we consider these confidence grades to be appropriate.

The overall grade applied to each line is generally to lower of the confident grades from the relevant data sources, unless one source dominates then the confidence grade from the dominant source is used.

Lines 13 to 17

Given the discrete data entities, we support the Company's decision to report an A1 confidence grade for these lines.

Lines 18 to 21

The Company's confidence grades remain unchanged from last year, maintaining the policy of reporting A2 grades for all data based on a calculation. Where a value is reported on an absolute value of zero (i.e. pass/fail) for Line 21, A1 is appropriate

Lines 22 to 24

NI Water has reported a confidence grade of A1 for all nominated output related data, as it is derived directly from CPMR and the beneficial use date is embedded into CPMR to ensure output has been handed over to Operations. This is slightly out of step with the equivalent data reported in Table 16, however, the water nominated outputs programme is well defined, relatively small and not subject to same level of uncertainty as the wastewater nominated outputs. As such we concur with an A1 confidence grade.

Lines 26 to 28

We confirmed confidence grades of A1 are appropriate for these lines

7. Recommendations

The entries of Lines 2 to 17 in this table are largely a summation of values provided from Networks Water Operations (NWO) and Engineering Procurement (EP). The values are collated centrally before compilation of the commentary and table. We also recommend that the data providers (EP and Networks Water or their contractors) supply a commentary with their data which discusses trends and highlights any reasons for atypical years

To retain some consistency with the reporting requirements for zonal distribution studies (Lines 13 to 17) we recommend that in addition to listing the models updated during the report year the Company also provides an estimate of the population covered by each model. This would enable reporting by percentage of population covered by updated models.

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