SUMMARY OF AUDIT FINDINGS

Table 2 – DG3 Interruptions to Supply. Lines 5-19

PREPARED BY	[X]
DATE	11 June 2019

RAG & Meaning	
	No material exceptions and compliant with requirement
	Content with the reported data but supporting information needs to be completed and/or improvement identified for AIR19, or other noteworthy comment
	Minor exceptions
	Material exceptions
N/A	Not applicable to report

1. Key Findings

AIR19 Table Criteria	RAG	Assessment
Independent review of performance against PC15 target (where relevant)		Compliant with PC15 targets.
Methodology – consistency with the reporting process with clear control points		Change in methodology for Line 5, led to significant decrease in reported number for AIR19 [Line 5, more than 3hours (>3hrs), unplanned interruptions], compared to previous years.
Assumptions – reasonableness and applicability		Assumptions clearly defined in Company commentary.
Source data – completeness		Source data complete, with comprehensive line methodology and company commentary.
Clarity of audit trails – evidence of appropriate audit trail		Clear evidence provided during audit to demonstrate compliance. DG3 composite report, DG3 register and internal audit processes.
Confidence grades – documentation of appropriateness and rationale		No changes to confidence grade from AIR18.
Governance – evidence of engagement and of final sign-off		SharePoint workflow process in place for document checks and approvals. Additional sign-off email shown at audit.

2. Audit Scope

An audit was carried out on the 23rd May 2019 and consisted of an interview with the owner and approver of the DG3 information to discuss the methodology and data used to generate Table 2, Lines 5-19 for AIR19.

The systems and methodologies used to gather data were also reviewed during the audit, in line with the Reporter scope requested by the Utility Regulator for AIR19.

3. Performance and Significant Events

Unplanned Interruptions (Lines 5 – 8)

Line 5

The AIR19 number of properties affected by unplanned, unwarned interruptions that lasted more than 3 hours is the lowest reported since AIR14. This is due to a change in methodology for unplanned, unwarned interruptions of more than three hours (Line 5) which has significantly reduced the reported figure compared to previous years [AIR18: 108,386 and AIR19: 58,816]. Previously, unplanned interruption events lasting 6 hours or less were not always reviewed to the same extent compared to those events used to determine the company's DG3 KPI performance i.e. events lasting more than 6 hours.

During the report year (2018-19), a review was carried out by the Company of all unplanned interruptions of greater than 3 hours but less than 6 hours, which affected more than 500 properties. The review was aimed at improving the accuracy of the Company's Minutes of Lost Supply per Property outturn, as well as establishing an accurate starting point on which to base future target reductions. The property band was selected to obtain a manageable number of incidents for the review i.e. 41 for AIR19. The information for these incidents was used to estimate a correction factor for the specific Line 5 reported time duration.

The original combined >3hr property count for those events was 55,720. Following the review, the combined property count for the 41 events was 21,668, a reduction of 34,052 (61%). 16 of the 41 events remained unchanged. Similar numbers were obtained for previous years when the correction factor was applied retrospectively. It is anticipated that the accuracy of future outturns should improve using the revised methodology.

During the audit, two months of Line 5 data were selected at random to follow through on how the figures were derived, and to assess the accuracy of the processes used for reporting. April and July 2018 were selected and reviewed, with no issues found.

Line 6

3,509 properties were reported to have experienced an unplanned, unwarned interruption that lasted more than 6 hours. This is the lowest reported figure since regulatory reporting started in 2007-08.

Through our audits, we found that that this is due to the fact that 2018-19 was an unexceptional year in terms of major incidents, and the majority of interruptions were associated with high summer demand and were limited to less than 6 hours' duration.

Line 7

308 properties were reported to have experienced an unplanned, unwarned interruption that lasted more than 12 hours, which is the lowest reported figure since regulatory reporting started in 2007-08. It is anticipated that this is due to the fact that it was an unexceptional year in terms of major incidents, and the majority of interruptions were due to high summer demand and were limited to less than 6 hours' duration.

Line 8

No properties experienced an unplanned, unwarned interruption of more than 24 hours. This report is consistent with the reported nil numbers for AIR17 and AIR18.

Planned and Warned Interruptions (Lines 9 – 12)

Line 9

38,289 properties were reported to have been affected by planned and warned interruptions that lasted more than 3 hours, of which 25,721 (67%) were related to the Water Mains Rehabilitation Programme (WMRP).

Line 10

7,313 properties were reported to have been affected by planned and warned interruptions that lasted more than 6 hours of which 6,059 (83%) were associated with the WMRP. This figure is the lowest reported value for Line 10 since regulating reporting commenced in 2007-08.

During the audit, two months of Line 10 data were selected at random to follow through on how the figures were derived, and to assess the accuracy of the processes used for reporting. June and November 2018 were selected and reviewed, with no issues found.

Line 11

No properties experienced a planned and warned interruption of more than 12 hours. This report is consistent with the reported nil numbers reported since the start of the PC15 period.

Line 12

No properties experienced a planned and warned interruption of more than 24 hours. This report is consistent with the reported nil numbers reported since the start of the PC15 period.

Interruptions caused by Third Parties (Lines 13 – 16)

Line 13

12,089 properties were reported to have experienced an unplanned interruption caused by third parties lasting for more than 3 hours. For AIR19, events involving more than 500 properties have been included in a detailed review to validate the property counts and durations. Six of the 41 events in the reporting year involved more than 500 properties, which accounts for 9,246 properties, which is 76% of the outturn.

Two of the six events occurred in June 2018 and related to hydrant abuse which continues to be a problem for the Company, particularly during periods of good weather. Of the remaining four events, the most significant in terms of minutes of lost supply per property occurred on 17 August 2018 when a building contractor damaged a main in Dromore. 1,594 properties were affected by the incident and the event was the subject of Upward Report 007.

During the audit, two months of Line 13 data were selected at random to follow through on how the figures were derived, and to assess the accuracy of the processes used for reporting. June 2018 and January 2019 were selected and reviewed, with no issues found.

Line 14

2,780 properties were reported to have experienced an unplanned interruption caused by third parties lasting more than 6 hours. Eleven events were reported to have lasted more than 6 hours, the most significant of which occurred on 14th January 2019 when a building contractor damaged a main in Clough. A total of 1,250 properties were affected by the incident, equating to 45% of the outturn.

Line 15

No properties experienced an unplanned interruption caused by a third party than lasted more than 12 hours, consistent with the reported nil numbers reported since the start of the PC15 period.

Line 16

No properties experienced an unplanned interruption caused by a third party than lasted more than 12 hours, consistent with the reported nil numbers reported since the start of the PC15 period.

Unplanned Interruptions (Overruns of Planned Interruptions) (Lines 17 – 19)

Line 17

159 properties were reported to have experienced an overrun of a planned and warned interruptions that lasted more than 6 hours. This is the lowest reported figure since regulatory reporting began, and is reported to be attributable to the Company's on-going policy to minimise disruption to water supplies.

During the audit, two months of Line 17 data were selected at random to follow through on how the figures were derived, and to assess the accuracy of the processes used for reporting. August and November 2018 were selected and reviewed, with no issues found.

Line 18

No properties experienced an overrun of a planned and warned interruption that lasted more than 12 hours.

Line 19

No properties experienced an overrun of a planned and warned interruption that lasted more than 24 hours.

4. Summary of Audit Checks

It is noted that this Table was not audited in AIR18 by the previous Reporter as it was outside of the scope of the AIR18 audits requested by the Utility Regulator.

A discussion was had regarding the new Interruption to Supply (ITS) strategy, being developed by the Company for PC21. The strategy has a focus on improving the quality of the data and providing challenge to the reported ITS events. The new strategy has led to a review of events with durations of less than 6 hours, which have historically not received as much scrutiny, and therefore are likely to have been overestimated. This relates to the reported figure for Line 5; unplanned, unwarned interruptions of more than 3 hours.

The Company has an online Incident Management System (IMS) which is used for reporting all ITS events which are captured in real-time through the RAPID/Ellipse reporting systems. The IMS is used by field managers of the Networks Water and Leakage Services functions of the Customer Service Delivery Directorate to log ITS events. Contractors working for Capital Asset Delivery and for the Customer Field Services record ITS events on Contractor Return Sheets, which are then retrospectively logged on the IMS. Start and end times for interruptions are reported through the IMS.

Reports with information about the ITS events can be downloaded directly from IMS and the information is then input into the DG3 composite report spreadsheet (updated as frequently as required) and the DG3 register (updated monthly). At audit, the process was demonstrated, with examples followed and evidence provided.

Company audits are undertaken monthly for DG3. Four ITS events are chosen at random each month, representing approximately 25% of reported events greater than 3 hours duration. Contractor Return Sheets are compared to the IMS entry, and an example was followed through at audit, with accurate input of data. Spot checks are also undertaken comparing the “no water” complaints to unplanned interruption data. Start times for unplanned interruptions of greater than 6 hours are checked against IMS reported duration times. Any queries are followed up directly with field managers (an example email of a follow up query was provided as audit evidence). Changes to event information is picked up by a new macro in the DG3 Composite Report spreadsheet. The macro carries out the same checks as the previous manual method but makes it easier to identify changes to IMS entries. The outputs should therefore be the same as before, but with a more automated process making it easier for someone else to pick up in the data author’s absence on annual leave.

Additional checks were added to the internal audit process for undelivered warning notifications following AIR17 Reporter recommendations, with samples audited monthly.

Approval of reported data is tracked through the company SharePoint system, with data authors uploading documents which are then checked by the nominated data reviewer and approved by the nominated data approver (Level 3). The check and approval processes are tracked through the SharePoint workflow, and documents are locked following approval. In addition to the SharePoint process, email evidence showing the request from the data author to the data reviewer and data approver to check and approve final documents was provided as audit evidence.

The number of properties affected by interruptions caused by loss of electrical supply is reported in detail in the Company commentary, which also reports the percentage impact of interruptions caused by loss of electrical supply on annual outturns and the percentage impact of interruptions caused by loss of electrical supply on target compliance.

Properties which suffered an interruption to supply where NI Water considers that customers would not have noticed the loss of service, for example because it occurred at night, have been reported in detail in the Company's commentary. Ten unplanned interruption records and two planned and warned interruption records have been identified where customers would not have noticed the loss of service because it occurred at night. All twelve of the interruptions lasted 6 hours or less.

There were three major incidents that adversely affected DG3 programme reported for AIR19.

5. Confidence Grades

As per AIR16, AIR17 and AIR18, a confidence grade of A3 has been applied to Lines 5-19. There has been no change of confidence grade reported, despite the change in methodology for Line 5 which is aimed at improving the accuracy of the reported figure.

6. Recommendations & Suggested Actions

To provide a sound context for future AIRs and aspects of PC21 that relies on the AIR19 supply interruptions data, we suggest that the Company writes up the AIR19 review into a reference document, with justifications for the change of methodology and the associated method validation.

SUMMARY OF AUDIT FINDINGS

Table 3 – DG5 Internal Flooding. Lines 1-34.

PREPARED BY	[X]
DATE	12 June 2019

RAG & Meaning	
	No material exceptions and compliant with requirement
	Content with the reported data but supporting information needs to be completed and/or improvement identified for AIR19, or other noteworthy comment
	Minor exceptions
	Material exceptions
N/A	Not applicable to report

1. Key Findings

AIR19 Table Criteria	RAG	Assessment
Independent review of performance against PC15 target (where relevant)		Performance is good, and targets have been met.
Methodology – consistency with the reporting process with clear control points		There are some gaps within the methodology as it aligns with the UR's requirements. The reporting process is undertaken monthly so that the manual checking required is smoothed out over the reporting year. There are clear check points for reporting. Weaknesses are understood.
Assumptions – reasonableness and applicability		Assumptions are reasonable and appropriately applied.
Source data – completeness		Source data is often incomplete and requires a lot of follow up in order to assess each of the incidents and the cost of schemes undertaken for the removal of a property from the DG5 register.
Clarity of audit trails – evidence of appropriate audit trail		The audit trail is often not fully available, but for incidents there is sufficient investigation completed to enable appropriate assessment. However, for the DG5 removals we recommend that the reports used at the panels are more comprehensive.
Confidence grades – documentation of appropriateness and rationale		Confidence grades are appropriate and the rationale for them is clearly documented.
Governance – evidence of engagement and of final sign-off		Through our audits, we have seen evidence of engagement and final sign-off for the lines in this table.

- During the audit of the DG5 register an error was found in the reporting of a scheme. This error made material difference to the pre-audit numbers provided for lines 12-34.
- We can confirm that NI Water took corrective actions from our audits to prepare the final numbers for the AIR19 submission.
- We observed that NI Water's commentary for Table 3 had significant gaps. NI Water took corrective actions from our audits to address these gaps prior to submission of AIR19.

2. Audit Scope

Three separate audits were carried out with the key NI Water system holders. It involved representatives from the Wastewater Operations Team and the Asset Management Team. The audits were held on; the 21st May, 30th May, and 5th June. Whilst at the Company offices, we conducted a review of written documentation and data, as it was made available. These cover an in-depth challenge of the

methodologies for the lines in Table 3 and the Utility Regulator (UR)'s requirements, and an audit of the individual schemes and/or properties to confirm the appropriateness of the data being reported.

3. Performance and Significant Events

Number of domestic properties connected to the sewerage system

Line 1

The number of new connections in AIR19 is 675,900 this is up from 648,600 in AIR18. The Company continues to not hold data on those customers connected and billed for surface water drainage only.

NIW continues to work towards a more accurate reporting and a single source of data. The process for reporting the figure for the line is completed using an automated Property Model tool. This process has remained consistent since the tool's introduction in AIR12.

Flooding due to overloaded sewers and other causes

Lines 2-11

NI Water's wastewater business unit carries out a monthly reporting process (through Ellipse), whereby all contacts received about flooding incidents are verified to determine which of the reports were truly internal flooding incidents. As the process is undertaken monthly, it appears to be a sustainable process, and ensures that all internal flooding incidents are captured.

We understand that the Company's contract with MUL is coming to an end and as such NI Water has seen a reduction in the quality and variability of the incident reports.

The Company stated that it has added details to the scope of the potential new contractors work to include the reporting/evidence gathering for each of the flooding incidents that are attended. This will make this a requirement of the new contracts. NI Water will also be including any lessons learned to ensure that evidence is gathered to an appropriate level of detail. These changes should improve the capture of information on incidents and also improve the efficiency of the monthly verification process.

At audit, NI Water stated that, in the 2018-19 report year, the Company received 695 contacts for flooding incidents, taken from call centre logs. Each of these reported incidents are reviewed and assessed to determine their validity as internal flooding incidents. Of the 695 contacts, 665 were removed because they were verified as not being internal flooding incidents. The 665 incidents removed are made up of 160 where confirmed that there were no flooding incidents during a call out and 351 because these were follow-up jobs related previous incidents. This leaves a balance of 665 -160-351 = 154.

Of the remaining 154 contacts; 19 were excluded because they were incorrectly logged, 24 excluded because they were repeat calls about the same incident, 34 were cancelled or test jobs and so excluded, and 77 were excluded as the flooding incident occurred on a private system. The Company continues to report low numbers of incidents.

The number of internal flooding incidents due to overloaded sewers attributed to severe weather for AIR19 is 7. The Company has reported zero flooding due to overloaded sewers for hydraulic reasons. Of the 7 properties that flooded due to severe weather none of the incidents were limited to uninhabited cellars only.

In 2018-19, the number of properties flooding due to other causes is 23, 17 due to blockage and 4 due to collapse. For this report year, 21 properties flooded more than once in the last ten years.

At audit, NI Water explained that each blockage that occurs within a pipe will have a CCTV inspection carried out. The inspections allow the Company to determine if there are other potential blockages in the pipe and to remove the build-up of materials that results in blockages.

During the audit we discussed a change that was raised in AIR18 by the previous Reporter with respect to the reporting procedure for a flooding incident in a communal area of a block of flats. The UR requires that this be reported as one property for the event but last year it was reported as the number of flats that were in the block. We agreed that reporting should return to be in line with the UR requirements and as such the pre-audit number of 24 decreased by 1 because of the removal of [X].

Through our audits, we conducted a detailed review of a selection of the internal flooding incidents, both those removed and included. A summary of these checks can be found in Section 4 of this Table commentary.

DG5 Properties on the at risk register

Lines 12-34

NI Water has a target to remove 8 properties from the DG5 register at risk of flooding from the 2 in 10, 1 in 10 and 1 in 20 risk register by its actions and to reduce the total number of properties on the register down to 128.

During the audit of the DG5 register an error was found in the reporting of a scheme. This error made a material difference to the pre-audit numbers provided for lines 12-34.

As part of our review of the schemes associated with the removal of properties from the register due to Company action, we found that a scheme linked to the removal of 4 properties had 5 associated properties and that the scheme itself had not been completed in the report year. Through post-audit follow – up of this issue and in discussion with the project manager, we concluded that the 5 properties should be removed from the register.

The DG5 register is fully compliant with the Utility Regulator's requirements. The records include: date of incident, properties identified by address, cause of flooding, action taken, and their 'at risk' category.

4. Summary of Audit Checks

Checks on flooding incidents:

Incident Location	Approximate Date of Incident	Summary
[X]	20/07/2018	• An internal property issue rather than sewer flooding therefore it has been excluded • **The Reporter agrees with the exclusion of this incident**
[X]	29/07/2018	• An external flooding incident because of a severe storm of a return 1:117.7yrs, therefore it has been excluded • **The Reporter agrees with the exclusion of this incident, and recommends that it should be included in Table 3a for external flooding**
[X]	08/2018	• The work at this property had already been completed and a sewer investigation was undertaken, and the problem was not internal flooding therefore it has been excluded • **The Reporter agrees with the exclusion of this incident**
[X]	03/2019	• An incorrect job code was added to the customer contact, so the job was cancelled it has been excluded • **The Reporter agrees with the exclusion of this incident**
[X]	03/2019	• A flooding issue on a private supply therefore it has been excluded

Incident Location	Approximate Date of Incident	Summary
		• **The Reporter agrees with the exclusion of this incident**
[X]	03/2019	• A flooding incident due to a private septic tank therefore it has been excluded • **The Reporter agrees with the exclusion of this incident**
[X]	10/2018	• An internal flooding incident due to a blocked sewer because of grease in the network therefore it has been included • **The Reporter agrees with the inclusion of this incident**

Check on location removed from the DG5 register:

Location	Status	Summary of findings
[X]	The property has been removed from the DG5 register	• Removal report reviewed • Removed due to company action • The scheme is a new sewer pumping station • **The Reporter agrees with its removal from the register**

Checks on schemes used to remove locations from the DG5 register:

Scheme	Status	Audit notes
[X]	Completed – removing one property	• Removing one property – 103 Duluce Rd, Portrush, BT56 8NB • 40/60% split of the project – 60% ESL • Cost: £52k in total and £31.2k ESL part
[X]	Scheme not complete	• The scheme is not complete, but the benefit of the scheme is already felt as it was a small part of the outcomes of the scheme • ESL is <1% of the scheme • Discharge pumping into a bathing water is holding up the completion of the scheme
[X]	Completed	• The scheme involved the re-laying of the road so pipes could be upgraded as part of the scheme • Cost: £100k for the whole scheme and £65k for the ESL • Information about the breakdown of the project costs was obtained by an email from the project manager • Available information was reviewed; the CPRM did not include the cost split
[X]	Not completed	• Error found in the calculations for this scheme as described in the main body of the report. The wrong number of properties were being reported and therefore the average cost spent to remove a property from the register

5. Confidence Grades

The Company has assigned confidence grades for the table lines as highlighted below:

Table Line(s)	Grade	Reason
Line 1	A2	The rapid system is used as the source of data for the line and the system has been used for many years. Unchanged from AIR18.
Lines 2-11, 15a and 17	B2	All the data has been derived from Ellipse and the company investigates all the reported incidents. Unchanged from AIR18.
Lines 12-16, 22-26 and 30-34	B2	The data is derived from Ellipse and project cost data with very little calculations required for the data. Unchanged from AIR18.

6. Recommendations & Suggested Actions

a) The scheme error in the DG5 register for removals could not be fully investigated during the audit because the source data (the removal reports) are summarised and do not give a full picture of what the scheme is and how it has removed the properties. **We, therefore, recommend that for source data completeness the removal and additional reports need to be stand-alone in their nature.**

b) The Company methodology for the DG5 register was not fully compliant with the UR's requirements. We queried the Company in this respect. It is understood that NI Water is updating the methodology to be fully compliant. **We recommend that NI Water updates its methodology to be fully compliant.**

c) At audit, we queried the derivation of the line 16 (properties on the register which have not flooded in the past 10 years (excluding severe weather)) numbers against the definition provided in the UR guidance document. The number provided at audit has been undated to report the number of properties that have not flooded in more than 10 years. **We suggest that NI Water clarifies the definition in the UR guidance with the UR to ensure that the Company's method of deriving the reported numbers is aligned with its anticipated end use for regulatory reporting.**

d) Incident excluded from DG5 register [X]. **We suggest that this should be included in Table 3a.** Table 3a is out of scope of the Reporter's AIR19 audits.

SUMMARY OF AUDIT FINDINGS

Table 5 – Key Outputs (including new customer satisfaction measures). Lines 19-23

PREPARED BY	[X]
DATE	11 June 2019

RAG & Meaning	
	No material exceptions and compliant with requirement
	Content with the reported data but supporting information needs to be completed and/or improvement identified for AIR19, or other noteworthy comment
	Minor exceptions
	Material exceptions
N/A	Not applicable to report

1. Key Findings

AIR19 Table Criteria	RAG	Assessment
Independent review of performance against PC15 target (where relevant)		N/A
Methodology – consistency with the reporting process with clear control points		The methodology for multiple lines has changed since AIR18, and in some cases is yet to be finalised (Line 23). NI Water confirmed that changes have been agreed with the Utility Regulator and reporting is following the new methodologies.
Assumptions – reasonableness and applicability		Processing assumptions are reasonable and applied as agreed with the Utility Regulator.
Source data – completeness		Data for Lines 19, 20, 22 are sourced from the system and collated by NI Water through clear processes and reports. Data for Lines 23, 24, 25 are generated by NI Water through reports clearly identified and handled by independent research companies, which follow specified methods to data sampling, collection and reporting.
Clarity of audit trails – evidence of appropriate audit trail		At audit, NI Water provided evidence of audit trails for the reported numbers.
Confidence grades – documentation of appropriateness and rationale		Confidence grade appropriate and rationale clearly documented.
Governance – evidence of engagement and of final sign-off		Responsibilities for integrity of data and commentary clearly defined, data and commentary approvals governed through SharePoint tasks. Final sign-off confirmed.

2. Audit Scope

The scope of this audit was the Customer Satisfaction Measures which comprises Table 5 Lines 19-20 and 22-25. Line 21 is excluded from the AIR19 Table set [Table 5].

3. Performance and Significant Events

Total contacts and unwanted contacts

Lines 19-21

The definition of 'contact' and 'unwanted contact' has been updated in AIR19[1]. We understand that the new meanings have been agreed by the Customer Measures / Satisfaction Working Group (CM/SAT-WG)

[1] Utility Regulator, Section 2 Chapter 5 in 'Annual information return reporting requirements and definitions manual 2019', Version 1.0 – March 2019.

who report to the Consumer Engagement Oversight Group (CEOG) and have been endorsed by the Regulator. According to the new definitions, three categories of contacts (requests for information, run of water and switchboard contacts) are no longer considered as 'unwanted' as these events do not cause customers unnecessary aggravation. This explains why the number of unwanted contacts has significantly dropped compared to last year [AIR18: 105,964 and AIR19: 75,569].

The AIR19 numbers reported in Table 5 are as follows;

- Line 19 - Total contacts are reported as 252,844, higher than in AIR18 (250,753) but lower than AIR17 (257,866)
- Line 20 - Unwanted contacts are reported as 75,569. The number reported in AIR18 was 105,964 and in AIR17 it was 110,197.

The number of unwanted contacts according to the old methodology would have been closer that reported in AIR18 and AIR17 (107,590). NI Water explained that the increase compared to AIR18 was related to extreme weather conditions last summer compared to 2017.

The Company monitors its monthly performance against target values for unwanted contacts. The targets were generally met, with the exception of the summer months due to the last year's hot weather. Company action is on-going to reduce the time of reaction in case of an incident (dispatching a crew after 3 contacts on the same incident compared to 4 contacts used before) and improve communication on the website in order to reduce the amount of unwanted contacts related to the same issue in a given area.NI Water advised us that further refinement to the definition of unwanted contacts is on-going and will be reflected in next annual information reports.

Line 21 (unwanted contacts) is defined as a percentage (%)of total contacts, which for AIR19 29.9%. NIW stated that since AIR18, this line is no longer reported in Table 5. We note that this line is excluded from Table 5 of the Company's AIR19 submission. The total number of contacts and unwanted contacts are obtained from the All Received CorVu report, which the Company receives from Eco, the external service provider contracted to run the service. The estimate of unwanted contacts is then calculated using the CMS categories of contacts logged within Rapid. We confirm that the estimates presented in Table 5 are consistent with the CMS reports produced by NI Water.

The A reliability band attributed to Line 19 and Line 20 seems reasonable. We are satisfied with the processes and templates demonstrated at audit and the clarity of resulted presented. Accuracy band 2 is justified by uncertainties associated with manual handling and logging of data for the CMS category. There is a large number of CMS categories classified as unwanted contacts. For example, contacts regarding water quality can be classified with more than 30 CMS categories. It is possible that contacts are classified under the wrong category of unwanted category, but it is unlikely that an unwanted contact is registered under non-unwanted contact category. Therefore, using an accuracy band of +/-5% seems sensible.

For the management of the Company's contract with Eco, each month NI Water listens to a sample of 10 calls to assess if they are managed correctly, and to a sample of both 50 wanted and 50 unwanted contacts to ensure they are logged and processed correctly. The Company then provides feedback to Eco on the outcomes of its monthly check including any required corrective measures. This process also facilitates the training of new staff, following new recruitments.

First Point of Contact Resolved (FPOCR)

Line 22

We established that the definition of First Point of Contact Resolved provided by NI Water is 'when a contact requires an action and the action is completed and

- there has been no prior contact from the same property on the same issue within a 90-day period then it shall be counted as FPOCR'.

NI Water advised us that the Company is undertaking a detailed review of its approach for the calculation of FPOCR and has come up with a new methodology in agreement with the Utility Regulator. The new methodology is yet to be finalised, but NI Water explained that the AIR19 figure for FPOCR is based on the following criteria:

1. A 90-day historic window – a report run on 31 May for the month of May would look back to 31 January to check whether there was a repeated call in that time window.

2. Same CMS category – a contact that has been made regarding the same issue in the given historic window (as more than one contact may have been made by the same customer about different issues). Currently only 77 CMS codes are captured in the analysis, but this is being debated and may be different for AIR20.

3. Same property – a contact that has been made with reference to same property (as customers may have multiple properties in a given area).

The value reported in Line 22 is the number of FPOCR divided by the number of events, where event is defined as the same issue reported by the same property one or more times. Previously it was calculated as a percentage of total number of contacts.

The contacts which are resolved on the first point of contact are reported to be 90% based on the new methodology, while the number reported in AIR18, based on the old methodology, was 65.8%. At audit, NI Water demonstrated the process used to the generation of FPOCR numbers.

We consider that a confidence grade of A2 is appropriate Line 22 for the reasons stated for the numbers in Lines 19 and 20.

Customer Advocacy measure

Line 23

A market research company Allto (McCallum & Layton) undertakes an independent survey using the same methodology as last year. NI Water provides Allto a report of resolved contacts (from both telephone and written channels) for a given week, from which Allto obtains a random sample of 800 customers per year. NI Water explained that they aligned the closed date and actual closed date fields in the report to ensure the contact is effectively resolved. The process for generating the data is triggered by an email from Allto on the Monday after the designated 'un-notified' week requesting the previous week's data.

At audit, NI Water explained that this year respondents were in the range of 169 to 185 for each wave of survey (4 waves per year of 200 customers). If the level of response is not adequate or the sample is not fully representative of the population from which it is drawn, Allton requests an additional sample taken at a later date to ensure that data sets are reliable.

The customer advocacy measure is represented by Net Promoter Score, calculated as the percentage of customers responding to the question 'Likelihood of recommending NI Water 1-10' with grades 9 and 10 (promoters), minus the percentage of those responding with grades 1 to 6 (detractors). Respondents with grades 7 and 8 are considered passive and do not form part of the calculation. The value reported for Line 23 is calculated as the average of Net Promoter Scores for each quarterly survey and can fall between -100 (worst score) to +100 (best score). The calculated AIR19 number is 32, and this shows an upward trend from AIR18 (31) and AIR17 (27).

The results of each wave of surveys are reported in detail in the Customer Research Appendix, reviewed through our audits.

Omnibus survey question 1 and 2

Lines 24-25

Kantar Milward Brown is the firm contracted by NI Water in June 2017 to carry out the Omnibus surveys for AIR19 as for AIR18. As part of this survey, 1035 domestic and 200 non-domestic customers are asked whether they are satisfied with the service provided by NI Water (Question 24) and whether they would recommend NI Water (Question 25).

Line 24 is the combined percentage of domestic and non-domestic customers responding 1 (strongly agree) and 2 (tend to agree) on a 1 to 6 scale. From the numbers stated in the customer research appendix, overall satisfaction has decreased to 80% for domestic customers (93% in AIR18) and remains at 90% for non-domestic customers (as in AIR18). The combined score indicates that overall satisfaction has decreased by more than 10% since last year (81.6% in AIR19 from 92.4% in AIR18), but remains in line with previous years' results (80.3% is AIR17).

Line 25 shows theAIR19 mean score for likelihood to recommend of 8.29 (with 1- not likely at all and 10- extremely likely). This is derived as the weighted average of domestic (8.54) and non-domestic respondents (8.23) scores. Both scores are an improvement compared to AIR18 (8.23 for domestic respondents and 7.85 for non-domestic respondents).

The AIR19 survey shows a significant decrease in Net Promoter Score[2] for domestic customers (-8% from 32% in AIR18) and an increase for non-domestic customers (35% from 26% in AIR18).

4. Summary of Audit Checks

Our audit was attended by the NI Water team responsible for the derivation of numbers for Table 5, Lines 19-25. The team explained new definitions and changes in methodology for data collation and responded to our questions on the draft Table 5 commentary provided pre-audit. The Auditees also explained how the scores from survey results the fed into the Lines 23, 24 and 25 entries are calculated.

We checked that the reported numbers for Lines 19-25 against those generated by the underlying reports and found the numbers to be consistent.

We checked that results for this report year, generated using the old methodologies are consistent with the AIR17 and AIR18 numbers.

5. Confidence Grades

In Section 3 of this table commentary, we have provided commentary on the reliability and accuracy of data for each audited line. We generally agree with the rationale for the confidence grades stated as: A2 for Line 19, 20 and 22 and A1 for Line 23 and 25.

We note that entries in Lines 23-25 are given the highest confidence grade because scores are generated by specialised and independent service providers, who ensures that samples used for the surveys are randomly selected, of adequate size and are representative of the population from which they are drawn.

Typical sources of errors such as in sampling design, data analysis and processing should be minimum as data collection and management is carried out following clear procedures by experienced professionals specialising in this type of service. This suggests that data are reliable and that the true population

[2] Calculated with the same methodology used for Line 23

parameter (satisfaction and likeliness of recommending NI Water) should be within +/-1% of the sample estimate.

6. Recommendations & Suggested Actions

a) To provide a sound context for future AIRs and aspects of PC21 that relies on the reported AIR19 customer satisfaction measures, we suggest that the Company writes up the details of how the methodologies have changed, with justifications of why results shown in Line 19 and Line 22 have significantly improved from previous years. Results of the Company's monthly check on data accuracy should be also reported to justify the assigned confidence grades.

b) We also suggest that future commentaries associated with the Table 5 AIR submissions should include a description of the calculation of scores from survey results to inform assessment of trends in declared NI Water's customer service metrics.

SUMMARY OF AUDIT FINDINGS

Table 11 – Water Service. Lines 1-28

PREPARED BY	[X]
DATE	17 June 2019

RAG & Meaning	
	No material exceptions and compliant with requirement
	Content with the reported data but supporting information needs to be completed and/or improvement identified for AIR19, or other noteworthy comment
	Minor exceptions
	Material exceptions
N/A	Not applicable to report

1. Key Findings

AIR19 Table Criteria	RAG	Assessment
Independent review of performance against PC15 target (where relevant)		Good performance. All annual baseline PC15 FD targets were met/exceeded. Reporting process well managed.
Methodology – consistency with the reporting process with clear control points		Methodologies consistent with current processes, except for Line 12 (total length of mains) which is reported as a directly extracted number from the CAR system and not as a calculated sum of Lines 1, 2 and 6 minus Line 7, hence not in accordance with the UR guidance.
Assumptions – reasonableness and applicability		Assumptions reasonable and appropriately applied.
Source data – completeness		Data sources clearly identified with no material concern and appear to have been well managed and recorded.
Clarity of audit trails – evidence of appropriate audit trail		Content with reported information but some audit trails and explanation of year-on-year changes appear limited. Lack of version/change control mechanism. Post-audit commentary for Line 9 has some non-material shortcomings.
Confidence grades – documentation of appropriateness and rationale		Confidence grades appear to have been appropriately assigned.
Governance – evidence of engagement and of final sign-off		Through our audits, we have seen evidence of engagement and final sign-off for the lines in Table 11.

2. Audit Scope

Four separate audits were carried out with the key NI Water system holders. It involved representatives from the Asset Delivery (also known as the AD or Engineering and Procurement) and the CSD Water Networks (Water Network Operations) teams. The audits were held on; the 20th May, 5th June, 6th June, 7th June and 12th June.

Whilst at the Company offices, we conducted a review of written documentation and data, as it was made available. These cover an in-depth challenge of the methodologies for the lines in Table 11 and the Utility Regulator (UR)'s requirements, and an audit of the individual numbers, schemes and/or calculations to confirm the appropriateness of the data being reported.

3. Performance and Significant Events

3.1. Performance against PC15 Target

The following 13 measures have PC15 targets associated with them. NI Water (or NIW)'s performance against these targets in 2018/19 may be summarised as follows.

3.1.1. Length of new, renewed or relined mains delivered under the watermain rehabilitation programme (Line 6b).

a) Year-4 performance. NIW is approximately on target for the PC15 FD forecast of 167km in Year-4 for achieving 166.52km in 2018/19. The Year-4 report is made up of 143.40 km and 23.12km of renewed and new mains respectively. Relining was not used as a watermains rehabilitation method in 2018/19.

b) Cumulative by the end of Year-4 of PC15 performance. The cumulative length delivered by NIW over the four-year period in PC15 is 581.71km (116.92km, 172.27km, 126km and 166.52km in AIR16-19 respectively). The reported value is 11.71km more than the cumulative PC15 FD target for the same period of 570km (130km, 144km, 129km and 167km in AIR16-19 respectively).

c) Remaining performance in PC15. Having exceeded the Year-4 target, NIW has to deliver only 323.29km in the next two years to meet the remaining baseline target of 335km (147km and 188km in AIR20 and AIR21 respectively).

3.1.2. Lead communication pipes replaced under the proactive lead replacement programme (Line 8d)

a) Year-4 performance. NIW replaced 2,070 lead pipes through its proactive lead replacement programme (sub-programme 23). This performance exceeded the PC15 FD target for the year of 1,844 lead pipes by 226 pipes.

b) Cumulative by the end of Year-4 of PC15 performance. A total of 7,376 lead pipes have been replaced in PC15 since 2015/16 (1,922, 1,867, 1,767 and 2,070 in AIR16-19 respectively), which exceeded the 4-year FD target of 7,376 lead pipes (based on annual average of 1,844 lead pipes) by 226.

c) Remaining performance in PC15. Having exceeded the Year-4 target, NIW has to proactively replace only 3,438 of lead pipes to meet the baseline target of 3,688 in the next two years.

3.1.3. Percentage of overall compliance with drinking water regulations (Line 18)

a) Year-4 performance. NIW achieved an overall compliance of 99.90%, which exceeded the baseline target for the year (99.79%) by 0.11%.

b) Cumulative by the end of Year-4 of PC15 performance. Not applicable.

c) Remaining performance in PC15. NIW aims to meet the annual baseline target of 99.79% in the next two years.

3.1.4. Percentage compliance at consumers tap (Line 19)

a) Year-4 performance. NIW achieved 99.83% compliance at consumers tap, which exceeded the baseline target for the year (99.69%) by 0.14%.

b) Cumulative by the end of Year-4 of PC15 performance. Not applicable.

c) Remaining performance in PC15. NIW aims to meet the annual baseline target of 99.69% in the next two years.

3.1.5. Percentage iron compliance at consumers tap (Line 20)

a) Year-4 performance. NIW achieved 98.94% of iron compliance at consumers tap, which exceeded the baseline target for the year (97.10%) by 1.89%.

b) Cumulative by the end of Year-4 of PC15 performance. Not applicable.

c) Remaining performance in PC15. NIW aims to meet the annual baseline target of 97.10% in the next two years.

3.1.6. Percentage of service reservoirs with coliforms in >5% samples (Line 21)

a) Year-4 performance. No service reservoir sites had more than three failures during the year, as profiled in the baseline forecast.

b) Cumulative by the end of Year-4 of PC15 performance. Not applicable.

c) Remaining performance in PC15. NIW aims to meet the annual baseline target of 0% outcome in the next two years.

3.1.7. Completion of nominated trunk main schemes (Line 22)

a) Year-4 performance. NIW did not deliver the Carmoney to Strabane Strategic Link Watermain scheme as planned in the baseline forecast as the project is delayed to 2020/21.

b) Cumulative by the end of Year-4 of PC15 performance. NIW has delivered 3 nominated trunk schemes in PC15 against the baseline target of 2 schemes since 2015/16. One of the completed schemes, the Carland to Cookstown Trunkmain project was originally planned for PC13 but delivered in 2015/16. So, NIW has delivered only two PC15 schemes to date. They are the Castor Bay to Belfast TM which was delivered as planned in 2015/16 and the Carland to Cookstown Trunkmain which was delivered in 2016/17 having been brought forward from 2020/21.

c) Remaining performance in PC15. NIW aims to complete the Carmoney to Strabane Strategic Link Watermain scheme by 2020/21 to meet the stated baseline target for PC15.

3.1.8. Completion of nominated water treatment works schemes (Line 23)

a) Year-4 performance. No output delivered against the PC15 FD (baseline) Year-4 target of a single output for Caugh Hill WTW. The project is currently the subject of a Change Control being prepared for submission to the Utility Regulator. This Change Control emerged from NIW's discussions with the UR and Drinking Water Inspectorate (DWI) on the THM /DOC water quality driver and the fact that the works is passing the THM regulatory standard. The Caugh Hill WTW project will be substituted out of the PC15 delivery programme and several WTW sites with enforcement orders for pesticides and a bromide water quality related issue will be brought into PC15. The completion date for Caugh Hill WTW has been revised to 2020/21.

b) Cumulative by the end of Year-4 of PC15 performance. NIW has only delivered a single WTW output in PC15 against the baseline target of two WTW outputs. The Glenhordial WTW was delivered in 2015/16.

c) Remaining performance in PC15. NIW will have to deliver three WTW outputs (Caugh Hill, Dorisland and Killyhevlin WTWs) in 2020/21 to meet the overall baseline target of four WTW outputs in PC15.

3.1.9. Completion of nominated improvements to increase the capacity of service reservoirs and clear water tanks (Line 24)

a) Year-4 performance. No output in accordance with the baseline target for the year.

b) Cumulative by the end of Year-4 of PC15 performance. NIW has delivered one output since 2015/16, meeting the cumulative baseline target.

c) Remaining performance in PC15. The overall baseline target for PC15 is 3 outputs, but NIW plans to deliver an additional output in the next two years. Two PC15 FD nominated outputs are to be delivered as planned, with Lough Fea CWB and Drumaroad WTW clear water tank in 2019/20 and 2020/21 respectively. The new addition output, Killyhelvin clear water tank is to be delivered in 2020/21.

3.1.10. Number of Catchment Management Plans (Line 25)

a) Year-4 performance. No output against the baseline target of 6 for the year. The two EU's INTEREGG funded catchment studies for Killyhevlin and Belleek are currently in draft format and are expected to be completed by Q1 of 2019/20.

b) Cumulative by the end of Year-4 of PC15 performance. NIW completed a total of 13 catchment studies in PC15 (3 in AIR16, 7 in AIR17, 3 in AIR18 and 0 in AIR19) against the baseline total of 26 (6 in AIR16, 7 in AIR17, 7 in AIR18 and 6 in AIR19). NIW advised that, all the required 'live' catchment management plans have been completed, except for Killyhevlin and Belleek which are in draft format. So the remaining outputs against the baseline target involve out of service (either abandoned or closed)catchments.

c) Remaining performance in PC15. No more catchment management studies are planned to be carried out in the next two years. The total baseline target is 40 catchment studies in PC15, but NIW intends to submit a change control to have it revised to 36. This is because a review by NIW shows that the number of abandoned/closed catchments should be revised from 23 in PC15 FD plan to 21 as Knockbracken and Ballintemple sites have subsequently been sold.

3.1.11. Number of school visits (Line 26)

a) Year-4 performance. 247 school visits were carried out against the baseline target of 176 visits for the year.

b) Cumulative by the end of Year-4 of PC15 performance. NIW continues to outperform the annual baseline target of 176 visits since 2015/16. NIW has carried out a total 999 school visits (277, 257, 219 and 267 visits in AIR16-AIR19 respectively) against the cumulative baseline total of 704 visits, an outperformance of 295 visits over the four-year period.

c) Remaining performance in PC15. NIW plans to continue to outperform the annual baseline target over the next two years.

3.1.12. Number of other educational visits (Line 27)

a) Year-4 performance. 66 education visits were carried out against the baseline target of 57 visits for the year.

b) Cumulative by the end of Year-4 of PC15 performance. NIW continues to outperform the annual baseline target of 57 visits since 2015/16. NIW carried out a total 257 educational visits (65, 64, 62 and 66 visits in AIR16-AIR19 respectively) against the cumulative baseline target of 228 visits, an outperformance of 29 visits over the four-year period.

c) Remaining performance in PC15. NIW plans to continue to outperform the annual baseline target over the next two years.

3.1.13. Percentage service reservoirs where sample taps have been assessed and are to required standard (Line 28)

a) Year-4 performance. NIW achieved 98.3% against the baseline target of 100% for the year.

b) Cumulative by the end of Year-4 of PC15 performance. A total of 286 sample taps were installed out of 291 to be addressed. Of the five sample taps shortfall, three were completed in April 2019, so will be reported next year. The two outstanding sample taps were not completed due to site operational issues but NIW is confident that all equipment has been procured by the contractor and ready to install.

c) Remaining performance in PC15. NIW expects the full delivery of 100% service reservoir sample taps by the next report year.

3.2. Performance Against AIR18

A summary of the reported values for the measures in Table 11 from AIR16 to AIR19, and the movements from AIR17 to AIR18 and AIR18 to AIR19 are shown in Table TC_T11_1 below.

Table TC_T11_1: Summary of annual AIR16-AIR19 values and movements from AIR17 to AIR18 and AIR18 to AIR19.

	DESCRIPTION	UNITS	REPORTING YEAR 2015-16	CG	REPORTING YEAR 2016-17	CG	REPORTING YEAR 2017-18	CG	REPORTING YEAR 2018-19	CG	Change from AIR17 to AIR18 (value)	Change from AIR17 to AIR18 (%)	Change from AIR18 to AIR19 (value)	Change from AIR18 to AIR19 (%)
A	**ASSET BALANCE AT APRIL 1**													
1	Total length of mains	km	26,712.44	B3	26,728.83	B3	26,778.15	B3	26,837.45	B3	▲ 49.32	▲ 0.18%	▲ 59.30	▲ 0.22%
B	**CHANGES DURING REPORT YEAR**													
2	Mains renewed	km	105.24	A2	161.29	A2	120.55	A2	154.66	A2	▼ -40.74	▼-25.26%	▲ 34.11	▲28.30%
3	Mains relined	km	0.00	A1	0.00	A1	0.00	A1	0.00	A1	▬ 0.00	▬ 0.00%	▬ 0.00	▬ 0.00%
4	Mains cleaned (total)	km	1,191.68	B3	1,665.69	B3	2,008.61	B3	2257.19	B3	▲ 342.92	▲20.59%	▲ 248.58	▲12.38%
6	New mains	km	76.51	B2	75.22	B2	92.43	B2	83.91	B2	▲ 17.21	▲22.88%	▼ -8.52	▼-9.22%
6a	Total length of new, renewed or relined mains	km	181.75	B2	236.51	A2	212.98	A2	238.57	A2	▼ -23.53	▼-9.95%	▲ 25.59	▲12.02%
6b	Length of new, renewed or relined mains delivered under the watermain rehabilitation programme	km	116.92	A2	172.27	A2	126.00	A2	166.52	A2	▼ -46.27	▼-26.86%	▲ 40.52	▲32.16%
7	Mains abandoned and other changes	km	105.51	A2	167.55	A2	124.24	A2	158.49	A2	▼ -43.31	▼-25.85%	▲ 34.25	▲27.57%
8a	Lead communication pipes replaced as a consequence of water quality sample failures	nr	37	B2	44	B2	43	B2	35	B2	▼ -1.00	▼-2.27%	▼ -8.00	▼-18.60%
8b	Lead communication pipes replaced as a consequence of customers notifying NI Water that they are replacing their lead supply pipe	nr	703	B2	599	B2	574	B2	562	B2	▼ -25.00	▼-4.17%	▼ -12.00	▼-2.09%
8c	Opportunistic lead communication pipes replacement undertaken under the watermain rehabilitation programme or during burst service pipe repairs	nr	660	B2	1801	A2	76	B3	75	B3	▼-1,725.00	▼-95.78%	▼ -1.00	▼-1.32%
8d	Lead communication pipes replaced under the proactive lead replacement programme	nr	1,922	B2	1,867	A2	1,767	A2	2070	A2	▼-100.00	▼-5.36%	▲ 303.00	▲17.15%
9	Total lead communication pipes replaced	nr	3,322	B2	4,311	A2	2460	A2	2742	A2	▼-1,851.00	▼-42.94%	▲ 282.00	▲11.46%
10	Communication pipes replaced - other	nr	3,915	B3	5,608	B2	3,769	B2	4232	B2	▼-1,839.00	▼-32.79%	▲ 463.00	▲12.28%
11	Mains bursts per 1000km	nr	74	B3	80	B3	91	B3	92	B3	▲ 11.00	▲13.75%	▲ 1.00	▲ 1.10%
C	**ASSET BALANCE AT MARCH 31**													
12	Total length of mains	km	26,728.83	B3	26,778.15	B3	26837.45	B3	26958.4	B3	▲ 59.30	▲ 0.22%	▲ 120.95	▲ 0.45%
D	**DISTRIBUTION STUDIES**													
13	Cumulative number of distribution zone studies completed	nr	71	A1	71	A1	71	A1	71	A1	▬ 0.00	▬ 0.00%	▬ 0.00	▬ 0.00%
14	Distribution zone studies ongoing	nr	0	A1	0	A1	0	A1	0	A1	▬ 0.00	▬ 0.00%	▬ 0.00	▬ 0.00%
15	Total distribution zones identified for study	nr	71	A1	71	A1	71	A1	71	A1	▬ 0.00	▬ 0.00%	▬ 0.00	▬ 0.00%
16	Cumulative % distribution zone studies completed	%	100.0	A1	100.0	A1	100.0	A1	100.0	A1	▬ 0.00	▬ 0.00%	▬ 0.00	▬ 0.00%
17	Percentage population/properties - completed studies	%	100.0	A1	100.0	A1	100.0	A1	100.0	A1	▬ 0.00	▬ 0.00%	▬ 0.00	▬ 0.00%
E	**WATER QUALITY COMPLIANCE MEASURES**													
18	% overall compliance with drinking water regulations	%	99.83	A2	99.86	A2	99.88	A2	99.90	A2	▲ 0.02	▲ 0.02%	▲ 0.02	▲ 0.02%
19	% compliance at consumers tap	%	99.74	A2	99.77	A2	99.81	A2	99.83	A2	▲ 0.04	▲ 0.04%	▲ 0.02	▲ 0.02%
20	% iron compliance at consumers tap	%	98.40	A2	98.66	A2	98.85	A2	98.94	A2	▲ 0.19	▲ 0.19%	▲ 0.09	▲ 0.09%
21	% Service Reservoirs with coliforms in >5% samples	%	0.00	A1	0.00	A1	0.00	A2	0.00	A1	▬ 0.00	▬ 0.00%	▬ 0.00	▬ 0.00%
F	**NOMINATED WATER SERVICE OUTPUTS**													
22	Completion of nominated trunk main schemes	nr	2	A1	1	A1	0	A1	0	A1	▼ -1.00	▼100.00%	▬ 0.00	▬ 0.00%
23	Completion of nominated water treatment works schemes	nr	1	A1	0	A1	0	A1	0	A1	▬ 0.00	▬ 0.00%	▬ 0.00	▬ 0.00%
24	Completion of nominated improvements to increase the capacity of service reservoirs and clear water tanks	nr	0	A1	0	A1	1	A1	0	A1	▲ 1.00	▲100.00%	▼ -1.00	▼100.00%
G	**ADDITIONAL WATER SERVICE OUTPUT MEASURES**													
25	Number of Catchment Management Plans	nr	3	A1	7	A1	3	A1	0	A1	▼ -4.00	▼-57.14%	▼ -3.00	▼100.00%
26	Number of school visits	nr	277	A1	257	A1	219	A1	246	A1	▼ -38.00	▼-14.79%	▲ 27.00	▲12.33%
27	Number of other education events	nr	65	A1	64	A1	62	A1	66	A1	▼ -2.00	▼-3.13%	▲ 4.00	▲ 6.45%
28	% Service Reservoirs where sample taps have been assessed and are to required standard	%	0.0	A1	0.0	A1	72.9	A2	98.3	A1	▲ 72.90	▲72.90%	▲ 25.40	▲34.84%

It is clear from Table TC_T11_1 that NIW's performance for the report year is in line with its AIR18 reports for most measures, notably the distribution studies and water quality compliance measures. Other water activities have registered minor changes and these changes include the following.

- The length of mains renewed (Line 2) has increased by 34.11km between AIR18 and AIR19, in comparison to a decrease of 40.74km between AIR17 and AIR18. However, the renewed length of mains in AIR19 (154.66km) is relatively consistent with the range over the PC15 performances in AIR16 (105.24km), AIR17(161.29km) and AIR18 (120.55km).

- The length of new mains (Line 6) has reduced by 8.52km in between AIR18 and AIR19, in comparison to an increase of 17.21km in between AIR17 and AIR18. However, the length of new mains in AIR19 (83.91km) is relatively consistent with the range over the PC15 performances in AIR16 (76.51km), AIR17 (75.22km) and AIR18 (92.43km).

- The length of mains abandoned and other changes (Line 7) has increased by 34.25km between AIR18 and AIR19 after a 43.31km reduction between AIR17 and AIR18. However, the reported length in AIR19 (158.49km) is within the range of PC15 historical performances in AIR16 (105.51), AIR17 (167.55km) and AIR18 (124.24km).

- The various lead communication pipes replacement lengths in Lines 8a-8d, and 9 and other communication pipes replaced are also within the previous range observed in PC15.

Notes of our audit observations of trends in some of the water activities may be summarised as follows.

- Although the mains bursts per 1,000km in AIR19 is similar to that reported last year, the AIR18 and AIR19 numbers are higher than those in AIR17 and AIR18. It appears that the increased trend observed from AIR17 to AIR18 has not come down in AIR19.

- The total length of mains cleaned has increased by 248.58km from 2,008.61km in AIR18 to 2,257.19km in AIR19. Although the increase is lower than 342.92km observed last year, the annual length of mains cleaned numbers have increased consistently from 1,191.68km (AIR16) to 1665.69km (AIR17), 2,008.61km and 2,257.19km (AIR19), as expected with the committed PC15 activities.

- The total of lead communication pipes replaced as a consequence of customers notifying NIW that they are replacing their lead supply pipe showed a decreasing trend from 703 (AIR16) to 599 (AIR17), 574 (AIR18) and 562 (AIR19).

- Water compliance measures in Lines 18-20 show improving trends since AIR16.

4. Summary of Audit Checks

4.1. Asset Balance (Lines 1 and 12)

4.1.1. Line 1: Total length of mains at 1 April 2018.

The reported value for Line 1 is a copy of the AIR18 reported length of mains, which is consistent with the number reported last year. A check carried out during the audit confirmed the reported figure of 26,837.45km has been derived from NIW's Corporate Asset Register (CAR) via MapBasic script.

4.1.2. Line 12: Total length of mains at 31 March 2019.

NIW has continued to report the number for Line 12 using data directly extracted from the CAR system via MapBasic script using ArcGIS platform. The script extracts NIW water mains information excluding abandoned mains. The output includes not in-service mains as they could potentially be brought back into service as per AR14 audit recommendation. The script application was demonstrated during the audit and it successfully reproduced the reported figure of 26,917km. NIW confirms that there have been no significant changes made to the CAR's data that may affect the quality of the reported figures in AIR19. The same level of data quality assurance procedure has been maintained since AIR18.

The AIR19 Reporting Requirements and Definitions Manual states that the number for this line should be calculated from the sum of Lines 1 (26,837.45km), 2 (154.66km) and 6 (83.91km) less Line 7 (158.49km). Considering the variance between the calculated method (26,917.53km) and the directly extracted value from CAR is only 0.15%, NIW should consider using the calculated value in the future, consistent with the UR reporting guidance.

Furthermore, data from the CAR system is likely to be less than the calculated value due to the delays in uploading project information onto the corporate database, particularly for projects that are near the end of the reporting year (end of March). Unlike CAR, values for Lines 2, 6 and 7 are derived from Asset Delivery (AD) contract management information monthly returns and CSD Networks Water information collated by Field Managers, and are therefore more up-to-date.

4.2. Changes During the Report Year (Lines 2 to 11)

The overall methodologies and commentary structures for these lines have not changed significantly compared to last year. The commentary features the inputs from CSD Networks Water Operations (CSD) and Asset Delivery (AD) teams for Lines 2 to 10. Trunk main lengths are included in the totals, with details of trunk mains included in the commentary as required by the UR reporting requirements. Input for Line 11 is obtained solely from Mobile Work Management (MWM) system reports.

4.2.1. Line 2: Mains renewed.

NIW renewed 34.11km more mains than last year. The AD team renewed 143km and 10.02km of watermains and trunk main rehabilitation schemes respectively, while the CSD team delivered 1.24km of smaller schemes involving social housing redevelopments and minor mains diversions or realignments.

4.2.2. Line 3: Mains relined.

NIW has not carried out any spray lining of mains activity in AIR19 as the Company is still waiting to assess the viability and value of this technique. Other structural lining methods such as standard slip-lining techniques to replace existing mains are included in Line 2 as defined by the UR reporting requirements.

4.2.3. Line 4: Mains cleaned (total).

Mains cleaning is performed solely by the CSD team. The total length of mains cleaned in AIR19 (2,257.19km) is 248.58km more than in AIR18 (2,008.61km), which corresponds with the increase in the number of flushing performed from 6,763 (AIR18) to 7,143 (AIR19) flushings.

The flushing factor used to convert from number of mains flushings to length of mains flushed has increased from 0.297km per flush in AIR18 to 0.316km per flush in AIR19. The factor was derived based on a sample of 150 mains flushing events in AIR18, but NIW has not provided information about the sample size used in AIR19.

NIW advised that there remains a potential for some double counting in relation to the reactive flushing jobs. To provide assurance, data is checked for errors and duplication to filter out repeat flushings at the same location. NIW also advised that these occurrences are minimal, and the Company is continually improving the quality of data collated for this line.

Although the number of mains flushings has increased year on year in PC15, the number of burst mains is comparable to last year's report. So, the increase in reactive flushings may not be associated with burst main repair activities in 2018/19.

4.2.4. Line 6: New mains.

NIW installed 8.52km less new mains in AIR19 (83.91km) than in AIR18 (92.43km), but the AIR19 number is still higher than those reported in AIR16 (76.51km) and AIR18 (75.22km). The CSD team delivered 60.79km of new mains with the remaining 23.12km delivered by the AD team in AIR19, in contrast to 74.83km and 23.12km respectively in AIR18. So, less new mains were laid in new housing developments by the CSD team and more new mains for replacement upsizing were delivered by the AD team in AIR19.

4.2.5. Line 6a: Total length of new, renewed and relined mains.

This is a calculated line as the sum of Lines 2, 3 and 6, which is 238.67km in AIR19, an increase of 25.59km on last year (212.98km). At audit, the sum was checked during audit and confirmed to be correct and consistent with the line definition of the AIR19 Reporting Requirements and Definitions Manual.

4.2.6. Line 6b: Length of new, renewed or relined mains delivered under the watermain rehabilitation programme.
The reported length for this line has increased significantly from 126km in AIR18 to 166.52km in AIR19. NIW missed the last year's baseline target by 3km, but performance this year is consistent with the baseline target for this year of 167km.

4.2.7. Line 7: Mains abandoned and other changes.
NIW reported 34.25km of additional abandoned mains in AIR19 (158.49km) than in AIR18 (124.24km). The majority of the AIR19 number was reported by the AD team under the mains rehabilitation programme (157.25km) while the remaining (1.24km) was reported by the CSD team for smaller schemes involving social housing redevelopments and minor mains diversions. In the commentary document for this table, NIW states that 94% of mains renewed are subsequently abandoned based on the results for sub-programme 8 delivered by the AD team in 2018/19.

The reported length includes both wholly abandoned mains and those replaced by renewals as per definition for this line in the UR's Reporting Requirements and Definitions Manual.

4.2.8. Line 8a: Lead communication pipes replaced as a consequence of water quality sample failures.
This activity is carried out solely by the CSD team. A total of 35 lead communication pipes were replaced as a consequence of water quality failure in AIR19, in comparison to 43 in AIR18. The significant decrease (nearly 19%) from the previous year also sees the AIR19 number to be the lowest reported annual value in PC15 (37 in AIR16, 44 in AIR17 and 47 in AIR18).

4.2.9. Line 8b: Lead communication pipes replaced as consequence of customers notifying NI Water that they are replacing their lead supply pipes.
This activity is also carried out solely by the CSD team. The reported value in AIR19 is 12 less than the previous year's report of 574. It is also the lowest reported annual number in PC15 to date, where there is a decreasing trend from 703 (AIR16) to 599 (AIR17), 574 (AIR18) and 562 (AIR19).

4.2.10. Line 8c: Opportunistic lead communication pipes replacement undertaken under the watermain rehabilitation programme or during burst service pipe repairs.
There has been a great variability in the value reported for this line in the previous years: 2,747 (AIR15), 660 (AIR16), 1801 (AIR17) and 76 (AIR18). However the reported value for AIR19 (76) is comparable to the previous year. We note that the AIR19 replacements represent the contribution from work undertaken by the CSD team.

4.2.11. Line 8d: Lead communication pipes replaced under the proactive lead replacement programme.
Unlike other lead communication pipes replacement activities, this activity is delivered solely by the AD team and is related to the outcomes of sub-programme 23 in PC15 Year-4. The reported AIR19 number (2,070) is significantly higher than the previous year (2,460), and also the highest seen in PC15 (higher than 1,867 in AIR17 and 1,922 in AIR16).

4.2.12. Line 9: Total lead communication pipes replaced.
The reported value for AIR19 (2,742) is a summation of Lines 8a, 8b, 8c and 8d as per the UR's Regulatory Reporting and Definitions Manual definition for this line. This year's value is significantly higher (282 or 11.5%) than the previous year (2,460) but much lower than the values reported in AIR16 (3,322) and AIR17 (4,311).

4.2.13. Line 10: Communication pipes replaced - other.
The number of non-lead communication pipes replaced in a year reflects both the length of mains replaced and the rural/urban mix. Urban mix will have a greater density of communication pipes per km of mains. In AIR19, NIW replaced 4,232 non-lead communication pipes, which is consistent with the range over the PC15 years of 3,769 (AIR18), 5,608 (AIR17) and 3,915 9AIR16).

The AIR19 number is built up from 2,714 from the AD team (2,336, 4,419 and 2,736 in AIR18, AIR17 and AIR16 respectively) and 4,232 from the CSD team (1,415, 1,189 and 1,179 in AIR18, AIR17 and AIR16 respectively). The AD and CSD numbers for AIR19 are 16% and 12% higher than in AIR18, and they are comparable to the overall number in AIR19 being approximately 12% higher than in AIR18.

4.2.14. Line 11: Mains bursts per 1000km.

The reported AIR19 number (92 bursts per 1000km) is the highest in the PC15 period to date but comparable to the previous year (91 bursts per 1000km) after significant increases from AIR 17 (80 bursts per 1000km) and AIR16 (74 bursts per 1000km).

We note that the reported number is derived from the total number of recorded burst events (minus those attributable to third party damage) divided by the total length of mains. The number of bursts is calculated directly from monthly reports from the Mobile Work Management or MWM system compiled by the Water Business Unit. The reports summarise job split between those generated through proactive and non-proactive detection methods.

The Water Business Unit also collates information relating to the number of mains repairs attributable to third party damage, so that the number could be deducted from the total year end number. The Field Managers from the CSD Networks Water team and NIW's contractor are consulted to review the collated information. Cross checks are carried out against reports repair flags on CAR2Map database and reported samples collected for burst repairs. The outputs are also used for DG3 entries for the assessment of interruption to supplies relating to bursts, and the resolution of NIW's contractor's requests for clarification or confirmation of burst repair works.

We note that the reported AIR19 number is comprised of 1,451 reported burst mains (non-proactive) repairs by CSD Networks Water team and 1,111 proactive repairs by the active leakage control team less 95 bursts due to third party damage. The number of bursts detected through pro-active actions is comparable to the previous year. Although the number of non-proactive detection bursts has increased slightly, it has been offset by a significant increase in the number of bursts due to third party in AIR19 (see Table TC_T11_2).

Table TC_T11_2: Components of burst data from AIR14 to AIR19 and the changes over the last two years.

Number of bursts	AIR14	AIR15	AIR16	AIR17	AIR18	AIR19	Change (AIR17 to AIR18)	Change (AIR18 to AIR19)
CSD Networks Water (non-proactive detection)	1,397	1,352	1,127	1,313	1,394	1,451	6.2%	4.1%
Waste detection (pro-active detection)	985	996	924	883	1,116	1,111	26.4%	-0.4%
Third party damage	83	82	79	61	66	95	8.2%	43.9%
Total	2,299	2,266	1,972	2,135	2,444	2,467	14.5%	0.9%

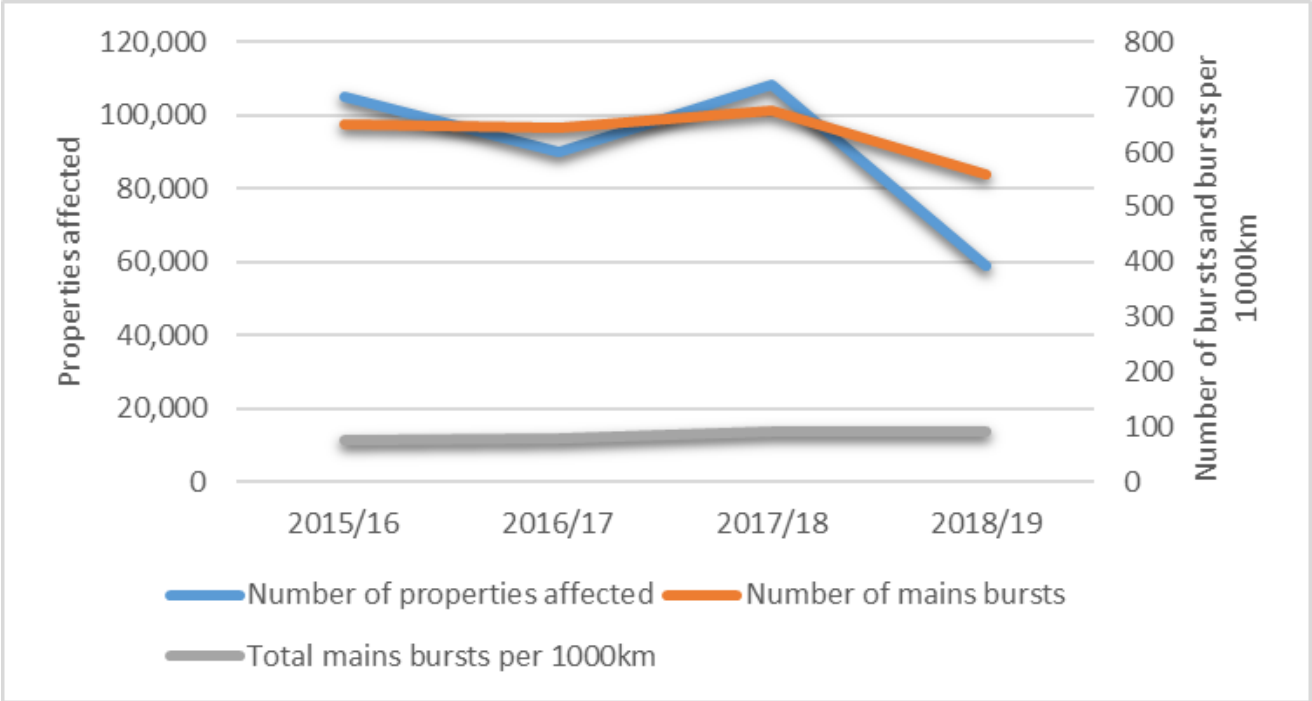
As shown in Table TC_T11_3, the total number of bursts (excluding those caused by third parties) linked to more than three hours of supply interruptions has significantly reduced by 17.5% from last year. The change is consistent with 27.5% fewer properties affected, which is an improvement from last year (see also Figure TC_T11_1).

NIW advised that the improved performance for AIR19 is linked to better working practices, the on-going focus by NIW on interruptions to supply with a new "Interruptions to Supply" and the consequences of a change in methodology for the assessment of unplanned, unwarned interruptions of more than 3 hours (Table 2, Line 5).

Table TC_T11_3: Number of properties affected by unplanned, planned and third party bursts incidents that resulting in more than 3 hours of supply interruptions.

Description	AIR16 2015/16 (Nr.)	AIR17 2016/17 (Nr.)	AIR18 2017/18 (Nr.)	AIR19 2018/19 (Nr.)	Change Yr1 to Yr2 (%)	Change Yr2 to Yr3 (%)	Change Y3 to Y4 (%)
Unplanned Interruptions > 3 hours							
Number of properties affected	105,235	90,094	108,386	58,816	-14.39%	20.30%	-45.73%
Number of mains bursts	650	644	676	558	-0.92%	4.97%	-17.46%
Planned Interruptions > 3 hours							
Number of properties affected	33,929	35,484	38,225	38,289	4.58%	7.72%	0.17%
Number of mains bursts	20	30	34	28	50.00%	13.33%	-17.65%
Third Party Interruptions > 3 hours							
Number of properties affected	4,739	12,691	4,078	12,089	167.80%	-67.87%	196.44%
Number of mains bursts	27	22	25	27	-18.52%	13.64%	8.00%
Total Interruptions > 3 hours							
Number of properties affected	143,903	138,269	150,689	109,194	-3.92%	8.98%	-27.54%
Number of mains bursts	697	707	735	613	1.43%	3.96%	-16.60%
Total number of mains bursts (> 3 hours, excl. third party)	670	674	710	586	0.60%	5.34%	-17.46%
Total number of mains bursts (< 3 hours, excl. third party)	1,302	1,461	1,734	1,881	12.21%	18.69%	8.48%

Figure TC_T11_1: Properties affected and bursts of supply interruptions lasting more than three hours and overall mains burst rate profiles.



4.3. Distribution Studies (Lines 13 to 17)

4.3.1. Line 13: Cumulative number of distribution zone studies completed.

NIW has completed all the 71 zonal studies. Therefore, the Company's report of the cumulative number of distribution zone studies completed has remained constant since 2012-13.

4.3.2. Line 14: Distribution zone studies ongoing.

Nil value reported. NIW has upgraded its previous zonal study methodology with the Water Mains Infrastructure Investment Model (WIIM) methodology. In the report year, NIW completed a trunk main model and the Company is in the process of rebuilding the 10 hydraulic models shown in Table TC_T11_4. The Company completed WIIM 3 data analysis in autumn 2018 to inform the next phases of WIIM 3 schemes to be delivered over the coming years.

Table TC_T11_4: Hydraulic models rebuilding in AIR19 (Source: NIW Commentary document for AIR19).

S/No	Hydraulic Models Rebuilds Ongoing in 2019-2020	Status	Year To Be Completed	Numbers of Properties
1	[X]	Ongoing	2019	2,735
2	[X]	Ongoing	2019	17,435
3	[X]	Ongoing	2019	2,086
4	[X]	Ongoing	2019	10,932
5	[X]	Ongoing	2019	4,652
6	[X]	Ongoing	2019	34,448
7	[X]	Ongoing	2019	2,122
8	[X]	Ongoing	2019	14,615
9	[X]	Ongoing	2019	16,508
10	[X]	Ongoing	2019	5,693

4.3.3. Line 15: Total distribution zones identified for study.
NIW has identified 71 distribution zones. The Company advised that these zones have been combined into 54 model areas that reflects the current configuration of water resources zones.

4.3.4. Line 16: Cumulative % distribution zone studies completed.
NIW has completed all the planned distribution zone studies and has reported 100%. This report is consistent with AIR18.

4.3.5. Line 17: Percentage population/properties – completed studies.
NIW has covered 100% of the population or properties associated with the completed distribution zone studies and has reported 100%. This report is consistent with AIR18.

4.4. Water Quality Compliance Measures (Lines 18 to 21)

There had been no shortfall of sample parameters tested for this year's reporting. A total of 97,935 sample tests were analysed to meet the required number of 97,496 tests for water quality reporting. Although there has been less than scheduled parameter tests carried out for service reservoirs, these are not regarded as a shortfall as some of the reservoirs were out of service. During the report year, 5 pesticide tests from Clay Lake WTW failed the Analytical Quality Control (AQC) standards and have not been included in the reported compliance numbers for Lines 18 and 19. NIW has informed the Drinking Water Inspectorate (DWI) about the calculated compliance numbers and is currently awaiting their feedback.

4.4.1. Line 18: % overall compliance with drinking water regulations.
The reported AIR19 value (99.90%) is similar to the previous year value of 99.88%. This year's report also exceeds the NIW's target of 99.79% and the highest compliance achieved in PC15 to date, with improving trend since AIR16.

If the 5 pesticide tests that failed AQC standard are considered as failed samples, it would reduce the number for this line by 0.01%.

4.4.2. Line 19: % compliance at consumers tap.
The reported AIR19 value (99.83%) is similar to the previous year's value of 99.81%. This year's report also exceeds the NIW's target of 99.69% and the highest compliance achieved in PC15 to date, with improving trend since AIR16.

If the 5 pesticide tests that failed AQC standard are considered as failed samples, it would reduce the number for this line by 0.01%.

4.4.3. Line 20: % iron compliance at consumers tap.
The reported AIR19 value (99.94%) is similar to the previous year's value of 98.85%. This year's report also exceeds the target of 97.10% and the highest compliance achieved in PC15 with improving trend since AIR16.

4.4.4. Line 21: % service reservoirs with coliforms in >5% samples.
No service reservoir sites have had more than 3 failures during the year. NIW advised us that it has an ongoing service reservoir cleaning programme to maintain this.

4.5. Nominated Water Service Outputs (Lines 22 to 24)

Through our audits, we established that DWI have full visibility of the programme and sign off of individual outputs to confirm delivery of outputs reported in Lines 22-24. We have checked the number of nominated outputs in these lines against the corresponding schemes in Tables 40 and 40a and found these to be consistent.

4.5.1. Line 22: Completion of nominated trunk main schemes.
Nil reported. NIW has not delivered any nominated trunk main schemes against the baseline forecast of a single output in AIR19.

4.5.2. Line 23: Completion of nominated water treatment works schemes.
Nil reported. NIW has not delivered any nominated water treatment works schemes against the baseline forecast of a single output in AIR19.

4.5.3. Line 24: Completion of nominated improvements to increase the capacity of service reservoirs and clear water tanks.
Nil reported. NIW has not delivered any nominated improvements to increase capacity of service reservoirs and clear water tanks in line with the baseline forecast for AIR19.

4.6. Additional Water Service Output Measures (Lines 25 to 28)

4.6.1. Line 25: Number of Catchment Management Plans.
No catchment management plans have been completed in AIR19 but NIW has completed 13 'live' catchment management plans so far in PC15. The two EU's INTERREG funded catchment studies for Killyhevlin and Belleek are currently in draft format and are expected to be completed by Q1 of 2019/20. Although Table 47 (Development Outputs) has not been reviewed as part of this audit, we note that the NIW's ORG (Output Review Group) regularly reviews the outputs of these projects.

Through our audits, we established that a review by NIW shows that the number of abandoned/closed catchments should be revised from 23 as stated in PC15 FD plan to 21 as Knockbracken and Ballintemple sites have subsequently been sold. NIW intends to submit a change control to revise the total number of catchment management plans in the baseline plan from 40 to 36.

4.6.2. Line 26: Number of School Visits.
A total of 246 school visits were carried out in AIR19 against the annual baseline target of 176. NIW has consistently outperformed its annual baseline target in PC15 since AIR16. NIW carried out 27 more school visits than the previous year (219 visits) but lower than the reported figures in AIR16 (277 visits) and AIR17 (257 visits). The number of pupils that took part in AIR19 (48,005 pupils) is significantly higher than in AIR18 (18,863 pupils) and AIR17 (19,700 pupils).

4.6.3. Line 27: Number of Other Educational Events.
A total of 66 events took place in AIR19 which is comparable to the previous years in PC15 (65, 64 and 62 events in AIR16-18 respectively). NIW has consistently outperformed its annual baseline target of 57 events in PC15 since AIR16.

4.6.4. Line 28: Percentage Service Reservoir Sample Taps.

NIW installed 286 sample taps in AIR19, an increase of 74 sample taps from AIR18 (212 sample taps). With 291 service reservoir taps to be addressed, the reported AIR19 number represents 98.3% of the total number of taps. It is a 25.4% increase from 72.9% in AIR18. Through our audits, we note that NIW underperformed against the annual baseline target of 100%. We also note that the underperformance has been due to the delays associated with the development and award of the related framework contract.

5. Confidence Grades

As shown in Table TC_T11_1, the confidence grades used have remained the same as last year, except for Lines 22 and 28 where both have improved from A2 to A1. The rationale and appropriateness of the assigned confidence grades were discussed at audit and found to be reasonable, with the following notes.

5.1. Asset Balance (Lines 1 and 12)

5.1.1. Line 1: Total length of mains at 1 April 2018.

The confidence grade for this line (B3) is the same as that reported for Line 12 in AIR18.

5.1.2. Line 12: Total length of mains at 31 Mar 2019.

NIW continues to assign confidence grade B3 to this line as the reported value for the line was derived from the company's CAR system using the MapBasic script as done for AIR18. NIW advised that there have been no significant improvements in data quality since AIR18. However, the Company's method statement has no change log or version control information for evaluation to confirm this statement.

As highlighted in Section 4.1.2, NIW has not adhered to the line definition in the Reporting Requirements and Guidance Manual which states that the reported value for the line must be calculated as the sum of Lines 1, 2 and 6 less Line 7. If a calculated value is used in the future, the confidence grade for this line could be improved as Lines 2 and 7 share the same confidence grade of A2 but with Line 6 having a confidence grade of B2.

5.2. Changes During the Report Year (Lines 2 to 11)

No change in confidence grades from AIR18.

5.3. Distribution Studies (Lines 13 to 17)

No change in confidence grades from AIR18.

5.4. Water Quality Compliance Measures (Lines 18 to 21)

Lines 18-20. No change in confidence grades from AIR18.

Line 21. Improved from A2 (AIR18) to A1 (AIR19) to reflect the nil value report for Line 21 in AIR19.

5.5. Nominated Water Service Outputs (Lines 22 to 24)

No change in confidence grades from AIR18.

5.6. Additional Water Service Output Measures (Lines 25 to 28)

- Catchment management plans (Line 25). No change in confidence grade from AIR18.
- School visits and education events (Lines 26-27). No change in confidence grades from AIR18.
- Service reservoir sample taps (Line 28). We established through our audits that information on the number of sample taps completed is provided by NIW's contractor. We note that NIW has now developed a procedure to ensure that the sample taps are marked as completed following proper installation and to the appropriate standard. The assessment for AIR reporting is therefore a simple binary counts (completed or not completed). The actual count of sample taps completed by 31st March 2019 has been added together from the monthly returns by the Asset Delivery team and

verified by the Project Manager to derive the % service reservoirs where sample taps have been assessed and are to the required standard. On this basis, we agree with the upgrade of confidence grade for this line from A2 (AIR18) to A1 (AIR19).

6. Recommendations & Suggested Actions

a) Line 12 (Total length of mains): We suggest use of the calculation processing rule in the UR's guidance document for Table 11 (i.e. sum of Line 1, Line 2 and Line 6 less Line 7) as opposed to the current use of data from the CAR system query. The Line 1 value is copied from previous years.

   The magnitude of the number derived from the CAR system is likely to be less than a calculated value due to the time lag between uploading project information onto the corporate database and year-end reporting. We observed that some project information would only be available towards the end of a report year. If a calculated value is used for future AIRs, then the confidence grade for this Line 12 could be improved as Lines 2 and 7 share the same high confidence grade of A2 within the calculation.

   If the UR guidance processing rule is used, the derived number would be expected to be more up-to-date because values for Lines 2, 6 and 7 can be obtained from Asset Delivery contract management information monthly returns and the Networks Water information collated by Field Managers. The Company should consider the impact of a change of approach on the Line 1 numbers copied from previous years and the effect of this on reporting for future years.

b) Line 11: To provide a better historic context for inter-AIR report comparisons, we suggest that NIW prepares a summary of mains bursts information, with a confirmation of the split between proactive, non-proactive and third-party repairs. The summary should include the estimated number of burst rates per 1000km.

c) Lines 26-27: To reduce the risk of transcription error, we suggest that NIW introduces control points and increase automation of data manipulations and calculations (where possible) associated with information on school visits and educational events. For example, through use of worksheets to record and analyse the number of school visits and educational events.

d) Lines 6, 6a, 6b: Enhance the Company's commentary document by providing information on the lengths and proportions of mains relined, renewed or new mains laid for quality and non-quality reasons.

e) Table 11 data collation and reporting methodology. Consider use of a change log to record changes made to the Table methodologies and processes so that version control can be tracked, and to facilitate easy identification of year-on-year changes for audit and assurance purposes.

SUMMARY OF AUDIT FINDINGS

Table 16 – Sewerage Service. Lines 1-33.

PREPARED BY	[X]
DATE	12 June 2019

RAG & Meaning	
	No material exceptions and compliant with requirement
	Content with the reported data but supporting information needs to be completed and/or improvement identified for AIR19, or other noteworthy comment
	Minor exceptions
	Material exceptions
N/A	Not applicable to report

1. Key Findings

AIR19 Table Criteria	RAG	Assessment
Independent review of performance against PC15 target (where relevant)		Performance is good, and targets have been met.
Methodology – consistency with the reporting process with clear control points		The reporting process is well managed. There are clear check points for reporting. Weaknesses are understood. However, there are some gaps within the methodology as it aligns with the UR's requirements. For example, NI Water's methodology for Lines 3-22 was not fully compliant with the UR's guidance. Post-audit, the Company produced a separate spreadsheet for drainage area studies in the format recommended by the UR guidance document for Table 16.
Assumptions – reasonableness and applicability		Assumptions are reasonable and appropriately applied
Source data – completeness		Source data is clearly identified, weaknesses are understood and are complete without material concern.
Clarity of audit trails – evidence of appropriate audit trail		The audit trail is often not fully available, but for compliance of treatment works the NIEA verifies all sampling that is sent to them. In the case of nominated works improvement there is sufficient investigation completed to enable appropriate assessment.
Confidence grades – documentation of appropriateness and rationale		Confidence grades are appropriate and the rationale for them is clearly documented.
Governance – evidence of engagement and of final sign-off		Evidence of engagement and final sign-off has been seen for the lines in this table.

- NI Water has met all its target in AIR19 for the improvement of the nominated wastewater treatment works.
- Through our audit of the length of time taken for blockages to be removed, a non-material typing error was found in the October reporting values. We can confirm that NI Water took corrective actions from our audits to prepare the final numbers for the AIR19 submission.
- We observed that there are some gaps in the Company's methodology and commentary as it aligns with the UR guidance document. NI Water took corrective actions from our audits to address these gaps prior to submission of AIR19.

2. Audit Scope

Five separate audits with the key NI Water system holders. This included representatives from the Wastewater Operations Team and Asset Performance Team. The audits were held on; the 21st May, 30th

May, and 5th June. Whilst at the Company offices, we carried out a review of written documentation and data, as it was made available. Our audits included an in-depth challenge of the methodologies for the lines in Table 16 and the UR's requirements; and an audit of the individual schemes and/or properties to confirm the appropriateness of the data being reported.

3. Performance and Significant Events

Asset Balance

Lines 1-2 & 14-15

The total length of sewers has increased by approximately 113km from AIR18 [15777.29km] to AIR19 [15890.63km]. The total length of critical sewers has increased by about 32km from AIR18 [3860.69km] to AIR19 [3892.98km]. The sewage area is unchanged from last year.

Changes During Report Year

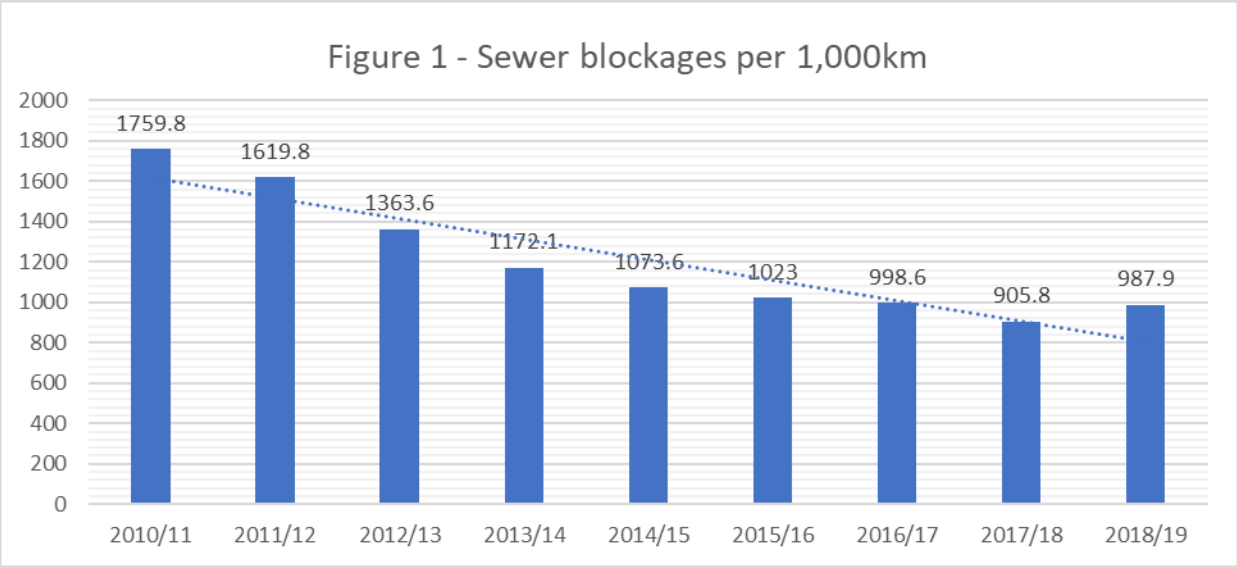
Lines 3-13c

The changes during the report year to the sewerage service assets have not been significant in the changes of length in new critical sewers compared to AIR18. No significant changes in the length of sewers renovated or replaced. In contrast, there has been a large decrease in the length of CCTV surveys (Line 4) compared to AIR18 and have returned to the level of AIR17 values; with approximately 90km (AIR17) rising to 150km in AIR18 and decreasing to 84km in AIR19. This decrease is the result of the end of a project to address the shellfish and bathing water directive which resulted in more CCTV surveys being completed.

In AIR19, NI Water has reported 77.5 collapses per 1,000km (Line 12) and 987.9 blockages per 1,000km (Line 13). The total number of blockages and collapses used to calculate the measures in Lines 12 and 13, are based on verified and paid contractor invoices for the numbers of blockages and collapses resolved.

The number of collapses per 1,000km reported year-on-year has remained relatively stable since AIR16, but the AIR19 report has seen a modest increase from 76 per 1,000km in AIR18 to 78 in AIR19. A decrease in the reduction of collapses will only be seen if proactive actions are taken to enhance the current level of CCTV investigations and sewer re-lining.

Although there has been an historic improvement in the sewer blockages per 1,000km there has been a slight increase in the number of blockages as shown below, this could be the start of stabilising of blockages and decreases in this number may only be seen with greater focus on cleaning pipelines before a blockage occurs.



NI Water runs a monthly report in Ellipse to obtain the length of time taken for a blockage to be cleared, as reported by job completion length. An infoview query is run for the jobs where a blockage has been cleared. As the Ellipse system calculates the length of time a job takes from the time the work request is raised until the work request is closed; therefore, all jobs exceeding 24 hours are investigated, as all follow-up jobs are included in the time the work request is open. These jobs are then reported in the correct category based on the length of time the blockage job took to complete.

Intermittent Discharges

Lines 16a-17b

NI Water does not allow overflows to be upgraded without approval from NIEA (Northern Ireland Environment Agency), therefore the reported numbers should be consistent with the NIEA's expectations. The number of UIDs excluding CSOs reported this year were 253 (Line 16a) and 137 CSOs (Line 16b).

The Asset Performance Team has been working in the report year to improve its GIS database for the number of CSOs and intermittent discharges. In AIR19 there has been a decrease in CSOs by 4 (2 have been added in AIR19 and 6 have been removed, balancing to a total of 4) and there has been no net change in wastewater pumping stations. Therefore, the Company has reported 784 CSOs (Line 17b) and a total of intermittent discharges excluding CSOs of 1771 (Line 17a). To date 44 assets have been removed from the GIS database - this is due to duplication of lines, bifurcation manholes and dual manholes which do not fall within the industry standard for reporting purposes.

NI Water advised that an exercise has been ongoing over the AIR reporting years to confirm the number of sewer system overflows within NI Water's wastewater collection system. An agreement is in place with NIEA that updates will only be submitted on a catchment by catchment basis once all information is confirmed. Any changes that may arise will be included onto NI Water's GIS system. We note that this process in ongoing.

Drainage Area Plans

Lines 18-22

We note that since the change in NI Water's process last year, DAP models has continued to be maintained and updated with changes as they occur, thus keeping the plans up-to-date. As such plans are reviewed on a five-year cycle and, if deemed necessary, to commission updates of the plans. Therefore, several updates of older plans have been completed and others have commenced. No DAPs were completed in this report year. Through our audits, we also note that the first stage of 7 DAP studies has been completed and that the second stage is in progress for a number of other studies.

We observed that there are a large number of studies (35) in progress at the end of the report year (Line 19). This is in part due to the length of time it has taken to complete some of the studies - can take up to two years, and the over-running of a number of studies that were due to finish in the report year. We note that the percentage population covered by the completed DAPs (Line 22) has decreased from the last year's reported number of 87.2% to 82.1%. This is due to the use of updated population equivalent (PE) data that has been used to calculate the percentage values. It does not mean that the coverage has decreased but it highlights the fact that the coverage is being continually corrected with the latest PE numbers.

Sewage Treatment Compliance Measures

Lines 23-25

We note that Line 23 to 24a are reported on by NIEA and are based on reported samples by NI Water to the NIEA. The Water Order Consents (WOC) specifies the number of samples to be taken per year and the

parameters which must be determined. A WwTW may fail if the required numbers of samples are not taken or the full range of parameter's are not determined. At monthly intervals (for the KPI, Board and CSDD/MT) and at the end of the calendar year (for AIR reporting), the number of WwTW's which have passed their numeric WOC was calculated as a percentage of the total number of works to determine the compliance with the target.

In AIR19 NI Water has reported 94.7% and 99.3% for the percentage of WwTW discharges compliant with numeric consents and the percentage of total PE served by WwTW's complaint with numeric consents respectively, meeting its PC15 target for the year.

All sites to be upgraded under NI Water's Rural Wastewater Improvement (RWI) project are agreed with the NIEA. The starting position for compliance projections throughout PC15 was based on NIEA's assessment of works as passing or failing in calendar year 2013. Compliance was projected to improve year on year through delivery of works agreed with NIEA for upgrade via the RWI project. In AIR19 a total of 307 WwTW's were assessed by the NIEA; 266 passed and 41 failed, giving a compliance of 86.64% (Line 25); this is a slight reduction on last year's compliance of 87.21% (AIR18). NI Water has not met the target of 91.86% for AIR19.

Nominated Sewerage Service Outputs

Lines 26-28

Through our audits we were able to confirm the total number of nominated unsatisfactory intermittent discharges (UIDs), WwTW and small WwTW improvements delivered during the year using data from Tables 40 and 41 (out of the Reporter's scope of work), the (Capital Programme Monitoring and Reporting) (CPMR) system, and a selection of the samples that are used to verify the compliance.

For AIR19, NI Water has delivered 8 nominated UID outputs against a PC15 target for Year 4 of 8 outputs. Of the outputs delivered; 6 were profiled for delivery in 2016/17 (delivered three years late) and one which had been profiled for delivery in 2015/16 which was completed in the year. The final output was a UID nominated profiled for completion in 2018/19. There are 20 PC15 nominated UIDs outputs outstanding for delivery over the final two years of PC15.

Six WwTW nominated outputs were delivered in 2018/19 (Maghaberry, Dundrum, Cloughey, Moneyreagh, Clabby and Mullans). None of these outputs were projected to be delivered in 2018/19. NI Water advised us that 2 of these WwTW's, Clabby and Mullans have been deemed to have achieved beneficial use in 2018/19 because of an in-year change of definition of beneficial use agreed with the Utility Regulator. NI Water now anticipate completing 8 WwTW improvements in the last two years of PC15.

A total of 10 small WwTWs achieved beneficial use during 2018/19, against a forecast delivery profile for Year 4 of PC15 of 8 outputs. All 10 of these outputs were forecast for delivery in 2018/19. We note that NIEA have full visibility of the programme and the sign-off of individual outputs confirming the delivery of the outputs that are reported in Lines 26-28.

Additional Sewerage Service Output Measures

Lines 29-33

We note that there have been 115 EDM (event duration monitor) installations in AIR19 which is a large increase from the previous year of zero. Having achieved this, NI Water still has 116 installations left to do to make up for the previous years when no equipment was installed, and a further 58 per year for the remaining two year of the PC15 period.

We also note that there are currently 28 qualifying works reported for WwTW upgraded to comply with PPC Regulations. In AIR19, 14 sites were upgraded to comply with the PPC regulations. A further 9 treatment works are due for completion by the end of PC15.

Through our audits, we established that in AIR19 NI Water has reported that the impermeable surface water collection area that has been removed from the combined sewerage is 34,103m^2 which is above the Company's target of 30,000m^2 for the year. This was achieved by the completion of 5 schemes; of particular note was the KS935 project (College Avenue/Shandon Drive Bangor Strom Sewer) which removed 24,180m^2.

We confirm that one sustainable WwTW solution was delivered during the report year for a works of PE > 250. Maghaberry is an upgraded WwTW with a new Biological Filter Process, and with capacity to treat to a maximum PE of 5,172. The target for the year was to deliver a sustainable solution at a WwTW of PE < 250 this has not been achieved this year due to difficulties in meeting land requirements. But progress has been made towards delivering a solution at the end of AIR20.

4. Summary of Audit Checks

Asset Balance

Lines 1-2 & 14-15

Lines 1 and 2 are a copy of the AIR18 reported lengths. We confirmed that the final numbers are consistent with the reported numbers last year.

Line 14 is calculated using a MapBasic script, which was re-run during the audit to generate the length 16009.1km which is the same as the reported number.

Line 15 is also calculated using a MapBasic script. However, sewers are assigned as critical using a third-party process, it was re-run and produced the length of 3930.23km which is the same as the reported number. The background data sets used in the process (building polygons, railway lines, traffic sensitive street and watercourse) have been updated recently.

Changes During Report Year

Lines 3-13c

The data for lines 3, and 5-11a is calculated from three sources: asset delivery (AD), developer services (DS), and operations (CSD).

The AD numbers are sourced from the NI Water system CPRM. A report is generated from CPMR listing all the capital schemes. Calculations are performed on the data pulled by the report to separate the length of pipes into new, renovated and replaced, non-critical and critical. This method produces all AD data for lines 3 to 11 and we confirmed that the reported lengths are the same as the lengths produced by the calculations sheet.

The reported DS numbers are consistent with the lengths quoted in the Quarterly Sewerage Adoption sign-off sheets and we confirmed that the split between critical and non-critical is consistent with the stated methodology.

We could not confirm that the reported lengths of renovated sewers by CSD are consistent with the source data as the complier of the reporting measure is sent the numbers by a colleague who obtains them from CPMR.

AD data for CCTV surveys comes from the same CPMR report as described above. The length reported was reviewed in the calculation sheet and we can confirm that it is the same as the reported number.

Intermittent Discharges

Lines 16a-17b

NI Water has a master spreadsheet of overflows and UIDs which they will deliver solutions to rectify. These solutions are agreed with NIEA. It is a locally held list which then forms the basis of the reported numbers for UIDs and overflows. We confirmed that the reported numbers are consistent with the source data.

Drainage Area Plans

Lines 18-22

We confirmed that the number of DAPs completed up to the end of the report year is 83 and the number in progress is 35, both of which are consistent with the lists provided in the Company's commentary.

Sewage Treatment Compliance Measures

Lines 23-25

These numbers are reported by NIEA to the Company. Through our audits, we performed a check on the raw data that was sent by NIEA that is used to calculate the compliance. We can confirm that these calculations for Table 16 have been completed appropriately.

Nominated Sewerage Service Outputs

Lines 26-28

We checked sampling data for Dundrum WwTW, Clabby and Mullans WwTW to confirm that their discharges complied with the required beneficial use. NIEA consents for Clabby Road Camgrat WwTW and Mullans WwTW were reviewed to confirm the works have been signed off and agreed.

Additional Sewerage Service Output Measures

Lines 29-33

Five schemes are listed in CPRM for surface water removed and these are sourced from CPMR using the same report as for the Asset Balance. We checked these schemes in the CPMR report and the number is consistent with the 5 schemes quoted in the commentary.

Line 32 is reported as 1. The delivery report for the WwTW in line 33 was reviewed to confirm the completion of the project.

5. Confidence Grades

The Company has assigned a confidence grades for the table lines as per below:

Table Line(s)	Grade	Reason
Line 1	B3	Records are not complete and potential errors in the total length of sewers is acknowledged.
Line 2	C3	Due to the reliance on 3rd party datasets for reporting. Actual lengths may not fully align with the reported number.
Line 3	C3	Based on mixed data sources. The grading is subjective but reasonable.
Line 4	C4	Based on mixed data sources. The grading is subjective but reasonable.
Lines 5 - 7, 9 - 11a	B2	Based on stable and reliable sources with small errors.
Line 8	C3	Based on mixed data sources. The grading is subjective but reasonable.

Table Line(s)	Grade	Reason
Lines 12 - 13	B3	The data is derived from checked and paid invoices and relies on the total length of mains.
Lines 13a - 13c	A1	Data is collated directly from Ellipse.
Line 14	B3	Records are not complete and errors in the total length of sewers is acknowledged.
Line 15	C3	Due to the reliance on 3rd party datasets for reporting. Actual lengths may not fully align with the reported number.
Lines 16a - 17b	C2	The measure relies on 3rd party data for the assigning of the measures.
Lines 18 -22	B2	Some data is taken as-is while other data requires calculation to obtain the reported numbers.
Lines 23 - 25	A1	The sampling data is reported and agreed by the NIEA.
Lines 26 – 27	A1	The reporting measures are based on sound, time specific data captured relevant to each individual UID.
Line 28	A2	No change from AIR18
Line 29	B2	Data collected from several sources and there is potential for error.
Line 30	A1	The reporting measure is based on samples reported to and agreed upon by NIEA.
Line 31	B2	The reporting measure is based on several data sources and has a small margin of error.
Lines 32 -33	A2	The reporting measures are based on sound and well-defined types of solutions that are sustainable.

6. Recommendations & Suggested Actions

a) Through our audit, we observed that Lines 14 and 15 (Total length of sewer (Line 14) and Total length of "critical sewers" (Line 15)) were not calculated as per the processing rule of the UR guidance document. Upon discussion we note that this year the number will remain uncalculated and that the output from the GIS system will be used for AIR19 reporting.

For next year's reporting, we recommend that NI Water use the calculated value, checked against the and GIS numbers. The Company should develop justifications that considers the impact of a change of approach on the numbers copied from previous years (Line 1 and Line 2) and the effect of this on reporting for future years. The use of a calculated value going forward may require the introduction of a reconciliation adjustment, but this should be investigated over the next report year.

b) In the cause of auditing the length of time taken for blockages to be removed, we found a typing error in the October reported values; this was corrected at audit and in advance of the AIR19 submission. We suggest the automation of the collation of data sets within the Excel spreadsheet used for reporting.

c) Currently, the NI Water's commentary is very summarised and did not always fully comply with the UR guidance document. We recommend that for the next reporting year the Company should work to improve the Table commentary, with full compliance with the UR guidance document.

SUMMARY OF AUDIT FINDINGS

Table 40 – Capital Investment Monitoring (CIM). CIM Template.

PREPARED BY	[X]
DATE	10 June 2019

RAG & Meaning	
	No material exceptions and compliant with requirement
	Content with the reported data but supporting information needs to be completed and/or improvement identified for AIR19, or other noteworthy comment
	Minor exceptions
	Material exceptions
N/A	Not applicable to report

1. Key Findings

AIR19 Table Criteria	RAG	Assessment
Independent review of performance against PC15 target (where relevant)		Good performance. Reporting process is mature and well managed.
Methodology – consistency with the reporting process with clear control points		No material changes to the AIR18 methodology. At audit, the method was demonstrated and is consistent with current reporting process.
Assumptions – reasonableness and applicability		Reasonable and appropriate assumptions applied.
Source data – completeness		Source data is taken directly from the Capital Programme Monitoring and Reporting (CPMR) system, with good reconciliation with Oracle data and Table 36 [Table 36 is excluded from the Reporter's AIR19 Audit Scope]. Programme changes and output dates are captured within CPMR. Outputs are subject to NIW's on-going quarterly reviews.
Clarity of audit trails – evidence of appropriate audit trail		Audit processes are captured within the Company's SharePoint system with evidence seen through our audits.
Confidence grades – documentation of appropriateness and rationale		N/A. But we note that project information in CPMR reconciles well with the more accurate financial information from Oracle, and are subject to NIW's on-going quarterly reviews.
Governance – evidence of engagement and of final sign-off		Through our audits, we have seen evidence of good governance covering both financial and project output information.

- NI Water's methods for proportional allocation of expenditure are applied consistently across most of the capital programme areas. Sample checks performed through our audits identified no material concerns.
- Through our audit of the control point designed to check profile of selected schemes from the Capital Programme Monitoring and Reporting (CPMR) system against beneficial use (BU) dates of the Oracle database, we identified a discrepancy between the Oracle and the CPMR BU dates for one of the schemes. We can confirm that NI Water took corrective actions from our audits to prepare the final numbers for the AIR19 submission.
- We note, from the Table 40 information provided by NI Water, that the overall amount of actual spend in 2018/19 (£170m) is £44m more than that forecast for the year in PC15 FD (£126m). We also note that, since beginning of the PC15 period in 2015/16, NIW has applied some £484m of capital

expenditure against a baseline forecast of £509m: an underspend to date of the order of£26m. We therefore note that the total money spent over the entire PC15 is expected to be about £717m, which is £43m lower than the PC15 FD baseline forecast of £760m.

2. Audit Scope

Audits of Table 40 information and reported numbers were carried out on 5th June and 12th June against the principles and requirements of the UR guidance. We sampled projects in Table 40 across scheme types to examine the proportional allocation of expenditure and the appropriateness and consistency of interpretation/application of the company's Capital Investment Driver Allocation (CIDA) guidance.

3. Performance Against PC15 Target

3.1. Delivery of PC15 Nominated Outputs

We reviewed and checked PC15 nominated outputs in Table 40a against the information given in Table 40 and the associated commentary given in Table 30. The outputs were found to be consistent across these reports. [Note that both Table 30 and Table 40a are excluded from the Reporter's AIR19 Audit Scope and table commentaries have not been prepared for these]. Our audit notes of NIW's performance in Year 4 of PC15 (2018/19) may be summarised as follows.

- **Sub-programme 04 (water treatment works, WTW).**

  We identified that NI Water did not deliver any output against the PC15 FD (baseline) Year-4 target of a single output for Caugh Hill WTW. The project is currently the subject of a Change Control being prepared for submission to the Utility Regulator (UR). This Change Control emerged from discussions which involved NI Water, the UR and the Drinking Water Inspectorate on the THM /DOC water quality driver and the fact that the works is passing the THM regulatory standard.

  We note that the Caugh Hill WTW project will be substituted out of the PC15 delivery programme, with a number of WTW sites (with enforcement orders for pesticides and a bromide water quality related issue) brought into PC15. The completion date for Caugh Hill WTW has been revised to 2020/21.

- **Sub-programme 05 (water trunk mains).**

  We note that NI Water did not deliver any output against the PC15 FD (baseline) Year-4 target of a single output for Carmoney to Strabane Strategic Link Watermain.

- **Sub-programme 06 (service reservoirs and clear water tanks)**.

  We identified that the Company did not deliver any output in the year, in line with the PC15 FD plan for Year-4. Completion date for Killyhelvin Clear Water Tank project has been deferred to 2020/21. Lough Lea and Drumaroad projects remain to be completed in 2019/20 and 2020/21 respectively.

- **Sub-programme 12 (unsatisfactory intermittent discharge, UID)**.

  We note that a total of 8 nominated UID outputs were delivered in 2018/19, in line with the forecast delivery target for PC15 FD (baseline) in Year-4. One of the outputs delivered (KT391 UID223 Antrim Street SCS 05) was originally nominated for delivery in PC15 Year-1. We therefore note that this output was delivered 3 years late. The other 6 outputs (KR417 comprising UID 191, 192, 193, 194 and 265, and KB486 UID 399) were nominated for delivery in PC15 Year-2, and they were delivered 2 years late.

  We identified that project KS872 UID 012 Killaney WWPS 3 was delivered as planned, matching the PC15 FD forecast for Year-4. We also identified that there are 4 UIDs to be delivered in 2019/20 with additional UIDs to be delivered in 2020/21.

We note that there is no requirement to deliver any UID outputs in Year-4 and Year-5 of the PC15 FD forecast period.

- **Sub-programmes 15 & 16 (wastewater treatment works, WwTW)**.

  A total of 6 outputs were delivered in 2018/19, in line with the PC15 FD (baseline) Year-4 forecast delivery profile. Two of the outputs (KP586 Clabby WwTW and KS111 Ards South-Cloughey) were delivered 2 years late as they were originally put forward for delivery in 2016/17. The other two outputs (Moneyreagh and Dundrum WwTWs) were delivered a year late as they were originally nominated for delivery in 2017/18. Mullans WwTW was delivered early (it was originally planned for delivery in 2020/21 in PC15 FD).

  We note that the Maghaberry WwTW scheme was an addition to the PC15 programme as an output to be delivered in 2016/17.

  We identified that Annacloy WwTW which was planned for delivery in PC15 FD Year-1 has no actual output delivery information in Table 40a. We note that NIW anticipates delivery of 3 outputs (Ballintoy, Ballybogy and Greyabbey WwTWs) in 2019/20 with the delivery of a further 6 outputs [Robinsontown, Ballygowan, Ballykelly, Carrowdore, Ballywalter and Ballyhaskin WwTWs] in 2020/21.

- **Sub-programme 17 (small wastewater treatment works).**

  Ten outputs were delivered against the Year-4 of PC15 FD forecast of 8 outputs. This contributes to a total of 26 outputs that have been delivered to date against the cumulative PC15 FD forecast of 30 outputs between 2015/16 and 2018/19.

3.2. Expenditure Projections

By reference to the UR guidance set out in Section 4.3 of the AIR19 Reporting Requirements and Definitions Manual for Table 40, we note that NI Water has not made any specific notes in its commentary for Table 40 with respect to:

- expenditure variations and the Company's ability to deliver outputs given any variation in actual expenditure from PC15.

We note, from the Table 40 information provided by NI Water, that the overall amount of actual spend in 2018/19 (£169.375m) is £43.531m more than that forecast for the year in PC15 FD (£125.844m). But, since beginning of the PC15 period in 2015/16, NIW has used some £483.458m of capital expenditure against the baseline forecast of £509.060m: an underspend of: £25.602m underspent to date. We therefore note that the total money spent over the entire PC15 is expected to be £717.484m, which is £42.941m lower than the PC15 FD baseline forecast of £760.425m.

We have assessed expenditure projections for projects in progress using a selection of randomly selected schemes. The profiles of the chosen projects were found to be reasonable, realistic and achievable. On the basis of the information available and reviewed, we anticipate that the split of expenditure across the purpose categories and asset types will be reasonably aligned with the given projections, except for those where significant expenditure has been forecast after the forecast completion date.

4. Compliance Methodology and Process Controls

4.1. Compliance Methodology

We note that the method used by NIW to produce the CIM report for Table 40 is documented in the Company's methodology document titled 'CIM Report Production Instructions, version 1.4' dated 18th April 2019. We note that the document is still under development.

4.2. Process Controls

We note that changes made to the Table 40 methodology are recorded in the Change Log section of the CIM Report Production Instructions document. We also note that two changes were made for AIR19 to facilitate the application of manually extracted Oracle data and to accommodate externally funded projects that are present in the Oracle dataset. The changes involved addition of references to deal with reconciliation of numbers from the Oracle system for schemes funded by the EU's INTERREG programme and to cross check the CPMR information (costs rounded to the nearest thousand) against the more accurate Oracle financial information (costs rounded to the nearest penny).

We identified that the externally funded INTERREG projects are not included in Table 40. We also identified that the changes have no material impact on the monitoring processes of NIW's capital investment schemes. We therefore note that the monitoring of capital expenditures and delivery of the PC15 capital programme has remained consistent with the AIR18 reports.

We note that regular checks are performed to ensure the nominated output dates are correctly claimed and there is a control point to cross reference BU dates between CPMR and the Oracle datasets. Through our audit of this control point, we identified a discrepancy between the Oracle and the CPMR BU dates for one of the schemes. We can confirm that NI Water took corrective actions from our audits to prepare the final numbers for the AIR19 submission.

Through our audits, we identified that the Leakage Other category [sub programme 08] (Sort Ref. 1583) does not have a Project ID reference in Table 40. But, its allocation was 80% Base, 1% Enhancement and 20% Growth, resulting in an overall purpose allocation of 80+1+20 or 101%. In addition, the KA262 Islandreagh WWPS Upgrade project is associated with a 100% water infrastructure and 100% wastewater infrastructure allocations, with a total service allocation of 200%. We can confirm that NI Water took corrective actions from our audits to prepare the final numbers for the AIR19 submission.

We have seen evidence that the PC15 project changes and movements within the PC15 capital programme are managed through the Company's change control processes, with changes and audit trails tracked in CPMR.

4.3. Reconciliation Checks

We established that, in order to populate the Capital Investment Driver Allocation (CIDA) worksheets, NI Water downloads total net expenditure (inclusive of capital contributions) from Oracle to cross reference information from CPMR. The Year-4 (2018/19) numbers from Oracle (£169.390m) and CPMR (£169.375m) are materially consistent with a small discrepancy of 0.01%.

In addition, the Company uses a reconciliation check that involves a comparison of the combined gross capital expenditure for water and wastewater services in Year-4 (2018/19) between Table 40 (£171.120m) and Table 36 Line 13 (£171.135m) entries. Through our audits, we note that the numbers from both Tables reconcile well with a difference of the order of 0.01%.

It is important to note that, at present, asset type, service area and investment driver information have not been captured in sufficient detail particularly for complex projects. We note that capitalised salaries and overheads are featured as a single programme or item in Table 40, but the applied service allocation and purpose allocation is based on the rest of the capital programme. We also note that NI Water attempted to increase the accuracy of capitalised salaries and overheads allocation in the report year to better reflect the way salaries are allocated to individual projects. This was done by examining each of three elements of the programme, namely Capital Works Programme, M&G and Operations Capital, before assigning salaries and overheads against each of these programmes and eventually combining them into a single line. The Company's approach seems rational with respect to its strategic intent.

5. Key Assumption

We note that the key assumption for the Table 40 report is that all capital expenditures have been appropriately allocated across investment drivers in accordance to the guidance set out in the Company's Capital Investment Driver Allocation (CIDA) manual published in 2009, which uses investment drivers set by Ofwat's Regulatory Accounting Guidelines (RAG) 2.03.

5.1. Proportional Allocation

5.1.1. Introduction

We note that the Company's proportional allocation procedures have matured as a result of continuing resolution of issues identified from regular reviews by NI Water's Investment Management team over the years. Changes made to CIDA allocation of schemes during the year are reviewed by the Capital Programme Manager on a quarterly basis. The common issues identified this year are similar to the issues observed for AIR18 and noted as follows.

- New development allocated to Growth
- First time service provision allocated to Base rather than New Development
- WwTW expenditure incurred to bring a failing WwTW up to required standard, allocated to Quality rather than Base
- Remaining asset life not considered in the QBEG allocation of expenditure.

We also note that when issues are identified, they are addressed and satisfactorily resolved through the continuing Capital Programme Manager reviews.

We reviewed the proportional allocation of the four types of capital schemes that are highlighted through the UR guidance document for reporting. We found that these allocations are appropriately and reasonably applied.

5.1.2. Leakage Programme

We note that capital expenditure associated with leakage reduction programme is primarily allocated to Base (B) except for growth related elements such as trunk main studies, DMA optimisation and pressure management, which are allocated to Supply Demand Balance (G).

5.1.3. Water Mains Rehabilitation Programme

We established that the Company's proportional allocation is determined for each zone separately. We observed that a number of spreadsheets are produced which provide details of the works required in each street, the principal reason why the work is necessary, lengths, diameters, and materials of existing and proposed assets, and the technique for rehabilitation/replacement. We identified that the principal reasons (justifications) for the work in each street is used as a surrogate to determine the prime purpose category as follows:

- Structural as Base
- Operational as Base
- Hydraulic as Supply/Demand Balance (New Development or Growth)
- Water quality as Quality

5.1.4. Water and Wastewater Treatment Works Programmes

We note that proportional allocation for water and wastewater treatment works programmes are assessed by the relevant project manager on a project by project basis. We also note that allocations have been on the following basis.

- Like for like replacement as Base (B)
- New assets/processes to meet a changing standard as Quality (Q)
- Increases in treatment capacity as Growth (G)

5.1.5. Unsatisfactory Intermittent Discharge (UID) Programme

We note that proportional allocation for UID programmes are assessed by the relevant Project Manager on a project by project basis on the same basis as applied to the water and wastewater treatment works programmes.

6. Source Data

The two key data sources for Table 40 are the Company's CPMR (Capital Programme Monitoring and Reporting) and Oracle systems. The CPMR provides project governance information. Financial management information is derived from the Oracle system.

We note that the Oracle system records financial information to the nearest penny and is considered to be more accurate than the CPMR system which registers data to the nearest thousand pounds. The Company undertakes cross reference checks to reconcile the two data sets for quality assurance purposes. The year-end reconciliation of the two data sets was demonstrated at audit and it showed a good agreement. We also note that NI Water conducts in-year reconciliation of CPMR with Oracle data during the report year.

7. Audit Trails

At audit, we conducted a review of a sample of schemes to assess proportional allocation and expenditure projections for individual schemes. The sampled schemes cover the sub-programmes that are highlighted in the UR's guidance for AIR19 reporting. These are:

- Leakage (sub-programme 04)
- Water mains rehabilitation (08)
- Water treatment works (04)
- Wastewater treatment works (16); and
- Unsatisfactory intermittent discharges (12).

7.1. Proportional Allocation

Our audit assessment of proportional allocation is shown in Table TC_T40_1 below.

Table TC_T40_1: Assessment of Proportional Allocation.

[X]

7.2. Expenditure Projections

Our audit assessment of expenditure projections is shown in Table TC_T40_2 below.

Table TC_T40_2: Assessment of Expenditure Projections.

[X]

By reference to the contents of Table TC_T40_2, we note that there are no forecast expenditures for 3 WTW schemes: Dorisland and Killyhevlin (JI052) and Caugh Hill (JL772). These are to be delivered in 2020/21 but capital expenditures have been allocated to the projects in the next two years in Table 40. We also note that the Carmoney to Strabane Strategic Link Watermain project has been moved from 2018/19 to 2020/21 with no forecast capital expenditures post AIR19.

8. Confidence Grades

Confidence grades do not apply to Table 40 entries.

9. Governance

We note that NI Water uses the I-Stream SharePoint system for the governance of all information used to populate Table 40. At audit, the application of the system was demonstrated.

We observed that the author, reviewer and approver names and their action timestamps are digitally recorded in the Company's database. We also observed that NI Water reviews the capital delivery and expenditure performances regularly. Any issues raised through these reviews, including those relating to service cost and investment driver allocations are addressed and resolved promptly. Notes of our observations represent evidence of good governance by the Company in managing the information associated with Table 40.

10. Recommendations

We make the following suggestions aimed at improving the robustness of information reported through Table 40.

a) Introduce control points to ensure that reconciliation of purpose allocation and service cost allocation totals for baseline and actual/current are exactly 100%.

b) Introduce control points to ensure BU data from CPMR matches those from the Finance team's data sets.

c) Enhance the accuracy of service and purpose allocation applied to each programme and scheme

d) Introduce additional reconciliation and cross reference checks or control points between CPMR and Oracle data sources, and also between data tables at sub-programme or individual scheme level.

e) Improve the methodology statement for Table 40 to include narrative on the steps taken by NI Water to prepare data, and to analyse and derive the reported numbers for Table 40, with a note of the associated audit and governance processes. Formalise the 'CIM Report Production Instructions, version 1.4' document.

f) By reference to Section 4.3 of the UR guidance for Table 40, provide commentary to explain the differences in expenditure and NI Water's ability to deliver outputs given any variation in actual expenditure from the PC15 forecasts.

g) Update forecast capital expenditure profiles for reprioritised and rescheduled projects e.g. Carmoney to Strabane Strategic Link Watermain, Dorisland WTW, Killyhelvin WTW and Caugh Hill WTW.

SUMMARY OF AUDIT FINDINGS

Table 42 – PPP reporting. Lines 1-52.

PREPARED BY	[X]
DATE	10 June 2019

RAG & Meaning	
	No material exceptions and compliant with requirement
	Content with the reported data but supporting information needs to be completed and/or improvement identified for AIR19, or other noteworthy comment
	Minor exceptions
	Material exceptions
N/A	Not applicable to report

1. Key Findings

AIR19 Table Criteria	RAG	Assessment
Independent review of performance against PC15 target (where relevant)		Overall good performance, reporting process well managed
Methodology – consistency with the reporting process with clear control points		The methodologies are coherent and consistent with the reporting process. No changes to AIR18 methodologies.
Assumptions – reasonableness and applicability		Reasonable assumptions have been made, in particular, with respect to the volume of sludge produced by the PPP facility.
Source data – completeness		Data sets are accessible and complete. Some data sets are provided directly by the PPP contractor by way of invoices for payments, e.g. Opex costs. There is no full visibility of the breakdown of Opex costs from the contractor, due to contract sensitivity. At audit, the Company indicated that the methodology it uses to construct the APH value in Table 42 (Line 27) for the discreet PPP Alpha sites is not consistent with the methodology used in Table 12 for the "NIW Only" APH value. The scope of our Audit does not cover Table 12 (Line 5) and therefore we cannot comment further on this variance. If the Reporter's Audit scope for AIR20 is extended to cover Table 12, then it would be appropriate for us to investigate such inconsistencies further.
Clarity of audit trails – evidence of appropriate audit trail		Clear evidence provided during audit to demonstrate compliance with the UR guidance documents.
Confidence grades – documentation of appropriateness and rationale		No change from the AIR18 confidence grades. Our reviews and audits support the reported confidence grades.
Governance – evidence of engagement and of final sign-off		Through our audits, we have seen evidence of good governance with responsibilities for integrity of data and commentary clearly defined.

- NI Water's methodologies for reporting Table 42 are unchanged from AIR18.
- Through our audits of aspects of the Table 42 data entries, we identified two non-material shortcomings related use of N/A to represent zero entries and worksheet labelling. We can confirm that NI Water took corrective actions from our audits to prepare the final numbers for the AIR19 submission.

2. Audit Scope

Audits of Table 42 data were carried out on 29th May and 5th June 2019 against the principles and requirements of the UR guidance for reporting. Our audits consisted of series of interviews with NI Water's staff responsible for the preparation of AIR19 data and the PPP contracts team. Through the audits we reviewed methodologies and commentaries as well as a selection of supporting data reports (working sheets).

3. Performance and Significant Events

Block A - Project description

Line 1 - 6 (Static and factual data relating to the PPP contracts). No changes from the AIR18 reports.

Block B - Payment to the PPP concessionaire

Line 7 is the Unitary charge for Capacity charges and only applies to the Alpha sites, which is paid monthly to the concessionaire on invoice. Costs have increased nominally due to inflation, in line with the contract requirements.

Line 8 is the Unitary charge for variable charges and applies to all PPP concession sites. These are paid monthly based on concessionaire invoices. We note that for the Alpha sites, the variable cost is [X]% of total costs. For Omega and Kinnegar sites, these charges are [X]% variable costs.

For all the Alpha sites, variable costs have risen by about 6% from the AIR18 report. NI Water explained that the increase was due to an increase of about 2.4% in Distribution Input (DI) compared to the AIR18 report. For the Omega and Kinnegar sites the variable costs decreased marginally in comparison with the previous year's report.

Line 9 is the Unitary charge for deductions. These are applicable to all sites. However for the 2018/19 report year, deductions apply to the Alpha sites. No deductions were made for the Omega or Kinnegar sites.

We note that NIW have made relevant performance deductions from invoices submitted by the concessionaire, (via prior agreement with the concessionaire) as per the terms of the Alpha PPP contract. A total of £[X]m deductions were made by NIW for 2018/19. Through our audits, we established that sufficient information was provided to justify the deductions.

Line 10 is the cost of atypical expenditure incurred by the concessionaire. All three concessionaires incurred atypical expenditures in 2018/19. This included any payments or credits agreed in monthly invoices between the parties beyond the Unitary Charge payments due. It also includes provisions for Claims.

The Company's commentary details the breakdowns of the atypical expenditures for all three contracts. Essentially, the atypical expenditure for the Alpha Contract was £[X]m, for Omega Contract £[X]m and for Kinnegar £[X]m. All have been agreed and paid.

Line 11 is the Efficiency Gains at the PPP contract level. Some changes for cost reductions have resulted in efficiency gains in the report year against the baseline contract at award. For the Alpha Contract, £[X]m was reported. The equivalent cost for Omega is £[X]m.

There is sufficient information provided to justify the efficiency gains for both PPP contracts. Alpha is due to a reorganisation costs credit ([X]m) and quality monitoring change (£[X]m). Efficiency gains for the Omega contract is due to a combination of a number of savings made such as the North Down Disinfection Change implemented in September 2011 which resulted in a £[X]m efficiency saving. A Supplemental Agreement 4 executed in 2011/12 which reflects a change in wastewater flow management performance

requirements resulted in a £0.115m deduction in 2018/19. The change in weighbridge calibration frequency implemented in 2013/14 resulted in £[X]m of savings.

Line 12 is the Total PPP Payments and is sum of Line 7 – 10. This line is also the source data for Table 43 line 4.

Line 13 is the Capital Repayment line. It relates to paying off finance lease liability. The reported numbers are consistent with the Company's financial accounts. This report line applies to all PPP contract areas.

Line 14 is the Capital Maintenance line. This line is allocated based on a straight line assumption over the life of the contract following a change implemented in 2013/14 (IFRS). This reflects the assumption that the unitary charge does not fluctuate with changes in the capital maintenance spend in any year. The straight-line amount has been allocated to the sites on the basis of the total amounts included in the original contract financial models. The Line commentary explains the allocation by site and is sufficiently detailed and supported by the working calculation sheet.

Line 15 has been deleted and is no longer used.

Line 16 is the Atypical Payments Capitalised. PPP capital payments/receipts arising from exceptional events outside standard contract payment terms and conditions. The Company has provided a nil return for this line for all three PPP contracts.

Line 17 is the Total Capital Capitalised and calculated by the summation of line 13 to 16. We can confirm that the line has been calculated correctly.

Line 18 is the Total PPP expenditure expensed and is the summation of line 12 (Total PPP Payments) minus line 17 (Total Capital Capitalised). This will provide the Total charge to P & L account arising from payment of PPP contracts.

Line 19 is the Interest. This applies to all PPP contracts. In 2017/18, It was only applicable to Alpha sites and therefore the overall total figures for this line will differ from the previous year as Omega and Kinnegar are now included in AIR19 table. We established that this is due to the fact NIW adopted the IFRS in regulatory reporting in 2018/19. All contracts are now reported in Company's financial accounts. Entries to this line represent the notional interest on the finance lease.

Line 20 is the Total PPP Opex and is summation of line 18 (Total PPP expenditure expense) minus line 19 (Interest) and has been calculated correctly.

Block C - Water Distribution Data

Line 21 – Distribution Input – (DI). The reported data is only relevant for the Alpha PPP Contract and is supplied by the Alpha Ops Contractor. The line data and methodology are linked to the Table 10 Line 26 report (excluded from the Reporter's Audit Scope). The total across Alpha sites is 280.88Ml/d [AIR19] from 269.66 Ml/d [AIR18] – a 4% increase. We note that the reasons for the increase in DI numbers are twofold as follows.

- 2018/19 was a dry high demand year
- Operational actions associated with a contamination spill incidence on the River Bann, which is the source of water, via an impounding reservoir that feeds Ballinrees PPP WTW (Alpha Site).

The confidence Grade is stated as B2 which is appropriate for the reported data.

Line 21a – Water Treatment Capacity. This data is specified in the contract arrangements for each site in the Alpha contract. The reporting guidance refers to this as 'Qminreq' for each site and in line with the

Alpha Contract requirements. There has been no change to the minimum required capacity in the report year. We found that the confidence grade for the line is appropriate at A1.

Line 22 – Length of Mains. This data is specified in the Alpha contract. This is the length of the DBFO link main from Castor Bay to Forked Bridge, that the Alpha Ops Contractor manages. This length of main was derived from "as built" record drawings and is used in Table 11 Line 12. There has been no change in the 16.42 length of main and confidence grading of A2 between AIR18 and AIR19.

Block D – Water resource and treatment data

Line 23 & Line 24 - Turbidity 95%ile greater or equal to 0.5NTU and Turbidity 95%ile less than 0.5NTU (respectively). These lines only apply to the Alpha sites which are Moyola, Ballinrees, Castor Bay, Dunore Point and Forked Bridge.

We note that NI Water provides the schedule of samples to be taken at each site to Serco, who carry out the sampling. Samples are taken post clear water tanks at each site. Data is fed back in to NIW's Laboratory Information Management System, LIMS. Samples are scheduled daily at each site as per the Drinking Water Inspectorate standards and regulations. Therefore 365 yearly samples should be extracted from LIMS. In some cases, not all sites will have 365 days of sample data for various reasons including site shutdowns for maintenance. These are excluded from the count. The LIMS compliance manager extracts the raw sample data via a programme query applied to the database. We consider that the confidence grade of A2 applied to these lines are appropriate in view of the analytical data variables present in the data sets.

Through our audits, we identified a non-material corrective action on a summary table in the Company's commentary to make the labelling clearer - an additional column was required to identify the table line entry values i.e. the "Turbidity 95%ile greater or equal to 0.5NTU".

Line 25 - Source Type. The source type is only applicable to the Alpha PPP contracts. There is no change to this line from the previous year. Information is consistent with the methodology and summary data in Table 12 (Block A). Note that Table 12 is excluded from the Reporter's Audit scope. The confidence grade for the line is appropriate at A1.

Line 26 - Treatment type. The Treatment type is only applicable to the Alpha PPP contract. There is no change to this line from the previous year. Information is consistent with the methodology and summary data in Table 12 (Block B). Balinrees, Castor Bay, Dunore Point, and Moyola are all reported as W4 category i.e. the category intended to capture processes with very high operating costs . The confidence grade for the line is appropriate at A1.

Line 27 - Average pumping head (APH). For AIR19 submission the APH report is consistent with the previous year's numbers as shown below.

		Balinrees	Castor Bay	Dunore Point	Moyola	Total
APH	18/19	144.8	145.8	173.0	146.5	156.7
	17/18	131.6	147.2	173.0	146.5	155.9

NIW have confirmed that double validation flow meter test has been carried for self-assurance which has a +/-2% tolerance for DI. We note that this line is derived from Table 12.

Block E – Sewerage Data

Line 28 & 29 - Total length of sewer & Total length of critical sewer. These two lines apply to two sites in the Omega Contract: Ballynacor and North Down.

We note that lengths have been derived from "as built" sewer records and have not changed from previous years.

The confidence grades for these lines are appropriate at B2.

Block F – Sewage Treatment and Disposal Data

Line 30 - Population equivalent of total load received. The data is provided by the Omega & Kinnegar Ops contractors. This line is derived from measured total load highlighted in line 31 below, using standard industry value of 60g BOD per person per day in the calculation. Confidence Grade B3 is agreeable and consistent with the Table 15 Line 6 where the data is mirrored. Note that Table 15 is excluded from the Reporter's Scope of Audits.

Line 31 - Load received by STW's. The data is provided by the Omega & Kinnegar Ops contractors. The total load is based on analytical data derived from samples taken from the inlet of all the PPP wastewater treatment works. Confidence Grade B3 is agreeable and consistent with Table 17D where this data is mirrored. Note that Table 17d is excluded from the Reporter's Scope of Audits.

Line 32-36 - STW Contents Data. These lines are related to the consents data namely: Suspended Solids, BOD, COD, Ammonia and Phosphates for the associated STWs. The consents data are derived from the Water Order Consent held by the Contractor for each of the sites which have been provided by the Northern Ireland Environment Agency. The Water Order Consents are set on lower and upper tier limits with pass/fail being based on look up tables, a breach of the upper tier limits being classed as a failure. NI Water advised us that there has been no material change to the Water Order Consents since AIR18. The applied confidence grades of A1 are deemed appropriate for these lines.

Line 37 - Classification of Treatment Works. There has been no change to the treatment facility classifications since AIR18. The reporting for these works' classification is consistent with the guidelines and methodologies reported in Table 17b Line 8. Note that Table 17b is excluded from the Reporter's Audit Scope. The applied confidence grade of A1 is appropriate.

Line 38 - Size band of sewage treatment works. This line is related to the size band based on BOD loading for each site (applies to Omega and Kinnegar sites) in accordance with the UR's guidance document.

We note that the only change from the last report period is that Richhill WwTW has now been re-classified as a Band 3 size works (from Band 4). We also note that NI Water has been monitoring Richhill site for a number of years with respect to its BOD loading and banding and felt that Richhill is more in line with the Band 3 category. The confidence grade of B3 is appropriate.

Block G Sludge Treatment Disposal Data

Line 39 - Total sludge imported from NI Water. This is the total volume of sludge imported from NI Waters operated sites (non-PPP sites) that is measured by weigh bridges or by slogger meters and received at two sludge treatment sites. The measurement is on receipt of sludge at these sites and not on dispatch. The total volume measured for AIR19 is 34.712 TTDS which is consistent with the AIR18 report. This line is consistent with Table 15 line 16. Note that Table 15 is excluded from the Reporter's Audit scope. The confidence grade of B2 is appropriate.

Line 40 - Sludge produced by the PPP facility. This is the amount of sewage sludge resulting from the treatment of sewage on the PPP facility in the report year expressed in thousands of tonnes of dry solids (TTDS) of sludge produced. All sludge from the Kinnegar site is transferred to the incineration plant at Duncrue Street

A back calculation is used to establish the indigenous sludge at Ballynacor by subtracting the input slogger data (which records both inputs from NI Water and PPP facilities at North Down Ards, Ballyrickard, Richhill and Armagh) from the cake transferred to Duncrue Street. We note that the total value reported for AIR19 is 6.329 TTDS, which show an increase from last year's reported number, 5.690 TTDS.

This line report is consistent with Table 15 line 15 where this is also reported, but the difference between the numbers being the grit and screenings from the Omega and Kinnegar sites. The applied confidence grade at B2, based on metered and weighed sludge data, is appropriate.

Line 41 - Sludge exported to Duncrue Incinerator. This is the amount of sewage sludge exported from the PPP facility to the PPP facility at Duncrue Street in the report year expressed in thousands of tonnes of dry solids of sludge produced. All sludge is delivered to Duncrue Street Sludge Treatment Facility, including all Company and PPP sludge, for either incineration or for disposal through other alternative routes.

We note that it is very difficult to ascertain the exact volume of PPP sludge that is incinerated at Duncrue Street, as the sludge is mixed with NI Water's sludge. Therefore, this line only reports the volume of PPP sites sludge to Duncrue Street as these are measured. All NI Water's sludges are not included in this line but are captured in Table 42 Line 39. At Duncrue Street the sludge is either incinerated or disposed of by alternative disposal routes. Grit and screenings are excluded from this volume, as these will always end up at landfill sites.

We note that a confidence grade of B2 is applied to Line 41 data – no change from the AIR18 report.

Line 42 – Sludge Exported to Other PPP Facilities. Reported as N/A in the pre-audit version of the table. We can confirm that the N/A entries were replaced by zero entries in the final version of the AIR19 table submission.

Line 43 - Sludge exported to NI Water. Reported as N/A in the pre-audit version of the table. We can confirm that the N/A entries were replaced by zero entries in the final version of the AIR19 table submission.

Line 44 - Sludge disposed of from site to - Farmland Untreated. Reported as N/A in the pre-audit version of the table. We can confirm that the N/A entries were replaced by zero entries in the final version of the AIR19 table submission.

Line 45 - Sludge disposed of from site to - Farmland Conventional. Reported as N/A in the pre-audit version of the table. We can confirm that the N/A entries were replaced by zero entries in the final version of the AIR19 table submission.

Line 46 - Sludge disposed of from site to - Farmland Advanced. The PPP Contractor disposed of 0.898 TTDS of sludge in the report year [AIR18: 0.788 TTDS]. This has arisen from the PPP Contractor's choice of alternative compliant disposal routes. The applied confidence grade of B3 is appropriate.

Line 47 - Sludge disposed of from site to Incineration. This is the amount of sewage sludge disposed of, to incineration from the PPP facility in the report year expressed in thousands of tonnes of dry solids of sludge produced. The volume is calculated as the total sludge received at Duncrue minus total sludge disposed off-site i.e. to landfill and farmland.

The AIR19 reported value is 40.142 TTDS being incinerated as the PPP contractor's preferred method of disposal [AIR18: 39.618 TTDS]. We consider that the applied confidence grade of B2 is appropriate.

Line 48 - Sludge disposed of from site to – Landfill. This is the amount of sewage sludge disposed of to landfill from the PPP facility in the report year expressed in thousands of tonnes of dry solids of sludge produced. The disposal route to landfill is mainly for grit and screenings. The Kinnegar Contractor

disposed of some 0.033 TTDS of Screenings (no grit produced) while the Omega Contractor disposed of 0.220 TTDS of Screenings and Grit. The applied confidence grade of B3 is appropriate.

Line 49 - Sludge disposed of from site to – Composted. Reported as N/A in the pre-audit version of the table. We can confirm that the N/A entries were replaced by zero entries in the final version of the AIR19 table submission.

Line 50 - Sludge disposed of from site to - Land Reclamation. Reported as N/A in the pre-audit version of the table. We can confirm that the N/A entries were replaced by zero entries in the final version of the AIR19 table submission. We note that the AIR18 report for this line is 0.183 TTDS [AIR19: 0 TTDS].

Line 51 - Sludge disposed of from site to - Other (Willow Coppice). Reported as N/A in the pre-audit version of the table. We can confirm that the N/A entries were replaced by zero entries in the final version of the AIR19 table submission.

Line 52 - Sludge disposed of from site – Total. This is the total amount of sewage sludge disposed through all discharge routes by the PPP concessionaire for the report year expressed in thousands of tonnes of dry solids of sludge produced, excluding any sludge returned to NI Water for further treatment or disposal. The line is calculated from the sums of Lines 44 to 51. The applied confidence grade of B2 is appropriate.

4. Summary of Audit Checks

Through our audits, we checked NI Water's Excel spreadsheet calculations associated with the population of the Table 42 data entries. We can confirm that the Company's calculations are correct.

5. Confidence Grades

No changes from the confidence grades used for AIR18 reporting.

6. Recommendations & Suggested Actions

At audit, the Company indicated that the methodology it uses to construct the APH value in Table 42 (Line 27) for the discreet PPP Alpha sites is not consistent with the methodology used in Table 12 (Line 5) for the "NIW Only" APH value. The scope of our Audit does not cover Table 12 and therefore we cannot comment further on this variance. If the Reporter's Audit scope for AIR20 is extended to cover Table 12, then it would be appropriate for us to investigate such inconsistencies further.

We suggest that the Reporter's Audit scope for AIR20 is extended to cover Table 12 to facilitate investigation of the inconsistencies between the approach used for the reporting of APH values across Table 42 (Line 27) and Table 12 (Line 5).

SUMMARY OF AUDIT FINDINGS

Table 43 –PPP reporting. Lines 1-15

PREPARED BY	[X]
DATE	10 June 2019

RAG & Meaning	
	No material exceptions and compliant with requirement
	Content with the reported data but supporting information needs to be completed and/or improvement identified for AIR19, or other noteworthy comment
	Minor exceptions
	Material exceptions
N/A	Not applicable to report

1. Key Findings

AIR19 Table Criteria	RAG	Assessment
Independent review of performance against PC15 target (where relevant)	N/A	N/A
Methodology – consistency with the reporting process with clear control points		The methodologies are up-to-date, coherent and consistent with the reporting process and the UR guidance document.
Assumptions – reasonableness and applicability		The assumptions used are reasonable and consistent with the Table 42 assumptions related to the reporting of sludge handled at the PPP sites. The data for the Line 5 report is provided by the PPP Ops contractor with no auditable supporting information. In response to our challenge, NI Water noted that it is possible for the Company to use the provisions of the Omega contract to ensure that the Reporter is given access to Glen Water staff to audit/validate the sums Glen have presented for Table 43 Line 5 [Payments from Concessionaire to Operator], through future AIR returns. We concur with the Company's statement in this regard.
Source data – completeness		Data sets are accessible and complete.
Clarity of audit trails – evidence of appropriate audit trail		Clear evidence provided during audit to demonstrate compliance with the UR guidance documents.
Confidence grades – documentation of appropriateness and rationale	N/A	N/A
Governance – evidence of engagement and of final sign-off		Through our audits, we have seen evidence of good governance with responsibilities for integrity of data and commentary clearly defined.

2. Audit Scope

An audit of Table 43 data was carried out on 29th May against the principles and requirements of the UR guidance for reporting. Our audits consisted of series of interviews with NI Water's staff responsible for the preparation of AIR19 data and the PPP contracts team. Through the audits we reviewed methodologies and commentaries as well as a selection of supporting data reports.

We also looked at movements in data reported between the AIR18 and the AIR19 data tables. Where changes are material, we have sought explanation from the Company.

3. Performance and Significant Events

Lines 1 to 3 – Project Description. No change from the previous AIR18 report.

Line 4 - Payment to Concessionaire. This line represents the total unitary charge (both opex and capex) paid by NI Water to the concessionaire reported in £ms for the report year. There are no significant variances between the AIR18 and AIR19 numbers. This line is copied from Table 42 line 12.

Line 5 - Payment by Concessionaire to Operating Company. This line reflects the payments made by concessionaire to the operating company per site i.e. operating costs and profit. The data is provided by the PPP Ops contractor with no auditable supporting information.

At audit, we confirmed that the Line 5 data is consistent with entries in Table 21 Line 22a and Table 22 line 21a. We note that the capital maintenance and other capital/financial charges have not been included as part of this payment cost.

Line 6 – Power Costs. This is the energy costs associated with the provision of PPP facilities. This line is not required to be completed for Kinnegar as direct power costs at this site is paid as part of the Concessionaires payment to the Operating Company. The Company is therefore unable populate this line.

For the Alpha sites, the cost of power is picked up from the sum of invoices received by the Company for the relevant Meter Point Reference Numbers (MPRN) during the report period as recorded in the NI Water's Oracle system. We observed an increase of costs by 18% since the AIR18 report. At audit, NI Water explained that one possible reason for the increase in cost is due to an increase in DI numbers (about 2.4% up from AIR18 report) because the 2018/19 report year is a dry and high demand year with the application of hosepipe ban in summer 2018.

Power costs for the Omega sites are also picked up from the sum of invoices received by the Company for the relevant MPRNs over the report period as recorded by the Company's Oracle system. The MPRN's are agreed and cross checked with the PPP Contracts Management Team (CMT).

Duncrue Street has one electricity meter which includes the costs for the Belfast WwTWs and the incinerators. The split of usage between the incinerators and the Belfast works is taken as 49% of the total costs are allocated to the PPP Incinerators, a change from 56% in the previous year.

We note that total for columns 20 and 21 [Table 43] are consistent with the Line 2 data totals in the PPP only section of Tables 21 and 22.

Line 7 - Other direct costs. This is reported as any other operational costs incurred by NI Water for the provision of PPP facilities. This could include any materials, service charges, fines, penalty costs or any other direct costs which NI Water have to bear in relation to PPP operations. We note that for the report year, the Alpha sites cost includes the cost of abstraction licences at each of the PPP Alpha sites. There are no other direct costs for the Kinnegar and Omega operations.

Line 8 - Total direct costs. This is the sum total of lines 6 and 7.

Line 9 - General and support expenditure. This is the management and general administration costs of managing the PPP contracts. The cost data are derived from the project cost centre codes. The staff costs are allocated by contracts and sites. The cost of using consultancy services are contract specific and are also included. The total cost for Alpha is allocated evenly over the 7 Alpha sites. Likewise, the total for Omega is allocated over the 7 Omega sites. Kinnegar is a single site so is allocated directly.

Line 10 - Total functional expenditure. This is the sum total of lines 8 and 9.

Line 11 - Scientific services. This cost includes the costs of scientific and laboratory services, and of the monitoring of quality (excluding 3rd service providers). For Alpha sites, the reported values are zero, due to the fact that the Unitary Charge invoices for Alpha sites is reduced by an amount to cover any costs associated to this line definition. This is consistent with the AIR18 report.

Line 12 – Rates. This is the cost of all rates at PPP sites. All Alpha PPP site rates are based on the water Distribution Input values for the sites i.e. volume of water supplied from each PPP site into the Distribution Network. The volume of water is taken as a percentage of the total NIW's water supplied and this number was multiplied by the total NIW's rates cost. For AIR19 the reported value is £[X]m which has marginally increased from AIR18 (£[X]m). We note that this increase is due to the increase in DI over the report year with 2018/19 being a dry, high demand year associated with a hosepipe ban in summer 2018.

For all Omega PPP sites and the Kinnegar site, the rates are calculated directly from the rates bills for each site.

For Duncrue, a consistent approach has been used since AIR18, where the area of the site is split between NI Water and the PPP site area (incinerator area). The incinerator area at Duncrue is 15% of the overall site, so the PPP area is 15% of the total rates for Duncrue.

Line 13 - Estimated terminal pumping costs. Power costs are derived from Meter Point Reference Numbers (MPRN) record of the Oracle system for each site. There are only two Omega PPP site facilities that have Terminal Pumping Stations (TPS) associated with them. These are:

- North Down Ards Facility, which has 5 TPS sites power costs
- Ballynacor WWTW Facility, which has 2 TPS sites power costs

Total power costs for TPS for AIR19 is £[X]m, and we note that this is consistent with the AIR18 report of £[X]m.

Line 14 - Estimated sludge costs. This line reflects the costs associated with the PPP sludge Omega facilities at Duncrue Street and Ballynacor. It totals the costs included at Lines 5, 10, 11 and 12. The reported costs for AIR19 is £[X]m which has marginally increased from the AIR18 report of £[X]m due to increased sludge management over the report year.

Line 15 - Total PPP operating expenditure. This is the total operating expenditure associated with PPP assets. This includes the costs and profits of the operator (concessionaire payment) at each site and the costs incurred by NI Water. This is auto calculated from the sum of Lines 5, 10, 11 and 12, by each PPP contract site and totals for each contract area. We note that Line 14 is not included to avoid double counting.

4. Summary of Audit Checks

Through our audits, we checked NI Water's Excel spreadsheet calculations associated with the population of the Table 43 data entries. We can confirm that the Company's calculations are correct.

5. Confidence Grades

N/A.

6. Recommendations & Suggested Actions

The data for the Line 5 report is provided by the PPP Ops contractor with no auditable supporting information. In response to our challenge, NI Water noted that it is possible for the Company to use the provisions of the Omega contract to ensure that the Reporter is given access to Glen Water staff to audit/validate the sums Glen have presented for Table 43 Line 5 [Payments from Concessionaire to Operator], through future AIR returns.

For future AIR reporting, we suggest that NI Water ensures that the Reporter is given access to Glen Water staff to be able to audit and validate the sums Glen are providing for Table 43 Line 5 reporting.

SUMMARY OF AUDIT FINDINGS

Table 46 – Serviceability. Line 13 Customer contacts (Discoloured water) only.

PREPARED BY	[X]
DATE	12 June 2019

RAG & Meaning	
	No material exceptions and compliant with requirement
	Content with the reported data but supporting information needs to be completed and/or improvement identified for AIR19, or other noteworthy comment
	Minor exceptions
	Material exceptions
N/A	Not applicable to report

1. Key Findings

AIR19 Table Criteria	RAG	Assessment
Independent review of performance against PC15 target (where relevant)	N/A	N/A
Methodology – consistency with the reporting process with clear control points		The methodology is consistent with the AIR18 methodology
Assumptions – reasonableness and applicability		Reporting assumptions are reasonable.
Source data – completeness		Data sets are accessible for audit purposes.
Clarity of audit trails – evidence of appropriate audit trail		Clear evidence provided during audit to demonstrate compliance against the UR guidance documents for this Line. NI Water's commentary for Line 13 was not available at the time of our audits. We suggest that a commentary is developed for Table 46, Line 13 in AIR20 covering data sets from the 2019/20 report year.
Confidence grades – documentation of appropriateness and rationale	N/A	N/A
Governance – evidence of engagement and of final sign-off		Through our audits, we have seen evidence of good governance with responsibilities for integrity of data and commentary clearly defined.

2. Audit Scope

An audit of Table 46 Line 13 data was carried out on 5th June against the principles and requirements of the UR guidance for reporting. Our audits consisted of series of interviews with NI Water's staff responsible for the preparation of AIR19 data. Through the audits we reviewed methodology for the Line 13 data report. We also looked at movements in data reported between the AIR18 and the AIR19 data table entries for Line 13.

Note that the Reporter's Audit scope for Table 46 is restricted to Line 13 - Customer contacts (Discoloured water) and this Table commentary has been prepared to report on our findings within the boundary of this scope.

3. Performance and Significant Events

Block A – Water Infrastructure

Line 13 – Customer contacts (Discoloured water). The source data for this line is generated from RAPID system via the NI Water's customer services team. The raw data is categorised by customer services call

agents through scripts designed to draw the correct category for discoloured water complaints. The categories used are: -

- Appearance - Discolouration - Blue/Green. (**47** Reported)
- Appearance - Discolouration - Black/Brown/Orange. (**3396** Reported)
- Appearance - Discolouration - Others. (**4** Reported)

Total reported for AIR19 is **3447** customer contacts.

We note that the Line 13 data requirement is on a calendar year basis, as reported to the Drinking Water Inspectorate. We therefore note that the reported data is extracted on this basis. Through our audits, we checked the consistency of the Line 13 entry back to source and we found that it is consistent.

We note that there has been an increase from the AIR18 report of 2632 customer contacts: a 23.64% increase.

4. Summary of Audit Checks

Through our audits, we checked NI Water's Excel spreadsheet calculations associated with the population of the Table 46 Line 13 entry. We can confirm that the Company's calculation is correct.

5. Confidence Grades

N/A.

6. Recommendations & Suggested Actions

NI Water's commentary for Line 13 was not available at the time of our audits. We suggest that a commentary is developed for Table 46, Line 13 in AIR20 covering data sets from the 2019/20 report year.

For future AIR reporting, we suggest that the Company commentary for Table 46 Line 13 should describe how the Company is using the water quality contact information to inform investment decisions, including prioritisation of water main rehabilitation (see UR's Reporter's Audit Scope for Table 46 Line 13).

We also suggest that the Reporter's Audit scope for AIR20 is extended to cover the full Table 46 audit to enable investigation of the links between actionable data and prioritisation of all associated water main rehabilitation proposals.