Water & Sewerage Services
Price Control 2015-21

Final Determination – Annex F

Outputs

December 2014



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Final Determination Annex F
Outputs

1.0 Introduction

1.1.1 Chapter 3 of the final determination provides a summary of the outputs and outcomes for PC15 and further information on:

- PC15 consumer engagement;
- The definition of outputs;
- Maintaining serviceability;
- Overall Performance Assessment;
- The development of new consumer measures and satisfaction survey; and
- A summary of the key benefits that PC15 will deliver.

1.1.2 This annex provides more detailed information on the outputs which are included in Tables 3.2 and 3.4 of the main document under the following sections:

Section 2	Consumer outputs
Section 3	Water service outputs
Section 4	Sewerage service outputs
Section 5	Serviceability
Section 6	New output measures
Section 7	PC15 output summary

2.0 Consumer Outputs

2.1.1 We currently monitor performance against a basket of consumer contact measures which cover: the speed of response to billing contacts, consumer complaints, and telephone calls; whether metered bills are based on readings; and overall call handling satisfaction. This will continue into PC15 on an interim basis.

2.1.2 NI Water performance for the majority of these measures is already high and comparable to the most recently reported average performance achieved by companies in England and Wales. The proposed targets for PC15 are based on the company maintaining this high level of comparative performance throughout the price control period.

Table 2.1 – Consumer response measure outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
DG6 % billing contacts dealt with within 5 working days	99.90	99.90	99.90	99.90	99.90	99.90
DG7 % written complaints dealt with within 10 working days	99.50	99.50	99.50	99.50	99.50	99.50
DG8 % metered customers received bill based on a meter reading	99.00	99.00	99.00	99.00	99.00	99.00
Call handling satisfaction score (1-5)	4.65	4.65	4.70	4.70	4.75	4.75
DG9 % calls not abandoned	99.00	99.00	99.00	99.00	99.00	99.00
DG9 % calls not receiving the engaged tone	99.90	99.90	99.90	99.90	99.90	99.90

2.1.3 Whilst these measures have provided useful indicators of improvements and comparative performance in the past, their usefulness has diminished as performance levels approach 100%.

2.1.4 As part of the collaborative working arrangements developed to support the consumer engagement research to inform PC15, a new Consumer Measures (CM) / Consumer Satisfaction Survey (CSAT) working group otherwise referred to as CM/SAT was formed. This working group, reports to the Consumer Engagement Oversight Group (CEOG) and is chaired by the Utility Regulator. Work is already underway to develop new consumer measures and a new satisfaction survey. An indicative timetable for this work is included in Section 3.0 of the final determination Main Report.

2.1.5 For the final determination we have included new KPI's to reflect the work that needs to be completed at the start of PC15 to allow reporting against the new measures and survey to commence in 2016-17. Section 6.2 provides additional detail on the measures and targets chosen.

3.0 Water Service Outputs

3.1. Overview

3.1.1 In this section we provide more detailed information on water service measures included in Table 3.2 of the main report covering:

- Properties at risk of low pressure (DG2);
- Properties experiencing interruptions to supply (DG3);
- Leakage;
- Security of supply;
- Power usage;
- Drinking water quality compliance;
- Water quality at service reservoirs; and
- Nominated outputs and activities.

3.2. Properties at risk of low pressure (DG2)

3.2.1 Since the start of the SBP period, NI Water has developed and validated a register of properties which are at risk of low pressure. At the end of the PC13 period it is estimated that this register will contain around 1,132 properties.

3.2.2 NI Water plans to remove a further 836 properties from the register by company action during PC15. The profile of delivery is show on Table 3.1.

3.2.3 The company has adjusted the outputs from its assessment to reflect past success in delivering against targeted reductions. We consider this to be appropriate so that targets remain realistic. The delivery profile also accounts for the time needed to validate that adequate pressure has been restored so that targets align with reported performance.

3.2.4 The planned reductions would leave 296 properties on the register at the end of the PC15 period and bring the percentage of properties that are at risk of low pressure broadly in line with historic average performance in England Wales. Investment undertaken in the final year of PC15 will result in a further 161 properties being validated and removed from the register in the first year of PC21, reducing the overall number of low pressure properties to around 135.

Table 3.1 – DG2 Outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
DG2 Properties at risk of low pressure removed from the risk register by company action	92	108	157	159	160	160
DG2 Properties receiving pressure below the reference level at end of year	1,040	932	775	616	456	296

3.2.5 Work to improve supply pressure is delivered as part of NI Water's planned programme of mains rehabilitation which prioritises work on the basis of a range of issues – including burst frequency and water quality. In recognition of the competing priorities and the ongoing impact that low pressure has on consumers affected, we asked NI Water to quantify the investment required to provide water at target pressure to all properties.

3.2.6 The company has completed this work and reported the outcome of its assessment as part of its PC15 submission. This is a positive development which will help inform stakeholder consideration of appropriate levels of investment in this area. The economics of providing target pressure to all remaining properties in PC21 will require careful consideration by stakeholders as the assessment undertaken by NI Water indicates that this becomes progressively more expensive.

3.3. Properties experiencing interruptions to supply (DG3)

3.3.1 Company performance on interruptions to supply is monitored using two measures:

- The percentage of connected properties that experience interruptions lasting greater than 12hrs; and
- A composite score calculated from the percentage of properties that experience interruptions lasting greater than 6hrs, 12hrs and 24hrs. Twice the weighting is applied to interruptions lasting greater than 24hrs in this score, in recognition of the impact that long duration interruptions have on consumers.

3.3.2 In previous determinations we noted that the link between DG3 improvements and investment was weak and stated that we expected the company to improve its understanding of interruptions to supply in order to develop more robust plans for improvement. We advised that we expected NI Water to consider the interaction between length of main per property, burst rates and interruptions to supply when undertaking this work and developing its proposals.

3.3.3 The company's response to the PC13 draft determination stated that its revised approach to identifying and prioritising water mains would allow it to establish clear linkages between investment and beneficial outputs for the PC15 Business

Plan. Despite these assurances NI Water did not address this issue with respect to its interruptions to supply submission for PC15.

3.3.4 Whilst an improved methodology for prioritising water infrastructure investment has been implemented, DG3 requirements have not yet been fully incorporated into this process. The company has also recently commenced service failure analysis for all unplanned and unwarned interruptions lasting more than 6 hours. This should lead to a greater understanding of the root cause of incidents and the necessary mitigations that need to be put in place. However the company is at the early stages of this process and does not currently have sufficient information available to inform its submission for PC15.

3.3.5 NI Water has undertaken a separate assessment of investment and outputs for PC15 due to its inability to establish clear links between the two. Its output proposals are therefore based on assumptions relating to the extension or variation of historic targets. As such, it is unclear how the company determined whether they are achievable and based on the information available we are unable to assess whether they are appropriate.

3.3.6 The company's planned outputs assume: that the target number of interruptions >24hrs remains unchanged; the target number of interruptions >12hrs reduces by 50 properties per annum (in line with PC10 and PC13 assumptions); and, that the annual reduction in the number of interruptions >6hrs is approximately 50% of that assumed for PC13.

Table 3.2 – DG3 Outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
DG3 Supply interruptions > 12hrs (unplanned and unwarned)	0.18	0.17	0.17	0.16	0.15	0.15
DG3 Supply interruptions (overall performance score)	1.07	1.05	1.03	1.00	0.98	0.96

3.3.7 NI Water was unable to provide any additional information to better inform this assessment for the final determination. The company's draft determination response acknowledged that further work needed to be completed to fully incorporate the DG3 assessment into its water infrastructure investment prioritisation methodology, complete its root cause analysis and to establish a link between investment and beneficial outputs.

3.4. Leakage

3.4.1 During PC10 and PC13 the company has made significant improvements to the quality of information and methodology used to estimate leakage. Improvements include the adoption of industry best practice, the move from industry default data to company specific data and the adoption of best practice software. This has improved the confidence in the leakage estimates produced by NI Water.

3.4.2 The company has also completed two assessments of its economic level of leakage during this period. This is the level at which further leakage reduction

activity starts to become uneconomic. The most recent assessment, which was completed in 2013, identified an economic level of leakage of 159Mld. This figure been used to inform the leakage reduction targets set for PC15.

3.4.3 The company's economic level of leakage assessment and business plan submission has been reviewed by an independent expert on our behalf. This review has concluded that the methodologies used are now broadly in line with industry best practice, that the PC15 business case is robust and that costs represent good central estimates. We have accepted the company's proposal to reduce leakage by 12Mld during PC15 on this basis.

3.4.4 A uniform reduction of 2Mld per year during the 6 year price control period has been applied.

Table 3.3 – Leakage output for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Total leakage	163	161	159	157	155	153

3.4.5 The outturn figure of 153 Ml is 2Mld lower than that submitted in NI Water's business plan. This accounts for some anticipated outperformance in PC13 and has been accepted by the company.

3.4.6 The decision to go beyond the economic level of leakage aligns with consumer views expressed through the consumer engagement process and the interventions for addressing emerging supply deficits identified in the company's water resource management plan.

3.4.7 We are aware that annual performance can be influenced by external factors such as severe weather. These tend to be short lived and recoverable but have the potential to result in the company exceeding its target in any one year. We therefore believe that an allowable performance range should be set for leakage in addition to annual targets to account for potential variations.

3.4.8 The company proposed a range of ±10Mld in its business plan submission.

3.4.9 We have used an approach similar to that used for serviceability in Annex G to estimate a performance range for leakage. Use of 2012-13 and 2013-14 performance and 3 times the difference to the reference level would indicate ±5% to be appropriate, which equates to approximately ±8Mld.

3.4.10 We expect the company to deliver the target levels of leakage in Table 3.3. However because of the potential for performance to be influenced by external factors, we intend to judge performance against the target in the same way as we would assess serviceability. Over the long term, we would expect the company to operate at or below the target level, with years when good performance exceeds the target balancing years when leakage is higher than target. This approach will provide time for the impact of external factors to abate and for corrective action to be taken by the company.

3.4.11 We will not take action if leakage is no more than 8 Mld above target level in any one year. We will judge overall leakage performance by monitoring a 4 year moving average against target level from 2015/16.

3.4.12 The company plans to undertake another economic level of leakage assessment within the next 2-3 years. We will review, and if necessary, adjust PC15 targets on the basis of the outcome of this updated assessment at the midterm review. A further update will be undertaken by the company towards the end of the PC15 period to inform targets for PC21.

3.5. Security of supply

3.5.1 Security of supply is assessed using an index based on the number of properties in each of the company's Water Resource Zones (WRZs) that are considered to be in supply deficit.

3.5.2 The company's score has improved significantly since the SBP period and it now reports a maximum score of 100. In addition to capital investment, the improved assessment and modified WRZs used in the company's updated 2012 Water Resource Management Plan (WRMP) contributed to this improvement.

3.5.3 The assessment of security of supply is based on a 'dry-year annual average' condition only. The company is not able to assess security of supply under short term critical conditions such as a freeze thaw. Since these conditions can be more onerous, current performance may not be as good as the target and reported performance implies.

3.5.4 The company's next WRMP will be completed in 2017. This has the potential to impact on the security of supply assessment as the calculation is based on the number and size of the zones adopted in the planning process.

3.5.5 We will review the PC15 targets following the publication of the company's updated WRMP and if necessary revise them to take account of any updated information contained within it. We will also review our regulatory approach to assessing security of supply and consider any alternative approaches proposed by the company as part of this process.

3.5.6 The company should ensure it will be able to report security of supply against critical conditions once it has completed the next WRMP. We will consider including a critical condition security of supply target at the mid-term review based on the outcome of the revised WRMP.

3.6. Power usage

3.6.1 The annual targets for the percentage of power usage derived from renewable sources, has been profiled to meet the NI Assembly programme for government target of 40% by 2020. The company's profile for power usage accounts for planned initiatives to mitigate against increases resulting from capital investment.

Table 3.4 – Power usage outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Percentage of NI Water's power usage derived from renewable sources	20.0	25.0	30.0	35.0	40.0	40.0
Power usage	292	293	294	295	295	296

3.7. Drinking water quality compliance

Overview

3.7.1 The Department for Regional Development's final Social & Environmental Guidance for PC15 identifies the need to sustain the current high levels of drinking water quality achieved through sustained investment in water treatment and mains rehabilitation. The key priority is to sustain overall compliance levels. The final guidance does not state any minimum performance requirements for specific measures.

3.7.2 The outputs submitted in NI Water's business plan reflected the minimum requirements published in DRD's draft Social & Environmental Guidance for PC15 (i.e. overall compliance >99.7% and OPI[TIM] > 99.1%). DRD has removed these specific requirements from the final guidance.

3.7.3 For PC15, we have adopted three target measures for water quality compliance:

- Overall water quality compliance;
- Water quality compliance at tap; and
- Iron compliance at tap.

3.7.4 Overall compliance is a key measure published in the Drinking Water Inspectorate's (DWI) annual Drinking Water Quality Report. It combines the results of statutory samples taken at water treatment works, service reservoirs and at tap into a composite measure of compliance.

3.7.5 In the past a more complex measure of 'mean zonal compliance' (MZC) was also published by the DWI and used as a regulatory target. While more complex, this was based on water quality samples at tap providing a more direct measure of the service experienced by the consumer.

3.7.6 A measure which combined compliance data for turbidity, iron and manganese, as measured at consumers taps (OPI[TIM]), was also used previously for regulatory purposes to provide an indicator for the deterioration of water quality in the distribution system. This deterioration occurs mainly due to corrosion products from iron pipes.

3.7.7 The investment which NI Water proposes in its business plan is targeted at maintaining the quality of water by taking action to counter deterioration of its water mains and water treatment works. Some improvements necessary to

secure compliance will be delivered in PC13 but the impact these will have on overall compliance is small.

3.7.8 In setting targets for PC15, we have considered both recent historical performance and the natural variability in reported data which is created by the statutory regime of random sampling used to assess water quality at tap. The results of our analysis and our conclusions in relation to how performance should be monitored in PC15 are described below.

Overall water quality compliance

3.7.9 Overall drinking water quality compliance is a composite measure comprising of 52 parameters: 2 bacteriological and 2 chemical parameters measured at water treatment works; 2 bacteriological parameters measured at service reservoirs; and, 46 parameters measured at consumer taps.

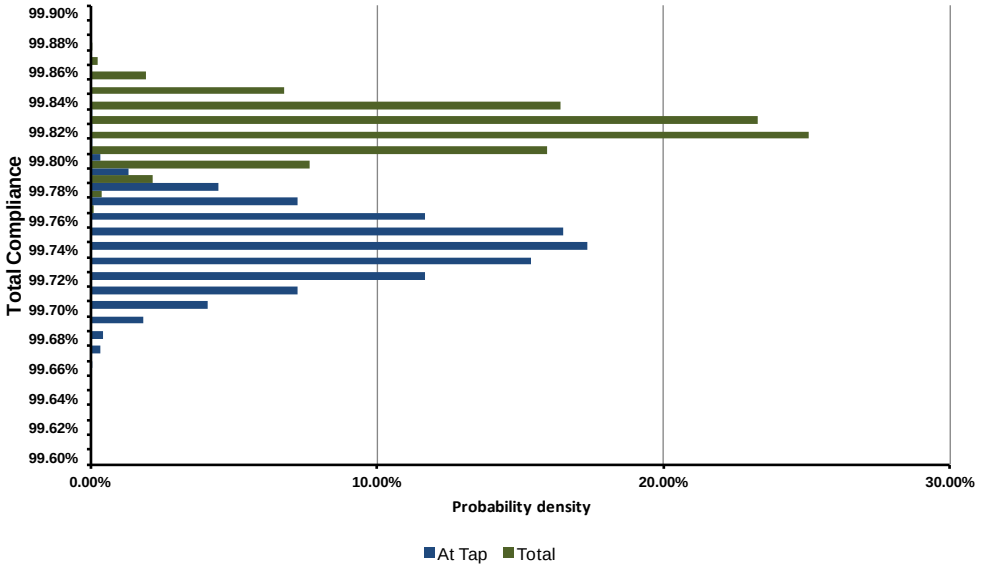
3.7.10 We analysed data both for overall water quality compliance and water quality compliance measured solely at the consumer tap. The outcome of our assessment is shown in

3.7.11 Figure 3.1. This analysis emphasises two points:

- There is natural background variability to reported compliance. This is caused by the random sampling regime used to assess statutory water quality compliance as well as performance issues caused by both variability in raw water quality and process failures at water treatment works. As a result compliance will vary within a range; and

- Overall compliance is higher than compliance measured at the consumer tap. This is a consequence of the higher percentage compliance rates at water treatment works and service reservoirs which are included in the overall measure.

Figure 3.1 - Comparison of overall compliance and compliance measure at tap



3.7.12 Based on our analysis we would expect the company to operate in the range 99.79% to 99.87% for overall compliance. Our assessment indicates that an average value of around 99.82% might be expected.

3.7.13 We believe that PC15 should also include a target for total water quality compliance at tap to reflect the direct service experienced by consumers. Our assessment of compliance at consumers tap indicates that we would expect the company to operate in the range 99.69% to 99.82% during PC15 and that an average value of around 99.74% might be expected.

Iron compliance at tap

3.7.14 Following stakeholder discussions, it was agreed that iron compliance would provide a simpler and equally effective alternative to OPI(TIM) for monitoring deterioration of water quality in the distribution system. It was therefore decided that iron compliance should be used as the distribution system measure for PC15.

3.7.15 We have assessed the likely variation of measured performance for iron compliance in PC15 and concluded that the company would be expected to operate in the range 97.10% and 98.90%. Our assessment indicates that an average value of around 97.86% might be expected.

3.7.16 The drinking water quality compliance targets for PC15 are summarised in Table 3.5. These reflect the minimum of the likely operating range based on a lower 2.5 %-ile.

Table 3.5 – Water quality compliance outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
% overall compliance with drinking water regulations	99.79	99.79	99.79	99.79	99.79	99.79
% compliance at consumers tap	99.69	99.69	99.69	99.69	99.69	99.69
% iron compliance at consumers tap	97.10	97.10	97.10	97.10	97.10	97.10

3.7.17 If compliance for any of the measures fell below the values stated in Table 3.5 we would expect the company to report to us on the reasons this has happened and the action it plans to take to restore compliance to expected levels.

3.7.18 The targets set for PC15 fall short of the company's statutory obligations in relation to drinking water quality. These targets are not intended to replace or undermine these obligations. They simply reflect the minimum levels of performance that might be expected based on the funding provided and the natural variability in performance associated with the random sampling regime used to assess statutory compliance.

3.7.19 We would expect the company to continue to strive to outperform these targets and deliver the highest levels of compliance possible. Other activities and nominated output measures (such as lead pipe replacement, water mains rehabilitation, treatment works enhancement and asset maintenance) provide

the opportunity to deliver improvements in performance and prioritising these effectively will be key to successful delivery in PC15.

3.8. Water quality at service reservoirs

3.8.1 The quality of water at service reservoirs is assessed using a measure based on the percentage of reservoirs sampled which have coliforms in more than 5% of samples.

3.8.2 NI Water has been fully compliant with this measure throughout PC10 and PC13. PC15 targets have been set on the basis of the company maintaining full compliance throughout the period.

Table 3.6 – Service reservoir water quality outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
% Service Reservoirs with coliforms in >5% samples	0.00	0.00	0.00	0.00	0.00	0.00

3.8.3 NI Water has recently introduced a new methodology for prioritising service reservoir rehabilitation based on operational information, including water quality data. This feeds a prioritised programme of condition assessments which determine the specific investment to be delivered at each site through a rolling programme of work. The company has advised that its assessments will be continually updated and reprioritised on the basis of emerging information and that any work required as a result of water quality issues will automatically be promoted within the programme. This should help minimise the risk of non-compliance.

3.8.4 NI Water's proposed programme for replacing substandard water quality sample taps at service reservoirs at the start of PC15 should also minimise the risk of non-compliance as a result of 'unrepresentative' samples.

3.8.5 Addressing the issue of 'unrepresentative' samples is a priority requirement for DWI, so for the final determination we have included an output associated with the completion of the sample tap replacement programme. Section 6.2 provides additional detail on the measure and targets chosen.

3.9. Nominated outputs and activities

3.9.1 In its business plan the company identified specific activities for investment. These are summarised below along with our views of the company's submission.

Water mains activity

3.9.2 In the draft determination we noted that the company's PC15 targets for water mains activity did not include any length associated with the investment allocated to delivering interruptions to supply improvements. We asked the company to assess this length so that it could be included in the final determination.

3.9.3 The company has confirmed that it expects to deliver an additional 89km of water mains during the PC15 period as a result of this expenditure. This is based on the average unit rate for water main activity in PC15 and the assumption that 80% of the interruptions to supply budget will be assigned to 'structural' schemes. The remainder of the budget is to be allocated to resilience schemes to improve operational flexibility.

3.9.4 The inclusion of the additional length associated with the interruptions to supply budget has increased the overall activity target for water mains rehabilitation in PC15 from 816km to 905km. For the purposes of setting annual targets in the final determination it has been profiled evenly over the period.

Table 3.7 – Water mains activity outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Water mains activity - Length of new, renewed or relined mains	130	144	129	167	147	188

3.9.5 Figures for 2015-16 include for 27km of mains delivered as a result of carry over expenditure from PC13. These have been estimated on the basis of average unit rates for the period.

3.9.6 Proposed activity levels for the remainder of the PC15 programme have been estimated through the company's Water Infrastructure Investment Model assessments. The development and implementation of the water infrastructure investment methodology is a positive development which should allow the company to prioritise expenditure more effectively and help maximise benefits for consumers.

3.9.7 The company has indicated that it will broadly maintain its PC13 split between work planned for rural areas and work planned for urban / city / arterial environments. We will monitor this split during delivery to confirm that the balance of outputs funded has been maintained.

3.9.8 The company's assessment of the overall level of activity for PC15 is still based on an assumed funding allocation and it has further work to do to enable it to assess whether this level of activity is appropriate for maintaining serviceability.

We expect the company to address this issue as part of the development and implementation of its approach to asset management planning.

3.9.9 We also expect the company to continue to update its priority assessment based on emerging information on asset performance and to balance the weightings within its assessment to ensure that the outputs are aligned with consumer expectations and priorities.

Trunk main schemes

3.9.10 The constrained programme for PC15 includes three nominated trunk mains outputs:

Table 3.8 – Trunk main nominated outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Completion of nominated trunk main schemes	1	0	0	1	0	1

Ballydougan to Newry trunk main

3.9.11 Since the Business Plan submission, the company has confirmed that Phase 2B of the Ballydougan to Newry trunk main, a PC13 nominated output, will now carry over into the first year of PC15 due to issues with the tender process. We have adjusted the nominated output delivery profile for PC15 to include this as a PC15 delivery.

Carland to Cookstown trunk main

3.9.12 This proposed trunk main provides an additional supply into the Cookstown area fed from Castor Bay WTW. The trunk main partially addresses a supply deficit in the Central Water Resource Zone under dry year annual average conditions. The company's water resource management plan identified it as being required in 2015-16 under this planning scenario. It will also provide resilience in an area which was badly affected in the 2010-11 freeze thaw event.

3.9.13 The trunk main places an additional demand on Castor Bay WTW during peak conditions and will be a key support to the Cookstown area in the event of a future freeze thaw. For the final determination, we therefore asked the company to provide us with an assessment of the demand on Castor Bay WTW to ensure that the trunk main could be supplied in these conditions. In its response, the company provided a partial response which did not confirm that Castor Bay would be able to match demand during a freeze thaw event. The company should provide this confirmation with its PC15 Monitoring Plan.

3.9.14 In its Business Plan submission, the company scheduled construction of this trunk main for 2015-16, consistent with the current water resource management plan. In an updated submission, the company has moved delivery to 2020-21. We are concerned about the impact that this deferral might have for the Cookstown area if another freeze thaw event occurred in the intervening period. When it submits its Monitoring Plan, the company should demonstrate that this

change is not detrimental to consumers or amend the delivery date to meet consumer needs.

Carmoney to Strabane strategic link watermain

3.9.15 Supplies to the area around Omagh have been critical for a number of years. The area is isolated and relies on small WTW's with unreliable supplies. The largest of these is the Derg WTW. In the past this water treatment works drew water solely from the River Derg which is vulnerable under dry conditions. In PC13 a new abstraction from the River Strule was completed, accessing a more reliable source in drought conditions. However, this is also limited by a 'hands-off' flow which means that it cannot be relied on in more extreme conditions.

3.9.16 The company plans to construct a strategic link main from Carmoney WTW to Strabane as a drought mitigation measure to minimise reduce the risk of breaching its abstraction licence for the Derg and the Strule. The trunk main will also improve resilience and recovery through a freeze thaw event.

3.9.17 At the draft determination we expressed concerns over whether the proposed trunk main was a robust drought measure. It is fed by water abstracted from the River Faughan which, like the rivers Strule and Derg, flows from mountains subject to Atlantic weather patterns. If low flows occur in the River Faughan at the same time as low flows in the rivers Strule and Derg, it might not be possible to use the trunk main in times of drought as intended.

3.9.18 In response to the draft determination, the company provided river flow information from 1982. For this period, the only time the Strule/Derg abstraction would have been restricted was in 1995. At that time it would have been necessary to abstract almost all the water in the Faughan to match the dry weather demand. While recognising the issue of coincident low flows in the Strule and the Faughan the company:

- Explained how the trunk main would be used in a developing drought, including how impounded water would initially be preserved in anticipation that it could be used to support supply in prolonged drought conditions;
- It also undertook modelling to estimate the supply demand deficit in 1995, the driest year for which records exist, and the ability of the Faughan to meet this deficit. The modelling indicates that the transfer of water from the Faughan under EU Water Framework Directive compliant licence conditions would not have met all the shortfall, although it would have provided a significant level of mitigation; and
- Noted that NIEA has indicated that it is very unlikely that any revision to the Faughan abstraction licence would result in a tangible reduction to the volumes available to NI Water from this source. This however cannot be confirmed until a review of the abstraction licence is carried out.

3.9.19 The investment in this trunk main has been retained in the final determination on the basis of the interim responses received. However the interim responses continue to reinforce the concerns expressed in the draft determination and the

need for NI Water to complete the following work as part of the next Water Resource Management Plan, due to be complete in 2017, before committing to construction:

a. Obtain formal confirmation from NIEA of the abstraction licence conditions that are going to be applied at the River Faughan.

b. Extend the hydrological record to determine how representative the 1995 drought is of the ongoing risk.

Water treatment works schemes

3.9.20 Nine nominated outputs were included in NI Water's constrained PC15 submission.

- WTW effluent quality;
- Caugh Hill washwater and sludge disposal;
- Glenhordial sludge press;
- Derg upgrade of filters and dosing;
- Caugh Hill treatability;
- Carmoney DAF optimisation and treatability;
- Glenhordial treatability;
- Dorisland treatability; and
- Killyhevlin treatability.

3.9.21 None of the nominated outputs proposed for PC15 were identified as requirements by the Drinking Water Inspectorate or were defined as having a water quality driver by NI Water.

WTW effluent quality

3.9.22 The WTW Effluent Quality project is for the completion of an ongoing programme of minor upgrades at a number of treatment works to ensure that flow measurement of sludge treatment plant effluent meets NIEA requirements. This represents a very small amount of investment which the company plans to complete in the first year of PC15. As it does not deliver a significant quality upgrade at a specific works we do not intend to include it as a nominated output for PC15.

Caugh Hill washwater/sludge, Glenhordial sludge and Derg filter upgrades

3.9.23 The upgrade to the washwater and sludge facilities at Caugh Hill, the upgrade of the sludge press to Glenhordial and the upgrade of the filters and treatment at the Derg WTW are proposed to address capacity issues and specific process requirements. Expenditure on these schemes is entirely base maintenance and

we therefore do not intend to include them as nominated outputs. Instead we expect the company to consider the need and priority of this work when balancing requirements within its overall base maintenance budget allocation. In doing so we would expect the company to consider the queries raised in advance of the draft determination and to consider other least cost options when determining final solutions. Any money released as a consequence of this process should be made available to other elements of the base maintenance programme.

Caugh Hill treatability

3.9.24 The justification provided for the treatability upgrade at Caugh Hill WTW in the business plan submission was primarily historic trihalomethane (THM) non-compliance at the works. NI Water recently completed process improvements at this site in response to a Drinking Water Inspectorate enforcement order related to this issue. Water quality in 2013 appeared to have improved and so we did not include this scheme as a nominated output in the draft determination.

3.9.25 Since then, NI Water has submitted 2014 performance data to DWI which suggests that investment to mitigate the risk of THM failure at this works might be necessary. We understand that further studies are necessary to confirm requirements, the optimum solution and the scale of investment required. We expect the company to complete this work in accordance with DWI requirements and seek DWI's support for any process improvements found to be necessary. Completion of this investigation and the delivery of any associated upgrade have been included as a single nominated output for PC15. We hope that the investigatory work can be completed to confirm any further investment in advance of the mid-term review.

Carmoney DAF optimisation and treatability

3.9.26 The optimisation and treatability upgrade at Carmoney has been proposed to address performance deficiencies in the DAF system during periods of high solids loading. NI Water completed a significant upgrade at this works in PC10 and the water quality appears to have subsequently improved. The company's risk assessment for the site has improved as a result of the upgrade and it acknowledges that process optimisation could potentially resolve these issues. We have discussed the need for this scheme with NI Water and other stakeholders in this context and it has been agreed that optimisation and monitoring of performance over a longer period is required to establish whether additional investment is needed. If performance monitoring subsequently confirms that there are ongoing issues at this site, we would expect the company to consider the need and priority of this work within its overall base maintenance budget allocation. As the expenditure identified for this scheme is entirely base maintenance it would not necessarily be included as a nominated output.

Glenhordial, Dorisland and Killyhevlin treatability

3.9.27 The proposals for treatability upgrades at Glenhordial, Dorisland and Killyhevlin are primarily addressing base maintenance issues but also include for quality expenditure in the order of 40%. These schemes are currently at early stages of development and NI Water need to complete additional work to determine the exact requirements. The outline proposals however include process

improvements that are focused on specific issues at the sites and are reflective of best practice. These schemes have been included as nominated outputs in the PC15 final determination on this basis. NI Water should continue to progress the work necessary to confirm the exact investment requirements and submit the information necessary to demonstrate this to DWI and other stakeholders.

Table 3.9 – Water treatment works nominated outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Completion of nominated water treatment works schemes	1	0	0	1	0	2

Service reservoirs and clear water tanks

3.9.28 NI Water included proposals to increase the capacity of the following three clear water tanks in its constrained PC15 submission. It has confirmed that there is no water quality driver for these schemes.

- **Drumaroad CWT**. The company's proposal is for the construction of a tank with a capacity of 37.5Ml. This would increase storage for the gravity supply to Belfast from Drumaroad WTW from less than 1hr to around 6hrs. The company identified the primary need as the provision of strategic capacity to minimise the risk of supply interruptions associated with short term planned maintenance, breakdown of the WTW or periods of above average demand;

- **Killyhevlin CWT**. The company proposes constructing an 11.4Ml tank to replace two tanks with a capacity of around 1Ml. This will increase storage from less than an hour to around 6.5hrs at periods of peak demand. The company has identified the primary need as the provision of additional capacity to minimise the risk of supply interruption associated with the complex operational control regime required at the site and the potential downtime associated with a unique treatment process; and

- **Lough Fea CWT**. The company proposes constructing a 12.4Ml tank to replace two existing clear water tanks with a combined capacity of around 1.55Ml. This would increase capacity from around 3.5hrs to 24hrs for average daily demand. The company has identified the primary need as the provision of strategic capacity to minimise the risk of supply interruptions associated with planned maintenance, breakdown of the WTW or periods of above average demand.

3.9.29 We did not feel that the initial PC15 submission explained the need for these schemes clearly enough and asked the company to provide additional clarification to support its original business case. A substantial amount of additional information was provided in response. This attempted to provide

further justification of the need for the schemes but still didn't clearly demonstrate the historic performance issues they would address.

3.9.30 In view of the additional information provided by the company in response to the draft determination, we have concluded that there is sufficient information to retain the investment in the PC15 programme. In particular, the risks associated with the lack of adequate clear water basins at Killyhevlin and Lough Fea WTWs, which are relatively isolated, suggests a strong case for enhancing the resilience of these treatment works. However the additional information provided did not evaluate the current risks and the extent to which those risk would be reduced by the proposed investment. The company should provide this assessment in advance of committing the investment to allow the UR to determine whether the investment is economically justified.

Table 3.10 – Service reservoir and clear water tank nominated outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Completion of nominated improvements to increase the capacity of service reservoirs and clear water tanks	0	0	1	0	1	1

Other general investment

3.9.31 In addition to the nominated outputs, funding in the PC15 final determination will allow NI Water to:

- Complete inspection and maintenance work at impounding reservoirs associated with the Reservoirs Bill and the Panel Engineers assessment;
- Carry out remedial work to Camlough impounding reservoir dam;
- Complete a water resource management plan and drought plan in a combined water resource and resilience plan;
- Complete the final stage of a programme of work to ensure that flow measurement of sludge treatment plant effluent at WTWs meets NIEA requirements;
- Complete security hardening work required at water treatment works, service reservoirs and clear water tanks, as agreed with DRD, to comply with guidance issued under the Preservation of Services and Civil Emergency Direction 2010;
- Continued rehabilitation of NI Water service reservoirs through a prioritised rolling programme of work;
- Invest in project development, design and procurement to secure continuity of investment into PC21; and

- Continue to make new connections to the water supply system. This includes service connections and requisitions as well as laying new water mains within new developments.

4.0 Sewerage Service Outputs

4.1. Sewer flooding

4.1.1 The need to reduce the risk of sewer flooding is consistently identified by consumers as a high priority. The outcome of the consumer engagement undertaken for PC15 showed that consumers are most willing to contribute to improvements which have a direct impact on their daily lives such as flooding.

4.1.2 We asked NI Water to develop a register of properties which are at risk of internal flooding. The company's ongoing assessment of these properties indicated that that there were 190 properties at risk of flooding more frequently than 1 in 20 years due to limited hydraulic capacity in the sewerage system at the end of March 2014.

4.1.3 It is likely that new properties which are at risk of flooding will be identified over time as hydraulic issues continue to be exposed by storm events. The company's plans assume that an additional 6 properties at risk of flooding will be identified each year.

4.1.4 For PC15, the company has proposed to address the risk of flooding at 62 properties which are confirmed as at risk of flooding more frequently than once in 20 years. Taking account of the additional properties which are identified during PC15, the company estimates that the number of properties at risk will fall to 124 properties by the end of PC15.

4.1.5 Our draft determination was based on the profile of outputs included in the company's Business Plan. Following responses received on the draft determination we have re-profiled the outputs to accelerate delivery.

Table 4.1 – DG5 outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
DG5 Properties at risk of flooding - number removed from the 2 in 10, 1 in 10 and 1 in 20 risk register by company action	8	8	22	8	8	8
DG5 Properties on the 2 in 10, 1 in 10 and 1 in 20 risk register at the end of the year	148	146	130	128	126	124

4.1.6 Only fourteen of the properties the company will remove from the at risk register have been developed to the point that detailed solutions were identified in the business plan. Thirteen of these will be delivered by a major drainage scheme in Belfast. The company should provide a baseline version of a sewer flooding report (see Section 3.6 of the Main Report) with the Monitoring Plan. In this plan

the company identify any barriers which prevent it further accelerating the delivery of flooding schemes.

4.1.7 Most of the 124 properties remaining on the register at the end of PC15 are associated with strategic drainage solutions. They are unlikely to be addressed until these major schemes are scoped and funded.

4.1.8 In the draft determination we asked the company to identify the steps it could take to mitigate the risk of flooding at properties where the long term solution is linked to a major investment programme and may be delayed until that programme can be funded.

4.1.9 In response to the draft determination, the company advised that it will review the viability of providing mitigation at properties which do not already have measures in place and which are not scheduled for removal from the register in PC15. It will then implement a programme of mitigation measures. It plans to commence the review process in April 2015 after work to verify properties currently on the register has been completed. The company should report the outcome of this review to us in September 2015.

4.1.10 The company estimates that mitigation may need to be delivered to between 40 and 80 properties during the PC15 period. NI Water's plans to focus on the installation of non-return valves on lateral sewers and on landscaping and/or floodwater diversion. The company has also noted the potential for additional assistance to be provided through a Homeowner Flood Protection Grant Scheme proposed by the Northern Ireland Executive.

4.1.11 We will consider the introduction of additional reporting in the company's annual information return to capture the activity rates and costs associated with the company's flood mitigation work during PC15.

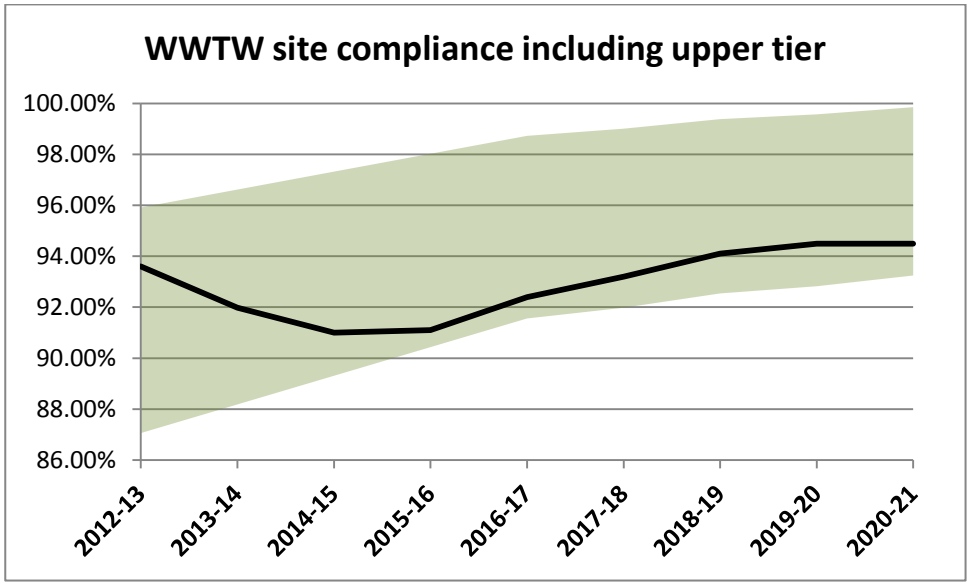
4.2. Wastewater treatment works compliance

4.2.1 PC15 wastewater treatment works compliance performance will be monitored using the following measures

- % of WwTWs discharges compliant with numeric consents;
- % of total p.e. served by WwTWs compliant with numeric consents; and
- Small WwTW compliance (works greater than or equal to 20p.e. but less than 250p.e.).

4.2.2 Wastewater treatment works performance can be affected by a range of factors including weather conditions. In the case of NI Water, which operates works that need to be upgraded, this can cause variations in compliance from year to year. We have assessed the historic performance of NI Water's treatment works and used this to estimate the likely range of compliance now and in the future. The range is shown in Figure 4.1 along with NI Water's recent performance and projected performance targets.

Figure 4.1 – % of WwTWs discharges compliant with numeric consents Operating range



4.2.3 NI Water has proposed a target at the lower end of our projected operating range. We consider this a reasonable assessment of the operating risk but we would expect the company to operate at or above this target level.

4.2.4 We have concluded that the target proposed by the company for the percentage of population equivalent compliant with numeric consents is reasonable.

4.2.5 We have concluded that the target proposed for small WwTW compliance (works greater than or equal to 20p.e. but less than 250p.e.) reflects the current level of assessed compliance and the proposed investment.

Table 4.2 – Wastewater treatment works compliance outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
% of WwTWs discharges compliant with numeric consents	91.1	92.4	93.2	94.1	94.5	94.5
% of total p.e. served by WwTWs compliant with numeric consents	98.08	98.26	98.30	99.12	99.16	99.16
Small WwTW compliance (works greater than or equal to 20p.e. but less than 250p.e.)	83.71	86.97	89.58	91.86	94.46	96.74

4.3. Pollution Incidents

4.3.1 The level of high and medium pollution incidents attributed to NI Water is higher than the level of pollution incidents attributed to water and sewerage companies in England and Wales. The company has noted a low level of investment in the sewerage system in Northern Ireland compared to investment in England & Wales over the last 20 years as a significant cause of its relatively low level of performance.

4.3.2 The company's original submission targeted a small annual reduction in high and medium pollution incidents of one per annum over PC15. This target was based on an extension of historic trends. The 'starting point' for the reductions was based on the average performance over the period from 2010 to 2013.

4.3.3 The company has also commented on the impact which rainfall has on pollution incidents. For example, the number of medium and high pollution incidents in 2012 was significantly lower than in previous years and the company attributes this to lower levels of rainfall. As a result the company out-performed its target for 2012 by a significant margin.

4.3.4 The company has outlined a series of initiatives it has put in place to reduce the frequency and severity of pollution incidents as part of its Pollution Reduction Strategy. It also points to work on education and awareness which is being co-ordinated through its Pollution Reduction Working Group and which it hopes will lead to fewer blockages. However, the company has not been able to quantify the impact that these will have. Nor has it quantified the impact which the investment it has made, or proposes to make, will have on pollution incidents. It is not clear how the gap in performance with England and Wales will be closed and what level of investment will be required to achieve this.

4.3.5 In the draft determination we proposed a more challenging target for High & Medium pollution incidents in PC15. This was based on extending the trend in improvement from 2007 to 2013 to establish a starting position for PC15. We projected on-going improvement at a rate of 2 per annum, compared to a historic trend of 6 per annum.

4.3.6 In response, the company accepted our target for the start of PC15 but expressed concern about the rate of improvement proposed as the number of incidents reduced. Other respondents noted that the compliance targets set by the Utility Regulator were challenging. From our engagement with the company, we understand that NI Water is not able to determine the impact the measures it is taking to reduce pollution incidents will have with any confidence. This uncertainty underpins the company's concern about the challenging targets we proposed.

4.3.7 In light of this feedback we have reconsidered the pollution incident performance target. We have maintained our position on the start point for PC15 but accepted an improvement rate of 1 per annum. This is a target we believe the company should be able to out-perform and we have indicated a performance range on Figure 4.2.

Figure 4.2 - Pollution incident performance and target

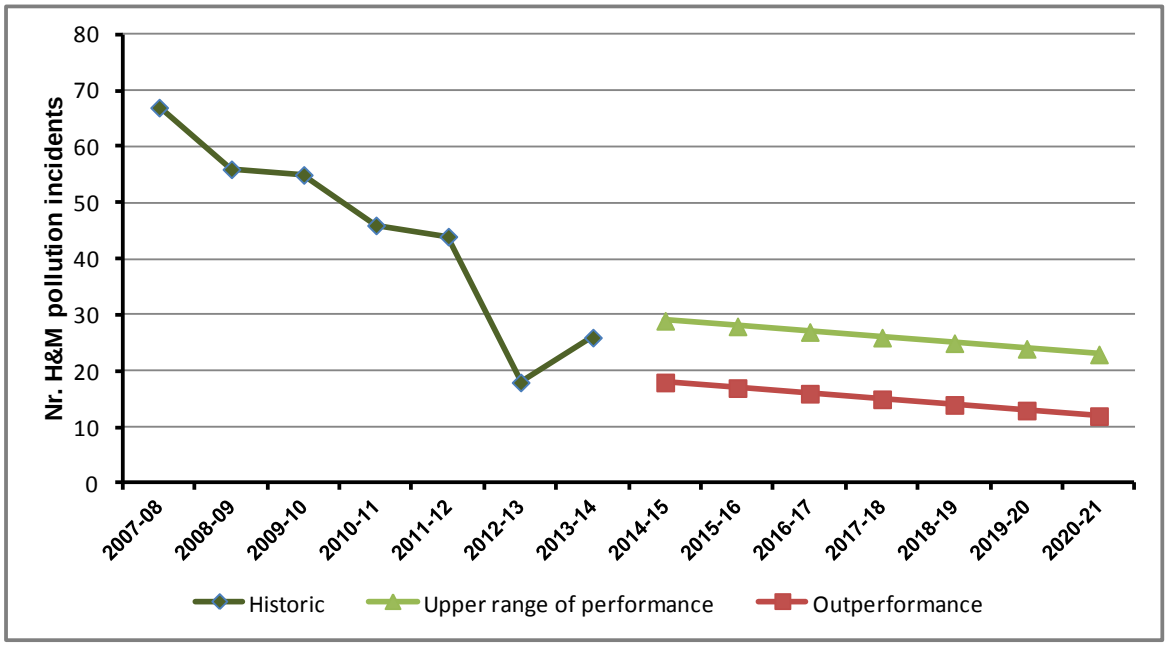


Table 4.3 – High and medium pollution incident performance target for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Number of high and medium pollution incidents attributable to NI Water	28	27	26	25	24	23

4.3.8 The company highlights the development of a draft flow policy by NIEA and the proposed introduction of flow compliance during PC15 as a cause for concern. It indicates that application of the flow policy in conjunction with performance issues at NI Water's MBR treatment works has the potential to increase the number of pollution incidents recorded. If these risks materialise, we will consider the impact on the pollution incident target.

4.4. Nominated outputs and activities

4.4.1 Nominated outputs and activities have been identified for:

- The length of sewer replaced or relined;
- Improvements to unsatisfactory intermittent discharges;
- Improvements to wastewater treatment works; and
- Improvements to small wastewater treatment works.

4.4.2 These nominated improvements deliver specific quality improvements required by NIEA and form an integral part of the outputs to be delivered. They also contribute to the improvement in overall wastewater compliance targets described in Section 4.2.

Sewers replaced or relined

4.4.3 The final determination allows for the renovation and renewal of 74km of sewers over the six year period of PC15. In addition the company plans to deliver some 64km of new sewers in PC15. Much of this related to adoption of sewers in new developments. The output target relates to the renovation and replacement of sewers in an urban environment.

Table 4.4 – Sewerage activity outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Sewerage activity - Length of sewers replaced or renovated	11	12	11	13	13	14

4.4.4 The rate at which sewers are renewed or replaced is remarkably low when compared to the 15,000 km of existing sewers. While this rate may reflect the age profile of the existing sewerage stock and the long life of sewerage assets, it is not supported by a robust assessment of need. We expect the company to move from the current top-down approach to investment planning to a risk based bottom up approach for identifying appropriate levels of activity. This requires the company to develop a better understanding of asset performance and deterioration and establish clearer links between investment and outputs.

Nominated improvement to unsatisfactory intermittent discharges

4.4.5 The final determination allows for improvement to 56 unsatisfactory intermittent discharges (UIDs) to meet standards set by NIEA.

Table 4.5 – Unsatisfactory intermittent discharge outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Delivery of improvements to nominated UIDs as part of a defined programme of work	27	16	5	8	0	0

4.4.6 We have confirmed that the number of nominated outputs aligns with the list of UID outputs that has been developed and agreed between NI Water and NIEA. This list includes additional information to clarify the scope of individual schemes.

4.4.7 The nominated outputs for PC15 take account of progress in PC13 and include the delivery of PC13 nominated outputs which have subsequently carried forward into PC15. Our approach is consistent with the approach we have taken to adjusting the financial determination for PC13 out-turn (see Annex I). Our

approach ensures that consumers are not required to pay a second time for outputs which have been delayed. The profile of output delivery, including nominated outputs for PC10, PC13 and PC15, are shown on Table 4.6.

Table 4.6 - UID delivery profile

Project Source	PC13	15-16	16-17	17-18	18-19	19-20	20-21	Total
PC10 carry over	7	1	0	0	0	0	0	8
PC13 nominated output	46	23	10	4	0	0	0	83
PC13 substitution	32	0	0	0	0	0	0	32
PC15 New	0	3	6	1	8	0	0	18
Total	85	27	16	5	8	0	0	141

Nominated improvements to wastewater treatment works

4.4.8 The final determination allows for improvement to 19 wastewater treatment works with a population equivalent greater than 250 to meet discharge consent standards set by NIEA.

Table 4.7 – Wastewater treatment works outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Delivery of improvements to nominated WwTWs as part of a defined programme of work	3	4	4	0	1	7

4.4.9 We have confirmed that the number of wastewater treatment works outputs aligns with the prioritised list that has been agreed between NI Water and NIEA.

4.4.10 As with UIDs, the nominated outputs for PC15 take account of progress in PC13 and include the delivery of PC13 nominated outputs which have subsequently carried forward into PC15. The profile of output delivery, including nominated outputs for PC13 and PC15, are shown on Table 4.8.

Table 4.8 – Wastewater treatment works delivery profile

Project Source	PC13	15-16	16-17	17-18	18-19	19-20	20-21	Total
PC13 nominated output	33	2	1	0	0	1	0	37
PC13 substitution	2	0	0	0	0	0	0	2
PC15 New	0	1	3	4	0	0	7	15
Total	35	3	4	4	0	1	7	54

Small wastewater treatment works upgrades

4.4.11 The final determination allows the company to upgrade 45 small wastewater treatment works serving a population equivalent between 20 and 250. The individual works are to be prioritised by agreement between NIEA and NI Water under the rural wastewater investment programme. The estimated number of upgrades is based on an annual budget allocation of £2m and the historic average cost for upgrading an individual works.

Table 4.9 – Small wastewater treatment works outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Small wastewater treatment works delivered as part of the rural wastewater investment programme	7	8	7	8	7	8

5.0 Serviceability

5.1.1 We use serviceability to assess whether the capability of the company's assets to provide a service is being maintained. It is a broad measure based on a mix of service indicators, asset performance indicators and sub-threshold indicators which balance consumer experience and the underlying performance of the assets.

5.1.2 We have undertaken a detailed assessment of the company's performance with respect to serviceability. This is presented in Annex G which includes additional information on the concept of serviceability and our approach to monitoring it.

5.1.3 Our assessment concludes that performance in each sub-service area is currently stable which aligns with the company's assessment. It also details our assessment of performance for individual indicators and explains how we have derived the individual performance ranges that we will use during PC15 to assess whether the company is maintaining serviceability.

5.1.4 Stable serviceability is being targeted in each sub-service area throughout PC15, as detailed below. This is in line with the requirements of DRD's Social and Environmental Guidance.

Table 5.1 – Serviceability assessment outputs for PC15

Output	15-16	2016-17	2017-18	2018-19	2019-20	2020-21
Water infrastructure serviceability	Stable	Stable	Stable	Stable	Stable	Stable
Water non-infrastructure serviceability	Stable	Stable	Stable	Stable	Stable	Stable
Sewerage infrastructure serviceability	Stable	Stable	Stable	Stable	Stable	Stable
Sewerage non-infrastructure serviceability	Stable	Stable	Stable	Stable	Stable	Stable

6.0 New Output Measures

6.1. New measures proposed by NI Water

6.1.1 Our PC15 reporting requirements encouraged NI Water to propose additional service measures which better reflect the qualities of service which consumers value and which are relevant to their needs.

6.1.2 Following a gap analysis of the Social and Environmental Guidance NI Water proposed the following additional measures and targets.

Table 6.1 – Additional output measures proposed by NI Water for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Number of Catchment Management Plans	6	7	7	6	7	7
Number of lead communication pipes replaced	2,815	2,815	2,815	2,815	2,815	2,815
Number of school visits	176	176	176	176	176	176
Number of events	57	57	57	57	57	57
Number of CSO and EO discharges at which event and duration monitoring equipment is installed/fully optimised, and meet NIEA requirements	57	58	58	58	58	58
Impermeable surface water collection area removed from the combined sewerage network (such as roads and pavements, roofs and hardstandings)	30,000	30,000	30,000	30,000	30,000	40,000
Number of 'sustainable solution' WWTW serving a PE > 250 delivered as part of the defined programme of work for improvements to nominated WWTWs	0	1	1	0	0	0
Number of 'sustainable solution' WWTW serving a PE < 250	0	0	0	1	1	1

Number of catchment management plans

6.1.3 The catchment management plan targets submitted reflect NI Water's intention to sequentially develop sustainable catchment area management plans (SCAMPs) for each of its 'live' water catchments, followed by the catchment plans for its 'out-of service' catchments, during the PC15 period.

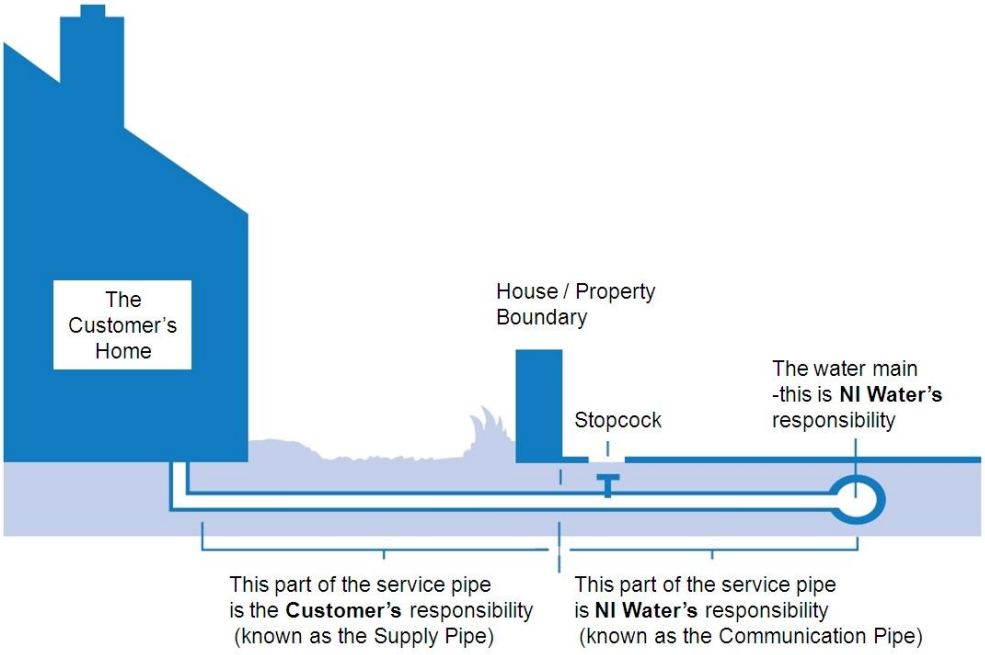
6.1.4 We expect the company to discuss the scope and priority for these plans with DWI as it develops its proposals.

Lead communication pipe replacement

6.1.5 The quantity of lead in water leaving water treatment works is almost zero. However it can dissolve from lead pipes and fittings in the distribution system and domestic plumbing, causing water quality to deteriorate. Historically the most common use of lead was in smaller pipes used in domestic plumbing and the 'service pipe' which connects a property to the water main. Recent regulation and practice means that lead is no longer used in either the water industry or in domestic plumbing, but there remains a legacy issue affecting older distribution systems and older properties.

6.1.6 NI Water is responsible for the pipe from the water main to the boundary of the property (the communication pipe). The property owner is responsible for the length of pipe from the property boundary to the property (the supply pipe) and any internal plumbing.

Figure 6.1 - Service pipe responsibility



6.1.7 Work undertaken by NI Water to replace lead pipes within the distribution system may only have a limited impact on lead compliance. This is because ortho-phosphoric acid dosing already minimises failures from the lead pipes that are being removed. In addition, failures may continue after the company has replaced its pipework because of lead in the supply pipes and internal plumbing on consumer premises.

6.1.8 NI Water has historically taken the following action to reduce the number of water quality failures due to lead.

- Dosing ortho-phosphoric acid to drinking water supplies to reduce the rate at which lead dissolves into the water supply;
- Replacement of lead communication pipes on mains renovated by its water

main rehabilitation programme; and

- Replacement of lead communication pipes where a water quality test revealed a lead failure, or at the specific request of a consumer.

6.1.9 In addition to the above activities the company commenced a proactive programme of lead communication pipe replacement in PC13. The company will continue to undertake all of these activities throughout PC15 and will double the budget for the proactive replacement programme from £500k to £1m per annum.

6.1.10 Proactive replacement forms part of the overall lead reduction strategy that the company has been developing in consultation with other stakeholders. This should prove beneficial and help the company target investment and maximise the improvements it can deliver. The company should continue to review and develop this strategy in consultation with other stakeholders, particularly DWI.

6.1.11 NI Water estimates that the number of pipes replaced through water main rehabilitation and as a result of sampling failures and consumer requests will continue at historic rates during PC15. The number of pipes that will be replaced by the proactive programme has been estimated using the unit rate from similar work undertaken in PC13 and the overall annual budget allocation of £1m. The company's estimates are detailed in the table below.

Table 6.2 –Lead communication pipe replacement estimates for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Number resulting from quality sampling and consumer requests	455	455	455	455	455	455
Number delivered by watermain rehabilitation	1,270	1,270	1,270	1,270	1,270	1,270
Number replaced through the proactive lead programme	1,844	1,844	1,844	1,844	1,844	1,844

6.1.12 The company proposed a target for PC15 which was based on the number of pipes replaced by all of its lead replacement activities. We believe that it would be more appropriate to base targets on the proactive element only, as the numbers delivered by the other activities are more difficult to predict in the longer term due to their reactive nature.

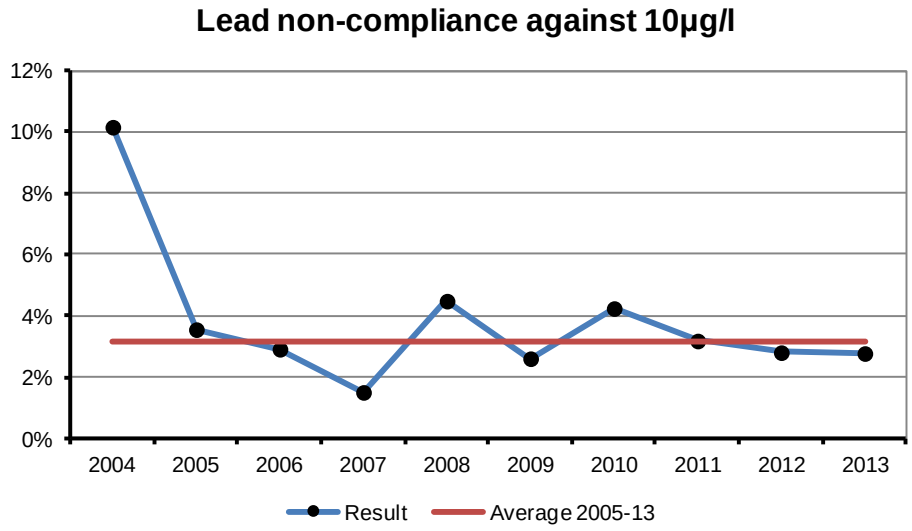
6.1.13 We have therefore set the company a target of replacing 1,844 lead communication pipes per annum during PC15 based on the numbers submitted for the proactive programme only.

Table 6.3 – Proactive lead replacement outputs for PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Number of lead communication pipes replaced through the proactive lead programme	1844	1844	1844	1844	1844	1844

6.1.14 In addition we will continue to monitor the number of lead pipes replaced by the company through the watermain rehabilitation programme and as a consequence of sampling or customer requests through the annual information return.

6.1.15 The regulatory standard for lead was reduced to the final European drinking water standard of 10µg/l in December 2013. The following graph shows historic performance against this standard and demonstrates that recent investment activity by NI Water has not delivered significant improvements in compliance at the tap.



6.1.16 The need for broader action to address lead quality compliance is acknowledged within the wider stakeholder group. DRD therefore recently sought views on a range of options which might help deliver compliance as part of its consultation on new water legislation.

6.1.17 It has published a report[1] which summarises the outcome of this process and identifies the initiatives and legislative changes that are to be taken forward as a consequence.

Number of school visits and events

6.1.18 NI Water has included targets for the number of school visits and the number of events attended as a measure of increased education activity.

[1] http://www.drdni.gov.uk/final_consultation_report_november_2014_-_water_bill_policy_consultation.pdf

Number of CSO and EO discharges at which event and duration monitoring equipment is installed/fully optimised, and meet NIEA requirements

6.1.19 NI Water has proposed a measure of CSOs and EO discharges at which event and duration monitoring equipment is installed / fully optimised, and meets NIEA requirements. This reflects a list of priorities agreed with NIEA and targets have been accepted on this basis.

Impermeable surface water collection area removed from the combined sewerage network

6.1.20 The company has proposed a target for the area of impermeable surface removed from the combined sewerage network. We welcome this approach which has the potential to deliver sustainable improvement of the sewerage network. However, at this stage, we do not have sufficient information to judge whether the quantum of this target is reasonable.

6.1.21 The limited funding for storm water separation in PC15 will provide the opportunity to test and develop experience of a technique which could be a major part of the development of sustainable solutions. A key output is that the company targets this investment to determine the effectiveness and cost of storm water separation across a range of development types and assesses the potential for delivering storm water separation across Northern Ireland. Undertaking and reporting on this development work is a key output for PC15.

6.1.22 NI Water has been funded to deliver a range of flood alleviation and improvements to UIDs. It is possible that the most cost effective way of delivering these outputs will include storm water separation. The company has already made provision for storm water separation in some of the solutions it has costed for PC15. The funding for storm water separation is in addition to this and should deliver additional outputs. The company should identify storm water separation which contributes to the delivery of funded PC15 objectives separately from the work carried out under the storm water separation funding.

Number of 'sustainable solution' WWTW serving a PE > 250 delivered as part of the defined programme of work for improvements to nominated WWTWs

6.1.23 The company estimates that it can only deliver sustainable solutions at two works serving a p.e. > 250. This scale of sustainable development will only have a small impact on energy consumption.

6.1.24 In addition to delivering on this target, there is a need to accelerate the assessment of options to the extent that the company can secure land to allow further sustainable treatment to be delivered.

Number of 'sustainable solution' WWTW serving a PE < 250

6.1.25 The company estimates that it can only deliver sustainable solutions at three works serving a p.e. < 250. This scale of sustainable development will only have a small impact on energy consumption.

6.1.26 In addition to delivering on this target, there is a need to accelerate the assessment of options to the extent that the company can secure land to allow further sustainable treatment to be delivered.

6.2. New measures included by the Utility Regulator

6.2.1 For the final determination we have included additional output measures for the trialling of new customer measures and a new consumer survey and for sample tap replacement.

New consumer measures and consumer survey

6.2.2 Section 3.0 of the final determination Main Report explains the work being undertaken by the CM/SAT working group and the indicative timetable for the introduction of new consumer measures and a new consumer satisfaction survey. The aim is to provide NI Water with new 'actionable data' to allow the company to deliver sustainable improvements in service delivery for consumers.

6.2.3 For the final determination we have introduced new output measures to reflect the work that needs to be completed at the start of PC15 to allow reporting against the new measures and survey to commence in 2016-17.

6.2.4 The company, in conjunction with the CM/SAT working group, is required to have trialled the new measures by the end of September 2015 and the new survey by the end of December 2015.

6.2.5 A post-trial phase will then review the results of the trial and finalise the new measures and choice of survey. Discontinuation of one or more of the existing consumer surveys will be considered as part of this process, which will include the following activities:

- Amendment of the PC15 Monitoring Plan to include the new KPIs, with consideration to be given to whether targets and/or tramlines are to be used for assessing performance in the remainder of the PC15 period;
- Annual information return guidance to be updated to enable monitoring to commence in 2016-17; and
- OPA assessment and scores for PC15 to be amended as necessary to accommodate the adoption of the new measures and survey.

6.2.6 The company is required to 'go-live' with the new consumer measures and consumer satisfaction survey on 1st April 2016.

6.2.7 The PC15 programme targets related to the implementation of new consumer measures and a new consumer satisfaction survey are therefore:

- Complete a trial of new consumer measures by the end of September 2015;
- 'Go-live' with new consumer measures on 1st April 2016;
- Complete a trial of a new consumer satisfaction survey by the end of December 2015; and,
- 'Go-live' with a consumer satisfaction survey on 1st April 2016.

Sample tap replacement

6.2.8 Addressing the issue of 'unrepresentative' samples is a priority requirement for DWI. This is necessary to ensure sample results accurately reflect the quality of water stored in the reservoirs.

6.2.9 In the draft determination we advised of our intention to consider whether an output associated with the company's proposed programme of sample tap replacement should be included in our final determination. We believe this would be appropriate considering the priority placed on this issue by DWI.

6.2.10 We have therefore included a target which requires the company to confirm that it has assessed, and if necessary upgraded, sample taps to the appropriate standard at 50% of its service reservoirs in each of the first two years of PC15. This reflects the delivery profile quoted by the company in its business plan submission.

Table 6.4 – Service reservoir sample tap replacement in PC15

Output	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
% Service Reservoirs where sample taps have been assessed, and if necessary upgraded, to the appropriate standard	50%	100%	100%	100%	100%	100%

7.0 PC15 Output Summary

7.1.1 The summary outputs for PC15 are set out in Table 7.1 (Consumer service and water quality outputs for PC15) and Table 7.2 (Sewerage service outputs for PC15). The output tables include projected performance for the final year of PC13 to show how the outputs planned for PC15 compare with the current period.

Table 7.1 – Customer service and water quality outputs for PC15

	Line description	Units	PC13	PC15					
A	**Consumer Service**		**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**
1	DG2 Properties at risk of low pressure removed from the risk register by company action	nr	170	92	108	157	159	160	160
2	DG2 Properties receiving pressure below the reference level at end of year	nr	1,132	1,040	932	775	616	456	296
3	DG3 Supply interruptions > 12hrs (unplanned and unwarned)	%	0.19	0.18	0.17	0.17	0.16	0.15	0.15
4	DG3 Supply interruptions (overall performance score)	nr	1.08	1.07	1.05	1.03	1.00	0.98	0.96
5	DG6 % billing contacts dealt with within 5 working days	%	99.90	99.90	99.90	99.90	99.90	99.90	99.90
6	DG7 % written complaints dealt with within 10 working days	%	99.50	99.50	99.50	99.50	99.50	99.50	99.50
7	DG8 % metered customers received bill based on a meter reading	%	99.00	99.00	99.00	99.00	99.00	99.00	99.00
8	Call Handling Satisfaction score (1-5)	nr	4.75	4.65	4.65	4.70	4.70	4.75	4.75
9	DG9 % Calls not abandoned	%	99.00	99.00	99.00	99.00	99.00	99.00	99.00
10	DG9 % calls not receiving the engaged tone	%	99.90	99.90	99.90	99.90	99.90	99.90	99.90
11	Overall Performance Assessment (OPA) score (11 Measures)	nr	215	218	221	224	227	232	236
12	Total Leakage	Ml/d	165	163	161	159	157	155	153
13	Security of supply index	nr	100	100	100	100	100	100	100
14	Percentage of NI Water's power usage derived from renewable sources	%	20.0	20.0	25.0	30.0	35.0	40.0	40.0
B	**Quality Water**								
15a	% overall compliance with drinking water regulations	%		99.79	99.79	99.79	99.79	99.79	99.79
15b	% compliance at consumers tap	%		99.69	99.69	99.69	99.69	99.69	99.69
16	% iron compliance at consumers tap	%		97.10	97.10	97.10	97.10	97.10	97.10
17	% Service Reservoirs with coliforms in >5% samples	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C	**Water Outputs**								
18	Water mains activity - Length of new, renewed or relined mains	km	168	130	144	129	167	147	188
19	Completion of nominated trunk main schemes	nr	2	1	0	0	1	0	1
20	Completion of nominated water treatment works schemes	nr	3	1	0	0	1	0	2
21	Completion of nominated improvements to increase the capacity of service reservoirs and clear water tank	nr	1	0	0	1	0	1	1
D	**Serviceability**								
22	Water infrastructure serviceability	Text	Stable	Stable	Stable	Stable	Stable	Stable	Stable
23	Water non-infrastructure serviceability	Text	Stable	Stable	Stable	Stable	Stable	Stable	Stable
E	**New Output Measures**								
24	Number of Catchment Management Plans	nr		6	7	7	6	7	7
25	Number of lead communication pipes replaced (proactive)	nr		1,844	1,844	1,844	1,844	1,844	1,844
26	Number of school visits	nr		176	176	176	176	176	176
27	Number of events	nr		57	57	57	57	57	57
28	% Service Reservoirs where sample taps have been assessed, and if necessary upgraded, to the appropriate standard	%		50.0	100.0	100.0	100.0	100.0	100.0

Table 7.2 – Sewerage service outputs for PC15

	Line description	Units	PC13	PC15					
A	**Consumer Service Sewerage**		**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**
1	DG5 Properties at risk of flooding - number removed from the 2 in 10, 1 in 10 and 1 in 20 risk register by company action	nr	21	8	8	22	8	8	8
2	DG5 Properties on the 2 in 10, 1 in 10 and 1 in 20 risk register at the end of the year	nr	150	148	146	130	128	126	124
B	**Quality Sewerage**								
3	% of WwTWs discharges compliant with numeric consents	%	91.0	91.1	92.4	93.2	94.1	94.5	94.5
4	% of total p.e. served by WwTWs compliant with numeric consents	%	97.80	98.08	98.26	98.30	99.12	99.16	99.16
5	Small WwTW compliance (works greater than or equal to 20p.e. but less than 250p.e.)	%	79.15	83.71	86.97	89.58	91.86	94.46	96.74
6	Number of high and medium pollution incidents attributable to NI Water	nr	29	28	27	26	25	24	23
C	**Sewerage Outputs**								
7	Sewerage activity - Length of sewers replaced or renovated	km	14	11	12	11	13	13	14
8	Delivery of improvements to nominated UIDs as part of a defined programme of work	nr	59	27	16	5	8	0	0
9	Delivery of improvements to nominated WwTWs as part of a defined programme of work	nr	18	3	4	4	0	1	7
10	Small wastewater treatment works delivered as part of the rural wastewater investment programme	nr	18	7	8	7	8	7	8
D	**Serviceability**								
11	Sewerage infrastructure serviceability	Text	Stable	Stable	Stable	Stable	Stable	Stable	Stable
12	Sewerage non-infrastructure serviceability	Text	Stable	Stable	Stable	Stable	Stable	Stable	Stable
E	**New Output Measures**								
13	Number of CSO and EO discharges at which event and duration monitoring equipment is installed/fully optimised, and meet NIEA requirments	nr		57	58	58	58	58	58
14	Number of qualifying Wastewater Treatment Works delivered as part of the defined programme of improvements to comply with PPC Regulations	nr		0	0	0	To be defined by output from and assessment of PPC sites and NIEA		
15	Impermeable surface water collection area removed from the combined sewerage network (such as roads and pavements, roofs and hardstandings)	m2		30000	30000	30000	30000	30000	40000
16	Number of 'sustainable solution' WWTW serving a PE > 250 delivered as part of the defined programme of work for improvements to nominated WWTWs	nr		0	1	1	0	0	0
17	Number of 'sustainable solution' WWTW serving a PE < 250	nr		0	0	0	1	1	1