4.4 Growth at STWs

4.4.1 Approach and implementation

What we said in our draft determinations

We proposed a non-delivery PCD for all wastewater companies to clawback allowances for additional growth at sewage treatment works (STWs) capacity that is not delivered. We allowed companies to change the scope or substitute a scheme due to changing growth forecasts. But companies cannot substitute in a scheme that has a change in the flow-to-full treatment (FFT) permit level without a corresponding change in the dry weather flow (DWF) permit level, or schemes that address previous non-compliance with DWF or FFT permit levels. We proposed to cap the aggregate PCD adjustment at zero, recognising our policy that PCDs should not be used to fund additional growth at STWs requirements in-period.

Stakeholders' representations

Southern Water supported a scheme level PCD for growth at STWs.

Anglian Water, Wessex Water and Severn Trent Water queried the ability to substitute with non-compliant schemes that may not be compliant with flow permits. Wessex Water further argued that our limit of substitution to compliant schemes could restrict the ability to reprioritise schemes.

Severn Trent Water suggested that only schemes that require changes to permits (DWF, FFT or quality) should require the completion date to be signed off by the EA.

Wessex Water said that the design of the PCD could hinder company programmes and therefore proposed simplification of the design of the PCD to track cumulative PE served of growth schemes.

Our assessment and reasons

Need for PCD

We are setting allowances for companies to deliver expenditure related to growth at STWs. The non-delivery PCD will clawback allowances for additional growth at sewage treatment works capacity that is not delivered. Customers should not pay for sewage treatment works upgrades that are not delivered. We apply the PCD to all wastewater companies.

Approach to deliverable

We will track the delivery of the schemes and accompanying cost drivers we used to calculate scheme level allowances for growth at STWs. The cost drivers we used to calculate these allowances are:

- process capacity added over the 2025-30 period to meet current and expected quality permits, measured in population equivalent (PE);
- expected change in Dry Weather Flow (DWF) permit levels of the 2025-30 period, measured in m^3 per day; and
- ammonia permit dummy, indicating if the ammonia permit level falls and the new level is below 3mg/l.

We will allow companies to change the scope or substitute a scheme due to changing population growth forecasts in their service areas. We acknowledge companies' comments on substituting non-compliant schemes and agree that addressing forward-looking growth needs at sites should not be held back by historical non-compliance. Therefore, companies can substitute schemes provided that:

- the site does not have a change in the FFT permit without a corresponding change in the DWF permit;
- none of the expenditure in scope of the PCD is for addressing compliance with existing DWF permits;
- none of the expenditure in scope of the PCD is for addressing compliance with existing FFT permits; and
- none of the expenditure in scope of the PCD is for reducing storm overflow spills.

We set out assurance requirements needed to justify the change in scope or substitution of growth at STWs schemes in section 4.4.2 below.

More broadly, we continue to consider that a scheme level PCD is the best way to protect customers. Our assessment of historical delivery suggests that the inherent uncertainty of growth requirements usually leads to non-delivery of funded growth schemes or delivery of schemes at different sites. Our scheme level PCD protects customers from these changes and can more effectively track the delivery of additional capacity over time.

We will cap the aggregate PCD adjustment at zero. This recognises our policy that PCDs should not be used to fund additional growth at STWs requirements in-period.

Time incentives

Given the under delivery of previously funded investment in this area, if companies do not deliver a significant part of their funded growth at sewage treatment works programme by the end of the

2025-30 period, then we reserve the right to apply additional time penalties on companies rather than simply clawing back funding in PR29.

Our final determination

We apply a PCD on the growth at sewage treatment work schemes that we have provided an allowance for. We will track delivery at the scheme level and claw back allowed investment in the case of non-delivery. We apply time incentives on the cumulative process capacity added companies deliver.

4.4.2 Price control deliverable

Our final determination

This PCD is for tracking delivery of expenditure on treatment schemes for growth at STWs.

Deliverable

We expect the company to deliver growth at STWs schemes to make sure they can treat increased flows and loads to existing permit standards or ensure compliance with any new DWF, FFT and quality permit levels implemented due to population growth.

As mentioned above, companies can make changes to the scope or substitute a scheme due to changing population growth forecasts in their service areas. Substituted schemes must not:

- have a change in the FFT permit without a corresponding change in the DWF permit; and
- use any expenditure funded via the PCD to address previous non-compliance with DWF or FFT permits or reduce storm overflows spills.

To maintain consistent treatment, any new or substitute schemes should provide assurance that no expenditure is to address compliance with existing DWF or FFT permits or to reduce spills. Where the scheme has a DWF compliance base ove

rlap element, we will calculate the DWF non-compliance adjustment fixed as of 2023. This will achieve consistent treatment with growth at STWs schemes included in the final determinations.

The company should inform Ofwat of any substitution in a timely manner, and we will approve changes in schemes in the PR24 end-of-period reconciliation. Third party assurance requirements are set out below.

For the purposes of this price control deliverable, for the scheme to be confirmed as delivered it must be fully commissioned, operational and in permanent use. The solution delivered must be permanent and not temporary.

Where investment at a specific site is still required due to PE growth, but the scope is reduced as the process capacity added is lower, or the flow or quality permit changes are not as stretching as forecast, then we will apply a non-delivery PCD payment based on the modelled allowance accounting for the changes.

Measurement and reporting

The company should report progress against deliverables as per the common reporting requirements set out in section 2.2.

In addition to the above common requirements, the company should for each growth at STWs scheme, report on the:

- Process capacity added over the 2025-30 period to meet current and expected quality permits, measured in population equivalent.
- Change in Dry Weather Flow (DWF) permit level over the 2025-30 period, measured in m^3 per day. The historical and enhanced DWF permit should be provided.
- Change in the ammonia permit level as a result of the change in the DWF permit level, measured in mg/l. The historical and enhanced ammonia permit level should be provided.

The companies should report progress at the scheme level. We will set out data requirements in due course.

Other conditions

We expect the company to secure confirmation from the Environment Agency / Natural Resources Wales that the change in DWF permit enforceable (i.e. by which the Environment Agency monitors compliance). We also expect the company to provide third party assurance, the new DWF is being met through permanent capital investment, is not base funded capital maintenance and will deliver a step change in capacity.

Any changes in sites, PEs or flow and / or quality permit levels must be reported to Ofwat in a timely manner, so we can review the PCD rates as they may need to be amended.

Any changes to permit levels must be agreed with the Environment Agency or Natural Resources Wales.

If the predicted growth for a site with an allowance is not likely to occur in the 2025-30 period as expected, and therefore any associated flow and / or quality permit changes are delayed, we would

expect companies to assess if the growth (and associated permit changes) will proceed in the 2030-35 period. If this is the case, we will not implement the PCD clawback in the PR24 end-of-period reconciliation as the investment should still continue. We will reassess delivery of the scheme in the PR29 end-of-period reconciliation. If this is not the case and growth is only predicted beyond 2035, we would clawback funding in the PR24 end-of period reconciliation for that site, and the company could reapply for funding at a later price review.

Assurance

Common assurance requirements apply as per section 2.3.

In addition to the common requirements, the independent third-party assurer shall provide annual assurance of the date that the scheme was fully commissioned, operational and in permanent use. The solution delivered must be permanent and not temporary.

Independent third-party assurance should be provided for each scheme on:

- Process capacity added over the 2025-30 period to meet current and expected quality permits, measured in population equivalent.
- Change in Dry Weather Flow (DWF) permit level over the 2025-30 period, measured in m3 per day, including the historical and enhanced DWF permit level for each scheme.
- Change in the ammonia permit level as a result of the change in the DWF permit, measured in mg/l, including the historical and enhanced ammonia permit level for each scheme.

Where company proposes any changes to scope or substitution of a scheme, independent third-party assurance should be provided on:

- the rationale for why the scheme is being substituted or changed;
- whether the change or substitution and all the required effluent permits are agreed with the Environment Agency and / or Natural Resources Wales;
- whether any of the proposed expenditure will go toward addressing any historical noncompliance with DWF and / or FFT permit levels, which should have already been funded by customers.

Payment rates

Non-delivery

Non-delivery PCD payments will be calculated as per the approach set out in section 2.4.

The following methodology sets out the steps we take to calculate modelled allowances for growth at STWs enhancement costs. We will use a similar methodology going through these steps when

reconciling PCDs at the end of the 2025-30 period. Then we will consider the difference between the FD allowance and the updated allowance to calculate the total nondelivery PCD payment.

FD allowances calculation

First, we set out the equations for the allowances provided by each of our growth at sewage treatment works enhancement models (GS1 and GS2) for each scheme (where *i* denotes each scheme and *j* denotes the company).

GS1 model allowance:

$$GGSS1_{iiii} = 3.193778 + 0.000358 * (TTddddddddd\ PPddNNppddUUUU\ PPpppppppppddppdd\ ddNN\ PPEE)_{iiii} +$$

$$0.005245 * (EEMMppddpppppddddd\ pphppNNttdd\ ddNN\ PPDDFF\ ppddddppddpp)_{iiii} +$$

$$5.146740 * TTppppNNNNddpp\ ppddddppddpp\ pphppNNttdd\ ddddpppppdd\ (< 3\ pptt/dd)_{iiii}$$

The second model is in log form, so we additionally apply a log bias factor. We calculate the log bias adjustment factor as the ratio between the total industry requested costs and total modelled costs from the GS2 model. This comes to 1.5230. GS2 model allowance:

$$GGSS2_{iiii} = \exp(-1.337491 + 0.376392 * ddNN(TTddddddddd\ PPddNNppddUUUU\ PPpppppppppddppdd\ ddNN\ PPEE)_{iiii} +$$

$$0.007573 * ddNN(EEMMppddpppppddddd\ pphppNNttdd\ ddNN\ PPDDFF\ ppddddppddpp)_{iiii} +$$

$$0.736836 * TTppppNNNNddpp\ ppddddppddpp\ pphppNNttdd\ dduuppppdd\ (< 3\ pptt/dd)_{iiii}) * (1.5230)$$

We then triangulate allowances for each modelled scheme by equally weighting each model (weight of 50%):

$$MMNNddddddddddddd\ UUpphddppdd\ ppddddNNaappNNppdd_{iiii} = 0.5 * GGSS1_{iiii} + 0.5 * GGSS2_{iiii}$$

We sum scheme allowances across all schemes to generate a modelled company allowance for each company:

$$TTNNppppdd\ ppNNpppppppNNdd\ ppNNddddddddddddd\ ppddddNNaappNNppdd_{ii} = \sum_{ii=1}^{nn} MMNNddddddddddddd\ UUpphddppdd\ ppddddNNaappNNppdd_{iiii}$$

Outlier schemes are excluded from modelling. We deep dived outliers instead. Please refer to section 2 of 'PR24 final determinations: Expenditure allowances – Enhancement cost modelled appendix' for an overview of the treatment of outlier schemes.

The treatment of outliers is different depending on whether the schemes are efficient or inefficient.

If the outlier scheme is efficient (i.e. company request < modelled allowance), then:

$$OOuuppddddddddd\ UUpphddppdd\ ppddddNNaappNNppdd_{iiii} = PPNNpppppppNNdd\ dddddeeuuddUUpp_{iiii}$$

If the outlier scheme is inefficient (i.e. company request > modelled allowance), then:

$$OOuuppddddddddd\ UUpphddppdd\ ppddddNNaappNNppdd_{iiii} = OOuuppddddddddd\ ppNNddddddddddddd\ UUpphddppdd\ ppddddNNaappNNppdd_{iiii} + PPddddpp\ ddddddddd\ ppNNUUpp\ ttpppp\ ppddjjuuUUpppppddNNpp\ (\%)_{iiii} * (PPNNpppppppNNdd\ dddddeeuuddUUpp_{iiii} - OOuuppddddddddd\ ppNNddddddddddddd\ UUpphddppdd\ ppddddNNaappNNppdd_{iiii})$$

$$TTNNppppdd\ ppNNpppppppNNdd\ NNuuppddddddddddUU\ ppddddNNaappNNppdd_{ii} = \sum_{ii=1}^{nn} OOuuppddddddddd\ UUpphddppdd\ ppddddNNaappNNppdd_{iiii}$$

We calculate allowances before efficiency adjustments for each company by summing allowances for all relevant schemes (see 'PR24 final determinations: Expenditure allowances – Enhancement cost modelling appendix' for more detail):

$$PPdddd\ FFSS\ ppNNdd\ RRPPEEUU\ ppddddNNaappNNppdd_{ii} = TTNNppppdd\ ppNNddddddddddddd\ ppNNpppppppNNdd\ ppddddNNaappNNppdd_{ii} + TTNNppppdd\ NNuuppddddddddUU\ ppNNpppppppNNdd\ ppddddNNaappNNppdd_{ii}$$

Post-modelling adjustments

There are several post-modelling adjustments that we make to the modelled and outlier allowances. Two of these adjustments, the AMP8 adjustment and the adjustment for compliance overlap with base are done on the scheme specific level.

The AMP8 adjustment is found by calculating for each scheme, the proportion of requests that occur in the 2025-30 period:

$$TTMMPP8\ ppddjjuuUUpppppddNNpp\ pppppppppNNdd^{iiii} = \frac{FFsshUUmmUU\ AAAAPP8\ UUeeUUUUnnUUiittooooUU^{iiii}}{ssshUUmmUU\ UUeeUUUUnnUUiittooooUU_{iiii}} TTootUUoo$$

The compliance overlap with base adjustment value is calculated in two ways. It is only applied for companies that have not provided assurance that expenditure to address previous non-compliance with DWF permits is not included in growth at STWs expenditure.

The first scenario is that a scheme is non-compliant with its DWF permit and has:

- no expected DWF permit change; or
- an expected DWF permit change that is insufficient to regain compliance with the Q90 average of the failing years, applying the 3-in-5 years rule for DWF compliance.

In this scenario, the scheme is fully disallowed. The adjustment value is therefore the entire AMP8 value of the scheme:

$$PPNNppppddddppNNppdd\ ppddjjuuUUppppddNNpp\ ddppdduudd_{iiii} = TTMMPP8\ ppddjjuuUUppppddNNpp\ pppppppppNNdd_{iiii} * TTNNppppdd\ UUpphddppdd\ ppddddNNaappNNppdd_{iiii}$$

For other DWF non-compliant schemes, the adjustment factor is calculated as the proportion of the expected DWF change to bring the site into compliance with the Q90 average of the failing years. We first calculate the average DWF permit failure value in the failing years:

$$TTddddddppttdd\ PPDDFF\ ppNNppppddddppNNppdd\ pppppddddddNNtt\ ddppdduudd_{iiii}$$
$$= \left(QQ90\ PPDDFF\ ddddppddddNNtt_{ttiiii} * II(QQ90\ PPDDFF\ ddddppddddNNtt_{ttiiii} > PPDDFF\ PPddddppddpp_{iiii}) \right) - PPDDFF\ ppddddppddpp_{iiii}$$
$$\text{2023} \quad tt = \text{2019}$$

Then we can calculate the compliance adjustment factor as:

$$PPNNppppddddppNNppdd\ ppddjjuuUUppppddNNpp\ ddppdduudd_{iiii} = TTMMPP8\ ppddjjuuUUppppddNNpp\ pppppppppNNdd_{iiii} * TTNNppppdd\ UUpphddppdd\ ppddddNNaappNNppdd_{iiii} *$$
$$AAAAUUooUUAAUU\ FFDDFF\ ssoommUUooiiUUnnssUU\ ffUUiiooiinnAA\ AAUUooooUU_{iiii}$$

$$(RReeUUUUssttUUUU\ FFDDFF\ UUUUoommiitt_{iiii} - CCooooooUUnntt\ FFDDFF\ UUUUoommiitt_{iiii})$$

These adjustments are applied to each relevant scheme:

$$PPNNUUpp\ TTMMPP8\ ppNNdd\ ppNNppppddddppNNppdd\ ppddjjuuUUppppddNNpp\ UUpphddppdd\ ppddddNNaappNNppdd_{iiii} = SSpphddppdd\ ppddddNNaappNNppdd_{iiii} * TTMMPP8\ ppddjjuuUUppppddNNpp\ pppppppppNNdd_{iiii}$$

$$-PPNNppppddddppNNppdd\ ppddjjuuUUppppddNNpp\ ddppddduudd_{iiii}$$

These allowances can be aggregated per company:

$$PPNNUUpp\ TTMMPP8\ ppNNdd\ ppNNppppddddppNNppdd\ ppddjjuuUUppppddNNpp\ ppNNpppppppNNdd\ ppddddNNaappNNppdd_{ii}$$
$$nn$$
$$= PPNNUUpp\ TTMMPP8\ ppNNdd\ ppNNppppddddppNNppdd\ ppddjjuuUUppppddNNpp\ UUpphddppdd\ ppddddNNaappNNppdd_{iiii}$$
$$ii{=}1$$

The other adjustments are done using an aggregate per-company factor as they are not attributed to specific schemes. This is calculated as the ratio between the allowance post AMP8 and compliance adjustments and the allowance post all adjustments (including frontier shift efficiency and real price effects):

$$PPNNUUpp\ TTMMPP8\ ppNNdd\ ppNNppppddddppNNppdd\ ppddjjuuUUppppddNNpp\ ppNNpppppppNNdd\ ppddddNNaappNNppdd_{ii}$$
$$FFPP\ ppddjjuuUUppppddNNpp\ pppppppppNNdd_{ii} = \frac{}{PPNNUUpp\ ppddjjuuUUppppddNNppUU\ ppNNdd\ FFSS\ ppNNdd\ RRPPEEUU\ ppddddNNaappNNppdd_{ii}}$$

This factor includes the impact of the past under-delivery adjustment, reconciliation adjustment, frontier shift efficiencies and real price effects.

That gives us all the relevant information to undertake the last step of calculating final allowances for each scheme adjusted by the FD adjustment factor. This is the allowance used in the PCD:

$$PPNNUUpp\ ppddjjuuUUppppddNNppUU\ ppNNdd\ FFSS\ ppNNdd\ RRPPEEUU\ ppddddNNaappNNppdd_{iiii}$$
$$= PPNNUUpp\ TTMMPP8\ ppNNdd\ ppNNppppddddppNNppdd\ ppddjjuuUUppppddNNpp\ UUpphddppdd\ ppddddNNaappNNppdd_{iiii} * FFPP\ ppddjjuuUUppppddNNpp\ pppppppppNNdd_{ii}$$

$$nn$$
$$PPNNpppppppNNdd\ ppddddNNaappNNppdd_{ii} = PPNNUUpp\ ppddjjuuUUppppddNNppUU\ ppNNdd\ FFSS\ ppNNdd\ RRPPEEUU\ ppddddNNaappNNppdd_{iiii}$$
$$ii{=}1$$

Non-delivery PCD payment calculation

When calculating the PCD, we will rerun this process using updated cost drivers for all relevant schemes.

We are going to implement several steps:

- plug in the new cost drivers (for existing schemes that change);
- add new schemes with their cost drivers if relevant; and
- remove schemes that are no longer due to be delivered

Outliers

For outliers that are inefficient and have changes to cost drivers, we will recalculate allowances and use the ratio of updated modelled cost and FD modelled cost to amend the outlier scheme allowance.

$$OOuuppddddddddd\ ppNNddddddddddddd\ ppNNUUpp\ pphppNNttdd\ ddpppppddNN^{iiii} = \frac{UUUUUUUUttUUUU\ oooottooiiUUoo\ mmooUUUUooooUUUU\ sssshUUmmUU\ UUooooooaaUUnnssUU^{iiii}}{FFFF\ OOoottooiiUUoo\ mmooUUUUooooUUUU\ sssshUUmmUU\ UUooooooaaUUnnssUU_{iiii}}$$

$$UUppddpppppddddd\ NNuuppddddddddd\ UUpphddppdd\ ppddddNNaappNNppdd_{iiii} = FFPP\ NNuuppddddddddd\ UUpphddppdd\ ppddddNNaappNNppdd_{iiii} * OOuuppddddddddd\ ppNNddddddddddddd\ ppNNUUpp\ pphppNNttdd\ ddpppppddNN_{iiii}$$

If the outlier scheme is efficient (i.e. company request < modelled allowance), then we will cap the maximum aggregate allowance for any substitute schemes at the FD allowance for the outlier scheme (kk denotes substitute solutions for outlier scheme dd for the company jj).

$$\sum_{ii=1}^{nn} UUppddpppppddddd\ NNuuppddddddddd\ UUpphddppdd\ ppddddNNaappNNppdd_{iiiiii} \leq PPNNpppppppNNdd\ ddddeeuuddUUpp_{iiii}$$

If the outlier scheme is inefficient (i.e. company request > modelled allowance), then the substitute schemes will receive the modelled allowance.

Updated allowances

Once we determine the allowances, we will calculate and apply any compliance adjustment and AMP8 adjustment as detailed above. We will then multiply the resulting allowances with the FD adjustment factor to apply the remainder of the adjustments.

Finally we will compare the allowances in final determinations and the updated allowance to calculate the aggregate non-delivery PCD payment:

$$NNNNNN - ddddddddddddddd\ PPPPPP\ ppppddppddNNpp_{ii} = FFPP$$
$$ppddddNNaappNNppdd_{ii} - UUppddpppppdddd\ ppddddNNaappNNppdd_{ii}$$

The final allowance after accounting for changes to existing schemes, added new schemes and removed schemes no longer due to be delivered will be capped at the final determination allowance the company was allocated.

Notes

1. Unfunded 7 schemes, base funded? Still a PCD?
2. Measurement of “added Process Capacity in PE”
3. Submission to Ofwat the baseline? Can that be refined through delivery?
4. Audit process
5. Changes to growth forecasts

Section	Paragraph	Terminology	Query
Approach to deliverable	We will allow companies to change the scope or substitute a scheme due to changing population growth forecasts in their service areas. We acknowledge companies' comments on substituting non-compliant schemes and agree that addressing forward-looking growth needs at sites should not be held back by historical non-compliance. Therefore, companies can substitute schemes provided that:		Will we get a defined process from Ofwat on how we communicate scope changes or substitutions? Each will also need to be audited by a 3rd party?
Time incentives	Given the under delivery of previously funded investment in this area, if companies do not deliver a significant part of their funded growth at sewage treatment works programme by the end of the 2025-30 period, then we reserve the right to apply additional time penalties on companies rather than simply clawing back funding in PR29.	“Significant”	Would significant be defined by Ofwat?
Our final determination	We apply a PCD on the growth at sewage treatment work schemes that we have provided an allowance for. We will track delivery at the scheme level and claw back allowed investment in the case of non-delivery. We apply time incentives on the cumulative process capacity added companies deliver.		Can we get confirmation around the schemes with a zero allowance (7 schemes) do Ofwat expect us to report on these? And can they also confirm that these are not subject to the claw-back mechanism?

Deliverable	Where investment at a specific site is still required due to PE growth, but the scope is reduced as the process capacity added is lower, or the flow or quality permit changes are not as stretching as forecast, then we will apply a non-delivery PCD payment based on the modelled allowance accounting for the changes.		Understand that if we reduce scope within a scheme and deliver less capacity we will pay back part of the scheme though the claw-back, but what happens if we deliver the capacity we said we would but achieve efficiencies in the scheme? Does this stay with AW?
Other conditions	We also expect the company to provide third party assurance, the new DWF is being met through permanent capital investment, is not base funded capital maintenance and will deliver a step change in capacity.		Each scheme will need an external auditor. Cost and time implications were not factored in at PR24.
Other conditions	If the predicted growth for a site with an allowance is not likely to occur in the 2025-30 period as expected, and therefore any associated flow and / or quality permit changes are delayed, we would expect companies to assess if the growth (and associated permit changes) will proceed in the 2030-35 period. If this is the case, we will not implement the PCD clawback in the PR24 end-of-period reconciliation as the investment should still continue. We will reassess delivery of the scheme in the PR29 end-of-period reconciliation. If this is not the case and growth is only predicted beyond 2035, we would clawback funding in the PR24 end-of period reconciliation for that site, and the company could reapply for funding at a later price review.		Will there be a process set from Ofwat on this? Will an audit need to be undertaken on scheme we decide could be pushed back to AMP9?
General Questions			Will Ofwat specify how we measure “added process capacity in PE”?

General Questions			The data given on baseline capacity at WRCs in the FD may change when the scheme goes into detailed design (following a more in-depth investigation into all asset capacity on site) Can this be reported back to Ofwat so baselines are clear on each scheme?
General Questions			Confirm that the scheme allowances have already had any DWF non-compliance factors applied?