Performance-Based Contracting for Non-Revenue Water and its Relevance in the South African Context

Report to the

WATER RESEARCH COMMISSION

by

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WRC Report No. 3143/1/24
ISBN 978-0-6392-0622-6

May 2024

WATER RESEARCH COMMISSION

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This is the final report of WRC project no. C2022/2023-01522.

Executive summary

Introduction and background

Non-revenue water (NRW) is a large and growing problem in South Africa. Performance-based contracts (PBCs), whereby the private sector takes on financial risk in implementing NRW interventions in return for a share of the savings, are a means or bringing in private-sector expertise at low financial risk to municipalities.

PBCs have been successfully implemented internationally and in South Africa but have failed to be adopted at scale in this country. This research sought to answer the question: “Why not?”, and in unpacking these reasons, proposes a framework for successful implementation of these forms of contract in a South African context.

NRW challenges in South Africa

NRW in South Africa has become progressively worse – from 37% in 2012 to 46% in 2022. Non-revenue water is an indication of inefficient water supply networks, failing infrastructure, and sub-optimal revenue value chains, which in turn are symptoms of poor management of the systems. Reasons for the high level of technical loss (leaks) include historically poor maintenance and lack of adequate asset replacement leading to old, leaking infrastructure. The reasons underlying poor asset management are fundamentally about a lack of capacity (not enough people, experience, inadequate skills, lack of systems), bureaucratic constraints, a lack of adequate funding, and the interaction between these issues. Reasons for commercial losses (meter inaccuracies and theft) include insufficient funding to replace faulty meters, insufficient staff capacity/funding for meter reading, political resistance to installing meters, political/community resistance to removing illegal connections and poor billing systems.

Application of PBCs in South Africa

The two main reasons why PBCs have not scaled in South Africa are: i) that the risks to the private sector have been too high, leading to a lack of interest; and ii) that municipalities lack the skills and experience to design and implement these contracts.

PBCs, by design, are intended to transfer performance and financial risk to the private contractor. However, there are several other non-performance risks that may be faced by potential contractors:

- Local political risks – including disruption by the ‘construction mafia’, community protest or community resistance to the contractor’s presence in certain areas.
- Council political risk – that a Council will renege on the contract, or, given the long-term nature of the contract, a subsequent Council will challenge or reject the contract entered into by the previous Council.
- Payment risk – disputes over the remuneration calculation, delayed payment, or total non-payment of agreed amounts.
- Partnership risk – lack of cooperation by municipal officials to gain access to the network, to control impact on the network by third parties, or to collect billed revenue after metering and billing interventions.
- Data quality risk – if data quality regarding the baseline water consumption or the technical details of the network are poor, then this adds to the standard performance risk hat contractors must take.

PBCs are a new form of contract that have only been tested twice to address NRW in South Africa. As such, it may be unfamiliar to municipal officials, who may be reluctant to try this approach, or not know how to design such a contract. Reluctance to enter into a PBC is often linked to the bureaucratic inertia created by the regulatory environment. While a legal review found that there are no legal or regulatory prohibitions on PBCs, some forms of PBCs will trigger Section 33 of the Municipal Finance Management Act, the requirements of the Public-Private Partnership Regulations, or alternatively, the Municipal Asset Transfer Regulations. PBCs can be designed to avoid these regulatory processes, but this negates some of the advantages of the risk transfer. Municipalities need to match their appetite for regulatory burden with the advantages of greater risk transfer. A lack of experience in these types of contracts can be addressed through external specialist technical support and tools.

The reason for implementing a PBC is so that a private party can address NRW issues that a municipality is unable to address. However, the major underlying reasons for NRW, namely a lack of capacity and lack of money, are also likely to limit the applicability of NRW PBCs. Capacity is an issue because some technical and contract management capacity is needed to scope, engage with, and manage the contractor. Conversely, those municipalities that are well capacitated and can manage their

network adequately may not need a PBC, which will cost more than the municipality doing the work itself. A lack of money is an issue because money is still needed to set up the contract and pay the contractor, but NRW fuels a downward spiral of municipal water service viability where costs increase and revenues decrease, leading to a shortage of money. Municipalities with severe financial issues may not be able to honour PBC contracts.

PBCs are therefore most appropriate where there is some, but insufficient internal technical capacity, low internal incentives for NRW reduction and the cost of NRW to the municipality is high, but where the municipality has sufficient financial liquidity and contract management capacity to honour these contracts.

Framework for NRW interventions incorporating PBCs

The ultimate goal of a NRW intervention is an efficiently managed water network with all customers who should be paying, paying the correct amount for the service delivered. NRW can only be sustained through a range of interventions that broadly fit into three phases:

- *Short term* (1-3 years): Undertake a diagnosis, develop a baseline, and implement the “quick wins” to arrest financial freefall.
- *Medium-term* (3-5 years): Detect and fix leaks and through the process build community relationship and trust.
- *Long term* (5-10 years): Improve metering and billing, tightly implement the municipal indigent policy, undertake proactive maintenance and monitor the water balance to sustain NRW at the lowest possible level.

PBCs are well suited to the short-term interventions and some of the long-term interventions, but the municipality should eventually take responsibility of the sustainable management of the system.

Timeframe	Activities	Responsibility	NRW Target
Short term (1-3 yrs) **ARREST FREEFALL**	Diagnosis and baseline Pressure management Reservoir leaks Large leaks	PBC Contractor	30%-40%
Medium term: (3-5 yrs) **BUILD TRUST**	Leak detection and repair Build community relationship/trust Set up systems Transfer skills		20%
Long term (5-10 yrs) **ACHIEVE FINANCIAL SUSTAINABILITY**	Improve metering and billing Implement indigent policy Proactive maintenance Monitor water balance	Municipality	Sustain 20%

Prerequisites before entering into a NRW PBC

There are several preconditions that need to be in place to address the abovementioned risks to make PBCs attractive to the private sector and cheaper for the municipality:

- Correct diagnosis: The nature of the NRW problem needs to be correctly understood to specify the correct intervention.
- Credible baseline: Meter records, preferably of minimum night flow, are required to set a baseline against which to pay the contractor.
- Ring-fenced district metered area: The areas in which interventions are planned need to be discreet from other zones and all pipes supplying the area must be metered.
- Political support: Council support will increase confidence that the contract will be honoured and assist with community engagement.
- Institutional support: Senior management needs to motivate the contract to the Council and to gain adequate and unrestricted access to the network.
- Community support: Benefits to the community need to be communicated to ensure support and develop longer-term assistance with NRW reduction.
- Municipal technical capacity: A minimum level of technical capacity is required to engage with the contractor and to manage the contract.

- Responsibility and accountability: Officials need to be designated as being responsible for the contract and accountable for its success.
- Adequate funding: Funding is required for project setup, fixed fee items and incentive payments when these are due.
- Commercial attractiveness: Preliminary work is required to calculate the potential savings and return on investment to ensure commercial attractiveness before going out to tender.

Guidance for structuring a PBC

Several resources exist to guide the design of PBCs. Notwithstanding this guidance, the following best practice has emerged from the study:

- Contract length should be 3 to 7 years, depending on the level of capital investment required.
- Contracts should incorporate sufficient flexibility to accommodate changes in the network circumstances or if new information emerges.
- Technical competence of contractors is very important and can be ensured through pre-qualification of bidders.
- An independent auditor is required to verify performance and incentive payments and mediate disputes.
- An appropriate balance is required between the fixed fee portion and the incentive portion of the contract.
- The contract should include financial incentives for sustaining any savings achieved and capacity building to transfer knowledge and skills to municipal officials.
- Contracts should include remuneration caps, savings thresholds and a maximum incentive payment rate.

Conclusion

PBCs offer strong potential to address the rampant NRW in South African municipalities. However, there are reasons why PBCs have not been adopted at scale, which largely relate to municipal technical capacity and the complex and difficult context in which municipalities operate. PBCs should not be seen as an external ‘quick fix’ to a technical problem or a clever way to finance the fixing of leaks in old pipes. Rather, they are an initial mechanism for intervening in a failing municipal water

system. They are one part of a larger solution that needs to be found for the lack of adequate technical capacity and resources in municipal water services departments.

As such, PBCs for NRW need to be positioned as part of a long-term management intervention with benefits to the municipality and its customers. The result of a successful NRW programme is not the reduction of NRW to a particular percentage of system input volume or saving of a specific amount of money, but rather a social contract between a municipality and its customers where the former is trusted to provide a reliable water supply as efficiently as possible, and the latter can be relied upon to pay for the service provided. PBCs are one tool to begin to achieve this.

Recommendations

- The Water Partnerships Office (WPO) should undertake a high-level screening of municipalities to assess applicability of PBCs.
- Municipalities should not implement a PBC without:
  - An accurate diagnosis of the problem;
  - A council resolution supporting the contract; and
  - A clear accountability framework.
- WPO/National Treasury (NT) should monitor payment of contractors by municipalities.
- WPO/Municipal Infrastructure Support Agent should assist municipalities to set up district metered areas and baselines in advance of PBCs.
- WPO/Municipalities should include capacity building and skills transfer as an explicit requirement of the contract.
- NT should provide guidance around when PBCs qualify as Public-Private Partnerships.
- NT should confirm with the Auditor-General that PBCs will not be classified as unauthorized or irregular expenditure.

Table of Contents

1. Introduction

1.1 Background to PBCs for NRW

Non-revenue water (NRW) is a world-wide issue. Interventions such as leak detection, pipe replacement, consumer education, and improved billing have been commonly employed to tackle NRW. However, water utilities may lack the expertise or financial resources to make the necessary investments to address this issue effectively. In response, the World Bank and other organizations proposed PBCs in the 1990s as a solution to finance NRW reduction while transferring financial and operational risks to the private sector (Kingdom *et al.*, 2018).

The promotion of PBCs for NRW was strongly linked to the 'water privatization wave of the 1990s' driven by the World Bank, the International Finance Corporation (IFC) and the International Monetary Fund (IMF) (Schiffler, 2015). The first PBCs for NRW were piloted by the World Bank and the learnings captured in case studies and guideline documents published on platforms such as the Public-Private Partnership Legal Resource Centre (PPPLRC, 2023) and the Public-Private Infrastructure Advisory Facility. By offering incentives for private contractors to achieve NRW savings and utilizing cost savings and additional revenue to compensate them, PBCs emerged as an attractive solution for NRW management.

While PBCs for NRW were never implemented by the World Bank directly, most likely due to the strong resistance to privatization in early 2000s (McKinley, ND), the first PBC for NRW in South Africa was initiated by a private engineering consulting firm in 2005. Following on from a highly successful pressure management intervention in Khayelitsha, Cape Town, which was privately identified, but publicly funded (McKenzie, Mostert and de Jager, 2004), the same consultants identified an opportunity for large NRW savings in the Sebokeng/Evaton area of Emfuleni Municipality. This contract was the first PBC for NRW in South Africa and has been highly publicised and documented (see Mckenzie *et al.*, 2007; Still *et al.*, *2015*; Wegelin, 2021). A second project in Emfuleni followed in 2012 but was structured differently as a donor- and municipal-funded initiative. Anecdotal evidence exists of other PBCs attempted in South Africa, but these have either not been document or were not successful. It is notable that despite these resounding successes, PBCs for NRW in South Africa have not been

widely adopted by municipalities. They have been applied in the private sector and with other public sector clients (e.g. prisons, army bases, etc.), as well as in the electricity sector, but not in the municipal water sector.

1.2 Purpose of this framework

The DBSA, through the Water Research Commission (WRC) commissioned a study: examining *Performance-Based Contracting (PBC) for Non-Revenue Water (NRW) and its relevance in the South African context.* The research project involved a local and international literature review, case studies, and interviews with national government, municipal, and private sector stakeholders.

Many international case studies and guidance documents exist on the benefits of PBCs for NRW as well as how to implement them (see Kingdom *et al.*, 2006; PPPIAF, 2016). Work has also been done in South Africa on how to implement PBCs for NRW, culminating in the "*Guidelines the Use of Model Performance Based Contract for Water Conservation and Demand Management*" produced for GIZ and the Strategic Water Partners Network by Still *et al.* (*2015*). If so, much motivation and guidance exists, then why is a framework required?

PBCs for NRW seem to be a win-win for municipalities and the private sector, and yet in the 9 years since the local guideline was produced, they have not been considered or implemented at scale by SA municipalities. There is also an emerging international literature around the implementation of PBCs for NRW, particularly in developing countries, that documents the difficulties experienced in trying to implement these contracts (Dalton and Liemberger, 2022; Koelbl and Pena, 2022; Jalakam, 2023). There must be some underlying and unexplored reasons why these contracts are not more attractive in the South African context.

The purpose of this framework is not to repeat the good work that has already been done on PBCs internationally and in South Africa, or to provide technical guidance in how to implement them. Instead, it is to explore the potential risks and barriers and look at how these can be mitigated or addressed. It will engage with how these types

of contracts interface with the political economy of the variable contexts of South African municipalities in 2023.

With a number of metropolitan municipalities and secondary cities currently exploring PBCs for NRW, this framework is intended to better inform municipalities, and other State actors supporting municipalities, around when and where to implement PBCs and where not to. And if a decision is made to pursue a PBC, what can be done to maximise the potential for success?

1.3 Scope of the report

The report is focussed on PBCs as a specific contracting modality to address NRW in South African municipalities and not all types of private sector involvement. NRW is defined in the IWA Water Balance shown in Figure 1 and includes real losses (leaks), apparent losses (illegal connections and meter inaccuracies) and authorised, but unbilled consumption. Unbilled authorised consumption and apparent losses can be termed 'commercial losses' as they result in lost revenue to municipalities, while real losses, or 'physical losses' result in excess cost to the municipality. This distinction is important because the interventions to address each, and the form of PBC contract to address each, will be different.

<table>
<tr><td rowspan="10">System Input Volume (corrected for known errors)</td><td rowspan="4">Authorised Consumption</td><td rowspan="2">Billed Authorised Consumption</td><td>Billed Metered Consumption (including water exported)</td><td rowspan="2">Revenue Water
(in South Africa this includes the Free Basic Water Allowance, which is paid for from the Equitable Share Transfer)</td></tr>
<tr><td>Billed Unmetered Consumption</td></tr>
<tr><td rowspan="2">Unbilled Authorised Consumption</td><td>Unbilled Metered Consumption</td><td rowspan="8">Non-Revenue Water (NRW)</td></tr>
<tr><td>Unbilled Unmetered Consumption</td></tr>
<tr><td rowspan="6">Water Losses</td><td rowspan="2">Apparent Losses</td><td>Unauthorised Consumption</td></tr>
<tr><td>Customer Metering Inaccuracies</td></tr>
<tr><td rowspan="3">Real Losses</td><td>Leakage on Transmission and/or Distribution Mains</td></tr>
<tr><td>Leakage and Overflow from Reservoirs</td></tr>
<tr><td>Leakage on Service Connections up to point of Customer Metering</td></tr>
</table>

Figure 1: IWA Water Balance, modified for South Africa (Source: Still *et al.*, *2015*:26)

The types of WCDM interventions typically undertaken to address NRW are described in detail by Still *et al.* (*2015*:2-10) and are:

- Community awareness and education
- Sectorisation

- Flow and pressure logging
- Pressure management
- Active leak detection
- Inspection and replacement where necessary of non-domestic water meters
- Inspection and replacement where necessary of domestic water meters
- Leak reduction on domestic properties
- Pipe replacement
- Training of municipal officials and hand-over.

It is not within the scope of this project to provide details of the above tasks. Instead, this report will focus on the structure of the contracts, the potential barriers, and measures to address these. Section 2 describes the nature of the NRW challenge in South Africa and how this might impact on the type of PBC undertaken. The types of PBCs and their applicability in South Africa are discussed in section 3. Section 4 investigates why PBCs have not been adopted in South Africa, the contexts in which they might be appropriate and their application within the existing legal framework. Section 5 introduces a framework for longer-term NRW reduction, while section 6 sets out the pre-requisites for PBCs in South African municipalities. Measures to address the identified risks are set out in section 7 while some guidance to structure PBCs is provided in section 8.

2. NRW challenges in South Africa

Municipalities in South Africa have a clear mandate to provide water services in an efficient manner. This stems from their Constitutional allocation of the water services function, the Constitutional imperative for the conservation of resources, the National Water Act provision for the protection and conservation of water resources and the Water Services Act that requires municipalities to provide details of existing and proposed water conservation, recycling, and environmental protection measures in their Water Services Development Plan. They need to provide services in a manner that is conducive to the prudent, economic, and effective use of available resources, and financially and environmentally sustainable service delivery, as set out in the Municipal Systems Act.

NRW was flagged as a major issue with the publication of "*The State of Non-Revenue Water in South Africa*" when NRW for the country was estimated at 36.8% (Mckenzie, Siqalaba and Wegelin, 2012). Since then, it has become progressively worse, with the latest No Drop Watch Report issued by DWS estimating that the national NRW figure has increased to 46.4% (DWS, 2023). Figure 2 indicates the long-term trends in NRW from 2011 to 2022.

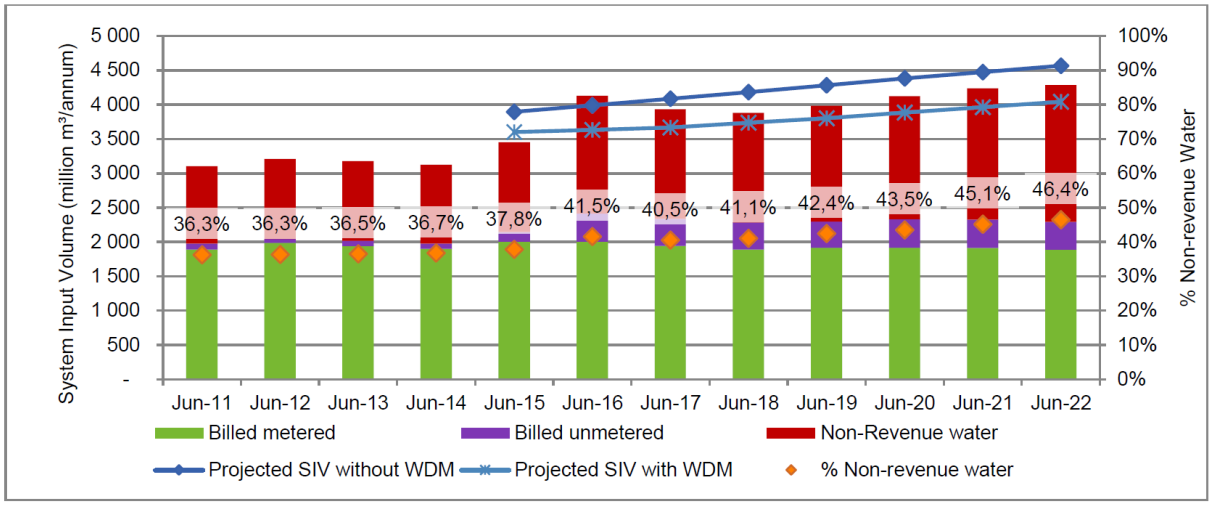

Figure 2: Non-Revenue Water trends in South Africa (Source: DWS, 2023: viii)

NRW used to be more of an issue in smaller municipalities, but the situation in the metros has been declining and metros now have the highest NRW (DWS, 2023). NRW in eThekwini Metropolitan Municipality is the highest of the metros at 58.2% (eThekwini

Metropolitan Municipality, 2023) with the other metros having figures of between 30% and 50% (Figure 3). All metros are looking at reducing NRW to achieve cost savings. eThekwini's 'aggressive' WCDM scenario involves reduction of NRW to 45% over three years (eThekwini Metropolitan Municipality, 2023).

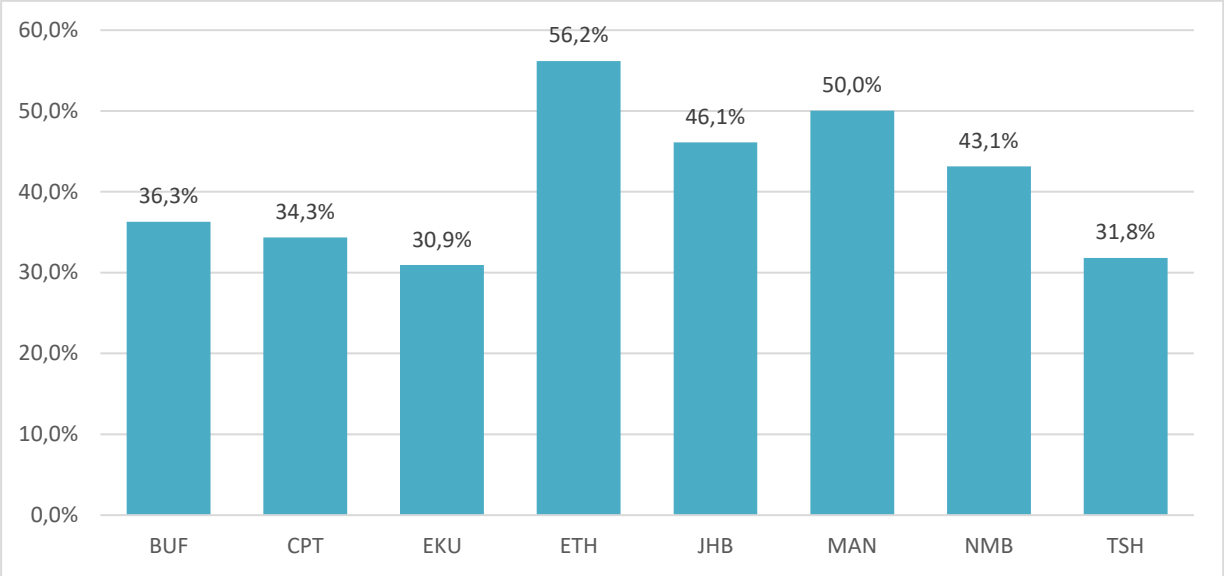

Figure 3: Non-revenue water in metros – 2022/23 (Source: National Treasury)

The National Water and Sanitation Master Plan emphasizes urgency in reducing NRW and highlights equitable water allocation and private sector collaboration (DWS, 2018). The National Water Resources Strategy outlines intensified water conservation efforts, strategic partnerships, and private sector involvement, recognizing the potential of innovative projects and sustainable water management as a "business" (DWS, 2022). A presentation by the Director-General of the Water and Sanitation Department underscores the need for a comprehensive 'Business Unusual' approach involving supply and demand-side strategies, with the transition to a professionally managed water service provider model (Phillips, 2023). Further, the No Drop reports reveal challenges in water conservation and quality, further emphasizing the private sector's role in efficient water management (DWS, 2023). Moreover, South Africa's commitment to SDG 6 is evident in efforts to improve water-use efficiency and mitigating water stress, with private sector engagement playing a pivotal role (Statistics South Africa, 2019).

Addressing NRW has been a feature of South African water policy for decades and there is a strong financial case for NRW interventions that reduce municipal cost and increase revenues. However, as Kingdom *et al.* (2006) state:

> *"If the reasons for reducing levels of NRW are so compelling, then why hasn't this widespread and generally well-understood challenge already been tackled and defeated? The reason is that reducing NRW is not just a technical issue but also one that goes to the heart of the failings of public water utilities in developing countries"* (Kingdom *et al.*, 2006: v).

Non-revenue water is an indication of inefficient water supply networks, failing infrastructure, and sub-optimal revenue value chains, which in turn are symptoms of poor management of the systems. The Municipal Infrastructure Grant Framework in the Division of Revenue Act 2023, states that: "*Where non-revenue water is in excess of 30 per cent and not decreasing from year-to-year, the municipality shall be determined to be failing to manage its water supply*". According to an analysis of the 2021/22 audited financial statements, this would include 70 out of the 113 Water Services Authorities that reported NRW figures (62%).

Reasons for the high level of technical loss include historically poor maintenance and lack of adequate asset replacement leading to old, leaking infrastructure. To delve deeper, the reasons underlying poor asset management are fundamentally about a lack of capacity (not enough people, experience, inadequate skills, lack of systems), bureaucratic constraints, a lack of adequate funding or all three, and the interaction between these issues. A private sector stakeholder in the workshop noted that losses in excess of 30% of system input volume are likely to be attributable to a shortage of skills, while a second stakeholder noted that a lack of incentives for officials to address the leaks is also a factor.

Reasons for commercial losses include insufficient funding to replace faulty meters, insufficient staff capacity/funding for meter reading, political resistance to installing meters, political/community resistance to removing illegal connections and poor billing systems.

Technical capacity in municipalities has been on the decline for some time and is well documented (Lawless, 2007; Lawless, 2016). In addition to a lack of technical capacity

to manage and monitor a system well, once NRW is high, capacity is required to diagnose problems and design solutions or procure external assistance to do so.
If a lack of funding is one of the reasons behind the decline of a water system, then the same lack of funding will be an issue in trying to intervene to address the NRW issue. Once the problem becomes large, the scale of intervention required may be unaffordable. NRW competes for capital budget with a range of other priorities. Partial funding means that big ticket interventions cannot be undertaken.
NRW fuels a downward spiral of municipal water service viability where costs increase and revenues decrease, meaning there is less money available to address the causes of the downward spiral or address the capacity gaps.

The absence of comprehensive metering makes it somewhat difficult to calculate the exact nature of the NRW problem. These figures therefore include a high degree of estimation. However, Figure 4 provides an indication of the split of NRW between the various subcategories. It is clear that the bulk of the problem (70% of NRW) is in physical losses in the water networks. Apparent losses (meter inaccuracies and theft) only make up 18% of NRW, while unbilled connections make up 12%.

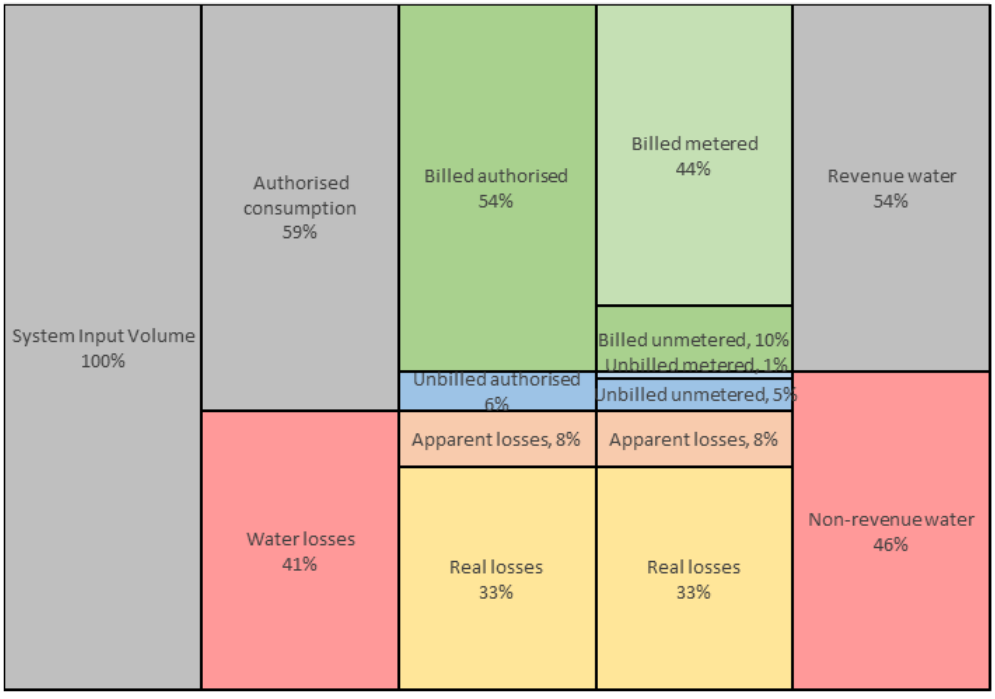

Figure 4: South African national water balance (Source: DWS, 2023)

Mckenzie and Wegelin (2008) developed a modified water balance for South Africa which separated out revenue water into Free Basic Water (FBW), recovered revenue

and non-recovered, the latter being water that is billed but not paid (Figure 5). NRW interventions can be classified as 'cost reduction' or 'revenue enhancement'. Cost reduction activities are typically aimed at real losses, while revenue enhancement activities are targeted at apparent losses and unbilled authorised consumption. However, revenue enhancement activities can extend to the non-recovered portion of billed authorised consumption if improved metering and billing is aimed at improving the payment rate for services.

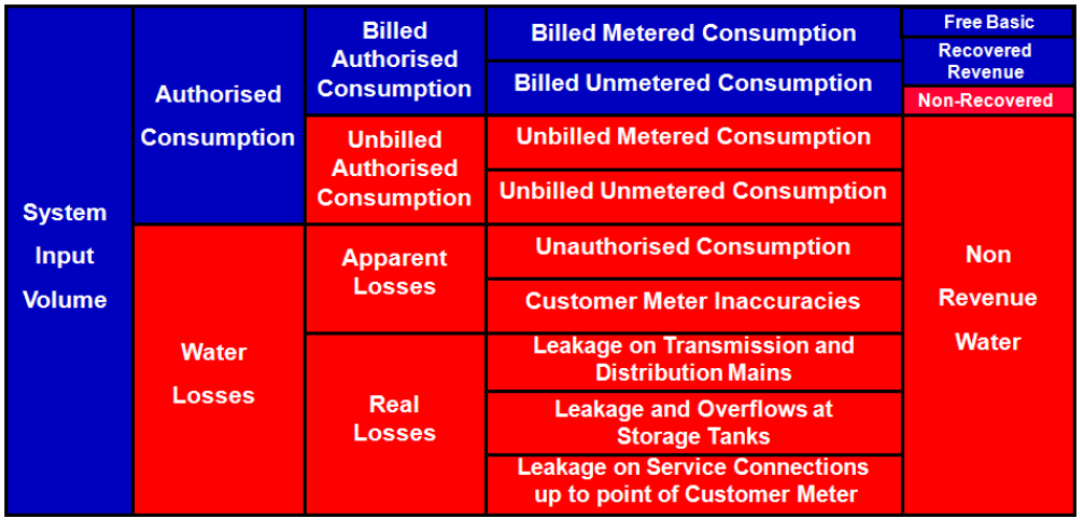

Figure 5: Modified water balance for South Africa (Source: Mckenzie and Wegelin, 2008:5)

In South Africa, the categorisation of NRW is complicated by the treatment of payment for water by indigent households in South Africa. While indigent households are provided with 6kl/month (or more, depending on the municipal policy) of FBW, many households consume more than this, either through actual use or through leaks on the property. The actual use above the free basic allowance could be billed, but the administrative burden and/or political resistance to billing for this consumption is high. It would therefore be included in the figure for unbilled authorised consumption. If the municipality has no intention of billing for consumption above the FBW amount, then the leaks on the property are not commercial losses, but effectively physical losses, i.e. reducing these losses saves the municipality on expenditure, but will not generate more revenue. The strategy in this case is one of three things:

1) for the municipality, in collaboration with households, to fix the leaks;
2) for the municipality to install a flow limiter to restrict consumption to the FBW allowance; or

3) for the municipality to bill the household for consumption above the FBW allowance to encourage them to fix their own leaks. These strategies may be implemented progressively in this order.

The socio-economic and political reality in South Africa means that most NRW interventions focus on the cost saving side and not the revenue enhancement side. However, some revenue increase may be possible through checking and replacement of meters to paying customers, or installing meters to non-indigent customers who consume more than the free basic amount. Cost saving interventions that eliminate intermittent water supply can in theory be revenue generating if they increase the demand by households who pay.

3. Types of PBCs for NRW and their applicability in South Africa

The discussion above highlighted the fact that the NRW challenge in South Africa is premised on a lack of technical capacity and/or a lack of finance. PBCs are specifically intended to address these two issues by drawing in private sector skill and through transferring some of the financial risk to the private sector. The incentives created in the contract are intended to achieve results faster than would be achieved if the municipality were to be tasked with the job. A range of PBCs exist which address these issues in slightly different ways and may be more or less suitable in different contexts. Kingdom *et al.* (2018) define four types of PBCs, shown in Figure 6 in terms of relative speed of contracting versus risk transfer (more detail is provided in Annexure A). Each of these types is described and discussed in the sections that follow.

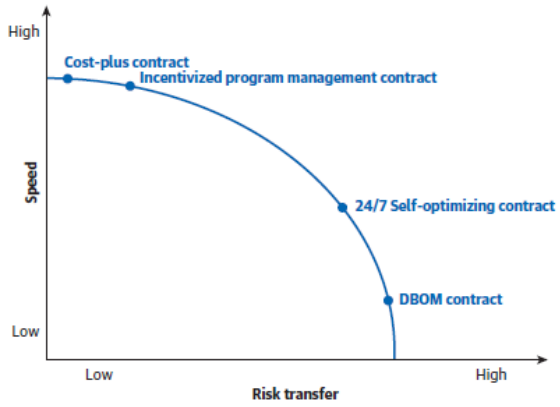

Figure 6: Types of Performance Based Contract (Source: Kingdom *et al.,* 2018)

3.1 Design-Build-Operate-Maintain (DBOM) Contract

This contract type involves transferring high levels of risk and incentive to the contractor, making them responsible for all costs. Payment is contingent on the volume of loss reduction achieved, and it often requires the construction of district metered areas (DMAs) and other physical infrastructure. Variants of DBOM contracts exist, differing in the degree of risk transfer and the level of prescription regarding the work to be undertaken on the network. Kingdom *et al.* (2018) describe three variants of the DBOM contract. For the full risk transfer variant, the contractor is responsible for all capital and operating costs and is paid per kl saved against a baseline. In South Africa, this is also known as a 'shared savings' contact (Rabe, personal communication.) and was the model adopted for the first Sebokeng/Evaton NRW contract in Emfuleni Local Municipality.

For the Ho Chi Minh City (HCMC) variant, the risk transfer is slightly reduced by requiring the contractor to bid rates against a Bill of Quantities (BOQ) to achieve a target loss reduction. The contractor is incentivized for exceeding the target with additional payments per kl saved, but also penalized for not meeting the targeted savings.

The progressive roll out variant is used where limited information exists regarding the network. The contract involves progressive DMA and baseline creation, which is then verified by an external auditor. The DMA creation and metering is paid on a BOQ while the remainder of tasks are paid by the contractor and recovered through a fee per kl saved. The progressive roll out variant is much quicker to establish and can be employed without having established DMAs or baselines.

The benefits of the DBOM contract include utilizing private sector expertise to scope and design the works if the municipality does not have the expertise or capacity to do so. Disadvantages include the time it takes to set up the contract and the high level of risk transferred to the contractor. In a South African context these contracts would most likely qualify as Public-Private Partnerships (PPPs) with the commensurate regulatory implications (see section 4.3.1).

The main purpose of this type of contract would be cost reduction. It could extend to revenue enhancement, but the capital outlay for individual meter replacement as part of revenue enhancement would be high and probably represent too much financial risk to potential contractors in South Africa.

The HCMC variant of the DBOM contract is the basis for the model contract for NRW PBCs in South Africa developed by Still *et al.* in 2015. The South African version of the contract was specifically designed to lower the risk transfer to a point that it would be unlikely to qualify as a PPP and thus avoid the associated regulatory burden. The lower technical risk to potential bidders (through the knowledge that they would at least be reimbursed for the capital works implemented) means that the overall contract will be cheaper to the municipality but there is also limited incentive to maximise savings. The model contract did provide for a spectrum of options ranging from fully priced BOQ with no incentive (which is effectively a standard Engineering, Procurement and

Construction (EPC) contract), to an incentive only version, which would amount to the high-risk DBOM contract.

The low-risk version requires the municipality to have a good idea of the nature and the extent of the work to be undertaken, but as one transfers technical risk onto the contractor to specify works, capital works could be priced more cheaply as contractors choose to place more focus on recovering costs through the incentive portion. Where the contractor is given the freedom to specify works, Still *et al.* (*2015*) recommend the use of provisional sums in the contract. However, if too great a portion of the contract is made up of provisional sum items, then adjudication is difficult and a pure incentive-based (shared savings) contract may be preferable (ibid.). A 100% incentive contract is difficult to price, particularly in a municipality where information is limited, and the cost will therefore be high.

3.2 24/7 Self-Optimizing Contract

This model is similar to the progressive roll-out variant of the DBOM model but provides incentives to the contractor based on the value of key outputs, such as customers moved to 24/7 supply and revenue collected, as well as the value of inputs, such as bulk water used. The design of the works is adaptable, and the contractor adjusts it as they gain more information, reducing the engineering work required during contract preparation. Capital costs are paid partially on BOQ basis, partially through the fees paid per connection on 24/7 (the extent of incentive and risk transfer can be adjusted by changing the ratio of payments). The contractor's costs are paid partly on a fixed fee to cover contractor's overhead, partly through the fee paid per connection on 24/7 supply. The contract can also include penalties for reduction in service level.

The objective of this type of contract is to increase the number of customers who enjoy an uninterrupted supply either through fixing leaks to increase pressure or increase storage time, or through reducing the demand on a limited resource. It is thus most applicable in places that struggle with intermittent supply because of leaks. The NRW impact of providing more customers with continuous supply is presumably greater revenue because of increased consumption and willingness to pay. However, a case study in Delhi, India found that reducing the intermittent water supply did not

significantly increase demand and revenue as most residents had underground storage tanks in which to store water when it was not available (Jalakam, 2023).

The application of the 24/7 optimized contract in South Africa may not have this intended impact of increased revenue if those customers with intermittent supply are not expected to pay for water. There is potential for application in areas of South Africa where paying customers are experiencing interrupted supply because of high network losses impacting the functioning of the system and/or exceeding the sustainable yield of the resource. The current problems being experienced in Johannesburg may be a relevant example.

3.3 Incentivized Program Manager Contract

Program management contracts separate the planning of interventions, such as creating DMAs and managing leak control, from the implementation of works. This is typically a professional services contract. The utility pays a company employing a team of experts (‘program manager’) to design, procure, and supervise NRW reduction works, while actual implementation is carried out by third-party contractors. There are two variations of this:

1) high risk – where the programme manager pays the contractors; and
2) low risk – where the utility pays the contractors.

The program manager receives a program management fee, typically around 10% of the works' value, and is incentivized through performance pay based on specified key performance indicators (KPIs). The low-risk version of an incentivized program manager contract was the model employed in Karnataka, India (see Box 1).

Box 1: Karnataka Urban Water Sector Improvement Project (KUWASIP) – PBC to achieve 24/7 water Supply and control NRW in Karnataka, India

The World Bank assisted three cities in Karnataka State to implement a Public-Private Partnership to address the large-scale problem of intermittent water supply between 2004 and 2011. An operating contractor was appointed on the basis of a competitive management fee (Jalakam, 2023). The operating contractor developed a capital investment plan within a threshold provided by the water utility. For the construction works, a third-party contractor was appointed on the basis of competitive bidding. The operating contractor managed the procurement process and selected the construction contractor, but the award was done by the water utility. The planned 2-year implementation period was extended to 3 years because of a prolonged discovery phase. During this time the construction contractor was supervised by the operating contractor but paid by the utility. The implementation period was followed by a 3-year operations and maintenance period. The fee structure for the operating contractor was 60% fixed and 40% linked to performance. The performance bonus was awarded for meeting certain performance KPIs (24/7 supply, time to resolve customer complaints, leakage rates and water quality), as well as for capital savings. Overall, an 18% reduction in the System Input Volume (SIV) was achieved. In one demonstration zone, the per capita consumption was reduced to half that of the rest of the city. While the project was regarded as a success, it was not replicated elsewhere in India because of a lack of private sector expertise and market interest (Jalakam, 2023).

For application in South Africa, the high-risk model is unlikely to comply with procurement legislation, unless the original tender for the programme manager included pre-qualified contractors and a budget for construction works. The low-risk version is more feasible and therefore more likely to be applied. The implication is that the municipality would need to have a budget available for the management contractor and a separate capital budget available to the contractor with which to specify works. The model is not unlike consulting engineering contracts, or programme management contracts, of which there is precedent in the South African water sector, for example, the Suez management contract to manage Joburg Water (Marin, Mas and Palmer, 2009). This model is appropriate where a municipality has budget to allocate to NRW interventions, but not the expertise to design and manage the interventions.

An interesting *public* sector incentivized management contract example is provided by Schiffler (2015) for Uganda, where public sector water managers were incentivized by up to 25% of their salaries for meeting certain performance targets. This example was derived from a private sector PBC in Kampala, but then extended to internal performance bonuses. The arrangement required the water utility to provide the responsible managers a greater degree of autonomy and decision-making power to be able to reach their targets (ibid). Schiffler (2015) reports that for some indicators, including NRW and bill collection efficiency, the improvements achieved by the internal performance contracts had been greater than those of the private sector contracts. This example raises the possibility that PBCs need not be limited to contracts with the private sector.

The advantage of this type of contract is that it brings specialist skills into the municipality in a closer working relationship that may be the case for the DBOM contract. For the low-risk option, the municipality would have more control over the procurement of contractors and the work that was undertaken. While the financial risk to the contractor is lower in this option, there is a risk that the municipality may not agree to the proposed interventions. The municipality may also experience procurement issues that compromise the contractor's ability to achieve results and thus incentive payments. For this option, expertise is crucial, and contractors would have to pre-qualify using strict criteria. This type of contract is also difficult for contractors to price. Conflicts of interest may arise where the management contractor is responsible for developing the baseline and calculating the savings that are used for incentive payments, and thus an independent auditor may be required.

3.3.1 Cost Optimization

If a management contractor is paid a portion of the value of the works, there is a perverse incentive to construct high value works without necessarily achieving the desired reduction in NRW. One way to deal with this perverse incentive is the more complicated, but better incentivised, 'cost optimization' version of the programme management contract.

This type of contract involves the minimization of total cost/optimization of revenue to the municipality, where total cost equals the cost of leakage (bulk water cost plus

maintenance costs) *plus* the cost of NRW interventions (and possibly minus revenue from water supply if commercial losses are included). The total cost for the status quo can be calculated for the baseline and projected forward. The assumption is that expenditure on NRW interventions reduces leakage and therefore the cost of leakage (red line in Figure 7). However, the costs of NRW interventions increase with the increased level of effort (green line). The combined costs of bulk water and NRW interventions (black line) decrease to an optimal point (optimal percentage NRW), after which the increased expenditure on interventions does not match the increased savings and total cost increases again. The contract would be drawn up with a target cost (purple line), calculated from the cost of bulk water, the estimated savings and the bid price for NRW interventions. Incentives and penalties can then be paid in relation to this target cost. If the contractor achieves the estimated optimum leakage at a total cost lower than the estimated total cost, then the savings (or a portion of this) is the bonus. If, however, the estimated optimum leakage costs more than anticipated, then the additional cost (or a portion of it) is also shared as a penalty (right hand side of Figure 7). In this way, the management contractor is incentivised to minimise capital costs and maximise savings.

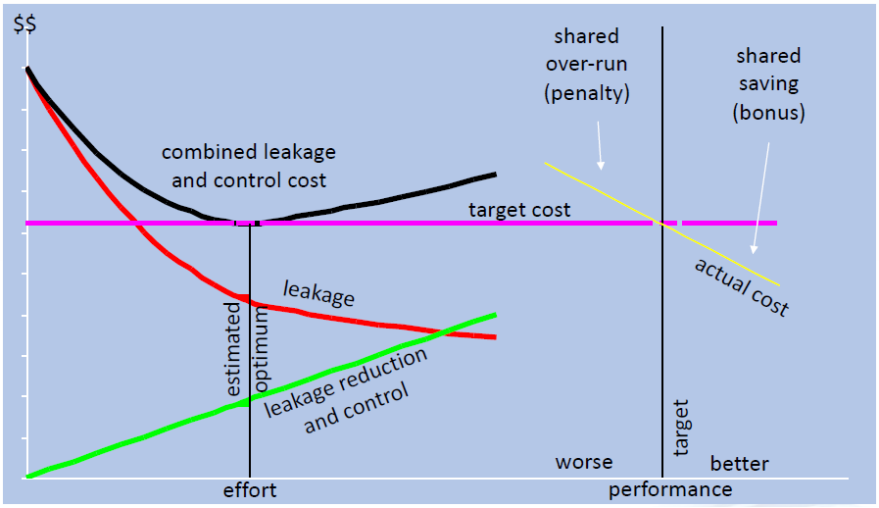

Figure 7: Graphic illustrations of the principles behind a cost optimisation model (Source: Harrison, 2022:7)

3.4 Cost-Plus Contract

This contract type involves paying the contractor for NRW reduction work based on the actual cost incurred, with an additional margin for profit. The actual cost is disclosed through an agreed "open book" process. Incentive payments for improvements in

specified KPIs can be included but are typically modest. The cost-plus contract is quick to implement but may not maximize value for money. It is often used in a Competitive Discovery Approach, where multiple contractors start work in selected zones, sharing valuable information with the utility to prepare contracts with greater risk transfer for the rest of the network. The contractor would put in place measurement equipment to calculate a baseline, which would then be verified by an independent auditor.

The benefits of this model are that it is quick to implement and requires little information about the network. The private sector expertise is leveraged in determining what interventions to pursue within a fixed budget. However, the risk transfer to the private sector is minimal and there is limited incentive to maximise savings.

For application in South Africa, it is assumed that potential contractors, after pre-qualification against strict competency criteria, would bid on a percentage mark-up on costs. This is permitted in terms of South African procurement legislation. The tender documentation would need to include detailed specifications for the declaration and validation of actual costs of construction, or standard rates against a pro forma BOQ could be specified in the tender and contract documentation.

4. Application in South Africa

4.1 Why PBCs have not scaled

From the literature review and key stakeholder interviews, two main reasons have emerged for the lack of adoption of PBCs in South Africa. Firstly, the risks to the private sector have been too high, leading to a lack of interest. Secondly, municipalities lack the skills and experience to design and implement these contracts.

4.1.1 The risks to the private sector are too high

Kingdom *et al*.(2006) explain the situation as follows:

> *"In practice, the applicability of performance-based service contracting to an NRW reduction program depends on the level of risk that the private sector is willing to take, which is itself linked to overall country risk, the specific conditions of the water utility, and the detailed contractual form"* (Kingdom *et al.*, 2006:11).

In undertaking PBCs, private contractors take on different types of risk. The standard performance risk, which the contract is designed to assume, is that the estimated savings will materialise, given the proposed interventions, and the contractor will be able to cover its costs and make a profit. This is a standard risk associated with all PBCs. However, there are also several other risks that are country and municipality specific:

- Local political risks – including disruption by the 'construction mafia', community protest or community resistance to the contractor's presence in certain areas.
- Council political risk – that a Council will renege on the contract, or, given the long-term nature of the contract, a subsequent Council will challenge or reject the contract entered into by the previous Council[1].
- Payment risk – disputes over the remuneration calculation, delayed payment, or total non-payment of agreed amounts.
- Partnership risk – lack of cooperation by municipal officials to gain access to the network, to control impact on the network by third parties, or to collect billed revenue after metering and billing interventions.

[1] One private sector stakeholder put it as: "The longer the contract, the shorter the memory of the municipality".

- Data quality risk – if data quality regarding the baseline water consumption or the technical details of the network are poor, then this adds to the standard performance risk hat contractors must take.

The above risks are largely or completely within the control of the municipality. Where systems are not in place to manage these risks then the contractor would need to price these into the contract. In municipalities perceived to be high-risk, at some point the increase in price will be unaffordable compared with the savings that can be achieved and PBCs will not work.

There is limited specialist private sector capacity to undertake NRW PBCs in South Africa and thus a limited market of 3 or 4 local firms. There are international firms that have shown interest in the past, but who would require significant scale to make investment worthwhile. Water boards have also expressed interest in being involved in NRW interventions, given that they have a vested interest in reducing municipal demand and increasing municipal revenue (see Box 2). Addressing the above risks would be more important for international firms who have not adapted to the South African context. The lack of private sector capacity was shown to be one of the main reasons for the lack of scaling of a pilot project in Karnataka, India (see Box 1). Risk also affects the ability of contractors to secure capital for investment in the project, if this is required. A private sector stakeholder noted that PBCs are too risky for commercial banks to provide capital. This means that the contractor would need to be able to raise finance on the basis of their balance sheet (thereby limiting the number of firms that would be able to bid) or secure a loan facility from the client. In the absence of the ability to raise capital, the project is reduced to a simple operations and maintenance contract, which misses the benefits of a PBC.

Box 2: The role of water boards in PBCs

The two largest water boards in South Africa, Rand Water and uMngeni-uThukela Water (UUW) attended the public stakeholder workshop held to discuss PBCs for NRW. These two water boards have a vested interest in addressing municipal NRW given that excess demand from municipalities that they serve has resulted in shortage of supply, extraction from water resources in excess of licences, or the need to build new water resources. Municipal debt to water boards is also a major issue and any intervention that improves the financial stability of municipal water services would be welcomed by water boards.

The two water boards that attended had different approaches to their potential involvement in NRW PBCs. UUW has established a subsidiary company, Umgeni Water Services, which currently has a shareholding in the Durban Water recycling company and envisages using this subsidiary to provide NRW services to municipalities on a PBC basis. Because UUW will benefit greatly from reduced water in its client municipalities, and in eThekwini metro municipality specifically, it is possible that Umgeni Water Services could provide discounted services, which would affect the competitive nature of PBC tenders in these municipalities.
Rand Water appears to have a different approach and is looking to support municipalities to implement private sector PBCs. One proposal is that Rand Water establishes a Water Demand Management Fund which municipalities could draw on to set up NRW PBCs, but the details of how this fund would work are not known.

4.1.2 The expertise/experience is not present within municipalities to develop and manage PBC

PBCs are a new form of contract that have only been tested twice in the context of addressing NRW. As such, it may be unfamiliar to municipal officials, who may be reluctant to try this approach, or not know how to design such a contract. The initiative undertaken by GIZ and the Strategic Water Partners Network to produce the Guideline and Model Contract (Still *et al.*, *2015*) was intended to address this specific problem. However, these documents did not have the intended effect and appear yet to be used.

It is possible that this is due to inadequate knowledge of the guideline, but another reason may be related to levels of organisational responsibility and decision making within municipalities. The responsibility for addressing leaks in a network is often given to a mid-level manager in a technical services or water department. This person has the power and authority to appoint contractors to fix leaks, but not to bind the municipality into a multi-year performance contract. This type of decision would require senior administrative and political approval. Thus, NRW has to be a sufficient priority to get senior management buy in and Council approval. This would require sufficient motivation to convince a Council to take an unorthodox approach, which is difficult and comes with a degree of bureaucratic inertia. The possibility of a PBC being classified as a PPP brings with it a great deal of resistance within municipalities (see section 4.3.1).

4.2 Which contexts are most appropriate for NRW PBCs?

There are two main reasons why a municipality may find a PBC for NRW attractive, corresponding to the two fundamental reasons behind the NRW challenge in South Africa: to address a capacity gap, or to address a shortage of finance in the short term.

Let us examine the financial logic first. While PBCs can eliminate the need for municipalities to provide up-front capital, they are more expensive than the municipality doing it themselves because government is paying for the transfer of risk. The more risk is transferred, the higher the price will be (Still *et al.*, *2015*). The private contractor will be willing to invest its own money into the venture based on a degree of certainty that the required savings are achievable. If the municipality was able to have the same degree of confidence in the savings, it would be relatively easy to make a business case for investment of the municipality's own resources, as the municipality will be making the payments to the contractor anyway. If this is not the case, then the only reason the private sector would be willing to invest resources where the municipality would not, would be that the municipality would be less certain of the potential for savings. This brings us back to skills and experience as the main reason for pursuing a PBC.

A municipality that is managing its network well and has adequate capacity would probably not opt to undertake a PBC because it would be more expensive than undertaking the tasks themselves. A municipality that has financial problems and that is dysfunctional would represent too much risk to the private sector and would therefore not be likely to be attractive to the private sector. A private sector stakeholder noted in the workshop that municipalities that have low levels of income and few customers to pay for water are very difficult contexts for PBCs. In the centre of the spectrum between under-capacitated, dysfunctional municipalities and fully capacitated, functional municipalities, is a band of municipalities where PBCs may be appropriate and attractive to the private sector (Figure 8).

While the municipalities on the more under-capacitated, dysfunctional end of the spectrum may wish to transfer more risk to the private sector due to lack of certainty of savings potential, but at the same time the private sector may want to de-risk the contract because of the non-performance risks mentioned above. At the other end of the spectrum, the opposite is true: less need to transfer risk, but likely more willingness on the part of the private sector to take it on. However, there are exception to this assumption at the higher capacity end of the spectrum (see Box 3).

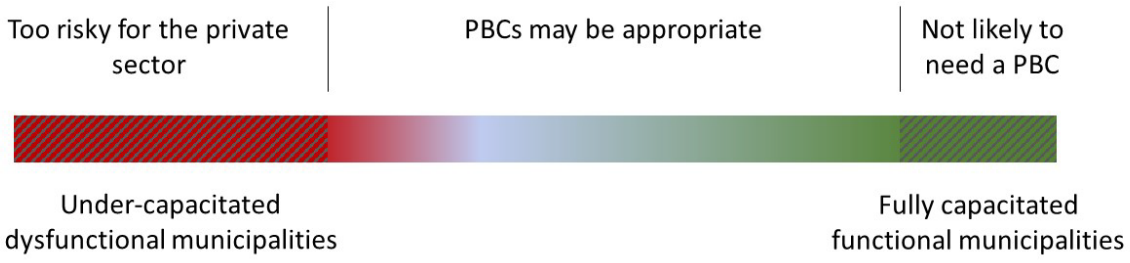

Figure 8: Spectrum of applicability of PBCs

Box 3: Undertaking a PBC in a functional utility – the case of SABESP

SABESP is one of the largest water utilities in the world, supplying water to 363 municipalities in São Paulo State, Brazil and serves 26.7 million customers. It is reportedly one of the best-run utilities in the world. Nevertheless, it opted to appoint private contractors to undertake a PBC for NRW as it believed that the private sector could undertake this work at lower cost than the utility could if it did it internally (Ignacio Peña, personal communication, 8 February, 2023).

NRWs are appropriate where the incentives for good performance are low amongst utility staff (Kingdom *et al.*, 2018). Regression analysis results have shown that NRW PBCs can be 70% more effective in achieving NRW reduction in comparison to utility-led NRW reduction programs (Kingdom, 2021). The theory behind PBCs is that the financial incentive to the private sector, provided it is large enough, will drive performance in NRW reduction. Conversely, Schiffler (2015) has shown that with the correct incentives, utility staff can perform well at reducing NRW, and in one instance, better than the private sector.

Another dimension of applicability is whether the cost of NRW is sufficiently high to justify the intervention and entice the private sector. The higher the cost of bulk water, the greater the applicability of PBCs. Where water is treated cheaply, PBCs are unlikely to be worthwhile, unless commercial losses are included and there are substantial revenue enhancement opportunities. Where municipalities are purchasing water from Water Boards, but are failing to pay their bills, then savings do not result in a reduction in actual payments, just a reduction in debt, and there is no 'real' money to pay a contractor. Savings need to be a reduction in actual, budgeted expenditure with a commensurate funding stream. To calculate the cost of NRW, municipalities will need to know the cost of bulk water. However, other costs could, or arguably should, be included in the calculation, including the cost of maintenance (for example, repairs to burst pipes because of high pressure), wastewater treatment cost of excess return flow, etc.

The combination of these factors means that PBCs are most appropriate where there is a lack of technical capacity, low internal incentives for NRW reduction and the cost

of NRW to the municipality is high, but where the municipality has sufficient financial liquidity and contract management capacity to honour these contracts.

4.3 Application in the current legislative and regulatory environment

A separate legislative review was undertaken and is attached as Annexure B. This section summarises the relevant legal and regulatory issues emerging from the review.

4.3.1 Public Private Partnerships (PPPs)

The main legal issue emerging is whether an NRW PBC would be classified as a PPP. The PPP Regulations issued in terms of the Municipal Finance Management Act (MFMA) define a PPP as:

"…a commercial transaction between a municipality and a private party in terms of which the private party-

a) *Performs a municipal function for or on behalf of a municipality, or acquires the management of use of municipal property for its own commercial purposes, or both performs a municipal function for or on behalf of a municipality and acquires the management or use of municipal property for its own commercial purposes; and*

b) *Assumes substantial financial, technical, and operational risks in connection with -*

    i. *The performance of the municipal function;*

    ii. *The management or use of the municipal property; or*

    iii. *Both, and*

c) *Receives a benefit from performing the municipal function or from utilising the municipal property or from both, by way of -*

    i. *Consideration to be paid or given by the municipality or a municipal entity under the sole or shared control of the municipality;*

    ii. *Charges or fees to be collected by the private party from users or customers of a service provided to them; or*

    iii. *A combination of the benefits referred to in subparagraphs (i) and (ii)"*

To be classified as a PPP, a contract would need to satisfy all three criteria.

- In terms of criterion (a) it could be argued that the PBC contractor is performing a municipal function, that of water conservation, which is ancillary to the provision of potable water. In addition, the PBC contractor would be using municipal property (the water network) for its own commercial purposes.
- In terms of criterion (b), the level of risk taken on by the private contractor would be dependent on the structure of the contract and could range from zero (where all contractor costs are covered and the performance-related payment, if any, is only an incentive), to 100% where all work is undertaken at risk.
- Criterion (c)(i) would be satisfied because the municipality would be paying the contractor for the work done and/or water saved.

The main consideration, therefore, is the level of risk included in the structure of the contract (criterion (b)). Still *et al*. (*2015*) conclude that a Water Conservation and Water Demand Management (WCWDM) contract which has a small performance bonus component where the bonus is used primarily to provide an incentive, but where the service provider will not necessarily make a loss if the bonus is not paid, will not qualify as a PPP. However, where the service provider is financing all of, or at least a major part of the work in the expectation that it will recover these costs through being paid a share of the resulting savings to the client, then this would qualify as a PPP (Still, et al., *2015*:9). They recommend consulting the National Treasury PPP Unit if in doubt. The model contract produced in 2015 assumes the contract does not qualify as a PPP. However, to maximise the risk sharing advantages of PBCs necessitate them being structured as a PPP. Manipulating the contract design to avoid the PPP process means accepting less of the risk sharing benefits.

The main implication of a NRW PBC being categorized as a PPP is that it would then be required to follow a substantial process of consultation and approval. Given the poor uptake of municipal PPPs, largely because of the delays caused by the process, this would likely put off both municipal officials and private parties from pursuing an NRW PPP. However, the National Treasury has been reviewing the municipal PPP regulations with a view to streamlining the process. The revised regulations have not yet been published, but a streamlined PPP process would increase the feasibility of a full, incentive-based PBC. An alternative course of action would be to exempt NRW

PBCs from classification as PPPs, and the projects would therefore not need to follow the full PPP process.

4.3.2 Contracts with a duration longer than three years

Section 33 of the MFMA prescribes a process to be followed if municipalities intend to enter a contract longer than three years. General experience appears to suggest that the ideal duration of a PBC is 3-5 years. Still et al. (*2015*) recommended a contract period of three years to avoid this provision of the MFMA, but this administrative process should not necessarily be a determinant of the contract design and may in fact be beneficial to raise awareness amongst the Council as to the implications of the contract and to get explicit agreement therewith.

4.3.3 Payment of contracts with an unknown total value

The value of a PBC, by design, will vary based on the performance of the contractor. However, certain provisions in the Municipal Finance Management Act, and the Supply Chain Management Act issued in terms of this legislation dealing with contract value still need to be complied with. The PBC would need to be budgeted for and the municipality would therefore need to estimate the contract value. This is where a contract cap is useful as the cap can be used for budget purposes.

The SCM regulations provide, in section 51, for contracts with compensation based on turnover, e.g. for the collection of fees, service charges or taxes. This would apply to a NRW PBC if the contract included addressing commercial losses, i.e. lack of billing and payment for unbilled authorized consumption. In these contracts, the SCM regulations require that the municipality **must stipulate a cap** on the compensation payable to the service provider and that such compensation must be performance based. It is therefore a requirement that this type of NRW intervention be a PBC.
The National Treasury SCM Guidelines (National Treasury, 2004) do contemplate the type of ‘reimbursable cost plus fees’ structure of many of the PBC contracts used internationally. However, it states:

> *“Reimbursable cost contracts should be acceptable only in exceptional circumstances, such as conditions of high risk or where costs cannot be determined in advance with sufficient accuracy. Such contracts should include*

appropriate incentives to limit costs and may only be concluded subject to the approval of the accounting officer/authority. It is advisable that the reasons and formal approval for following the reimbursement route are recorded for auditing purposes." (National Treasury, 2004:34)

4.3.4 Unsolicited bids

Should a PBC contractor approach the municipality with an unsolicited bid to undertake an NRW intervention, section 37 of the SCM regulations, read with section 113 of the MFMA, states that the municipality may only consider the bid if:

(a) the product or service offered in terms of the bid is a demonstrably or proven unique innovative concept;
(b) the product or service will be exceptionally beneficial to, or have exceptional cost advantages for, the municipality or municipal entity;
(c) the person who made the bid is the sole provider of the product or service; and
(d) the reasons for not going through the normal bidding processes are found to be sound by the accounting officer.

It is unlikely that a PBC for NRW would satisfy all four conditions. The implication is that this would deter private companies from taking initiative to identify profitable PBCs in South African municipalities, as was the case for the successful Sebokeng/Evaton PBC in Emfuleni Local Municipality (Box 4), as they would still have to bid competitively for the contract.

Box 4: Emfuleni Local Municipality: Pressure Management PBC for Non-Revenue Water Reduction

The Sebokeng/Evaton project, commissioned in 2005, was entirely funded by the service provider and undertaken at risk (Still et al., 2015). The project involved the installation of a large pressure management chamber to reduce internal plumbing leakage. This PBC initiative resulted in substantial savings of R150 million in bulk water costs over a five-year period, while the service provider received R25 million as payment and incurred costs of R15 million, generating a net profit of R10 million (Still et al., *2015*). Emfuleni Local Municipality saved R125 million over 10 years (5x investment).

4.3.5 Use and control of municipal assets

PBCs for NRW, by their nature, would involve the contractor making use of municipal assets in the form of the water network. The Municipal Asset Transfer Regulations (MATR) in Chapter 4 prescribe the processes and approvals for granting any right to use, control or manage municipal capital assets. Importantly, if the PBC were classified as a PPP, then the MATR would not apply. If the contract is not a PPP, then a public participation process is required, but only in relation to:

a) assets worth more than R10 million; and
b) for which a long-term right is granted.

While condition b) will likely always be satisfied by the PBC, condition a) may only be triggered in certain cases, such as pressure management installations on large pipelines or the large-scale replacement or management of municipal water meters. The prescribed public participation process requires the authorization of the Municipal Council and needs to include prescribed information. The consideration of a proposal to use, control or manage municipal capital assets, in this case for the contractor to control portions of the water network, includes checks and balances to weigh up the risks and rewards associated with the proposed contract. This process is similar to the considerations for a PPP, albeit less prescriptive, and includes fairly comprehensive oversight of the process by the Municipal Council, National Treasury and the Provincial Treasuries.

Municipalities have expressed reservations at allowing a contractor to control portions of the network, particularly to low-income areas, where priorities of the contractor and the residents may be different. Unscrupulous contractors may disconnect, restrict flow or unreasonably reduce pressure to households not paying for water in order to claim this as savings. It is therefore necessary to guard against these types of activities in the contract design.

4.3.6 PBCs as an external service delivery mechanism

Sections 76 to 78 of the Municipal Systems Act set out a process that municipalities are to follow if they are to use an external mechanism to provide a municipal service. If a private service provider were undertaking NRW activities through a PBC, or any

other form of contract, this would be ancillary to the main service of water supply, and thus would not constitute an external service mechanism.

4.3.7 Summary of the legislative review

From the legislative review it is clear that municipalities have a mandate to undertake water conservation activities and to provide municipal services in as efficient a manner as possible. The activities contemplated to address NRW would not constitute an external service mechanism as defined in the MSA.

The MFMA requires that PBCs would have to be budgeted for as accurately as possible and that the contracts would need to be structured in such a way that the final price paid to the contractor would be as close to the tendered value as possible and that the terms of payment are clear and unambiguous. International PBC case studies indicate that it is best practice for PBCs to run for 3-5 years, and thus the MFMA section 33 process would need to be followed for contracts longer than three years.

The main legislative issue affecting NRW PBCs is whether the contract would be classified as a PPP and have to follow the regulated process or not. If the intention of an NRW PBC is to transfer risk, specifically the technical and financial risk to the private sector, then it makes sense to structure the contract as a PPP and follow the legislated process. However, there are ways to structure the contract to avoid being classified as a PPP and the well-known delays that this may cause. However, even if a PBC was not classified as a PPP, it would likely have to follow the process prescribed in the MATR for the use, control, or management of municipal assets.

The procurement legislation does not pose any obvious barriers to municipalities wanting to enter into a PBC for NRW, provided the tender document is structured in such a way that tender offers are equivalent, and prices can be compared directly. The common international practice of a two-stage process, with a technical qualifying stage, followed by award based on price, is aligned with the provisions of the Preferential Public Procurement Framework Act.

5. Proposed framework for NRW interventions incorporating PBCs

PBCs have proven effective locally and internationally as a short-term fix to high levels of NRW. However, multiple sources warn against the risk of NRW levels rising again once the PBC contract is concluded (Kingdom *et al.*, 2018; Dalton & Liemberger, 2022; Frauendorfer & Liemberger, 2010). It is in the municipality's interest to consider up front how low levels of NRW will be sustained in the long term and then situate any PBC intervention within this overall programme.

The end goal of a NRW programme should be an efficiently managed water network with all customers who should be paying, paying the correct amount for the service delivered. This means that in addition to reducing leaks, the programme should also be focussing on capacity building within the municipality and improving the relationship between the municipality and residents around payment for services. Frauendorfer and Liemberger (2010:43) caution that PBCs should not be viewed as a standalone solution to all institutional problems faced by public water utilities in developing countries, and the underlying causes of dysfunctionality need to be addressed as well. The scope of a longer term NRW programme could comprise the following[2]:

Short term (1-3 years) – Undertake a diagnosis, develop a baseline, and implement the "quick wins". The objective of this phase is to arrest financial freefall. These quick wins are attractive to the private sector as they can generate savings quickly and relatively easily and are well suited to PBCs. Short-term interventions include pressure reduction, fixing leaking reservoirs and other large leaks. Pressure management is most cost effective as the capital cost is relatively low for the savings that can be achieved (in the right conditions) and the payback period can be a few months. Pressure management also extends the lifespan of the network. Quick wins should be targeted at reducing NRW from a high level down to 30-40%.

Medium term (3-5 years) – Detect and fix leaks and build community relationship/trust. These activities can be part of a PBC, particularly if it is a longer-term contract, but are not necessarily so because they are not as lucrative as the short-term interventions. Municipalities should not need a PBC to fix leaks – this is a routine

[2] Acknowledgement to Willem Wegelin who proposed this NRW framework (Wegelin, pers. comm., 20 September 2023)

task that can be done effectively with proper management. Similarly, the building of community relationship is a task that needs to be undertaken by the municipality, not the private sector. Detecting and fixing leaks can be a means to building community relationship and ownership of private infrastructure, as in the case of the Boloka Metsi project in Emfuleni Local Municipality (Wegelin, 2021). "*Stakeholders, implementing agents and contractors should not replace the municipality. The project should not replace existing functions, such as fixing leaks and customer care, but rather support the municipality into fulfilling its mandate*." (Wegelin, 2018:15). If these tasks are initially taken on as part of a PBC there should be an incremental handover to the municipality during the contract. Pipe replacement to address leaks is the most capital-intensive exercise and may be necessary but the cost vs savings ratio is high and therefore may not be attractive to a private contractor. Both the City of Tshwane and eThekwini Metropolitan Municipalities have undertaken large pipe replacement programmes with less impact than initially expected. The goal of the medium-term interventions should be to get NRW down to 20%.

Long term (5-10 years) – Improve metering and billing, tightly implement the municipal indigent policy, undertake proactive maintenance and monitor the water balance. These activities are core municipal responsibilities and should not be undertaken by a PBC contractor. Residents should be empowered to own and fix their own internal plumbing. A contractor can set up the systems, but the longer-term operation and maintenance of the systems has to be a municipal responsibility. The goal of the longer-term activities is to sustain NRW at around 20%.

Table 1: Framework for a long-term NRW Programme

Timeframe	Activities	Responsibility	NRW Target
Short term: **ARREST FREEFALL**	Diagnosis and baseline Pressure management Reservoir leaks Large leaks	PBC Contractor	30%-40%
Medium term: **BUILD TRUST**	Leak detection and repair Build community relationship/trust Set up systems Transfer skills		20%
Long term: **ACHIEVE FINANCIAL SUSTAINABILITY**	Improve metering and billing Implement indigent policy Proactive maintenance Monitor water balance	Municipality	Sustain 20%

6. Prerequisites before entering into a NRW PBC

PBCs are not suitable in all contexts. Certain preconditions need to exist to generate private sector interest and to prepare the municipality for the contract.

6.1 Correct diagnosis

The correct diagnosis of the causes of high NRW is necessary to establish the correct form and structure of a PBC, or whether one is required at all. This step is critical to understand the water system and how it functions. If this has not been done already, and a municipality is considering a PBC, then it is likely that it does not have the capacity to undertake this diagnosis. In this case, a consultant should be appointed to undertake this diagnosis. There are mixed views around whether the diagnosis can be done by the PBC contractor or not, with some PBC contracts wrapping this 'discovery phase' into the contract (see Box 6). However, the prevailing view seems to be that it is best done by an independent consultant with no perverse incentives for specifying any particular course of action. A range of tools are available on the Water Research Commission's website[3] to assist with this diagnosis. The diagnosis should provide an indication of whether the main NRW issue is commercial losses or physical losses.

Box 5: Getting the diagnosis right

A private consultant reported a case in uMsunduzi Local Municipality where the municipality had several planned water projects in rural areas that were becoming part of the formal urban area. After installing bulk meters, the municipality discovered major water losses that needed to be addressed first. The municipality requested the assistance of the consultant to set up a PBC to address the losses. When the consultant undertook a water balance, they realised that the population figures that were being used to estimate consumption were not correct, so they used drones to build maps and count dwellings. This exercise revealed that the population in the area was 50% more than planned and the issue was rapid growth and not water losses, so a PBC was not required.

[3] https://www.wrc.org.za/https-search-wrc-org-za/e-tools/

6.2 A credible baseline

A PBC requires that performance can be measured. A clear and agreed baseline is a non-negotiable component of a PBC: without a baseline the private sector cannot evaluate the potential savings and the municipality cannot structure the compensation. If the municipality is unable to develop a baseline, they would need to appoint a consultant to do this on their behalf. Alternatively, the setting of a baseline can be included in the scope of a PBC (see Box 6), but careful checks and balances need to be put in place to verify this. Setting a baseline can make the cause of the NRW issue evident to the municipality, which may then choose to fix obvious sources of wastage. This is positive for the municipality but affects contract attractiveness and skews the baseline. Unless included in the contract, the PBC contractor should not set the baseline but may want to validate meter accuracy with a check meter.

Projections should not be too complicated to cause disagreement or confusion when communicating to decision makers (Still *et al.*, *2015*). For the original Sebokeng/Evaton PBC in Emfuleni, the baseline projection was done using an exponential best fit curve. However, the municipality disputed the use of the exponential curve and a simpler linear projection of the baseline was used to calculate savings. The longer the consumption history the better as if the baseline is not long enough it exposes both the municipality and the contractor to financial risk. Still *et al.* (*2015*) recommend a baseline of data for at least two years prior to the commencement of the contract. The baseline can be made up of data on a range of indicators. Minimum night flow is a better indicator than system input volume as it indicates how much of the system input volume is consumption and how much is leaks. Best practice includes sending logging data out to bidders to be able to estimate the savings themselves.

A note was made at the private stakeholder workshop that setting a baseline is very difficult when there is intermittent water supply, as residents may be forced to use water when it is available (e.g. at night) and consumption may be artificially constrained. It may be necessary to address the intermittent water issue first, or initiate the PBC in an area where continuous supply can be guaranteed before moving onto the next area.

Box 6: Phased Discovery in Addis Ababa, Ethiopia and Fiji

The case study of Addis Ababa's Water Loss Reduction Performance-Based Project (AAWSA WLRPBC) by Koelbl and Peña (2022) provides valuable cross-cutting lessons for South Africa's efforts in addressing NRW through PBCs. A major challenge in Addis Ababa was that there was no available or unreliable system input volume information as well as gaps in the system information and no pressure data. To address this, a consultant was appointed to fill some of the data gaps to get a right 'order of magnitude' estimate of the problem, but not enough to do the detailed design of a NRW project. A phased approach was then taken, with the PBC contractor creating DMAs, undertaking a diagnostic and developing a baseline in the first phase, which was paid on an input basis according to a bill of quantities (BOQ). The baseline was checked and verified by a supervision consultant. In Phase 2A (learning phase) water loss reduction projects were undertaken in a sample area to understand the impact of the different interventions. This was also paid according to a BOQ. Phase 2B involved water loss activities in the remainer of the project area and Phase 3 involved maintaining levels of water loss and transferring skills. Both of these latter phases were paid on a lump sum and volume-based performance basis. Exactly the same phasing and payment structure is being applied by the Water Authority for Fiji (WAF, 2024), with further details given on the payment arrangements for the various phases.

This phased approach offers an efficient alternative for utilities lacking comprehensive data on water losses and distribution systems, a common challenge in South Africa. South African municipalities with limited experience in PBCs and NRW projects could benefit from engaging supervision consultants early on to ensure efficient contract outcomes and technical expertise throughout the project's phases. Furthermore, the provision for an independent expert to mediate and arbitrate potential conflicts between contractors and utilities is a valuable lesson from the AAWSA WLRPBC (Koelbl and Peña, 2022).

6.3 A ring-fenced district meter area

The second requisite component of measuring performance is defining the intervention area. Where the performance metrics relate to flow data, the DMA needs to be ring-fenced with all supply mains entering the area metered. The zone also needs to be

stable with limited or no plans for expansion or modification of the supply. The municipality and the contractor will jointly be responsible for monitoring any damage or change to the network by third parties.

The municipality may choose to designate the project area or leave this up to the contractor. There are pros and cons of both approaches. If the municipality selects the area, it should not only pick areas in which, for any number of reasons, it is not willing to intervene. But similarly, the contractor cannot have free reign to select areas and ignore others that may be of most concern to the municipality. There needs to be a balance between the two.

A guideline for decision-making around when to enter into an NRW PBC, or not, is provided in Annexure C.

6.4 Political support

PBCs for NRW are intended to address financial distress in municipalities. As such, it would be expected that Municipal Councils would support these contracts, but this is not always the case. Councils need to be convinced that the contract is beneficial to the municipality. Political support is required for two reasons: to increase the confidence of private contractors that the contract will be honoured, and for the contractor to be able to rely on political support when engaging with communities. Officials also need assurance that the council supports the initiative to give them confidence to sign the contract. The conscious engagement of the Council in the decision to enter long term contracts or PPPs is the express purpose of the MFMA S33 and PPP regulatory processes respectively. Public sector stakeholders suggested that political support is needed to address the ‘culture of non-payment’, although this is a broader issue that may need to be addressed at a national scale.

6.5 Institutional support

Similarly, the administration needs to be convinced that the PBC will benefit the municipality as well. More than one interviewee described a PBC as a ‘marriage’ between the municipality and the contractor where a large degree of trust and cooperation is required, and both parties have obligations. Where this is lacking,

projects are likely to fail. PBCs require the support of the Executive Director responsible for water services, and preferably the Municipal Manager, who would then advocate for such a contract to the Council.

The PBC contractor also requires support of the administration to gain access to the network, meters and data, and defend the network against any interference from third parties. Related to payment, the municipality needs to 'ring-fence' the savings – in other words, document and record daily and weekly flows against the projected baseline to justify the payments.

6.6 Community support

The community where interventions are being implemented also needs to support the intervention, particularly where this is addressing the more difficult revenue side of NRW dealing with disconnecting illegal connections and improving metering and billing. Community benefit is not often considered in the design of PBCs but is an essential part of obtaining buy in and improving NRW in the long term. Community benefits might include improved pressure, elimination of intermittent water supply, jobs, skills transfer, and less need to increase tariffs in the long term. For the second Emfuleni PBC, Wegelin (2021) notes that the project resulted in the creation of 145 local jobs, training of local contractors and plumbers, improved service levels, enhanced customer relations, optimized pressure management, and deferred infrastructure upgrades. The importance of community support prior to implementing a PBC was emphasised by private sector stakeholders at the stakeholder workshop.

6.7 Municipal technical capacity

It seems contradictory to state that municipal technical capacity is a pre-requisite to implement a programme to address a lack of municipal technical capacity. However, there is a minimum level of technical capacity required to engage with the contractor and to manage the contract. The municipality will need to have a hand in designing the PBC and in explaining the functioning of the municipal network to the contractor. Still *et al*. (*2015*) note that it is inadvisable to use a PBC where the municipality's knowledge of the water supply system with respect to the type, location and extent of the pipes and valves is very uncertain. Technical officials will also be required to

approve interventions proposed by the contractor and will be required to verify the performance for the payment of incentives where technical expertise is lacking. This may need to be supplemented by the appointment of a consultant and/or a transaction advisor. Even metros believe that they would need transaction advisors to structure a PBC contract correctly. Contract management skills and capacity have been noted as the largest capacity gap in municipalities in relation to implementing PBCs. Municipalities will need external support on contract structuring and to build contract management capacity. For PBCs to succeed in NRW reduction, a proper balance between government oversight and private sector initiative is crucial (Frauendorfer and Liemberger, 2010).

6.8 Responsibility and accountability

The municipality needs to accommodate the NRW programme within its institutional structure. Kingdom *et al.* (2006) state that:

> "*Not only do new technical approaches have to be adopted, but effective arrangements must be established in the managerial and institutional environment—often requiring attention to some fundamental challenges in the utility*" (Kingdom *et al.* 2006:6)

If there is not already someone responsible for NRW or WCDM, someone needs to be appointed in this position to be accountable for the results and to sustain the initiative. Accountability needs to cascade upwards from this person to the Executive Director responsible for water services and ultimately the Municipal Manager. The correct lines of responsibility and accountability will help ensure the required support to the PBC contractor.

6.9 Adequate funding

Again, it seems contradictory to state that funding is required to implement a programme which is at least partly intended to address a shortage of funding. However, funding is required for preliminary work required to set up the PBC which should not be part of the incentive-based portion (e.g. DMA demarcation and metering to set a baseline). Some of these costs could be funded by a donor. For example, the

Infrastructure Investment Programme for South Africa (IPSA) Project Preparation Grant and co-funding from the European Union was used to fund the WCWDM feasibility study and installation of bulk water meters around Tshwane (DBSA, 2022).

Funding is also required to pay the contractor for any fixed fee items and for incentive portions when these are due. Payment needs to be prompt to sustain the cash flow of the contractor. Non-payment could end the contract and discourage further potential contractors. While some commentators call for the ring-fencing of revenue for payment of PBCs, this is difficult in the municipal accounting environment. Complex financial structuring of escrow accounts, such as suggested in IFC (2013) and Ehrhardt (ND) is cumbersome and unlikely to be feasible. What is required is that municipalities adequately budget for the contract, as required by the MFMA, and reduce expenditure on bulk water costs by the equivalent amount, and then simply uphold the financial terms of the contract.

Box 7: Failure of a PBC due to non-payment

Starting in 2016, Emfuleni Local Municipality entered into a PPP with a private service provider to install smart electricity and water meters under a form of PCB. The private partner started with the installation of electricity meters at risk. Significant effort was put into electricity balancing and establishing a good baseline. The repayment was based on an 80:20 principle: the private party would receive 80% of the improved revenue until the upfront costs were repaid and would then receive 20% of the improved revenue. Disagreements arose when the improvement was calculated. The municipality was not able to pay the private contractor because money was not paid into a ring-fenced account and was 'lost'. The private party stopped investing in meters and the contract was cancelled due to non-payment.

6.10 Commercial attractiveness for the private sector

The contract needs to be sufficiently attractive to the private sector – i.e. of sufficient scale, and with achievable savings large enough to provide a return on investment for the private sector. IFC (2013) suggests that PBCs will only be feasible for zones of 10,000 connections or more. This may only be feasible in the 30-40 largest municipalities, limiting the applicability of PBCs to Metros and intermediate city municipalities. However, DWS (2023) notes that the greatest potential for NRW

reduction is in these municipalities. Still *et al.* (*2015*) suggest the specification of a maximum payment rate (R/kl saved) in the tender document as well as a performance bonus cap. The municipality must ensure that these constraints do not compromise the commercial attractiveness of the project. The municipality, or the appointed transaction advisor, should calculate the likely and possible returns on investment for the contractor before the tender documentation is finalised to check that the contract is sufficiently attractive. The required return on investment will be greater for higher levels of financial risk. Understanding the financial feasibility and cost savings of PBCs, especially in off-peak periods, is crucial (Meyer, Wright and Engelbrecht, 2009).

7. Addressing the risks of entering into a NRW PBC

The municipality needs to do what it can to reduce the non-performance risks listed in Table 2 to lower the contract cost and increase the chance of success.

Table 2: Mitigation measure to reduce non-performance risk

Risk category	***Risk description***	***Mitigation measure***
Local political risks	Construction mafia	Address construction site security at a city scale.
	Community protest	Include the community in PBC design. Include local labour requirements in contract. Provide for a Community Liaison Officer.
	Community resistance	Include the community in PBC design. Incorporate awareness campaigns into the PBC. Secure political support for cutting illegal connections and enforcing payment.
Council political risk	Reneging on contract	Employ a transaction advisor and set the terms of the contract upfront. Remuneration structure must be commensurate with risk. Follow the MFMA S33 or PPP process as appropriate.
Payment risk	Disputes over remuneration	Develop a clear and credible baseline over two years prior to the contract. Appoint an independent third party to verify performance and incentive payments.
	Payment delays/non-payment	Budget for the PBC as a project within the water department. Establish a clear line of responsibility and accountability for payment verification and approval, including timelines.

Risk category	*Risk description*	*Mitigation measure*
		Enforce a commitment to payment within 30 days.
Partnership risk	Lack of cooperation	Establish clear lines of responsibility and accountability up front.
	Inadequate control of third parties	Require special approvals for any construction work in the DMA. Make provision for unforeseen events in the performance calculation clauses of the contract.
	Inadequate collection of billed revenue	Nurture a culture of payment for services at a city scale. Meter reading and billing information should be available for the contractor's use (Still *et al*., 2015) Take conscious steps to build community trust.

In addition to the non-performance risks, the municipality can also undertake steps to reduce the performance risks to the contractor to increase its attractiveness or to achieve a lower price. This is typically done by issuing a Bill of Quantities (BOQ) that allows the contractor to get paid for work done, in addition to the incentives. This is a strategy used in the progressive roll out version of the DBOM contract and the Cost-Plus contract described in section 3.4.

8. Guidance for structuring a PBC

Detailed technical advice on the structuring of PBCs is provided in Kingdom *et al.* (2018) and Still *et al*. (2015). Still *et al.* (2015) also provide a model contract for a particular type of PBC. This section does not aim to duplicate this guidance but draws out some key points to be borne in mind when structuring a PBC for NRW in the South African context. Notwithstanding this and other guidance available around the PBCs, municipalities should appoint a transaction advisor or consultant to assist with the PBC design and contract drafting.

8.1 Length of contract

PBCs can be designed for less than three years for obvious pressure management solutions and detection and repair of large leaks. However, the longer the period, the greater the opportunity for savings and return on investment. Still *et al.* (2015) propose limiting the contract to three years, mainly to avoid the MFMA Section 33 provisions. However, international literature seems to suggest a period of three to five years, while some stakeholders suggest five to seven years to encourage investment in assets by the contractor. The longer the contract, the more scope there is for including municipal capacity-building and maintenance of water savings into the contract. Municipalities need to be realistic about timeframes for project establishment, with reports of NRW interventions taking 12-18 months just to get traction before savings are realised.

8.2 Maintaining flexibility

The international literature and local experience emphasise the need to allow flexibility for the contractor to decide how best to achieve water demand reduction and cost savings. This could even include developing new, cheaper water sources. The contract should not be too prescriptive; if the contractor is taking risks, then they need to be able to decide what to do Municipal oversight would still be required to sign off on proposed interventions. However, flexibility needs limits to prevent decisions that are disadvantageous to the municipality in the long term (e.g. selection of particular technologies that may be difficult for the municipality to sustain). The literature also stresses the need to allow flexibility within the contract to respond to a changing environment or a revealed situation (Kingdom and Liemberger, 2022). This may be

difficult in a South African context where municipal contracts with the private sector are typically tightly scoped and controlled to eliminate risk to the client.

Box 8: Incentives and flexibility leading to a successful PBC in Kaula Lumpur, Malysia

In Kuala Lumpur, Malaysia, a performance-based contract (PBC) successfully reduced non-revenue water (NRW) by 198 million litres per day (MLD), equivalent to 10 percent of the city's total water production, addressing a critical water shortage crisis (Kingdom, Liemberger and Marin, 2006). The contractor repaired over 11,000 leaks, replaced 119,000 customer meters, and established 220 NRW reduction zones (district metered areas or DMAs) (Kingdom, Liemberger and Marin, 2006). The NRW-PBC delivered significant benefits by avoiding $200 million in capital expenditure on alternative water supply sources, while costing only $110 million. Additional revenue was generated from the sale of the saved water, and operating costs per unit of water sold decreased due to a higher percentage of water being sold (Kingdom, Liemberger and Marin, 2006). The project also provided two valuable lessons: firstly, the effectiveness of incentives in driving performance, as incentives were strong and linked to actual results, leading to the contractor exceeding targets and achieving better outcomes; and secondly, the importance of granting contractors design freedom while ensuring alignment with the utility's long-term improvement plan for the water network to optimize the distribution of resources and maximize NRW reduction impact.

8.3 Prequalification

Much of the literature stresses the need for strict technical criteria for pre-qualification, given that this is specialist technical work and competence is very important. The need for strict prequalification increases with the level of independence and flexibility that contractors will be given for determining the interventions to be undertaken. The contractor will be given access to critical infrastructure providing basic services and the municipality must therefore ensure that the potential bidders are competent to be given this responsibility.

8.4 Independent auditor

An independent third party is needed to verify performance and the calculation of incentive payments as well as mediate any disputes between the contractor and the municipality. This auditor could be the transaction advisor appointed to draft the contract, the Water Partnerships Office (WPO), or a separate party. A private sector

contractor noted that municipalities often do not want to acknowledge savings, or do not read meters regularly enough, and thus compromise the payments to the contractor.

8.5 Fixed fee versus incentive portion

Including a fixed fee reduces the technical risk, but not the non-performance risk. It also reduces incentive and may increase cost of the fixed fee items. The fixed portion should cover things that will not necessarily generate savings, but may have a greater long-term benefit, such as getting the community on board and raising awareness. Incentive portions need to be large enough to incentivise the private sector to achieve savings that the municipality would be unable to achieve on its own.

8.6 Incentives for long-term improvement

Consideration should be given to including a financial incentive for sustaining any savings achieved in the early stages of the contract. This will incentivise the contractor to invest in assets and systems that have a longer-term impact, potentially beyond the term of the PBC. Well-structured PBCs also allow for capacity building, enabling the transfer of knowledge and skills from the contractor to the water utility over the medium- to long-term (Still *et al.*, 2015; Kingdom, 2021).

8.7 Remuneration parameters

A municipality must avoid a situation where it is worse off than it would have been had it not had the PBC. For example, if an escrow account is set up for customer payments to be ring-fenced for a percentage payment to the contractor and the percentage is too high, the remaining revenue after paying the contractor may be less than the municipality requires to sustain the system. If the potential savings are grossly underestimated in the contract design, and limits are not put on the incentive payments, then there is a risk of the contractor profiteering at the expense of the municipality. This is the reason that guidance, including the model contract for South Africa (Still *et al.*, 2015), recommends the use of the following remuneration parameters.

8.7.1 Remuneration caps

Differing views have been encountered on the use of remuneration caps. The private sector view is that as long as the payment rate is lower than the savings rate or rate of increase in revenue, then there is no need for a cap. However, officials believe that caps are necessary to prevent the contract from 'running away'. Caps are a prudent measure to put bounds on the contract value, which are also necessary for municipal budgeting. It is therefore recommended that remuneration caps be used.

8.7.2 Savings thresholds

The remuneration structure proposed by Still *et al.* (2015) includes a minimum savings threshold. The reason for a minimum savings threshold is that metering may not be accurate enough, or intermittent variability too high, to be able to attribute a small variation from the baseline as true savings. The use of a minimum savings threshold thus avoids payment within a margin of metering error or for minor improvement unrelated to the contractor's intervention.

8.7.3 Maximum payment rate

The maximum payment rate referred to in the model contract (Still *et al.*, 2015) places a cap on the incentive payment rate that the municipality is willing to pay the contractor. This level is effectively the cost of water losses to the municipality and remuneration above this level would not be worthwhile for the municipality. This provides a clear signal to the potential bidders who are then able to calculate whether the contract is sufficiently attractive, and it also prevents gaming the pricing, in the form of trading off the fixed rate versus the incentive rate, to the detriment of the municipality. The municipality needs to decide if the maximum payment rate includes anything over and above the cost price of bulk water, e.g. the reduction in maintenance costs, reduction in wastewater treatment, etc. (Still *et al.*, 2015:11).

9. Conclusion

PBCs have been successful both locally and internationally and offer strong potential to address the rampant NRW in South African municipalities. However, there are reasons why PBCs have not been adopted at scale, which largely relate to municipal technical capacity and the complex and difficult context in which municipalities operate. PBCs should not be seen as an external ‘quick fix’ to a technical problem or a clever way to finance the fixing of leaks in old pipes. Rather, they are an initial mechanism for intervening in a failing municipal water system. They are one part of a larger solution that needs to be found for the lack of adequate technical capacity and resources in municipal water services departments.

As such, PBCs for NRW need to be positioned as part of a long-term *management* intervention with benefits to the municipality and its customers. The result of a successful NRW programme is not the reduction of NRW to a particular percentage of system input volume or saving of a specific amount of money, but rather a social contract between a municipality and its customers where the former is trusted to provide a reliable water supply as efficiently as possible, and the latter can be relied upon to pay for the service provided. PBCs are one tool to begin to achieve this.

If PBCs for NRW are to be used, they have to be a win-win-win-win situation for the Council, the administration, the community and the contractor. That it *is* a win-win situation needs to be agreed to and acknowledged by all parties. Tailored approaches are necessary, as there are no one-size-fits-all blueprints for PBCs, and municipalities must develop strategies specific to their needs. A well-balanced contract with clear delineation of rights and responsibilities is essential to ensure fair outcomes for all parties.

10. Recommendations

- If a PBC is being supported by a national Department or programme, it is important to select the right municipality to implement a PPP. Do not force a PBC in a municipality with capacity and a well-run network, or in a municipality which is too dysfunctional to honour the contract.
- Municipalities should not implement a PBC without:
    - An accurate diagnosis of the problem;
    - A Council resolution supporting the contract; and
    - A clear framework for responsibility and accountability, including a single official responsible for the achievement of the contract objectives.
- National Treasury, DWS or any sponsoring agency should monitor payment of contractors by municipalities and come down hard on non-payment to avoid discouraging other contractors.
- The DBSA Water Partnership Office or MISA should assist municipalities to ring-fence DMAs and set up baselines well in advance of PBCs.
- Any PBC should include capacity building and skills transfer as an explicit requirement of the contract.
- National Treasury should provide general guidance around when PBCs qualify as PPPs or not, to allow for this to be factored into contract design and avoid case-by-case consultations with the PPP Unit.
- National Treasury should confirm with the Auditor-General that PBCs resulting in payments above the tendered amount, but in line with the contract payment provisions, will not be classified as unauthorised or irregular expenditure.
- The WPO should establish a community of practice for municipalities undertaking, or interested in, PBCs for NRW.
- The WPO, DWS and water boards should engage around the most appropriate role for water boards in NRW PBCs.

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Personal communication/interviews

Respondent	Position/ Department	Institution	Date
Ronnie McKenzie	Non-executive director	WRP	01 August 2023
Mike Rabe	CEO & Co-founder	Re-solve Consulting	04 August 2023
Ivy Maisela	Water Demand Management and Operational Implementation	City of Cape Town	07 August 2023
Collin Mubadiro	Head: Water Demand Management and Operational Implementation	City of Cape Town	07 August 2023
Dawid Dirks	Director of Operations	Ole Powers Systems & Ole Water Solutions (former Emfuleni Water Manager)	06 September 2023
Willem Wegelin	Director	WRP	20 September 2023
Brian Sonamzi	WCDM Director	City of Tshwane	21 September 2023
Zakhele Khuzwayo	Manager: Innovation & Technology	City of Johannesburg	22 September 2023
Mzakhe Mtshweni	Water Demand Manager	City of Johannesburg	22 September 2023
Victor Chewe	Planning Manager	City of Johannesburg	22 September 2023
Sizwe Kunene	Chief engineer	City of Johannesburg	22 September 2023
Pholo Nthutang	Water Department	City of Johannesburg	22 September 2023
Thabo Ncala	Head of WS unit	eThekwini Metropolitan Municipality	22 September 2023
Dave Still	Director	Partners in Development	26 September 2023
Johann Lubbe	Head: New Water Partnership Office	DBSA	17 November 2023

Annexure A: Types of PBC for NRW (Source: Kingdom *et al.*, 2018:42)

	DBOM			24/7 Self-Optimizing	Cost-Plus (suggested with Competitive Discovery Approach)	Incentivized Program Manager (PM)	
	Full Risk Transfer	**HCMC Variant**	**Progressive Roll-Out**			**Higher Risk**	**Lower Risk**
Objective	Decrease physical losses and sometimes also commercial losses	Decrease physical losses and sometimes also commercial losses	Decrease physical losses and sometimes also commercial losses	Number of customers on continuous supply	Any combination of: decrease physical losses; increase the number of customers on continuous supply; increase revenue/ receipts	Any combination of: decrease physical losses, increase the number of customers on continuous supply, increase revenue/ receipts	
Baseline *(how is it set)*	Extensive consultant study before bid	Extensive consultant study before bid	By contractor as each DMA is created, verified by auditor	By contractor in first phase, verified by auditor	By contractor in first phase, verified by auditor	By program manager in first phase, verified by auditor	
Measurement System *(how is it created)*	Before bid, by utility/ consultant	Before bid, by utility/ consultant	By contractor as each DMA is created, verified by auditor	By contractor as each DMA is created, verified by auditor	By contractor as each DMA is created, verified by auditor	By contractor as each DMA is created, verified by auditor	
Capital Cost *(how is it paid for)*	Contractor bears the capital works costs; price paid per m^3 reduced (bid by contractor at level to cover costs)	DMA creation paid on BOQ basis; leakage control, meter installation, and illicit connection detection costs borne by contractor; fee to reach target m^3 reduction bid by contractor at level to cover costs	DMA creation paid on BOQ basis; leakage control meter installation, and illicit connection detection costs borne by contractor; fee to reach target m^3 reduction bid by contractor at level to cover costs	Partially on BOQ basis, partially through the fees paid per connection on 24/7 (the extent of incentive and risk transfer can be adjusted by changing the ratio of payments)	Client pays actual costs, verified on open book basis	Utility pays Program Manager which pays works contractors	Utility pays works contractor directly, based on competitive bid price, and certification of works by program manager
Contractors, Staff and Operating Cash *(how is it paid for)*	Cost born by contractor; fee per m^3 saved bid at level to cover these costs	Costs related to DMA construction covered through DMA BOQ; cost related to active leak control and commercial loss reduction activities covered through fee	Costs related to DMA construction covered through DMA BOQ; cost related to active leak control and commercial loss reduction activities covered through fee	Partly on a fixed fee to cover contractor's overhead, partly through the fee paid per connection on 24/7	Covered through a standard mark-up on the actual cost of works	Covered through a program management fee, which is a standard percentage of the cost of works	

Annexure B: Legislative Review

Introduction

This section outlines the legislation relevant to performance-based contracts (PBCs) for non-revenue water (NRW) reduction. Specifically, it looks at the mandate of local government to undertake water conservation and demand management activities, as well as procurement legislation that needs to be adhered with in procuring private service providers to undertake this work on their behalf. Constitution of South Africa, Act 108 of 1996.

The Bill of Rights provides that everyone has the basic right to sufficient water (Section 27) and to a healthy environment that is protected, including the conservation of natural resources (Section 24). In relation to procurement, the Constitution, in section 217, requires public procurement to be fair, equitable, transparent, competitive, and cost-effective.

National Water Act 36 of 1998

The National Water Act (NWA) governs the way in which water resources are protected, used, developed, conserved, managed, and controlled. Of relevance to NRW is the promotion of efficient, sustainable, and beneficial use of water in the public interest. The NWA reinforces the Constitutional basic right to sufficient water and seeks to promote equitable access to water. This means that NRW interventions must not deprive anyone of their access to water to address basic needs. The NWA creates a general obligation for all spheres of government to protect and conserve water resources and provides that any water user may not waste water (section 22(2)(d)).

Water Services Act 108 of 1997

The Water Services Act (WSA) sets out the responsibilities of Water Services Authorities and Water Services Providers. Under the current constitutional allocation of powers and functions, a Water Services Authority will always be a municipality, while a municipality may choose to perform the Water Services Provider role or contract this function out to another public institution (such as another municipality or Water Board) or a private service provider. One of the purposes of the WSA is to promote effective water resource management and conservation. The duties of the Water Services Authority include ensuring access to water services, considering alternative ways of

providing access and the need for regional efficiency. A Water Services Authority may also impose reasonable limitations on the use of water services, which could include reducing pressure in a system in order to preserve resources. The Water Services Authority's Water Services Development Plan must contain details of existing and proposed water conservation, recycling, and environmental protection measures.

Local Government: Municipal Systems Act 32 of 2000

The Local Government: Municipal Systems Act provides municipalities with the power to provide services and to levy service charges for services provided. Section 73(2), which is directly relevant to NRW, provides that municipal services must:

a) *be equitable and accessible;*
b) *be provided in a manner that is conducive to -*
    i. *The prudent, economic, efficient and effective use of available resources; and*
    ii. *The improvement of standards of quality over time;*
c) *be financially sustainable;*
d) *be environmentally sustainable; and*
e) *be regularly reviewed with a view to upgrading, extension and improvement.*

Section 76 of the MSA specifies that municipalities may choose to provide municipal services themselves (an internal mechanism), or through an external mechanism, which may be another public institution, a community-based organization or NGO, or a private company. If a municipality wishes to provide a service externally, the process specified in Section 78 of the MSA needs to be followed. If a private service provider were undertaking NRW activities through a PBC, or any other form of contract, this would be ancillary to the main service of water supply, and thus would not constitute an external service mechanism. If, however, the contract included management of the municipal water distribution system, this would constitute an external mechanism and the Section 78 process would need to be followed. It is unlikely that a PBC for NRW would have a scope large enough to constitute an external mechanism. However, performance elements for NRW reduction could be included in the service level agreement signed between a municipality and an external water service provider.

Local Government: Municipal Finance Management Act 56 of 2003

The Local Government: Municipal Finance Management Act (MFMA) specifies that a municipality may only incur expenditure that is on its budget (Section 15) and the budget needs to be funded (Section 18). To avoid being categorized as 'unauthorised expenditure', a NRW contract would have to be included in a vote on the municipal budget and revenue (before anticipated savings) would need to be available to cover the full budgeted cost of the contract. Any contract with budgetary implications beyond three years needs to be approved by the Municipal Council in terms of the process set out in Section 33. As PBCs are often three years or longer, they would need to comply with this process. PBCs that result in payments beyond an anticipated amount (if savings are greater than expected) would not be variations to the contract, given that the payment terms would be specified in the contract and would be followed. A variation, in terms of section 111 of the MFMA, would therefore not be required. National Treasury Circular 62 (July 2013) prohibits variations in construction-related contracts of more than 20%. Although it does not appear that a variation would be required, even if the final contract value was more than 20% above the amount used to evaluate the tender, this eventuality may be queried by the Auditor-General of South Africa (A-G), who has flagged issues of contract variation in the past. It is important to confirm with the A-G that PBCS with variable final contract values would not require contract variation.

MFMA Supply Chain Management Regulations (2005)

National Treasury has issued the Municipal Supply Chain Management Regulations in terms of the MFMA to regulate SCM processes in municipalities. Municipalities have to act in accordance with their SCM policy in the procurement of goods and services. Many of the SCM regulations reinforce the provisions of the MFMA, requiring that procurement is undertaken in terms of an approved budget, that the bid documentation, evaluation and adjudication criteria are in line with any applicable legislation and that competitive bidding processes are required for procurement above R200 000, or for long term contracts, both of which would likely apply to PBCs. The municipal SCM policy must specify the criteria to which bid documentation for a competitive bidding process must comply, taking into account the general conditions of contract, any Treasury Guidelines on bid documentation and the requirements of the Construction Industry Development Board (CIDB) for bids relating to construction,

upgrading or refurbishment of infrastructure (which is likely to be the case for NRW PBCs). The SCM Regulations allow for a two-stage bidding process for large complex projects or long-term projects with a duration longer than three years, which would include NRW PBCs.

Should a PBC contractor approach the municipality with an unsolicited bid to undertake an NRW intervention, and section 37 of the SCM Regulations, read with section 113 of the MFMA, states that the municipality may only do so if:

> *(a) the product or service offered in terms of the bid is a demonstrably or proven unique innovative concept;*
> *(b) the product or service will be exceptionally beneficial to, or have exceptional cost advantages for, the municipality or municipal entity;*
> *(c) the person who made the bid is the sole provider of the product or service; and*
> *(d) the reasons for not going through the normal bidding processes are found to be sound by the accounting officer.*

It is unlikely that a PBC for NRW would satisfy all four conditions. The implication is that this would deter private companies from taking initiative to identify profitable PBCs in South African municipalities, as they would still have to bid competitively for the contract.

The SCM Regulations provide, in section 51, for contracts with compensation based on turnover, e.g. for the collection of fees, service charges or taxes. This would apply to NRW PBC if the contract included addressing commercial losses (i.e. lack of billing and payment for unbilled authorized consumption). In these contracts, the SCM Regulations require that the municipality must stipulate a cap on the compensation payable to the service provider and that such compensation must be performance based. It is therefore a requirement that this type of NRW intervention be a PBC.

The National Treasury SCM Guidelines (2004) do contemplate the type of 'reimbursable cost plus fees' structure of many of the PBC contracts used internationally. However, it states:

> *"Reimbursable cost contracts should be acceptable only in exceptional circumstances, such as conditions of high risk or where costs cannot be*

determined in advance with sufficient accuracy. Such contracts should include appropriate incentives to limit costs and may only be concluded subject to the approval of the accounting officer/authority. It is advisable that the reasons and formal approval for following the reimbursement route are recorded for auditing purposes." (pg. 34)

MFMA Municipal Public-Private Partnership Regulations (2005)

The other question around a PBC is whether it constitutes a municipal PPP, as contemplated in Section 120 of the MFMA. A municipal PPP is defined in the MFMA PPP Regulations as:

"…a commercial transaction between a municipality and a private party in terms of which the private party-

d) *Performs a municipal function for or on behalf of a municipality, or acquires the management of use of municipal property for its own commercial purposes, or both performs a municipal function for or on behalf of a municipality and acquires the management or use of municipal property for its own commercial purposes; and*

e) *Assumes substantial financial, technical, and operational risks in connection with -*

   i. *The performance of the municipal function;*

   ii. *The management or use of the municipal property; or*

   iii. *Both, and*

f) *Receives a benefit from performing the municipal function or from utilising the municipal property or from both, by way of -*

   i. *Consideration to be paid or given by the municipality or a municipal entity under the sole or shared control of the municipality;*

   ii. *Charges or fees to be collected by the private party from users or customers of a service provided to them; or*

   iii. *A combination of the benefits referred to in subparagraphs (i) and (ii)"*

In terms of criterion (a) it could be argued that the PBC contractor is performing a municipal function, that of water conservation, which is ancillary to the provision of

potable water. In addition, the PBC contractor would be using municipal property (the water network) for its own commercial purposes. In terms of criterion (b), the level of risk taken on by the private contractor would be dependent on the structure of the contract and could range from zero (where all contractor costs are covered and the performance-related payment, if any, is only an incentive), to 100% where all work is undertaken at risk. Criterion (c)(i) would be satisfied because the municipality would be paying the contractor for the work done and/or water saved. The main consideration, therefore, is the level of risk included in the structure of the contract. Still, *et al.* (2015) conclude that a Water Conservation and Water Demand Management (WCWDM) contract which has a small performance bonus component where the bonus is used primarily to provide an incentive, but where the service provider will not necessarily make a loss if the bonus is not paid, will not qualify as a PPP. However, where the service provider is financing all of, or at least a major part of the work in the expectation that it will recover these costs through being paid a share of the resulting savings to the client, then this would qualify as a PPP (Still, *et al.*, 2015:9). They recommend consulting the National Treasury PPP Unit if in doubt. The model contract produced in 2015 assumes the contract does not qualify as a PPP.

The main implication of an NRW PBC being categorized as a PPP is that it would then be required to follow a substantial process of consultation and approval. Given the poor uptake of municipal PPPs, largely because of the delays caused by the process (SALGA, 2020), this would likely put off both municipal official and private parties from pursuing an NRW PPP. However, the National Treasury has been reviewing the Municipal PPP Regulations with a view to streamlining the process. The revised regulations have not yet been published.

MFMA Municipal Asset Transfer Regulations (2008)

PBCs for NRW, by their nature would involve the contractor making use of municipal assets in the form of the water network. The Municipal Asset Transfer Regulations (MATR) in Chapter 4, prescribe the processes and approvals for granting any right to use, control or manage municipal capital assets. Importantly, if the PBC were classified as a PPP, then the MATR would not apply. If the contract is not a PPP, then a public participation process is required, but only in relation to a) assets worth more than R10 million, and b) for which a long-term right is granted. While condition b) will likely always

be satisfied by the PBC, condition a) may only be triggered in certain cases, such as pressure management installations on large pipelines or the large-scale replacement or management of municipal water meters. The prescribed public participation process requires the authorization of the Municipal Council and needs to include prescribed information. The consideration of a proposal to use, control or manage municipal capital assets, in this case for the contractor to control portions of the water network, includes checks and balances to weigh up the risks and rewards associated with the proposed contract. This process is similar to the considerations for a PPP, albeit less prescriptive, and includes fairly comprehensive oversight of the process by the Municipal Council, National Treasury and the Provincial Treasuries.

Preferential Procurement Policy Framework Act 5 of 2000

The Preferential Procurement Policy Framework Act (PPPFA) provides an overarching framework for public procurement to include a preference point system. All organs of State, including municipalities, must have preferential procurement policies which follow the prescribed preferential points system, whereby for contracts above R50 million, 90 points are allocated for price and 10 points may be allocated to specific goals, while for contracts less than R50 million the ratio is 80:20. The specific goals may include contracting with persons, or categories of persons, historically disadvantaged by unfair discrimination on the basis of race, gender and disability including the implementation of programmes of the Reconstruction and Development Programme. Organs of state, including municipalities, must determine their own preferential procurement policies in accordance with section 2 of the PPPFA and the thresholds and formula prescribed in the 2022 PPPFA Regulations. The PPPFA Regulations (2022) contain two different preference points formula depending on whether the procurement is for goods or services, or for 'income-generating' contracts, with the former favouring the lowest price tender and the latter favouring the highest price tender. PBCs for NRW, if structured as recommended in the 2015 guideline (Still *et al.*, 2015), would be considered the procurement of goods and services and the lowest priced tender would be favoured. The PPPFA makes provision for the Minister to exempt an organ of state from any or all of the provisions of the Act if the likely suppliers are international suppliers, which is possible in the case of NRW PBCs. National Treasury plans to replace the PPPFA and its regulations with the draft Public Procurement Bill in 2023.

Opportunities and potential challenges in the legislation

From the legislative review it is clear that municipalities have a mandate to undertake water conservation activities and to provide municipal services in as efficient a manner as possible. The activities contemplated to address NRW would not constitute an external service mechanism as defined in the MSA.

The MFMA requires that PBCs would have to be budgeted for as accurately as possible and that the contracts would need to be structured in such a way that the final price paid to the contractor would be as close to the tendered value as possible and that the perms of payment are clear and unambiguous. International PBC case studies indicate that it is best practice for PBCs to run for 3-5 years, and thus the MFMA section 33 process would need to be followed for contracts longer than three years.

The main legislative issue affecting NRW PBCs is whether the contract would be classified as a PPP and have to follow the regulated process or not. If the intention of a NRW PBC is to transfer risk, specifically the technical and financial risk, to the private sector, then it makes sense to structure the contract as a PPP and follow the legislated process. However, there are ways to structure the contract to avoid being classified as a PPP and the well-known delays that this may cause. However, even if a PBC was not classified as a PPP, it would likely have to follow the process prescribed in the MATR for the use, control, or management of municipal assets.

The procurement legislation does not pose any obvious barriers to municipalities wanting to enter into a PBC for NRW, provided the tender document is structured in such a way that tender offers are equivalent, and prices can be compared directly. The common international practice of a two-stage process, with a technical qualifying stage, followed by award based on price, is aligned with the provisions of the PPPFA.

Annexure C: Guideline for decision-making

For NRW PBCs to be successful in a South African context, the following pre-requisites need to be in place:

Correctly diagnose the nature of the NRW problem	
Secure political support for a PBC	
Secure senior administrative support for a PBC	
Secure community support for a PBC	
Ensure municipal contract management capacity	
Designate an official who will be accountable for the contract performance	
Ensure a realistic cash flow from which to pay the PBC contractor	
Assess the commercial attractiveness of the potential PBC	
Develop a credible baseline for performance measurement	
Ring-fence a district metered area(s)	
Develop a long-term NRW strategy	

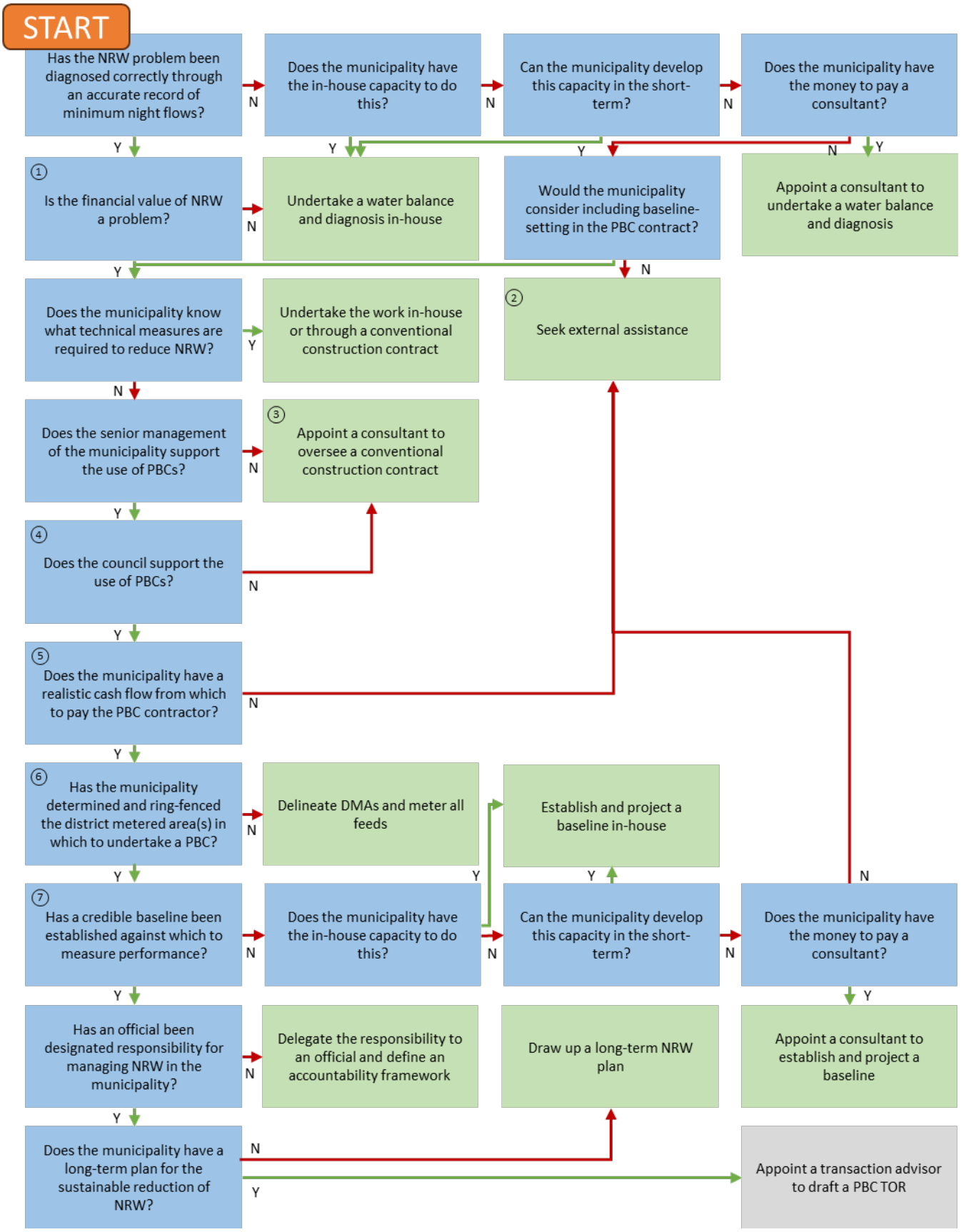
Addressing these pre-requisites also addresses many of the non-performance risks that would make PBCs more attractive to the private sector and thus reduce costs to the municipality and maximise the chance of success.

This guideline takes the form of a decision tree that guides the municipality, or other agents supporting municipalities, to assess whether the preconditions for a PBC are in place, and if not, what alternative course of action needs to be taken first. Explanatory notes follow the decision tree.

The guideline does not seek to replace the excellent practical guidelines for NRW preparation provided in the following references: Kingdom, B., Sy, J. & Soppe, G. 2018. The Use of Performance-Based Contracts for Nonrevenue Water Reduction. World Bank: Washington, DC.

Still, D., D Schaub-Jones & P Ramsden. 2015. Guidelines for the Use of Model Performance Based Contract for Water Conservation and Demand Management - Based on South African Procurement Law. Version 01/1410, prepared on behalf of GIZ and the Strategic Water Partners Network. Unpublished report.

NRW PBC decision tree – addressing the prerequisites



Explanatory notes

1. The cost of bulk water needs to be sufficiently high such that the savings are able to cover the costs of the intervention. Other costs could, or arguably should be included in the calculation, including the cost of maintenance (for example, repairs to burst pipes because of high pressure), wastewater treatment cost of excess return flow, and avoided capital investment in new water resources.
2. External assistance for funding preliminary project preparation work could come from the DBSA, an international donor, an international finance institution, a private industry (e.g. a mine) or the national Department of Water and Sanitation.
3. If the municipality recognises that NRW is a financial issue and does not have the technical capacity to address it, but also does not wish to institute a PBC, then the only other option is to source external expertise via a consultant as part of a conventional procurement process.
4. Council support is critical to ensure the contract is honoured and will help to de-risk the project for potential bidders. It is also a legal requirement if the contract is classified as a PPP, extends for more than 3 years or gives functional control over the water network to the contractor. An alternative course of action to appointing a consultant is to prepare a business case to attempt to change the Council position.
5. “Realistic” refers to the funding source to pay for the PBC being actual cash from tariffs or grants and real savings, in other words, discounting non-payment by customers or debt owed to bulk water service providers.
6. This step can be included in the scope of a PBC, depending on the type of contract chosen.
7. The baseline should relate to the indicators chosen to measure contract performance, which in turn are dependent on the municipal objectives. The baseline may or may not relate to water volume. The baseline needs to accommodate any changes to the network over time or the effects of intermittent water supply.