

## Fact Sheet 10: Non-Revenue Water Master Plan

Non-Revenue Water (NRW) is defined as the difference between System Input Volume (SIV) - determined as the volume of water produced/bought for supply to a distribution system - and the total Billed Authorised Consumption (BAC) (i.e. volume of water that has been paid for by consumers). Over the years EWS has an established record and history of focusing on the reduction of NRW as part of its overall Water Conservation/Water Demand Management strategy.

Any NRW reduction strategy and implementation program must take cognisance of both local and national imperatives, regulations and guidelines. In this regard, a holistic approach to the reduction of NRW from a strategic (5-year) to detailed operational (1-year) focus has been proposed, summarised in FIG 1. This constitutes the overall framework within which the NRW reduction program should take place.

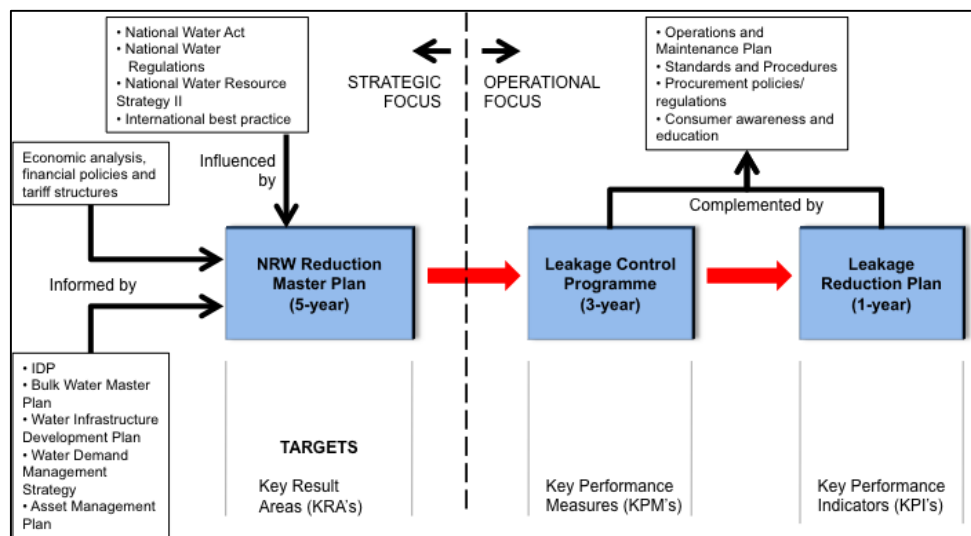


FIG 1: eThekweni Water and Sanitation NRW Reduction Program Implementation Framework

### Water balance

The first step in the NRW plan is to undertake a water balance to determine the water losses in terms of volume and costs. For example, for the period July 2013 to June 2014, NRW accounted for 39.4% by volume of water and in the region of R 6 million. The aim of this master plan is to reduce this figure to 25% by 2018/2019.

### NRW technical interventions

In order to achieve this aim, the following actions are planned:

- Targeted mains replacement based on scientific methods and prioritization
- Creation and maintenance of new Pressure Managed Zones, with a minimum and maximum operating pressure of 25m and 50m respectively
- Active leak detection and repair using a combination of leak detection contractors and Category B plumbers
- Continued control valve (pressure reducing and reservoir inlet) maintenance
- Reservoir storage integrity maintenance.

### NRW billing interventions

- Continued consumer meter replacement programme for ICI (industrial, commercial and institutional) customers (including fire connections), ensuring that no ICI consumer meter is older than seven years
- Continued domestic consumer meter replacement programme, ensuring that no consumer meter is older than 15 years

- Metering and control (volumetric, time or pressure) of all informal settlements
- Metering and control of all Metro Housing developments
- Enforcement and control of illegal connection policy
- Ensuring that all Water Management Devices (WMD's) are correctly installed and monitored to ensure that they operate as desired.

### Key challenges

There are a number of challenges that will impact on this NRW plan. This includes:

- The natural rate of rise of leakage for the EWS area of supply due to a decrease in infrastructure condition. The reticulation pipeline condition is getting worse on an annual basis, leading to the need for accelerated pressure reduction, leak detection and repair and pipeline replacement programs
- The uncontrolled and unplanned densification of both rural and urban areas through rapid development. The existing distribution networks have been designed for a particular level of service, but the increasing trend for the medium- (and sometimes high-income) development of these areas with increased water demand is placing extreme stress on existing water supply networks as these networks have not been designed to cater for this load.
- Illegal connections to the network or tampering with existing outlet devices by consumers in order to gain access to water. Many leaks are induced through these practices and it is almost impossible to limit these activities (FIG 2)
- The rising occurrences of intermittent supply which will result in accelerated deterioration of assets, leading to increased leakages and operating costs



FIG 2: Illegal connections

### Recommendations

The following actions and support are required in order to make the NRW plan a success:

- Raising the internal profile of Non-Revenue Water reduction and Water Conservation/Water Demand Management to such a level as to demonstrate Corporate and Finance Department support and buy-in.
- A targeted training and skills transfer program to ensure common understanding of NRW and interventions required to reduce NRW volumes
- Increase access to funding for continued NRW programmes
- Metering and registering of all unmetered connections and enforcing penalties for illegal connections and tampering of communal consumption control devices
- Adoption of a more scientific approach to pipeline replacement within EWS
- Resolve all the unregistered consumers in the billing database as this will have the largest impact on NRW volumes
- Expand the active leak detection and repair strategy
- Adopt a more aggressive approach to pressure management
- Increase the proactive maintenance on all water infrastructure and adopt the principles of