Item to: INFRASTRUCTURE, ENGINEERING AND ENERGY SERVICES COMMITTEE

MEETING : 4 APRIL2013

APRIL 4, 2013, B. MARTIN, NON REVENUE PROGRESS REPORT (73) 11-03-2013

PROGRESS REPORT ON NON REVENUE WATER

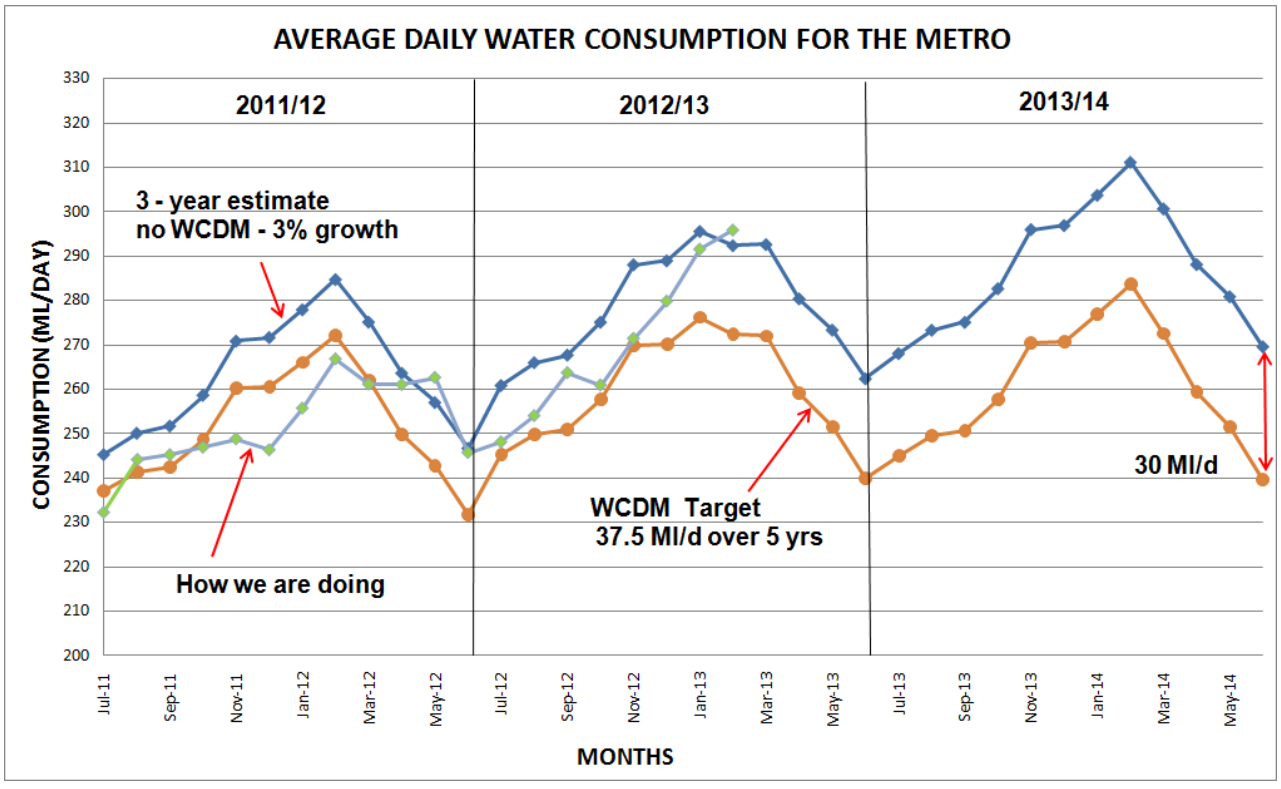
PURPOSE

The purpose of this report is to provide feedback on the progress made on reducing non revenue water and to quantify the financial gains achieved in reducing water losses. The report has been updated and additional detail included to the report submitted in February 2013.

BACKGROUND

The Algoa Water Resources Reconciliation Study determined that if WC/WDM measures were implemented a reduction of 13 500 Ml per year can be achieved. This amounts to 37.5 Ml per day reduction in demand. This is the target to be achieved over five years.

This report set out the progress made with the various interventions to reduce Non Revenue Water (NRW) that will ultimately address the subsequent financial losses. The report quantifies the financial gains achieved in reducing the volume of real losses. The following is therefore discussed in order to place the context in which the technical interventions are proposed and as captured in the Integrated Water Resource Management Strategy as previously approved by the Committee.



Non Revenue Water

Non revenue water (NRW) is water that has been produced and is “lost” before it reaches the customer. Losses can be real losses (through leaks, sometimes also referred to as physical losses) or apparent losses (for example through theft or metering inaccuracies and non-payment or unbilled authorised consumption (such as water used for fire fighting).

NRW Technical Committee

The NRW Technical Committee meets on a two-monthly basis to address strategies, progress with programmes, validation of data, information sharing and improved management and communication between the key directorates. The last progress meeting was held on 28 February 2013.

STATUS OF SERVICE PROVIDERS

The appointment for a service provider for the three-year contract for repairs and maintenance has not been made and it is likely that the tender will have to be re-advertised.The three-year contract for leak detection ends in June 2013 and a new tender will be advertised soon.

TECHNICAL INTERVENTIONS

Engineering Management Information System

The Engineering Design and Management System (EDAMS) for the water and sanitation services has successfully integrated many of the management components including, GIS, complaints database, flow networks, asset management and operations and maintenance. The EDAMS provides management information, commercial data analysis and reports that monitor water demand trends. Some of the management information is provided below.

Sectorising

By analysing the water distribution system, 220 water districts have been identified within the reticulation network of which 144 have district meters. The districts are essential to manage water losses in the reticulation system. A new database has been created of existing meters and new meters including bulk meters are being installed. Good progress has been made with the installation of the remaining district meters.

Water Meter Management

The water service has a database of over 217 000 water meters and EDAMS is used to manage the meter information, maintenance of meters and the need to replace meters.

A realistic period to replace water meters is between 7 and 10 years. The standard of water meters has improved due to improved technology.

Great progress has been made with this intervention and 18 298 domestic meters have already been replaced after 7 months of the financial year.

Table 1: Replacement of Domestic Meters

Financial Year	No of Meters Changed	Total Cost (R)
2003/04	16 765	6 446 640
2005/06	18 108	5 985 170
2006/07	19 605	9 070 830
2007/08	18 756	10 270 145
2008/09	35 015	14 611 332
2009/10	16 291	9 361 226
2010/11	11 274	7 675 551
2011/12	16 197	13 428 784
2012/13 (to Jan ’13)	18 298	18 023 530

Pressure Management

This is the method of reducing water wastage at night when the water pressure is at its highest. By strategically installing pressure reducing devices this wastage of water can be curbed.

There are currently approximately 80 pressure reducing valves (PRV) in the water network. Studies have been undertaken to establish if pressure management can be implemented in parts of the Metro’s supply system and it has been concluded that there is potential for advanced pressure control in certain key areas with high losses. Investigation into this advanced pressure control system has advanced significantly in order to look into the feasibility of this. A station was installed at BluewaterBay, Port Elizabeth, and at Blikkiesdorp, Uitenhage. The minimum night flow at BluewaterBay has decreased from 57.6 kl/hour to 14.1 kl/hour. This represents a saving of R2 843 000 per year, based on the price of R7.46/kl.

A further nine PRV installations are in the process of being installed.

Leakage Reduction

A programme to reduce leakage commenced in Motherwell during May 2010. In order to reduce the water losses, a contractor was appointed to undertake water loss detection surveys. This includes inspections of each connection, data logging of district meters and locating leaks on distribution pipes, hydrants and valves.

The following shows the results of this investigation:

Table 2: Summary of Water Loss Investigations

Survey		Faults		
No connections	119 360	Meter leaks	20 930	18%
Industrial Commercial & Institutional (ICI) connections	2 021	Internal leaks	25 760	22%
Valves/hydrants	5 137	Valves/hydrants	2 874	56%

- The water loss surveys undertaken indicate the minimum night flow to be about 65% of the average flow. This indicates high NRW and water wastage.
- The identified leaks are repaired on an ongoing basis. Meters replacements are undertaken under the control of the Water Installation Workshop.
- The water loss surveys regularly identifies large diameter meters that are malfunctioning and not recording the consumption.
- 231 data loggings in either pressure or flow measurement have been undertaken. Data logging determines minimum night flaws (MNF), discreteness of zones and to determine parameters for pressure management. It is also being used to determine before intervention at schools and after intervention to indicate reduction in usage.

The following table is an example of the potential revenue recovered over the last two years and for the following three years as a result of the interventions.

Table 3: Improved revenue from interventions

	Annual Benefits (R million)			
Intervention	**Ongoing benefits achieved**	**Continuation next 3 years**	**New initiatives**	**TOTAL**
MNF Reduction	15.4	15.7	-	31.1
Identified under-billing	48.8	30.0	-	78.8
Meter renewals ICI	18.0	5.0	-	23.0
Pressure management	2.5	12.0	-	14.5
Billing improvement			24.0	24.0
Top 100 ICI acc Execs			6.0	6.0
Total	**84.70**	**62.70**	**30.00**	**177.4**

Internal leaks of houses are compiled and leaks are repaired in terms of the ATTP Internal Leak Repair Programme.

- Large wastage at schools has also been identified as an area for attention. In December 2010 the municipality and the Department of Education signed a memorandum of understanding (MOU). In terms of this agreement the Metro will use contractors to repair the internal leaks at schools.

RESULTS OF WC/WDM INTERVENTIONS

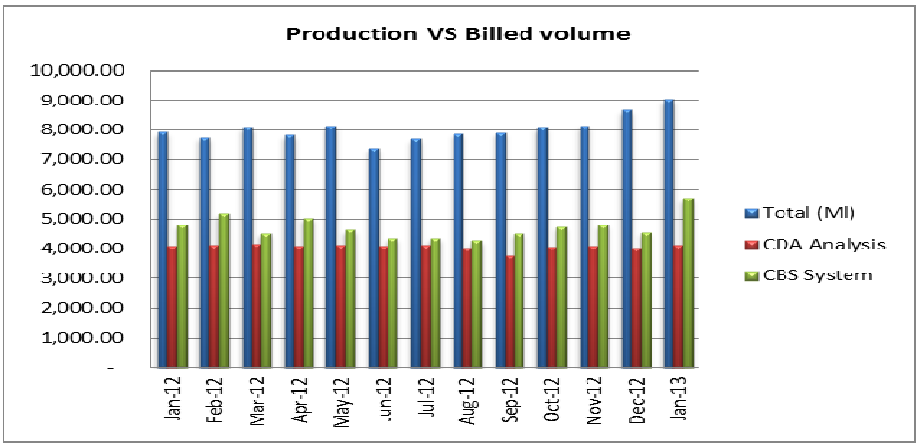
a) From analysing the historical consumption of 105 500 consumers for 6 months prior to interventions to consumption after interventions, the billed volume has increased by 42% from 373 831 kl/month to 645 715 kl/month.

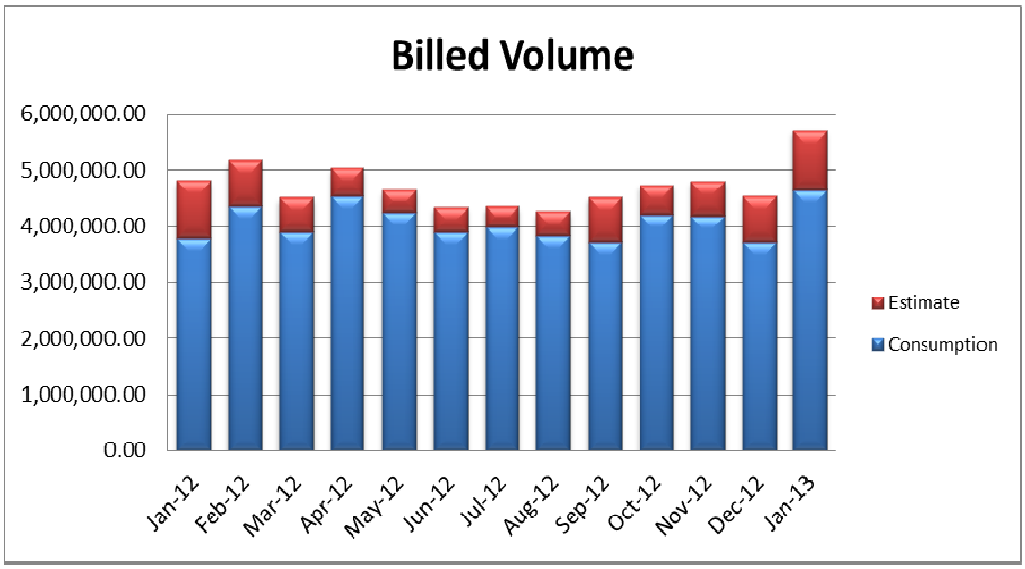
   This is partially influenced by the drought and water restrictions where consumption was subdued.

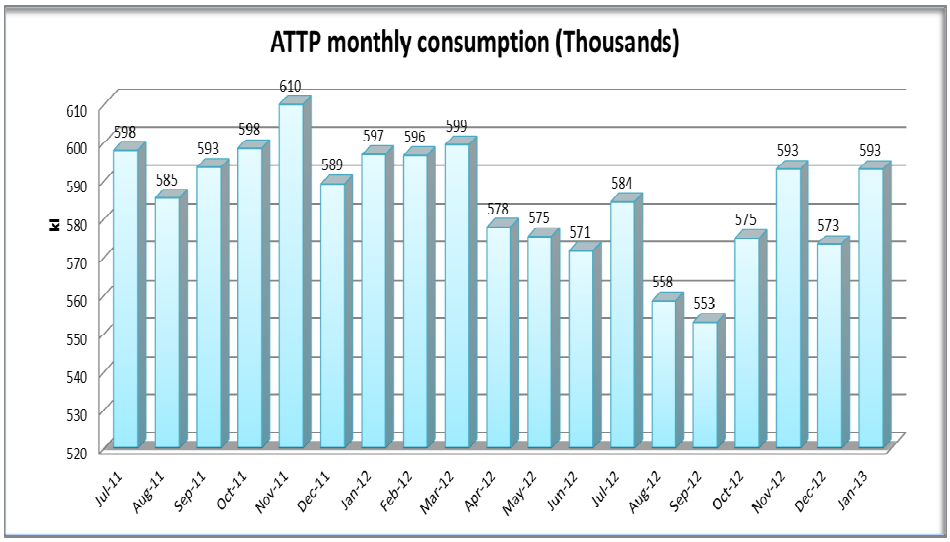
b) Improved revenue as a result of all the interventions undertaken and over the next three years is calculated to be R177.4 million as indicated in Table 3.

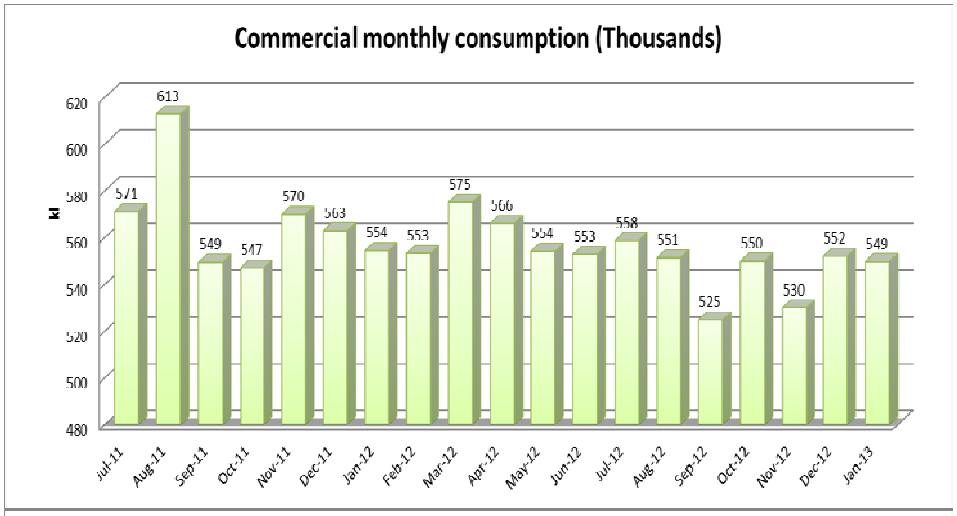
c) Despite all these interventions water demand has increased over the last four months where demand is matching the available water resources.

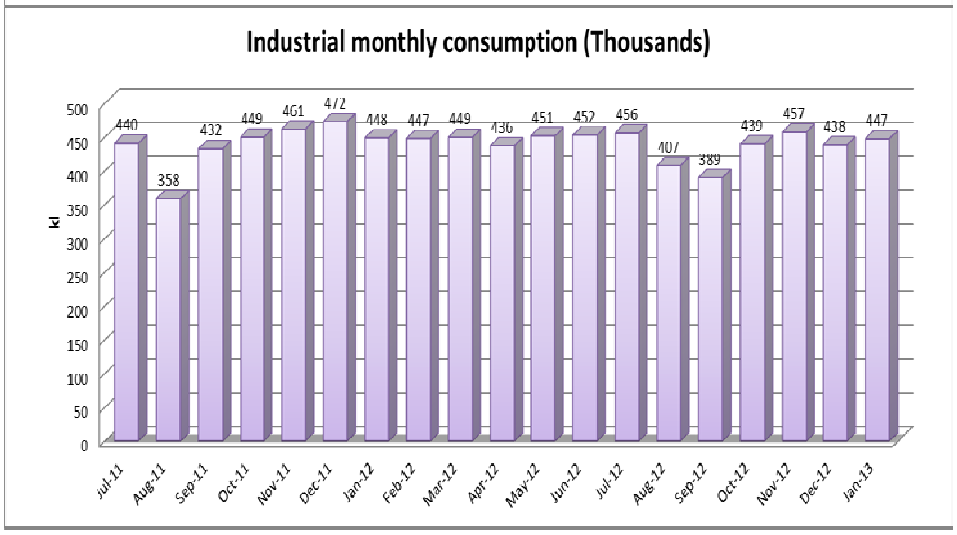
The information in bar chart format from the management system [commercial data analysis (CDA)] is as follows:

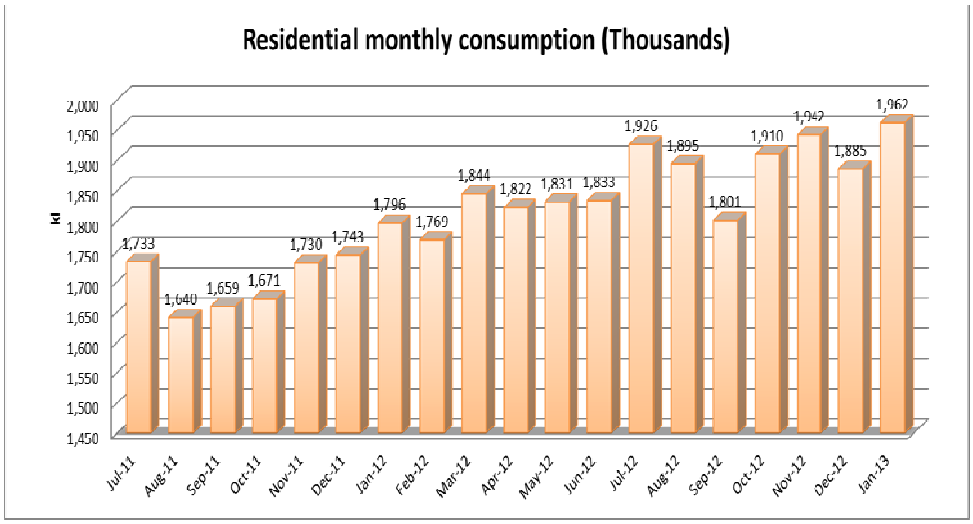












FINANCIAL IMPLICATIONS

Water Tariffs and Charges

Water tariffs are an important means of influencing demand management and for revenue management. One of the results of increased water demand has been increased income. By 28 February 2013 the estimated income for the 2012/13 financial year had already been achieved.

CONCLUSION

The water conservation/water demand management initiatives have been highly successful.

Addressing NRW is a long term programme, that must be funded on a continuous basis to achieve the goals set out in the Integrated Water Resources Management Strategy.

FOR INFORMATION

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DATE