KOUGA LOCAL MUNICIPALITY
SUPPORTED BY AMATOLA WATER

KOUGA MUNICIPALITY WATER CONSERVATION AND WATER DEMAND MANAGEMENT PROJECT

REPORT ON NON-REVENUE WATER

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Prepared by
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1 INTRODUCTION

Kouga Local Municipality is embarking on the implementation of a Water Conservation and Water Demand Management (WC/WDM) strategy aimed at reducing non- revenue water, reduce wasteful consumption, improve system and consumer metering and in this way deliver water to its consumers as cost efficiently as possible.

In support of this initiative, the Department of Water Affairs (DWA) has set aside an amount of R1.5 million for implementation of Water Conservation and Water Demand Management (WC/WDM) activities. These activities will initially be implemented in Jefferys Bay but extended to Humansdorp and the other towns under Kouga Municipality.

Amatola Water was approached by Kouga Local Municipality to assist in the development of a Water Conservation and Water Demand Management Project Implementation Plan outlining the WC/WDM activities to be implemented in the project.

Amatola Water has entered into a 3 year tripartite agreement with the DWA and Kouga Municipality under which Amatola Water will implement these Water Conservation and Water Demand Management initiatives. Further details on the WC/WDM activities can be found in the project implementation plan prepared by Amatola Water. This report is an outcome of an assessment of the bulk metering and billing status in Kouga Municipality.

2 SITUATIONAL ASSESSMENT

2.1 Billing meters

According to records obtained from the Kouga Municipality's finance directorate, there are 23077 billing meters on their system (July 2011 - June 2012).

Table 2.1: Household consumption brackets per town

	CONSUMPTION BRACKETS (July 2011 – June 2012)						
	0l/day	1-200l/day	200-500l/day	500-1500l/day	1500-2000l/day	>2000l/day	TOTAL
Cape St Francis	34	218	153	110	13	21	**549**
Hankey	211	699	678	639	72	114	**2413**
Humansdorp	431	1658	1647	718	41	61	**4556**
Jefferys Bay	3250	1373	1442	2628	843	1909	**11445**
Loerie	36	269	130	53	3	8	**499**
Oyster Bay	71	170	57	30	1	3	**332**
Patensie	72	292	326	88	7	17	**802**
St Francis Bay	55	438	573	643	95	207	**2011**
Thornhill	69	99	72	202	5	23	**470**
TOTAL	**4229**	**5216**	**5078**	**5111**	**1080**	**2363**	**23077**

Of these 23077 billing meters, 11445 (49.6%) of them are in Jefferys Bay followed by 4556 (19.7%) in Humansdorp.

Out of these 23077 billing meters, 4229 of them record zero consumption. Again a bulk of these zero consumption readings are in Jefferys Bay with 3250 meters (76.9%) and Humansdorp with 431 meters (10.2%), hence the decision to initially commence WC/WDM activities in these two towns.

Cabitech (2011:2) notes that the efficiency of meters starts to decline drastically after 8 years and results in meters running slow and under read. Cabitech further states that recent studies in other towns have shown a substantial loss in revenue due to old meters and that meter manufacturers recommend meter replacement after 8 years.

In commencing with WC/WDM activities in Kouga Municipality, Amatola Water inspected all the billing meters that recorded zero consumption in Jefferys Bay and Humansdorp. The purpose of this exercise was to, firstly, identify and isolate those

meters with zero consumption because the erven are vacant and, secondly, to identify and replace those meters that were found to be faulty.

In Jefferys Bay a total of 1980 billing meters which had zero consumption have been inspected between 20 February 2012 and 13 July 2012. Of these, 26 were on vacant sites and 83 were faulty and will be replaced under this WC/WDM project. The balance, 1871 meters, were found to be in working order.

In Humansdorp 529 billing meters which have had a zero consumption have been inspected. Of these, 8 were on vacant sites and 25 were found to be faulty and will be replaced under this WC/WDM project. The balance of 496 meters was found to be in working order.

From the findings of the meter assessments exercise we can conclude that 58% of the 3250 meters reportedly giving zero consumption is lost revenue due to meters not being read. Accordingly the zero consumption meters in Table 2.1 above will be reduced to 1360 meters.

Amatola Water has forwarded this meter assessment information to the Kouga Municipality's Technical Directorate, who in turn forwarded it to the Finance Directorate in order for this information to be included into their financial system and meter reading programme.

2.2 Bulk Meters **(This section must be read in conjunction with drawings 07-2012-TM to 14-TM-2012) – Annexure A)**

Amatola Water has, through various discussions held with Kouga Municipality's technical staff, developed meter schematic diagrams for all the towns under Kouga Municipality in order to provide perspective to the bulk metering environment.

The prevailing bulk metering environment as understood from the meter schematic diagrams highlights the need for additional bulk meters. Table 2.2 below shows the current average water losses in each of these towns. **Note**: Cape St Francis and St Francis Bay have are both served through the same bulk system and have thus been combined.

Table 2.2: Summary of average annual water losses per town

CAPE ST FRANCIS & ST FRANCIS BAY	
Treated water from Churchill pipeline (kl)	1 062 990
Volumes sold (kl)	664 613
Distribution losses (kl)	398 377
% Distribution losses	37

HANKEY	
Raw water in (kl)	515 353
Treated water out (kl)	463 818
Treatment losses (kl)(estimate 10%)	51 535
Volumes sold (kl)	271 131
Distribution losses(kl)	192 687
% Distribution losses	42
% Total losses	52

HUMANSDORP	
Raw water in (kl)	1 625 092
Treated water out (kl)	1 462 583
Treatment losses (kl)(estimate 10%)	162 509
Volumes sold (kl)	841 885
Distribution losses(kl)	620 698
% Distribution losses	42
% Total losses	52

JEFFERYS BAY	
Raw borehole water (kl)	1 224 427
Treatment losses (kl) (Estimate 10%)	122 443
Treated borehole water (kl)	1 101 984
Treated water from NMMM (kl)	1 593 060
Total treated water out (kl)	2 695 044
Volumes sold (kl)	1 824 097
Distribution losses(kl)	870 947
% Distribution losses	32
% Total losses	42

LOERIEHEUWEL	
Raw water in (kl)	166 170
Treated water out (kl)	149 553
Treatment losses (kl)(Estimate 10%)	16 617
Volumes sold (kl)	72 149
Distribution losses(kl)	77 404
% Distribution losses	52
% Total losses	62

OYSTER BAY	
Raw water in (kl)	52 087
Treated water out (kl)	46 878
Treatment losses (kl)(Estimate 10%)	5 209
Volumes sold (kl)	26 885
Distribution losses(kl)	19 993
% Distribution losses	43

PATENSIE	
Raw water in (kl)	497 585
Treated water out (kl)	452 350
Treatment losses (kl)(Estimate 10%)	49 759
Volumes sold (kl)	125 053
Distribution losses(kl)	327 297
% Distribution losses	72
% Total losses	82

THORNHILL	
Treated water from Summit -Chelsea p/line (kl)	78 962
Volumes sold (kl)	79 734
Distribution Losses (kl)	-772
% Distribution losses	-1

3 WAY FORWARD

3.1 JEFFERYS BAY & HUMANSDORP

The inspection of those meters showing zero consumption has been completed in both Jefferys Bay and Humansdorp. Details of the meters that were inspected and were found to be in working order but were not being read have been handed over to Kouga Municipality in order for the meters readers to commence reading these meters on a monthly basis. This will yield a reduction in non-revenue water in both towns.

Amatola Water is, under the current WC/WDM 2011/2012 project funding allocation, replacing those meters that were found to be faulty in both Humansdorp and Jefferys Bay.

It is recommended that Kouga Municipality considers the following further interventions:

- Installation of a bulk water meter at the outlet of the water treatment works in Humansdorp.
- Calibration of existing bulk water meters in both Jefferys Bay and Humansdorp
- Servicing of airvalves, scour valves & reservoir float control valves in both towns
- Retro-fitting in the areas serving the indigent population
- Installation of zonal meters in Humansdorp:
    a) At the outlet of the 500kl water tower supplying the industrial area and
    b) At the outlet of the reservoir supplying Arcadia.
- Installation of zonal meters in Jefferys Bay;
    a) At the branch off to Tokyo Sexwale, Pellsrus, C-Place, Central and Kabeljous.
- Installation a meter at the inlet to the wastewater treatment works

3.2 CAPE ST FRANCIS & ST FRANCIS BAY

It is recommended that Kouga Municipality considers the following interventions in Cape St Francis and St Francis Bay:

- Auditing all consumers in order to ensure they are metered and that the meters are in working order.
- Calibration of existing bulk meters
- Servicing of airvalves, scour valves & reservoir float control valves
- Installation of bulk meters at the outlets of the two 4.5Ml reservoirs
- Installation of zonal meters to St Francis Bay, Sea Vista residential area and Cape St Francis.
- Installation a meter at the inlet to the wastewater treatment works

3.3 HANKEY

It is recommended that Kouga Municipality considers the following interventions in Hankey:

- Auditing all consumers to ensure that they are metered and that the meters are in working order.
- Calibration of existing bulk water meters
- Installation of bulk meters at:
    a) the outlet to the WTW
    b) the outlet of the 149kl reservoir supplying Hankey
    c) the outlets of the reservoir supplying Phillipsville and Centerton
    d) the outlets to the 500kl reservoirs supplying Weston
    e) the outlets to the booster pumpstation
- Servicing of airvalves, scour valves & reservoir float control
- Retro-fitting in the areas serving the indigent population
- Installation a meter at the inlet to the wastewater treatment works

3.4 LOERIEHEUWEL

It is recommended that Kouga Municipality considers the following interventions in Hankey:

- Auditing all consumers to ensure that they are metered and that the meters are in working order.
- Calibration of existing bulk water meters
- Installation of bulk meters at:
    a) the inlet to the WTW
    b) the outlet to the existing reservoir
    c) the second outlet to the WTW
- Servicing of airvalves, scour valves & reservoir float control

3.5 OYSTER BAY

It is recommended that Kouga Municipality considers the following interventions in Oyster Bay:

- Auditing all consumers to ensure that they are metered and that the meters are in working order.
- Calibration of existing raw water meters
- Installation of bulk meters at:
    a) the outlets to the WTW
    b) the outlets to the pumpstations
    c) the outlets to the reservoirs
- Servicing of airvalves, scour valves & reservoir float control
- Retro-fitting in Mzamowethu
- Installation a meter at the inlet to the wastewater treatment works

3.6 PATENSIE

In addition to the magflow meter installed by Amatola Water at the inlet to the WTW, it is recommended that the following further interventions be considered by Kouga Municipality in Patensie:

- Auditing all consumers to ensure that they are metered and that the meters are in working order.
- Calibration of existing raw water meter
- Installation of bulk meters at:
    a) the outlet to the WTW
    b) the outlets to the reservoirs
- Installation of zonal meters to Ramaphosa village, Citrus village and Upper Patensie
- Servicing of airvalves, scour valves & reservoir float control
- Retro-fitting in the Ramaphosa village and Citrus village
- Installation a meter at the inlet to the wastewater treatment works

3.7 THORNHILL

It is recommended that Kouga Municipality considers the following interventions in Thornhill:

- Auditing all consumers to ensure that they are metered and that the meters are in working order.
- Calibration of existing bulk water meters
- Installation of bulk meters at:
    a) the outlet to the 44kl elevated tank
    b) the outlet to the 65kl reservoir
- Servicing of airvalves, scour valves & reservoir float control
- Installation a meter at the inlet to the wastewater treatment works

4 CONCLUSION

As shown in Figure 4.1 below Jefferys Bay and Humansdorp are the largest water users out of the 8 towns and as such implementation of the above mentioned recommendations should initially focus on these two towns.

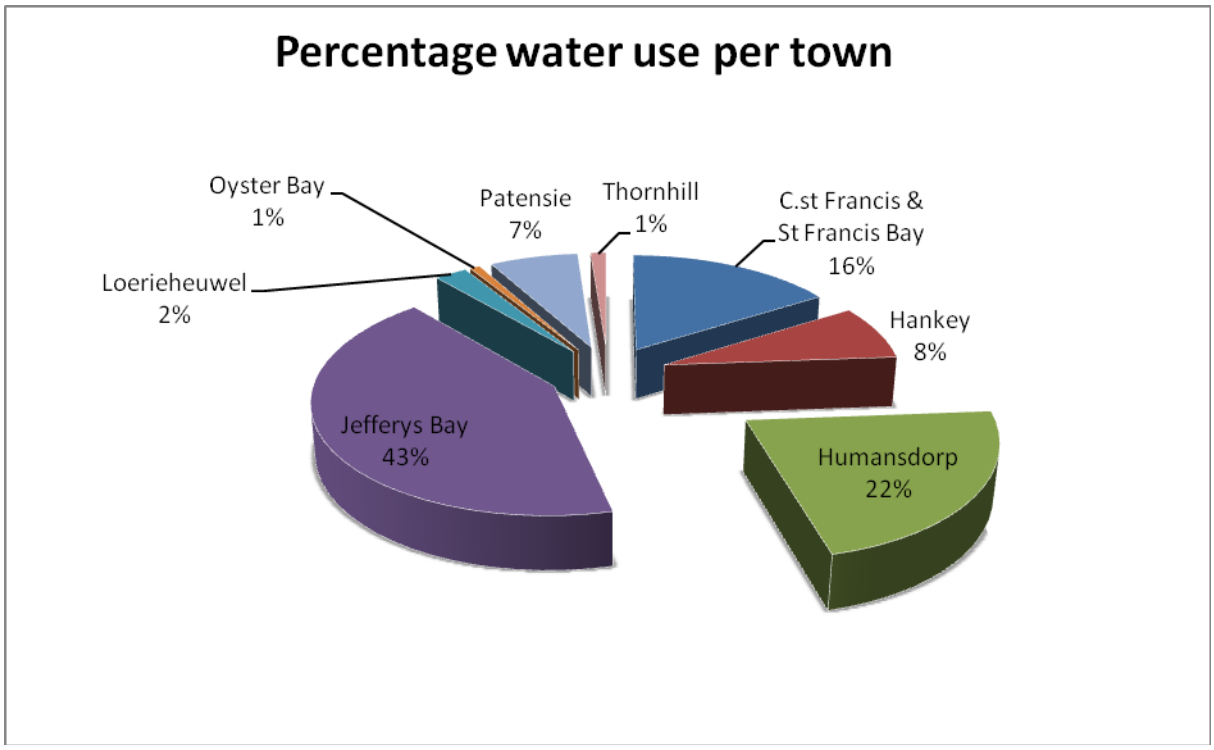

Figure 4.1: Usage of water per town

Based on the work covered by the current funding, it is anticipated that the funding required to implement the above recommendations will be substantial and as such it

is recommended that the approach to implementing the above recommendations should be on a multi-year basis.

ANNEXURE A

BULK WATER SCHEMATIC DIAGRAMS

ANNEXURE B

JEFFERYS BAY - TABLE OF INSPECTED METERS

ANNEXURE C

HUMANSDORP - TABLE OF INSPECTED METERS