

7.
WRITING OFF OF NON-TECHNICAL WATER AND ELECTRICITY LOSSES

5/17/2

S Müller

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Corporate Head Office

13 August 2018

1. Executive Summary

National Treasury issued guidelines (MFMA Circular No. 70, December 2013) on how to deal with non-revenue water and electricity. Annexure B of Circular No. 70 provides guidance on the accounting treatment of non-technical losses and mentions that a council resolution is required to write off the losses.

2. Service Delivery and Budget Implementation Plan - IGNITE

Directorate Finance
Department Revenue

3. Compliance with Strategic Priorities

Provision of democratic, accountable and ethical governance
Provision and maintenance of municipal services

4. Delegated Authority

None

5. Legal Requirements

Local Government: Municipal Finance Management Act, Act 56 of 2003

6. Background/Discussion/Evaluation/Conclusion

Background

National Treasury issued guidelines (MFMA Circular No. 70, December 2013) on how to deal with non-revenue water and electricity. Annexure B of the Circular provides guidance on the accounting treatment of non-technical losses and mentions that a council resolution is required to write off the losses.

Discussion

Losses occur in every water and electricity distribution system. Losses are divided into technical losses and non-technical losses. Technical losses are authorised, unmetered uses or unavoidable internal system losses, whereas non-technical losses are unauthorised, unmetered uses and avoidable system losses.

In the case of electricity:

- technical losses are caused by the physical properties of the components of the power system. The most obvious example is the power lost in the distribution lines and transformers due to unavoidable internal electrical resistance,
- non-technical losses are caused by illegal connections, inaccurate meters, incorrect meter readings, incorrect billing, etc.

In the case of water:

- technical losses are caused by unmetered, authorised water uses such as fire fighting, cleaning of reservoirs, flushing of pipelines and losses associated with the water treatment process (i.e. backwashing of filters),
- non-technical losses are caused by leaks, pipe bursts, illegal connections, inaccurate meters, incorrect meter readings, incorrect billing, etc.

Evaluation

Electricity (refer to Annexure A for details)

The Municipality purchased 251 003 895.39 kWh of energy from Eskom during the period under review (1 July 2017 to 30 June 2018) at a total cost of R173 388 430.56. The unit cost of electricity is therefore R0.69078 per kWh.

During the same period, the Municipality sold 238 145 884 kWh of energy to its customers. This equated to a total loss of 12 858 011.39 kWh (5.1226%). The National Treasury norm for electricity losses is between 7% and 10%.

The technical losses were calculated for the different supply areas as follows:

Gansbaai	4.9%
Kleinmond	6.4%
Hermanus and Hawston	6.51%

Based on the calculations above, it is estimated that the technical electrical losses for the entire system is 5.0%.

The non-technical losses are therefore 0.1226%, or 307 816.62 kWh. At a unit cost of R0.69078/kWh this equates to an amount of R 212 633.52.

Water (refer to Annexure B for details)

The Municipality produced 6 774 478 kl of potable water during the period under review (1 July 2017 to 30 June 2018).

During the same period, the Municipality sold 5 499 482 kl of potable water to its customers. This equated to a total loss of 1 274 996 kl (18.82%). The National Treasury norm for water losses is between 15% and 30%.

The technical water losses were calculated to be 163 145 kl (2.41%).

The non-technical losses are therefore 16.41% or 1 111 851 kl, and this equates to an amount of R 1 786 269.30.

7. Financial Implications

None (Disclosed in the notes to the Annual Financial Statements)

8. Staff Implications

None

9. Comments from other Departments, Divisions and Administrations

None

10. Annexures

Annexure A: Details of Electrical Losses

Annexure B: Details of Water Losses

RECOMMENDATION TO THE COUNCIL:

1. that the non-technical electricity losses to the value of R212 633.52 for the 2017/18 financial year be written off; and
2. that the non-technical water losses to the value of R1 786 269.30 for the 2017/18 financial year be written off.

RESPONSIBLE OFFICIAL :**BA KING****TARGET DATE FOR IMPLEMENTATION :****31 AUGUST 2018**

Electricity : Value of kWh Units purchased from ESKOM July 2017 to June 2018

	<u>Kleinmond</u> R	<u>Hawston</u> R	<u>Hermanus</u> R	<u>Stanford</u> R	<u>Gansbaai</u> R	<u>Total</u> R
July	399 264.02	159 708.78	2 373 319.03	144 420.11	1 301 264.81	4 377 976.75
	734 028.31	278 827.58	4 221 064.51	288 106.88	2 062 206.30	7 584 233.58
August	1 022 999.93	404 970.04	5 525 442.26	390 806.26	2 799 468.91	10 143 687.40
	358 413.19	149 012.44	2 210 109.34	121 595.96	1 213 458.16	4 052 589.09
	722 538.23	285 467.48	4 323 860.56	259 316.87	2 033 405.06	7 624 588.20
September	1 018 475.56	428 947.82	5 714 996.70	368 531.07	2 837 232.56	10 368 183.71
	289 356.30	118 759.60	1 659 410.55	104 829.79	838 985.24	3 011 341.48
	311 047.14	129 197.02	1 889 036.45	106 926.24	1 054 346.84	3 490 553.69
October	480 401.92	195 163.92	2 861 692.09	176 585.28	1 424 921.51	5 138 764.72
	312 683.37	119 687.57	1 844 953.93	112 929.91	888 824.84	3 279 079.62
	308 508.45	127 285.84	1 919 866.32	108 833.39	1 025 374.99	3 489 868.99
November	487 730.21	185 161.06	2 978 830.04	179 768.00	1 421 186.68	5 252 675.99
	300 859.31	115 866.50	1 797 943.41	110 628.01	883 503.09	3 208 800.32
	285 819.74	117 494.90	1 753 809.46	101 158.36	980 899.25	3 239 181.71
December	482 186.87	187 021.16	2 948 879.81	179 833.59	1 438 420.40	5 236 341.83
	297 681.25	101 085.50	1 662 424.64	94 134.47	848 166.92	3 003 492.78
	433 805.57	160 469.31	2 421 451.09	135 602.10	1 333 391.21	4 484 719.28
January	508 965.58	175 363.26	2 912 905.49	168 476.90	1 453 388.38	5 219 099.61
	322 954.94	114 592.50	1 523 362.16	104 896.40	875 566.72	2 941 372.72
	352 908.28	138 492.90	1 721 539.57	116 537.89	1 099 922.93	3 429 401.57
February	534 780.18	192 938.94	2 625 629.44	181 896.19	1 468 590.07	5 003 834.82
	274 643.77	104 911.20	1 623 119.79	98 840.04	847 117.75	2 948 632.55
	287 846.00	120 822.21	1 658 325.16	102 443.25	994 082.92	3 163 519.54
March	455 711.91	174 360.30	2 739 173.66	168 563.51	1 396 177.00	4 933 986.38
	285 886.80	110 163.56	1 679 849.88	101 967.22	873 551.64	3 051 419.10
	348 145.46	142 783.28	2 101 372.06	119 071.74	1 210 517.70	3 921 890.24
April	486 712.61	188 659.64	2 939 260.28	174 855.73	1 524 402.41	5 313 890.67
	287 124.72	110 252.38	1 651 368.00	100 577.57	842 678.64	2 992 001.31
	355 868.94	142 231.28	2 129 347.54	118 913.04	1 190 230.79	3 936 591.59
May	461 380.70	177 097.90	2 779 252.64	163 692.62	1 407 295.52	4 988 719.38
	336 634.02	133 260.26	1 885 727.75	120 005.84	969 069.28	3 444 697.15
	307 456.55	128 131.80	1 877 556.02	106 587.45	1 098 587.16	3 518 318.98
June	520 720.91	204 678.98	3 072 251.68	188 215.79	1 565 009.87	5 550 877.23
	362 039.61	151 764.92	2 247 826.62	123 945.76	1 226 948.96	4 112 525.87
	705 904.11	274 541.89	4 236 247.40	250 188.73	2 098 797.91	7 565 680.04
	1 014 141.23	414 676.88	5 674 054.15	365 439.18	2 897 581.23	10 365 892.67
Value of kWh	16 455 625.69	6 463 850.60	95 185 259.48	5 859 121.14	49 424 573.65	173 388 430.56
kWh purchased	23 267 404.44	9 142 874.43	138 362 013.91	8 186 854.89	72 044 747.72	251 003 895.39
Unit Cost R/kWh	0.7072	0.7070	0.6879	0.7157	0.6860	0.6908
kWh lost in Distribution 1 July 2017 to 30 June 2018						12 858 011.39
Less : 5 % Non-Revenue Technical losses (251 003 895.39 kWh x 5 %)						12 550 194.77
Non-Technical Losses to be written off at cost price (MFMA Circular No 70)						307 816.62
Nett Electricity Distribution Loss 2017/18 (July 2017 - June 2018)					0.12%	
						212 633.52

Administration	Suburb	July 2017	Aug 2017	Sep 2017	Oct 2017	Nov 2017	Dec 2017	Jan 2018	Feb 2018	Mar 2018	Apr 2018	May 2018	June 2018	TOTAL
		kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh
Electricity Losses		139 643	21 856	24 765	44 249	16 042	36 203	52 714	24 875	47 979	23 315	37 458	22 172	491 271
% Electricity Losses		19%	3%	4%	7%	2%	5%	8%	4%	7%	4%	5%	3%	6.0%

Administration	Suburb	July 2017	Aug 2017	Sep 2017	Oct 2017	Nov 2017	Dec 2017	Jan 2018	Feb 2018	Mar 2018	Apr 2018	May 2018	June 2018	TOTAL	
		kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	
GANSBAAI Metered	Birkenhead	10 216	5 678	9 132	7 729	9 323	7 305	12 593	8 284	7 886	10 431	8 175	9 566	106 318	
	Blompark	15 861	10 321	14 765	14 177	13 099	12 187	8 424	7 890	11 126	11 672	10 472	13 823	143 817	
	De Kalders	151 145	128 436	148 046	153 659	142 952	130 648	198 357	130 525	127 174	143 920	125 329	129 294	1 709 085	
	Franskrad	156 415	123 776	133 017	136 709	132 634	117 794	254 612	136 160	123 455	163 191	130 706	130 110	1 738 560	
	Gansbaai	1 113 574	1 246 983	1 182 679	1 092 917	1 017 008	1 106 005	1 243 334	1 102 838	1 268 977	1 501 293	1 268 105	1 276 183	14 419 896	
	GB Industrie Park	61 440	46 863	52 117	51 026	59 860	52 568	61 287	43 839	52 947	46 744	52 169	46 744	634 782	
	Kleinbaai	113 994	85 685	103 325	107 844	94 880	93 160	149 857	93 434	90 880	111 324	79 591	101 915	1 225 889	
	Moskhone	6 945	6 945	7 225	6 629	6 337	6 821	3 833	5 225	6 246	7 490	7 434	8 347	77 435	
	Peary Beach	146 350	140 525	137 048	142 205	133 503	128 482	240 239	153 048	121 477	156 935	148 762	131 695	1 780 272	
	Breedersdorp Distrik	24 306	22 148	22 768	20 747	24 843	20 279	25 425	22 574	21 150	27 349	23 709	22 976	278 274	
	Caledon Distrik	2 069 403	2 144 077	2 151 991	2 130 995	2 159 184	2 087 611	2 239 121	2 204 287	1 996 275	2 241 918	2 175 522	2 388 385	25 988 769	
	Subtotal		3 869 650	3 959 435	3 962 113	3 864 637	3 789 226	3 762 850	4 437 082	3 908 104	3 827 593	4 433 395	4 024 549	4 264 483	48 103 117
	PREPAID		1 760 735	1 718 376	1 689 251	1 667 047	1 647 266	1 915 322	1 734 984	1 556 571	1 717 028	1 722 621	1 696 272	1 765 060	20 590 732
	Total Sales		5 630 385	5 677 811	5 651 364	5 531 684	5 436 492	5 678 172	6 172 066	5 464 675	5 544 621	6 156 016	5 720 821	6 029 543	68 693 849
	ESKOM		6 175 880	5 967 488	5 755 504	5 731 760	5 642 929	6 501 177	5 976 488	5 569 914	6 335 838	6 068 331	6 225 654	6 093 785	72 044 748
Electricity Losses		545 495	289 677	104 140	200 076	206 437	822 806	-195 578	105 239	791 217	-87 685	504 833	64 242	3 350 899	
% Electricity Losses		9%	5%	2%	3%	4%	13%	-3%	2%	12%	-1%	8%	1%	4.7%	
TOTAL for GANSBAAI / STANFORD															
Consumption		4 123 026	4 247 947	4 219 734	4 111 759	4 054 770	4 030 965	4 705 645	4 163 480	4 082 170	4 700 120	4 230 067	4 534 506	51 264 189	
PREPAID		2 150 666	2 100 763	2 062 270	2 049 559	2 018 171	2 313 332	2 101 328	1 901 563	2 094 145	2 092 830	2 082 531	2 158 519	25 125 567	
Total Sales		6 273 692	6 348 710	6 282 004	6 161 318	6 072 941	6 344 297	6 806 973	6 065 033	6 176 315	6 792 950	6 372 598	6 693 025	76 389 856	
ESKOM		6 958 831	6 659 819	6 410 909	6 405 643	6 295 419	7 203 305	6 664 109	6 195 147	7 015 512	6 728 580	6 914 889	6 779 459	80 231 603	
Electricity Losses		685 138	311 109	128 905	244 325	222 479	859 008	-142 864	130 114	839 197	-64 370	942 291	86 415	3 841 747	
% Electricity Losses		9.8%	4.7%	2.0%	3.8%	3.5%	11.9%	-2.1%	2.1%	12.0%	-1.0%	7.8%	1.3%	4.8%	
Total Metered		13 204 646	12 868 876	13 065 007	12 204 771	12 359 031	12 714 993	15 085 860	13 315 799	12 345 746	13 925 334	13 028 181	13 632 728	157 750 972	
Total Streetlights		157 402	157 402	157 402	157 402	157 402	157 402	157 402	157 402	157 402	157 402	157 402	157 402	1 888 824	
Total Prepaid		6 824 192.50	6 707 227.60	6 488 916.00	6 442 055.90	6 343 327.60	7 017 056.90	6 540 217.90	5 959 480.30	6 531 584.10	6 362 244.00	6 530 448.30	6 779 374.90	78 506 088.00	
Total Consumption		20 186 200.50	19 733 505.60	19 711 325.00	18 804 228.90	18 859 760.60	19 889 455.90	21 783 479.90	19 412 681.30	19 034 732.10	20 444 980.00	19 716 031.30	20 568 504.50	238 145 864.00	
ESKOM		21 992 697.77	21 422 642.16	20 166 113.82	20 642 431.69	19 913 597.21	22 770 846.57	19 685 001.66	18 951 353.01	21 574 252.27	21 017 400.90	21 374 227.93	21 493 330.40	251 003 895.39	
Electricity Losses		1 806 497	1 689 137	494 789	1 838 203	1 053 837	2 881 393	-2 098 478	-461 328	2 539 520	572 421	1 658 197	923 826	12 858 011.39	
% Electricity Losses		8.21%	7.88%	2.26%	8.90%	5.29%	12.65%	-10.66%	-2.43%	11.77%	2.72%	7.76%	4.30%	5.12%	
Metered consumption since 1 July 2016		13 204 646	26 073 522	39 138 529	51 343 300	63 702 331	76 417 324	91 503 184	104 618 983	117 164 729	131 050 063	144 118 244	157 750 972		



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OVERSTRAND MUNICIPALITY

MASTER PLANNING AND STATUS REPORT ON THE ELECTRICAL INFRASTRUCTURE IN GANSBAAI

AND STANFORD : PERIOD 2018-2028

(REVISION B)

In July 2015 with all network changes taken into account. The table below summarises the contribution of each element in the network to the total technical loss:

Network Element	% loss contribution
Transformers No Load Losses	0.79
Transformers Partial Load Losses	0.35
MV Network Losses	2.78
LV Network Losses	0.97
Total losses	4.90

The total technical losses was and still is around 4,9 % on the total network which is within acceptable limits.

4. GIS DATABASE



In 2012 WorleyParsons created a new Geographic Information System (GIS) platform and database for the electricity networks in the Gansbaai and Stanford Areas, which is separate but in addition to this masterplan status report.

The GIS platform was developed from scratch with unique attributes compiled for each piece of equipment or material. All previous as-built information of the mentioned electricity networks, including medium and low voltage, consumer connections and streetlight information, was converted and transferred to the new GIS database.

All of these information transferred were re-evaluated and checked for correctness. All quantities applicable were also checked and re-measured as necessary.

The values of the networks were determined by re-calculation of all existing material and equipment rates.

The GIS platform was completed in 2017 with all information up-to-date. All services are placed geographically correct, and technical and statistical details of each piece of equipment and material is

	 WorleyParsons resources & energy	Overstrand Municipality-Energy Losses	
ELECTRICAL ENERGY LOSSES CALCULATION KLEINMOND, HERMANUS AND HAWSTON		Overstrand Municipality - Gansbaai 0	PAGE 2
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**Calculation of network losses in support of NRS 080
Reporting**

**CALCULATION SHEET NOTES
Overstrand Municipality-Energy Losses
NETWORK ANALYSIS AND ENERGY LOSSES
Energy losses calculation**

Notes:

Energy losses comprises:

- 1 System losses due to I^2R losses in distribution networks as calculated by loadflow analysis
- 2 No load losses of inductive element's magnetic circuits.
- 3 Load losses of transformers proportional to loading
- 4 Partial discharge losses - not considered due to destructive nature and maintenance requirements
- 5 Dielectric losses - Not considered
- 6 If this model includes LV distribution losses, it is calculated external to these calculations

Calculation base:

- 1 Network I^2R losses derived from network load-flow analysis
- 2 Network I^2R losses adjusted for averaged load
- 3 Monthly maximum demand and energy statistics required

Definitions

- 1 Demand - Apparent power drawn from supply network.
- 2 Load (Connected, etc) - The total connected load on the system.
- 3 Load Factor (L.F) - The average power in the typical monthly period divided by the peak apparent power
- 4 Demand factor (DF) - The maximum demand divided by the connected load (indicative of reserve capacity)

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OVERSTRAND
Municipality



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Overstrand Municipality-Energy Losses

ELECTRICAL ENERGY LOSSES CALCULATION

KLEINMOND

Overstrand Municipality - Gansbaai

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Date 12/12/2017


MV Network losses including Eracs simulation		Billing/log data				
Category	Value	Month	Demand KVA	Energy kWh	Load Factor	Demand Factor
Network peak power:	P kW	July	3006	207282	0.92	0.74
Network losses from load flow:	P _{loss} kW	Aug	2994	2004824	0.92	0.14
Network Average power:	KVA	Sep	4919	3187201	0.89	0.22
Total electrical losses:	kWh/month	Oct	2777	1859435	0.92	0.13
Transformer No load Losses:	49.0	Nov	2746	1779713	0.89	0.12
Transformer Partial Load losses:	4.1	Dec	3308	2215299	0.92	0.16
MV Network system losses pm:	12.7	Jan	2968	1997481	0.92	0.14
LV Network losses calculated pm:	82359	Feb	2807	1712530	0.84	0.13
Total losses:	130466	Mar	2843	1903823	0.92	0.13
Technical Loss Factor tif:	1.064	Apr	2980	1931315	0.89	0.14
		May	2839	1900149	0.92	0.13
		June	3057	1860896	0.88	0.14
		Avg demand	3104	2639596	0.90	0.14
		Avg power	2792			

Notes:


- 1) Network losses from ERACS models
- 2) Transformer quantities from asset register.
- 3) Billing/Logs from 1 min logs Eskom period Jul 2016 to Jun 2017.

City	kVA	Losses/transformer kW	No load	Load	No load	FL loss	Total loss kW
0	16	0.065	0.44	0	0	0	
1	25	0.12	0.57	0.12	0.12	0.57	
6	80	0.18	1	0	0	0	
9	130	0.3	1.7	0	0	0	
1	190	0.44	2.3	0.44	2.4		
7	200	0.52	2.7	3.84	18.9		
0	250	0.82	3.2	0	0		
17	315	0.72	3.8	12.24	84.6		
5	400	0.81	5.4	4.65	27		
16	500	1.1	5.4	17.6	86.4		
5	630	1.5	6.4	10.4	51.2		
0	800	1.6	5	0	0		
0	1000	1.9	9.5	0	0		
0	1800	2.75	13.5	0	0		
0	2000	3.25	16	0	0		
55			48.99	251.07			

Total installed capacity kVA 21980



OVERSTRAND
ELECTRICAL & MECHANICAL



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Overstrand Municipality-Energy Losses

ELECTRICAL ENERGY LOSSES CALCULATION
HAYSTON & HERMANUS

Overstrand Municipality - Gansbaai

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REV. 0

Date 12/12/2017

HV Network losses including Eracs simulation			
Network peak power:	P kW	Energy kWh	Demand Factor
Network losses from load flow:	27485	12165118	0.92
Network Average power	485		
Network Average power	15701		
Total electrical losses	% loss		
Transformer No load Losses	1.26%		
Transformer Partial Load losses	0.20%		
MV Network system losses p/m	1.01%		
LV Network losses calculated p/m	4.04%		
Total losses	6.51%		
Technical Loss Factor t/f:	1.066		

Billing/log data			
Month	Demand kVA	Energy kWh	Load factor
July	18168	12165118	0.92
Aug	17981	1172490	0.92
Sep	17235	11169460	0.89
Oct	16685	11513166	0.92
Nov	17056	11052502	0.89
Dec	18236	12211010	0.92
Jan	17748	11894066	0.92
Feb	17341	10561579	0.84
Mar	17050	11416654	0.92
Apr	17279	11199499	0.89
May	16884	11306390	0.92
June	17856	11570802	0.89
Avg demand	17444		0.90
Avg power	15701		0.20

Installed Transformer and reactor losses			
Qty	kVA	Losses/unit kW	Total loss kW
0	45	0.065	0
0	25	0.12	0
0	90	0.12	0
5	100	0.3	1.5
4	160	0.44	1.76
32	200	0.62	27.04
1	250	0.62	0.62
84	315	0.72	60.48
10	400	0.84	8.4
56	500	1.1	61.6
25	630	1.3	32.25
5	800	1.6	8
4	1000	1.9	7.6
0	1800	2.75	0
0	2000	3.25	0
227			197.4

Total installed capacity kVA	
38580	38580

Notes:

- 1) Network losses from ERACS models
- 2) Transformer quantities from asset register.
- 3) Billing/Logs from I min logs Eskom period Jul 2016 to Jun 2017.

Overstrand Municipality Water Distribution Losses 2017/2018 per Distribution Area

DEPARTMENT	Bulk Water per Town and Scheme	Water Metered	Losses per Town	Operational Losses	Water Metered plus Operational Losses	Non-Technical Water Losses	Cost per Kℓ Purified	Cost of Water Losses
	Kℓ	Kℓ	Kℓ	Kl	Kℓ	Kℓ	R	R
Water Treatment : Kleinmond	700 267	511 888	188 379	24 104	535 992	164 275	R 0.67	R 110 063.94
Water Treatment : Buffelsrivier	585 098	319 994	265 104	33 922	353 916	231 182	R 0.93	R 214 999.28
Water Treatment : Hermanus (De Bos & b/h)	3 643 596	3 381 326	262 270	33 559	3 414 885	228 711	R 0.26	R 59 464.77
Water Treatment : Stanford	300 486	221 763	78 723	10 073	231 836	68 650	R 0.02	R 1 373.00
Water Treatment : Franskraal	1 054 830	717 181	337 649	43 205	760 386	294 444	R 4.48	R 1 319 110.68
: De Kelders	350 677	238 426	112 251	14 363	252 789	97 888	R 0.32	R 31 324.06
: Greater Gansbaai	1 405 507	955 607	449 900	57 568	1 013 175	392 332		R 1 350 434.74
Water Treatment : Baardskeedersbos	14 708	7 956	6 752	864	8 820	5 888	R 5.14	R 30 264.49
Water Treatment : Buffeljagsbaai	4 443	4 070	373	48	4 118	325	R 0.00	R 0.00
Water Treatment : Pearly Beach	120 373	96 878	23 495	3 006	99 884	20 489	R 0.96	R 19 669.10
Overstrand Totals	6 774 478	5 499 482	1 274 996	163 145	5 662 627	1 111 851		R 1 786 269.30
				163 145	5 662 627			

	%	Kl
Total / General water losses	18.82%	1 274 996
Operational / Technical Losses	2.41%	163 145
Nett / Non-technical water losses	16.41%	1 111 851

Unit Costs per Water Scheme:

Water Scheme Name	Volume of Water Supplied per Water Scheme for 2017/18	Variable cost per Bulk O&M Contract (R/kl)
Buffelsrivier Bulk	585 098	R 0.93
Kleinmond Bulk	700 267	R 0.67
Greater Hermanus Bulk	3 643 596	R 0.26
Stanford	300 486	R 0.02
Greater Gansbaai - Franskraal	1 054 830	R 4.48
Greater Gansbaai - De Kelders	350 677	R 0.32
Pearly Beach Bulk	120 373	R 0.96
Buffeljagsbaai Bulk	4 443	R 0.00
Baardskeedersbos Bulk	14 708	R 5.14
	6 774 478	

Non-Revenue WATER LOSSES : 12 Months Moving Average : June 2018

Administration	Suburb	July 2017	Aug 2017	Sep 2017	Oct 2017	Nov 2017	Dec 2017	Jan 2018	Feb 2018	Mar 2018	Apr 2018	May 2018	Jun 2018	TOTAL
		K£	K£	K£	K£	K£	K£	K£	K£	K£	K£	K£	K£	K£
KLEINMOND	Kleinmond	32 538	28 626	28 212	35 468	36 199	36 723	64 741	47 061	35 843	40 000	32 170	28 925	446 506
Metered	Overhills	2 008	1 848	2 107	1 415	1 783	1 939	2 524	1 896	1 808	2 546	2 355	1 730	23 959
	Proteadorp	2 043	2 016	1 559	1 684	1 952	1 933	2 802	1 862	1 579	1 859	2 547	2 334	24 170
	Uitbreiding 6	1 375	1 332	1 113	1 214	1 274	1 460	2 757	1 262	1 205	1 480	1 567	1 214	17 253
Subtotal		37 964	33 822	32 991	39 781	41 208	42 055	72 824	52 081	40 435	45 885	38 639	34 203	511 888
Bulk Water		53 632	64 017	54 112	52 962	52 196	76 343	71 184	55 988	59 522	60 739	52 573	46 999	700 267
Water Losses		15 668	30 195	21 121	13 181	10 988	34 288	-1 640	3 907	19 087	14 854	13 934	12 796	188 379
% Water Losses		29	47	39	25	21	45	-2	7	32	24	27	27	27
BUFFELSRIVIER	(Battysbaai plus)													
Metered	Pringlebaai plus	23 583	20 553	20 724	21 534	24 059	24 744	51 392	31 876	26 452	28 107	26 336	20 534	319 994
Bulk Water	Hongklip plus	40 280	54 031	53 210	47 262	49 281	61 553	55 857	55 715	46 897	40 228	43 783	37 023	585 098
Water Losses	Rooiels)	16 597	33 478	32 486	25 728	25 202	36 809	4 465	23 839	20 445	12 119	17 447	16 489	265 104
% Water Losses		41	62	61	54	51	60	8	43	44	30	40	45	45
GREATER HERMANUS	De Bos	8	7	8	9	9	27	74	32	21	25	16	12	248
Metered	Eastcliff	21 699	17 508	19 437	28 280	30 658	39 852	54 387	40 257	35 106	32 372	24 239	22 033	365 828
	Fisherhaven	4 791	3 689	4 537	4 489	4 493	5 307	7 844	6 020	4 751	6 190	4 165	4 346	60 622
	Group Development	2 870	2 237	2 299	3 639	3 471	3 914	8 160	5 650	3 565	3 592	3 087	2 151	44 635
	Hermanus Heights	3 873	3 105	3 625	4 648	3 958	5 525	7 954	5 423	3 749	5 270	4 531	3 835	55 496
	Hawston	16 990	13 884	16 338	15 711	14 963	17 107	21 773	19 265	14 849	18 680	14 159	16 667	200 386
	Industria	4 280	3 215	3 194	3 540	3 356	3 606	3 913	3 615	3 447	3 105	3 518	3 320	42 109
	Kleinrivier	102	135	161	177	197	169	301	160	115	172	117	86	1 892
	Mount Pleasant	12 106	11 261	9 617	10 400	12 018	14 074	18 428	11 280	11 521	18 952	10 352	12 316	152 325
	Moosisig	4 996	4 646	3 981	4 855	6 464	5 860	9 562	6 464	5 503	7 258	4 209	4 754	68 552
	Northcliff	14 594	12 006	14 096	15 140	13 947	16 866	24 038	16 054	13 422	14 544	12 424	12 342	179 473
	Onrus	27 508	22 400	24 905	28 654	31 472	35 117	53 212	33 726	28 644	33 712	25 718	24 617	369 685
	Sandbaai	33 307	24 384	30 334	41 067	33 659	44 924	43 160	34 458	25 914	30 563	30 819	23 931	396 520
	Veëlklip	19 805	17 455	17 859	23 954	20 490	25 589	47 684	24 492	20 314	27 182	22 335	19 557	286 716
	Vermont	19 674	16 139	19 060	19 430	19 640	21 955	32 650	24 429	21 323	25 113	16 641	17 876	253 930
	Welcliff	22 981	21 722	22 308	23 894	23 726	24 999	31 781	24 225	19 991	20 924	21 495	20 842	278 888
	Zweilike	35 206	30 935	39 113	32 057	32 403	38 767	40 944	33 618	33 877	41 538	48 130	33 277	439 865
	Bredasdorp Distrik	0	0	0	0	0	0	0	0	0	0	0	0	0
	Benguella Cove	1 577	2 625	12 443	7 660	4 473	5 077	13 077	4 569	3 118	3 739	2 663	2 619	63 640
	Caledon Distrik	3 496	5 943	3 063	4 991	6 971	12 703	26 448	16 647	13 678	12 365	8 832	5 379	120 516
Subtotal		249 863	213 296	246 378	272 595	266 368	321 438	445 390	310 384	262 908	305 296	257 450	229 960	3 381 326
Bulk Water		303 166	274 280	290 540	314 920	311 870	403 500	361 980	286 090	302 240	278 600	272 160	244 250	3 643 596
Water Losses		53 303	60 984	44 162	42 325	45 502	82 062	-83 410	-24 294	39 332	-26 696	14 710	14 290	262 270
% Water Losses		18	22	15	13	15	20	-23	-8	13	-10	5	6	7
STANFORD	Stanford North	8 473	10 287	9 119	9 831	9 526	12 104	11 480	9 730	10 080	10 846	10 066	9 747	121 289
Metered	Stanford South	5 817	6 511	6 117	7 408	8 397	9 963	11 644	10 167	9 837	9 468	8 800	6 345	100 474
Subtotal		14 290	16 798	15 236	17 239	17 923	22 067	23 124	19 897	19 917	20 314	18 866	16 092	221 763
Bulk Water		20 415	21 147	23 214	23 771	25 407	30 005	28 967	25 298	27 305	25 728	25 170	24 059	300 486
Water Losses		6 125	4 349	7 978	6 532	7 484	7 938	5 843	5 401	7 388	5 414	6 304	7 967	78 723
% Water Losses		30	21	34	27	29	26	20	21	27	21	25	33	26
GANSBAAT	Bienpark	6 283	4 670	5 230	5 911	6 255	5 605	7 611	5 792	5 712	6 289	5 249	5 738	70 345
Metered	De Kelders	10 863	8 297	9 863	12 238	11 165	12 457	21 081	15 758	13 324	15 184	12 245	11 312	153 787
	Franskrans	9 156	7 514	8 178	8 898	10 115	9 381	22 400	15 465	10 587	12 740	9 325	8 322	132 081
	Gansbaai	32 462	24 676	24 843	29 283	29 512	36 737	36 683	36 138	29 412	40 213	27 511	29 105	376 575
	GB Industrie Park	1 377	1 394	1 371	1 453	1 491	1 429	1 549	1 136	1 527	1 250	1 494	1 505	16 976
	Kleinbaai	5 677	4 033	4 649	5 305	6 026	6 459	12 322	8 136	6 966	7 922	5 549	4 959	78 003
	Masakhane	2 768	2 657	2 895	3 096	3 209	2 983	3 121	3 172	3 025	3 622	2 980	3 297	36 825
	Bredasdorp Distrik	801	670	539	1 292	472	483	3 245	2 071	973	596	355	336	11 833
	Caledon Distrik	2 700	2 188	2 238	2 707	1 956	8 981	13 358	9 978	10 771	9 398	9 492	5 415	79 182
Subtotal		72 087	56 099	59 806	70 183	70 201	84 515	121 370	97 646	82 297	97 214	74 200	69 989	955 607
Bulk Water		99 847	97 090	100 499	109 395	113 828	146 051	144 113	125 915	132 447	119 098	113 597	103 627	1 405 507
Water Losses		27 760	40 991	40 693	39 212	43 627	61 536	22 743	28 269	50 150	21 884	39 397	33 638	449 900
% Water Losses		28	42	40	36	38	42	16	22	38	18	35	32	32
Metered	B/bos	573	548	404	607	777	627	1 255	674	650	881	481	450	7 956
Bulk Water		843	935	982	1422	1345	1 799	1 621	1 614	1 240	1 136	923	848	14 708
Water Losses		270	387	578	815	568	1 172	366	940	590	245	432	389	6 752
% Water Losses		32	41	59	57	42	65	23	58	48	22	47	46	46
Metered	Buffeljags	320	271	239	374	408	279	444	400	376	339	331	289	4 070
Bulk Water		314	312	349	441	341	432	455	395	344	327	364	369	4 443
Water Losses		-6	41	110	67	-67	153	11	-5	-32	-12	33	80	373
% Water Losses		-2	13	32	15	-20	35	2	-1	-9	-4	9	22	8
Metered	Pearly Beach	8 780	5 298	5 673	7 994	7 839	7 528	16 031	8 640	7 672	9 988	7 018	7 037	96 878
Bulk Water		8 397	8 289	8 058	9 028	9 358	15 479	12 705	10 391	11 389	10 227	8 966	8 076	120 373
Water Losses		1 637	3 001	2 385	1 034	1 519	7 951	-3 326	1 751	4 317	239	1 948	1 039	23 495
% Water Losses		19	36	30	11	16	51	-26	17	38	2	22	13	20
TOTAL		405 540	346 685	381 451	430 307	428 783	503 253	731 830	521 598	440 107	508 034	423 331	378 563	5 499 482
Bulk Water		526 894	520 111	530 964	559 201	563 606	735 162	676 882	561 406	581 384	536 081	517 536	465 251	6 774 478
Non-Revenue Water Losses		121 354	173 426	149 513	128 894	134 823	231 909	-54 948	39 808	141 277	28 047	94 205	86 688	1 274 996
% Water Losses		23.03	33.34	28.16	23.05	23.92	31.55	-8.12	7.09	24.30	5.23	18.20	18.63	18.82
Water Consumption since 1 July 2017		405 540	752 225	1 133 676	1 563 983	1 992 766	2 496 019	3 227 849	3 749 447	4 189 554	4 697 588			

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The operational requirements for purified water for the Overstrand during the 2017/18 financial year can be summarized as follows.

1. Fire fighting.

Fire fighting required 404 kl (Annex "A")

2. Cleaning of reservoirs.

Reservoirs are cleaned (flushed) once a year to avoid sludge settling in the reservoirs from being distributed in the water network. To avoid "contaminated" water entering the system the reservoirs are allowed to drain into the network to approx. 30% of its capacity.

The balance of the water is flushed out with the sludge when cleaning the reservoirs

The total capacity of Overstrand reservoirs is 67 659 kl (Annex "B")

Total amount flushed water is 20298 kl

3. Flushing of pipelines after the repair of burst pipes.

When burst pipes in the distribution networks occur, a certain amount of "debris" (mud etc.) enters the system. In order to avoid contaminated water being supplied to consumers, the pipelines are flushed through fire hydrants for approx. 1 hour at a time at a rate of 50kl/hr.

Due to the long pipelines, lack of valves and fire hydrants in the Betty's Bay network, the flushing time is 6 hours at a time (conservative estimate)

During 2017/18 Betty's Bay experienced 45 burst pipes and in the rest of Overstrand 206 pipe bursts occurred. (Annex "C")

Therefore 13500 kl ($45 \times 50 \text{kl} \times 6 \text{hrs}$) for Betty's Bay and 10300 ($206 \times 50 \text{kl} \times 1 \text{hr}$) for the rest of Overstrand was flushed , totalling 23800 kl.

4. Water used by contractors (metered standpipes)

Private contractors appointed to execute municipal contract use potable water during the execution of their contracts. This consumption is accounted for by means of metered standpipes.(Annex "D") The total amount used for this purpose is 3241 kl

5. Water meter audit (accuracy of domestic watermeters)

All water meters in the Overstrand were audited by Worlay Parsons Consulting Engineers during 2011. With age, the accuracy of the domestic water meters deteriorate and according to this report, meters older than 10 years are reading 8% less than the actual consumption. According to a report (Annex F) extracted from DB4 9849 meters were older than 10 years on 30 June 2018. The total consumption (billed) for 2017/18 was 5,499482 kl, with a average annual consumption of 146 kl per consumer (37777 meters in total). Thus 9849 meters were "under reading" by 8% on an average annual consumption of 146 kl.


115036 kl consumption was therefore not accounted for, due to the "under reading" of the individual water meters, due to their age.

6. Replacement of water meters.

A contract for the replacement of watermeters is currently under way. In order to limit inconvenience to consumers these replacements is done "live". During this operation 0.25kl is lost per meter replaced.

1464 watermeters were replaced (Annex "E") totalling 366 kl lost in the process.

**Total losses due to operational requirements during 2017/18
is 163145 kl.**


M. Bartman

6 July 2018