

**Directorate: Water Resources Planning Systems** 

Development of **Annual Operating Rules** for the Integrated Vaal River System (IVRS)

**April 2018 Monthly Monitoring Report** 



May 2018

## Vaal River System: Annual Operating Analysis 2017/2018

Three yearly reservoir projections for all major dams in system

Trichardsfontein: 50% (Level = 1630.3)

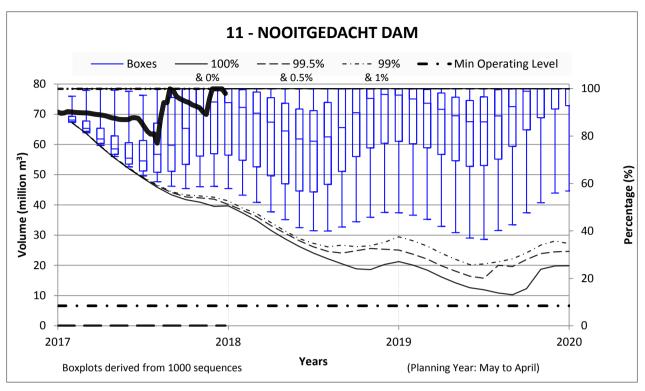
Lesotho Highlands Phase 2 (Polihali) was not modelled. It may start delivery in December 2024.

Note: Historical reservoir performances were updated to include actual dam storages up to 7 August 2017

It is important to note that the simulated reservoir trajectories are based on a scenario which was analysed as Scenario 17Ec which includes the updated system operating rules for the 2017/2018 AOA adopted at the SOF Meeting held on 10 Jul 2017. A detailed description of the operating rules adopted for Scenario 17Ec is provided below.

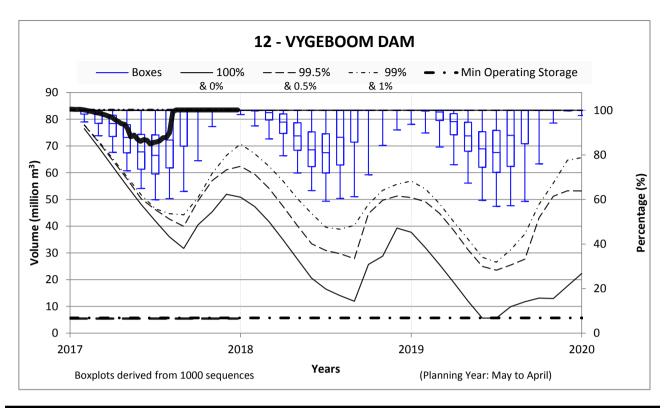
## A detailed description of the operating rules adopted for Scenario 17Ec is provided below. OPERATING RULES (2017/2018): Based on Scenario 17Ec (10 Jul 2017) Rand Water: Long-term demands were based on the RW 2003 Questionnaire projection passing through the actual water use of 1629 million m3/a recorded for 2015/2016 as starting point. This High water requirement projection does not include Water Conservation and Water Demand Management. The demand projection is the same as was used in 2015/16. Eskom: May 2017 Base Scenario water requirement projections. These projections show a reduction of about 40 million m<sup>3</sup>/a from 2020 of which 20 million m<sup>3</sup> occurs in the system b supplied from the Komati System. DWS should update the consumption data for all the Komati 3rd Party Users (i.e Hendrina, Anglo American, Optimum, Eyesizwe, Koornfontein Midvaal WC and Sedibeng Water: The revised May 2017 projections were adopted. С Sasol Secunda (Sasol 2&3): The May 2017 demand projection (which included a 14 MI/d intake from RW until end June 2024) was adopted for the analysis. The projected demand remains below 85 million m³/a until Jun 2024 when it increases to 90 million m³/a. Sasol Sasolburg (Sasol 1): The updated water requirement projection provided in May 2017 was used for this analysis. е Mittal Steel (previously known as Iscor): A reduced projection below 10 million m<sup>3</sup>/a was used for this analysis because the consumption for the last 5 years has been below 10 million m<sup>3</sup>/a. Other Urban/Industrial Users including small towns in the VRESS: The High Demand projections obtained from the All Towns Reconciliation Strategy Study (May 2011) as well as the Stand Alone Dams Study (April 2013) were adopted for consumption centres who do not receive their water from bulk water suppliers. The projections for Kroonstad and Potchefstroom were adjusted for use in the 2013/2014 AOA based on the 2012/2013 actual water use information. The Vaal Gamagara water use projection was revised based on Demand Projections information compiled as part of the Reconciliation Study undertaken for the Vaal Gamagara Scheme (August 2011). Irrigation: Information from the Water Use Compliance Enforcement Study for the Upper Vaal WMA, as presented in the 2014/15 AOA report indicated that the gross 2014 unlawful irrigation water use for 2014 was about 28.6 million m<sup>3</sup> more than the targeted 22.7 million m<sup>3</sup> (significantly less than the original unlawful use of 235 million m<sup>3</sup>/a). It was assumed that this additional 28.6 million m3/a was eliminated in 2015. It was also assumed that the existing lawful use in the Upper Vaal WMA was used. VRESAP 3rd Party Users: It was assumed that the projected VRESAP 3rd Party use reached the full allocated amount of 9 million m3/a in 2016. Qwa-Qwa Water Supply Scheme (WSS): Phase 1 abstractions from Sterkfontein Dam were included in the analysis. It was also assumed that Phase 2 of the WSS will be completed by the end of February 2019 with Phase 2 abstractions commencing in March 2019. Total capacity from both phases is 7.3 million m<sup>3</sup>/a Witbank (Region B) users: Modelled within Olifants sub-systems with no support from Vaal for the entire period of analysis. k Compensation and Environmental Releases Vygeboom compensation releases. Compensation releases of 0.65 m<sup>3</sup>/s (20.5 million m<sup>3</sup>/a) from Vygeboom Dam for the entire period of analysis. Grootdraai and Zaaihoek compensation releases. Revised compensation releases for Grootdraai (22.1) and Zaaihoek Dams (11.4) based on normal inflow: (Additional releases of 22.1 and 5.1 Mm<sup>3</sup>/a respectively). Sengu environmental releases. Revised releases from Katse and Mohale Dams for the Ecological Reserve modelled by means of adjusted IFR structures in accordance with an assessment that was made in 2003 (LHDA 2003) Releases from Driel: Compensation release of 2m<sup>3</sup>/s made from Driel for downstream users. Release from Nooitgedacht Dam: 0.15m<sup>3</sup>/s Releases from Westoe, Jericho and Morgenstond Dams modelled in WRPM are 0.037, 0.015 and 0.038 m3/s Grootdraai releaseses to Standerton and the EWR. According to the Recon strategy the releases will be the maximum of either Standerton's demand (about 11 million m3/a) or the EWR (about 20 million m<sup>3</sup>/a during normal years). i.e. Not the sum of both... In winter Standerton's requirements will predominate, while in the wet season / summer the EWR may For Bloemhof-Vaal sub-system reduce the yield of the short-term characteristic curves for nett storages less than 60% by 15%. This adjustment ensured that there is a less than 1 in 200 risk that the storage available to Randwater (in the Katse, Mohale, Sterkfontein and Vaal Dams) will reach their dead storage (940 million m3) prior to the delivery from LHWP phase II (Polihali). One reason for this adjustment is that the curtailment of consumers in the Upper Vaal is based on the combined storage in the Vaal, including Bloemhof. Increased dilution releases from the Vaal Dam (due to Acid Mine Drainage) result in a larger portion of this combined storage sitting in Bloemhof Dam, rather than the Vaal Dam, where it is inaccessible to consumers in the Upper Vaal. If the AMD treatment is fast tracked or the TDS is less than expected then less water wll be released into the Bloemhof Dam then one Curtailment could consider reverting to the original, unadiusted STCC. Strategic Demands (Eskom / Sasol) uncurtailed 0 Urban Demands Urban demands on the Mooi and Renoster Rivers from the following dams were uncurtailed: Mooi River (Klerkskraal, Boskop, Lakeside/Potchefstrroom & Klipdrift Dams) & Renoster River (Koppies Dam)) Irrigation uncurtailed (including irrigation demands on the Mooi and Renoster Rivers) q Allemanskraal Dam: Urban users unrestricted and irrigation users restricted by 25% s Erfenis Dam: Urban and irrigation users unrestricted Westoe-Jericho gravity feed: Transfers (with maximum transfer capacity of 1.62m3/s from 1 Aug 2017) regulated by the revised Usutu inter-reservoir operating rules adopted in 2006. u Morgenstond-Jericho Transfer: Transfers (with maximum transfer capacity of 3.182 m3/s from 1 Jul 2017) regulated by the revised Usutu inter-reservoir operating rules adopted in ٧ Jericho-Camden transfer. 2m<sup>3</sup>/s until 31 Jul 2017, therafter 2.8m<sup>3</sup>/s Usutu to Komati: Because of the reduced demand in the Komati the Usutu-Komati link need not be used. W Heyshope-Grootdraai: Heyshope pump station capacity increased from 3.0 to 4.3 m<sup>3</sup>/s on 1 Aug 2017. Zaaihoek to Grootdraai. Assume full 2.16m<sup>3</sup>/s available Katse-Mohale tunnel. Closed for maintenance until 31Jan 2018 Thukela-Vaal transfer: Assume that up to 14.6m<sup>3</sup>/s (of the 18.8 capacity) can be pumped from the Driel to Kilburn and up to 20m<sup>3</sup>/s (of the 24 capacity) can be pumped from Kilburn to ab Sterkfontein if there is sufficient inflow. In the current year (2017/18) transfers will stop when the Sterkfontein Dam is full and no releases will be made from Sterkfontein Dam Releases are normally planned during the rain season. Infrastructural constraints Vaal River Eastern Sub-system Project (VRESAP): For the first two years of analysis assume that the VRESAP pipeline can transfer 3.3m3/s, increasing to the capacity of 5.07m3/s in the third year. The scenario assumed that only when Grootdraai Dam drops to 50% capacity would water be supplied via VRESAP to reduce pumping costs. However, after the analyses were finalized, Sasol obtained water quality information which indicated it would be cheaper to use some water from the Vaal Dam on a continuous basis and the targets were adjusted to include a minimum demand of 60 million m<sup>3</sup>/a on the VRESAP pipeline. This also ensures continuous oparation and maintenance of pumps. Vlakfontein Canal Rehabilitation: It was assumed that future maintenance of the canal will be planned without interrupting the flow in the canal. ad Rietfontein-Matla (Kusile) Pipeline: Increased by 0.45 m<sup>3</sup>/s to 3.68 m<sup>3</sup>/s Eskom pipeline from Rietfontein (near Matla) to Duvha: The new Eskom pipeline was assumed to have a capacity of 1.6m³/s for the full period of analysis. Although the capacity was assumed to be 1.6m3/s it was assumed that Eskom would only be able to supply up to 50% of Duvha's water use from the Vaal in the first year from May 2017 and 90% thereafter. Limiting the water supply from the Vaal to Duvha Power Station via the new Rietfontein-Duvha pipeline causes a shift in demand from one sub-system to another. Because of the reduction in demands on the Komati System the Duvha link is unlikely to be used. Minimum Operating Levels Vaal Dam: 18% supply to Rand Water (Level = 1473.25m. Storage = 470 million m<sup>3</sup>) BLIT WRPM currently uses 167 million m<sup>3</sup> Vaal Dam: 16% supply to VRESAP (Level = ?m, Storage = 419 million m3). Vaalharts Weir: 90% level (1189.67 m). **Bloemhof Dam:** 6% (Level = 1219.32m, Storage = 74.55 million m<sup>3</sup>).

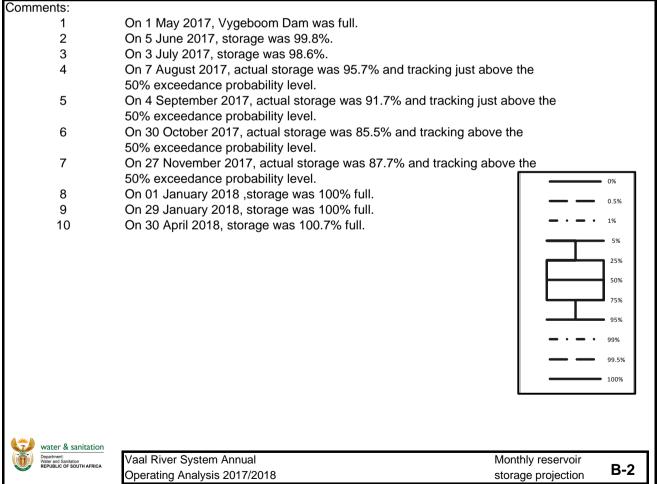
		Revised Usutu Inter-Reservoir Operating Rules: The revised 2006 inter-reservoir operating rules were adopted for this scenario. Draw down sequence from the "Usutu system: Inter-
		reservoir operating rules" plot:
		1 Westoe Upper 50%
		2 Jericho Upper 30%
	ai	3 Morgenstond Upper 79%
		4 Westoe Bottom 50% to RL 1537.5
		5 Mordenstond (10% to 21%)
		6 Jericho Bottom 70% to RL1457
		G Serial Solition 170% to RL 1358.15
		Transfers to Grootdraai Dam (Heyshope-Grootdraai and Zaaihoek-Grootdraai): The modelled operating rule for 2017/18 transferred from Heyshope to maintain Grootdraai Dam
		@ 90% (90% FSC storage = 315.38 mill m3 with level of 1548.02m). However it is recommended that for revised VRESAP operating rule that the transfers occur even when
	aj	Grootdraai Dam is full. No transfer from Zaaihoek Dam in the 2011/1/18 year but thereafter the transfers are only made when Grootdraai Dam drops to 75% storage level of 1546.462m
		Orbotulaal Daili is full. No transfer from Zaambek Daili iif the 2017/10 year but the transfers are only made when Grootulaal Daili drops to 73% storage level of 1340.40211
es	ak	When Grootdraai Storage drops below 50% water the abstractions supplied from Grootdraai via the Vlakfontein Canal are transferred to the Vaal Dam via the VRESAP
<u></u>		pipeline.
Operating Rules	al	Rietfontein-Duvha link switched off from 1 May 2019 because of the surplus water available in the Komati Basin
ati		Heyshope Dam Buffer Storage: When the storage in Grootdraai Dam drops below the following levels transfers to Grootdraai Dam are stopped to keep the water in reserve to
)er		transfer to Morgenstond:
ŏ	am	* May 2016 to March 2018 - Reserve storage below 150 million m3 (Level of 1294.54m) for transfer to the Usutu;
		* March 2019 to end of analysis period - Reserve storage below 58 million m <sup>3</sup> (Level = 1289.63 m) for transfer to the Usutu.
		Heyshope - Morgenstond transfer: from May 2016 onwards transfer when Morgenstond is below 50 million m <sup>3</sup> (level = 1378.144 m). Heyshope and Geelhoutboom pump stations
	an	assumed to be constrained as described above
		Dilution rule: Rand Water supplied from Vaal Dam with releases from Vaal Dam to maintain the TDS concentration downstream of Vaal Barrage at 600 mg/l, i.e. apply dilution rule in
		Vaal Barrage according to the newly developed Dilution Model. (Note:Simulated results based on dilution releases as determined by the water quality rule incorporated in the WRPM
	ao	configuration). This results show the storage in the Bloemhof Dam increasing to over 250 million m3 during extreme droughts (driest sequence out of 1000 sequences analysed) at the
		same time as the dams supplying Gauteng are almost empty
		Mine Dewatering and re-use thereof: During 2016 the observed Acid Mine Inflow from the Central and Eastern basin were 22.7 mill m³ @3900mg/l and 25.2 mill m³ @
		2400mg/I and these values were adopted for 2017. It was assumed that the water from the Central and Eastern Basins would be treated from Jan 2022 and provided to Rand Water
	ар	, · · · · · · · · · · · · · · · · · · ·
		at a TDS concentration of 200 mg/l. From Feb 2022 onwards it was assumed that only discharges from the Far Western Basin (amounting to 16.44 million m³/a) were made to the river
		systems with an associated TDS concentration of 700 mg/l.
	aq	Releases to Bloemhof Dam: There is no need for releases from the Vaal Dam to the Bloemhof Dam this year as the storage in Bloemhof remains well above minimum operating level
	- '	of 6%.
	ar	LHWP scheduled transfers: The monthly transfer schedule provided by the LHDA (amounting to 780 million m³/a), was adopted for the 2016/17 planning period. No provision was
		made for releases into the Caledon River to support Bloemfontein.
SIS		Grootdraai and VRESAP to Usutu-Vaal Power Stations: Transfer 37 million m <sup>3</sup> from Grootdraai and VRESAP pipeline to the Usutu-Vaal Power Stations (according to the monthly
ısfe	as	flow rates provided in the Monthly Monitoring Report). That means, for example, that 84% of Matla's water requirements could be supplied from Grootdraai Dam and the VRESAP
Transfers		pipeline.
F		Usutu to Usutu-Vaal Eskom PS (Camden, Kendal, Kusile, Kriel and Matla) and DWA 3 <sup>rd</sup> Party Users: Transfer 77.1 million m <sup>3</sup> from the Usutu to the remaining Usutu-Vaal PSs
	at	(i.e. 100% of the Camden, 100% DWS 3rd Party users, Kendal and Kriel demands and 16% of Matla's demand to be supplied from the Usutu) . Transfers to be made according to the
		monthly flow rates provided in the Monthly Monitoring Report.
_		Rietspruit Dam: This dam is monitored as a stand-alone system and has a separate, dedicated SOF and will no longer be included as part of the Vaal monitoring report. Drought
llar	au	restrictions have been implemented.
Miscellan eous	<u> </u>	·
Mis	av	Spitskop Dam: This dam is monitored as a stand-alone system and has a separate, dedicated SOF and will no longer be included as part of the Vaal monitoring report.
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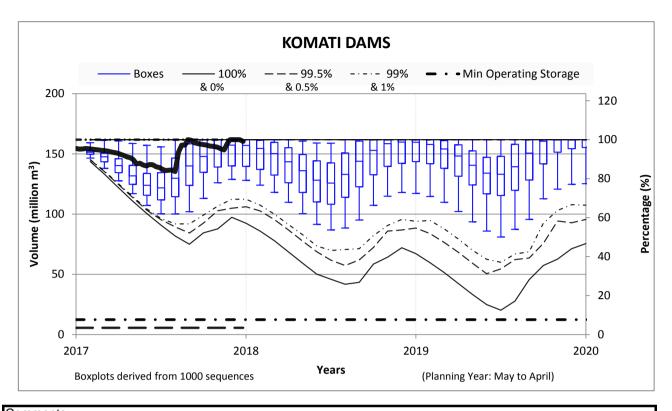


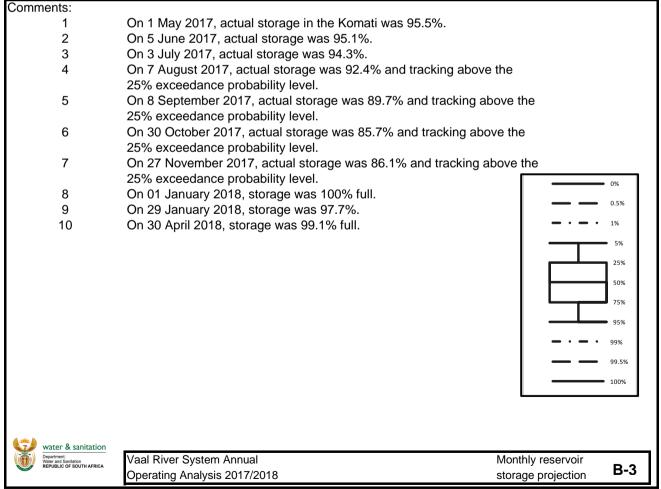
Comments:	
1	On 1 May 2017, storage was 90.2%.
2	On 5 June 2017, storage was 90.1%.
3	On 3 July 2017, storage was 89.9%.
4	On 7 August 2017, storage was 88.9% and tracking above the 25% exceedance probability level.
5	On 4 September 2017, storage was 87.6% and tracking above the 25% exceedance probability level.
6	On 30 October 2017, storage was 85.9% and tracking above the 25% exceedance probability level.
7	On 27 November 2017, storage was 81.1% and tracking below the 25% exceedance probability level.
8	On 01 January 2018 ,storage was 100% full.
9	On 29 January 2018, storage was 95.2%.
10	On 30 April 2018, storage was 98.6%.
	- • - • 1%
	5%
	25%
	50%
	75%
	/ /5%
	95%
	<b>- • - •</b> 99%
	99.5%
	100%

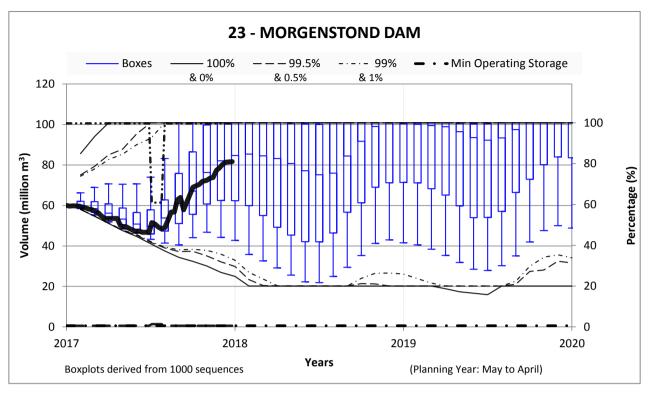
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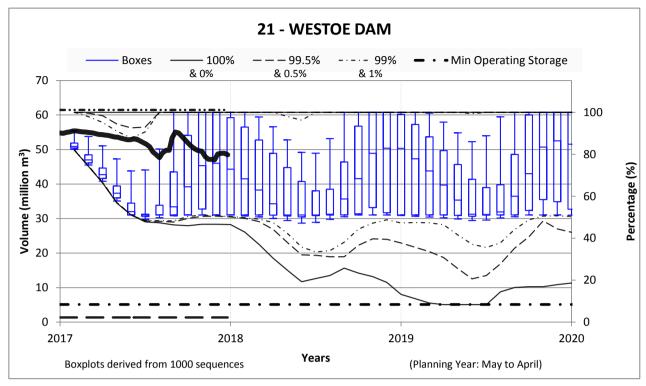


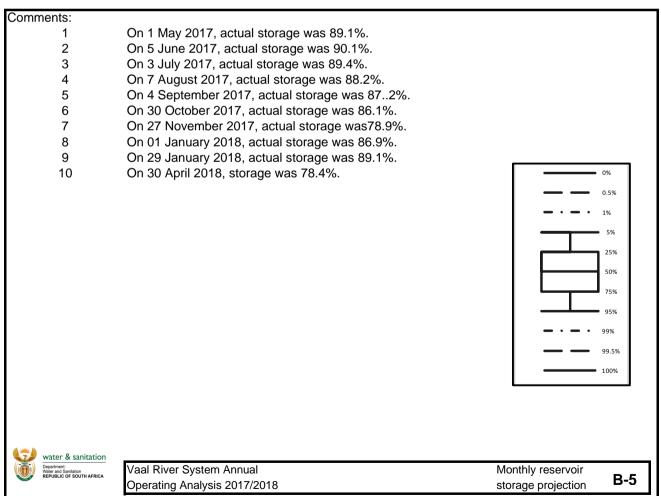


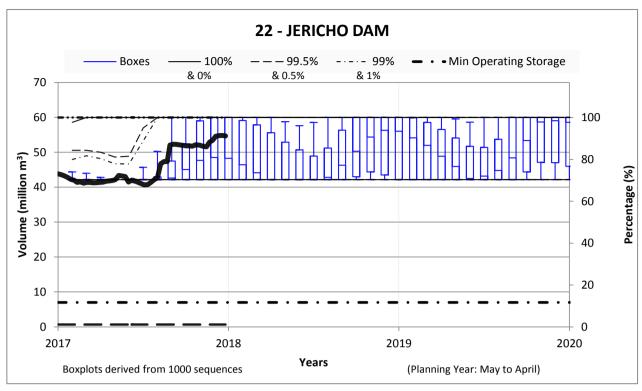


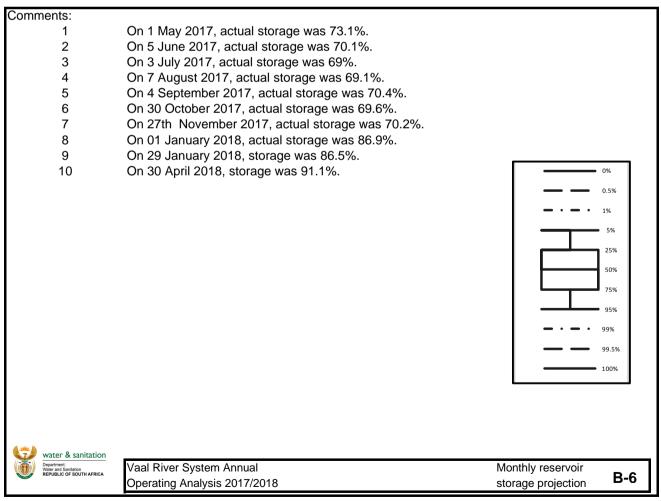


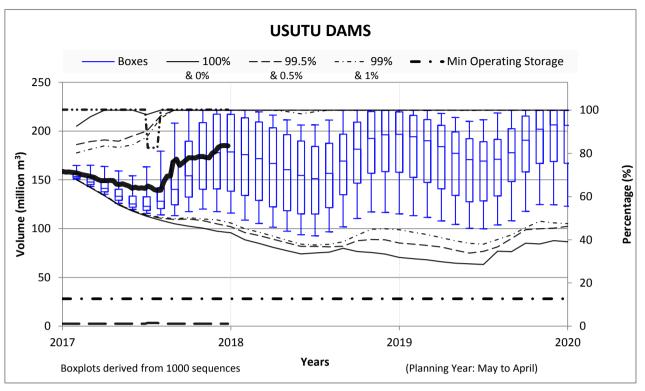
Comments:		
1	On 1 May 2017, actual storage was 59.6%.	
2	On 5 June 2017, actual storage was 58.8%.	
3	On 3 July 2017, actual storage was 56.8%.	
4	On 7 August 2017, actual storage was 53.3%.	
5	On 4 September 2017, actual storage was 49.2% and tracking just a 95% exceedance probability level.	above the
6	On 30 October 2017, actual storage was 46.3% and tracking on the 75 % exceedance probability level.	
7	On 30 October 2017, actual storage was 47.3% and tracking on the 75 % exceedance probability level.	0%
8	On 1 May 2017, actual storage was 62.4%.	- 0.5%
9	On 29 January 2018, storage was 67.7%.	0.5%
10	On 30 April 2018, storage was 81.1% full.	<b>- · - ·</b> 1%
	•	5%
		25%
		50%
		75%
		95%
		<b>- · - ·</b> 99%
		99.5%
		100%
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water & sanitation		
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	Operating Analysis 2017/2018 std	orage projection D-4

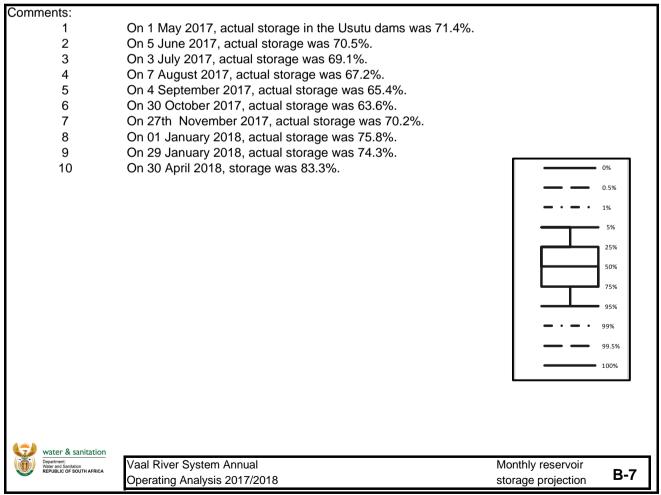


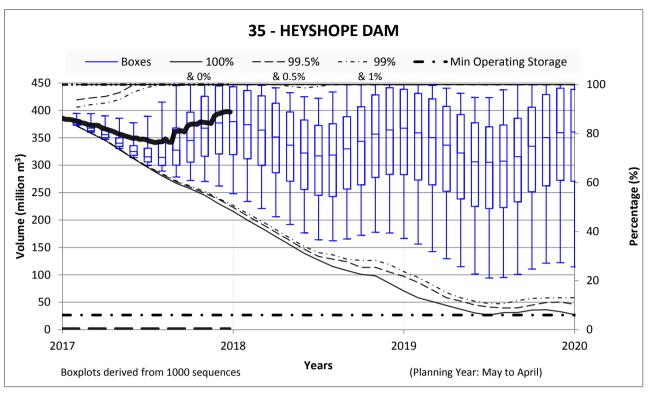


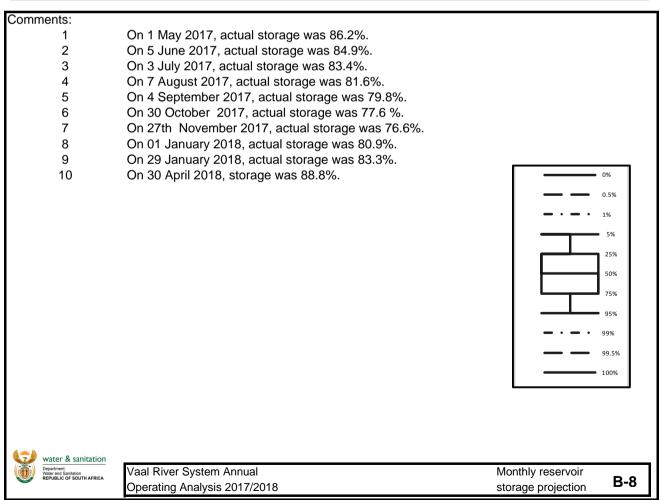


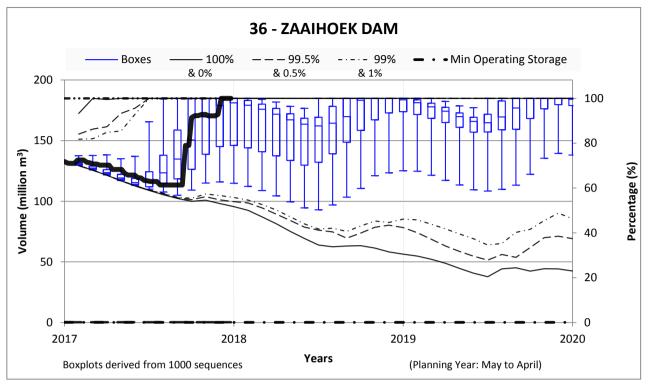


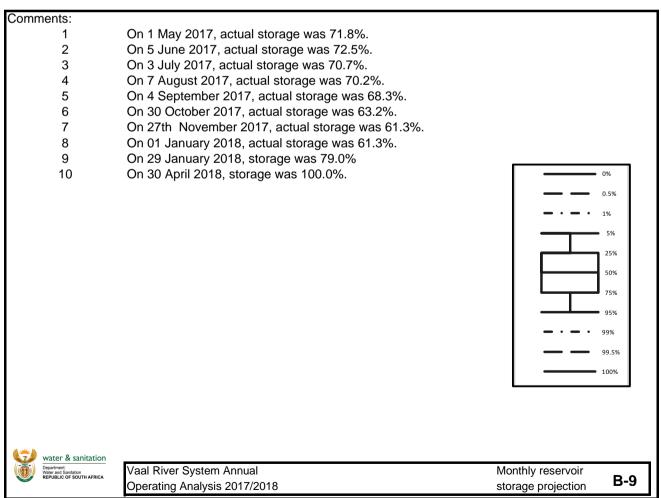


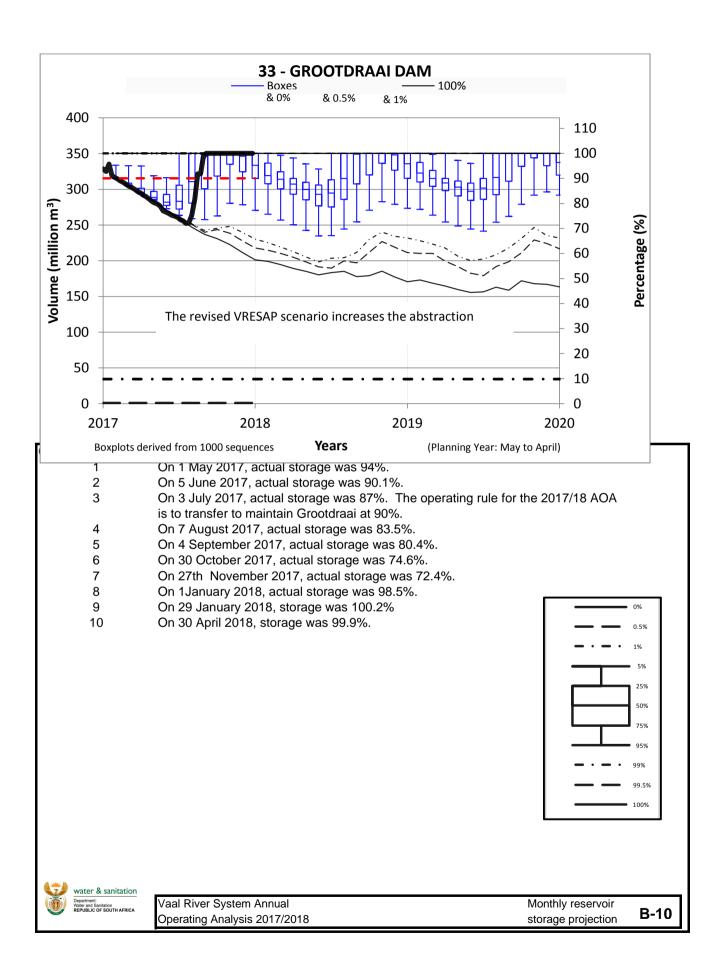


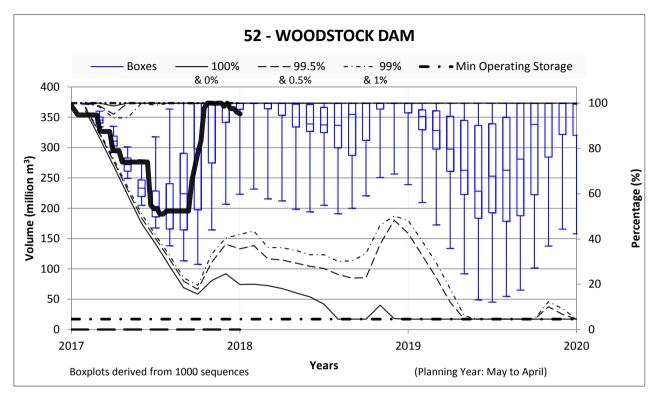


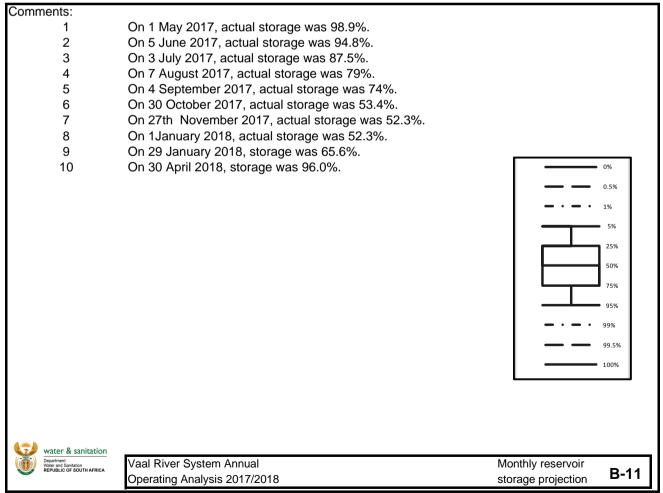


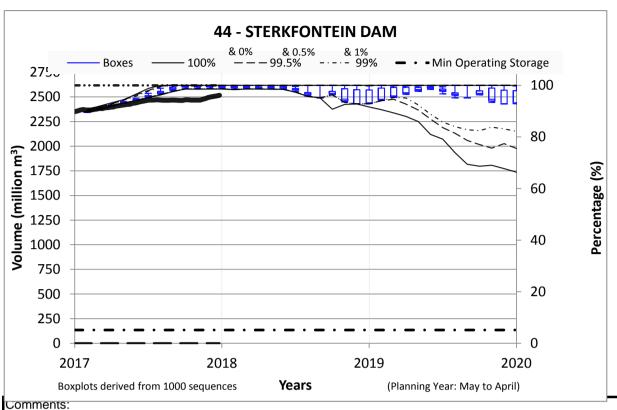




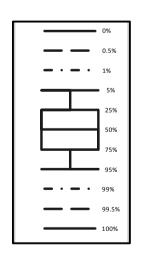




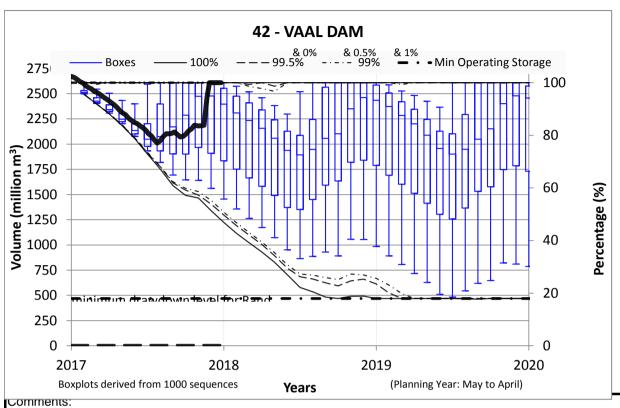




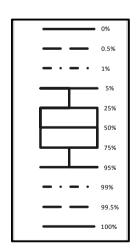
Comments:	
1	On 1 May 2017, actual storage was 89.8%.
2	On 5 June 2017, actual storage was 90.4%.
3	On 3 July 2017, actual storage was 91%.
4	On 7 August 2017, actual storage was 91.6%.
5	On 4 September 2017, actual storage was 92.4%.
6	On 30 October 2017, actual storage was 94.1%.
7	On 27th November 2017, actual storage was 94.4%.
8	On 1January 2018, actual storage was 94.3%.
9	On 29 January 2018, actual storage was 94.2%.
10	On 30 April 2018, storage was 96.1%.



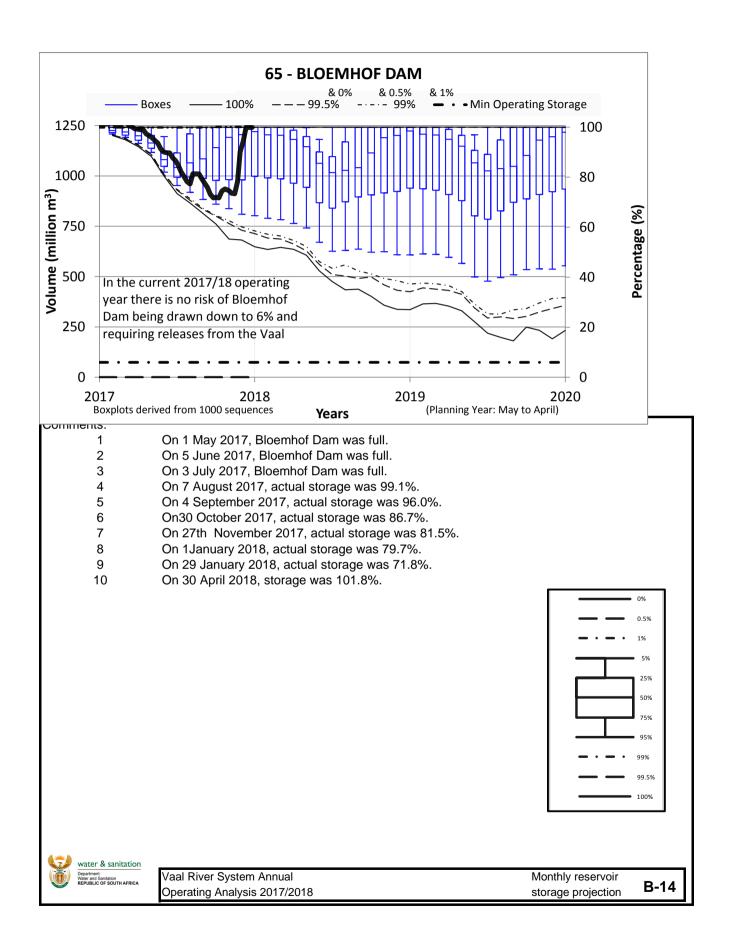


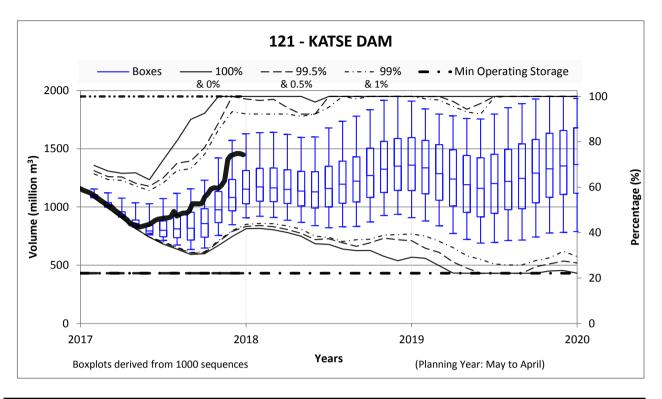


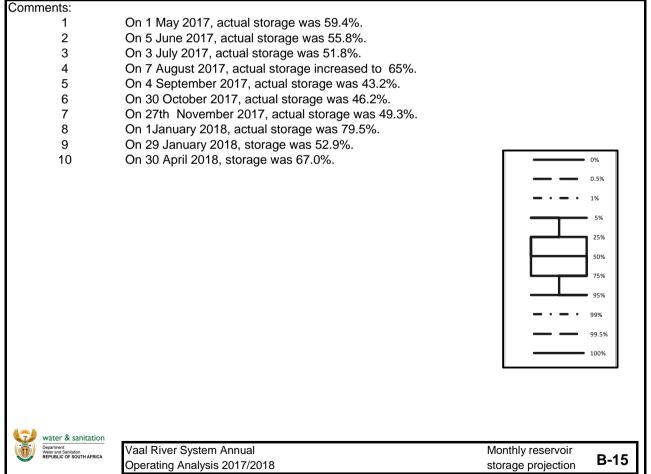
Comments:	
1	On 1 May 2017, Vaal dam was full.
2	On 5 June 2017, actual storage was 98.9%.
3	On 3 July 2017, actual storage was 96.2%.
4	On 7 August 2017, actual storage was 92.4%.
5	On 4 September 2017, actual storage was 88.5%.
6	On 30 October 2017, actual storage was 81.8%.
7	On 27th November 2017, actual storage was 77.0%.
8	On 1January 2018, actual storage was 80.7%.
9	On 29 January 208, storage was 79.6%.
10	On 30 April 2018, storage was 104.6%.

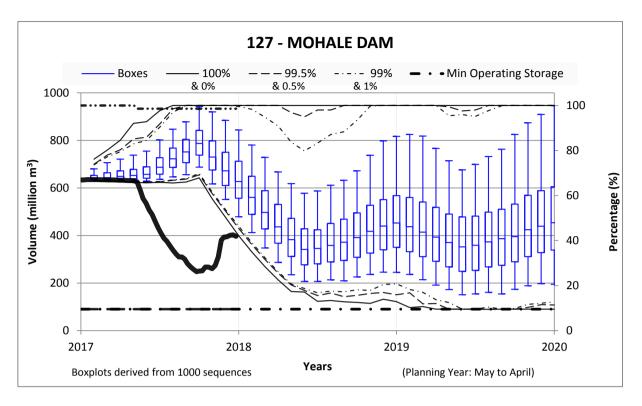




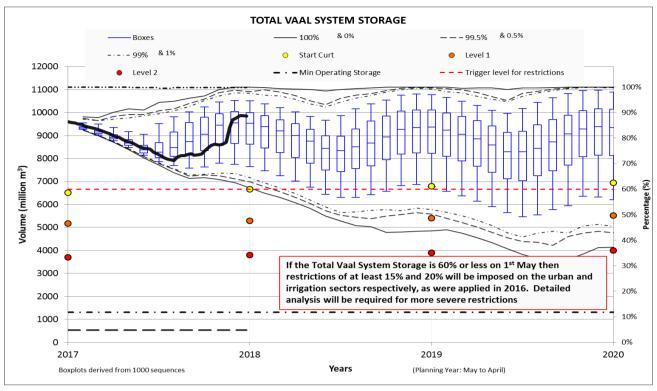


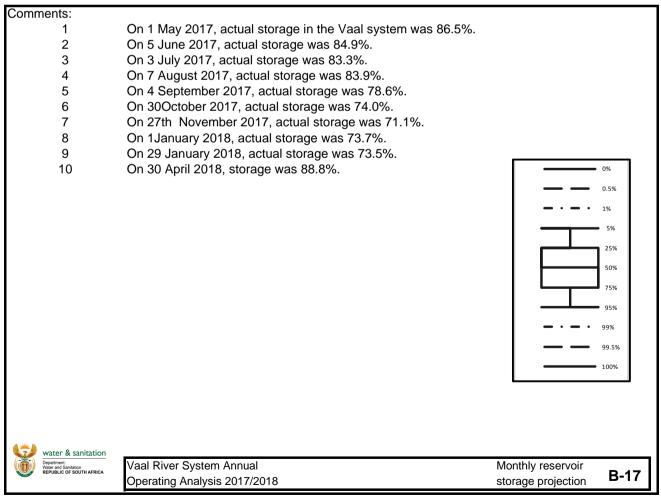


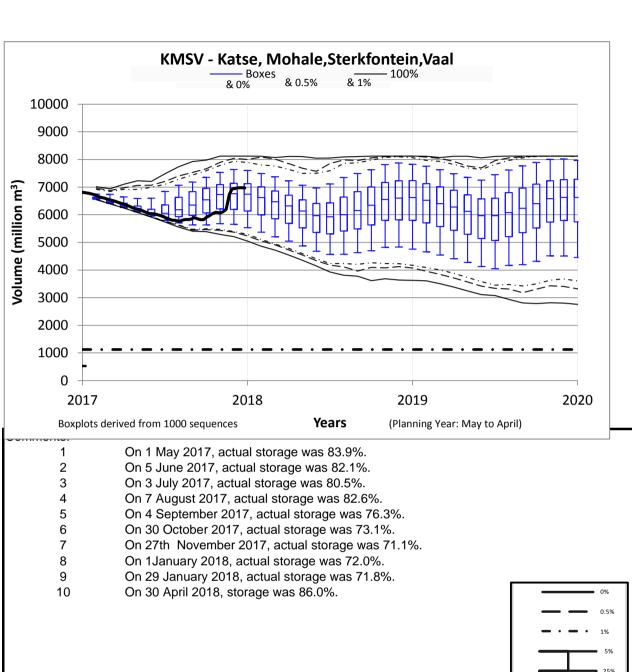


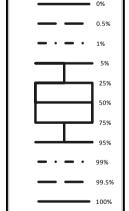


Comments:		
1	On 1 May 2017, actual storage was 66.9%.	
2	On 5 June 2017, actual storage was 67%.	
3	On 3 July 2017, actual storage was 66.9%.	
4	On 7 August 2017, actual storage was 66.7%.	
5	On 4 September 2017, actual storage was 66.5%.	
6	On 30 October 2017, actual storage was 46.2%. The Katse-Methe 8th of September 2017, 5 months earlier than the anticipate storage is plotting outside the projected storage.	•
7	On 27th November 2017, actual storage was 38.2%.	
8	On 1January 2018, actual storage was 32.3%.	0%
9	On 29 January 2018, storage was 26.6%.	
10	On 30 April 2018, storage was 36.4%.	- • - 1%
		5%
		25%
		50%
		75%
		95%
		<b>- • - •</b> 99%
		99.5%
		100%
al sake lik		
water & sanitation  Department:	Vaal River System Annual	Monthly recorrein
Water and Sanitation REPUBLIC OF SOUTH AFRICA	Vaai River System Annual Operating Analysis 2017/2018	Monthly reservoir storage projection B-16
	Operating Analysis 2017/2010	Sidiage projection

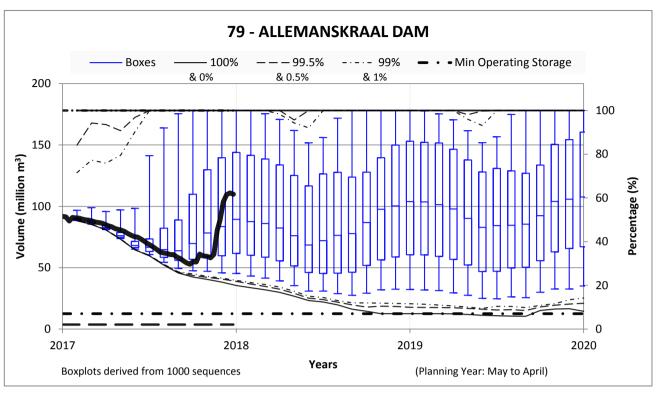




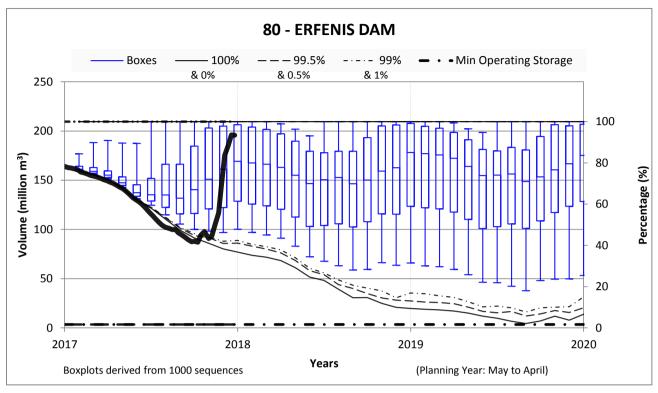




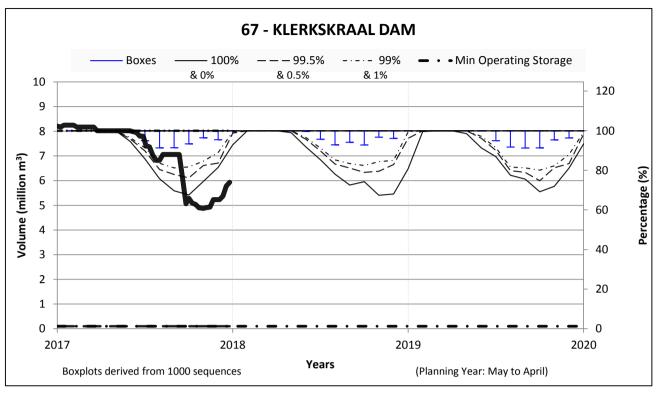


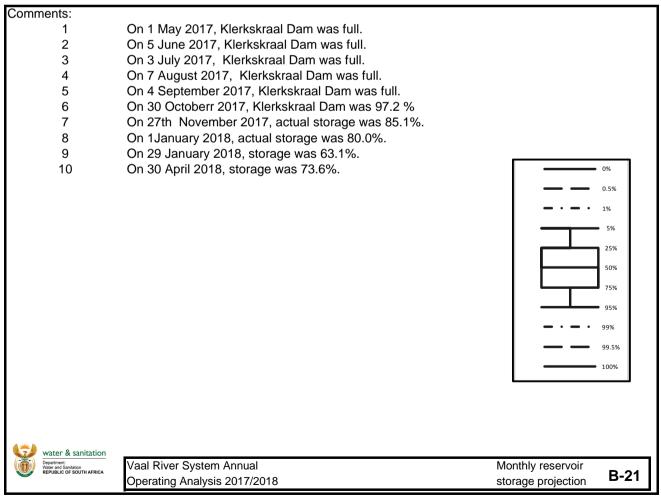


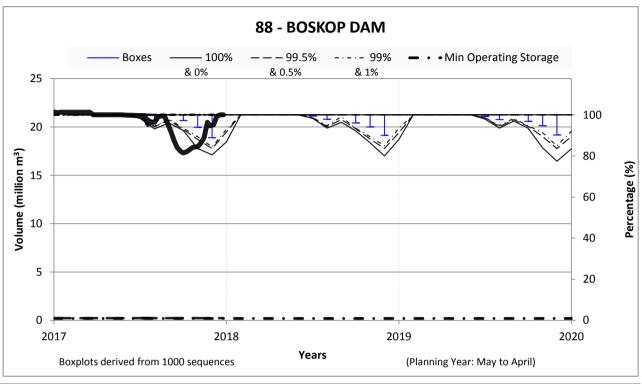
Comments:		
1	On 1 May 2017, actual storage was 51.6%.	
2	On 5 June 2017, actual storage was 50.7%.	
3	On 3 July 2017, actual storage was 49.4%.	
4	On 7 August 2017, actual storage was 47.3%.	
5	On 4 September 2017, actual storage was 45.3%.	
6	On 30 October 2017, actual storage was 39.1%.	
7	On 27th November 2017, actual storage was 35.1%.	
8	On 1 January 2018, actual storage was 33.0%.	
9	On 29 January 2018, actual storage was 29.7%.	
10	On 30 April 2018, storage was 60.9%.	
		0.5%
		<b>— · — ·</b> 1%
		5%
		25%
		50%
		75%
		95%
		<b>─ · ─ ·</b> 99%
		99.5%
		100%
		100%
ما عند له		
water & sanitation		
Water and Sanitation REPUBLIC OF SOUTH AFRICA	Vaal River System Annual	Monthly reservoir
	Operating Analysis 2017/2018	storage projection <b>B-19</b>

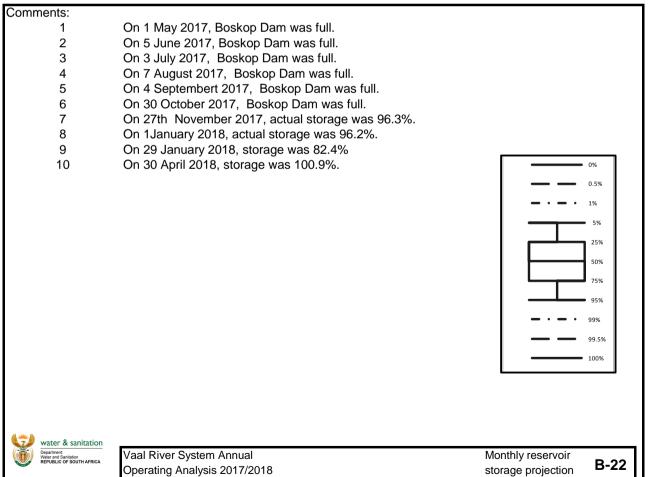


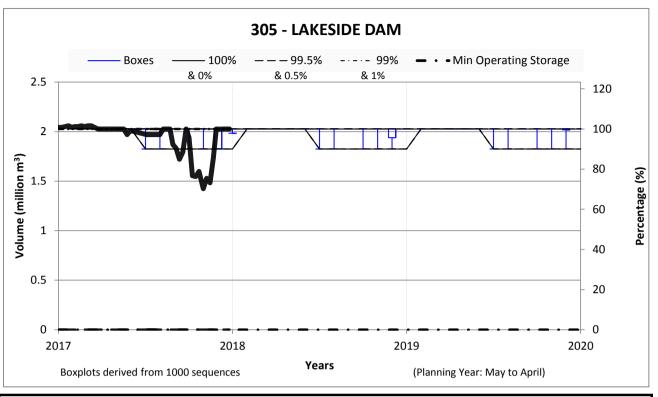
Comments:		
1	On 1 May 2017, actual storage was 78.3%.	
2	On 5 June 2017, actual storage was 75.6%.	
3	On 3 July 2017, actual storage was 73.6%.	
4	On 7 August 2017, actual storage was 70.7%.	
5	On 4 September 2017, actual storage was 67.5%.	
6	On 30 October 2017, actual storage was 56.0%.	
7	On 27th November 2017, actual storage was 49.7%.	
8	On 1January 2018, actual storage was 46.1%.	
9	On 29 January 2018, storage was 41.8%.	
10	On 30 April 2018, storage was 93.3%.	0%
		0.5%
		<b>- · - ·</b> 1%
		5%
		25%
		50%
		75%
		95%
		<b>— • — •</b> 99%
		99.5%
		100%
water & sanitation		
Department: Water and Sanitation	Vaal River System Annual	Monthly reservoir
REPUBLIC OF SOUTH AFRICA	Operating Analysis 2017/2018	storage projection B-20
	-1 3 7	

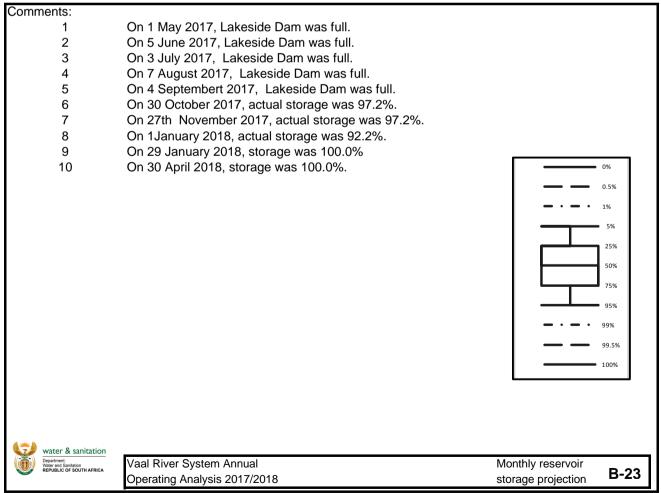


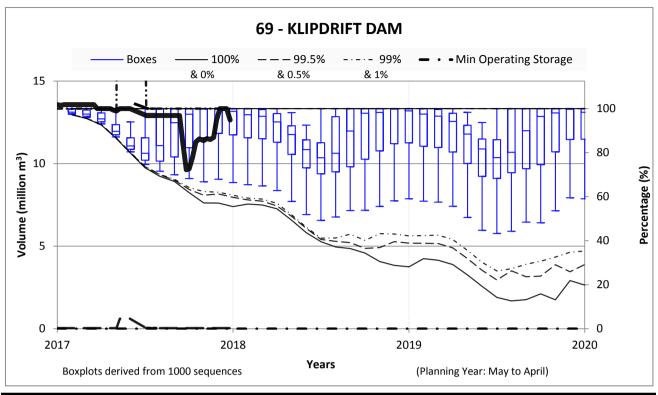


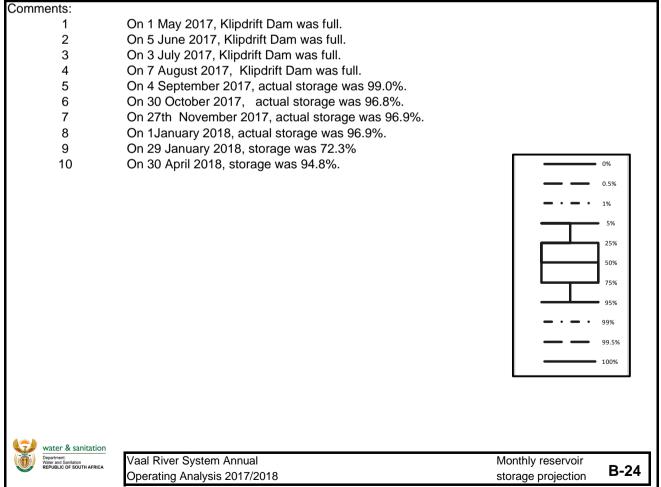


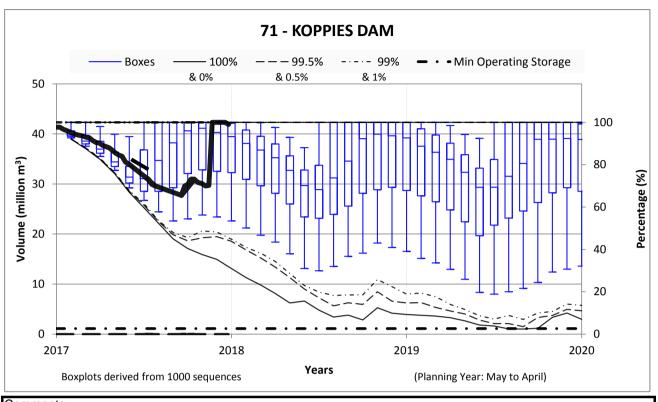


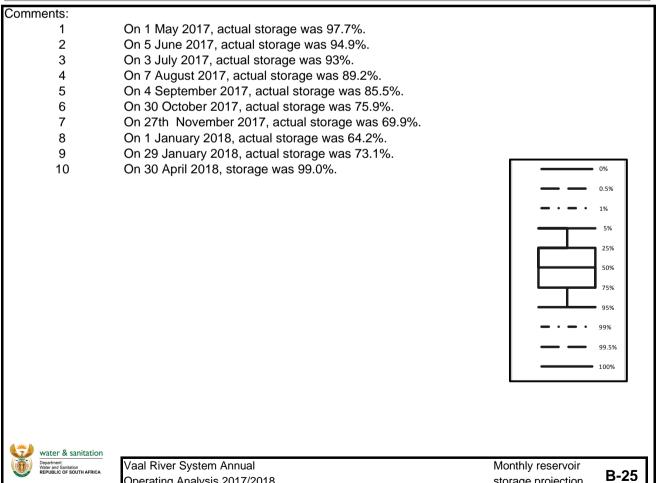












storage projection

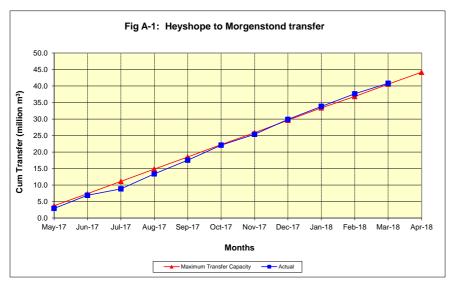
Operating Analysis 2017/2018

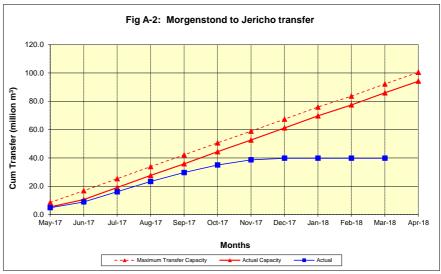
														Annual
Description	Units	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	Transfer
Hayahana ta Marganatand (tr	anafar whan M	lorgonaton	d io bolow	EO millon m	3 1270 14	4m) WPD	M Channal	603						
Heyshope to Morgenstond (tr	m <sup>3</sup> /s	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Maximum Transfer Capacity	Million m <sup>3</sup> /m	3.75	3.63	3.75	3.75	3.63	3.75	3.63	3.75	3.75	3.42	3.75	3.63	44.18
	Cumulative	3.75	7.38	11.13	14.88	18.51	22.26	25.89	29.64	33.38	36.80	40.55	44.18	
	m³/s	1.10	1.52	0.73	1.69	1.60	1.70	1.27	1.68		1.55	1.20	0.00	1.29
Actual	Million m <sup>3</sup> /m	2.95	3.95	1.96	4.53	4.16	4.57	3.28	4.49	3.95	3.79	3.20		40.82
	Cumulative	2.95	6.90	8.85	13.38	17.54	22.10	25.38	29.88	33.83	37.62	40.82		
Morgenstond to Jericho: Trans	sfer to maintai	n Jericho a	t 70% level	(Transfers	according	to Usutu i	nter-reserv	oir operatii	ng rules ad	opted in 20	06)- WRPM	Channel 8	}	
-	m <sup>3</sup> /s	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18
Maximum Transfer Capacity	Million m <sup>3</sup> /m	8.52	8.25	8.52	8.52	8.25	8.52	8.25	8.52	8.52	7.77	8.52	8.25	100.42
	Cumulative	8.52	16.77	25.29	33.82	42.06	50.59	58.83	67.36	75.88	83.65	92.17	100.42	
0 10 11	m³/s	2.00	2.00	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	2.98
Current Capacity	Million m <sup>3</sup> /m	5.36	5.18	8.52	8.52	8.25	8.52	8.25	8.52	8.52	7.77	8.52	8.25	94.19
	Cumulative	5.36 1.80	10.54 1.57	19.06 2.68	27.59 2.70	35.83 2.44	44.36 2.00	52.60 1.40	61.13 0.43	69.65 0.00	77.42 0.00	85.94 0.00	94.19	1.26
Actual	m <sup>3</sup> /s Million m <sup>3</sup> /m	4.83	4.06	7.17	7.23	6.34	5.36	3.63	1.15	0.00	0.00	0.00	0.00	39.77
Hotali	Cumulative	4.83	8.89	16.06	23.29	29.62	34.99	38.62	39.77	39.77	39.77	39.77		33.11
Westoe to Jericho: Transfers														
	m³/s	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62
Maximum Transfer Capacity	Million m <sup>3</sup> /m	4.34	4.20	4.34	4.34	4.20	4.34	4.20	4.34	4.34	3.95	4.34	4.20	51.12
. ,	Cumulative	4.34	8.54	12.88	17.22	21.42	25.75	29.95	34.29	38.63	42.59	46.92	51.12	1
	m³/s	0.00	0.00	0.00	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.21
Actual Capacity	Million m <sup>3</sup> /m	0.00	0.00	0.00	4.34	4.20	4.34	4.20	4.34	4.34	3.95	4.34	4.20	38.25
	Cumulative	0.00	0.00	0.00	4.34	8.54	12.88	17.08	21.42	25.75	29.71	34.05	38.25	
	m³/s	0.00	0.00	0.00	0.00	0.00	0.00	1.79	1.86	1.86	1.84	1.86	0.00	0.76
Actual	Million m³/m	0.00	0.00	0.00	0.00	0.00	0.00	4.64	4.98	4.98	4.50	4.98		24.09
	Cumulative	0.00	0.00	0.00	0.00	0.00	0.00	4.64	9.63	14.61	19.10	24.09		
Jericho to Onverwacht (Maxim	um transfer ca	pacity is 2	.8 m³/s)-	WRPM Cha	nnel 36 (C	hannels 27	and 39 tra	nsfers plus	Channel 1	425 transfe	er) (DWA Je	richo pum	ped)	
	m³/s	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
Maximum Transfer Capacity	Million m³/m	7.50	7.26	7.50	7.50	7.26	7.50	7.26	7.50	7.50	6.83	7.50	7.26	88.36
	Cumulative	7.50 2.00	14.76 2.00	22.26	29.76 2.80	37.01	44.51 2.80	51.77 2.80	59.27 2.80	66.77 2.80	73.60 2.80	81.10 2.80	88.36 2.80	2.60
Actual capacity	m <sup>3</sup> /s Million m <sup>3</sup> /m	5.36	5.18	5.36	7.50	2.80 7.26	7.50	7.26	7.50	7.50	6.83	7.50	7.26	2.60 82.00
Actual capacity	Cumulative	5.36	10.54	15.90	23.40	30.65	38.15	45.41	52.91	60.41	67.25	74.74	82.00	02.00
	m³/s	2.46	2.47	2.51	2.47	2.45	2.45	2.44	2.41	2.42	2.41	2.42	2.42	2.44
Target	Million m <sup>3</sup> /m	6.58	6.41	6.72	6.62	6.35	6.56	6.33	6.46	6.48	5.88	6.48	6.27	77.13
	Cumulative	6.58	12.99	19.71	26.33	32.67	39.23	45.56	52.02	58.49	64.38	70.86	77.13	
	m <sup>3</sup> /s	2.41	2.12	2.41	2.11	1.91	2.21	2.41	2.25	2.24	2.09	1.73	0.00	1.99
Actual	Million m <sup>3</sup> /m	6.46	5.50	6.45	5.65	4.95	5.93	6.26	6.02	6.01	5.10	4.63		62.95
	Cumulative	6.46	11.96	18.41	24.06	29.01	34.93	41.19	47.21	53.22	58.32	62.95		
Jericho (Onverwacht) to Nooit	gedacht - WRF	M Channe	l 168 or 142	5 (DWA UI	( Link)									
	m³/s	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Target	Million m <sup>3</sup> /m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cumulative	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Actual	m³/s Million m³/m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Notual	Cumulative	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jericho to Camden, Kriel, Ken			•								0.00	0.00	0.00	
Jones to Juniaen, Kiner, Ken	m <sup>3</sup> /s	2.46	2.47	2.51	2.47	2.45	2.45	2.44	2.41	2.42	2.41	2.42	2.42	2.44
Target	Million m <sup>3</sup> /m	6.58	6.41	6.72	6.62	6.35	6.56	6.33	6.46	6.48	5.88	6.48	6.27	77.13
	Cumulative	6.58	12.99	19.71	26.33	32.67	39.23	45.56	52.02	58.49	64.38	70.86	77.13	
	m³/s	2.41	2.12	2.41	2.11	1.91	2.21	2.41	2.25	2.24	2.09	0.00	0.00	1.85
Actual	Million m <sup>3</sup> /m	6.46	5.50	6.45	5.65	4.95	5.93	6.26	6.02	6.01	5.10			58.32
	Cumulative	6.46	11.96	18.41	24.06	29.01	34.93	41.19	47.21	53.22	58.32			
Grootdraai/VRESAP to Eskom	Power Station	s (Rietfont	ein - Usutu	-Vaal) - WR	PM Chann	el 40 (DWA	RIETX-PUI	MPED MAT	LA)					
	m <sup>3</sup> /s	1.22	1.29	1.45	1.29	1.19	1.19	1.16	1.03	1.07	1.03	1.07	1.07	1.17
Target	Million m <sup>3</sup> /m	3.28	3.34	3.87	3.45	3.09	3.19	3.01	2.77	2.85	2.52	2.85	2.76	37.00
	Cumulative	3.28	6.62	10.49	13.94	17.03	20.22	23.23	26.00	28.86	31.38	34.24	37.00	
Actual	m <sup>3</sup> /s	1.23	1.06	0.75	2.11	1.03	1.41	1.19	1.32	1.24	1.62	1.86	1.71	1.38 43.44
Actual	Million m³/m Cumulative	3.28 3.28	2.76 6.04	2.01 8.05	5.65 13.70	2.66 16.36	3.77 20.13	3.08 23.21	3.54 26.75	3.33 30.08	3.95 34.03	4.98 39.01	4.43 43.44	43.44
VII		•	•				•		•		UH.U3	00.01	<del>7</del> 3.44	
Vlakfontein Canal: Abstraction												40:	40:	
Original Tarret	m³/s	5.09	4.57	4.75	4.59	4.51	4.48	4.40	4.26	4.28	4.24	4.31	4.31	4.48
Original Target	Million m³/m	13.64	11.84	12.72	12.30	11.68	11.99	11.40	11.41	11.47	10.35	11.53	11.17 141.52	141.52
	Cumulative	13.64 3.48	25.48 2.95	38.20 3.13	50.50 2.98	62.18 2.89	74.17 2.86	85.57 2.78	96.99 2.65	108.46 2.67	118.81 2.63	130.34 2.69	2.70	2.87
Sasol's Revised Target	m <sup>3</sup> /s Million m <sup>3</sup> /m	9.31	7.66	8.39	7.97	7.50	7.66	7.21	7.09	7.15	6.41	7.21	6.99	90.55
Sacor o Novisca Target	Cumulative	9.31	16.97	25.37	33.34	40.84	48.50	55.71	62.80	69.95	76.36	83.56	90.55	30.33
	m <sup>3</sup> /s	3.91	0.02	2.42	0.02	0.03	0.02	0.03	0.03	0.01	0.21	0.05	0.05	0.58
														1
Actual	Million m <sup>3</sup> /m	10.47	0.06	6.48	0.06	0.07	0.06	0.07	0.08	0.04	0.51	0.13	0.12	18.15

Mathematical Progress   Math	Table A.1: Comparison of A	ctual and Tar	get transf	ers during	g Planning	Year 201	7/2018	ı		ſ	1	1	1	1	Annual
Manusham   Part   Manusham   Ma	Description	Units	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	Annual Transfer
Manusham Transfer Capools							•						mai 10	Aprilo	Transier
Actual Country  Amenia Country	, , , , , , , , , , , , , , , , , , ,	•											5.07	5.07	5.07
Actival Capacity   1988   2.50   3.00	Maximum Transfer Capacity	Million m <sup>3</sup> /m	13.58	13.14	13.58	13.58	13.14	13.58	13.14	13.58	13.58	12.37	13.58	13.14	160.00
Action Coperation   Self   555   564   565   564   565															
Charlotte   Char	4 . 10														
Congress   Page   Congress   Co	Actual Capacity														104.14
Company   Comp															0.28
Seminative control of the control of	Original Target														
Manuscripton   Misconner   100   4.00   5.00   4.00   5.00   4.00   5.00   4.00   5.00   4.00   5.00   4.00   5.00   4.					2.27							7.49			
Actual Marie 500 1001 1510 2019 2510 2511 2511 2511 2511 2511 2511 2511		m <sup>3</sup> /s	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
Antal Antal Oligan Property of the Property of	Sasol's Revised Target	Million m <sup>3</sup> /m													59.96
Actual   A															
Consideral VITES AP 10 No. 96	Actual														
Conception   Con	Actual														31.24
Maintum Transfer Capacity   Maintain   Mai	O		•	•	•	•	•	•	•	•		•	•	01.24	
Maintamum Transfer Capady   Maintamum Transfer	Grootdraai/VRESAP to Duvna													1.60	1.60
Cumulative 4.29 6.43 12.72 17.00 21.15 25.44 25.55 33.87 81.5 42.06 6.53 50.40	Maximum Transfer Capacity														
Target Miller m/m 0.00 0.00 0.00 0.00 0.00 0.00 0.00	maximum transfer Supusity														00.40
Mailor   Mile		_													0.00
Actual Marian Property 1,000 0.37 0.57 0.63 0.38 0.45 0.42 0.49 0.39 0.04 0.00 0.00 0.00 0.00 0.00 0.00 0.0	Target		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Actual Part															
Campalative   0.99   2.48															
New Part   Program   Pro	Actual														9.91
Maximum Transfer Capachy   Alexa   4.28		•									9.91	9.91	9.91	9.91	L
Mainton m/m   11.46   11.09	Heyshope to Grootdraai (Trans	sfer if Grootdr													
Curulative   11.46   22.56   34.02   45.48   56.58   69.04   79.14   90.60   102.06   112.51   123.97   35.07	Maximum Transfer Capacity														
Million m/m   0.04   0.70   0.00	(4.28 m3/s)														135.07
Actual capacity  Million m/m  5.04  No. 1581  Actual  Million m/m  5.04  Million m/m  5.05  Million m/m  5.06  Million m/m  5.07  Million m/m  6.07  Million m/m  6.0															3.96
Comutative   8.04   15.81   23.85   33.31   48.40   57.87   8.986   80.42   91.88   10.23   11.80   124.89	Actual capacity														124.89
Actual Mallon million   4.86	, ,														
Camulative   A-66   8.57   10.85   15.38   18.72   23.10   27.20   31.95   35.90   39.70   42.90		m <sup>3</sup> /s	1.67	1.59	0.85	1.69	1.29	1.63	1.58	1.77	1.47	1.55	1.20	0.00	1.36
Target Transfer	Actual	Million m <sup>3</sup> /m													42.90
Target Transfer		Cumulative	4.46	8.57	10.85	15.38	18.72	23.10	27.20	31.95	35.90	39.70	42.90		
Target Transfer   Million m/m   0.00   0.0	Zaaihoek to Grootdraai - WRPI	M Channel 920	(DWA PER	RDEWATER	SPRUIT)										
Cumulative															0.00
Actual m/s 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	Target Transfer														0.00
Actual Million m/m   0.000   0		_													0.00
Thukela to Sterkfontein (Average transfer 14.6m"/s) - WFPM Channel 88  Peak capacity: 20 m"/s	Actual														
Thukela to Sterkfontein (Average transfer 14.6m³/s) - WRPM Channel 88   M°/s   20.00	7101001														0.00
Peak capacity: 20 m³/s    Peak capacity: 20 m³/s   Peak capacity: 20 m³	Thukela to Sterkfontein (Avera	•		•	•										
Cumulative   53.57   105.41   158.98   212.54   264.38   317.95   369.79   423.36   476.93   525.74   579.31   631.15						20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Target approx 14.66 m³/s  Target approx 14.66 m³/s  Million m³/m	Peak capacity: 20 m <sup>3</sup> /s	Million m <sup>3</sup> /m	53.57	51.84	53.57	53.57	51.84	53.57	51.84	53.57	53.57	48.82	53.57	51.84	631.15
Target: approx 14.66 m³/s   Million m³/m   36.96   35.77   36.96   36.96   39.40   43.39   39.40   39.64   0.00   0.00   0.00   0.00   308.4   308.48   308.				105.41											
Cumulative   36.96   72.73   109.69   146.66   186.05   229.44   268.84   308.48															58.53
Actual m²/s 7.23 10.32 9.59 10.20 11.73 10.75 1.58 0.00 0.00 0.53 7.62 11.40 6.77 Million m²/m 19.36 26.75 25.69 27.31 30.39 28.81 4.09 0.00 0.00 1.28 20.40 29.54 213.6    Sterkfontein releases to Vaal Dam (Ch 65)  Million m²/m 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	Farget: approx 14.66 m <sup>3</sup> /s														308.48
Actual Million m³/m   19.36   26.75   25.69   27.31   30.39   28.81   4.09   0.00   0.00   1.28   20.40   29.54   213.63    Sterkfontein releases to Vaal Dam (Ch 65)  Adjusted target for 2017 AOA Adjusted target for 2017 AOA Actual Million m³/m   0.00															6.77
Sterkfontein releases to Vaal Dam (Ch 65)   Adjusted target for 2017 AOA   Million m³/m   0.00   0	Actual														213.63
Sterkfontein releases to Vaal Dam (Ch 65)															
Adjusted target for 2017 AOA  Million m³/m 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	Sterkfontein releases to Vaal F	Dam (Ch 65)				_	_	_		_					
Adjusted target for 2017 AOA    Million m³/m   0.00		1 ^	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Actual	Adjusted target for 2017 AOA														0.00
Actual Million m³/m		Cumulative													
Vygeboom to Bosloop - WRPM Channel 18 (DWA Meter 1)		-													0.00
Vygeboom to Bosloop - WRPM Channel 18 (DWA Meter 1)           Maximum Transfer Capacity         m³/s         2.78         2.79         2.08         2.09	Actual														0.00
Maximum Transfer Capacity         m³/s (Million m³/m)         2.78         2.75         3.75         4.20         51.40         58.85         66.29         73.08         80.52         87.73           Maximum Transfer Capacity         Million m³/m         5.47         5.82         5.47         5.58         5.39         0.41         1.99         5.33         4.40 <td></td> <td>Curriulative</td> <td>0.00</td> <td>U.UU</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>U.UU</td> <td>0.00</td> <td>0.00</td> <td>U.UU</td> <td><u> </u></td>		Curriulative	0.00	U.UU	0.00	0.00	0.00	0.00	0.00	0.00	U.UU	0.00	0.00	U.UU	<u> </u>
Maximum Transfer Capacity         m³/s (Million m³/m)         2.78         2.75         3.75         4.20         51.40         58.85         66.29         73.08         80.52         87.73           Maximum Transfer Capacity         Million m³/m         5.47         5.82         5.47         5.58         5.39         0.41         1.99         5.33         4.40 <td>Vygeboom to Bosloop - WRPN</td> <td>I Channel 18 (I</td> <td>DWA Meter</td> <td>1)</td> <td></td>	Vygeboom to Bosloop - WRPN	I Channel 18 (I	DWA Meter	1)											
Cumulative   7.45   14.65   22.10   29.54   36.75   44.20   51.40   58.85   66.29   73.08   80.52   87.73	·				2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78
Actual   m³/s   2.04   2.25   2.04   2.09   2.08   0.15   0.77   1.99   1.64   1.60   1.54   1.20   1.62	Maximum Transfer Capacity														87.73
Actual Million m³/m 5.47 5.82 5.47 5.58 5.39 0.41 1.99 5.33 4.40 3.92 4.13 3.10 51.02  Gemsbokhoek to Bosloop - WRPM Channel 17 (DWA Meter 2)  Maximum Transfer Capacity Million m³/m 2.28 2.20 2.28 2.28 2.20															
Cumulative   5.47   11.29   16.77   22.35   27.74   28.15   30.14   35.47   39.87   43.79   47.92   51.02	Actual														
Maximum Transfer Capacity   Million m³/m   0.00	Actual														51.02
Maximum Transfer Capacity         m³/s         0.85	Comphalths - Into Bull 1997	•		•	10.77	22.00	21.14	20.10	50.14	55.47	55.51	70.18	71.32	01.02	
Maximum Transfer Capacity         Million m³/m         2.28         2.20         2.28	Gerrisboknoek to Bosloop - Wi				0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Cumulative         2.28         4.48         6.76         9.03         11.24         13.51         15.72         17.99         20.27         22.34         24.62         26.82           m³/s         0.00	Maximum Transfer Canacity														
Martual Million m³/m 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.															20.02
Actual Million m³/m 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.															0.00
Cumulative         0.00	Actual	Million m <sup>3</sup> /m	0.00						0.00	0.00					0.00
		Cumulative	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

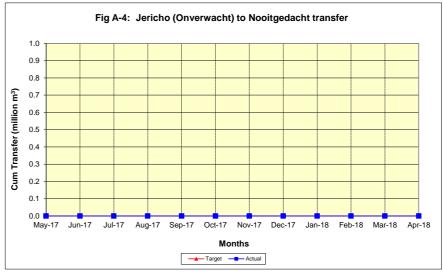
Table A.1: Comparison of A	ctual and Ta	rget trans	ters during	g Planning	Year 201	7/2018	1	ı	1					Annual
Description	Units	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	Transfer
Bosloop to Wintershoek - WRF	PM Channel 19		•											
Maximum Transfer Capacity	m³/s	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
(and Target)	Million m <sup>3</sup> /m	6.16	5.96	6.16	6.16	5.96	6.16	5.96	6.16	6.16	5.61	6.16	5.96	72.58
	Cumulative m <sup>3</sup> /s	6.16 2.17	12.12 2.41	18.28 2.21	24.44	30.40 2.23	36.56 1.62	42.53 0.81	48.69 2.12	54.85 1.67	60.46 1.78	66.62 1.64	72.58 1.28	1.85
Actual	Million m <sup>3</sup> /m	5.82	6.25	5.92	6.07	5.79	4.35	2.10	5.69	4.46	4.34	4.40	3.32	58.52
	Cumulative	5.82	12.07	17.99	24.06	29.85	34.20	36.30	41.99	46.45	50.79	55.20	58.52	
Wintershoek to Piccadilly - WR	RPM Channel 2	21 (DWA No	oitgedacht	to picadill	y pipeline ı	meter 1+2 -	6in+ 6 out)							
	m <sup>3</sup> /s	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
Maximum Transfer Capacity	Million m <sup>3</sup> /m	6.78	6.56	6.78	6.78	6.56	6.78	6.56	6.78	6.78	6.18	6.78	6.56	79.84
	Cumulative	6.78	13.33	20.11	26.89	33.44	40.22 0.24	46.78	53.56	60.33	66.51	73.28	79.84	4.70
Actual	m <sup>3</sup> /s Million m <sup>3</sup> /m	1.93 5.17	2.02 5.24	1.70 4.55	1.87 5.02	1.92 4.97	0.24	1.68 4.36	1.44 3.84	1.59 4.25	2.01 4.91	2.20 5.89	2.05 5.32	1.72 54.16
	Cumulative	5.17	10.41	14.96	19.98	24.95	25.58	29.94	33.79	38.04	42.95	48.85	54.16	0
Nooitgedacht to Klipfontein - V	WRPM Channe	el 15 (DWA	Meter 7)											
	m³/s	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Maximum Transfer Capacity	Million m <sup>3</sup> /m	2.84	2.75	2.84	2.84	2.75	2.84	2.75	2.84	2.84	2.59	2.84	2.75	33.45
	Cumulative	2.84	5.59	8.43	11.26	14.01	16.85	19.60	22.44	25.28	27.86	30.70	33.45	
Actual	m <sup>3</sup> /s Million m <sup>3</sup> /m	0.43 1.15	0.47 1.22	0.59 1.58	0.56 1.51	0.41 1.07	0.35 0.94	0.70 1.81	0.42 1.13	0.79 2.12	0.83 2.03	0.78 2.10	0.80 2.08	0.59 18.72
/ totali	Cumulative	1.15	2.37	3.94	5.45	6.52	7.46	9.26	10.40	12.51	14.54	16.64	18.72	10.12
Lesotho transfers - WRPM Cha														_
	m³/s	28.75	30.48	31.36	29.50	26.23	21.65	22.76	21.65	19.04	20.49	20.91	23.53	24.72
Target (No release to Caledon in 2017/18)	Million m <sup>3</sup> /m	77.00	79.00	84.00	79.00	68.00	58.00	59.00	58.00	51.00	50.00	56.00	61.00	780.00
· ·	Cumulative	77.00	156.00	240.00	319.00	387.00	445.00	504.00	562.00	613.00	663.00	719.00	780.00	
Target (after deducting releases	m <sup>3</sup> /s	28.75	30.48	31.36	29.50 79.00	26.23	21.65	22.76	21.65	19.04	20.49	20.91	23.53	24.72
to Caledon - 0 m <sup>3</sup> /s for the current year)	Million m <sup>3</sup> /m Cumulative	77.00 77.00	79.00 156.00	84.00 240.00	79.00 319.00	68.00 387.00	58.00 445.00	59.00 504.00	58.00 562.00	51.00 613.00	50.00 663.00	56.00 719.00	61.00 780.00	780.00
,,	m <sup>3</sup> /s	24.45	28.13	28.03	27.84	27.52	26.55	27.48	26.59	26.59	28.05	33.36	23.29	27.33
Actual	Million m <sup>3</sup> /m	65.50	72.90	75.08	74.58	71.34	71.11	71.23	71.23	71.23	68.47	89.36	60.36	862.39
	Cumulative	65.50	138.40	213.48	288.05	359.39	430.50	501.73	572.97	644.20	712.67	802.03	862.39	
Vygeboom Compensation Rele			1						0.05	0.05		0.05	0.05	
Target	m³/s Million m³/m	0.65 1.74	0.65 1.68	0.65 1.74	0.65 1.74	0.65 1.68	0.65 1.74	0.65 1.68	0.65 1.74	0.65 1.74	0.65 1.59	0.65 1.74	0.65 1.68	0.65 20.51
raigot	Cumulative	1.74	3.43	5.17	6.91	8.59	10.33	12.02	13.76	15.50	17.09	18.83	20.51	20.51
	m³/s	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.69	0.63	0.00	0.58
Francisco de la Companya de la Comp	Million m <sup>3</sup> /m	1.69	1.63	1.69	1.69	1.63	1.69	1.63	1.69	1.69	1.69	1.69		18.40
	Cumulative	1.69	3.32	5.00	6.69	8.33	10.01	11.65	13.33	15.02	16.71	18.40		
Westoe Compensation Release	e - WRPM Cha	annel 31												
	m <sup>3</sup> /s	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Modelled	Million m <sup>3</sup> /m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.10	0.10	1.17
	Cumulative m³/s	0.10	0.20	0.29 1.00	0.39 1.00	0.49 1.00	0.59 1.00	0.68 1.00	0.78 1.00	0.88	0.97	1.07 0.40	1.17 0.00	0.70
Actual	Million m <sup>3</sup> /m	0.00	0.00	2.68	2.68	2.59	2.68	2.59	2.68	2.68	2.42	1.07	0.00	22.07
	Cumulative	0.00	0.00	2.68	5.36	7.95	10.63	13.22	15.90	18.58	21.00	22.07		
Jericho Compensation Release	e - WRPM Cha	nnel 33												
beneno compensation release	m³/s	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01
Modelled	Million m <sup>3</sup> /m	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.47
	Cumulative	0.04	0.08	0.12	0.16	0.20	0.24	0.28	0.32	0.36	0.39	0.43	0.47	
Actual	m³/s	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Actual	Million m <sup>3</sup> /m Cumulative	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manager 10 =	•	•	•				5.00		. 0.00	2.00		2.00	5.00	
Morgenstond Compensation R	elease - WRP m³/s	M Channel 0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Modelled	m <sup>-</sup> /s Million m <sup>3</sup> /m	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	1.20
	Cumulative	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.91	1.00	1.10	1.20	
	m³/s	0.00	0.01	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.00	0.03
Actual	Million m <sup>3</sup> /m	0.00	0.03	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10		0.93
	Cumulative	0.00	0.03	0.13	0.23	0.33	0.43	0.53	0.63	0.73	0.83	0.93		<u> </u>
Heyshope Compensation Rele		0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
Modelled	m <sup>3</sup> /s Million m <sup>3</sup> /m	1.71	1.66	1.71	1.71	1.66	1.71	1.66	1.71	1.71	1.56	1.71	1.66	20.20
	Cumulative	1.71	3.37	5.09	6.80	8.46	10.17	11.83	13.55	15.26	16.82	18.54	20.20	
	m³/s	0.28	0.28	1.61	2.77	0.28	0.28	0.28	2.77	2.77	0.59	2.40	0.00	1.09
Actual	Million m <sup>3</sup> /m	0.74	0.72	0.74	7.42	0.72	0.74	0.72	7.42	7.42	1.45	6.43		34.52
	Cumulative	0.74	1.46	2.20	9.62	10.34	11.08	11.80	19.22	26.64	28.09	34.52		I
Nooitgedacht Release - WRPM		1	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Modelled	m <sup>3</sup> /s Million m <sup>3</sup> /m	0.15 0.40	0.15 0.39	0.15 0.40	0.15 0.40	0.15 0.39	0.15 0.40	0.15 0.39	0.15 0.40	0.15 0.40	0.15 0.37	0.15 0.40	0.15 0.39	0.15 4.73
	Cumulative	0.40	0.79	1.19	1.59	1.98	2.38	2.77	3.18	3.58	3.94	4.34	4.73	4.13
	m³/s	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.18	0.18	1.78	0.00	0.00	0.48
	11170													15.08
Actual	Million m <sup>3</sup> /m	0.00	0.00	0.00	0.00	0.00	0.00	3.73	4.82	2.18	4.35	0.00		13.06
Actual		0.00	0.00	0.00	0.00	0.00	0.00	3.73 3.73	4.82 8.55	10.73	4.35 15.08	15.08		15.06
Actual  Grootdraai Release - WRPM CI	Million m³/m Cumulative													15.08

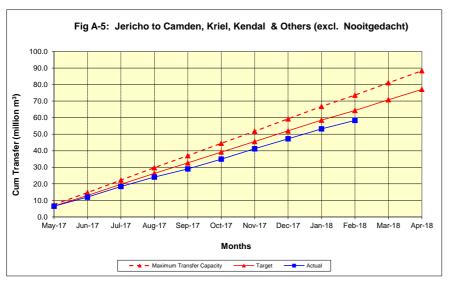
														Annual
Description	Units	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	Transfer
Modelled (Lower Quartile)	Million m <sup>3</sup> /m	2.39	1.90	1.86	1.42	1.15	1.19	3.89	4.02	4.02	3.66	4.02	3.89	33.41
	Cumulative	2.39	4.30	6.16	7.58	8.73	9.92	13.81	17.83	21.85	25.51	29.53	33.41	
	m <sup>3</sup> /s	0.89	0.79	0.69	0.53	0.45	0.45	1.50	1.50	5.81	7.15	1.50	1.50	1.87
Modelled (Median)	Million m <sup>3</sup> /m	2.39	2.04	1.86	1.42	1.15	1.19	3.89	4.02	15.55	17.45	4.02	3.89	58.87
	Cumulative	2.39	4.43	6.29	7.71	8.86	10.06	13.95	17.96	33.51	50.96	54.98	58.87	
	m <sup>3</sup> /s	1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	2.44	66.74	0.00	6.61
Actual	Million m <sup>3</sup> /m	2.68	2.59	2.68	2.68	2.52	2.68	2.59	2.68	2.68	5.96	178.75		208.48
	Cumulative	2.68	5.27	7.95	10.63	13.14	15.82	18.41	21.09	23.77	29.73	208.48		

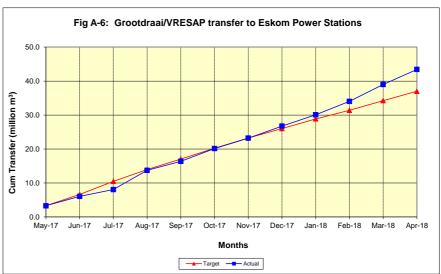


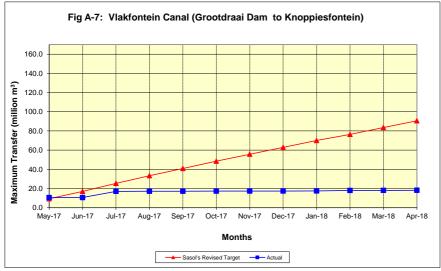


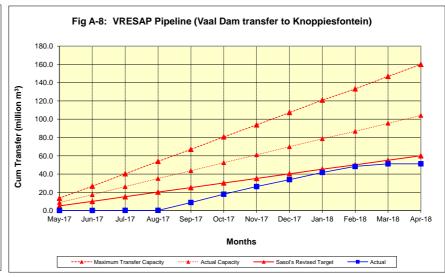


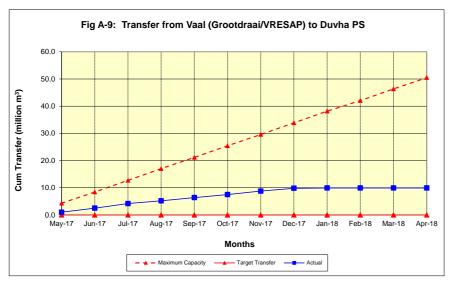


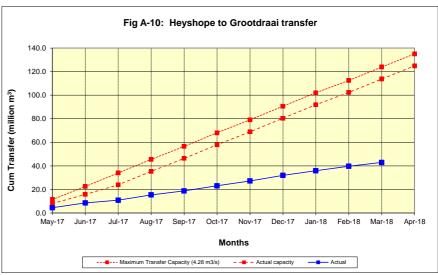




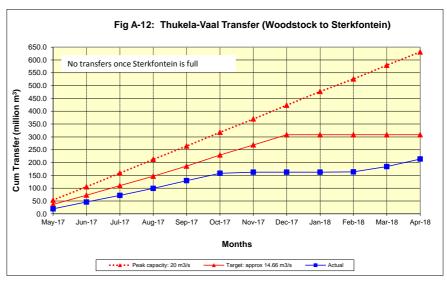


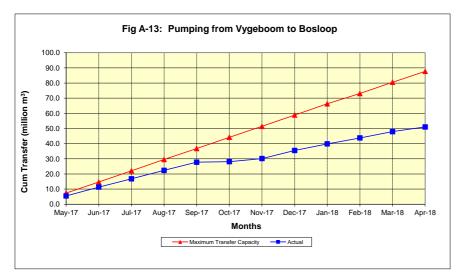


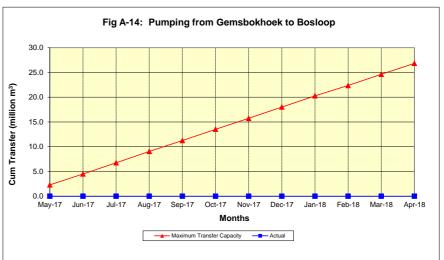


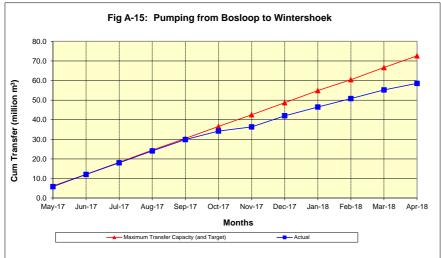


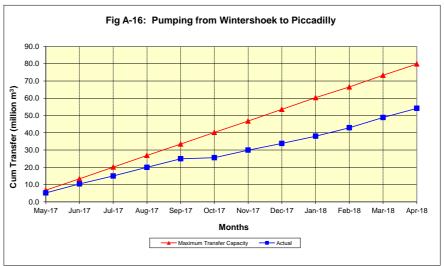


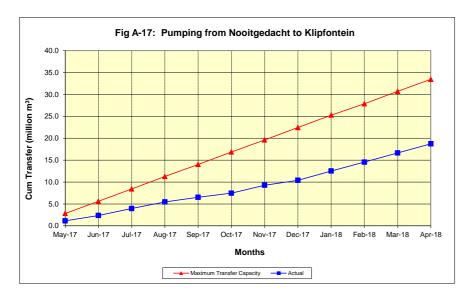




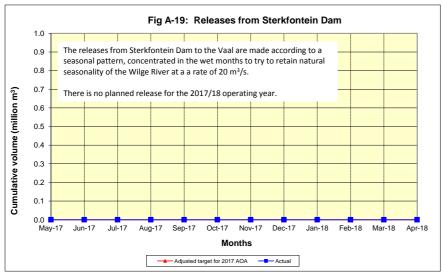


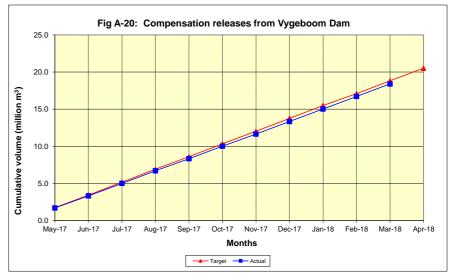


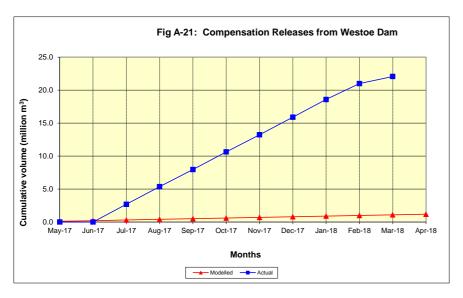


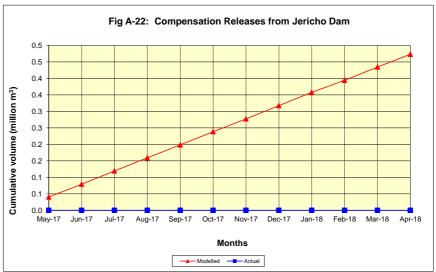


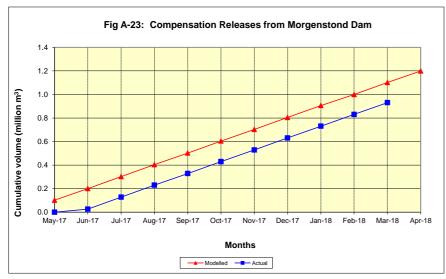


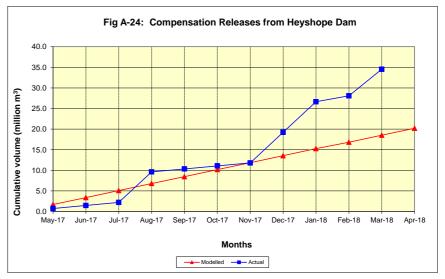


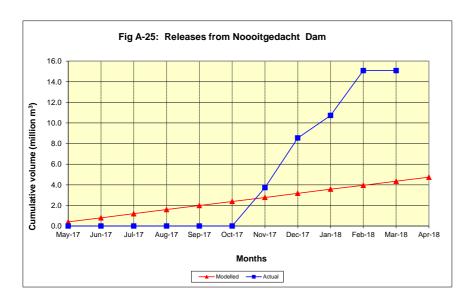












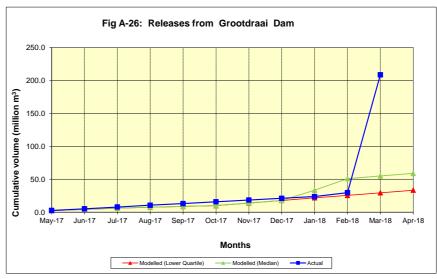


Figure Nr.	Comments on transfers
<u> </u>	It is important to note that revised operating rules for the 2017/2018 planning period were approved at the SOF meeting held on 10 July 2017.
	, , , , , , , , , , , , , , , , , , ,
A-1,2,3,4,5	The transfers in the Usutu are made according to the operating rule. All transfers up to end of January are at or below the maximum capacity because the dam levels have not reached the threshholds that trigger the rules for transfer.
A-6	The actual cumulative transfer at the end of April 2018 from the Vaal (Grootdraai and Vaal dams) to Eskom Power stations is above the target.
A-7	Actual cumulative transfer through Vlakfontein Canal is below target in April 2018.
A-8	The cumulative transfer volume up to the end of April 2018 is below the minumum target.
A-9	The target for 2017/18 AOA is zero. The actual cumulative transfers from the Vaal to Duvha PS are above the target in April 2018.
A-10	The operating rule for 2017/18 AOA is to transfer from Heyshope to maintain Grootdraai at 90% capacity. The actual cumulative transfers from Heyshope to Grootdraai for March 2018 were below the actual capacity however, Grootdraai Dam is 100% full.
A-11	The target transfer from Zaaihoek to Grootdraai is zero for the 2017/18 operating year.
A-12	The target transfer from Thukela to Vaal is to transfer until Sterkfontein is full at an average rate of 14.4 m3/s. The actual cumulative transfer up to the end of April 2018 was below the target.
A-13-17	Actual cumulative transfers from Vygeboom and Gemsbokhoek are below the maximum capacity values by end of April 2018.
A-18	The actual cumulative transfer from Lesotho is above the target in April 2018.
A-19	There are no releases planned from Sterkfontein Dam for the 2017/18 operating year.
A-20	The cumulative compensation releases from Vygeboom Dam are below target in March 2018.
A-21	Compensation releases from Westoe Dam in March 2018 is above the target.
A-22	There have been no compensation releases from Jericho Dam from May 2017 to April 2018.
A-23	The compensation releases from Morgenstond Dam from May 2017 to March 2018 are below the modelled values.
A-24	The compensation releases from Heyshope Dam in March 2018 are above the modelled values.
A-25	The releases from Nooitgedacht Dam are above target in March 2018.
A-26	The actual cumulative releases from Grootdraai Dam are above the modelled values for March 2018 .

Table A-2: Comparison of Actual and Target requirements during Planning Year 2017/2018

Description	Units	<b>May-17</b> 31.00	<b>Jun-17</b> 30.00	<b>Jul-17</b> 31.00	<b>Aug-17</b> 31.00	<b>Sep-17</b> 30.00	Oct-17 31.00	<b>Nov-17</b> 30.00	<b>Dec-17</b> 31.00	<b>Jan-18</b> 31.00	Feb-18 28.25	<b>Mar-18</b> 31.00	<b>Apr-18</b> 30.00	<b>Annual</b> 365.25
Rand Water: projected requirem users)	ent includes S	Sasolburg a	nd Sasol Se	cunda inta	ke of 25MI	_/d but exc	ludes auth	orised use	rs (i.e. Esko	om, Iscor, S	Sasol Saso	lburg, Mitta	I Steel and	Small
Projected Requirement 2017	m <sup>3</sup> /s	53.716	55.021	51.285	52.676	56.161	56.945	55.387	55.680	52.962	54.063	56.612	50.822	54.28
(Gross requirement)	Million m <sup>3</sup> /m Cumulative	143.87 143.87	142.62 286.49	137.36 423.85	141.09 564.94	145.57 710.51	152.52 863.03	143.56 1006.59	149.13 1155.73	141.85 1297.58	131.96 1429.53	151.63 1581.16	131.73 1712.90	1712.9
	m³/s	48.909	50.099	46.714	51.854	48.700	53.670	51.212	48.683	51.941	50.361	51.675	47.000	50.075
Actual	Million m <sup>3</sup> /m	131.00	129.86	125.12	138.89	126.23	143.75	132.74	130.39	139.12	122.92	138.41	121.82	1580.25
Differences estual from projected	Cumulative	131.00	260.85	385.97	524.86	651.09	794.84	927.58	1057.98	1197.10	1320.02	1458.42	1580.25	
Difference: actual from projected Difference: actual from projected	Monthly Cumulative	-9% -8.9%	-9% -8.9%	-9% -8.9%	-2% -7.1%	-13% -8.4%	-6% -7.9%	-8% -7.8%	-13% -8.5%	-2% -7.7%	-7% -7.7%	-9% -7.8%	-8% -7.7%	
		0.070	5.070	0.070		5			0.070		,			
skom		4.00	4.04		4.04	4.04	4.04	0.00	201	0.00	0.04	0.00	0.00	
equirement distribution	m³/s	1.02 10.894	1.04 11.478	1.11 11.856	1.04 11.108	1.01 11.147	1.01 10.788	0.99 10.926	0.94 10.040	0.96 10.254	0.94 11.017	0.96 10.254	0.96 10.595	10.88
Projected Requirement 2017	Million m <sup>3</sup> /m	29.18	29.75	31.75	29.75	28.89	28.89	28.32	26.89	27.46	26.89	27.46	27.46	343.3
	Cumulative	29.18	58.93	90.69	120.44	149.33	178.22	206.55	233.44	260.90	287.79	315.25	342.72	
	m <sup>3</sup> /s	9.631	9.674	9.159	8.895	9.039	9.050	9.174	8.139	8.796	9.308	9.633	9.059	9.127
Actual	Million m <sup>3</sup> /m Cumulative	25.79 25.79	25.08 50.87	24.53 75.40	23.82 99.23	23.43 122.66	24.24 146.90	23.78 170.68	21.80 192.48	23.56 216.04	22.72 238.76	25.80 264.56	23.48 288.04	288.04
Difference: actual from projected	Monthly	-12%	-16%	-23%	-20%	-19%	-16%	-16%	-19%	-14%	-16%	-6%	-15%	
Cumulative difference	Cumulative	-12%	-14%	-17%	-18%	-18%	-18%	-17%	-18%	-17%	-17%	-16%	-16%	
Pagel Consilient														
Sasol Sasolburg	m³/s	0.748	0.748	0.748	0.748	0.748	0.748	0.748	0.748	0.748	0.748	0.748	0.748	0.75
Projected Requirement 2017	Million m <sup>3</sup> /m	2.00	1.94	2.00	2.00	1.94	2.00	1.94	2.00	2.00	1.83	2.00	1.94	23.6
<u> </u>	Cumulative	2.00	3.94	5.94	7.95	9.89	11.89	13.83	15.83	17.83	19.66	21.66	23.60	
No. 1	m³/s	0.736	0.689	0.665	0.732	0.795	0.739	0.733	0.724	0.736	0.737	0.698	0.737	0.727
Actual	Million m <sup>3</sup> /m	1.97	1.79	1.78	1.96	2.06	1.98	1.90	1.94	1.97	1.80	1.87	1.91	22.93
Difference: actual from projected	Cumulative Monthly	1.97 -2%	3.76 -8%	5.54 -11%	7.50 -2%	9.56 6%	11.54 -1%	13.44 -2%	15.38 -3%	17.35 -2%	19.15 -1%	21.02 -7%	22.93 -1%	
Cumulative difference	Cumulative	-2%	-5%	-7%	-6%	-3%	-3%	-3%	-3%	-3%	-3%	-3%	-3%	
Sasol Secunda	3/-	2.655	0.655	0.055	2.655	2.655	0.655	0.055	0.655	0.055	0.655	0.055	0.655	2.66
Projected Requirement 2017	m³/s Million m³/m	7.11	2.655 6.88	2.655 7.11	2.655 7.11	2.655 6.88	2.655 7.11	2.655 6.88	2.655 7.11	2.655 7.11	2.655 6.48	2.655 7.11	2.655 6.88	2.66 83.8
, , , , , , , , , , , , , , , , , , ,	Cumulative	7.11	14.00	21.11	28.22	35.10	42.22	49.10	56.21	63.32	69.80	76.92	83.80	00.0
	m <sup>3</sup> /s	2.613	2.861	2.709	2.766	2.604	2.569	2.813	2.591	2.841	2.950	2.472	2.496	2.688
Actual	Million m <sup>3</sup> /m	7.00	7.42	7.26	7.41	6.75	6.88	7.29	6.94	7.61	7.20	6.62	6.47	84.84
Difference: actual from projected	Cumulative Monthly	7.00 -2%	14.41 8%	21.67 2%	29.08 4%	35.83 -2%	42.71 -3%	50.00 6%	56.94 -2%	64.55 7%	71.75 11%	78.37 -7%	84.84 -6%	
Cumulative difference	Cumulative	-2%	3%	3%	3%	2%	1%	2%	1%	2%	3%	2%	1%	
/aalharts	37.	0.740	F 000	0.000	0.500	04 505	00.404	40.500	44.074	20 505	40.050	44.404	7.454	47.40
Projected Requirement 2017	m <sup>3</sup> /s Million m <sup>3</sup> /m	6.710 17.97	5.860 15.19	8.080 21.64	6.502 17.42	21.565 55.90	20.131 53.92	12.532 32.48	14.874 39.84	20.505 54.92	18.952 46.26	14.461 38.73	7.154 18.54	17.16 541.5
,	Cumulative	17.97	33.16	54.80	72.22	128.12	182.04	214.52	254.36	309.28	355.54	394.27	412.81	041.0
	m³/s	4.723	5.212	7.807	8.576	5.204	9.745	10.069	9.745	10.865	12.414	12.582	13.194	9.162
Actual Use	Million m <sup>3</sup> /m	12.65	13.51	20.91	22.97	13.49	26.10	26.10	26.10	29.10	30.30	33.70	34.20	289.13
	Cumulative	12.65	26.16	47.07	70.04	83.53	109.63	135.73	161.83	190.93	221.23	254.93	289.13	
/aalharts Canal (C9H018)	Million m <sup>3</sup> /m Cumulative	14.60 14.60	22.00 36.60	22.80 59.40										
Difference: actual from projected	Monthly	42%	12%	3%	-24%	314%	107%	24%	53%	89%	53%	15%	-46%	
Cumulative difference	Cumulative	42%	27%	16%	3%	53%	66%	58%	57%	62%	61%	55%	43%	
MidVaal Water Company														
wid vaai vvater Company	m³/s	1.469	1.469	1.469	1.469	1.469	1.469	1.469	1.469	1.469	1.469	1.469	1.469	1.47
Projected Requirement 2017	Million m <sup>3</sup> /m	3.93	3.81	3.93	3.93	3.81	3.93	3.81	3.93	3.93	3.59	3.93	3.81	46.4
	Cumulative	3.93	7.74	11.68	15.61	19.42	23.35	27.16	31.10	35.03	38.62	42.55	46.36	
Actual Use	m³/s	1.201	1.426	1.396	1.394	1.426	1.337	1.578	1.445	1.452	1.673	0.000	0.000	1.191
notual USE	Million m <sup>3</sup> /m Cumulative	3.22 3.22	3.70 6.91	3.74 10.65	3. <b>73</b> 14.39	3.70 18.08	3.58 21.66	4.09 25.75	3.87 29.62	3.89 33.51	4.08 37.60			37.60
Difference: actual from projected	Monthly	-18%	-3%	-5%	-5%	-3%	-9%	7%	-2%	-1%	14%	-100%	-100%	
Cumulative difference	Cumulative	0.22	0.12	0.10	0.09	0.07	0.08	0.05	0.05	0.05	0.03	#DIV/0!	#DIV/0!	
Sadihana Water (Ball-fantair	lv)													
Sedibeng Water (Balkfontein onl	m <sup>3</sup> /s	2.291	2.788	2.060	2.025	2.622	2.182	2.342	2.271	2.276	2.502	2.284	2.365	2.33
Projected Requirement 2017	Million m <sup>3</sup> /m	6.13	7.23	5.52	5.42	6.80	5.85	6.07	6.08	6.09	6.11	6.12	6.13	73.5
·	Cumulative	6.13	13.36	18.88	24.30	31.10	36.94	43.01	49.10	55.19	61.30	67.42	73.55	-
	m³/s	2.643	2.674	2.087	2.356	2.160	2.102	2.647	1.759	2.852	2.343	2.341	1.806	2.314
Actual Use	Million m <sup>3</sup> /m	7.08	6.93	5.59	6.31	5.60	5.63	6.86	4.71	7.64	5.72	6.27	4.68	73.02
Difference: actual from projected	Cumulative Monthly	7.08 15%	14.01 -4%	19.60 1%	25.91 16%	31.51 -18%	37.14 -4%	44.00 13%	48.71 -23%	56.35 25%	62.07 -6%	68.34 2%	73.02 -24%	
Cumulative difference	Cumulative	-0.13	-0.05	-0.04	-0.06	-0.01	-0.01	-0.02	0.01	-0.02	-0.01	-0.01	0.01	

Mittal (Iscor)														
Projected Requirement 2017	m <sup>3</sup> /s	0.271	0.271	0.271	0.271	0.271	0.271	0.271	0.271	0.271	0.271	0.271	0.271	0.27
	Million m <sup>3</sup> /m	0.73	0.70	0.73	0.73	0.70	0.73	0.70	0.73	0.73	0.66	0.73	0.70	8.6
	Cumulative	0.73	1.43	2.16	2.88	3.59	4.31	5.02	5.74	6.47	7.13	7.86	8.56	
Actual use (from Arcelor Mittal)	m <sup>3</sup> /s	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Million m <sup>3</sup> /m													0.00
	Cumulative	0.00	0.00	0.00	0.00									
	m³/s	0.234	0.250	0.221	0.273	0.269	0.235	0.247	0.250	0.261	0.229	0.223	0.208	0.242
Actual use (from RW meters)	Million m <sup>3</sup> /m	0.626	0.649	0.592	0.730	0.696	0.630	0.640	0.670	0.700	0.560	0.597	0.539	7.63
	Cumulative	0.63	1.27	1.87	2.60	3.29	3.92	4.56	5.23	5.93	6.49	7.09	7.63	
Difference: actual from projected	Monthly	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	
Cumulative difference	Cumulative	#DIV/0!	#DIV/0!	#DIV/0!	11.1%	8.9%	10.0%	10.0%	9.8%	9.1%	9.9%	10.9%	12.3%	

All users total														
Projected Requirement 2017	m <sup>3</sup> /s	78.755	80.292	78.424	77.455	96.639	95.190	86.331	88.009	91.140	91.677	88.755	76.080	85.69
	Million m <sup>3</sup> /m	210.94	208.12	210.05	207.46	250.49	254.96	223.77	235.72	244.11	223.77	237.72	197.20	2704.3
	Cumulative	210.94	419.05	629.11	836.56	1087.05	1342.01	1565.78	1801.50	2045.61	2269.38	2507.10	2704.30	
	m <sup>3</sup> /s	70.455	72.635	70.536	76.573	69.929	79.211	78.226	73.086	79.484	79.787	79.401	74.291	75.284
Actual Use	Million m <sup>3</sup> /m	188.71	188.27	188.92	205.09	181.26	212.16	202.76	195.75	212.89	194.75	212.67	192.56	2375.79
	Cumulative	188.71	376.98	565.90	771.00	952.25	1164.41	1367.17	1562.92	1775.81	1970.56	2183.23	2375.79	
Difference: actual from projected	Monthly	-11%	-10%	-10%	-1%	-28%	-17%	-9%	-17%	-13%	-13%	-11%	-2%	
Cumulative difference	Cumulative	0.12	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	

Urban users total														
Projected Requirement 2017	m <sup>3</sup> /s	72.045	74.432	70.344	70.953	75.074	75.059	73.799	73.134	70.635	72.725	74.294	68.926	72.61
	Million m <sup>3</sup> /m	192.96	192.93	188.41	190.04	194.59	201.04	191.29	195.88	189.19	177.51	198.99	178.66	2291.5
	Cumulative	192.96	385.89	574.30	764.34	958.93	1159.97	1351.26	1547.14	1736.33	1913.84	2112.83	2291.48	
	m <sup>3</sup> /s	65.732	67.423	62.729	67.997	64.724	69.467	68.156	63.341	68.619	67.373	66.819	61.097	66.122
Actual Use	Million m <sup>3</sup> /m	176.06	174.76	168.01	182.12	167.77	186.06	176.66	169.65	183.79	164.45	178.97	158.36	2086.66
	Cumulative	176.06	350.82	518.83	700.96	868.72	1054.78	1231.44	1401.09	1584.88	1749.33	1928.30	2086.66	
Difference: actual from projected	Monthly	-9%	-9%	-11%	-4%	-14%	-7%	-8%	-13%	-3%	-7%	-10%	-11%	
Cumulative difference	Cumulative	10%	10%	11%	9%	10%	10%	10%	10%	10%	9%	10%	10%	

Notes:

<sup>&</sup>quot;Rand Water" includes all raw water abstracted from the Vaal River for the purpose of producing potable water. It excludes the raw water abstracted for supply as raw water to Authorised Users. Source: STATS OCTOBER 2016
"Mittal (Iscor)" includes consumption via Rand Water raw water meters 3103, 3104 and 3072. SOURCE: CONS-201610









