



DEPARTMENT OF WATER AFFAIRS AND FORESTRY
LIMPOPO PROVINCE
WATER RESOURCE INFORMATION

STATUS ON MONITORING &
SURFACE WATER LEVEL TRENDS
APRIL 2011 to SEPTEMBER 2011

D VILJOEN
DECEMBER 2011

GH4323



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1. EXECUTIVE SUMMARY

The majority of dams used in this report have more water than during the corresponding period last year. In the Luvuvhu / Letaba Water Management Area the **Middle Letaba Dam is at a critical stage of 10.3%** and the Albasini Dam with a storage level of only 47.23% also gives reason for concern.

In the Limpopo WMA the following dams have less water than the previous year: Mogol, Glen Alpine and Nzhelele. The following dams have more water than the previous year: Doorndraai, Luphephe and Nwanedzi. The Mutshedzi Dam is at the same level as the corresponding time last year. The average storage volume for the Limpopo WMA is 264.3 million cubic meters (94.3%) and is 7.41million cubic meters less than the corresponding period last year (96.9%).

The average storage volume for the Luvuvhu / Letaba WMA is 459.8 million cubic meters (70.5%) and is 12.84 million cubic meters more than the corresponding period last year (68.5%).

In the Sekhukune area the Flag Boshielo Dam is at a storage level of 98.6% ($182.54 \times 10^6\text{m}^3$) and 1% higher than the previous year, which means that the storage volume is 1.85 million cubic meters more than the corresponding period last year.

The average storage volume for the Olifants WMA is 1033.9 million cubic meters (96.3%) and is 4.56 million cubic meters less than the corresponding period last year (96.7%). Numerous smaller dams (0.7 – 3.5 million cubic meter capacity) exist in this WMA but only two are equipped with Data Loggers namely Piet Gouws and Molepo Dams. No Real Time data is available from these dams and the obtaining of updated dam status observations are hampered by the remoteness thereof. Although provision has been made at some dams for the installation of Data logging equipment, funds for the purchasing thereof are lacking. The following dams falls within the Olifants WMA, but no status information is available: 1. Piet Gouws (3.94 million Cubic meters), Lola Montes (1.2 million Cubic meters), Makotswane (3.48 million Cubic meters), Spitskop (0.54million Cubic meters), Vergelegen (1.34million Cubic meters) Dr. Esselen (0.73million Cubic meters), Chunnies Poort (2.47million Cubic meters), Der Brogen, Lepellane and Mahlangu dams.

The average storage volume for the Inkomati WMA is 1013.7 million cubic meters (96.6%) and is 8.28 million cubic meters more than the corresponding period last year (95.8%).

The challenge in all the WMAs discussed in this report is the fact that there are smaller dams, which supply water to communities that still need to be monitored. Owing to the lack of data these dams could not be included. Infrastructure at these dams are also a major concern and will have to be put in place before any form of water level monitoring can be considered.

Gauge plates have been installed at some of the smaller dams, but there are no observers to relay gauge plate readings to the Tzaneen Office. Hout River Dam has been equipped with near real-time data acquisitioning equipment.

The information presented in this report is based on the status of all the major dams in the province up to the end of September 2010.

2. MONITORING NETWORK

The hydrological monitoring network for the Limpopo Province consists of the following amount of gauging stations:
81 river flow gauging stations (excluding canals and pipelines)
21 dam gauging stations
16 evaporation stations

It is important to take cognizance of the fact that the hydrological gauging stations in the Crocodile-West and Olifants Water Management Areas (shared boundaries) are being managed by the hydrological offices of Gauteng and Mpumalanga respectively.

For the purpose of this report and owing to the strategic location and importance of certain dams in the Olifants and Inkomati Water Management Areas, information regarding their status is also attached.

3. OVERVIEW

No river flow gauging stations were used in this report as their importance will only play a roll when inflow stream requirements have to be met or during big flood events.

Take note that that the following dams have been included under the provincial boundary of the Limpopo Province: Nandoni, Flag Boshielo, Klaserie, Rust De Winter, Tonteldoos, Tours, Vlugkraal and Warmbad. This results in the full supply storage capacity increasing from 767.6 million cubic meters to 1166.6 million cubic meters.

To give an indication of what the percentage of normal rainfall was for the period October 2010 up to September 2011, see attached map (page 11). For information purposes a graph depicting provincial rainfall for the current hydrological year is attached (page 12). Rainfall forecasts for October 2010 up to December 2010 are also attached see page 19. This information was obtained from the South African Weather Service.

The National dam storage graph (page 13) has been attached to the report for additional information. The Limpopo Province dam storage graph (page 14) as well as the graphs of the two WMAs (page 15-16), indicates the current situation clearly.

This information was obtained from Mr Mantaneng Phaladi from Hydrological services, National Office.

For information purposes a graph indicating the comparison of water storage percentage for the different WMA's is attached on page 17. This information is also depicted in tabular format with the relevant storage volumes for each WMA, see page 18.

The purpose for attaching graphs of individual dams is to give a broader picture of water storage and status in the sub drainage catchments.

4. LIMPOPO WATER MANAGEMENT AREA

The catchment consists of secondary drainage areas A4, A5, A6, A7 and A8.

A4 Drainage Area (Matlabas, Mokolo Rivers)

The Mokolo Dam (A4R001) was used as no other dam exists in the A4 hydrological monitoring network. The dam storage is at a storage level of 98.13% ($142.65 \times 10^6 \text{m}^3$) and 2.07% lower than the previous year, which means that the storage volume is 3.01 million cubic meters less than the corresponding period last year. See attached graph!

4.2 A5 Drainage Area (Lephalala River)

Two small dams exist in the A5 hydrological network namely the Susandale Dam (A5R001) and the Vischgat Dam (A5R002). Owing to their relatively small storage volumes of approximately 0.6 million cubic meters in total, these dams have not been included in this report!

4.3 A6 Drainage Area (Nile, Sterk, Mogalakwena and Dorps Rivers)

The Doorndraai Dam (A6R001) and Glen Alpine Dam (A6R002) were used as no other dams exist in the A6 hydrological monitoring network. The Doorndraai Dam is at a storage level of 97.16% ($42.52 \times 10^6 \text{m}^3$) and 0.36% higher than the previous year, which means that the storage volume is 0.16 million cubic meters more than the corresponding period last year. See attached graph!

Glen Alpine Dam is at a storage level of 69.3% ($13.09 \times 10^6 \text{m}^3$) and 27.1% lower than the previous year, which means that the storage volume is 5.12 million cubic meters less than the corresponding period last year. See attached graph!

It must be noted that the full capacity storage of Glen Alpine Dam is only 18.889 million cubic and therefore the dam fills and empties much faster than Doorndraai Dam! The graph of Glen Alpine clearly indicates this!

Take note that the full supply capacity ($18.889 \times 10^6 \text{m}^3$) as supplied in the National Weekly Dam Status report, was used for calculation purposes!

4.4 A7 Drainage Area (Sand, Blood, Diep, Hout, Dwars and Brak Rivers)

There are no existing dam monitoring stations in the hydrological network for this drainage area!

The Tzaneen Area Office in conjunction with the Hydrometry office is currently busy with the installation of gauge plates at dams in both of the Water Management Areas. Hout River Dam has been equipped with gauge plates, but a futile exercise at Mashashane Dam just reiterated the point that gauge plates should be installed once water levels are below lowest outlet levels! Data capturing and real-time equipment has been installed at Hout River Dam.

Seshego and Rietfontein Dams will be investigated, but due to high water levels and the lack of infrastructure, the installation of gauge plates remains a huge challenge. According to preliminary investigations it seems obvious that the installation of gauge plates will only be feasible when water levels at these dams are on or below lowest outlet levels!

4.5 A8 Drainage Area (Nwanedzi and Nzhelele Rivers)

The Nzhelele Dam (A8R001), Luphephe (A8R002), Nwanedzi (A8R003) and Mutshedzi (A8R004) Dams were used as indicators! The Nzhelele Dam is at a storage level of 90.81% ($46.52 \times 10^6\text{m}^3$) and 0.39% lower than the previous year, which means that the storage volume is 0.2 million cubic meters less than the corresponding period last year. See attached graph!

Luphephe and Nwanedzi Dams are at storage levels of 82.98% and 80.54% respectively. Their combined storage is at $15.74 \times 10^6\text{m}^3$. The combined storage for the corresponding period the previous year was $14.92 \times 10^6\text{m}^3$. (78% of storage volume) See attached graphs!

Mutshedzi Dam, is at a storage level of 100% ($2.34 \times 10^6\text{m}^3$) and on the same level as the corresponding period last year!

5. LUVUVHU / LETABA WATER MANAGEMENT AREA

The catchment consists of secondary drainage areas A9, B8 and B9.

5.1 A9 Drainage Area (Mutale, Luvuvhu Rivers)

The Albasini Dam (A9R001), Vondo Dam (A9R002) and Nandoni (A9R004) Dams were used as monitoring points in this report.

Albasini Dam is at a storage level of 47.23% ($13.32 \times 10^6\text{m}^3$) and 15.53% higher than the previous year, which means that the storage volume is 4.38 million cubic meters more than the corresponding period last year. See attached graph!

Vondo Dam is at a storage level of 90.84% ($27.66 \times 10^6\text{m}^3$) and 4.96% lower than the previous year, which means that the storage volume is 1.51 million cubic meters less than the corresponding period last year. See attached graph!

Nandoni Dam is at a storage level of 97.18% ($161.43 \times 10^6\text{m}^3$) and 2.62% lower than the previous year, which means that the storage volume is 4.35 million cubic meters less than the corresponding period last year. See attached graph!

5.2 B8 Drainage Area (Groot, Middle and Klein Letaba Rivers)

The Ebenezer Dam (B8R001), Magoebaskloof Dam (B8R003), Tzaneen Dam (B8R005), Middle-Letaba Dam (B8R007), Nsami Dam (B8R009) and Modjadji Dam (B8R011) were used as monitoring points in this report. The Dap Naudé Dam (B8R006) and Hans Merensky Dam (B8R002) are also being monitored, but were not included in this report!

Thapane Dam has been investigated but due to high water levels and the lack of infrastructure, the installation of gauge plates remains a huge challenge. According to preliminary investigations it seems obvious that the installation of gauge plates will only be feasible when the water level at this dam is on or below lowest outlet level!

The Ebenezer Dam is at a storage level of 98.6% ($68.17 \times 10^6\text{m}^3$) and 2.2% higher than the previous year, which means that the storage volume is 1.524 million cubic meters more than the corresponding period last year. See attached graph!

Magoebaskloof Dam is at a storage level of 100.4% ($4.86 \times 10^6\text{m}^3$) and 0.3% higher than the previous year, which means that the storage volume is 0.021 million cubic meters more than the corresponding period last year. See attached graph! **Take note that the full supply capacity ($4.84 \times 10^6\text{m}^3$) as supplied in the National Weekly Dam Status report, was used for calculation purposes!**

Tzaneen Dam is at a storage level of 95.8% ($149.89 \times 10^6\text{m}^3$) and 3.2% higher than the previous year, which means that the storage volume is 4.94 million cubic meters more than the corresponding period last year. See attached graph! **Take note that the full supply capacity ($156.53 \times 10^6\text{m}^3$) as supplied in the National Weekly Dam Status report, was used for calculation purposes!**

Middle-Letaba Dam is at a storage level of 10.3% ($17.75 \times 10^6\text{m}^3$) and 6.5% higher than the previous year, which means that the storage volume is 11.22 million cubic meters more than the corresponding period last year. See attached graph!

The Nsami Dam is at a storage level of 46.41% ($10.15 \times 10^6\text{m}^3$) and 7.29% lower than the previous year, which means that the storage volume is 1.59 million cubic meters less than the corresponding period last year.

The Modjadji Dam is at a storage level of 89.7% ($6.44 \times 10^6\text{m}^3$) and 8.6% higher than the previous year, which means that the storage volume is 0.62 million cubic meters more than the corresponding period last year.

5.3 B9 Drainage Area (Shingwedzi, Phugwane and Mphongolo Rivers)

Only a limited part of this drainage area falls outside the Kruger National Park!
There are no existing dam monitoring stations in the hydrological network for this drainage area!

6. OLIFANTS WATER MANAGEMENT AREA

Monitoring points in the B3, B5, B6 and, B7 sub drainage areas were also included in this report owing to their strategic location and importance to operational matters in the Limpopo Province.

6.1 B3 Drainage Area (Olifants, Elands, Bloed and Selons Rivers)

For information as well as operational matters the status of Rust de Winter Dam (B3R001) and Loskop Dam (B3R002) has been included in this report.

Rust de Winter Dam is at a storage level of 99.7% ($28.1 \times 10^6\text{m}^3$) and 0.5% lower than the previous year, which means that the storage volume is 0.014 million cubic meters less than the corresponding period last year. See attached graph!

Loskop Dam is at a storage level of 95% ($343.43 \times 10^6\text{m}^3$) and 1.7% lower than the previous year, which means that the storage volume is 6.15 million cubic meters less than the corresponding period last year. See attached graph!

6.2 B5 Drainage Area (Olifants River)

For information as well as operational matters the status of Flag Boshielo Dam (B5R002) has been included in this report.

Flag Boshielo Dam is at a storage level of 98.6% ($182.54 \times 10^6\text{m}^3$) and 1% higher than the previous year, which means that the storage volume is 1.85 million cubic meters more than the corresponding period last year. See attached graph!

6.3 B6 Drainage Area (Blyde and Ohrigstad Rivers)

For information as well as operational matters the status of Ohrigstad Dam (B6R001) and Blyde Rivierspoort Dam (B6R003) has been included in this report.

Ohrigstad Dam is at a storage level of 74.9% ($10.07 \times 10^6\text{m}^3$) and 27.2% higher than the previous year, which means that the storage volume is 3.663 million cubic meters more than the corresponding period last year. See attached graph!

Take note that the full supply capacity ($13.448 \times 10^6\text{m}^3$) as supplied in the National Weekly Dam Status report, was used for calculation purposes!

Blyde Dam is at a storage level of 94.9% ($51.6 \times 10^6\text{m}^3$) and 8.5% higher than the previous year, which means that the storage volume is 4.63 million cubic meters more than the corresponding period last year. See attached graph!

Take note that the full supply capacity ($54.369 \times 10^6\text{m}^3$) as supplied in the National Weekly Dam Status report, was used for calculation purposes!

6.4 B7 Drainage Area (Klaserie and Olifants Rivers)

For information as well as operational matters the status of Klaserie Dam (B7R001) and Tours Dam (B7R003) has been included in this report.

Klaserie Dam is at a storage level of 100.4% ($5.63 \times 10^6\text{m}^3$) and 5.3% higher than the previous year, which means that the storage volume is 0.3 million cubic meters higher than the corresponding period last year. See attached graph!

Tours Dam is at a storage level of 97.6% ($5.94 \times 10^6\text{m}^3$) and 7.6% higher than the previous year, which means that the storage volume is 0.46 million cubic meters more than the corresponding period last year. See attached graph!

Take note that the full supply capacities ($5.604 \times 10^6\text{m}^3$ and $6.084 \times 10^6\text{m}^3$) Klaserie and Tours Dams respectively, as supplied in the National Weekly Dam Status report, were used for calculation purposes!

7. NKOMATI WATER MANAGEMENT AREA

7.1 X2 Drainage Area (Crocodile River)

For information as well as operational matters the status of Kwena Dam (X2R005) has been included in this report.

Kwena Dam is at a storage level of 95.4% ($151.58 \times 10^6\text{m}^3$) and 1.1% higher than the previous year, which means that the storage volume is 1.75 million cubic meters more than the corresponding period last year. See attached graph!

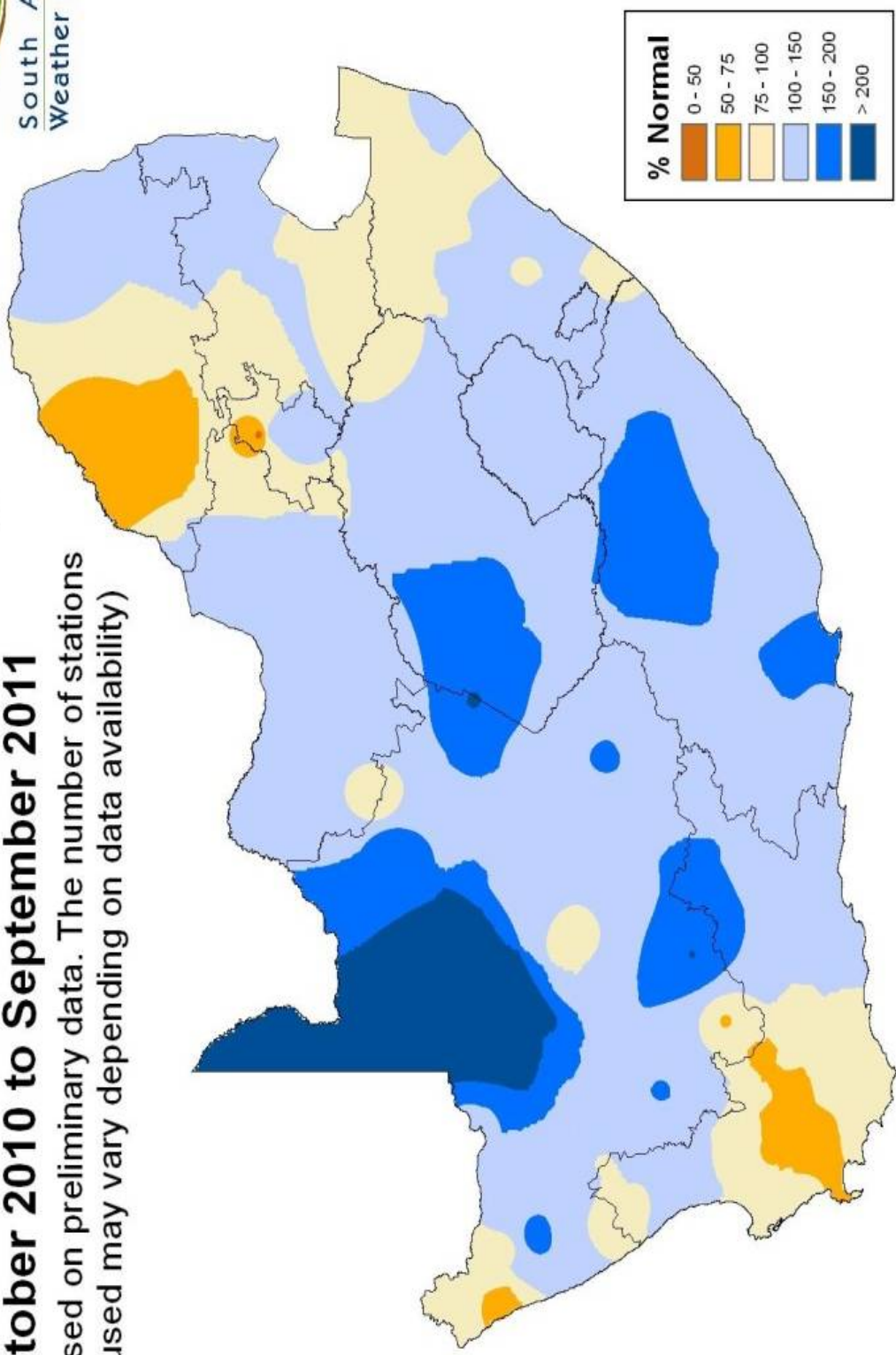
7.2 X3 Drainage Area (Mariti River)

For information as well as operational matters the status of Inyaka Dam (X3R002) has been included in this report.

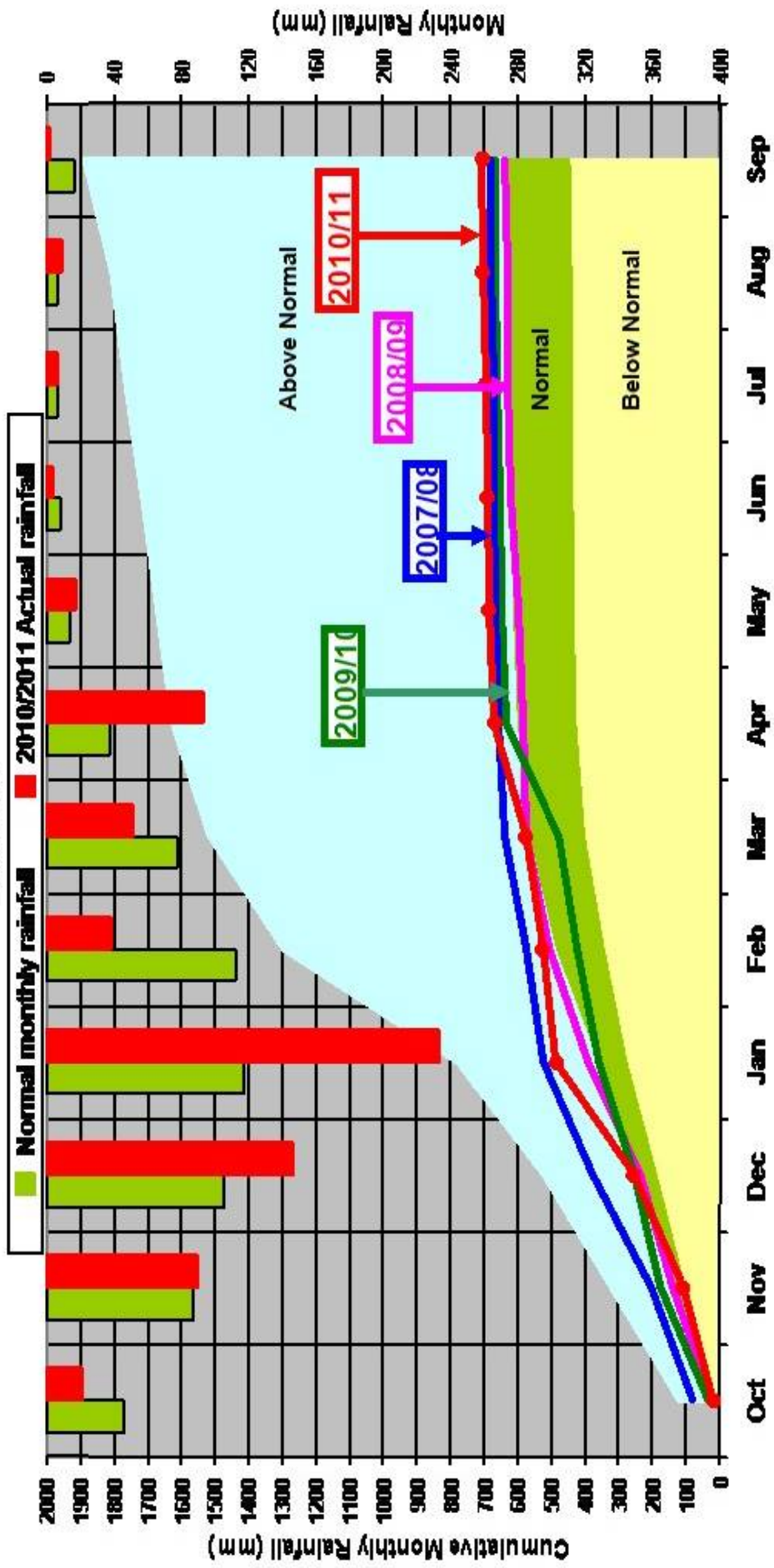
Inyaka Dam is at a storage level of 100% ($123.66 \times 10^6\text{m}^3$) and 2.1% higher than the previous year, which means that the storage volume is 2.6 million cubic meters more than the corresponding period last year. See attached graph!

Percentage of Normal for the Hydrological Season October 2010 to September 2011

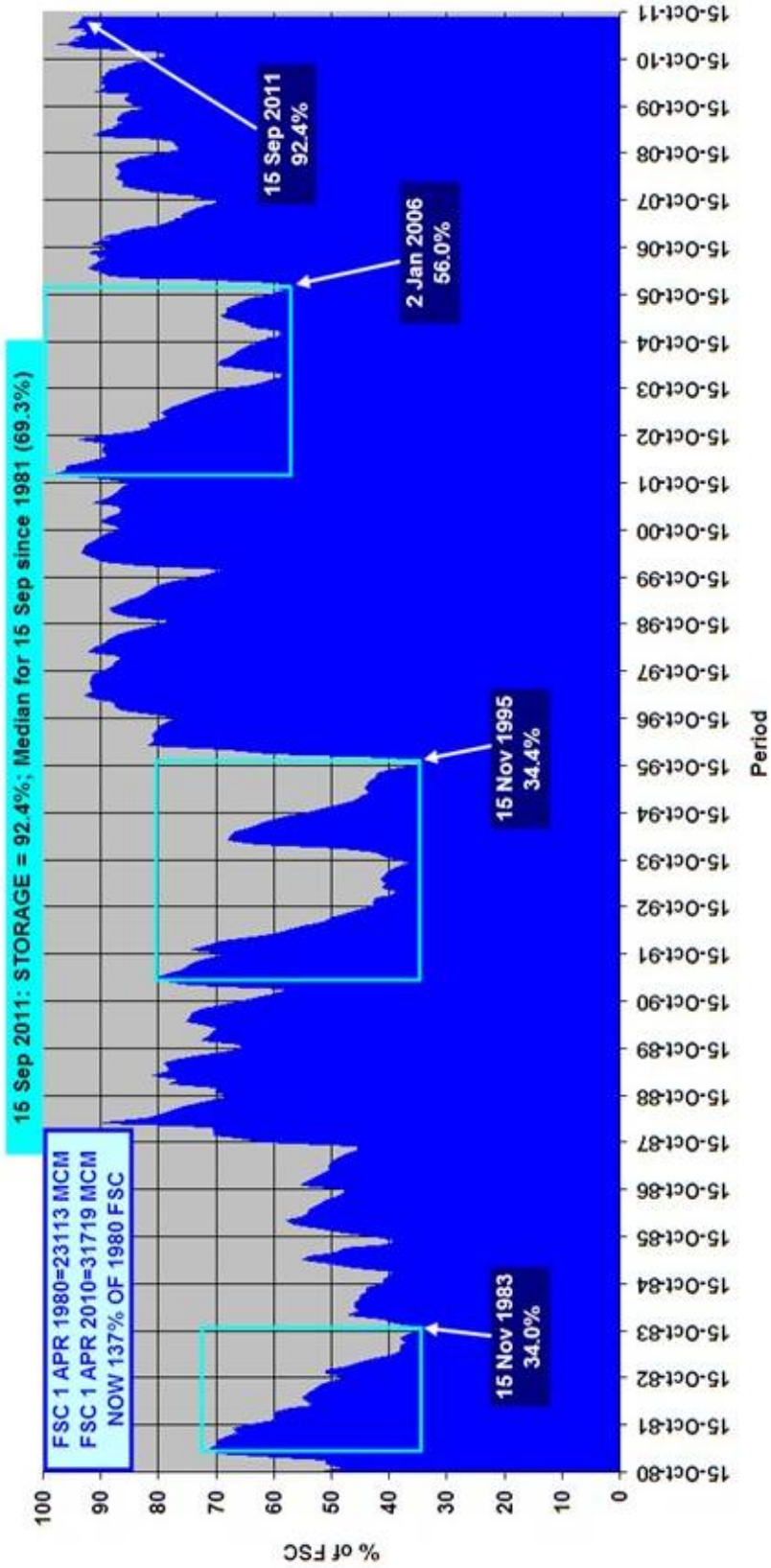
(based on preliminary data. The number of stations used may vary depending on data availability)



LIMPOPO

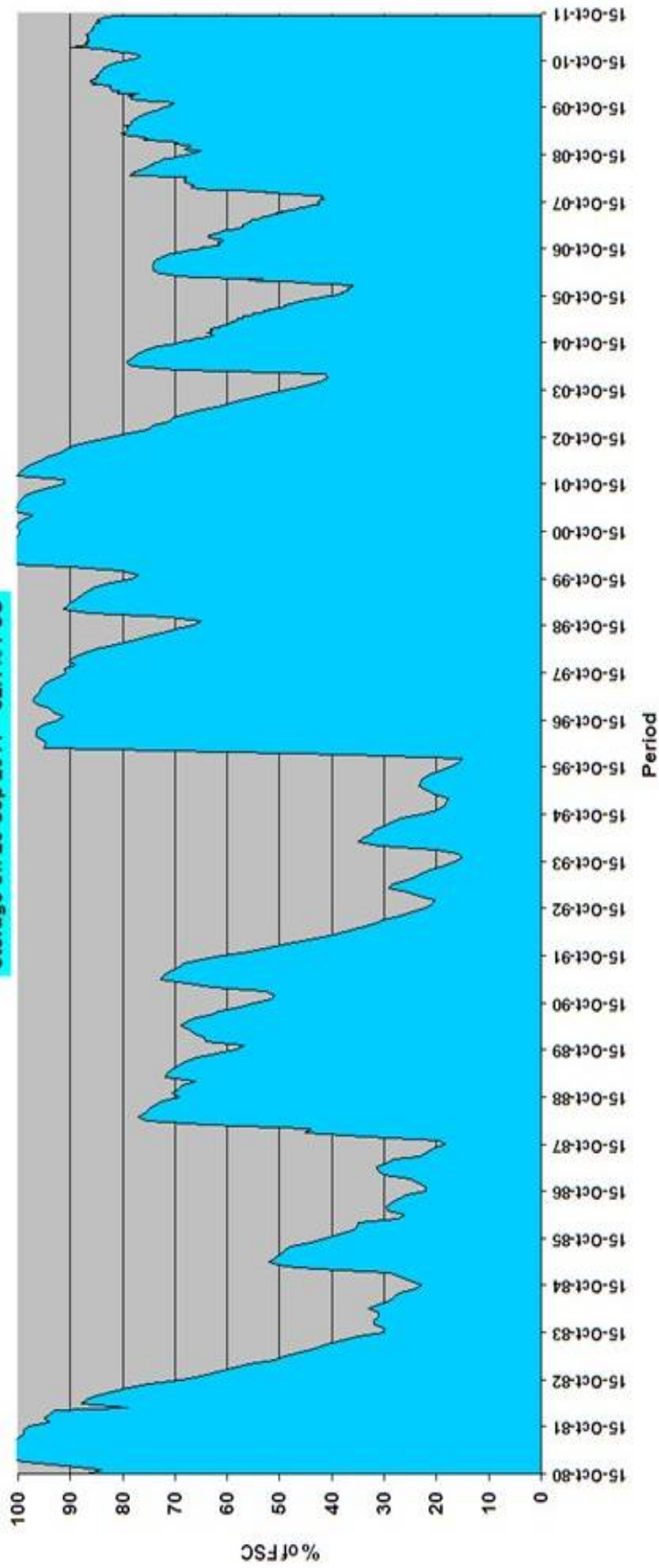


**National Dams: Water Storage: 2nd Highest on record for Sep since 1981
Oct 1980 to 15 Sep 2011 (Weekly values since 4/10/04)**

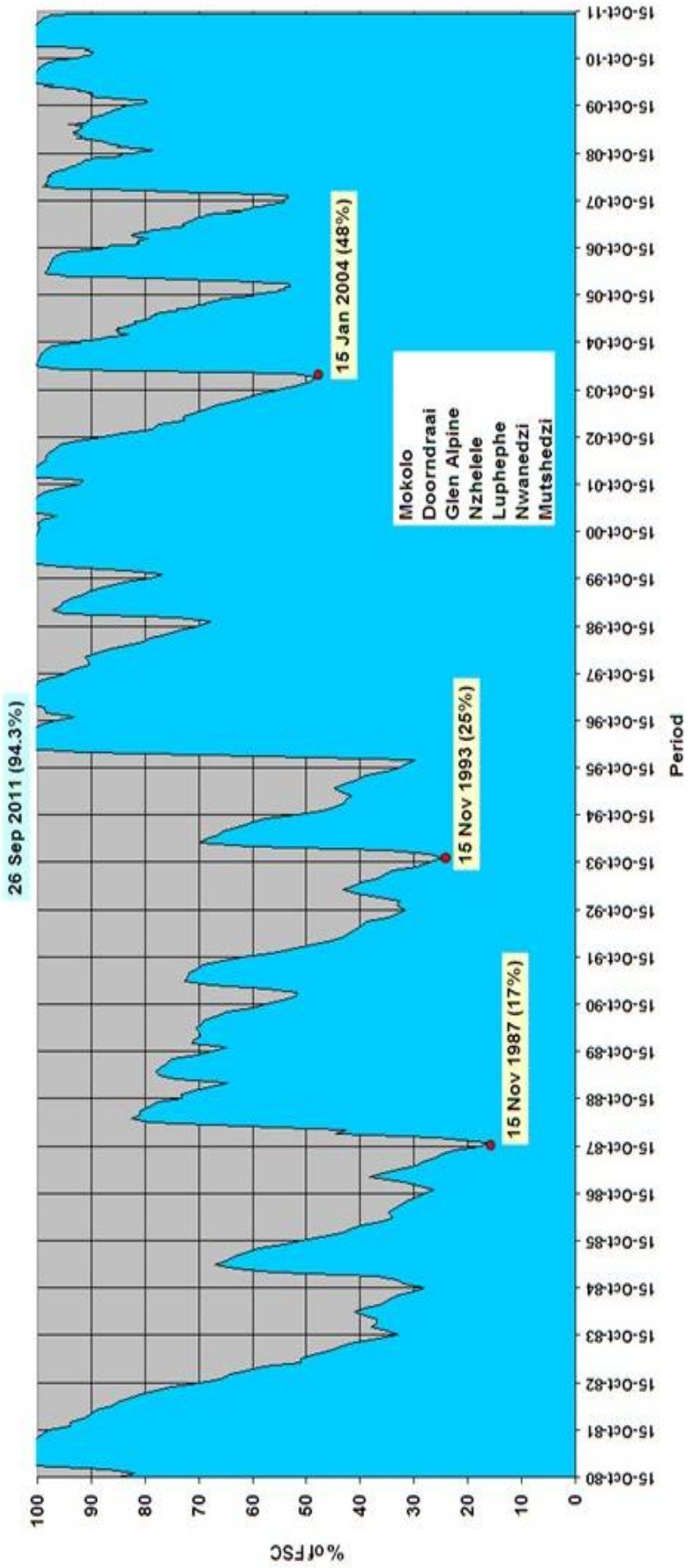


Limpopo Province: Dam Water Storage: Oct 1980 to 26 Sep 2011 (Weekly values since 4/10/04)

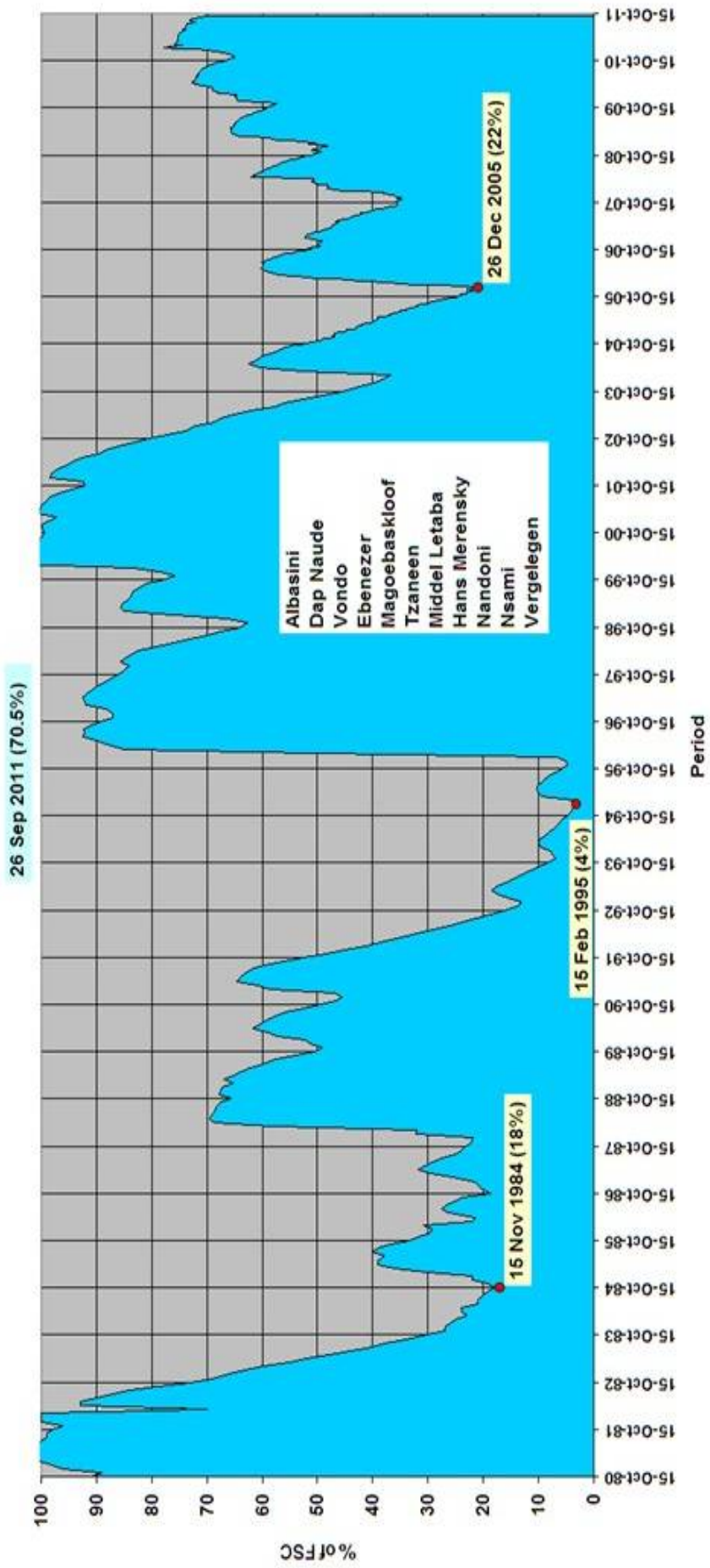
Storage on 26 Sep 2011 = 82.1% FSC



WMA 1: Limpopo (Weekly values since 4/10/04) up to 26 Sep 2011



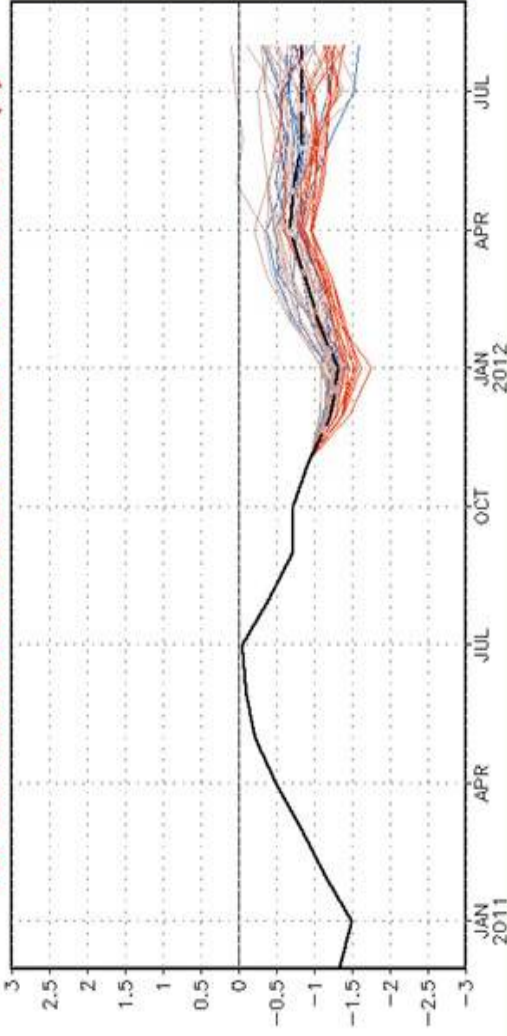
WMA 2: Luvuvhu & Letaba (Weekly values since 4/10/04) up to 26 Sep 2011



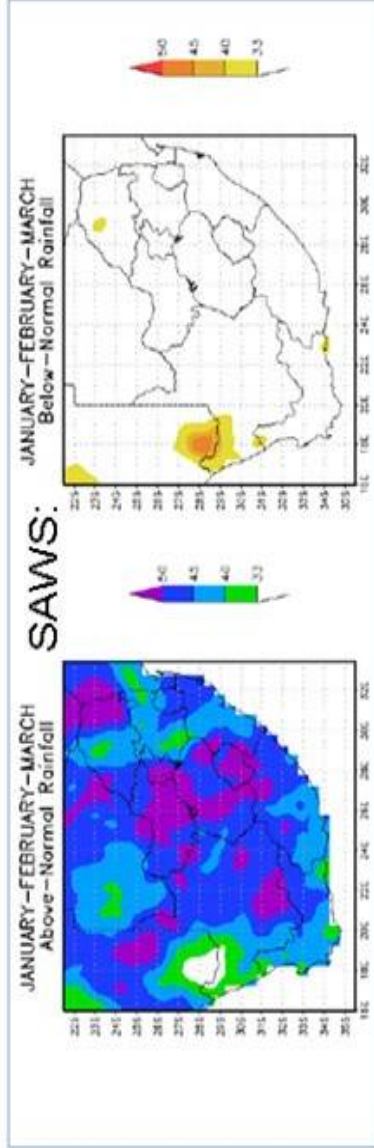
Summary WMA		Full Supply Capacity 10 ⁶ M ³	Water in Storage 10 ⁶ M ³	Last Year %Full	Last Week %Full	This Week 17 Oct 2011 %Full
1	Limpopo	280.4	258.5	94.8	93.2	92.2
2	Luvubu/Letaba	652.5	457.4	66.7	69.9	70.1
3	Crocodile (West) Marico	813.8	705.7	72.5	87.7	86.7
4	Olifants	1073.9	1006.1	93.5	94.9	93.7
5	Inkomati	1049.5	1004.0	92.2	96.4	95.7
6	Usutu/Mhlatuze	3276.2	2533.3	71.9	77.6	77.3
7	Thukela	1115.3	1045.7	81.7	94.6	93.8
8	Upper Vaal	5629.8	5267.3	90.7	94.1	93.6
9	Middle Vaal	1671.6	1549.4	81.9	93.3	92.7
10	Lower Vaal	108.5	100.9	89.1	96.9	93.0
11	Mvoti/Umzimkulu	802.1	722.8	81.2	90.5	90.1
12	Mzimvubu/Keiskamma	1062.5	1040.5	64.8	98.6	97.9
13	Upper Orange	11416.1	10520.5	80.1	93.2	92.2
14	Lower Orange	36.1	38.7	105.5	107.6	107.2
15	Fish/Tsitsikamma	726.0	501.1	27.2	69.4	69.0
16	Gouritz	258.6	207.1	27.8	82.1	80.1
17	Olifants/Doorn	127.5	125.0	100.2	99.1	98.1
18	Breede	1038.9	845.4	82.1	82.2	81.4
19	Berg	416.5	380.9	95.4	92.7	91.4
GRAND TOTAL		31555.7	28310.3	80.1	90.5	89.7



PDF corrected CFS forecast Nino3.4 SST anomalies (K)

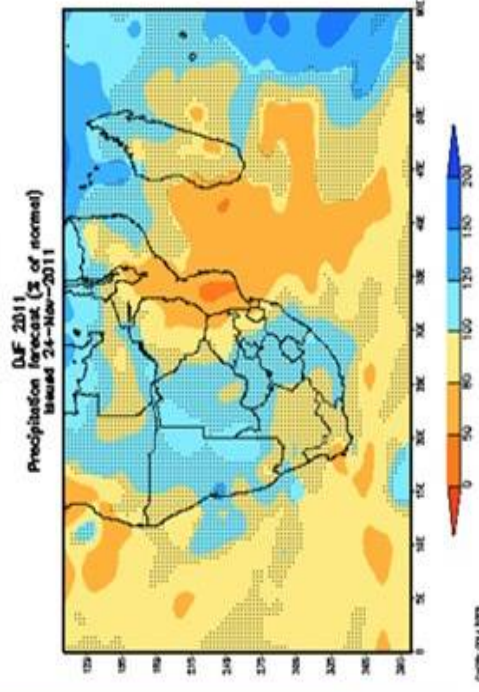


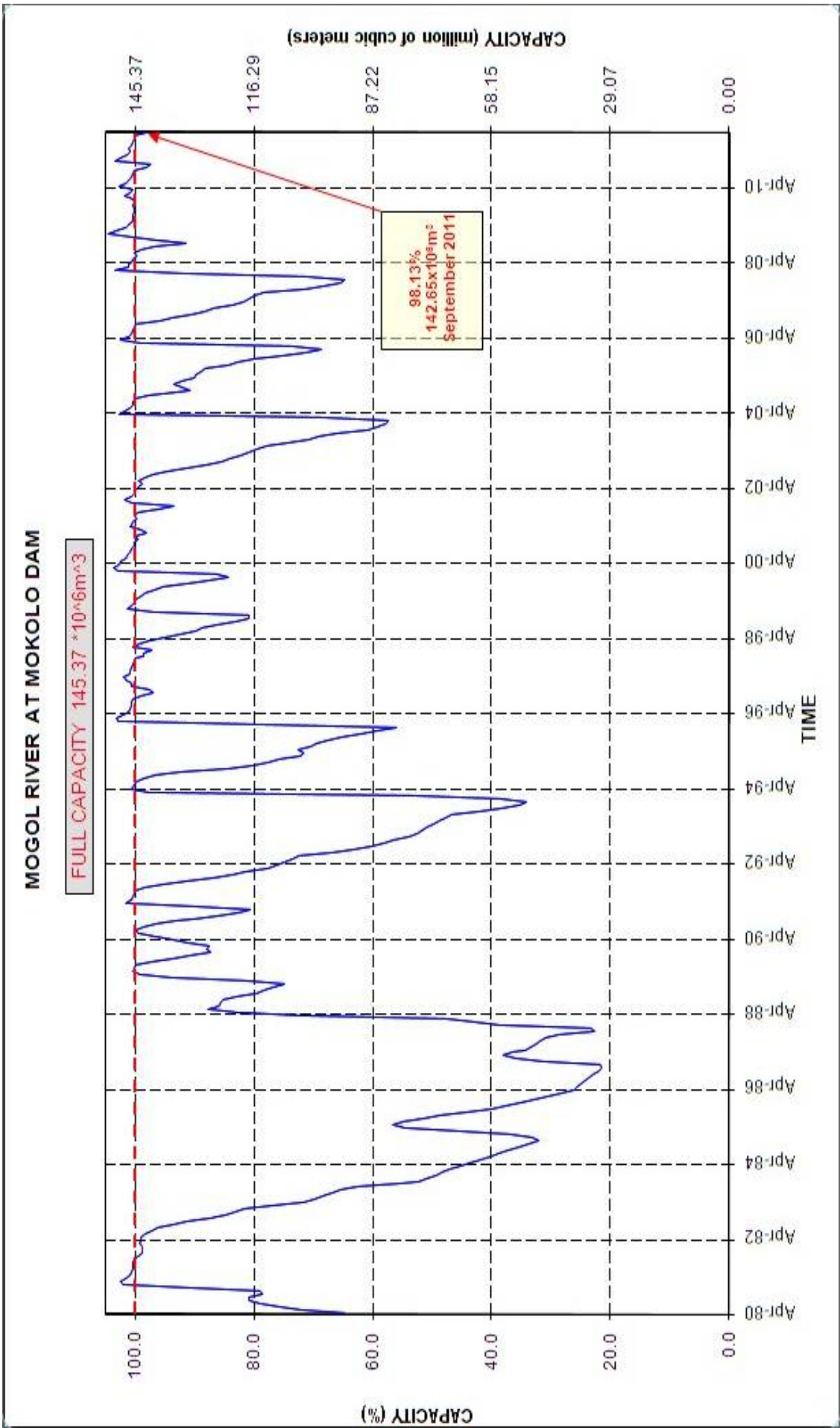
SAWS:
ENSO is currently in a La Nina phase and is predicted to strengthen for the forecast period. The December-January-February (DJF) season show favored above-normal observed category when there is an ENSO La Nina phase; in effect for most parts of the country.

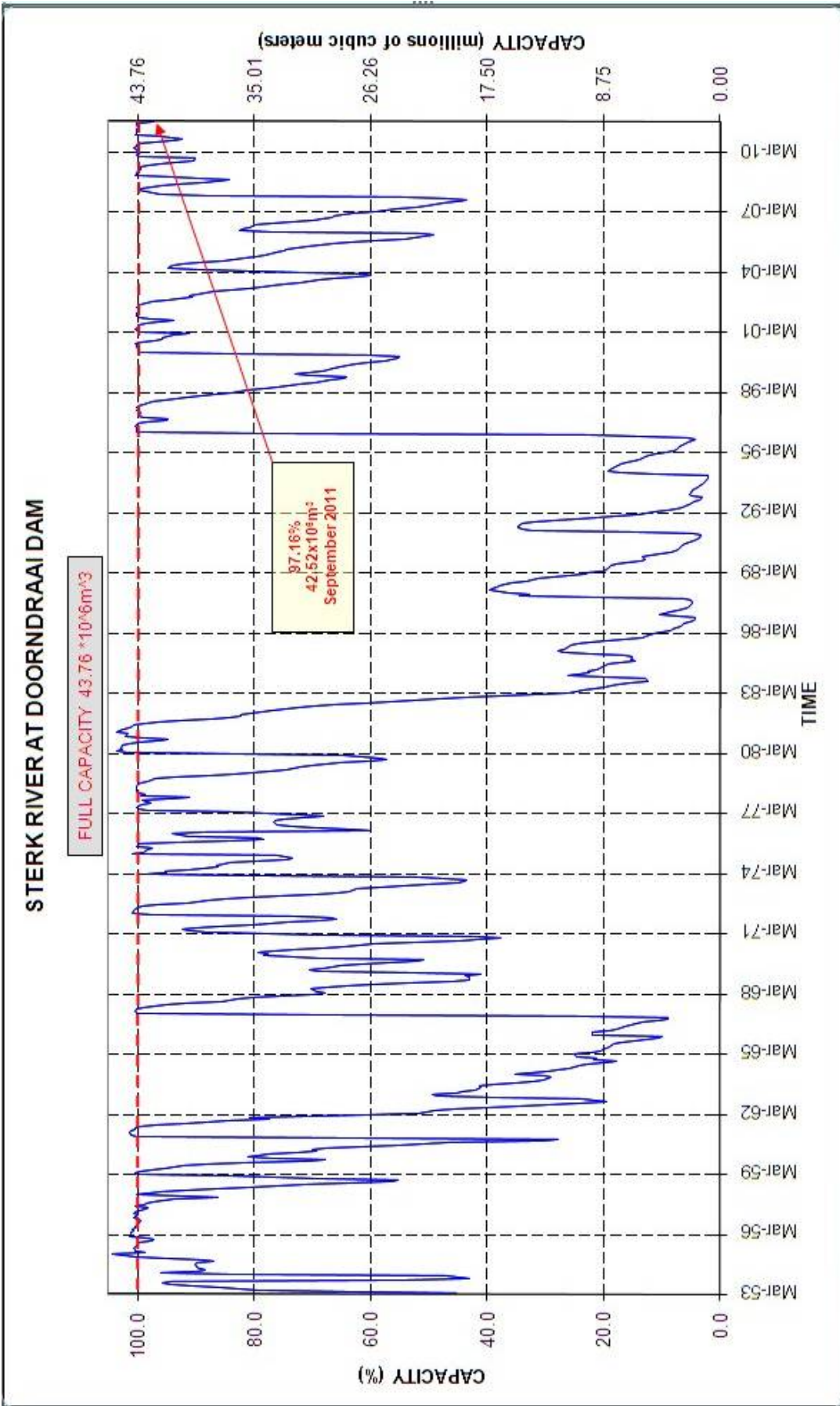


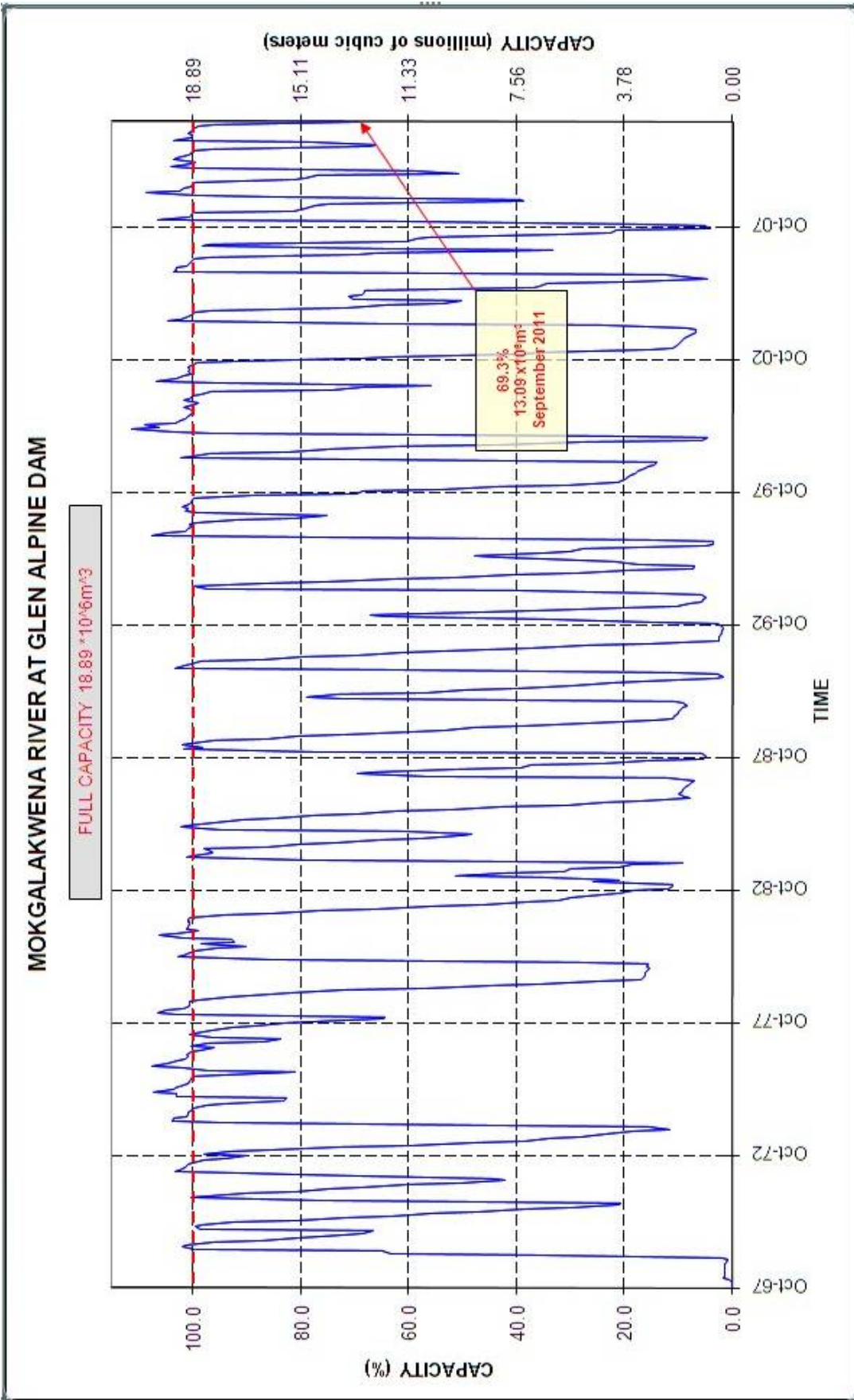
January-February-March
Enhanced probabilities for above-normal rainfall totals are expected for most parts of South-Africa.

GFCSA:

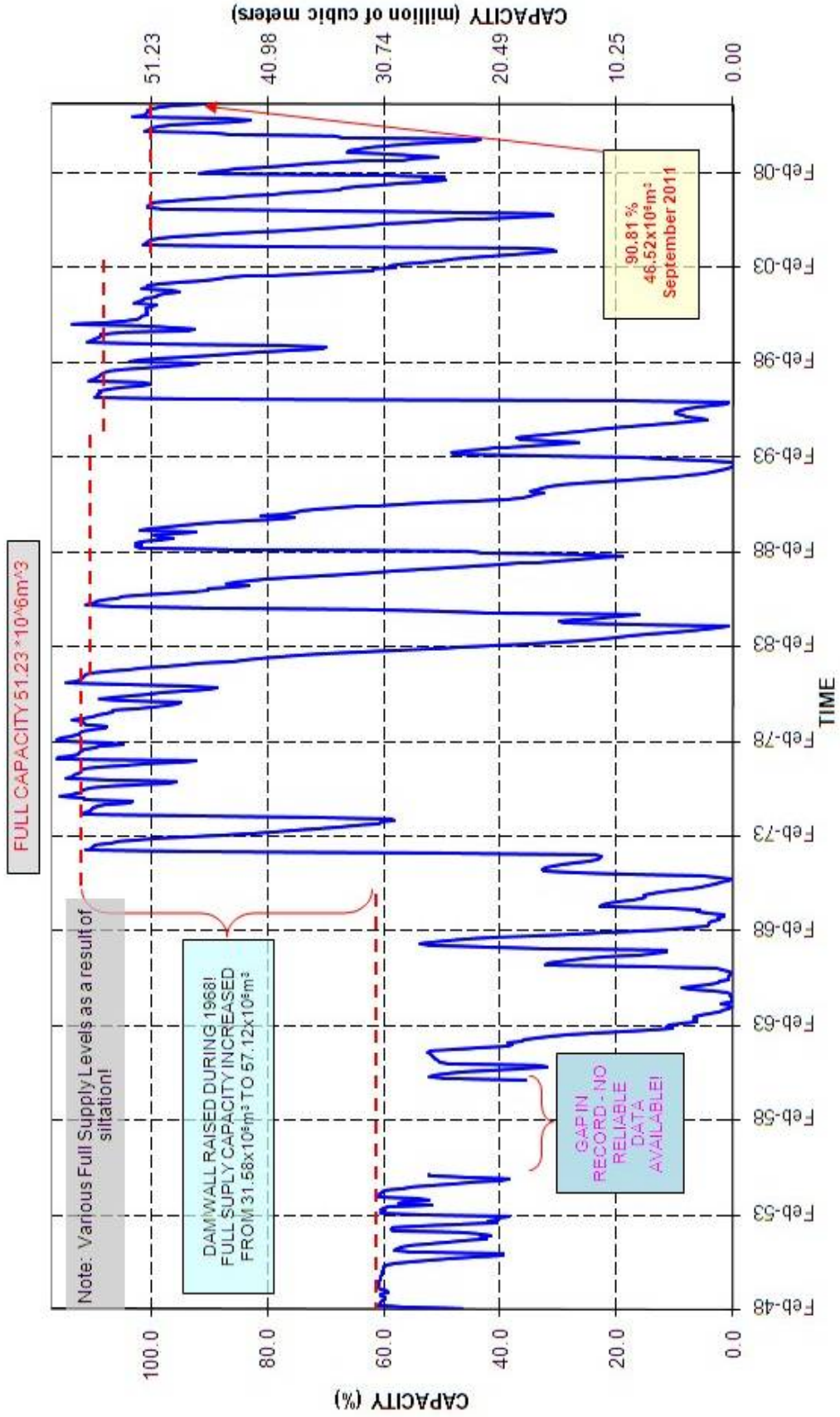


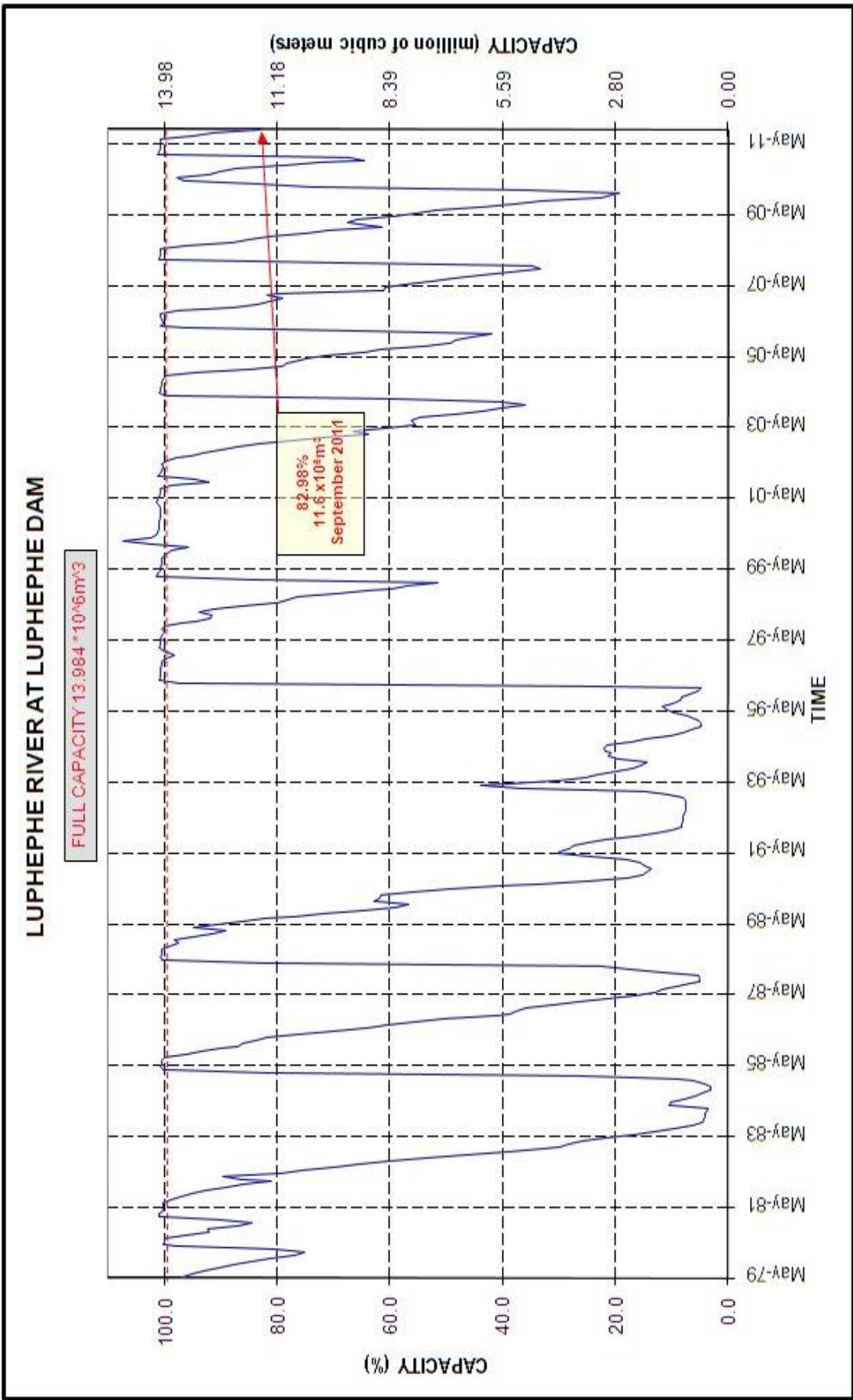


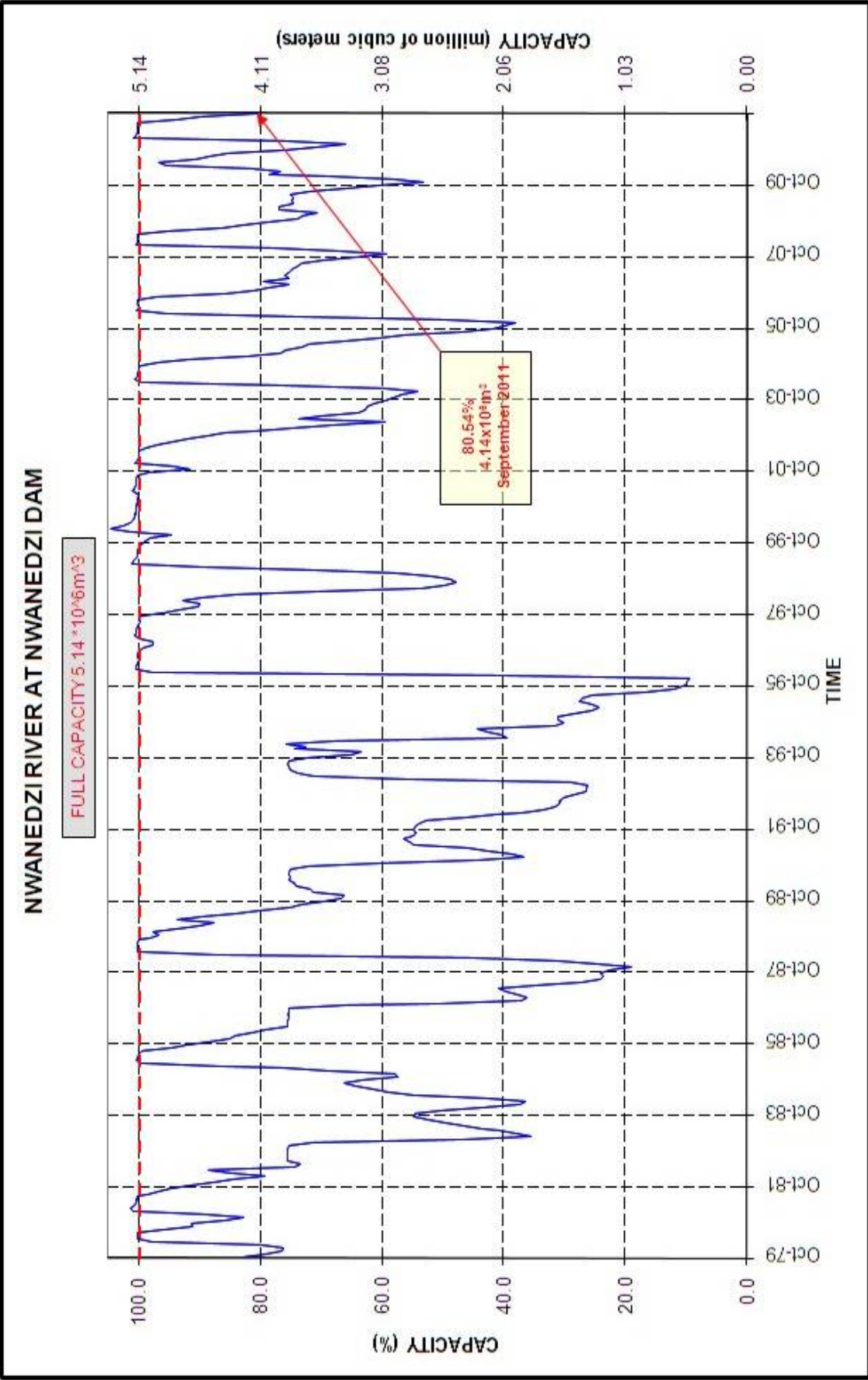


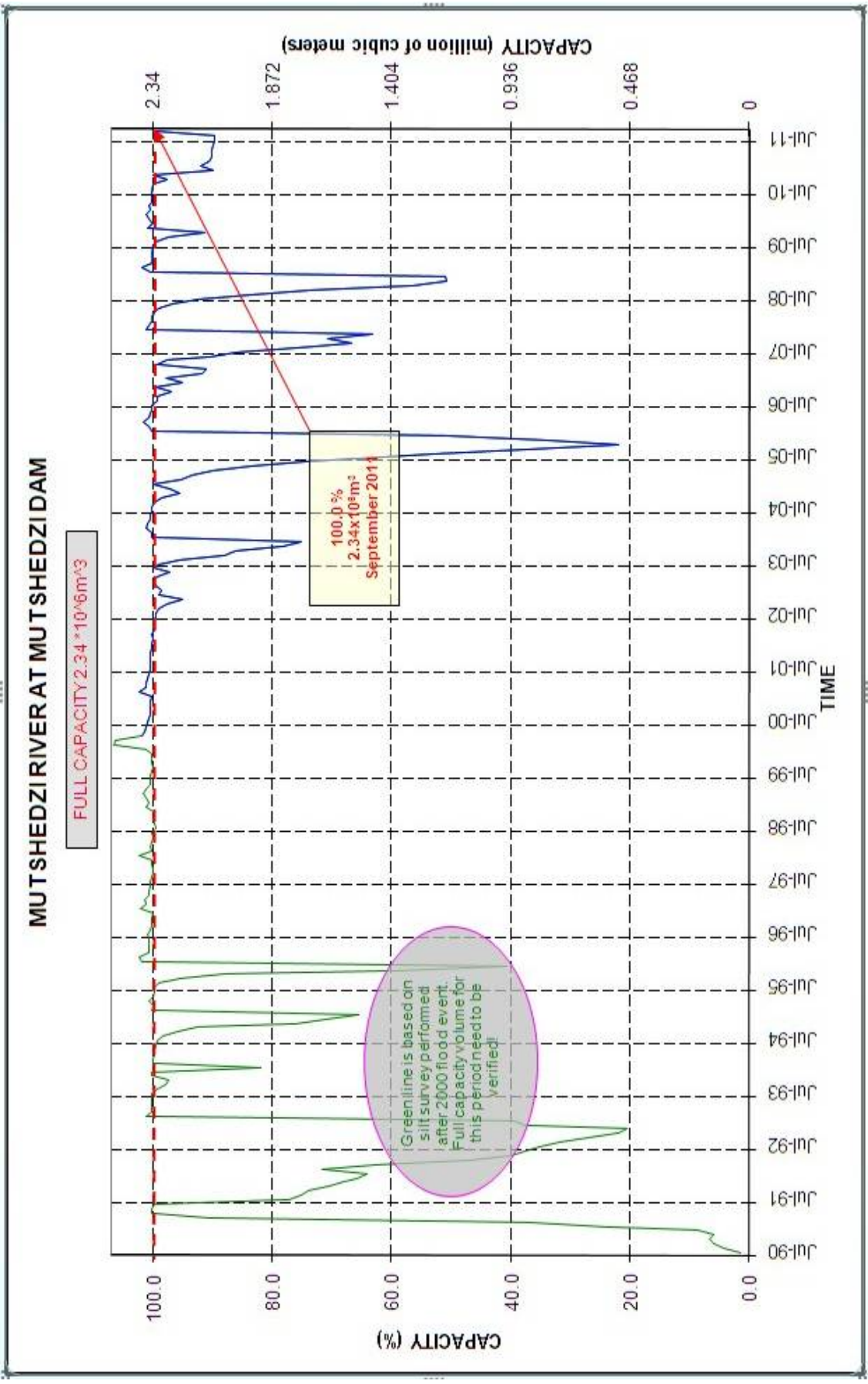


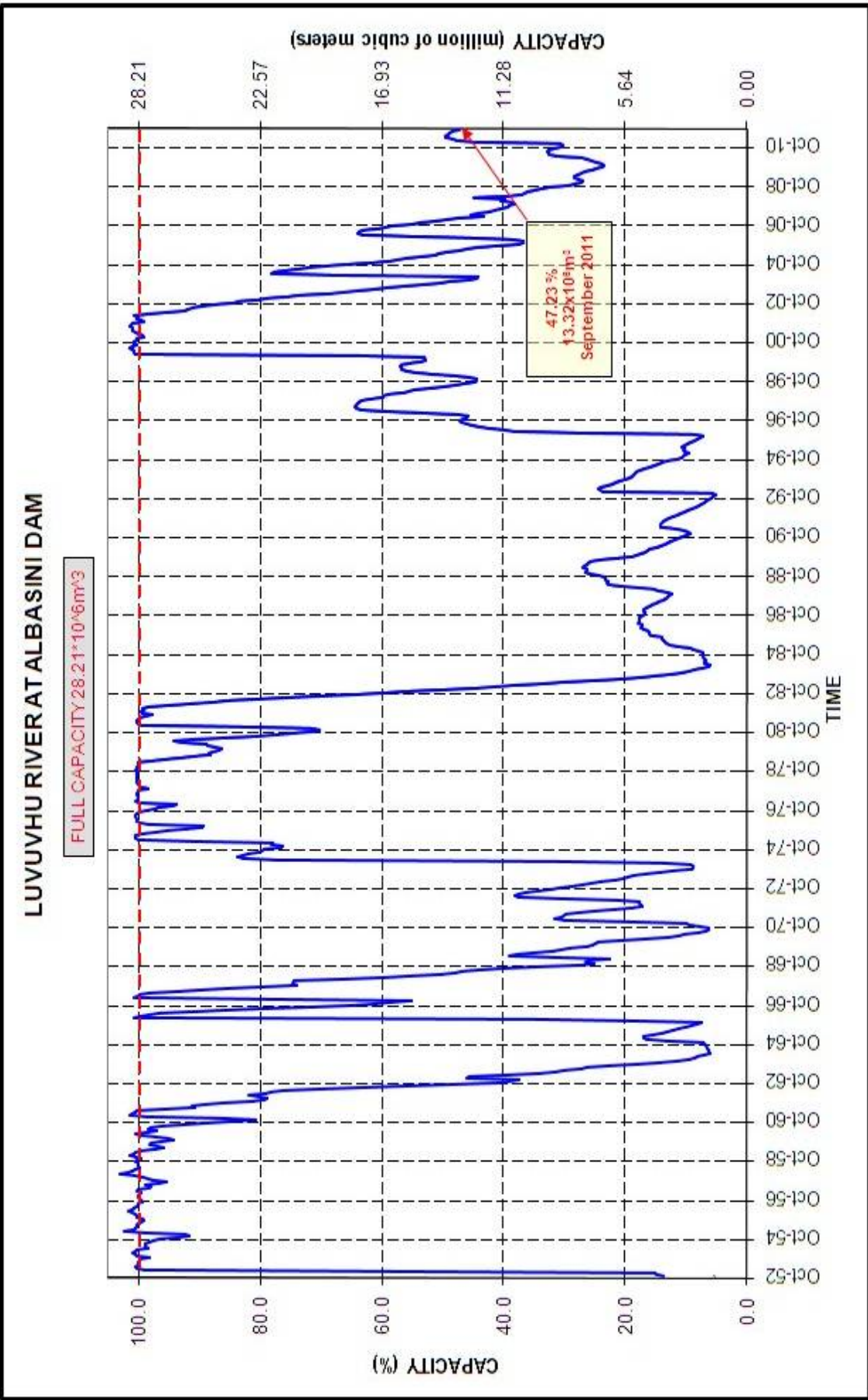
NZHELELE RIVER AT NZHELELE DAM

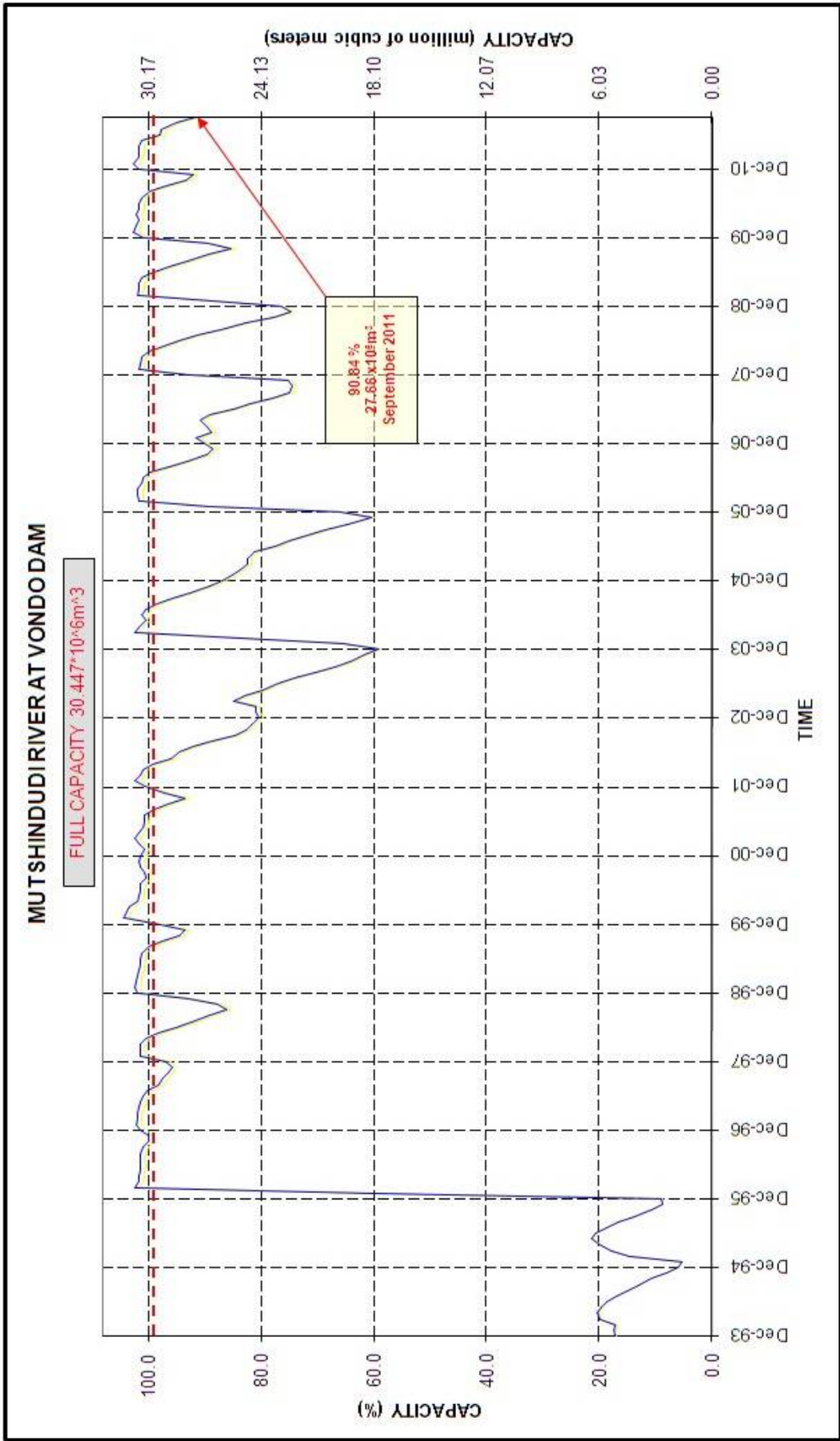


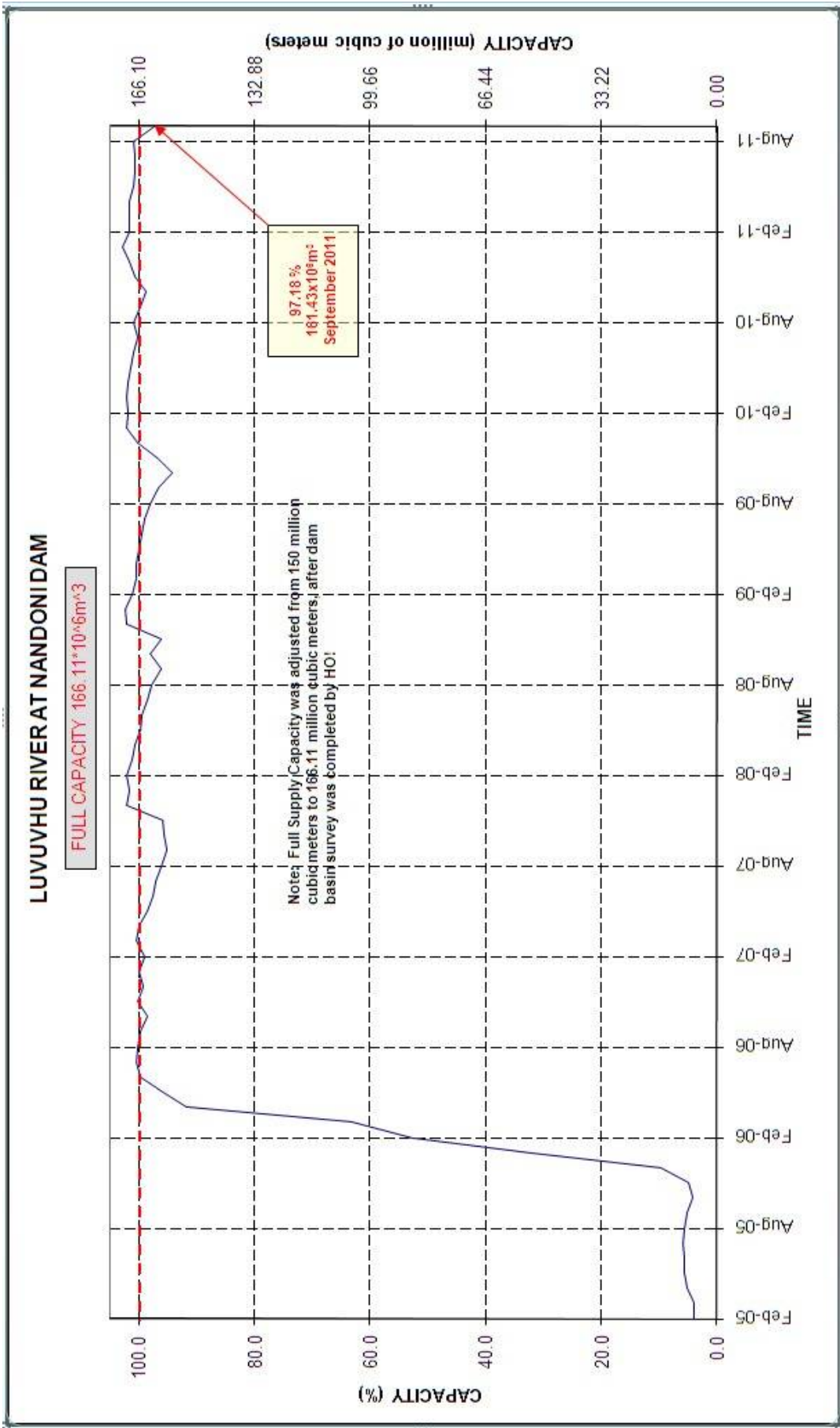




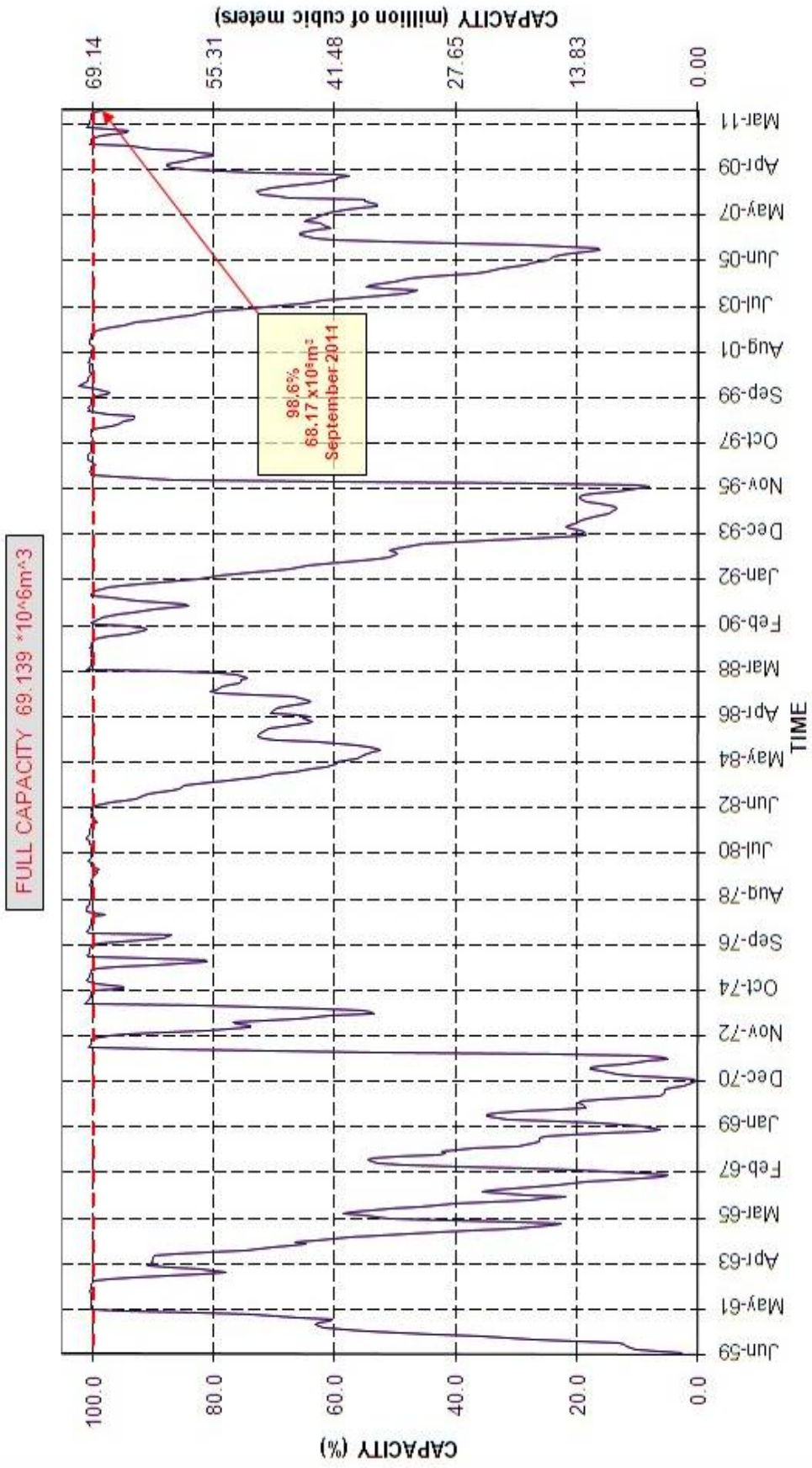




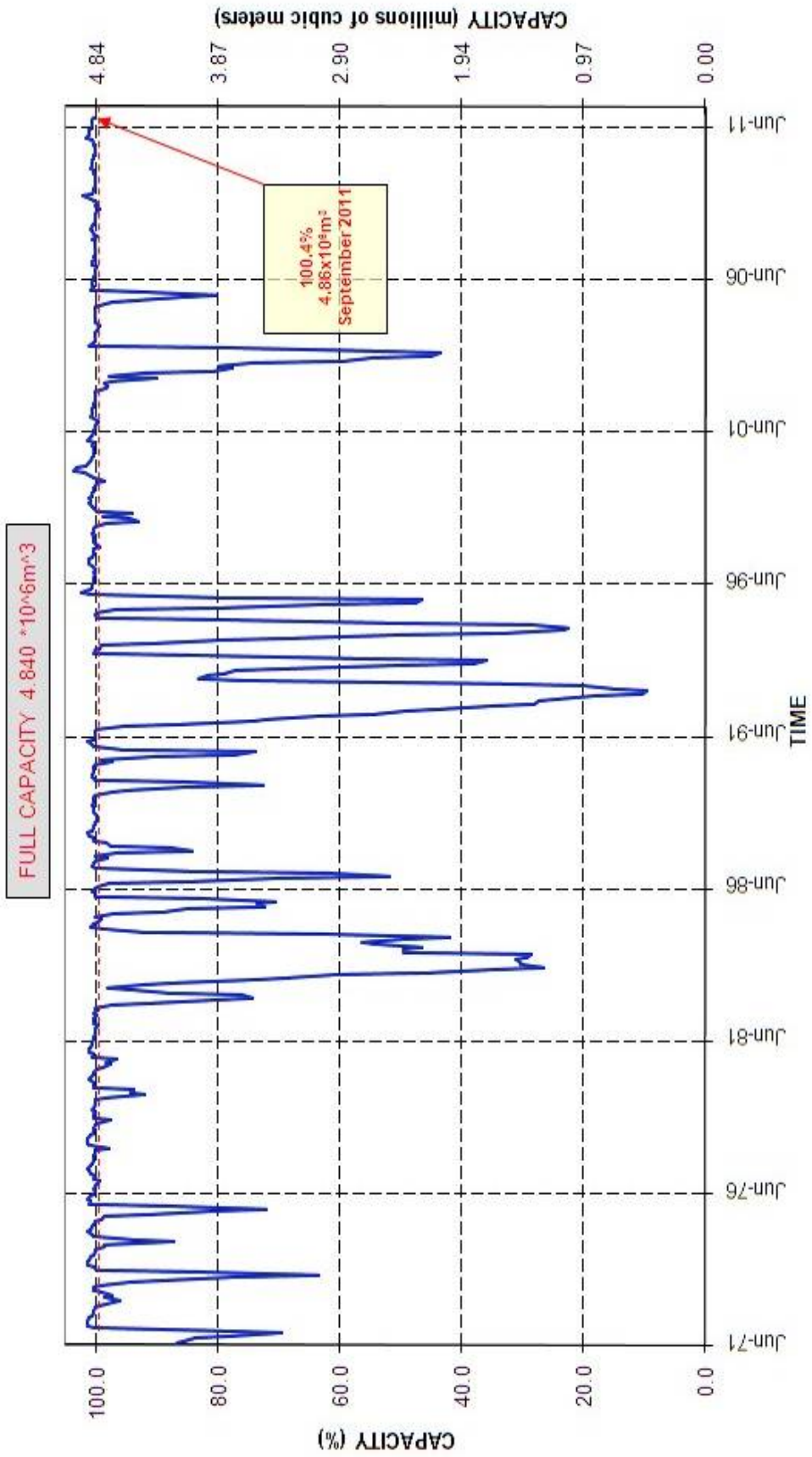




GREAT LETABARIVER AT EBENEZER DAM

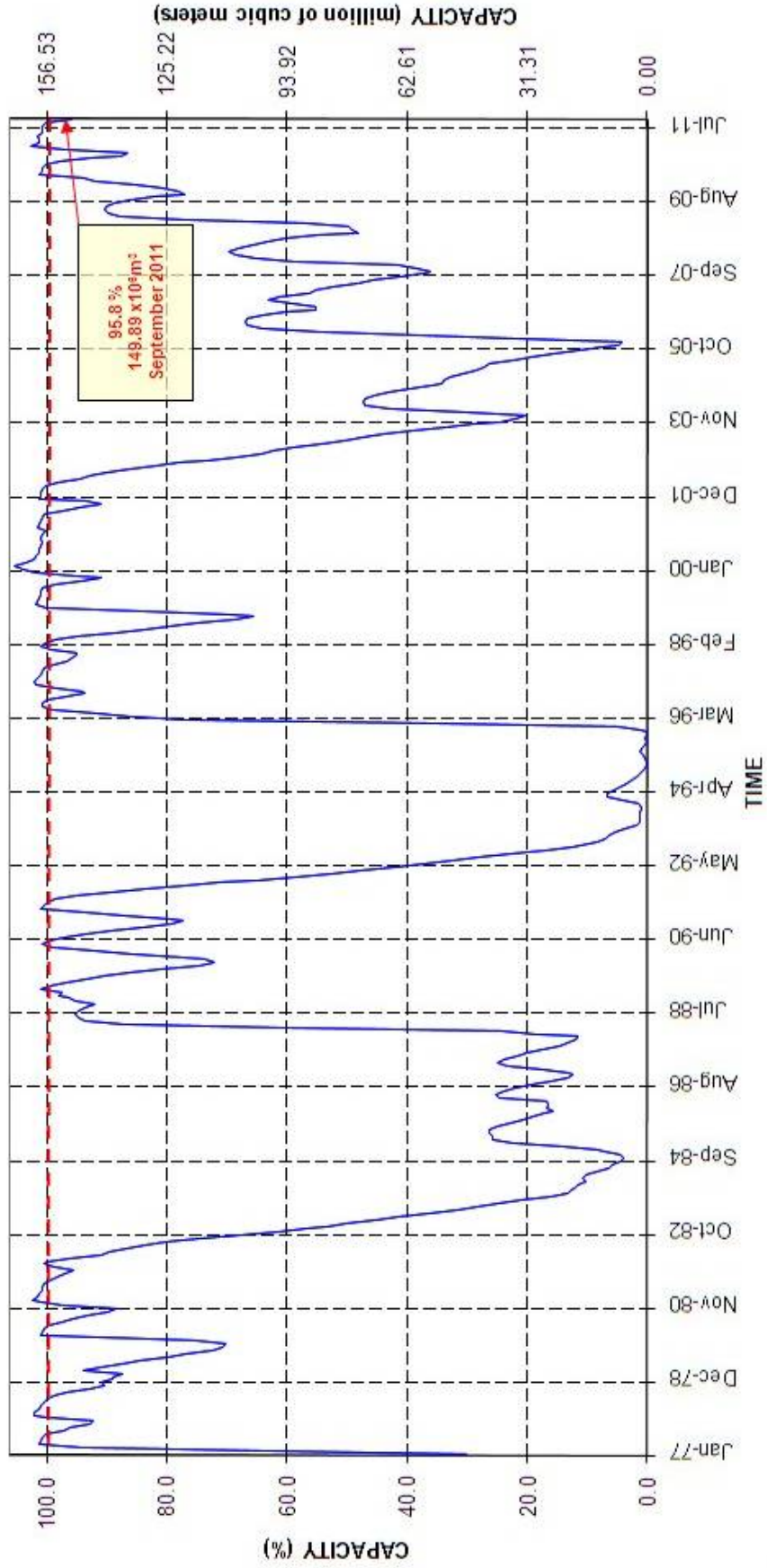


POLITSIRIVER AT MAGOEBASKLOOF DAM

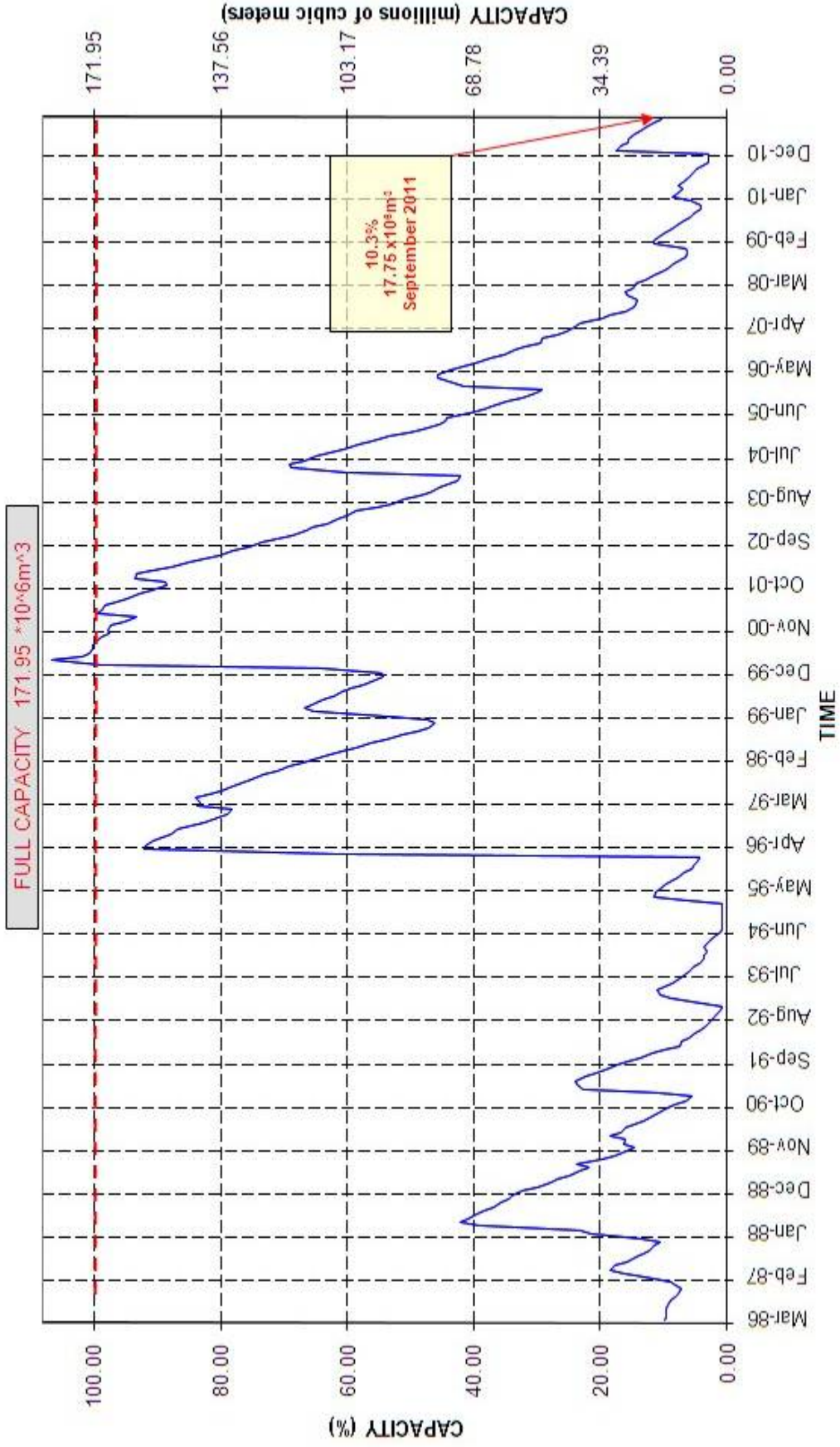


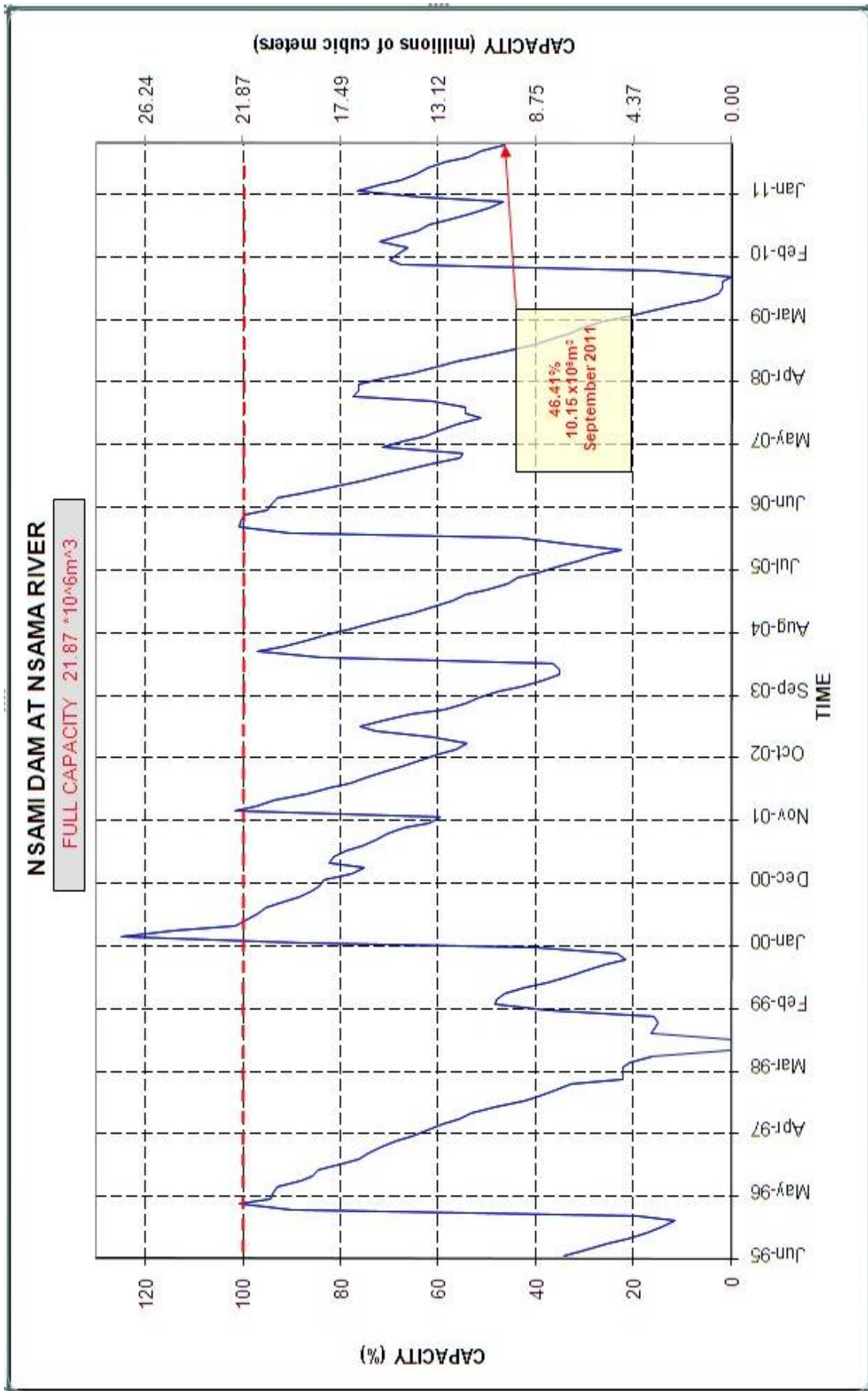
GREAT LETABARIVER AT TZANEEN DAM

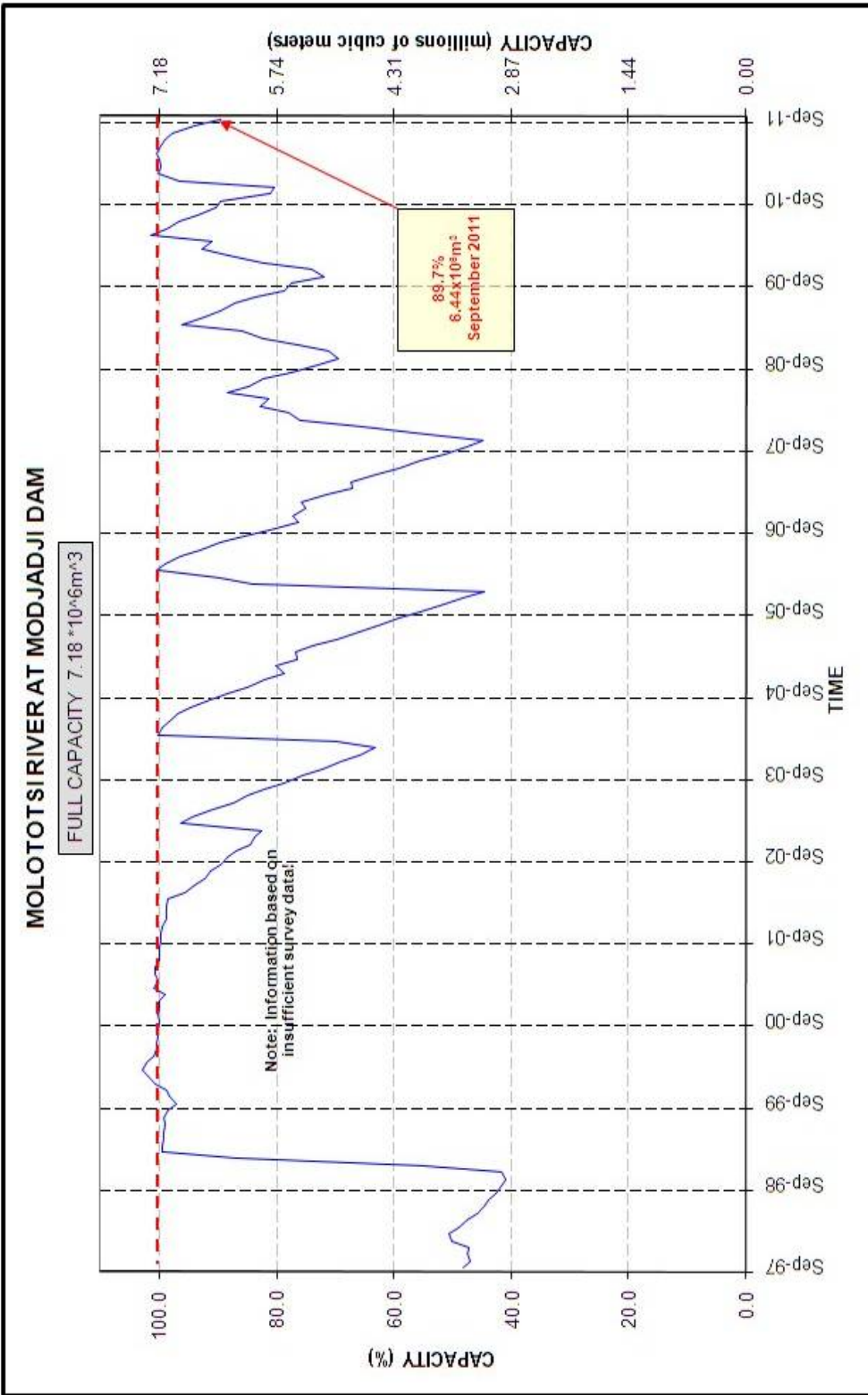
FULL CAPACITY $156.53 \times 10^6 \text{m}^3$

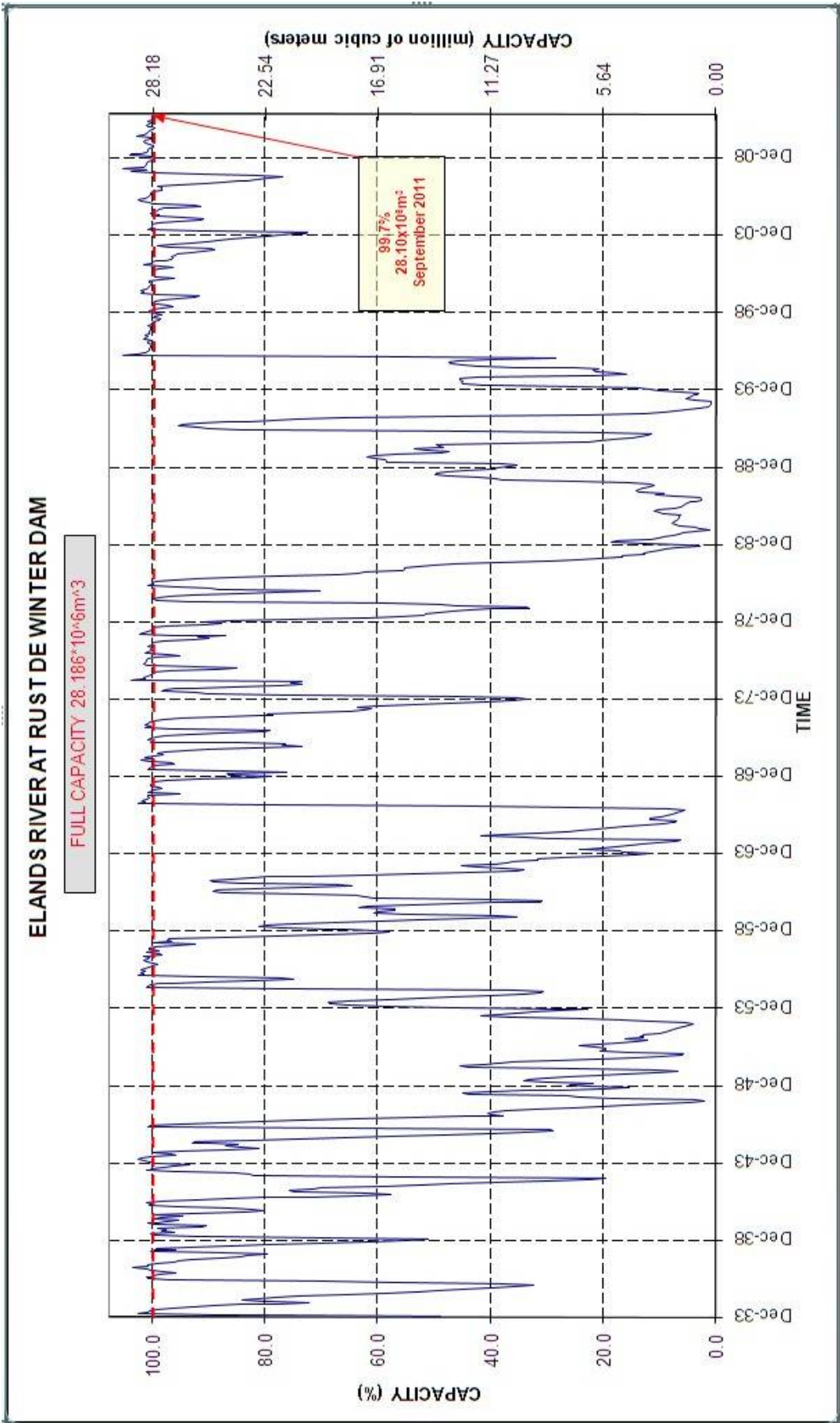


MIDDLE LETABRIVER AT MIDDLE LETABADAM



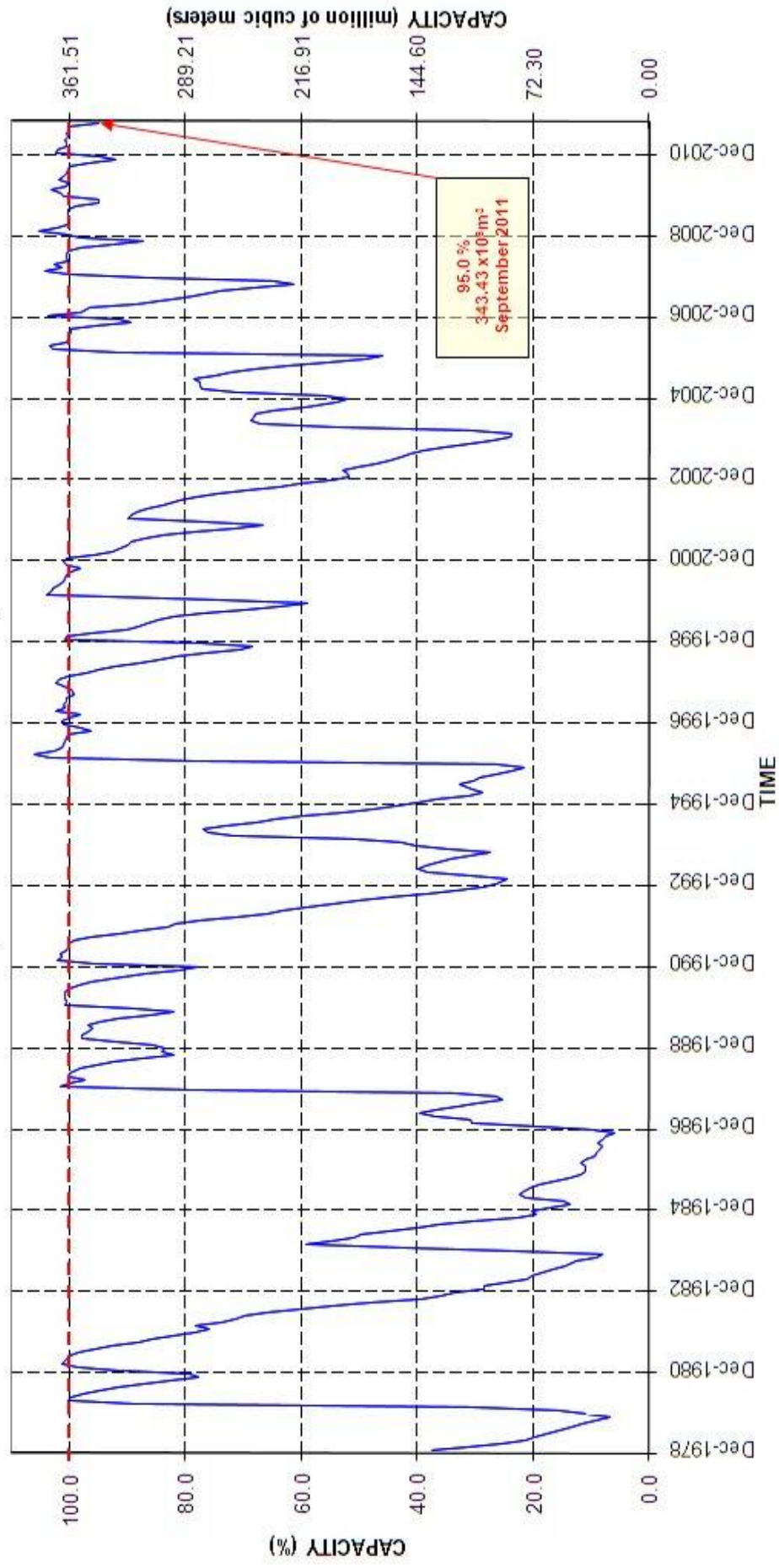




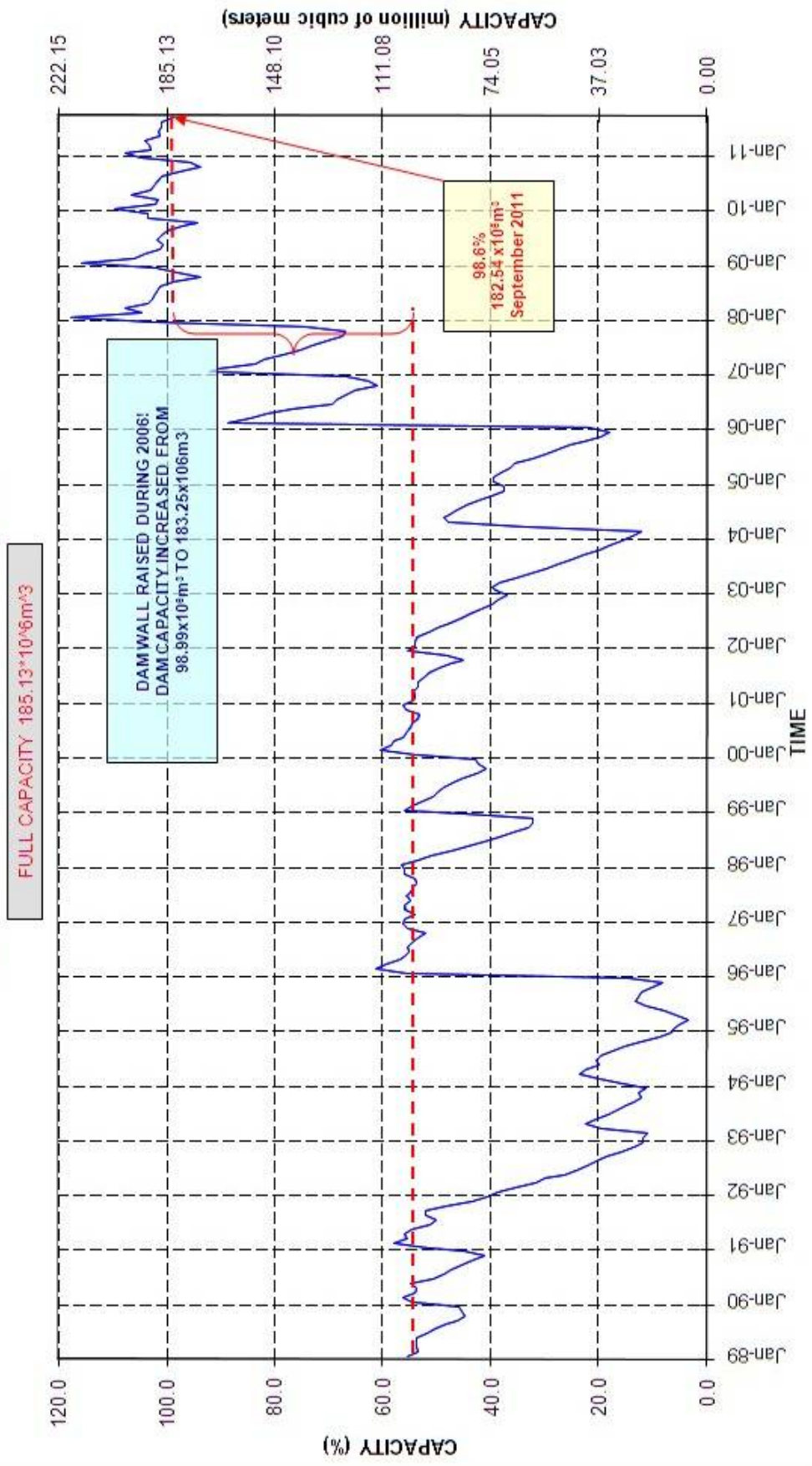


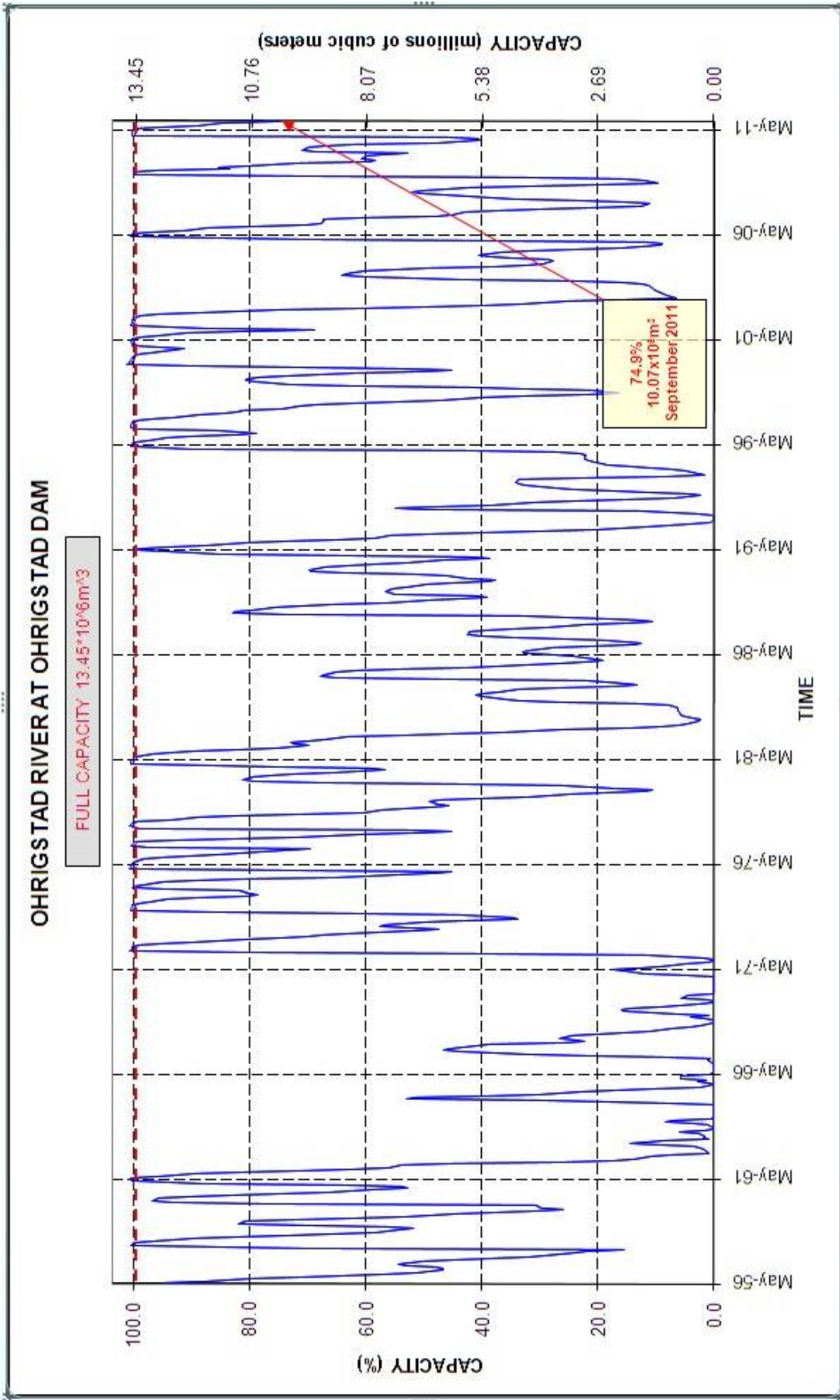
OLIFANTS RIVER AT LOSKOP DAM

FULL CAPACITY 361.51*10⁶m³



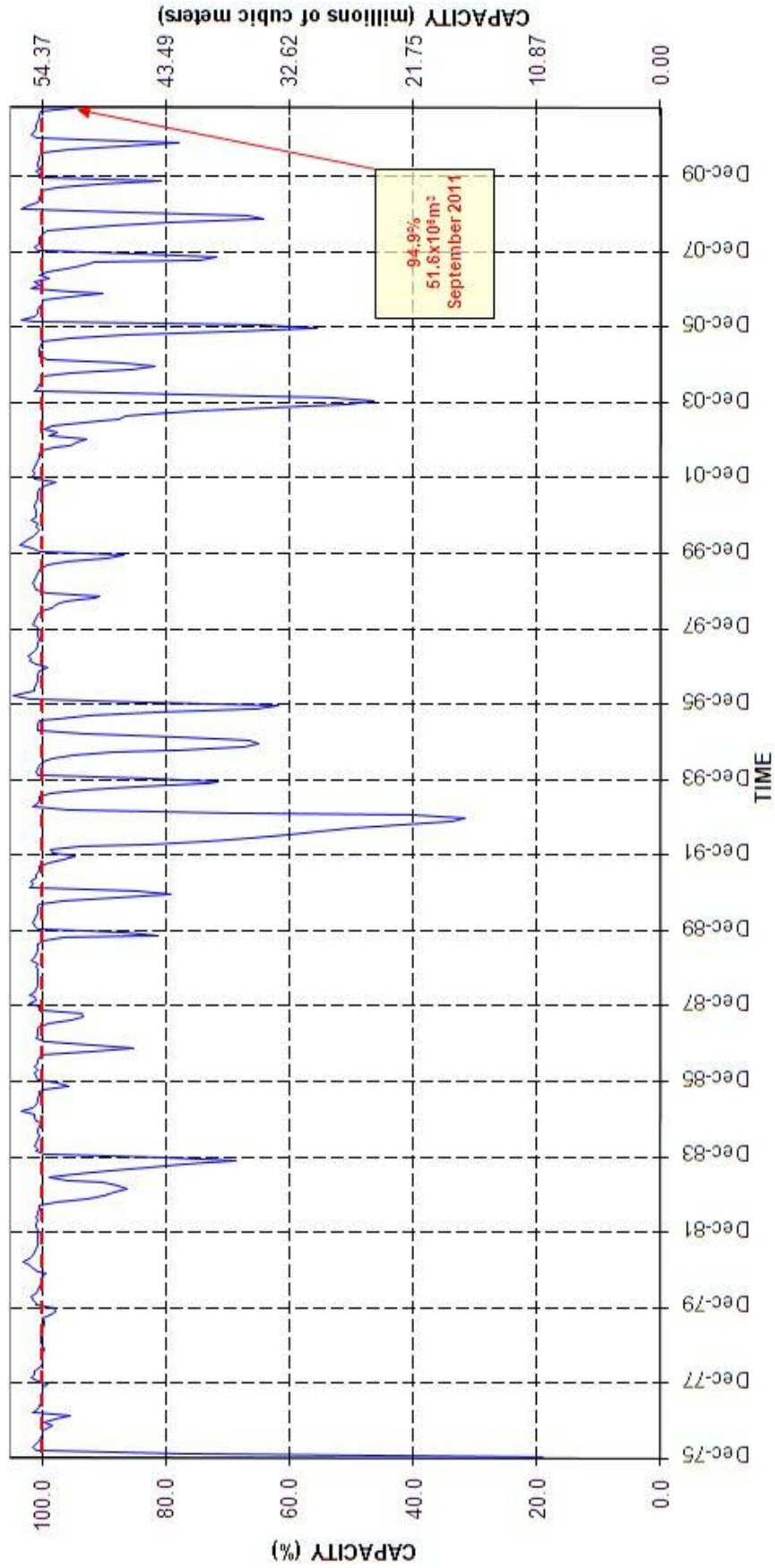
OLIFANTS RIVER AT FLAG BOSHIELO DAM





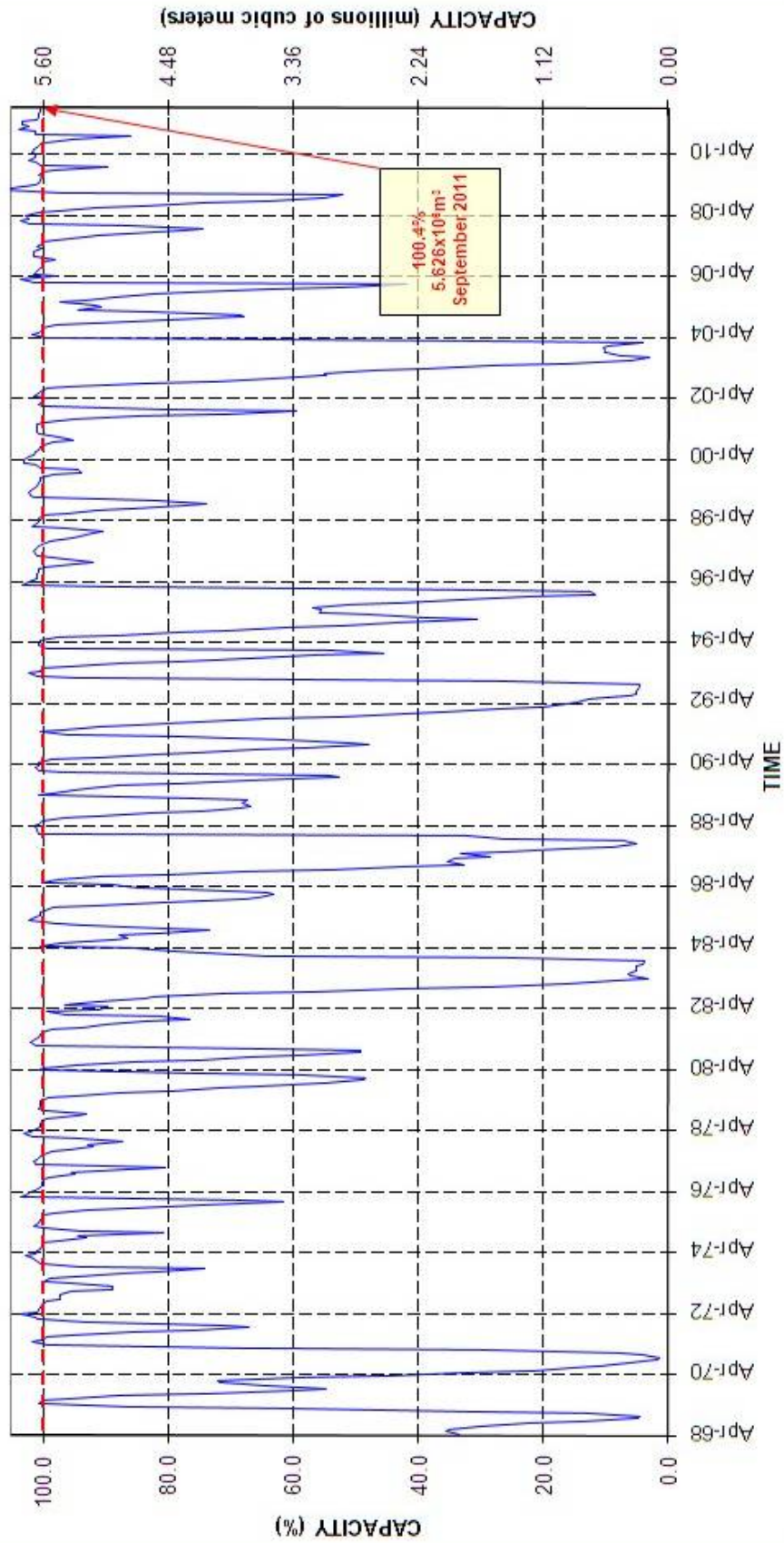
BLYDE RIVER AT BLYDE RIVIERSPOORT DAM

FULL CAPACITY 54.369*10⁶m³



KLASERIE RIVER AT KLASERIE DAM

FULL CAPACITY: $5.604 \times 10^6 \text{m}^3$



NGWABITS RIVER AT TOURS DAM

FULL CAPACITY 6.084 * 10⁶ m³

