



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

**WATER RESOURCE INFORMATION MANAGEMENT
LIMPOPO PROVINCE**

**INTERIM STATUS ON MONITORING &
SURFACE WATER LEVEL TRENDS
up to 08 February 2016**

**D VILJOEN
11 February 2016**

GH4338



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1. EXECUTIVE SUMMARY

This is an interim report to indicate the effect of the current drought situation on the major dams with special attention to the dams in the Limpopo and Luvuvhu / Letaba WMA's. 100% of the dams in WMA's 1, 2 and 4 have less water than the corresponding period last year.

In the Limpopo Water Management Area the following dam levels are of great concern: the **Luphephe Dam is at 14%, the Nwanedzi Dam is at 37.9%, the Glen Alpine dam is at 11.5%, the Nzhelele Dam at 37.4% and Mutshedzi Dam at 42.4%.**

In the Luvuvhu / Letaba Water Management Area the following dam levels are of great concern: **the Middle Letaba Dam is at 26.6%, the Nsami Dam is at 19.2%, the Thabina Dam is at 19.2%, Tzaneen Dam at 33.9% and Modjadji Dam at 19.9%. The Thapane Dam is empty!**

The average storage volume for the Limpopo WMA is 173 million cubic meters (61.6%) and is 101.05 million cubic meters less than the corresponding period last year (97.8%).

The average storage volume for the Luvuvhu / Letaba WMA is 318.23 million cubic meters (48.2%) and is 203.57 million cubic meters less than the corresponding period last year (79.1%).

The average storage volume for the Olifants WMA is 854.1million cubic meters (60%) and is 459 million cubic meters less than the corresponding period last year (92.3%).

Take note that the storage volume of the Olifants WMA increased with 348.7 million cubic meters, as a result of the new De Hoop Dam 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 Broggen, Lepellane and Mahlangu dams.

The average storage volume for the Inkomati WMA is 528.0 million cubic meters (49.5%) and is 514.9 million cubic meters less than the corresponding period last year (97.7%).

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. The Thapane and Sheshego Dams are examples of this.

The information presented in this report is based on the status of all the major dams in the province up to 08 February 2016.

River flows per catchment is discussed under Overview, page 5

It is important to take note that the rainfall for the previous hydrological year (01 October 2014 to 30 September 2015) is the lowest since the 2009/2010 hydrological year. Attached find the Provincial monthly rainfall and storage map from October 1980 to December 2015, page 8 and Provincial Cumulative Annual Rainfall, page 9

Available water resources will have to be managed with great care and restrictions will have to be adhered to as part of precaution measures. The SAWS predicts:

- The **below-normal rain situation** is expected to persist for the next 2 to 3 months
- Virtually the entire country has a high likelihood of the occurrence of **warmer than normal temperatures** for the next 2 to 3 months

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 Nkomati Water Management Areas, information regarding their status is also attached.

3. OVERVIEW

For information purposes graphs depicting monthly provincial rainfall and storage for the previous hydrological year (1 October 2014 to 31 December 2015), page 8 and Provincial Cumulative Annual Rainfall, page 9, are attached.

For information purposes a table indicating the comparison of water storage percentage for the different WMA's is attached on page 10.

The following river flow conditions need to be highlighted:

A4 CATCHMENT

- No flow at A4H008 Sterkstroom River
- A4H005 Zero inflow into Mokolo Dam
- A4R001 (Mokolo Dam): 78.6%, No releases into the Mokolo River

A5 CATCHMENT

- Palala River flowing in the upper catchment measured at Muisvogelkraal at 0.186 m³/s
- No flows at Palala River at Vischgat as well as downstream towards the Limpopo confluence

A6 CATCHMENT

- No flow in Nyl River upstream of Sterk River confluence
- A6R001 (Doorndraai Dam) 74.3%: No River releases
- A6R002 (Glen Alpine Dam): 11.5% No releases into the Mogalakwena River.

A7 CATCHMENT

- Sand River @ Polokwane flowing at 1.62 m³/s
- Very little flow at Sand River @ Waterpoort 0.120 m³/s
- Limpopo River flowing at Beit Bridge, structural damage flow estimated at less than 1.0 m³/s (Peaked at 500 m³/s on 16 January 2016)

A8 CATCHMENT

- The Nzhelele dam is at 37.4%: 0.35 m³/s water released into canal system for irrigation
- The Nwanedzi Dam at 37.9% and Luphepe Dam 14%: Water is released into the Nwanedzi River at 0.3 m³/s

A9 CATCHMENT

- Albasini Dam @ 71.3%: No releases into Levuvhu River
- Vondo Dam @ 64.8%: No releases into Mutshindudi River
- Nandoni Dam @ 70%: 1.58 m³/s released into Levuvhu River
- Levuvhu River flowing at 1.24 m³/s at Mhinga

B8 CATCHMENT

- B8R001 (Ebenhezer dam) at 72.1%: 0.76 m³/s released into Great Letaba River towards Tzaneen dam
- Flow at B8H014 @ Grys Appel: Great Letaba River flowing at 0.260 m³/s towards Tzaneen dam
- B8R003 (Magoebaskloof dam) at 100.1%
- B8R005 (Tzaneen dam) at 33.9% : 3.8 m³/s released from Tzaneen Dam
- B8R007 (Middel Letaba) at 26.7%: No releases
- B8R009 (Nsami) at 19.3%: No Releases
- Currently no flow at Great Letaba River at Engelhardt Dam (Letaba Camp KNP)

4. LIMPOPO WATER MANAGEMENT AREA

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

4.1 A4 Drainage Area (Matlabas, Mokolo Rivers)

A graph of the Mokolo Dam (A4R001) is attached as no other dam exists in the A4 hydrological monitoring network.

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)

Graphs of the Doordraai Dam (A6R001) and Glen Alpine Dam (A6R002) are attached as no other dams exist in the A6 hydrological monitoring network.

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 Doordraai Dam! The graph of Glen Alpine clearly indicates this!

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! Hout River Dam is the only dam equipped with gauge plates. Data capturing and real-time equipment has been installed at Hout River Dam.

4.5 A8 Drainage Area (Nwanedzi and Nzhelele Rivers)

Graphs for the Nzhelele Dam (A8R001), Luphephe (A8R002), Nwanedzi (A8R003) and Mutshedzi (A8R004) Dams are attached.

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)

Graphs for the Albasini Dam (A9R001), Vondo Dam (A9R002) and Nandoni (A9R004) Dams are attached.

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

Graphs for the Ebenezer Dam (B8R001), Magoebaskloof Dam (B8R003), Tzaneen Dam (B8R005), Middle-Letaba Dam (B8R007), Nsami Dam (B8R009) and Modjadji Dam (B8R011) are attached.

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, B4, 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 graphs of Rust de Winter Dam (B3R001) and Loskop Dam (B3R002) has been included in this report.

6.2 B4 Drainage Area (Steelpoort River)

De Hoop Dam (B4R007) is currently at 92.8%, with current storage at 323.5 million cubic meters

6.3 B5 Drainage Area (Olifants River)

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

6.4 B6 Drainage Area (Blyde and Ohrigstad Rivers)

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

6.5 B7 Drainage Area (Klaserie and Olifants Rivers)

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

7. INKOMATI WATER MANAGEMENT AREA

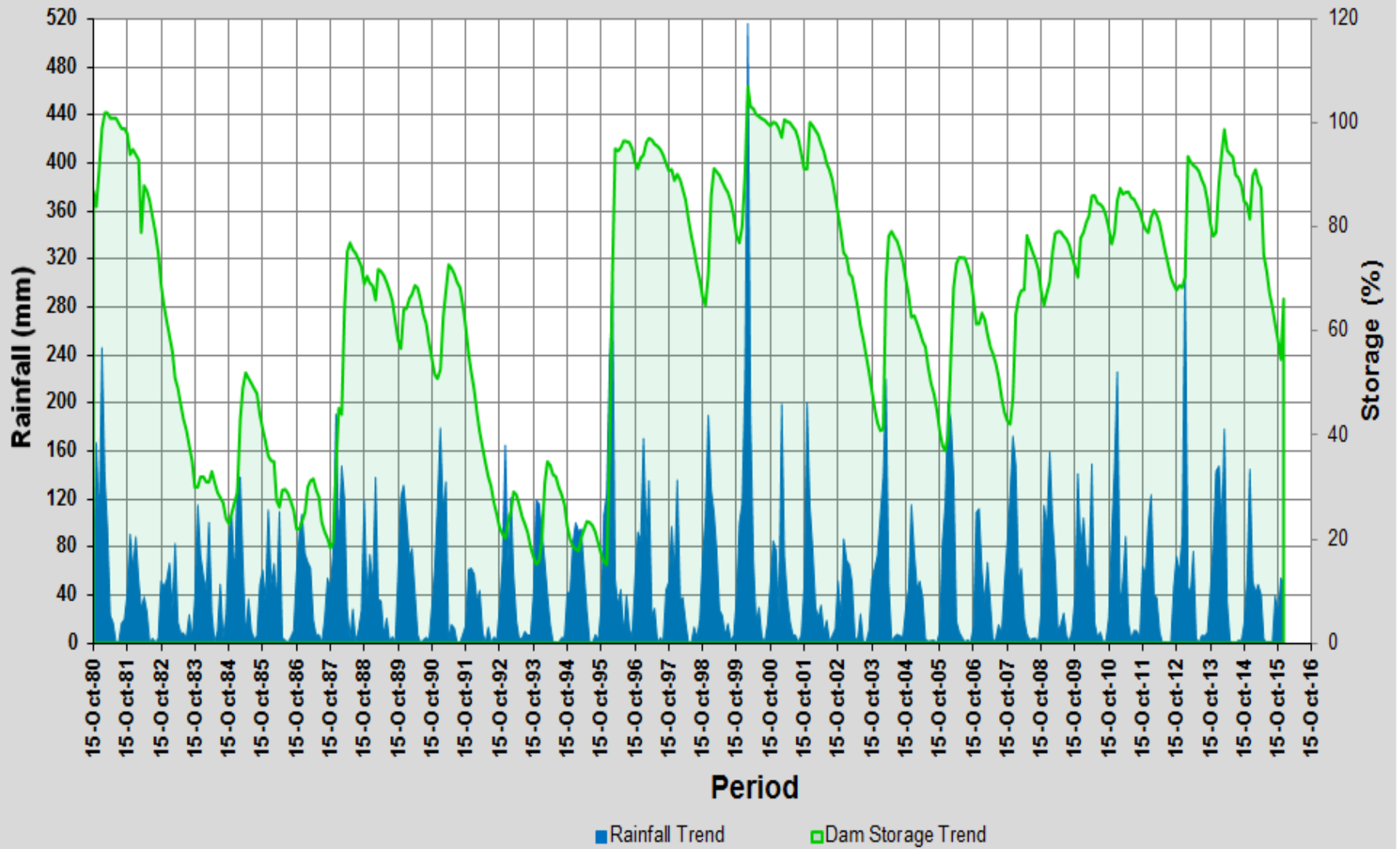
7.1 X2 Drainage Area (Crocodile River)

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

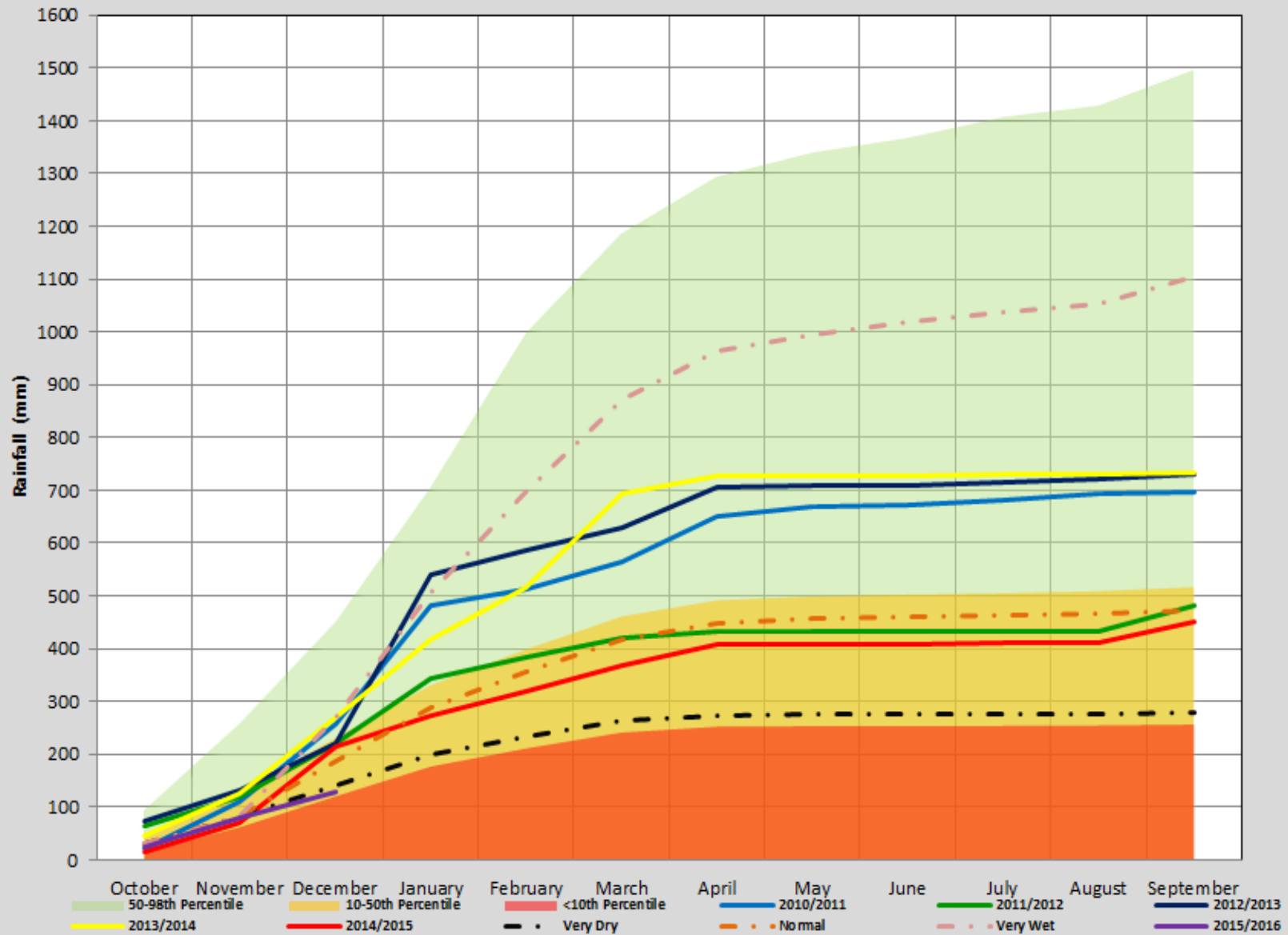
7.2 X3 Drainage Area (Mariti River)

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

Limpopo: Monthly Rainfall and Dam Storage Trend Oct 1980 to December 2015



Limpopo: Cumulative Annual Rainfall Since 2009/10 and Percentiles Since October 1960



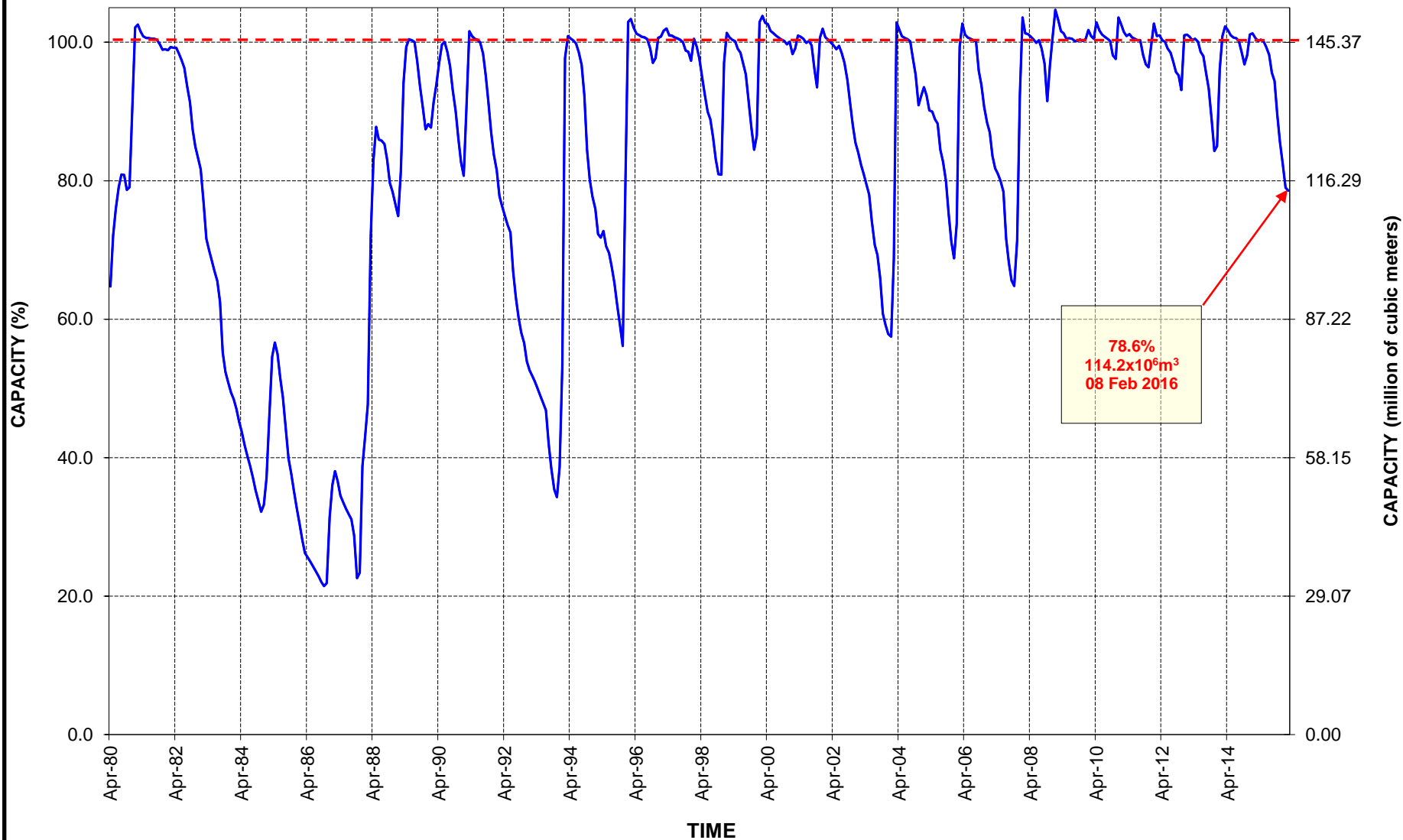
Summary WMA		Full Supply Capacity 10 ⁶ M ³	Water in Storage 10 ⁶ M ³	Last Year %Full	Last Week %Full	This Week 08/02/2016 %Full
1	Limpopo	280.7	173.0	97.8	62.2	61.6
2	Luvubu/Letaba	652.5	316.8	79.2	49.3	48.5
3	Crocodile (West) Marico	825.2	397.6	69.3	49.2	48.2
4	Olifants	1422.6	854.1	92.3	60.7	60.0
5	Inkomati	1067.5	528.0	97.7	50.7	49.5
6	Usutu/Mhlatuze	3276.6	1690.4	67.8	52.0	51.6
7	Thukela	1254.5	854.3	94.6	66.5	68.1
8	Upper Vaal	5659.2	3915.1	91.6	69.4	69.2
9	Middle Vaal	1677.3	323.2	63.8	20.5	19.3
10	Lower Vaal	108.5	56.1	86.8	52.2	51.7
11	Mvoti/Umzimkulu	801.9	434.0	79.0	54.3	54.1
12	Mzimvubu/Keiskamma	1091.6	944.8	94.6	86.2	86.6
13	Upper Orange	11428.3	5826.8	85.6	51.3	51.0
14	Lower Orange	36.1	35.3	98.5	104.5	97.9
15	Fish/Tsitsikamma	731.5	391.2	49.2	54.2	53.5
16	Gouritz	268.3	149.0	53.7	56.3	55.5
17	Olifants/Doorn	128.2	44.0	51.3	37.6	34.3
18	Breede	1041.0	451.0	64.9	45.4	43.3
19	Berg	416.5	181.1	71.6	44.5	43.5
GRAND TOTAL		32168.0	17565.7	82.4	55.0	54.6

Please note that the above summaries are not representative of all dams within any of the Provinces or Water Management Areas.

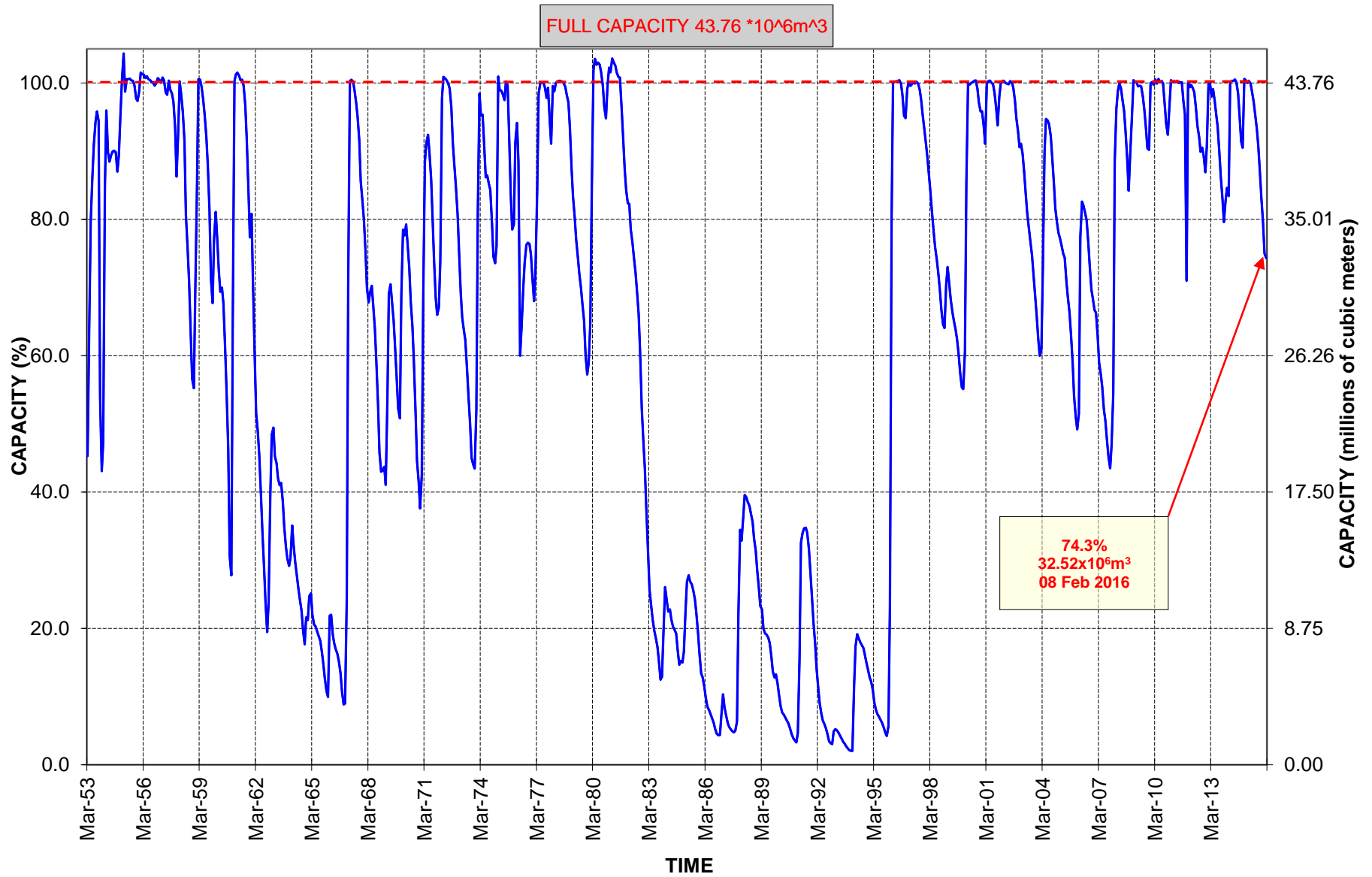
The summaries only reflect the storages for those dams listed in the Weekly State of Reservoirs Report.

MOGOL RIVER AT MOKOLO DAM

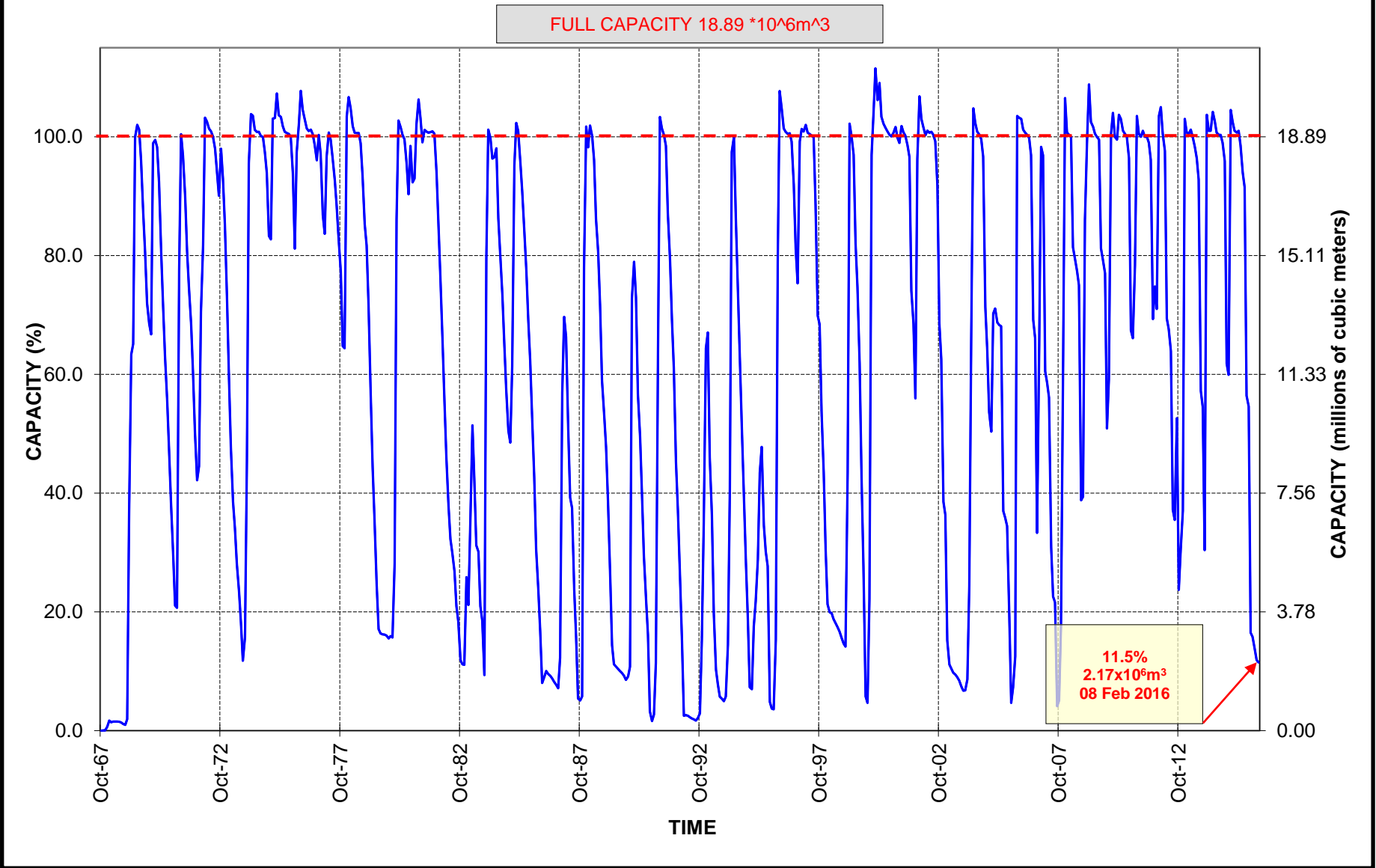
FULL CAPACITY $145.37 \times 10^6 \text{m}^3$



STERK RIVER AT DOORNDRAAI DAM



MOKGALAKWENA RIVER AT GLEN ALPINE DAM



NZHELELE RIVER AT NZHELELE DAM

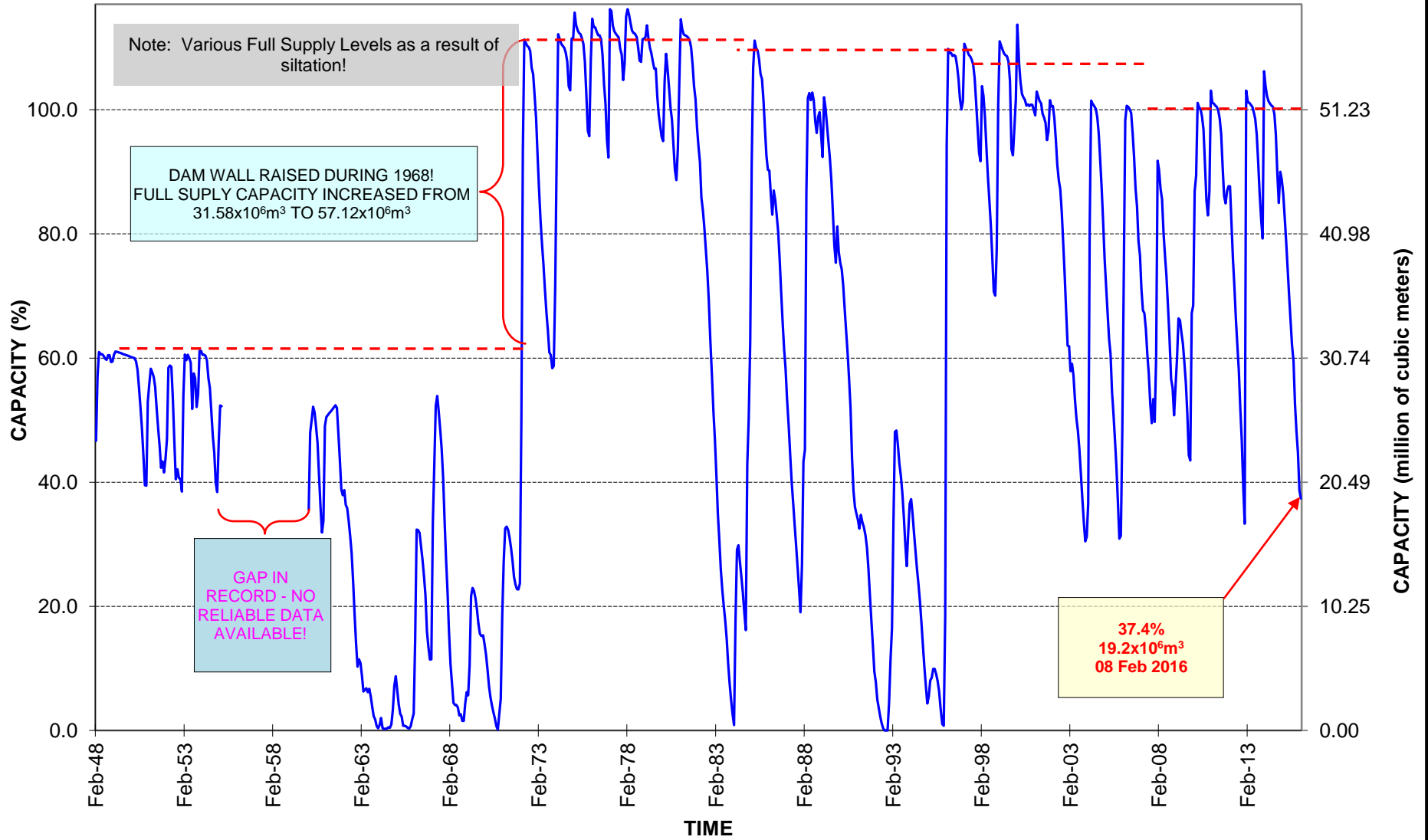
FULL CAPACITY $51.23 \times 10^6 \text{m}^3$

Note: Various Full Supply Levels as a result of siltation!

DAM WALL RAISED DURING 1968!
FULL SUPPLY CAPACITY INCREASED FROM $31.58 \times 10^6 \text{m}^3$ TO $57.12 \times 10^6 \text{m}^3$

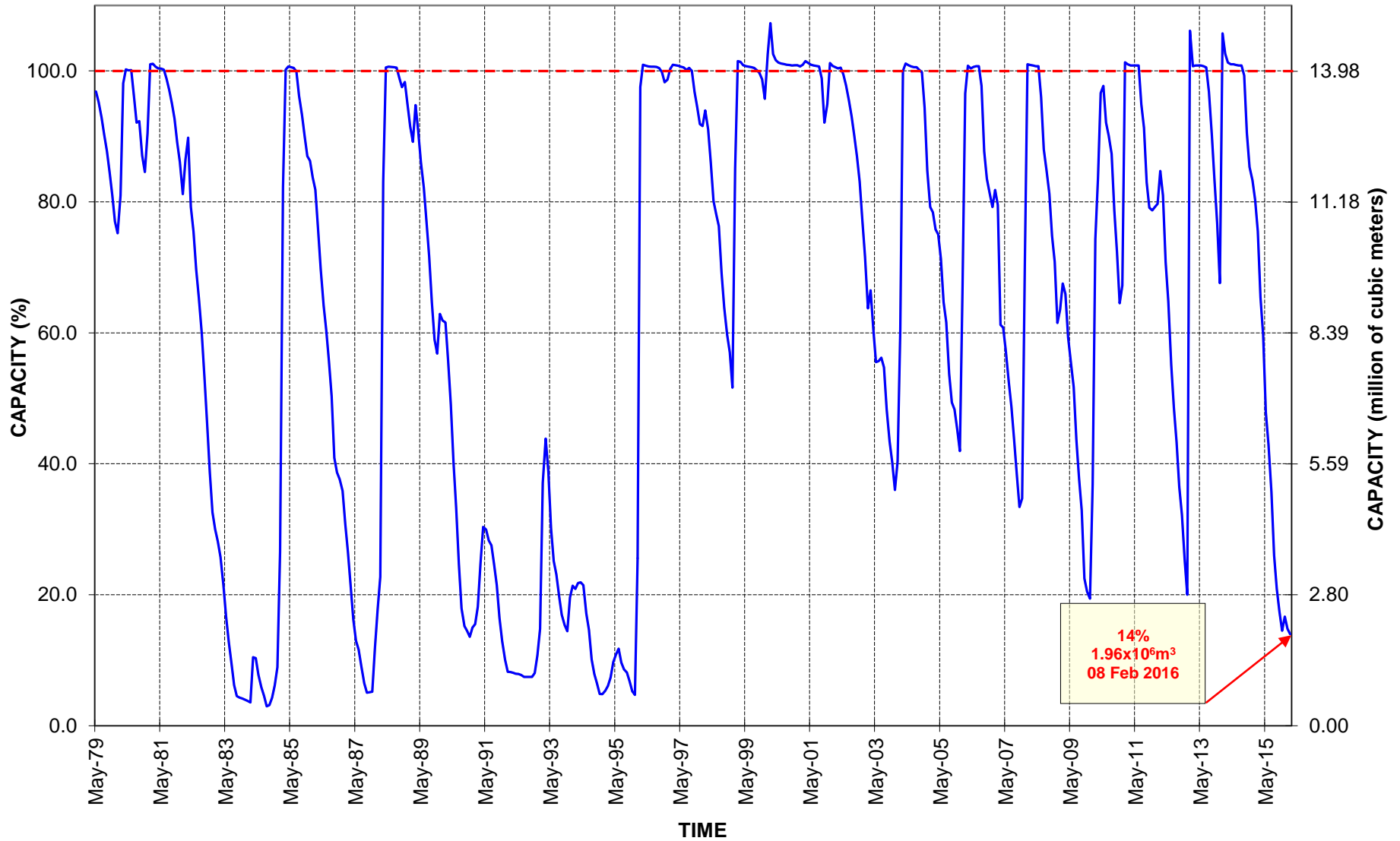
GAP IN RECORD - NO RELIABLE DATA AVAILABLE!

37.4%
 $19.2 \times 10^6 \text{m}^3$
08 Feb 2016



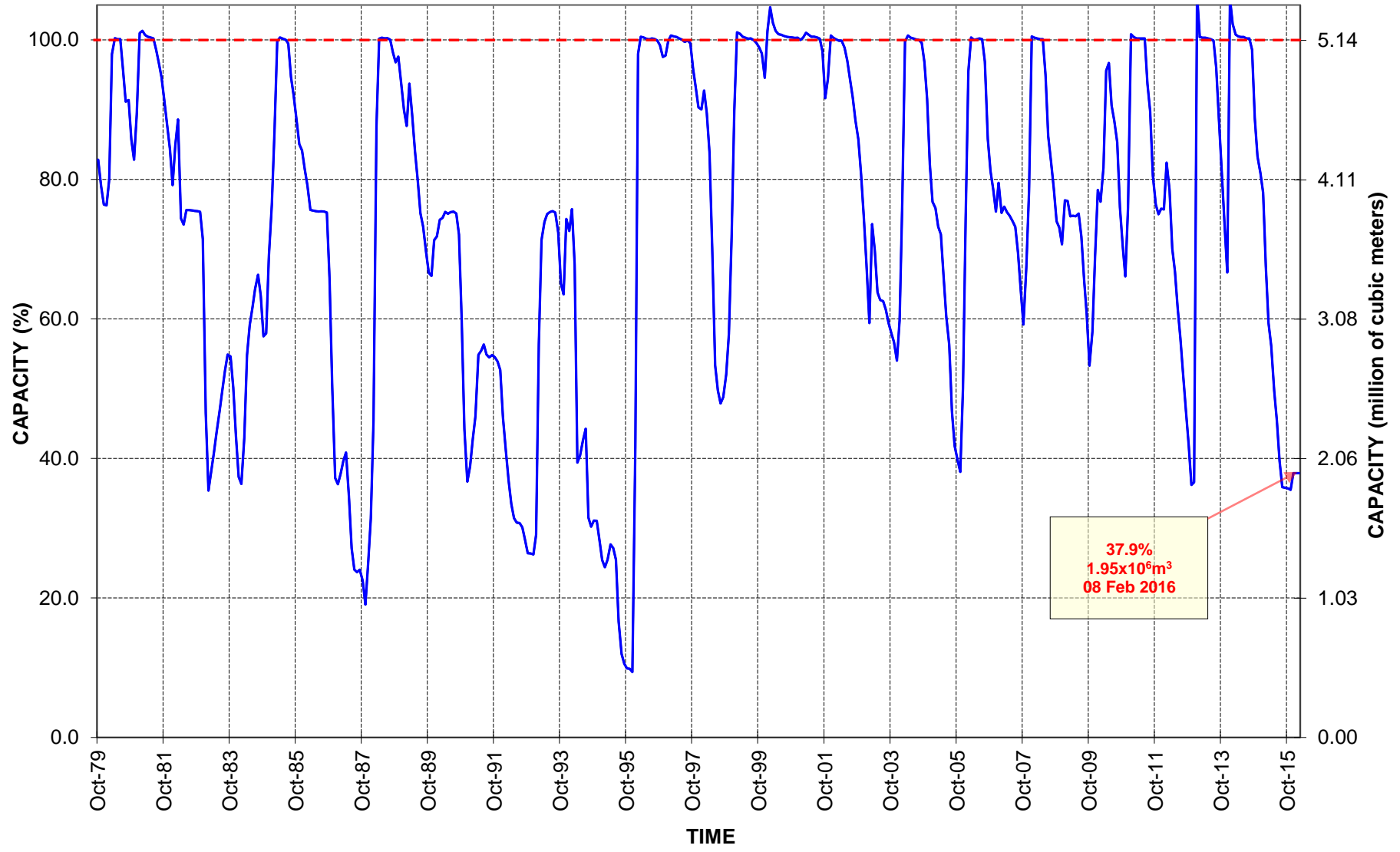
LUPHEPHE RIVER AT LUPHEPHE DAM

FULL CAPACITY $13.984 \times 10^6 \text{m}^3$



NWANEDZI RIVER AT NWANEDZI DAM

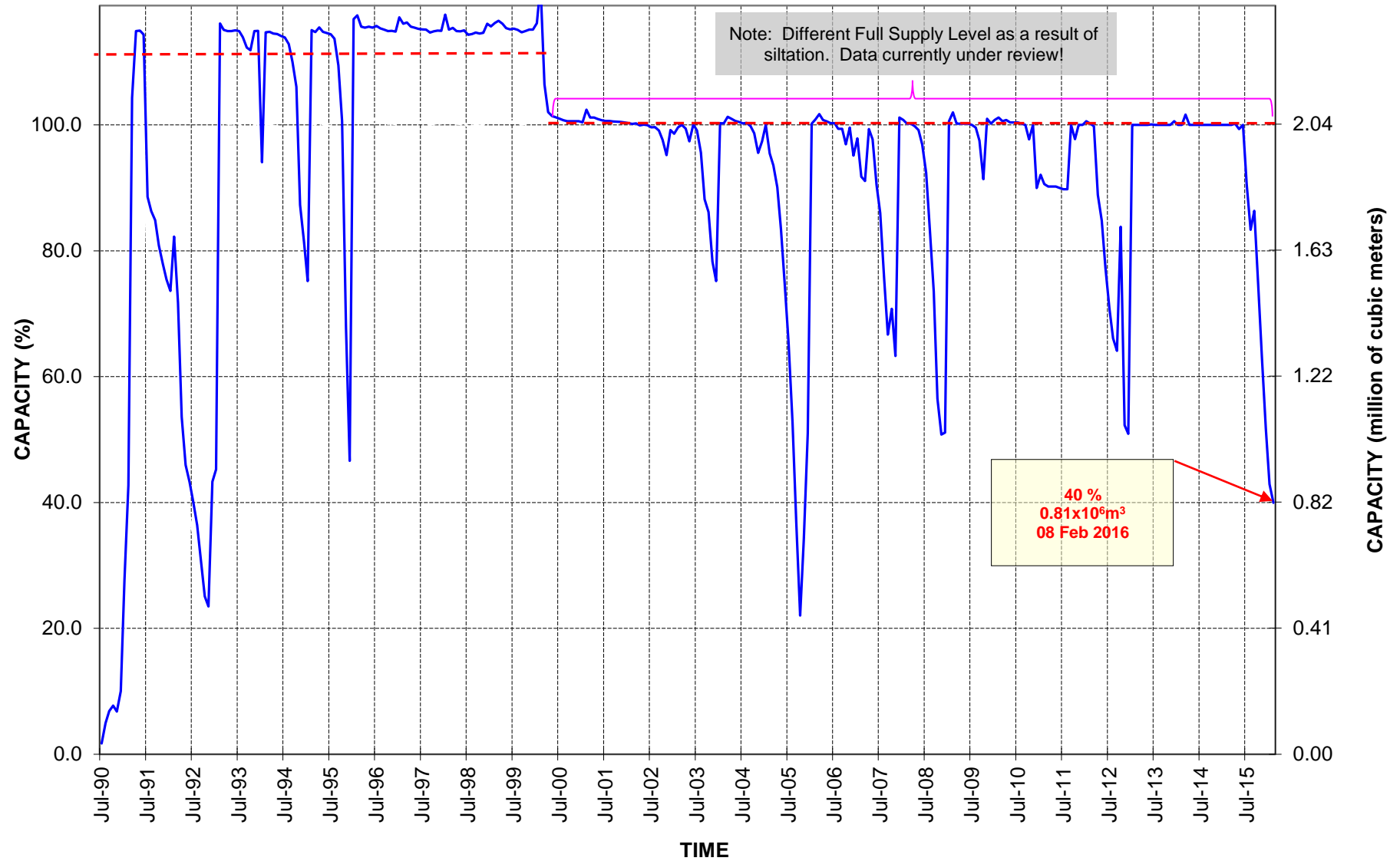
FULL CAPACITY 5.14 *10^6m^3



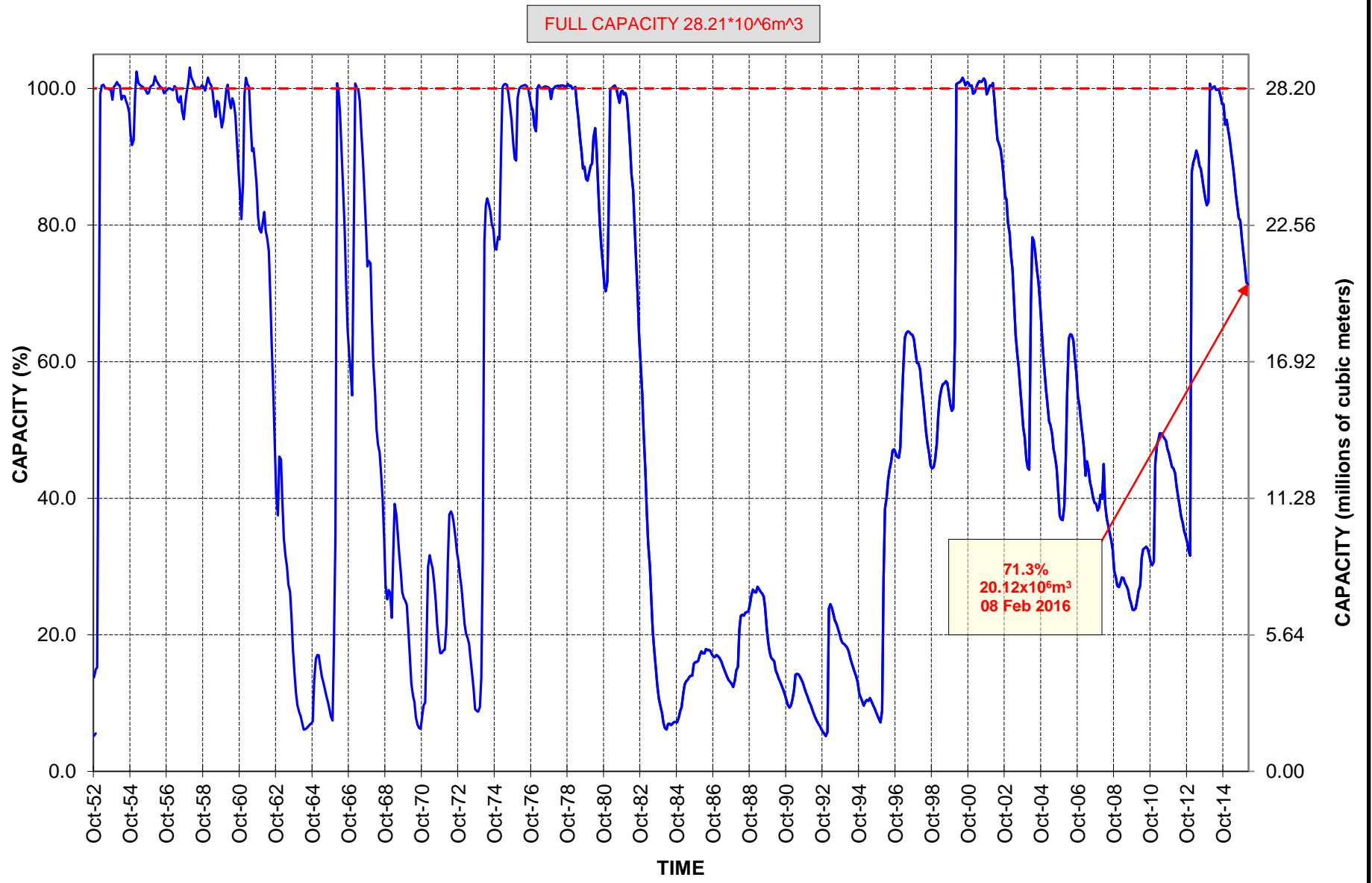
MUTSHEDZI RIVER AT MUTSHEDZI DAM

FULL CAPACITY $2.037 \times 10^6 \text{m}^3$

Note: Different Full Supply Level as a result of siltation. Data currently under review!

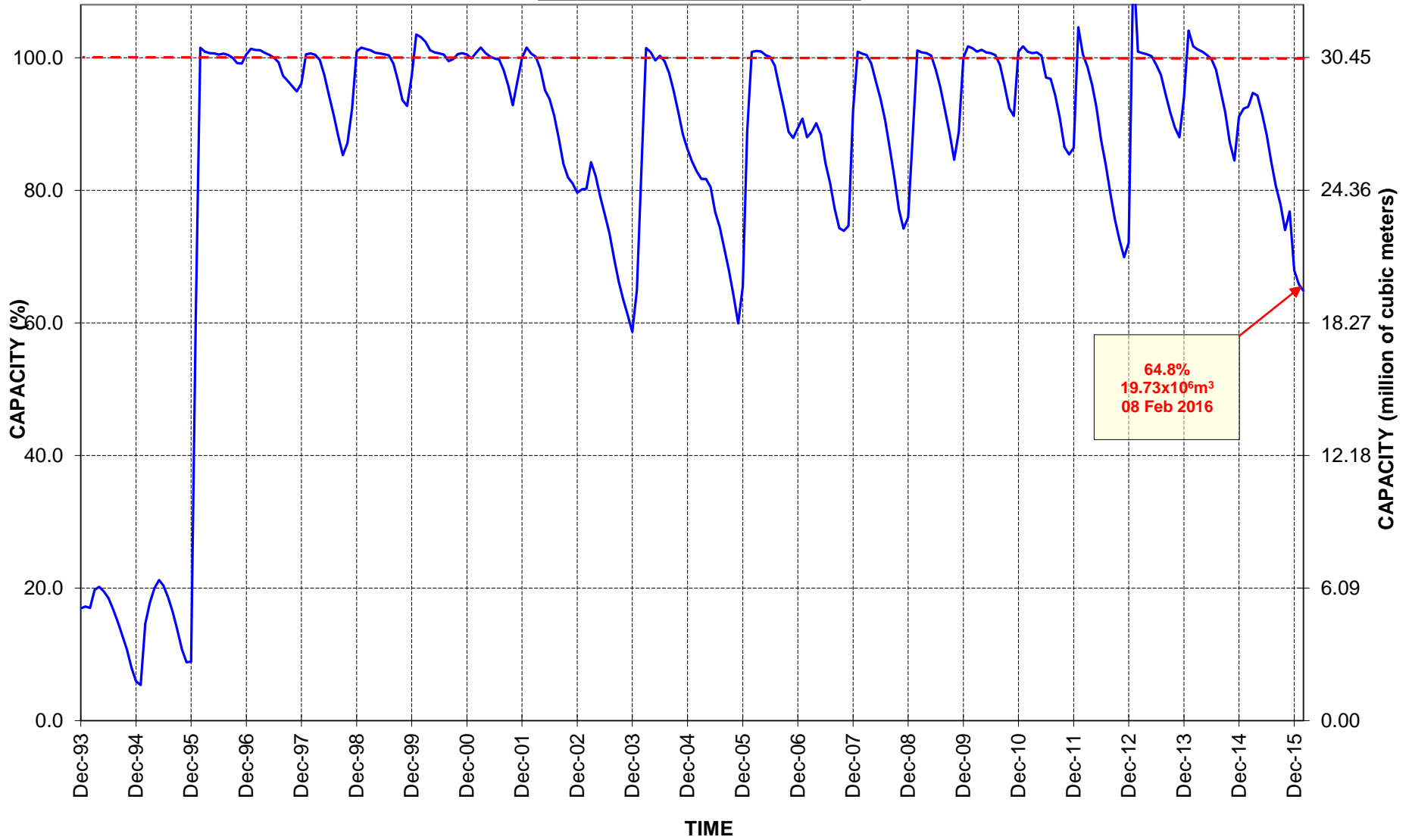


LUVUVHU RIVER AT ALBASINI DAM



MUTSHINDUDI RIVER AT VONDO DAM

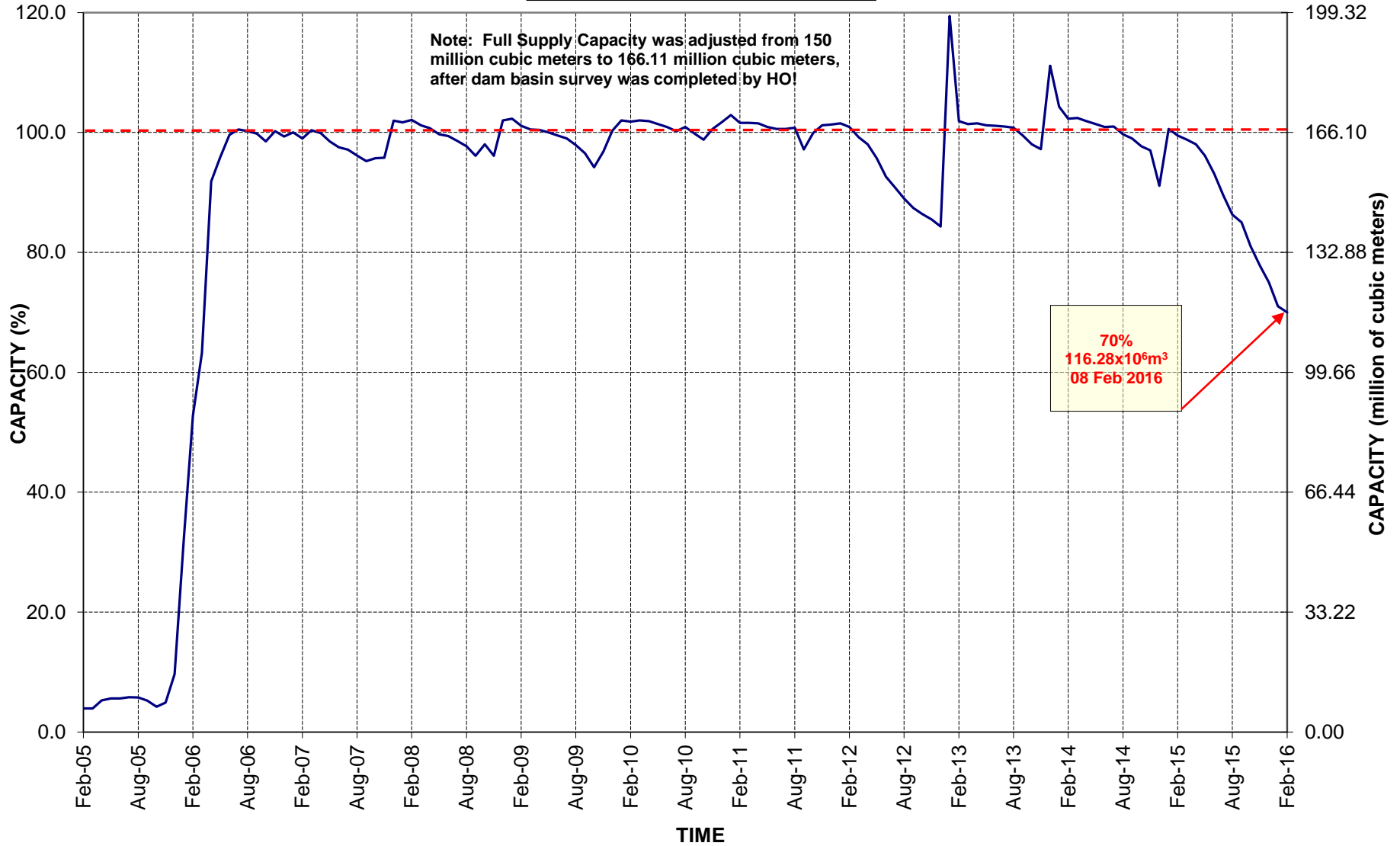
FULL CAPACITY $30.447 \times 10^6 \text{m}^3$



LUVUVHU RIVER AT NANDONI DAM

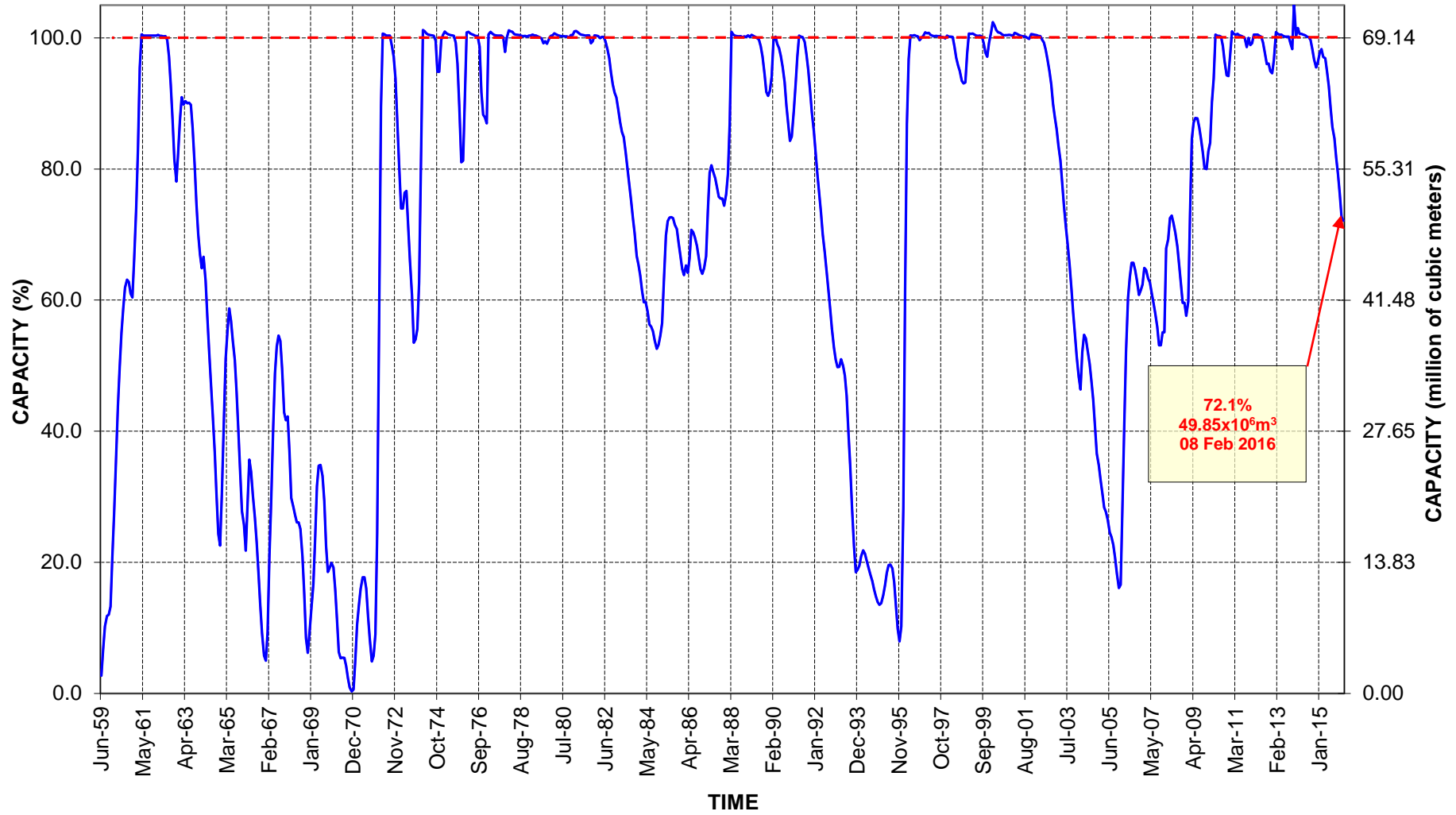
FULL CAPACITY 166.11*10⁶m³

Note: Full Supply Capacity was adjusted from 150 million cubic meters to 166.11 million cubic meters, after dam basin survey was completed by HO!

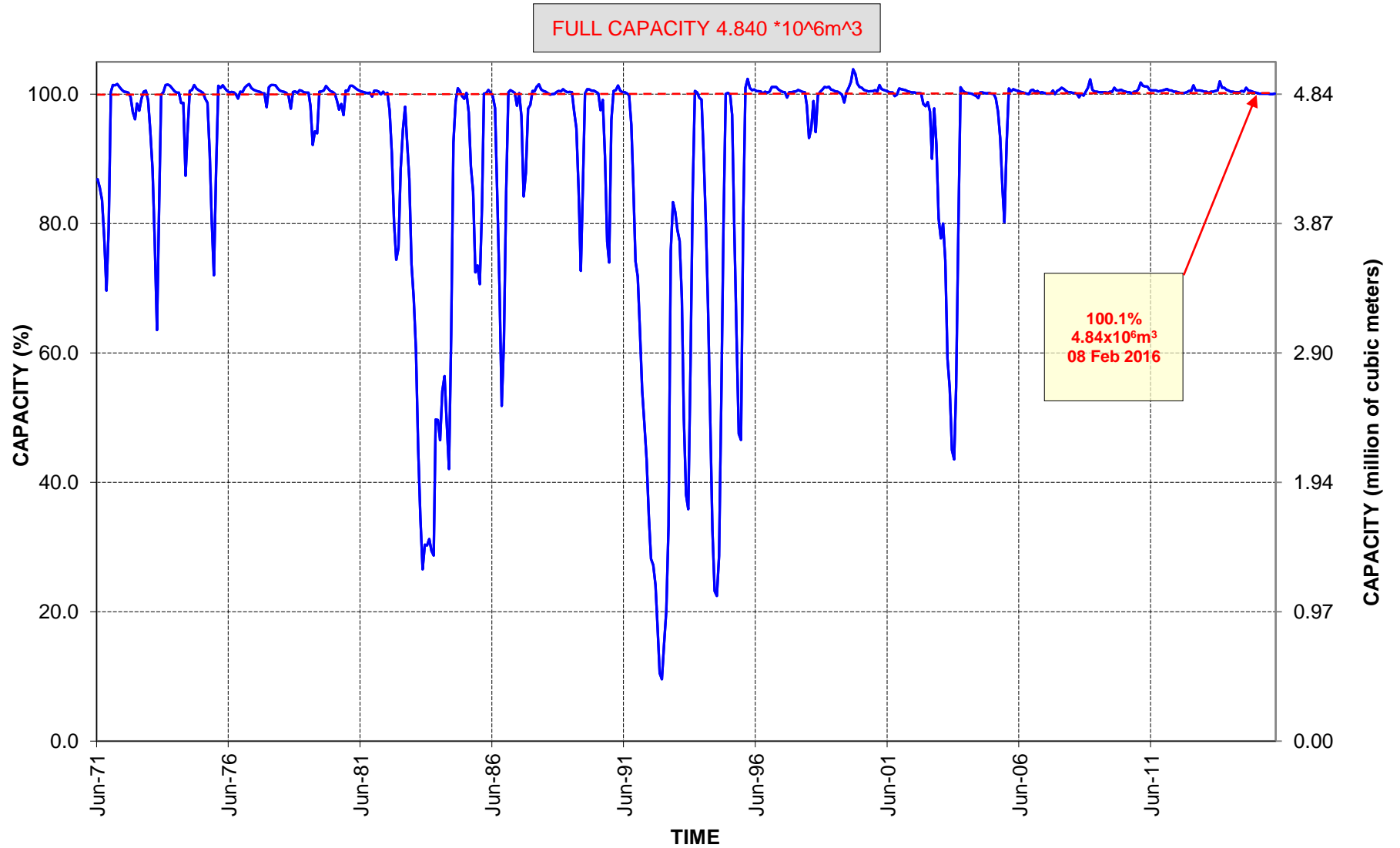


GREAT LETABA RIVER AT EBENEZER DAM

FULL CAPACITY 69.139 *10^6m^3

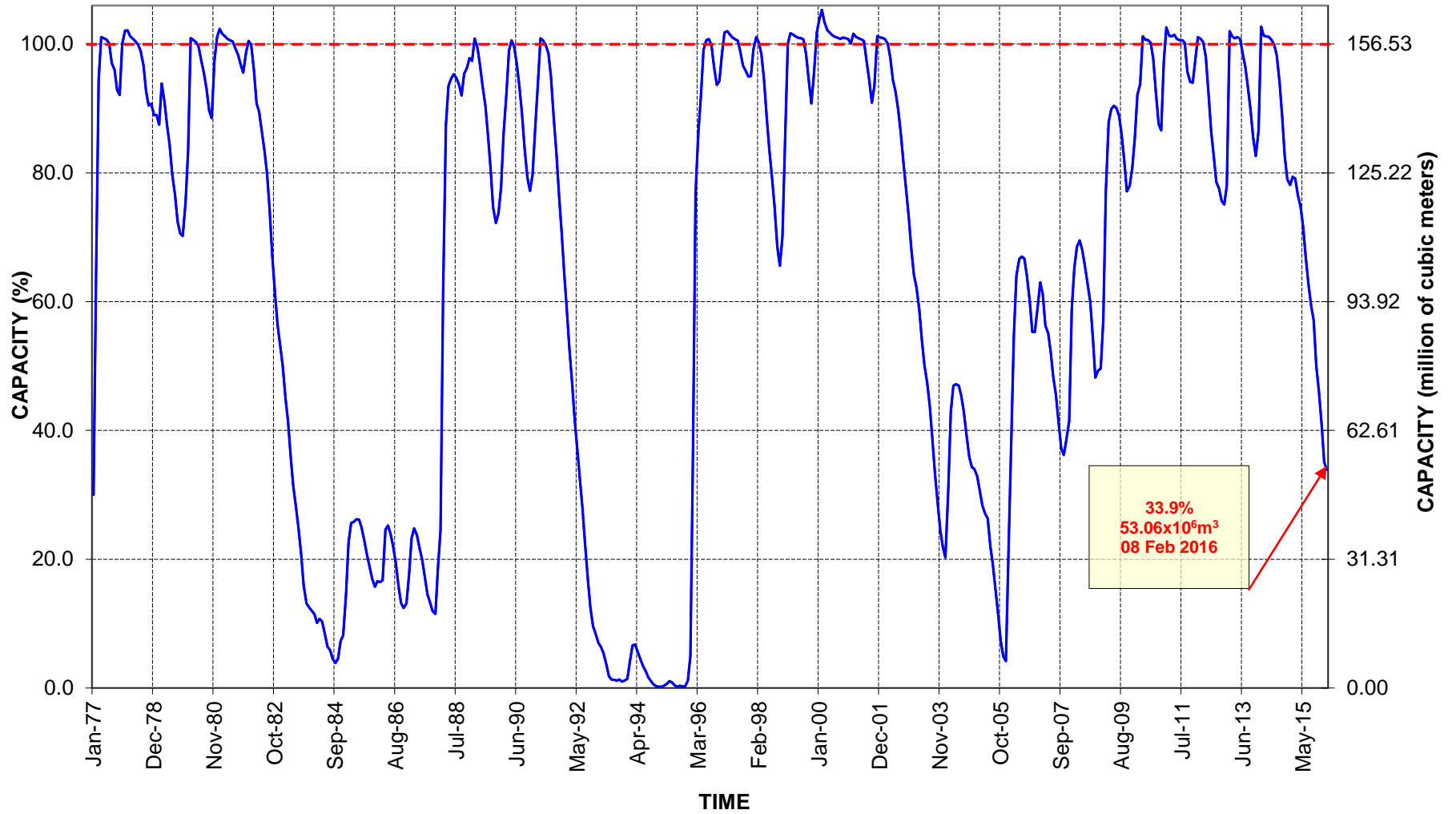


POLITSI RIVER AT MAGOEBAKLOOF DAM

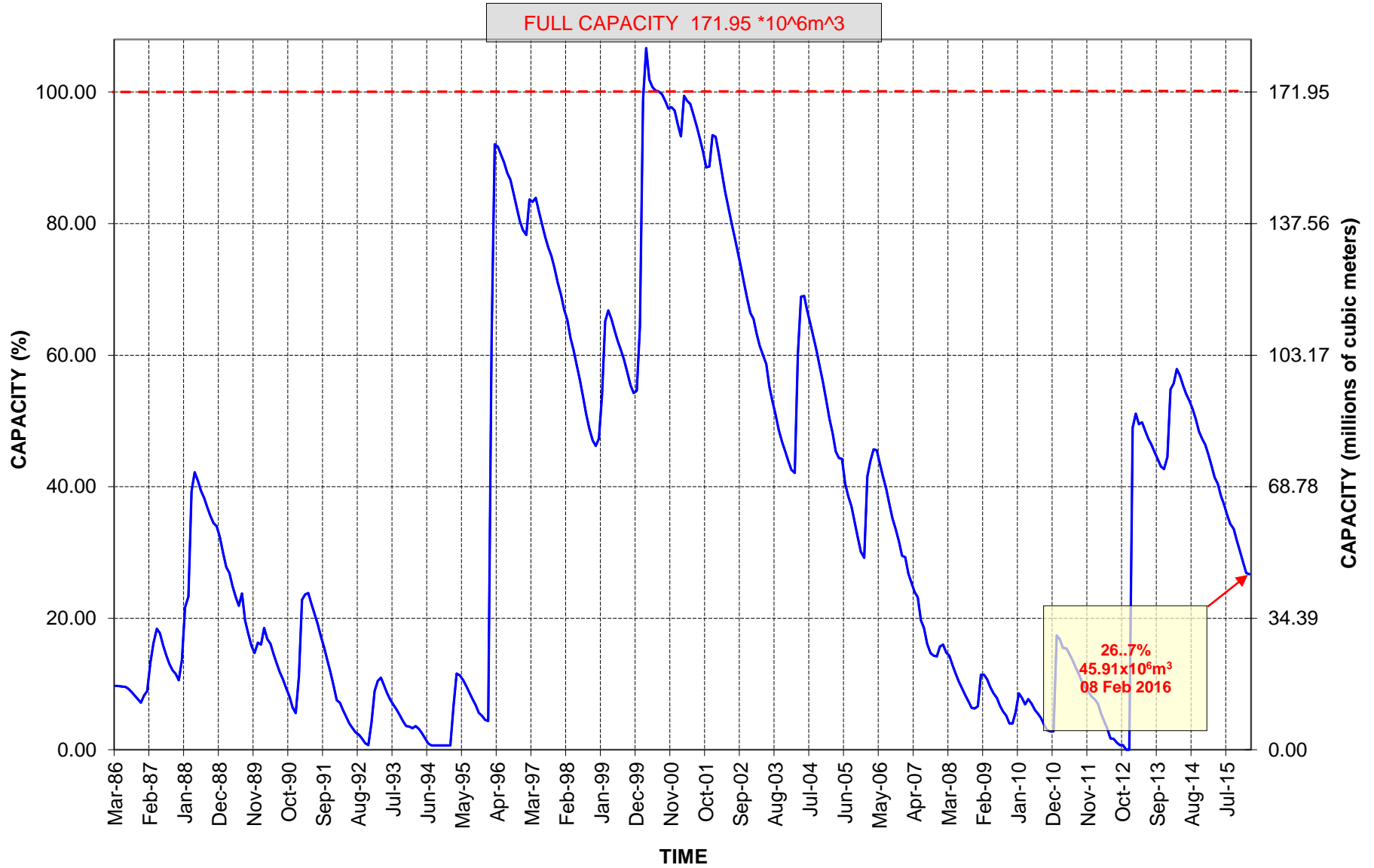


GREAT LETABA RIVER AT TZANEEN DAM

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

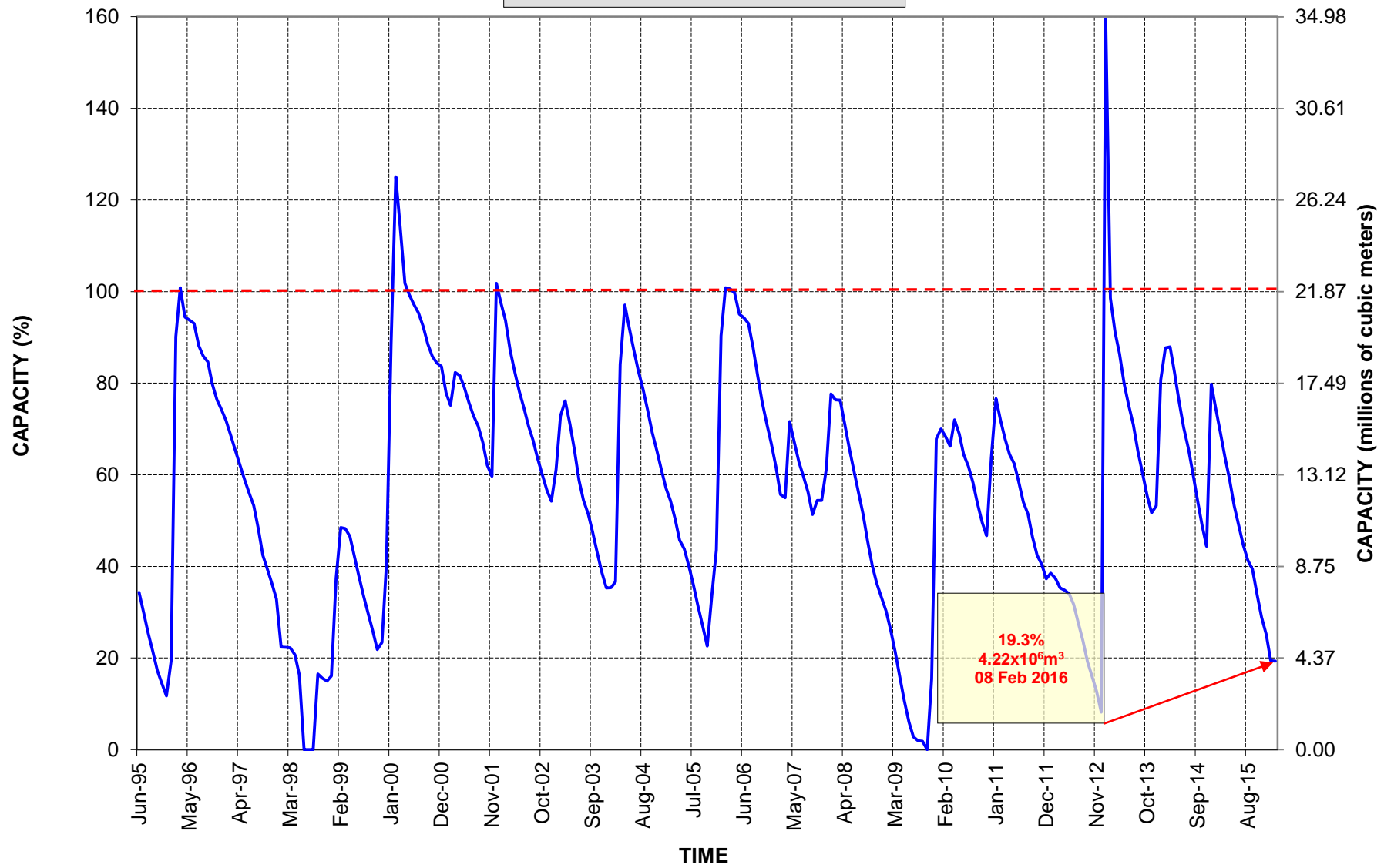


MIDDLE LETABA RIVER AT MIDDLE LETABA DAM



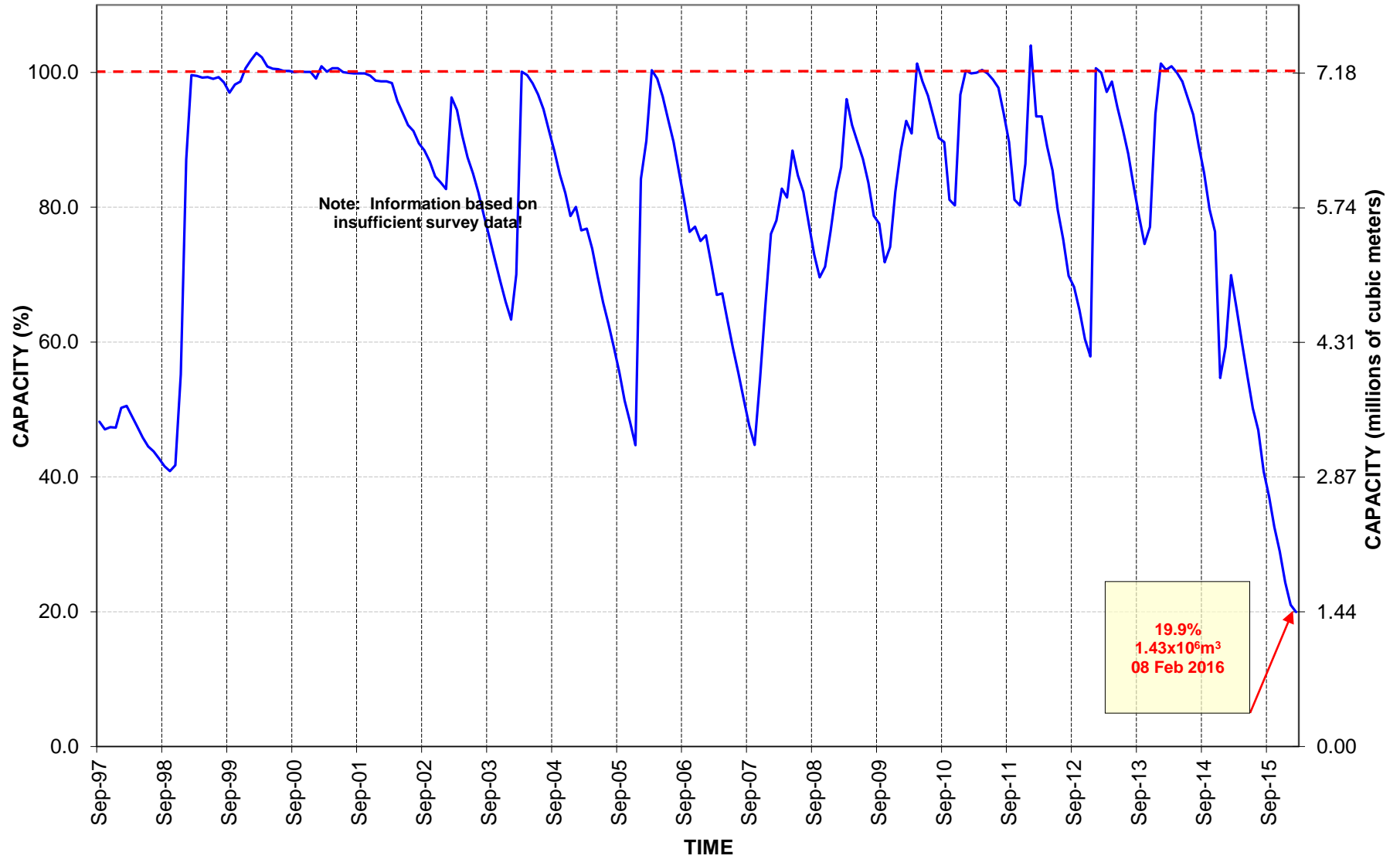
NSAMI DAM AT NSAMA RIVER

FULL CAPACITY 21.87 *10⁶m³



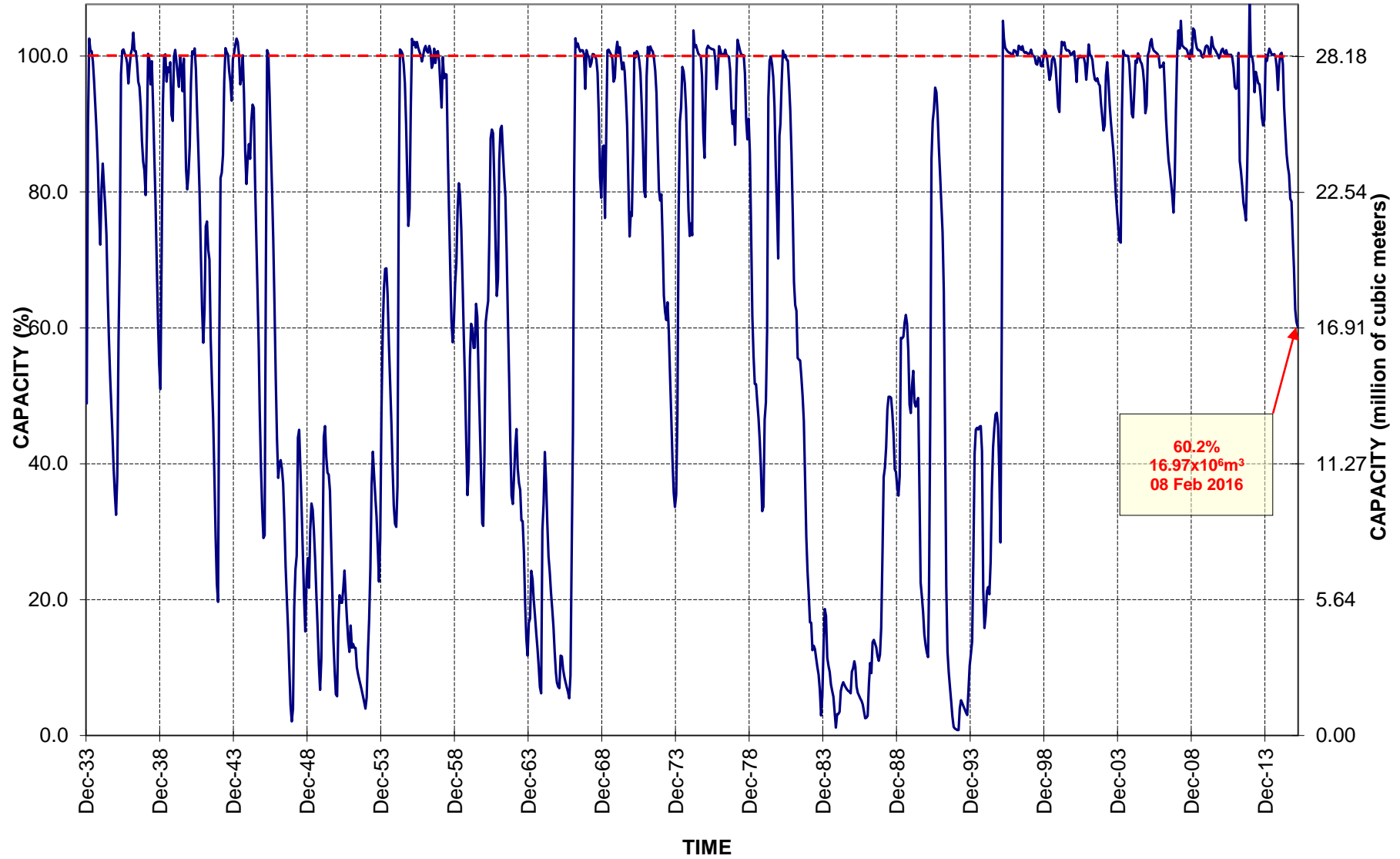
MOLOTOTSI RIVER AT MODJADJI DAM

FULL CAPACITY $7.18 \times 10^6 \text{m}^3$



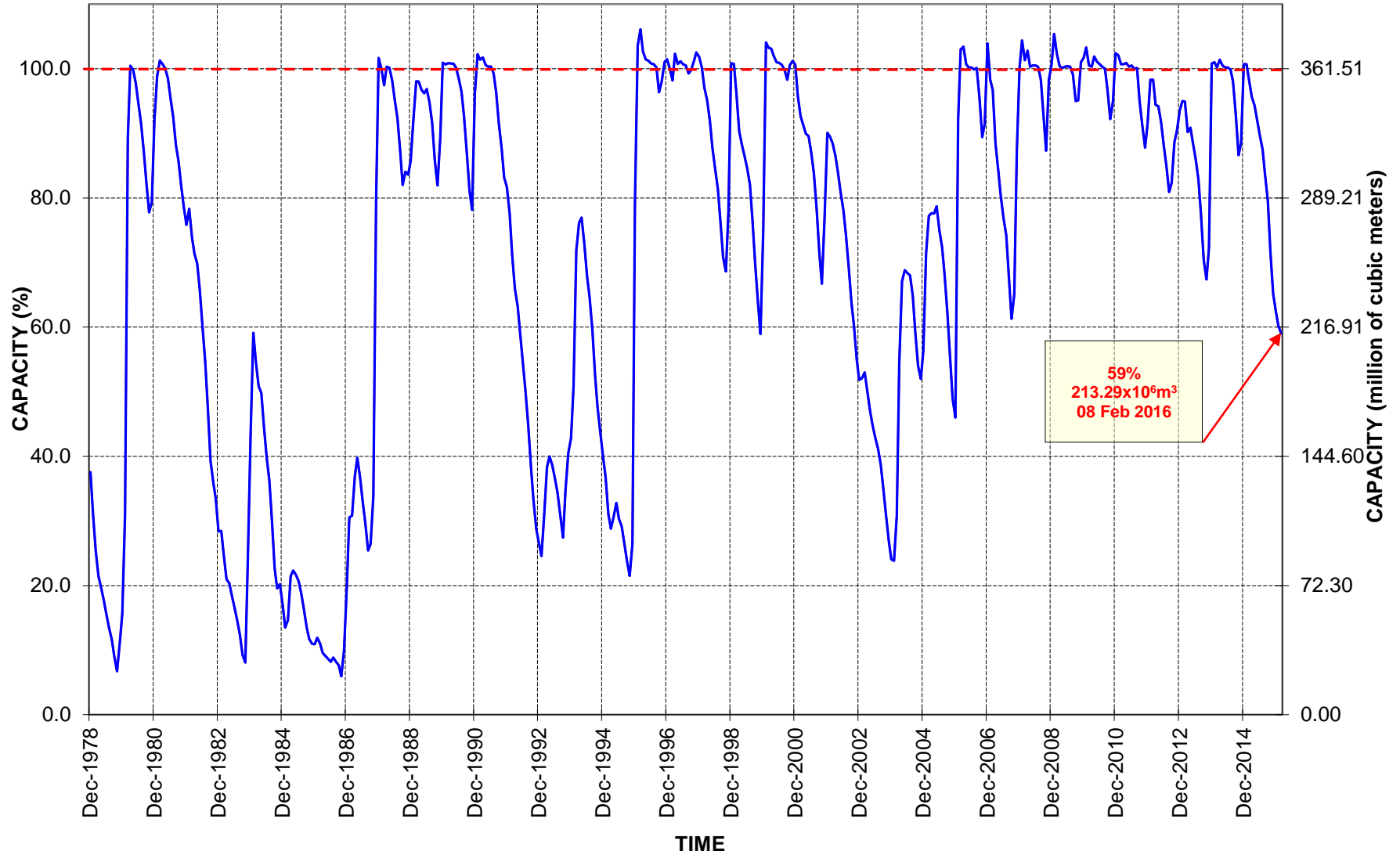
ELANDS RIVER AT RUST DE WINTER DAM

FULL CAPACITY $28.186 \times 10^6 \text{m}^3$

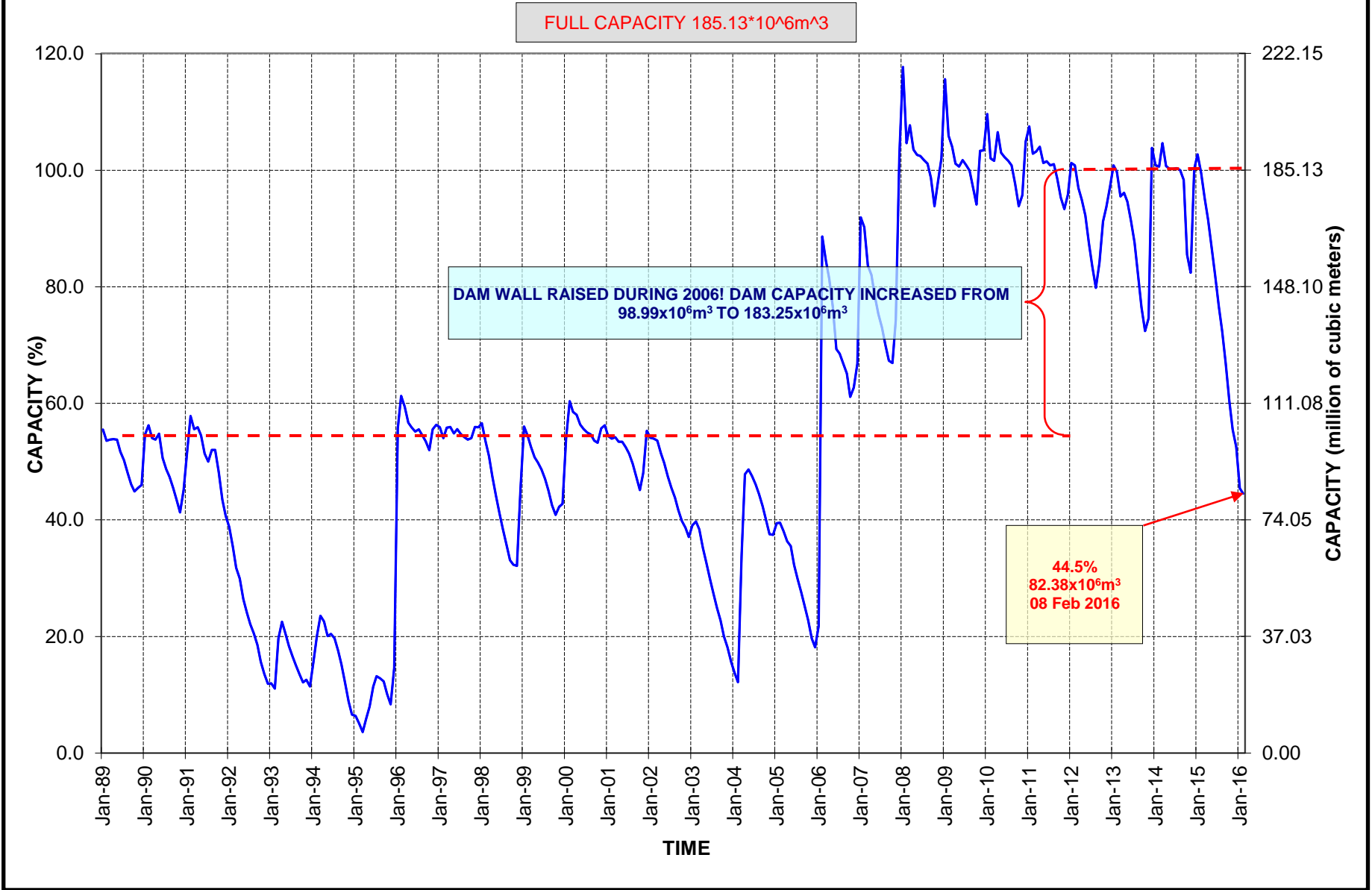


OLIFANTS RIVER AT LOSKOP DAM

FULL CAPACITY

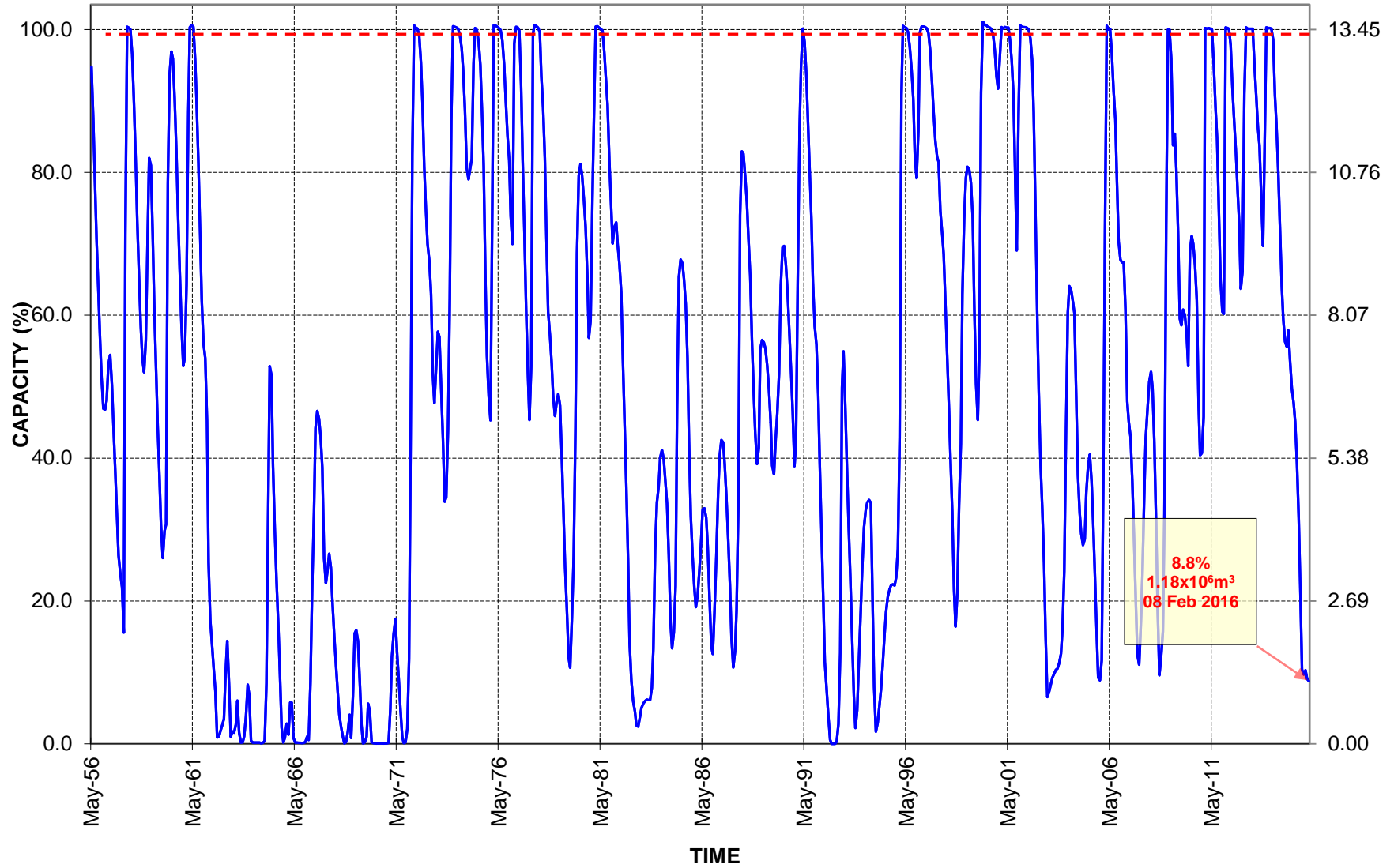


OLIFANTS RIVER AT FLAG BOSHELLO DAM



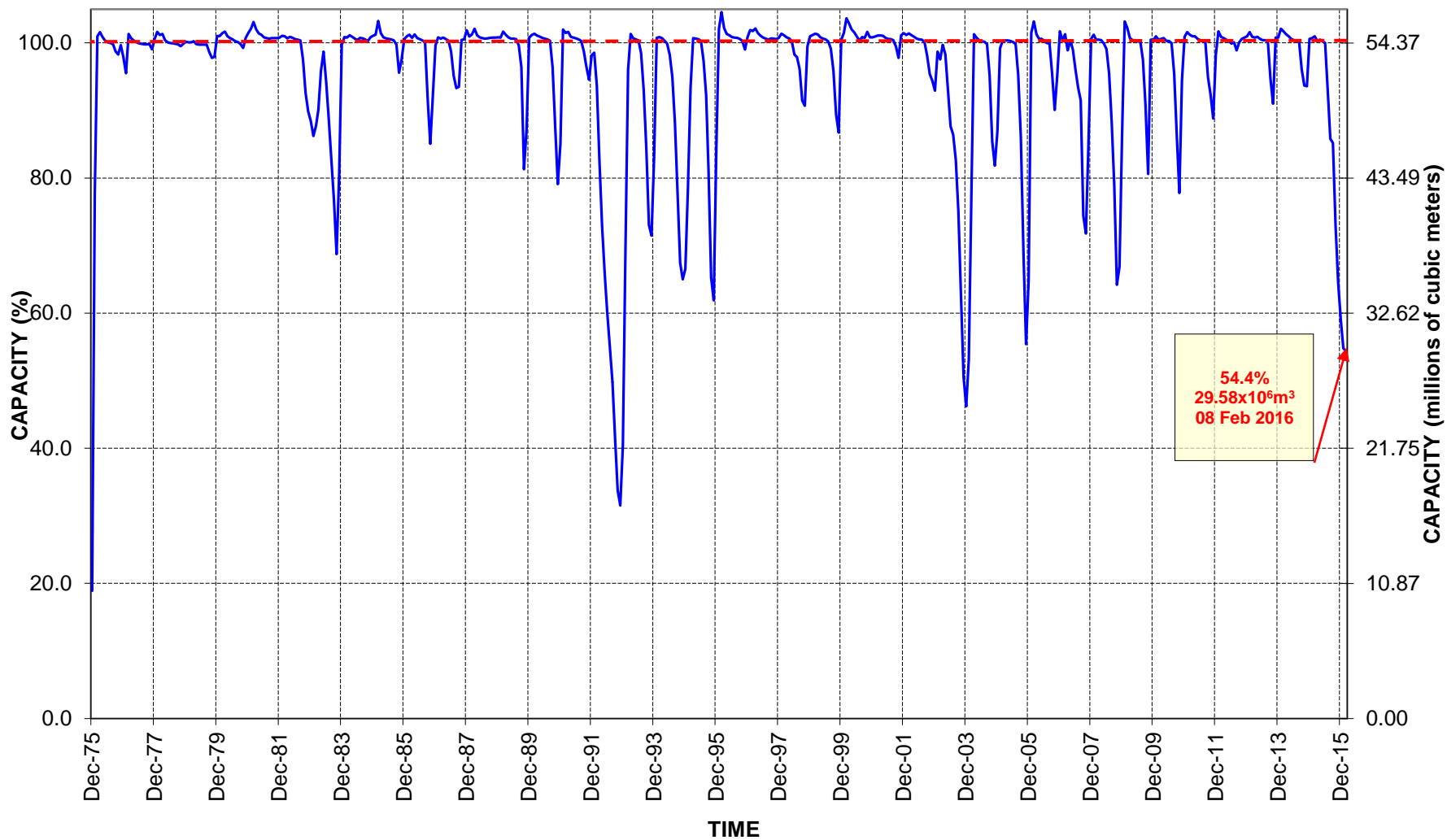
OHRIGSTAD RIVER AT OHRIGSTAD DAM

FULL CAPACITY $13.45 \times 10^6 \text{m}^3$



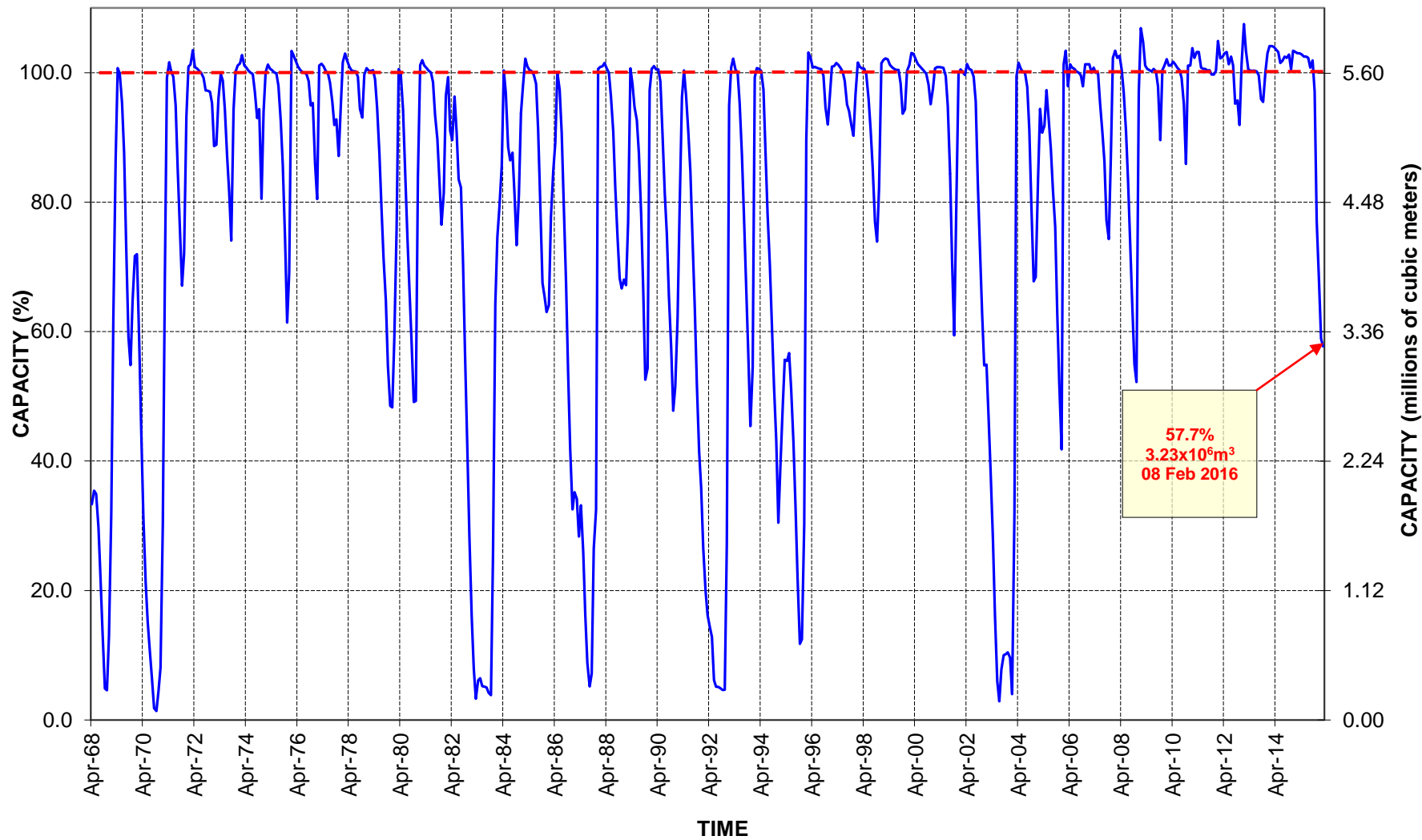
BLYDE RIVER AT BLYDE RIVIERSPOORT DAM

FULL CAPACITY $54.369 \times 10^6 \text{m}^3$

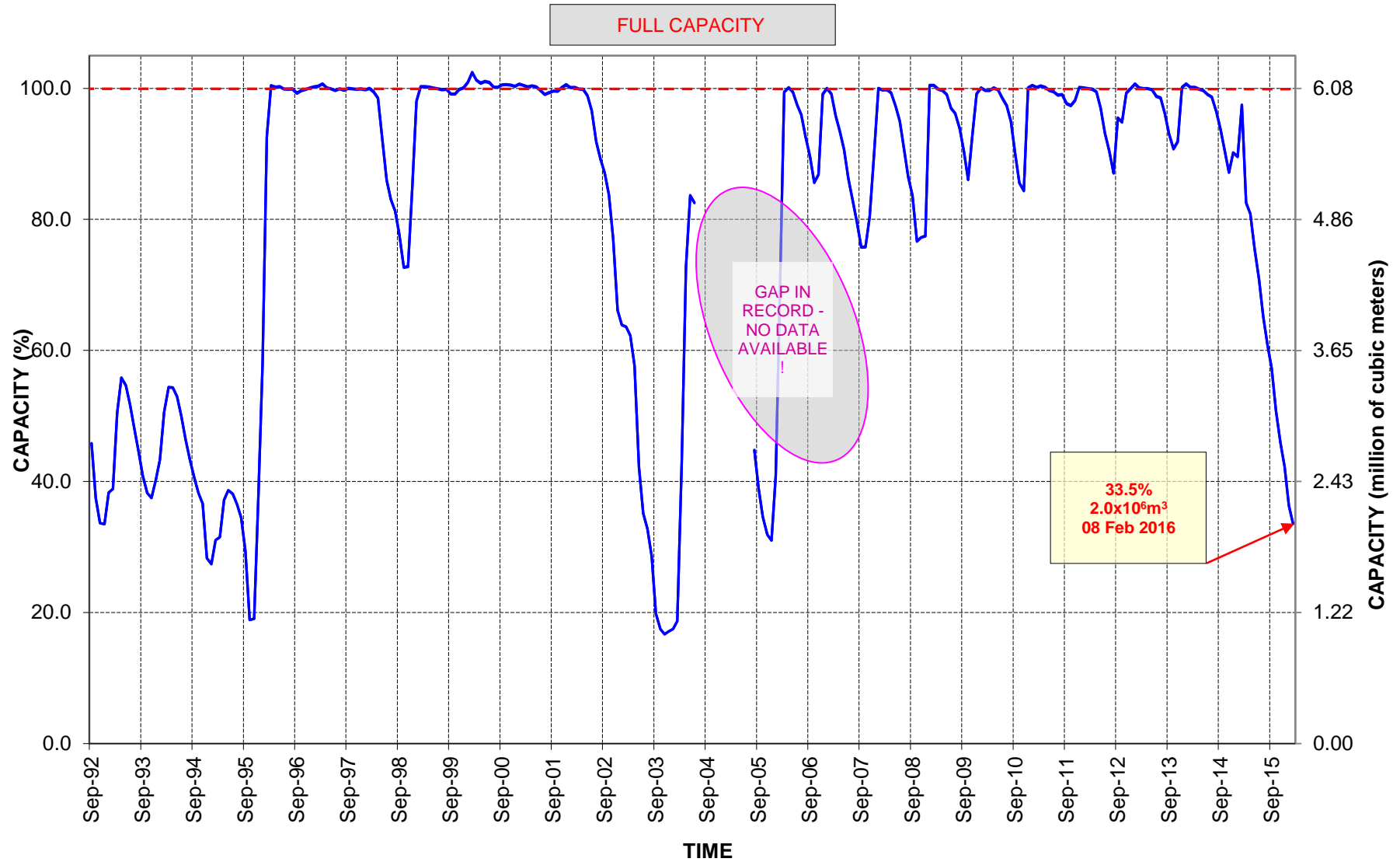


KLASERIE RIVER AT KLASERIE DAM

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

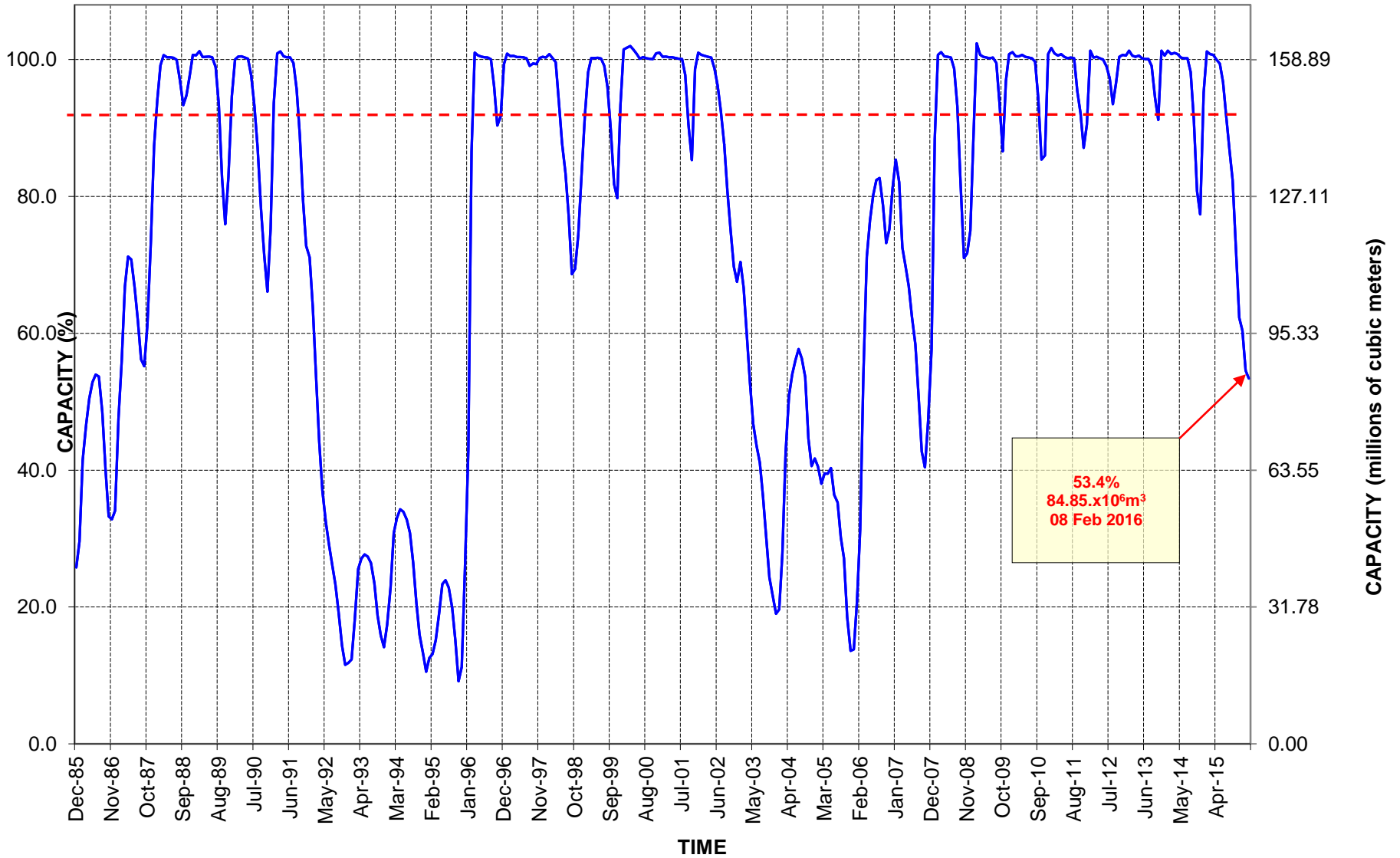


NGWABITSI RIVER AT TOURS DAM



CROCODILE RIVER AT KWENA DAM

FULL CAPACITY $158.89 \times 10^6 \text{m}^3$



MERITI RIVER AT INYAKA DAM

FULL CAPACITY 123.66 *10⁶m³

