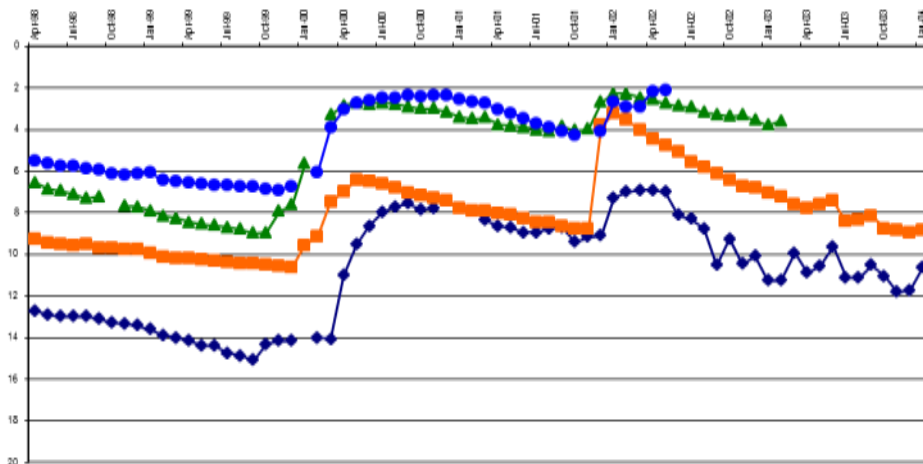


LIMPOPO REGION

ABBREVIATED QUARTERLY STATUS REPORT ON GROUNDWATER LEVEL TRENDS



H VERSTER

DIRECTORATE
PLANNING AND INFORMATION
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Data collection~ and processing* assisted by:

P F TSHELANE~

E RAMOBA~*

D A TLEANE~

T P SEAKAMELA~

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SUMMARY

The groundwater level status discussed in the report represent the situation on 30 September 2016, which is the end of the hydrological year. Very limited to no groundwater recharge over the past two seasons is evident. Groundwater levels at 90.74% of monitoring stations are lower than the corresponding time last year.. The general status of the groundwater is still considered to be healthy in most areas despite the current declining trend. Historical groundwater level trends indicates that current status is still far from critical. Some areas in the northern parts of the A5 and A6 drainages. As well as the north eastern part of the A9 drainage may become a concern if recharge do not occur soon. In the previous status report areas of the B8 drainage were also identified as possible concern. Unfortunately no updated data for the area is currently available.

The importance of monitoring and sound groundwater management cannot be over emphasised.

1. BACKGROUND

The report is an abbreviated version of the normal quarterly status report. Due to delays in obtaining approval to travel was no data collection possible in November as is usually done. Data collection resumed in December but not all stations could be visited in the available time. Thus an abbreviated report as data is not available for all areas.

The report reflects the status on 30 September, the end of hydrological and the end of the dry season. Electronic groundwater level data was downloaded during October and December 2016 and processed in December. Some typical groundwater level trends were selected and discussed.

The distribution of the monitoring network is illustrated by **MAP 1**.

The distribution of monitoring stations used for compilation of the report is illustrated by **MAP 2**.

2. GROUNDWATER LEVELS

2.1 DIFFERENCE IN GROUNDWATER LEVELS; 1 OCTOBER 2015 TO 30 SEPTEMBER 2016 (TABLE 1)

The groundwater level at only one of the ten stations indicating higher water levels at the end of the hydrological year is not related to abstraction levels. At this station, A7Klein Bolayi, recharge took place in April 2016 but the water level has since declined again to just 33 cm above that at the start of the hydrological year (**GRAPH 1**).

Groundwater levels at 90.74% of the stations with data for this period are lower than last year. The distribution of monitoring stations with higher or lower groundwater levels is illustrated by **MAP 3**.

From the map is clear that data for the eastern to south eastern part of the Province was not collected.

1 October 2015 to 30 September 2016	
Total stations visited	139

With data	108 Stations	77.7%
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Water level	Number of stations	Average(m)	%
Down	98 Stations	1.18	90.74%
Up	10 Stations	0.40	9.26%
No change	0 Stations		0.00%
No Data	31 Stations		
Total	139		100.00%

TABLE 1

3 SOME GROUNDWATER LEVEL TRENDS IN DIFFERENT SECONDARY DRAINAGE AREAS

3.1 DRAINAGE AREA A4

The groundwater time series of station A4Naboom-Vaalwater is a good indication of the general trend in this drainage with the limited recharge over the past two seasons clearly visible from January 2015 onwards (**GRAPH 2**)

Groundwater levels in this drainage are generally stable and despite the lack of recent recharge is still considered to be healthy. A small area in the north eastern part however indicate constantly declining groundwater level for some years now.

3.2 DRAINAGE A5

Groundwater levels in the southern part of the drainage indicate stable conditions with normal seasonal fluctuation but no recharge the past two seasons. The current groundwater levels in this area represent a healthy status.

Groundwater levels in the northern part are continuously declining with little or no evidence of recharge for some years now. (**GRAPH 3**). This trend is also displayed at some stations in A4 and A6 drainage areas adjacent to this area.

3.3 DRAINAGE A6

Except for a part in the north western area of this drainage is groundwater levels still considered to reflect a healthy status despite the limited recharge the past two seasons Groundwater levels are not all affected to the same extend or at the same time by a lack of recharge. The groundwater level time series of stations A6Manhlodi and A6Vlakfontein illustrate this (**GRAPH 4**). The groundwater level at A6Vlakfontein is characterised by pronounced seasonal fluctuation and clearly more affected by the lack of recharge. Despite the current declining trend is the water level still not a reason for concern at this stage. The groundwater level at A6Manhlodi is more stable and less affected by the lack of recharge.

3.4 DRAINAGE A7

The current status of groundwater levels in the A7 drainage in general, is considered healthy when compared with historical levels (**GRAPH 5**) The graph also give a better perspective on the current two-year declining trend. .

3.5 DRAINAGE A8

The general groundwater level trend in this drainage is a stable one with clear seasonal fluctuations. The current declining trend is not as pronounced in this drainage. (**GRAPH 6**).

3.6 DRAINAGE A9

The majority of groundwater levels indicate a constant decline since 2006 followed by good recharge in 2013 to 2014 where after the decline continues. (**GRAPH 7**) The decline at some stations in the lower reaches of the Mutale river is a concern.

3.7 DRAINAGE B3

Updated data not available

3.8 DRAINAGE B5

Data available for 5 stations. The two-year decline is also notable here but available data indicate a good status. It is however known that abstraction impact in the area of Roedtan is severe (**GRAPH 8**)

3.9 DRAINAGE B7

Updated data not available

3.10 DRAINAGE B8

Updated data not available

3.11 DRAINAGE B9

Groundwater level trends are similar to that in the A9 drainage indicating a steady decline, good recharge in 2013-2014 followed by the same declining trend (**GRAPH 9**)

4 RAINFALL

4.1 PERCENTAGE OF NORMAL RAINFALL; JULY 2015 TO JUNE 2016 (FIGURE 1).

4.2 PERCENTAGE OF NORMAL RAINFALL; JULY 2016 TO SEPTEMBER 2016

Figures 1 & 2 from the South African Weather Services indicate that Limpopo mostly received below normal rainfall the past year.

6 IMPORTANCE OF GROUNDWATER MONITORING AND RESOURCE MANAGEMENT

Taking of timely and appropriate actions to ensure sustainable use of any resource depends on sound and timely data and information. Sound management of groundwater depends on accurate and timely groundwater level, quality and abstraction volume data.

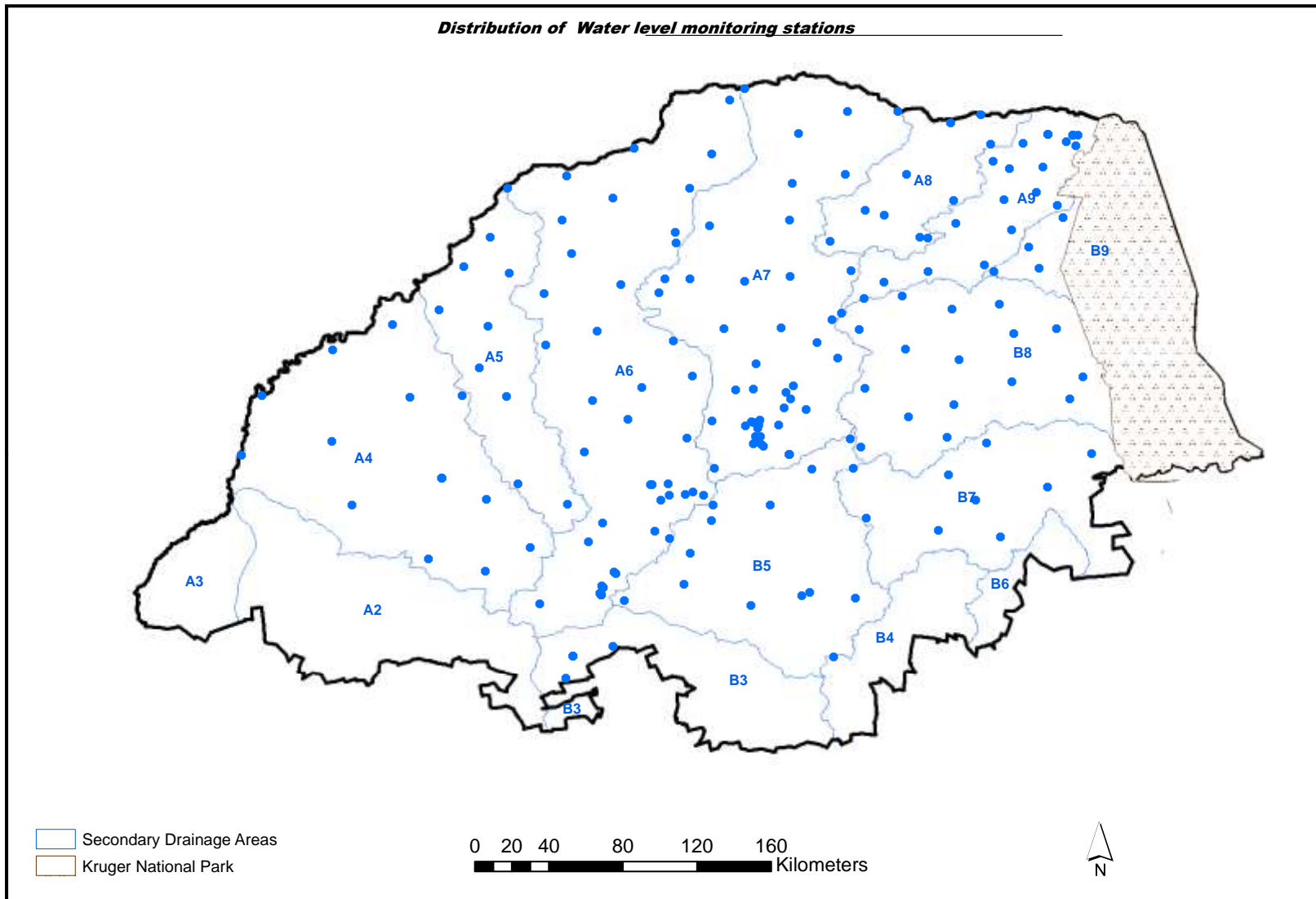
6.1 COMBINED EFFECT OF DROUGHT AND ABSTRACTION; A9LEVHUVHU

All the factors contributing to the current decline in groundwater levels as noted in all areas is not always easily recognised. In some areas it may only be related to lack of recharge while combined abstraction over a large area may be an underlying factor not easily recognised. Direct effects of nearby abstraction can easily be noted. A good example of the combined effect of abstraction and lack of recharge is presented by (**GRAPH 10**)

7 ACKNOWLEDGEMENTS

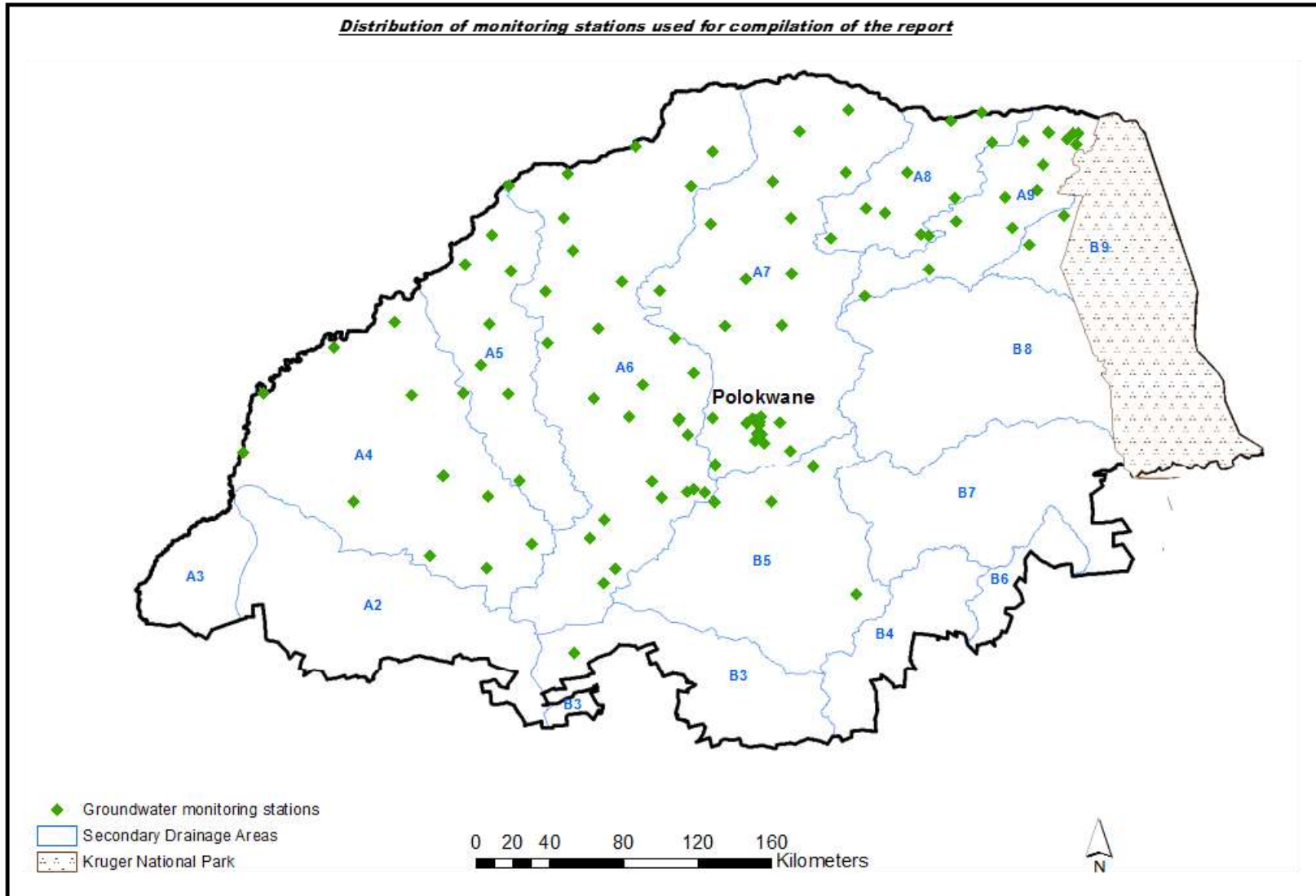
Percentage of normal rainfall: South African Weather Services: <http://www.weathersa.co.za>

Distribution of Water level monitoring stations



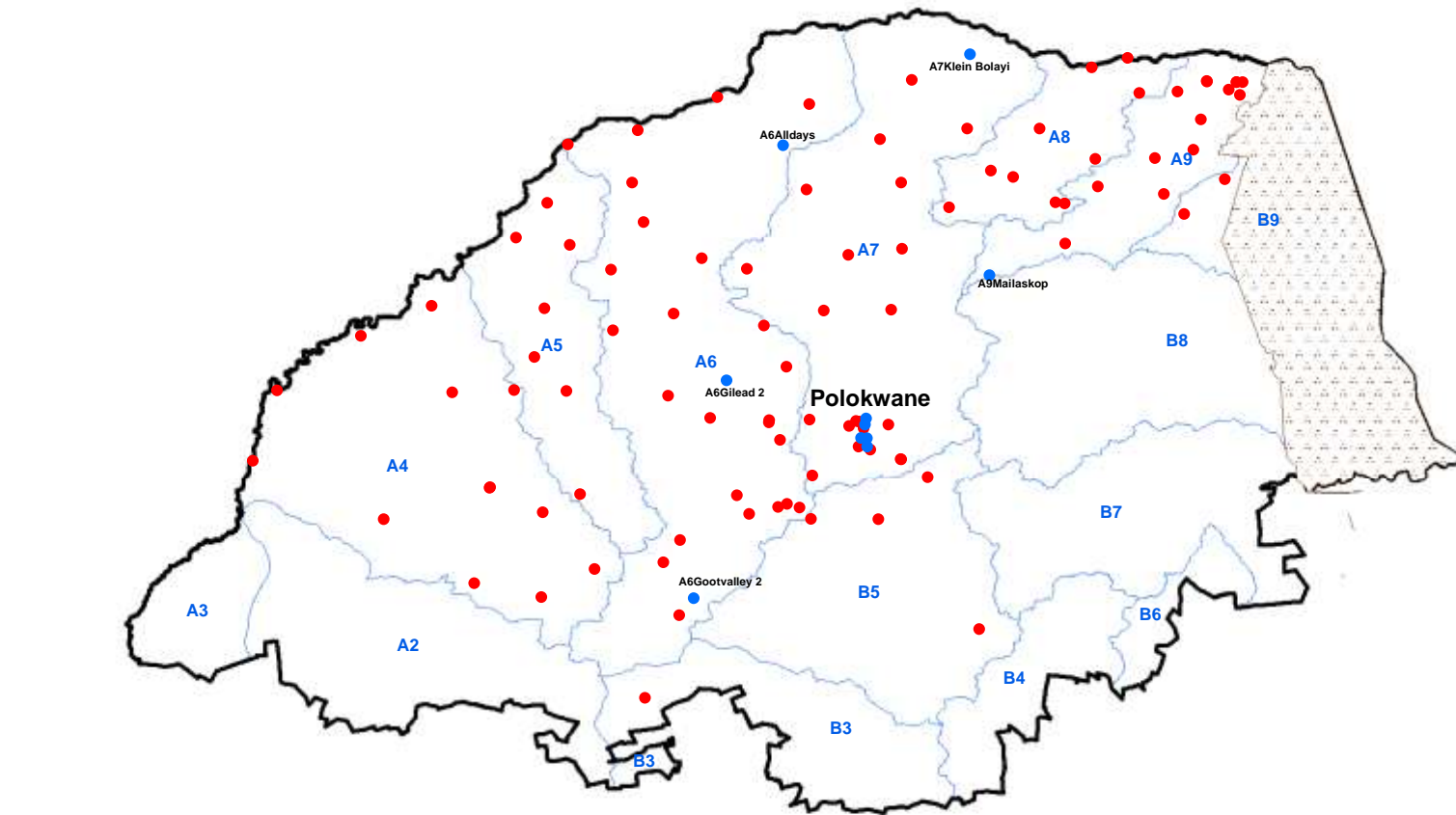
MAP 1

Distribution of monitoring stations used for compilation of the report



MAP 2

Difference in groundwater levels 1 October 2015 to 30 September 2016



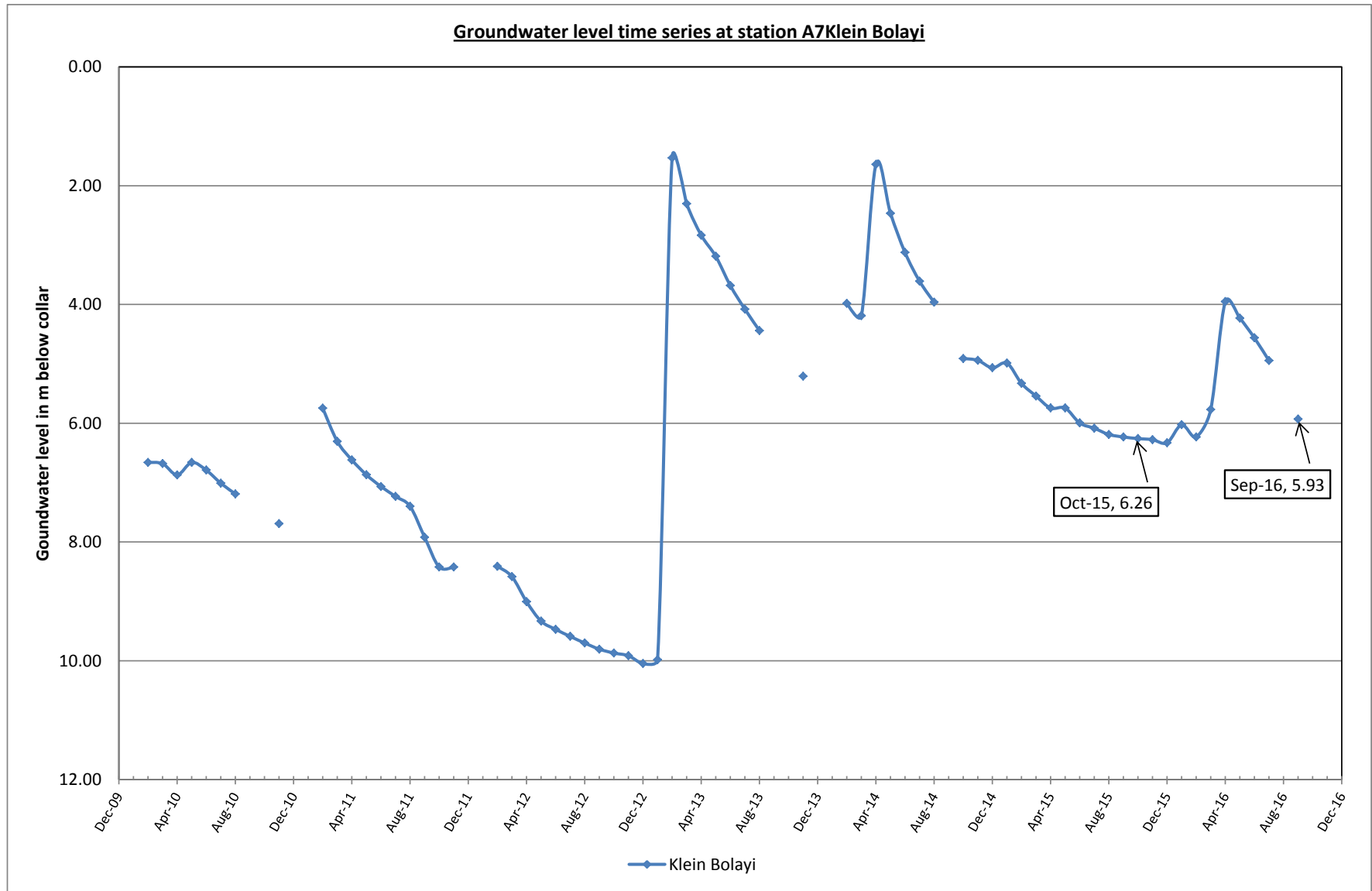
Groundwater levels 1 October 2015 to 30 September 2016

- Lower water levels
- Higher water levels
- Secondary Drainage Areas
- ▨ Kruger National Park

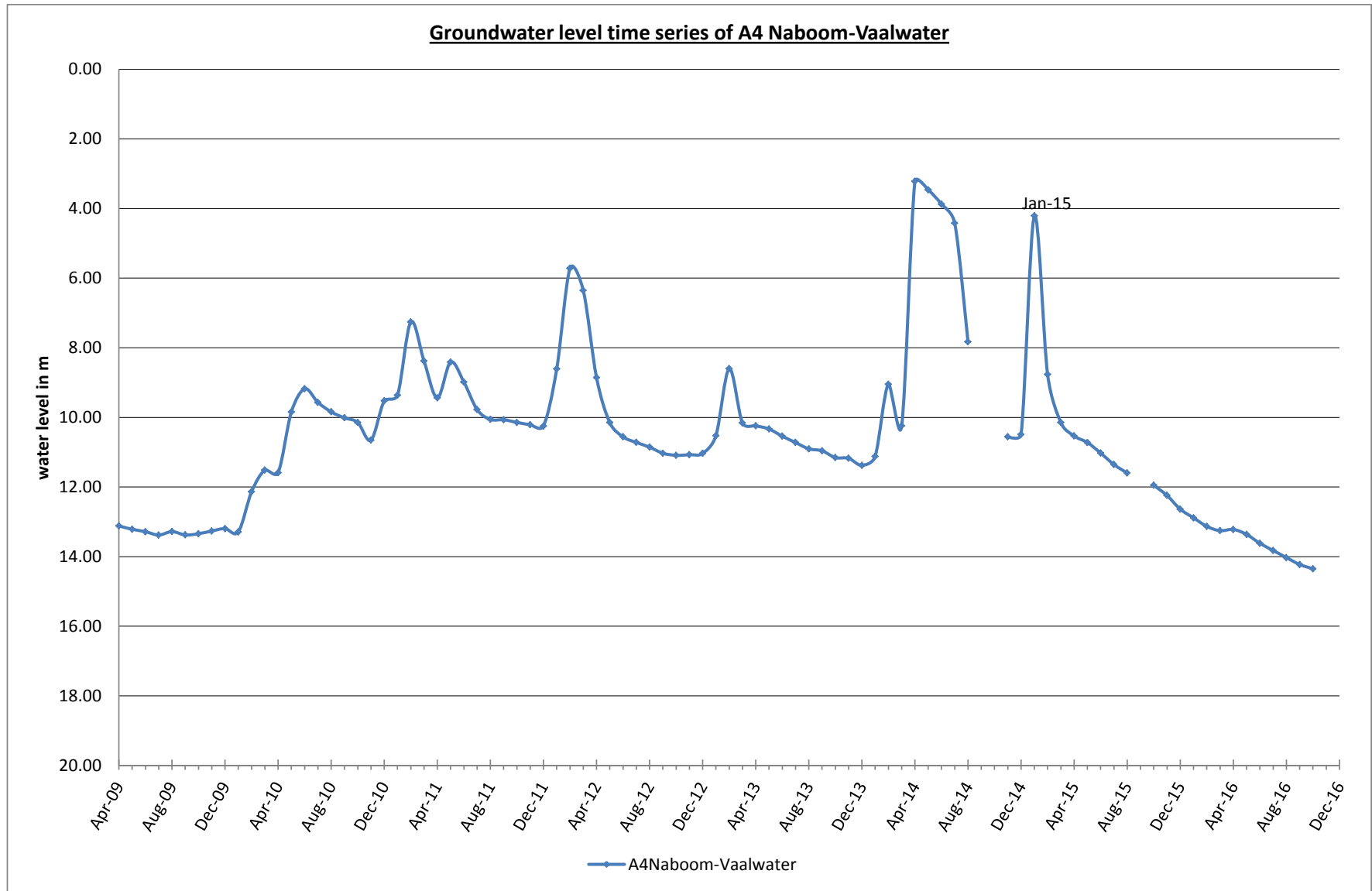
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Kilometers



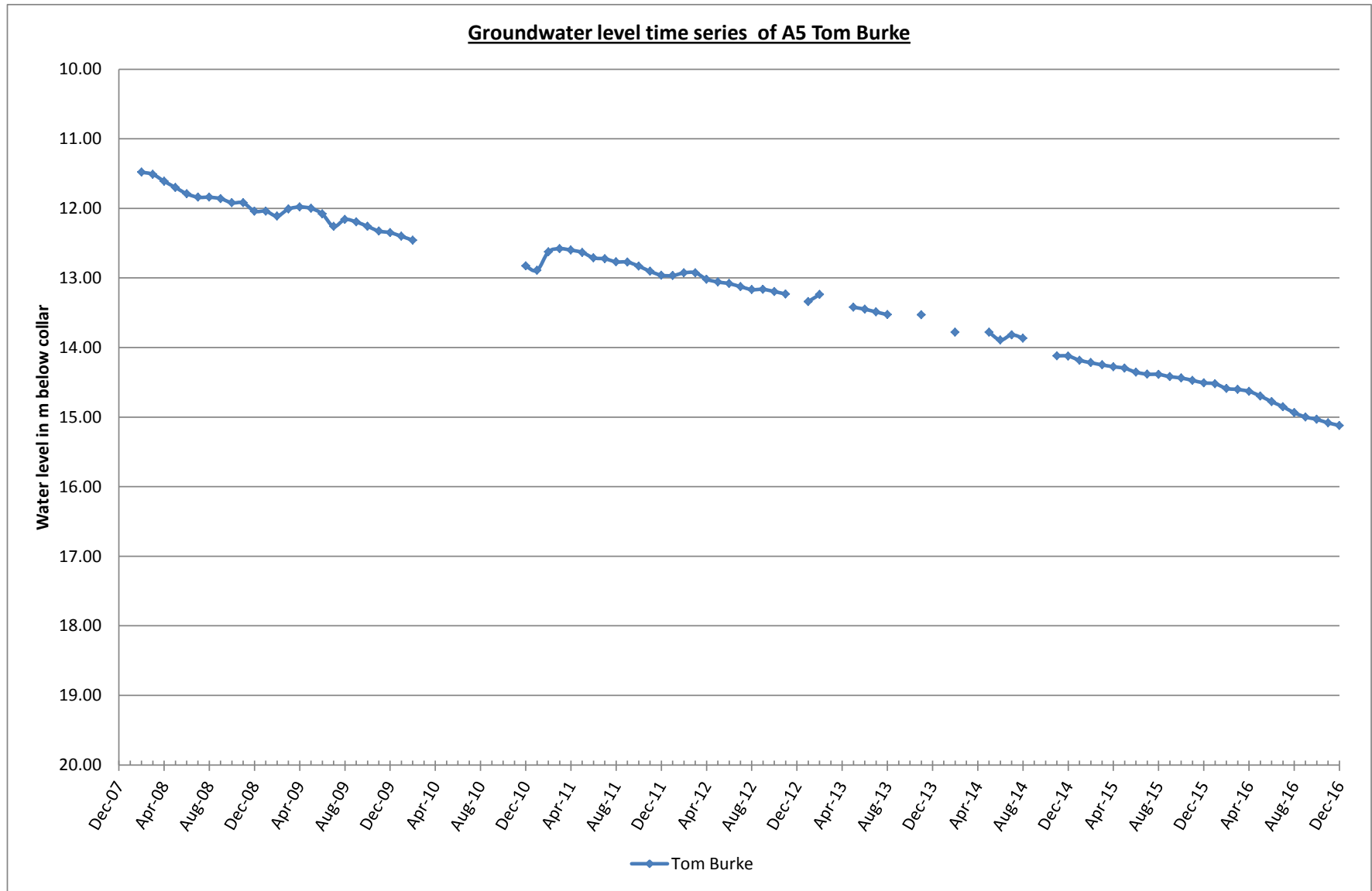
MAP 3



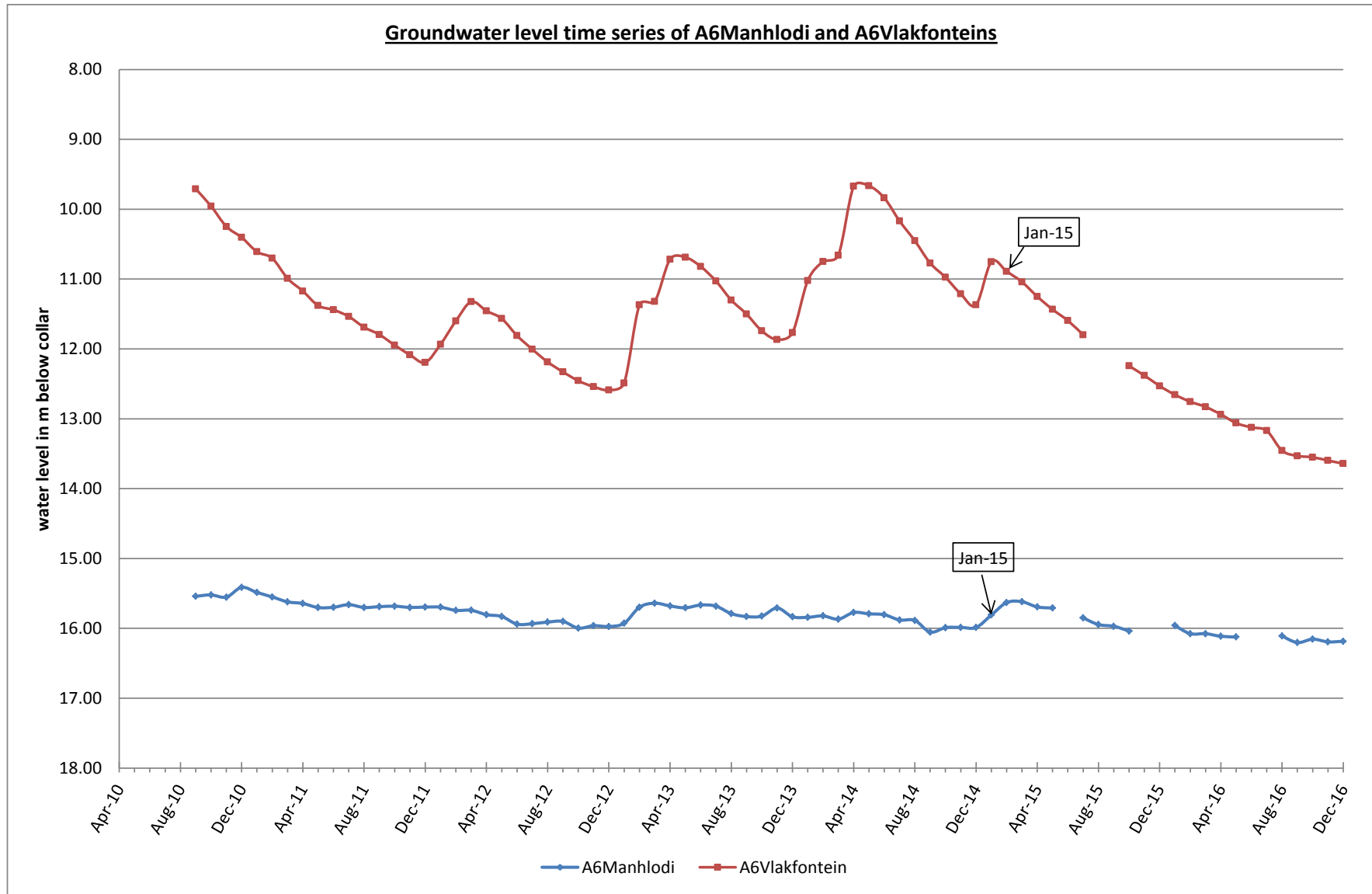
GRAPH 1



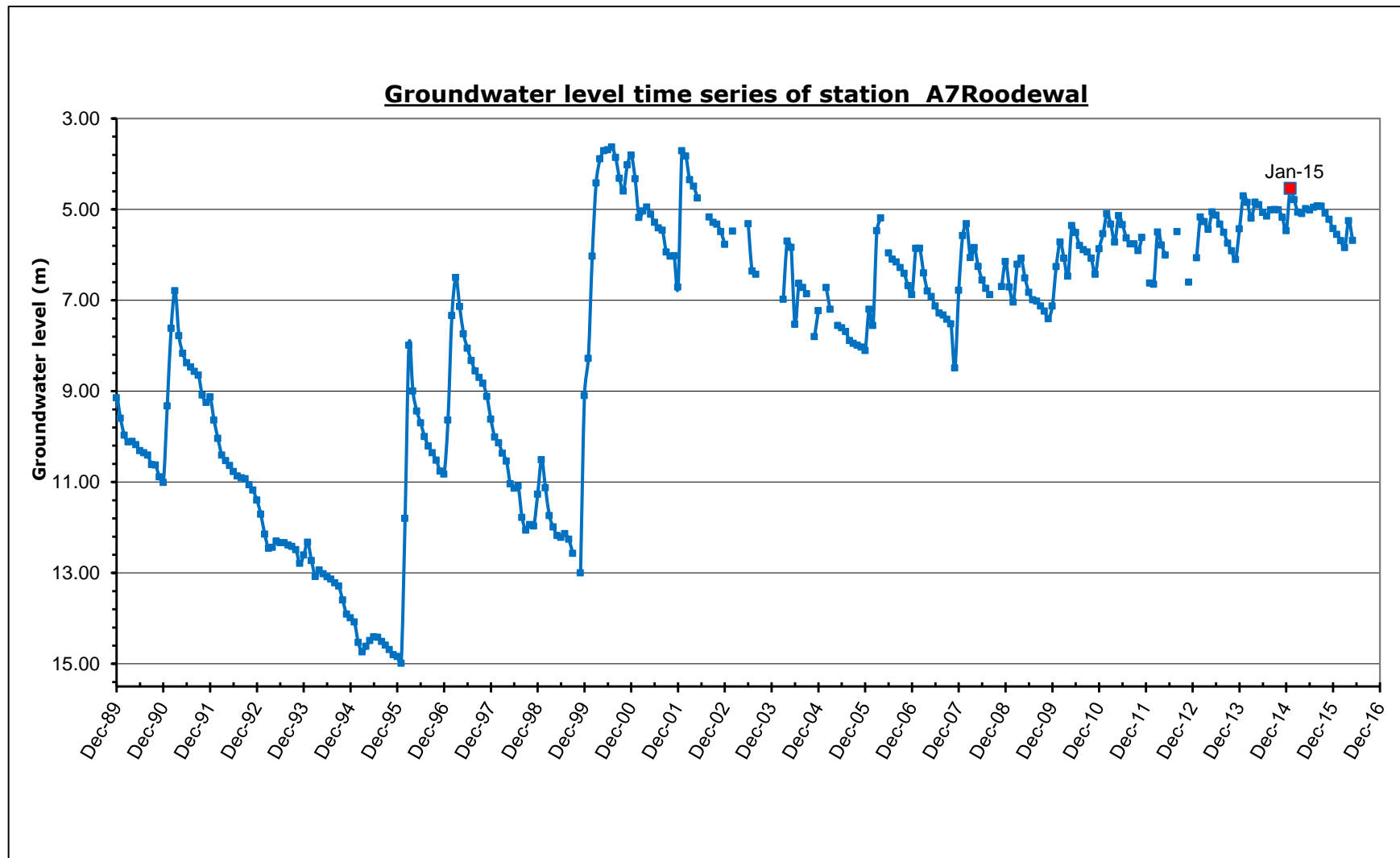
GRAPH 2



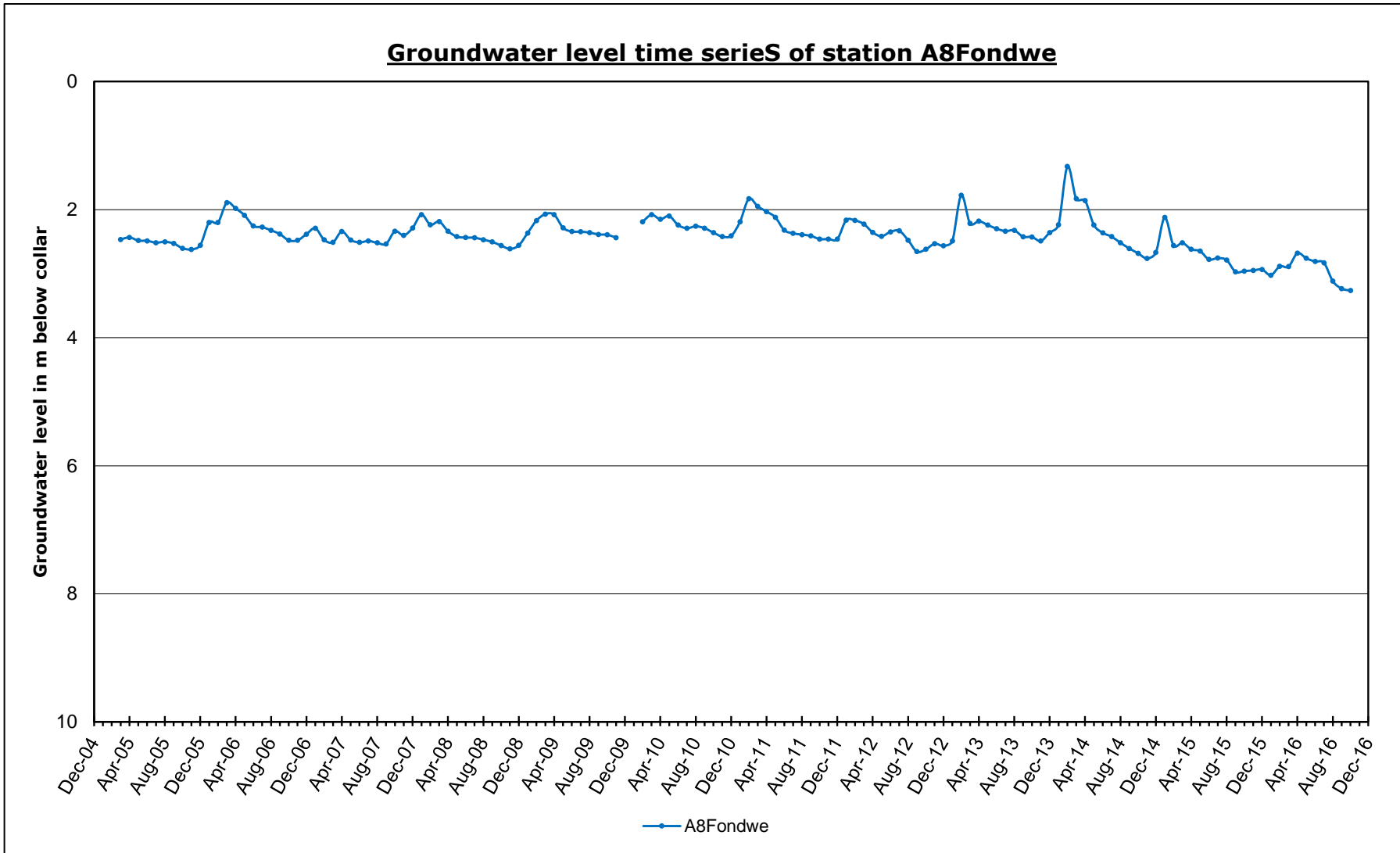
GRAPH 3



GRAPH 4

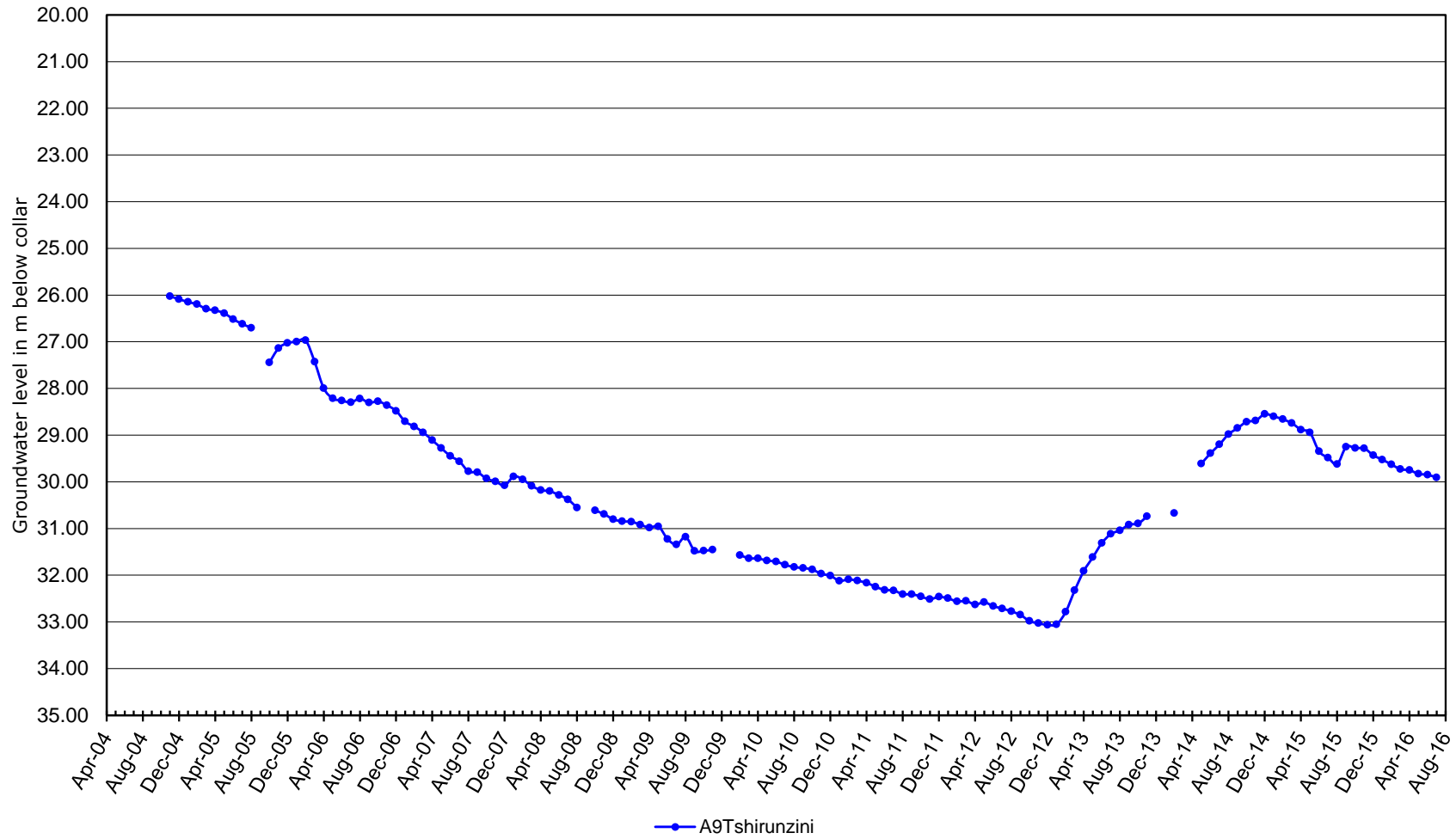


GRAPH 5



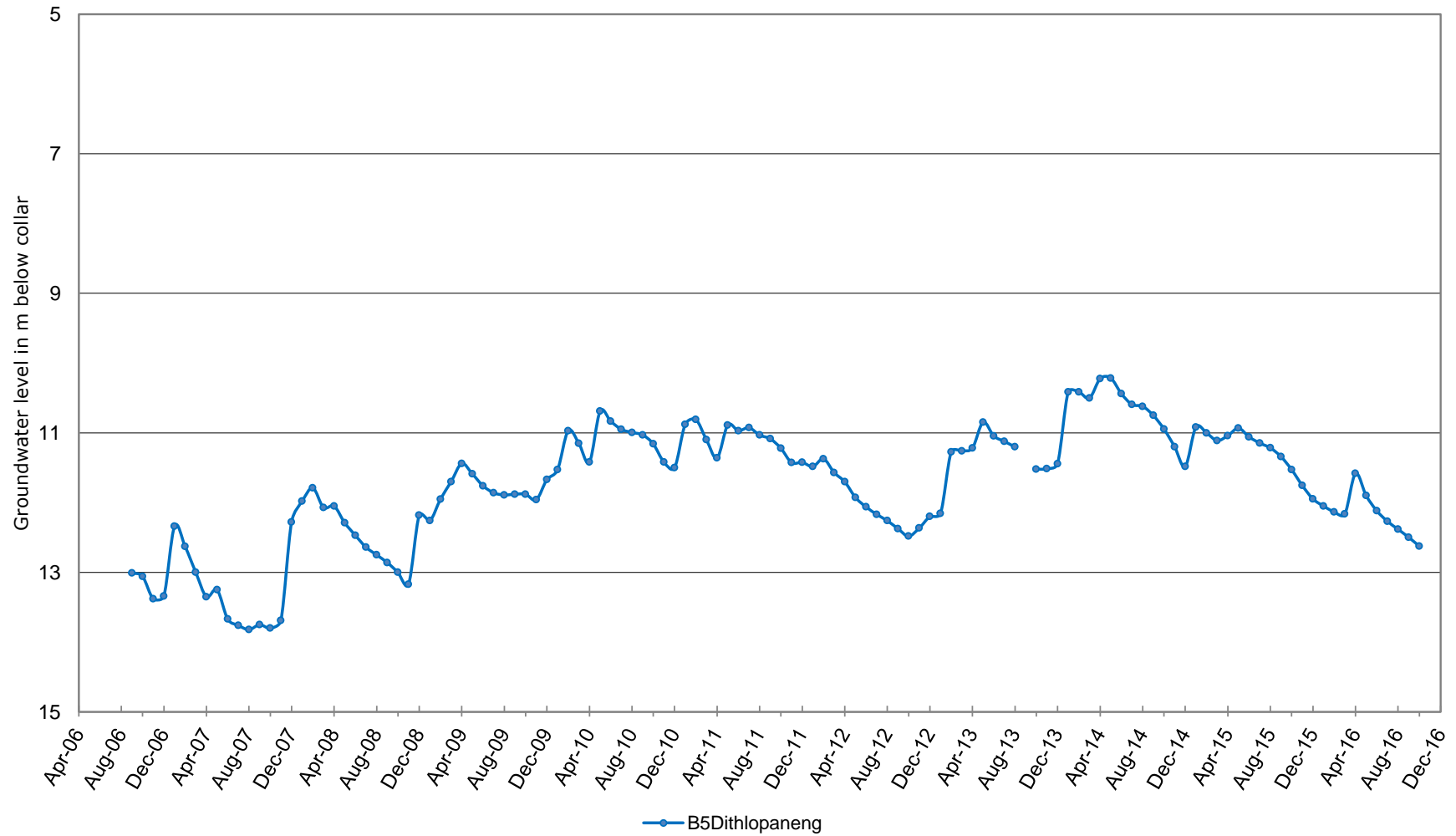
GRAPH 6

Groundwater level time series of A9Tshirunzini

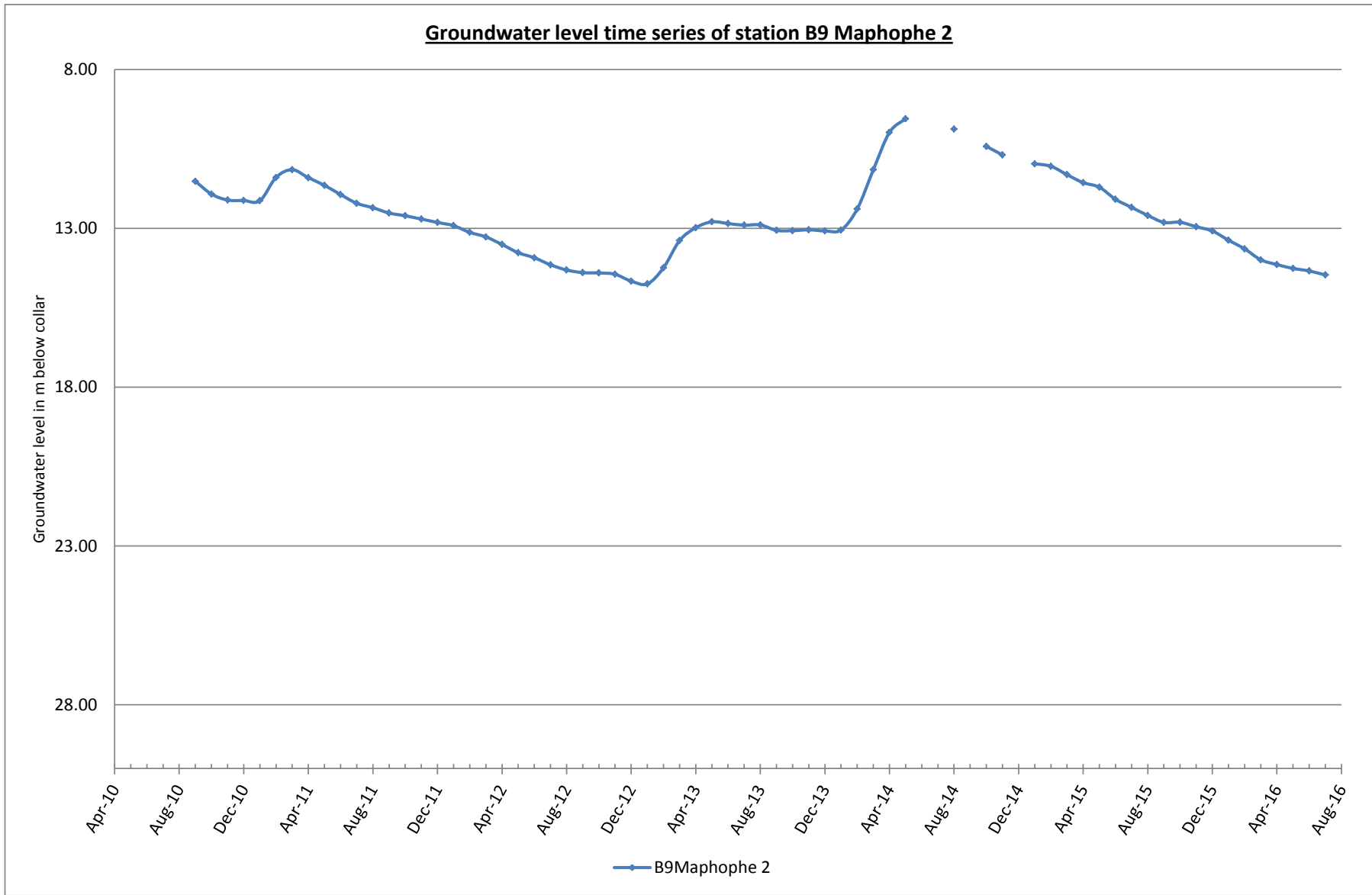


GRAPH 7

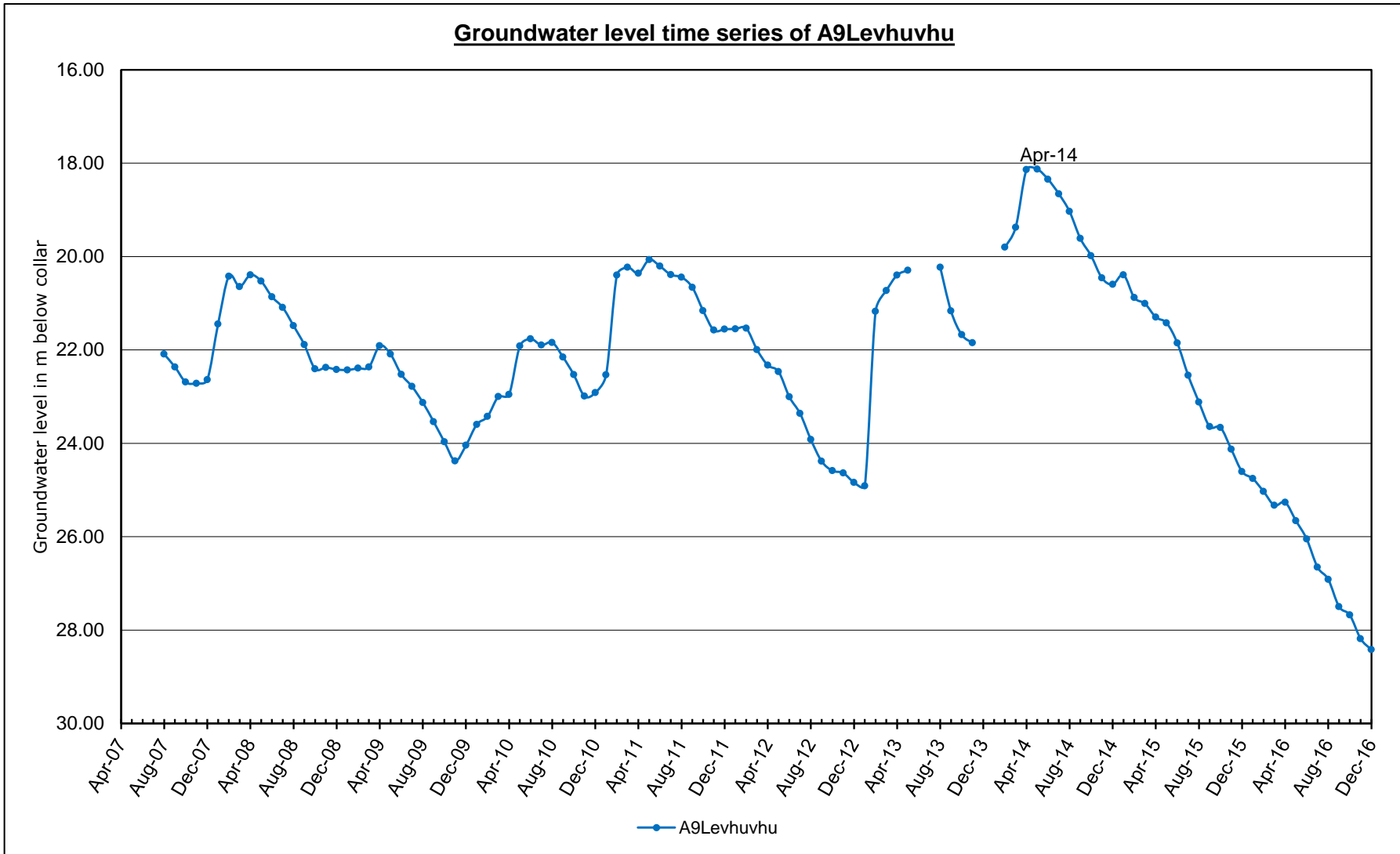
Groundwater level time series of B5Dithlopaneng



GRAPH 8



GRAPH 9



GRAPH 10