



# A South African Surface Drainage Network for GIS



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## COMPLETED?

No, 8% of the coverage is still unedited (mainly in the central region) while a further 10% is outside the range of our reference data. Twelve quaternary drainage regions have no rivers. Many river naming problems remain unresolved (!Nu or iXnu or Wildebees?). Despite these shortcomings, we have decided to release the coverage for general use: please inform us of any errors you discover.

## PEDIGREED

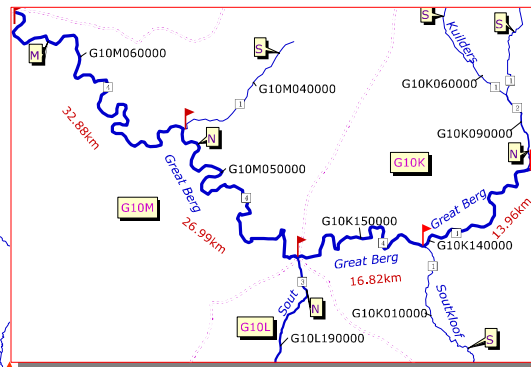
The coverage is based on the 1:500 000 rivers provided by Surveys and Mapping in 1994. GisLAB performed the first fix in 1995, filling gaps, ordering and pruning. Our group has performed spatial adjustments to align the rivers to the Surveys and Mapping 1:50 000 coverage. We have filled in the gaps from ESRI's Digital Chart of the World, the Hydrogeological Map of Namibia and assorted other data.

## CODED

The network has USA-style river reach codes:  
**C 9 2 B 0 2 0 0 0 0**  
The first four digits are the 1°, 2°, 3° and 4° drainage region. These can be expanded through a look-up table to the 8 digits required by BASINS. We allocate the quaternary code of the region in which most of the river lies. The next two digits are a sequence code from 01 to 99 for the reaches within a quaternary drainage region. The last four digits allow for the addition of more rivers later. At the 1:500 000 scale, the first six digits uniquely identify a reach.

## ANALYSED

The coverage consists of 10 160 line segments made up of 996 630 vertices, and conforms to the Cape Datum.



## ORDERED

The entire network is ordered using the Strahler method with Lamphear and Lewis's algorithm.

## NAMED

Sixty percent of the rivers have names: 5% of these have aliases (e.g. old names or alternative spellings). About 1% are spelt incorrectly.

## ALIGNED

Seventy-four percent of the rivers are within our tolerance ( $\pm 50m$  of the 1:50 000 river coverage). Sixteen percent are in areas with no reference data, 8% have errors in their endpoints and 2% do not comply with the reference data at all.

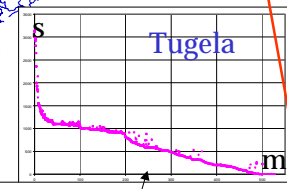
## EXTRUDED

Five-thousand-and-sixty-two tables of every possible source-to-mouth sequence, for example:

| End Seq. | Sorter    | Order | Reachcode | Name      | kmCumul. |
|----------|-----------|-------|-----------|-----------|----------|
| S 1      | A00003433 | 1     | A23A07000 | Piensaars | 46.02    |
| N 2      | A00003707 | 2     | A23A20000 | Piensaars | 50.69    |
| N 3      | A00003708 | 2     | A23B07000 | Piensaars | 53.51    |
| N 4      | A00003840 | 2     | A23C02000 | Piensaars | 91.58    |
| N 5      | A00003841 | 2     | A23C02000 | Piensaars | 145.73   |
| N 6      | A00004244 | 3     | A23J03000 | Piensaars | 152.10   |
| N 7      | A00004373 | 3     | A23J04000 | Moretele  | 178.05   |
| N 8      | A00004697 | 4     | A23J05000 | Moretele  | 182.73   |
| N 9      | A00004759 | 4     | A23J06000 | Piensaars | 195.61   |
| N 10     | A00004940 | 4     | A23L03000 | Piensaars | 214.81   |
| N 11     | A00004941 | 4     | A23L04000 | Piensaars | 229.06   |
| N 12     | A00050001 | 5     | A24B03000 | Crocodile | 253.17   |
| N 13     | A00050509 | 5     | A24C03000 | Crocodile | 270.22   |
| N 14     | A00051116 | 5     | A24C04000 | Crocodile | 297.26   |
| N 15     | A00060209 | 5     | A24H17000 | Crocodile | 308.23   |
| N 16     | A00060300 | 5     | A24H18000 | Crocodile | 312.95   |
| N 17     | A00060311 | 5     | A24J07000 | Crocodile | 362.42   |
| N 18     | A00060804 | 5     | A24J08000 | Crocodile | 376.86   |
| N 19     | A00061316 | 5     | A24J09000 | Crocodile | 407.60   |
| N 20     | A00014837 | 5     | A41D03000 | Limpopo   | 468.72   |
| N 21     | A00016140 | 5     | A41D04000 | Limpopo   | 477.97   |
| N 22     | A00016141 | 5     | A41E01000 | Limpopo   | 523.23   |
| N 23     | A00016285 | 5     | A41E02000 | Limpopo   | 559.31   |
| N 24     | A00016429 | 5     | A41E03000 | Limpopo   | 656.96   |
| N 25     | A00016430 | 5     | A50B02000 | Limpopo   | 693.14   |
| N 26     | A00016431 | 5     | A50B03000 | Limpopo   | 721.57   |
| N 27     | A00016432 | 5     | A50J05000 | Limpopo   | 739.34   |
| N 28     | A00016433 | 5     | A50J06000 | Limpopo   | 757.92   |
| N 29     | A00016794 | 5     | A63C03000 | Limpopo   | 811.07   |
| N 30     | A00016795 | 5     | A63C04000 | Limpopo   | 848.52   |
| N 31     | A00016796 | 5     | A63E23000 | Limpopo   | 857.58   |
| N 32     | A00016797 | 5     | A63E24000 | Limpopo   | 879.46   |
| N 33     | A00017258 | 5     | A63E25000 | Limpopo   | 892.51   |
| N 34     | A00017259 | 5     | A63E26000 | Limpopo   | 921.86   |
| N 35     | A00017260 | 5     | A63E27000 | Limpopo   | 921.86   |
| N 36     | A00018556 | 5     | A71L25000 | Limpopo   | 942.50   |
| N 37     | A00020335 | 5     | A71L26000 | Limpopo   | 945.83   |
| N 38     | A00020336 | 5     | A71L27000 | Limpopo   | 946.36   |
| N 39     | A00020337 | 5     | A71L28000 | Limpopo   | 960.27   |
| N 40     | A00020338 | 5     | A71L29000 | Limpopo   | 966.38   |
| N 41     | A00020339 | 5     | A71L30000 | Limpopo   | 977.44   |
| N 42     | A00020340 | 5     | A71L31000 | Limpopo   | 989.78   |
| N 43     | A00020341 | 5     | A71L32000 | Limpopo   | 992.40   |
| N 44     | A00020342 | 5     | A71K05000 | Limpopo   | 1012.17  |
| N 45     | A00020368 | 5     | A71K06000 | Limpopo   | 1017.11  |
| N 46     | A00020369 | 5     | A80J08000 | Limpopo   | 1046.47  |
| N 47     | A00020370 | 5     | A80J03000 | Limpopo   | 1058.62  |
| N 48     | A00020413 | 5     | A80J04000 | Limpopo   | 1073.94  |
| N 49     | A00020414 | 5     | A80J05000 | Limpopo   | 1089.19  |
| N 50     | A00020415 | 5     | A92B03000 | Limpopo   | 1132.44  |
| N 51     | A00020947 | 5     | A91K09000 | Limpopo   | 1140.60  |
| N 52     | A00022062 | 5     | A91K10000 | Limpopo   | 1158.84  |
| N 53     | A00022063 | 5     | Y30A15000 | Limpopo   | 1172.44  |
| N 54     | A00022064 | 5     | Y30A16000 | Limpopo   | 1213.26  |
| N 55     | A00022112 | 5     | Y30A17000 | Limpopo   | 1248.99  |
| N 56     | A00022113 | 5     | Y30D07000 | Limpopo   | 1248.99  |
| N 57     | A00022150 | 5     | Y30D08000 | Limpopo   | 1331.53  |
| N 58     | A00022151 | 5     | Y30D09000 | Limpopo   | 1389.67  |
| N 59     | A00022152 | 5     | Y30D10000 | Limpopo   | 1426.31  |
| N 60     | A00022153 | 5     | Y30E23000 | Limpopo   | 1527.22  |
| N 61     | A00022163 | 5     | Y30E24000 | Limpopo   | 1585.84  |
| N 62     | A00022223 | 5     | Y30E25000 | Limpopo   | 1593.18  |
| N 63     | A00022224 | 5     | Y30E26000 | Limpopo   | 1616.68  |
| N 64     | A00022239 | 5     | Y30E27000 | Limpopo   | 1621.39  |
| N 65     | A00022245 | 5     | Y30E28000 | Limpopo   | 1669.28  |
| N 66     | A00022264 | 5     | Y30E29000 | Limpopo   | 1676.24  |
| N 67     | A00022265 | 5     | Y30E30000 | Limpopo   | 1679.02  |
| N 68     | A00022266 | 5     | Y30E31000 | Limpopo   | 1687.36  |

## APPLIED

- Profiles against digital elevation models.
- Checking of monitoring point locations.
- Water quality reporting.



## FRAZZLED

The nerves of Naomi Roberson, Juanita Moolman, Elna Vermaak, Magda Smidt, Kama Chetty and Axel Diefenbach, without whose hours of mouse-breaking toil this coverage would never have happened.

It's clearly a budget. It's got a lot of numbers in it...

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## PUBLISHED

[http://www.dwaf.gov.za/iwqs/gis\\_data/river/rivs500k.html](http://www.dwaf.gov.za/iwqs/gis_data/river/rivs500k.html)