BoreholeLogs

Graphic borehole logs – in-browser app • Hydrogeological Repository

What it does

BoreholeLogs draws a graphic log for any borehole in the National Groundwater Archive that has one – **245 001** of them, holding **466 838** logged rock units, **176 308** water strikes and **1.30 million** static water levels. Find a borehole by number, by quaternary catchment, or by distance from a town or a coordinate, then see the rock, the constructed hole, the water struck in it and the level it stands at, all on one depth scale.

Up to six boreholes can be selected at once. Each gets its own full log sheet, and all of them are drawn side by side in a correlation panel – hung either from each collar, which compares the drilling, or on elevation above sea level, which is what compares the geology.

What is on a log

Column	What it shows
Depth and elevation	Metres below the collar, with metres above sea level beside it wherever the borehole records a collar elevation.
Lithology	Every logged unit as a hatched column, from a 244-code standard covering unconsolidated sediment through sedimentary, igneous, metamorphic and mineral rock. The hatch is assigned by rock family; the fill colour follows the long-standing South African convention for these codes where one exists.
Description	The unit read out the way a geologist writes it – colour, fabric, rock, then texture, hardness, sorting, weathering and fracturing. Fields the logger left empty simply do not appear. Labels are placed clear of each other with a leader back to the unit, so a 1 m unit in a 200 m hole is still legible.
Construction	The hole drawn to scale across its width: each drilled diameter, the casing and screen with their materials, and any annulus fill. A change of diameter and a casing shoe show up as the steps they are.
Water	The rest level as a dashed line with the standing water shaded below it, and every strike as a wedge aimed at the hole with a bar for the yield blown at it, on a scale of its own.

Where the data comes from

Every borehole comes from the Department of Water and Sanitation's **National Groundwater Archive**. The archive stores a log as numeric codes spread over ten tables against forty lookups; those are resolved to words once, when the app's database is built, so nothing is interpreted at the moment you look at it. Only boreholes that actually carry a log are included – a record with nothing but a position is of no use here and is left out.

What	Boreholes	Detail
Lithology log	145 168	466 838 units, each with the rock type and what was recorded about its colour, fabric, texture, hardness, weathering and fracturing.
Water strikes	148 470	176 308 strikes with the depth, the aquifer type and the yield blown at each.
Construction	228 275	Drilled diameters, casing and screen, and annulus fill.

What	Boreholes	Detail
Static water level	68 330	1.30 million readings flagged as a static level. Drawdown and recovery readings belong to a pump test rather than a log and are left out.
Pump test	–	46 244 tests with their rates and durations, and transmissivity, storativity and specific capacity where they were derived.

Three things about this archive that change how a log is read

Most positions are farm centroids, not drill sites. Before GPS, a borehole was recorded at the centroid of the farm it fell on; the archive then nudged records sharing a centroid a few metres apart so they are separable in a GIS. **71 134 boreholes – 29 %** – sit within about 100 m of five or more others, and the largest such group holds 134. Those are one farm, not 134 boreholes on one spot, and none of them can be found in the field with a GPS. The map draws a ring around every such group and the log says so on the borehole's own sheet.

Elevation is usually a 20 m contour reading. 73 % of collar elevations are an exact multiple of 20 m, because for most of the archive's history they were read off a contour map rather than measured. The elevation scale beside every log, and the elevation datum in the correlation panel, are reliable to about that and no better.

There is no total-depth field. The depth quoted is the deepest depth anything was recorded at, and every log says which table supplied it – a depth from a measured diameter run and one from the lithology log are not the same claim. Where the diameters stop short of the hole, the log draws the rest with a broken wall rather than inventing a width. 8 574 boreholes carry a placeholder depth of 9 999.99 m in the archive; those are treated as no depth at all rather than as 10 km holes.

Reading a strike yield

On an air-percussion log the yield written against each strike is normally the *accumulated* blow yield at that point, not the strike's own contribution. Where a borehole's strike yields never decrease with depth – the signature of that convention – the log says so, and tells you to read the deepest figure as the hole's blow yield and the steps between bars as what each strike added. Summing the bars would otherwise overstate the hole several times over.

What comes out

- A full log sheet per borehole: identity, site, drilling and construction, the graphic log, a legend of the rock types it actually uses, and every row the archive holds.
- A correlation panel of up to six boreholes on one scale, on either datum.
- A standalone printable report of the whole selection – the map, the summary, the correlation panel and every log sheet – that opens in a new tab and prints to A4.
- PNG export of the map, drawn from its own geometry rather than screen-grabbed.
- CSV of the lithology, the strikes, the construction, the water levels, the selection summary, and every borehole in the searched area.

Each log sheet carries a **What this record does not say** panel, written from that borehole's own record: where the lithology was never logged, where the casing stops short of the hole, how many water level readings were left out and why, and whether the position or the elevation can be trusted. A field the archive left empty is shown as empty and never as a zero.