Water Data SA – Available Data

Updated 26/04/2021

Water Data SA provides data for a range of surface water, groundwater and meteorological monitoring locations (also known as sites) throughout South Australia, including locations that are currently operational and those that are no longer monitored.

A range of hydrological and meteorological parameters are measured at monitoring locations, with each location configured for a specific purpose.

Available data includes:

- Logger data (continuous) acquired via telemetry or during field visits.
- Field readings collected during a field visit to a location.

The principal monitoring parameters at locations relate to water quantity, water quality and meteorology as described below.

Water quantity

Key parameters are:

- **Water level:** Measured in metres (m). Water level at surface water monitoring locations is measured against either a local datum, an arbitrary value (generally 1.000 or 10.000 metres) representing the level where a stream stops flowing (also known as the Cease to Flow), or referenced to the Australian Height Datum (AHD). Groundwater level is measured as Depth to Water measured from a reference point, usually top of the well casing, to the water surface. Groundwater levels are also available as SWL (Standing Water Level), representing the depth to water below ground level, and RSWL (Reduced Standing Water Level), representing the water surface elevation referenced to AHD.
- **Discharge:** Flow rate measured in Megalitres per day (Ml/d).
- **Storage volume:** Storage volume of a lake or reservoir may be expressed in two ways: Absolute volume in Gigalitres (Gl); or Proportion (%) of its Full Supply Level (FSL).

Water quality

Key parameters are:

- **Salinity:** Generally estimated from a measurement of electrical conductivity (EC), which is expressed in microsiemens per centimetre (µS/cm), also known as *EC Units*. *Uncorrected* EC refers to the original measurement of EC, while *Corrected EC* refers to a temperature-compensated EC measurement (corrected to a sample temperature of 25°C), also known as *specific EC*.
- In some cases, salinity is provided as Total Dissolved Solids (TDS) in mg/L, which is derived from corrected EC in µS/cm using the formula: $TDS = (0.548 * EC) + (2.2 * 10^{-6} * EC^2) + (2.02 * 10^{-12} * EC^3)$.
- **pH:** Acidity or alkalinity measured in pH units.
- **Dissolved oxygen (DO):** Measured in milligrams per litre (mg/L) but can also be expressed as a percentage. To convert a reading in mg/L to a percentage, divide by 10,000.

Salinity is commonly measured:

- Near the surface of a water body, which gives a general indication of the salinity of a water body.
- Near the bed of a water body, which can indicate saline groundwater entering into a water body.

- In a groundwater bore when the measuring point is considered a reasonable representation of the salinity of the adjacent aquifer.

Typical Electrical Conductivity ranges of various water bodies are shown below:

Water Type	EC (µS/cm)
Deionised water	0.5 – 3
Pure rainwater	< 15
Freshwater rivers	0 – 800
Marginal river water	800 – 1600
Brackish water	1600 – 4800
Saline water	> 4800
Seawater	50,000
Industrial waters	100 – 10,000

Meteorology

Key parameters are:

- **Rainfall** measured in millimetres (mm).
- **Relative humidity** as a percentage.
- **Wind speed** measured in kilometres per hour (km/h), as an average over a time period.
- **Wind direction** measured in degrees, as an average over a time period.

Data accuracy

A variety of factors influence the quality of data being collected. The physical location of a monitoring site is often a compromise between accessibility, engineering constraints, environmental sensitivity and technical requirements.

Other influences include the method used to measure and record the data, damage to recording equipment during extreme weather and equipment calibration changes over time.

Whilst all data undergoes a thorough validation process, this is not the case for telemetered data, which is published in near real-time. More information about data validation is under Data sets (time series) below.

It is important to be aware that these factors can affect the usability of the data.

See also, the Data grades section below.

Location type and identifier

Location types (groundwater, surface water or meteorology) are assigned according to the primary objective for monitoring at the location. Multiple parameters may be collected at a single location.

Note that some surface water locations also have meteorological data sets, e.g. rainfall.

Each location has a unique identifier in one of two formats:

- A4261067 – seven digits prefixed with an alpha character signifies a surface water or meteorology location.
- 6727-3734 – this is a hyphenated number called the 'unit number', signifying a groundwater location in the 1:100,000 topographic map series sheet 6727.

Data sets (time series)

Each data set has an identifier (data set id) consisting of the parameter, type of data set and the location identifier, e.g. Discharge.Best Available@A4260662.

Types of data sets available are:

- **Telem:** Logger data received via telemetry (telemetered data) and is unverified.
- **Master:** Logger data collected during a field visit, regardless of whether the data has been telemetered, and is verified up to the last field visit. Example: Water Level.Master@A4261075
- **Best Available:** Generally, a composite of Master data and Telem (if available), with Telem data only being used where there is no other data available. Example: Discharge.Best Available@A4261075
- **Field Visit:** Manual measurements (field readings) collected during a field visit. These are used to validate and, if necessary, correct the Master data set. Example: Discharge.Field Visits@A4261075
- **EC Corr:** EC calculated at 25°C. Example: EC Corr.Best Available@A4261075

Where a location has multiple data sets for the same parameter, additional information is added separated by two dashes (--), to the data set id.

Examples:

Discharge.Master--ADCP-Pylon@A4260644

Discharge.Master--Historical Derived@A4260644

Water Level.Master--Daily Read@A4260644

Data grades

Indicates the data quality that informs the level of confidence in the data. Typically, unverified telemetered data is applied a graded of **TBD** by default, which would then be reviewed and updated when verified

A quality grade is applied to data, to inform the level of confidence in the data. Unverified logger data is applied a grade of 1 Unverified Telem by default. This is then reviewed and, if necessary, updated during the data validation process. A short list of grades follows.

Grade code	Name	Description
30	Good	Data is validated and may have been adjusted to calibration readings; but it has not been modified.
20	Fair	Data is a fair representation of actual events.
15	Poor	Data is an unreliable, poor representation of actual events.
10	Water Level Below Recordable Range	
5	Quality Unknown	Data is not validated/verified or is of unknown data collection standards.
1	Unverified Telem	Data that has not been verified/validated.
0	Undefined	
-1	Unspecified	
-2	Unusable	
-3	Gap	
-5	Outside Recordable Range	Data is known to be incorrect as the value is outside of the specified recordable range.

Grade code	Name	Description
-6	Outside Rating Range	
-10	Not Operating	Instrument not operating or parameter not being recorded.
-15	Missing	Data recording was attempted; but the data is missing, void or known to be incorrect.

When viewing a data set as a chart, coloured bars are shown at the bottom of the chart representing the data Grade and the Approval Level respectively. Legends for these are shown in the right panel.