

PIEZOMETER INSTALLATION CARDINIA DAM, VICTORIA

BACKGROUND

At 287 giga litres Cardinia Reservoir is Melbourne Water's second largest reservoir. Constructed in the early 1970's it has no direct catchment, instead water is fed via Silvan Reservoir and more recently the Victorian Desalination Plant.

With recent improvements in dam safety and design standards Cardinia Dam has slipped below best practice guidelines in dam safety.

The upgrade to Cardinia dam will bring the fifty-year-old structure back into compliance with the guidelines issued by the Australian National Committee on Large Dams. (ANCOLD)

Melbourne Water has a duty of care to comply under the Water Act 1989 for all dams within its portfolio.

The upgrade works are due to start in 2024/25 and expected completion is mid 2025

As part of the initial geotechnical investigation HMA Geotechnical was contracted by consulting engineers AECOM to install instruments at two locations on the primary dam.

OBJECTIVE

- Install Vibrating Wire piezometers at two locations.
- Install two posts enclosures and RST Vibrating Wire loggers.



Figure 1 – Cardinia Main Dam

SOLUTION AND OUTCOME

Boreholes at the two locations on the upper berm were drilled and installation of the instruments carried out under HMA Geotechnical's supervision in June 2022. The instruments were installed at depths of 29.5m and 13m in mostly dry boreholes.

The installation of the RST Vibrating Wire Loggers occurred shortly after the instruments had been grouted.

The logger installation and programming were carried out by an HMA Technician. A 6hr scan frequency was programmed into both loggers.



Figure 2 – RST Vibrating Wire data logger, Cardinia Dam

DATA PRESENTATION

Data downloaded manually by the client as a csv file may be presented in any number of ways.

At the end of this case study is a typical graph showing data from one of the RST Vibrating Wire loggers.

Instruments installed in a dry borehole can show a negative pressure(suction) as the grout cures and dries out, as seen in this plot.

HMA GEOTECHNICAL STATEMENT

HMA Geotechnical have supplied customised monitoring systems and instrumentation to water authorities in Australia and overseas for nearly 40 years.

As an Australian employee-owned company, we take pride in our work.

Given our experience, workshop facilities and product range, we can supply the following options:

- Custom enclosures and frames to suit any application or condition made in Australia where possible to decrease lead-times.
- Radio Node or standalone dataloggers.
- Integration with multiple software packages/protocols to suit any on-site requirement. Output can be via a range of industrial protocols (Modbus, DNP3, SFTP, others).
- Flexibility to supply and install globally.

HMA Geotechnical is ready to assist the client to meet their Geotechnical goals and solve problems whenever they arise.

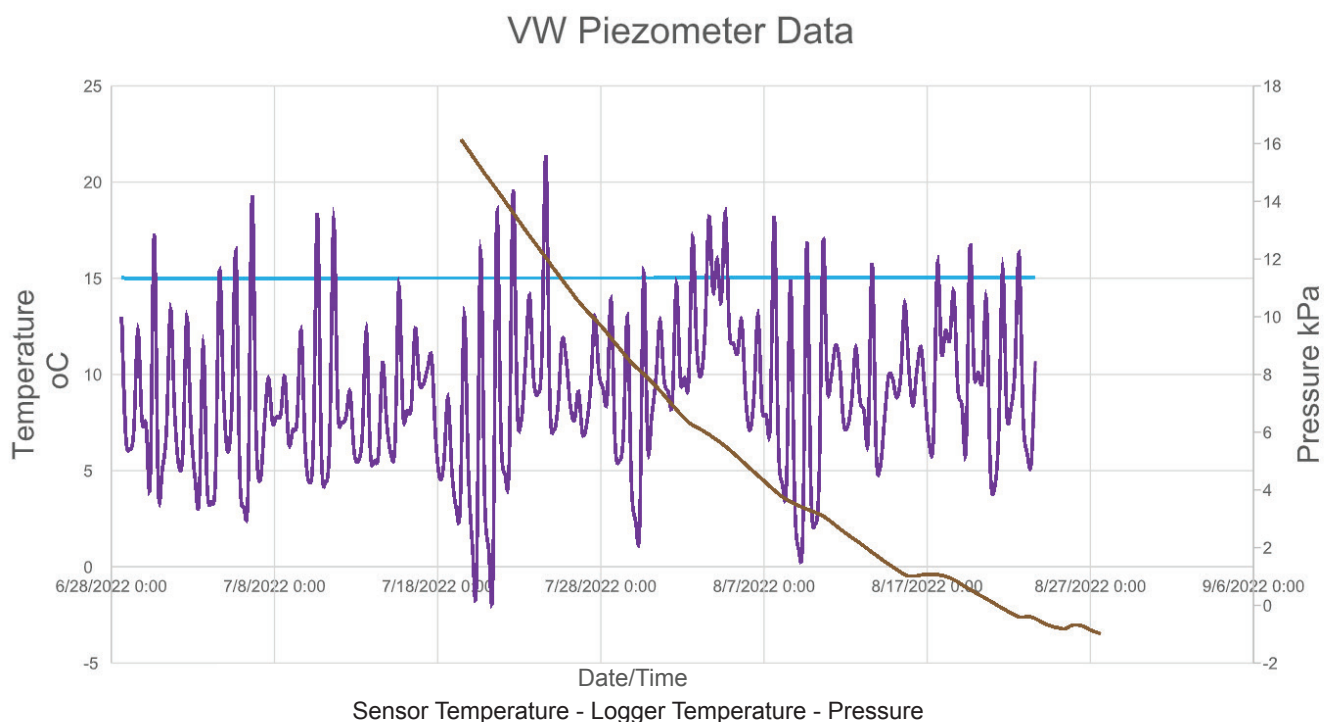


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