



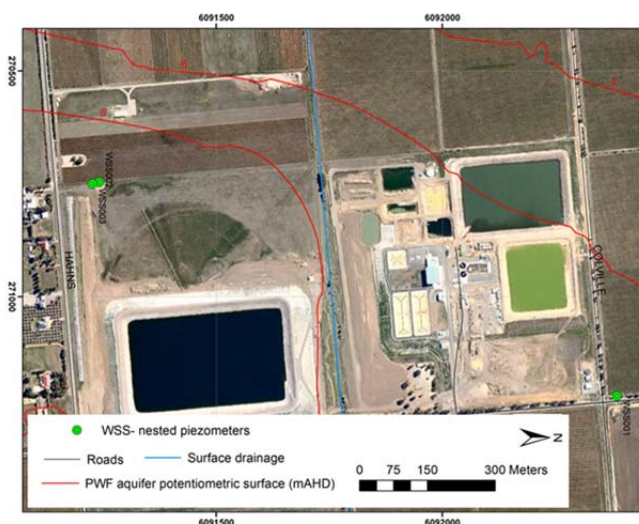
An Australian Government Initiative

Groundwater Education Investment Fund Project

Borehole Infrastructure Report

Borehole Type	Multi-Level Piezometer	GPS Easting	(MGA-94 Zone 54)	270750
Unique Well ID	WSS-003	GPS Northing		6091228
Completion Date	12/12/2010	Location		Willunga Super Science Site
Drilled By	Geodrill	Installed By		Geodrill
Monument Type	PVC12	Depth Drilled		75 mBGS
Monument Diameter/Width	254 mm	Drilled Diameter/Method		200 mm (min), Rotary Mud
Development Details	Air lifted 2.0 hours			
Project Comments: WSS-003 is a multi-level piezometer monitoring bore, located at the Willunga Basin MAR site.				

Bore ID	Casing Size (mm)/ Type	TOC (mAHD)	Casing Depth (mBGL)		Screen Size (mm)/ Aperture (mm)/ Type	Cement (mBGL)		Screen Depth (mBGL)		SWL after develop (mTOC)
WSS-003	254/PVC 12	19.515	-0.545	36	NA	0.0	36	NA	NA	NA
WSS-003-A	50/PVC	19.512	-0.542	37.9	50/1/PVC	0.0	37.4	37.9	38.9	16.95
WSS-003-B	50/PVC	19.518	-0.548	43.1	50/1/PVC	39.4	42.6	43.1	44.1	16.93
WSS-003-C	50/PVC	19.514	-0.544	49.1	50/1/PVC	44.6	48.6	49.1	50.1	16.98
WSS-003-D	50/PVC	19.513	-0.543	55.1	50/1/PVC	50.6	54.6	55.1	56.1	16.96
WSS-003-E	50/PVC	19.505	-0.535	59.1	50/1/PVC	56.6	58.6	59.1	60.1	16.95
WSS-003-F	50/PVC	19.509	-0.539	62.5	50/1/PVC	60.6	62.0	62.5	63.5	16.97



Map of Willunga Super Science Multi-level Piezometer Locations



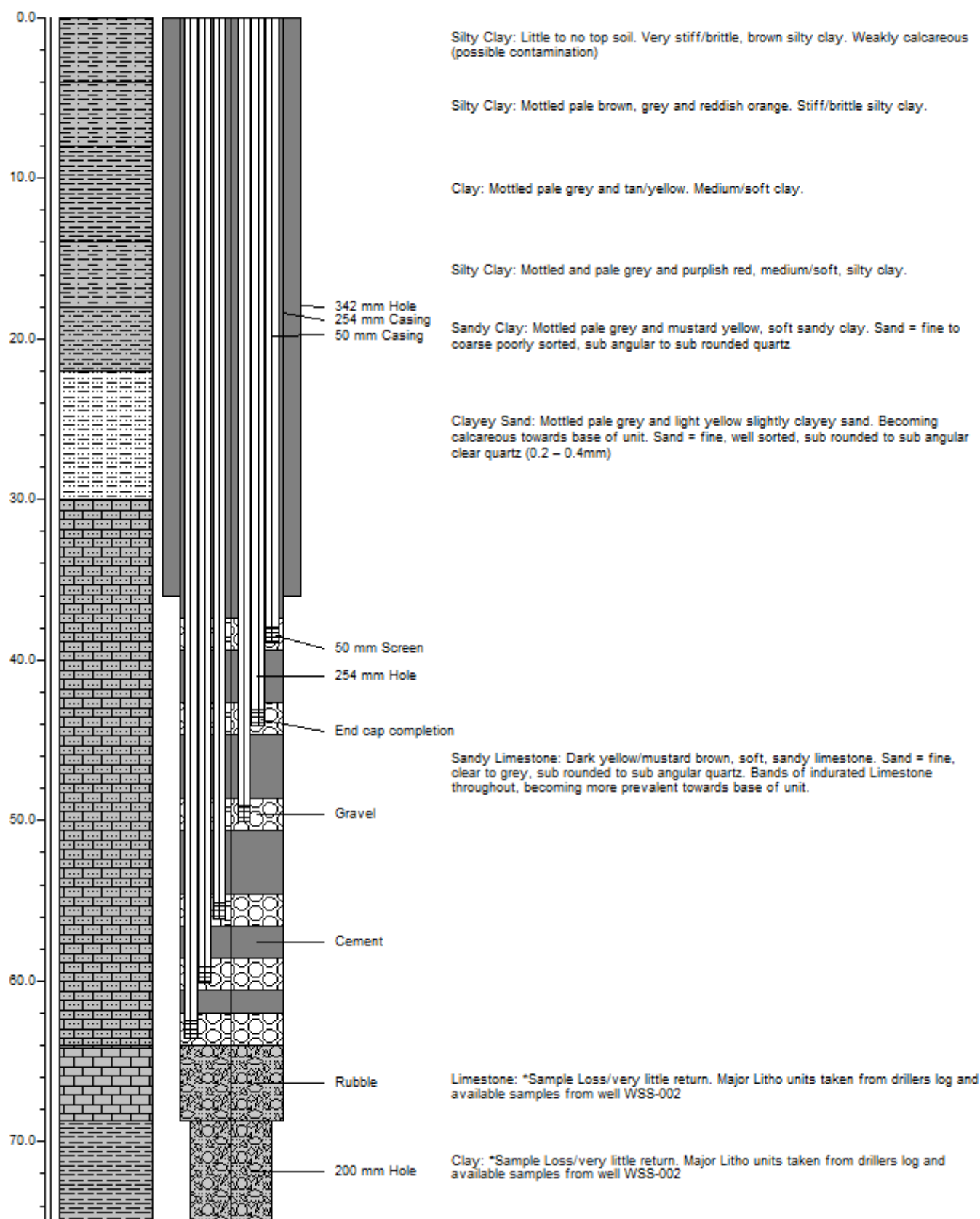
WSS-003 Installation

Note* Appendix includes Lithology and Well Completion Log, Geophysical Logs, Hydraulic Test and Chemical Analysis.

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Lithology and Well Completion Log

WSS-003

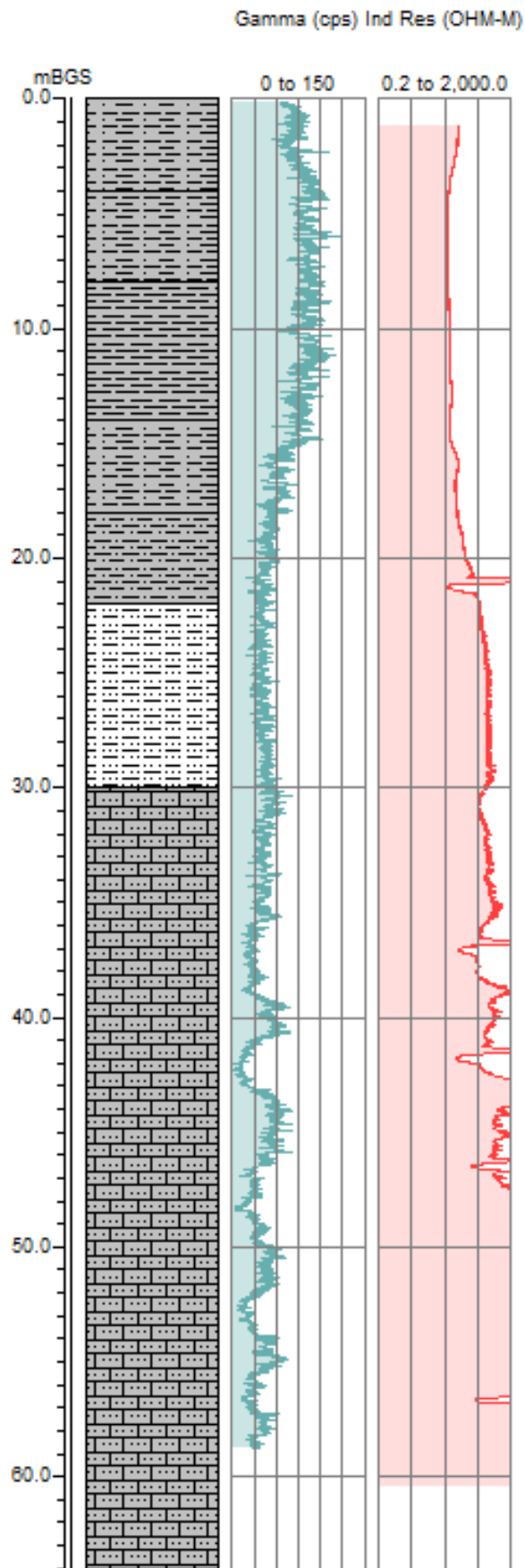


*Gravel pack interval from 0.5 m above and to 0.5 m below each screen. The well collapsed back to 42 m during development and was cleared to 64 m during redevelopment.

Geophysical Logs

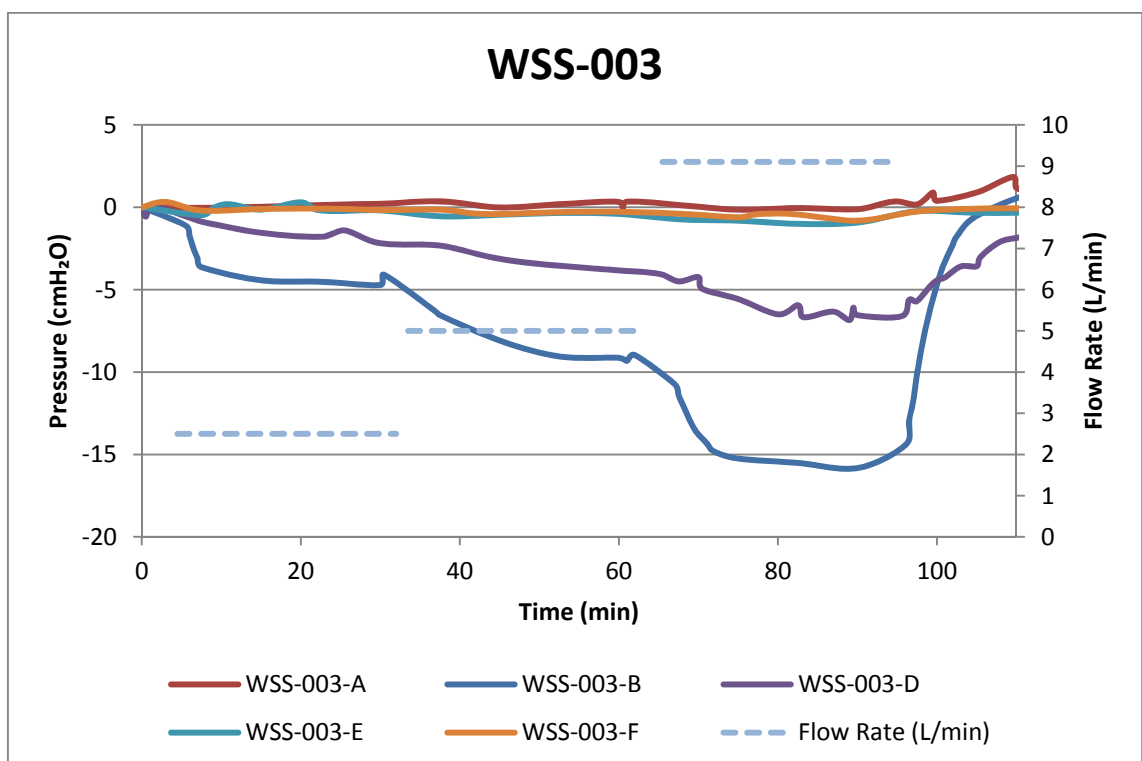
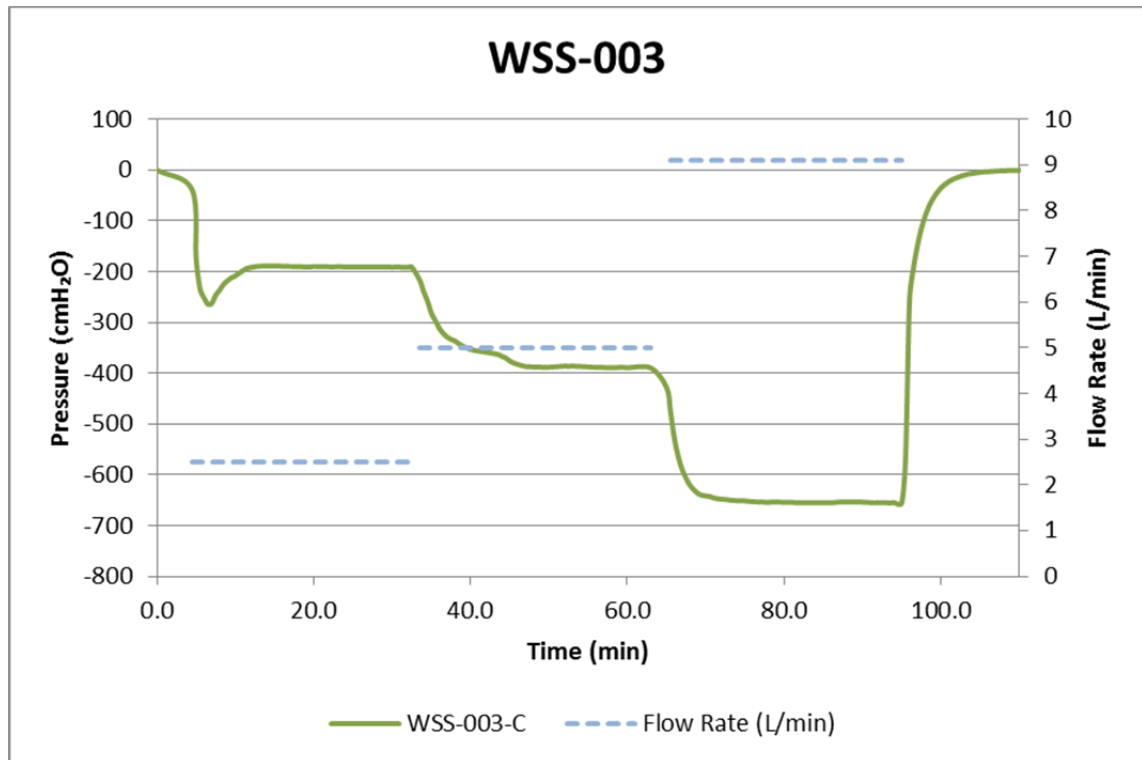
The portable Mount Sopris logging system was used to collect geophysical data from bore WSS-003-F, the deepest peizometer. The 2PGS probe was used to collect natural gamma measurements, and the 2PIA probe was used to measure conductivity/induced resistivity.

WSS-003-F



Pumping Test

A step draw-down test was conducted in piezometer WSS-003-C, with all six intervals instrumented with water level loggers. The results of the test are presented below. The report author may be contacted for the full data set.



Chemical Analysis

Data from the chemical analysis of water from WSS-003 piezometers is shown below.

Well ID	Date Sampled	SWL	Field Parameters				Laboratory Analyses @ CSIRO ASU								
			pH	EC	Temp	Alkalinity	E.C.	Total Alkalinity	F ⁻	Cl ⁻	Br ⁻	NO ₃ ⁻	SO ₄ ⁼	Ca	K
		mTOC		μS/cm	°C	meq/L	μS/cm	meq/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
WSS003-A	25/05/2012	17.1	7.7	2716	19.67		2643	7.8	0.4	734.4	2.209	0.487	98.494	53.9	5.87
WSS003-B	25/05/2012	17.1	7.29	2518	19.82		2342	6.4	0.29783	701.9663	2.1	0.561046	96.71723	83.2	10.7
WSS003-C	25/02/2012	17.1	7.26	2278	20.03		2335	5.1	0.365564	530.8549	1.6	229.67	60.79832	50	4.46
WSS003-D	25/05/2012	17.1	7.47	1472	19.43		1612	8.8	0.790781	248.2423	0.8	<0.05	63.32095	28.2	6.51
WSS003-E	23/05/2012	17.1	7.4	1558	20.48		1606	7.7	0.738894	262.2801	0.9	<0.05	92.3343	35	5.32
WSS003-F	23/05/2012	17.1	7.53	1499	20.86		1504	6.3	0.688	291.5	1.000	<0.05	96.823	49	4.8
	Well ID	Mg	Na	S	Al	As	B	Cd	Co	Cr					
	WSS-003-A	28.4	556	26.9	<0.05	0.216	0.574	<0.05	<0.05	<0.05					
	WSS-003-B	45.4	424	26.1	<0.05	0.0574	0.456	<0.05	<0.05	<0.05					
	WSS-003-C	25.5	470.00	17.3	<0.05	0.148	0.452	<0.05	<0.05	<0.05					
	WSS-003-D	13.9	323.00	17.8	<0.05	0.143	0.286	<0.05	<0.05	<0.05					
	WSS-003-E	17	310	25.6	<0.05	0.0981	0.235	<0.05	<0.05	<0.05					
	WSS-003-F	22.6	260	27	<0.05	0.0547	0.272	<0.05	<0.05	<0.05					
	Well ID	Cu	Fe	Mn	Mo	Ni	P	Pb	Sb	Se					
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					
	WSS-003-A	<0.05	0.368	0.266	<0.05	<0.05	25.7	<0.05	<0.1	<0.05					
	WSS-003-B	<0.05	0.631	0.136	<0.05	<0.05	22.2	<0.05	<0.1	<0.05					
	WSS-003-C	<0.05	<0.1	0.0673	<0.05	<0.05	35.3	<0.05	<0.1	<0.05					
	WSS-003-D	<0.05	1.79	0.143	<0.05	<0.05	27.7	<0.05	<0.1	<0.05					
	WSS-003-E	<0.05	2.76	<0.05	<0.05	<0.05	32.7	<0.05	<0.1	<0.05					
	WSS-003-F	<0.05	1.78	<0.05	<0.05	<0.05	9.96	<0.05	<0.1	<0.05					
	Well ID	Si	Sr	Zn											
		mg/L	mg/L	mg/L											
	WSS-003-A	16.5	0.367	<0.05											
	WSS-003-B	17.8	0.549	<0.05											
WSS-003-C	21.4	0.248	<0.05												
WSS-003-D	14.6	0.188	<0.05												
WSS-003-E	14.3	0.219	<0.05												
WSS-003-F	10.4	0.346	<0.05												