



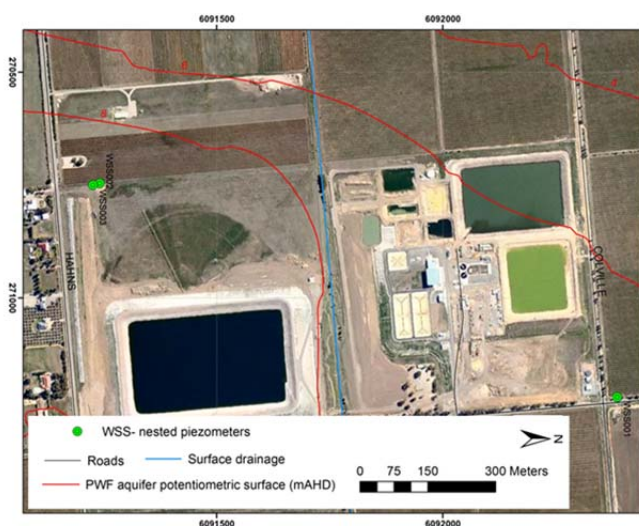
An Australian Government Initiative

Groundwater Education Investment Fund Project

Borehole Infrastructure Report

Borehole Type	Multi-Level Piezometer	GPS Easting	(MGA-94 Zone 54)	270749
Unique Well ID	WSS-002	GPS Northing		6091242
Completion Date	11/11/2010	Location		Willunga Super Science Site
Drilled By	Geodrill	Installed By		Geodrill
Monument Type	PVC12	Depth Drilled		76 mBGS
Monument Diameter/Width	254 mm	Drilled Diameter/Method		254 mm (min), Rotary Mud
Development Details	Air lifted 2.0 hours			
Project Comments: WSS-002 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-002	254/PVC 12	19.546	-0.619	36	NA	0.0	36	NA	NA	NA
WSS-002-A	50/PVC	19.548	-0.621	37.5	50/1/PVC	0.0	37.0	37.5	38.5	16.96
WSS-002-B	50/PVC	19.553	-0.626	42.4	50/1/PVC	39.0	41.9	42.4	43.4	16.97
WSS-002-C	50/PVC	19.544	-0.617	49	50/1/PVC	43.9	48.5	49.0	50.0	16.97
WSS-002-D	50/PVC	19.563	-0.636	54.7	50/1/PVC	50.5	54.2	54.7	55.7	16.96
WSS-002-E	50/PVC	19.552	-0.625	58.6	50/1/PVC	56.2	58.1	58.6	59.6	16.98
WSS-002-F	50/PVC	19.558	-0.631	63.3	50/1/PVC	60.1	62.8	63.3	64.3	16.96



Map of Willunga Super Science Multi-level Piezometer Locations



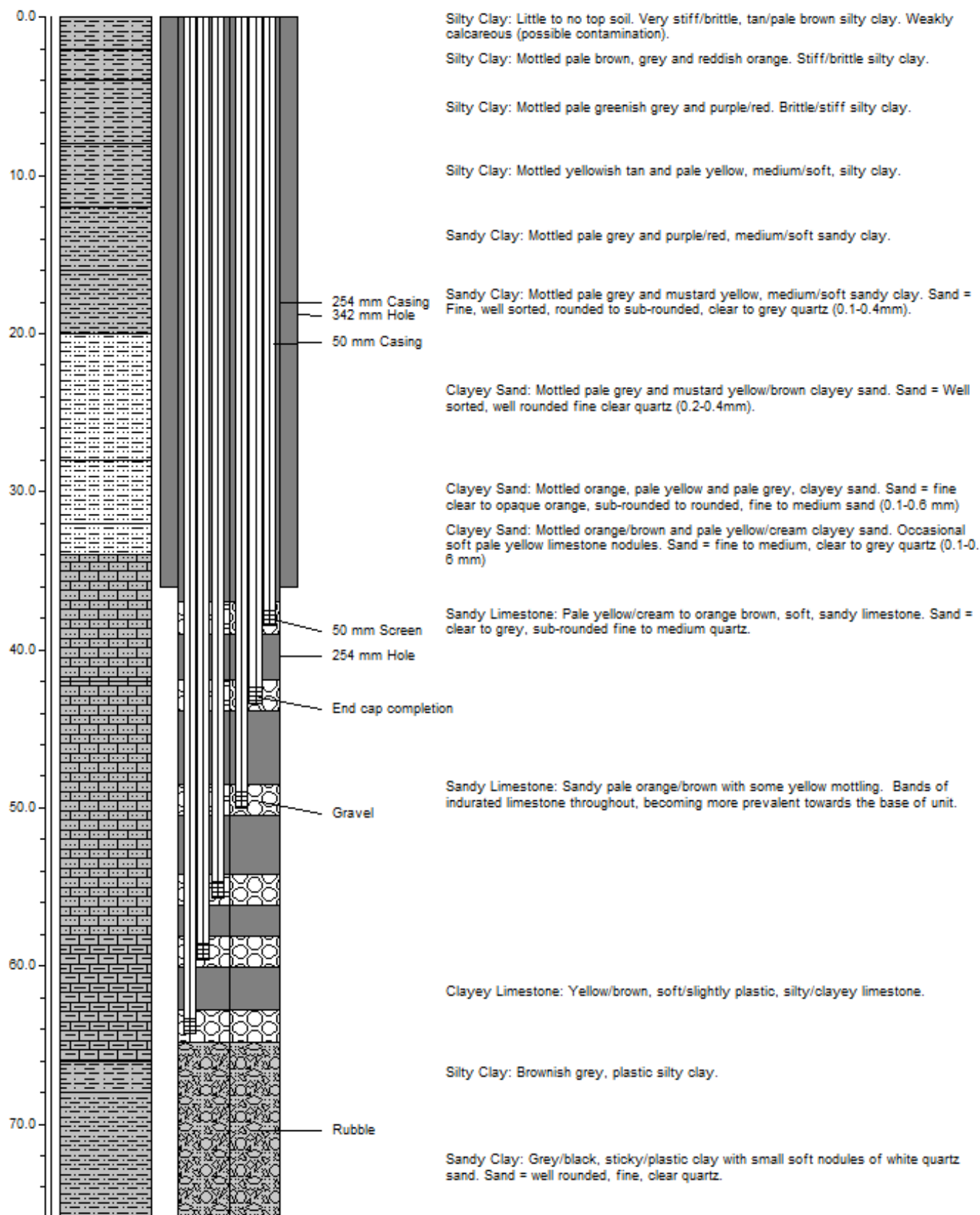
WSS-002 Installation

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-002

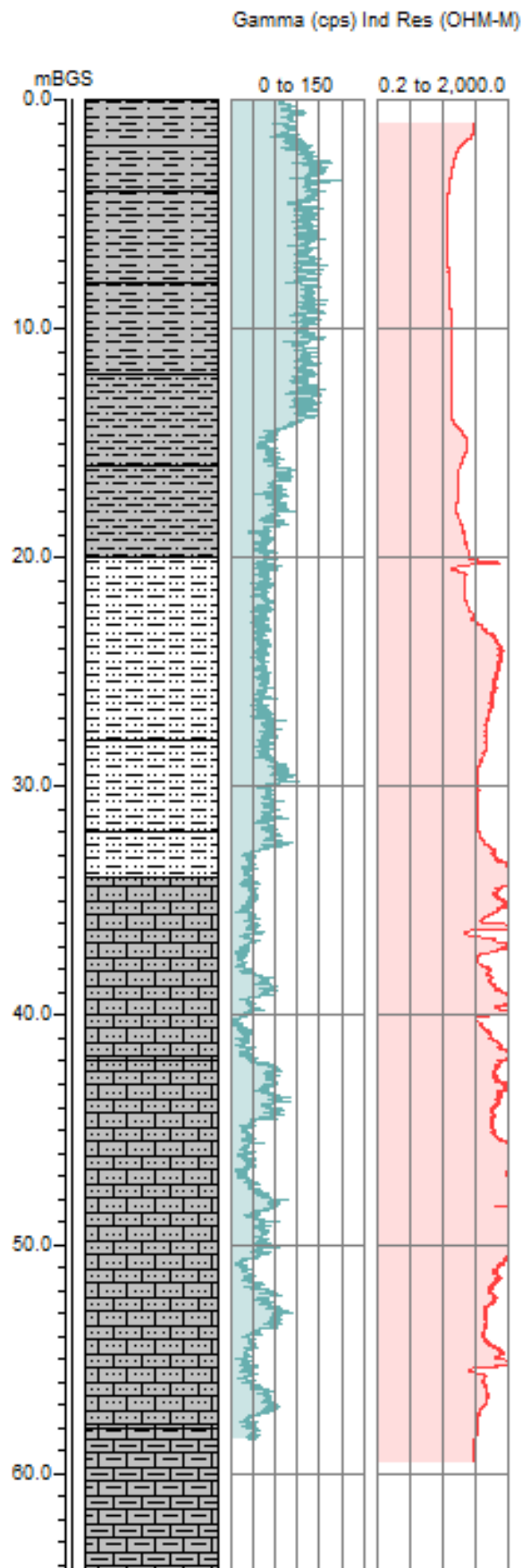


*Gravel pack interval from 0.5 m above and to 0.5 m below each screen. The well collapsed back to 53 m during development and was cleared to 65 m during redevelopment.

Geophysical Logs

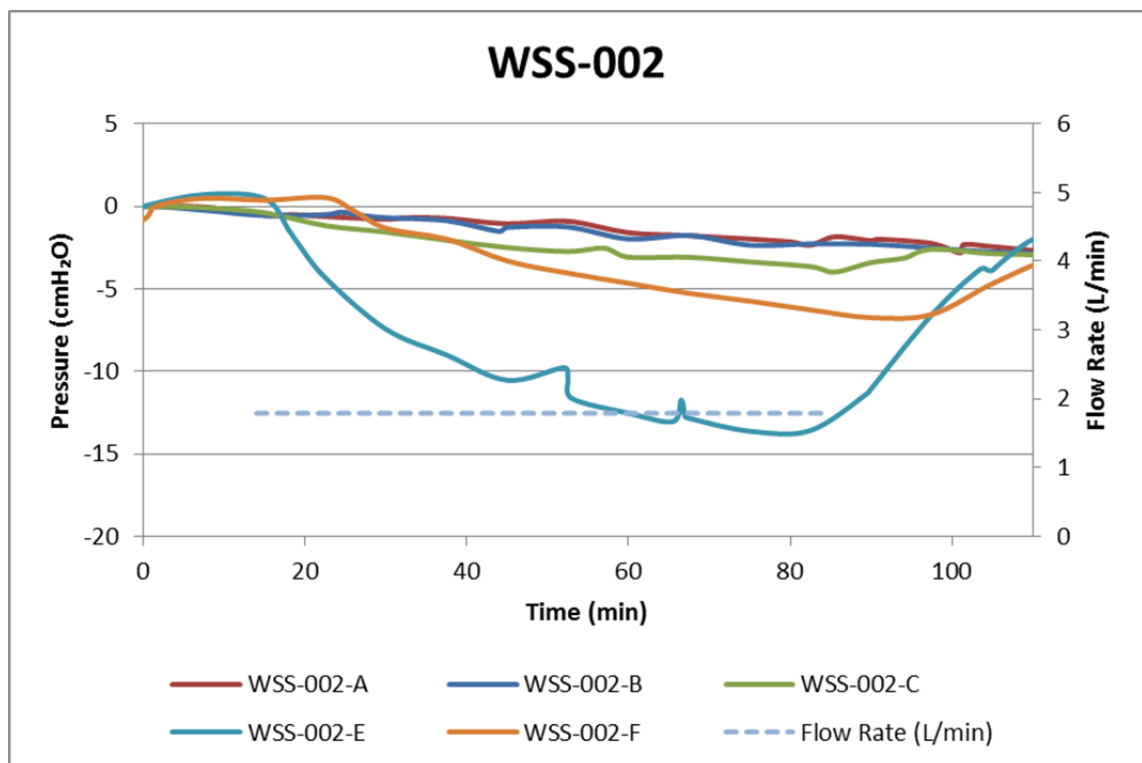
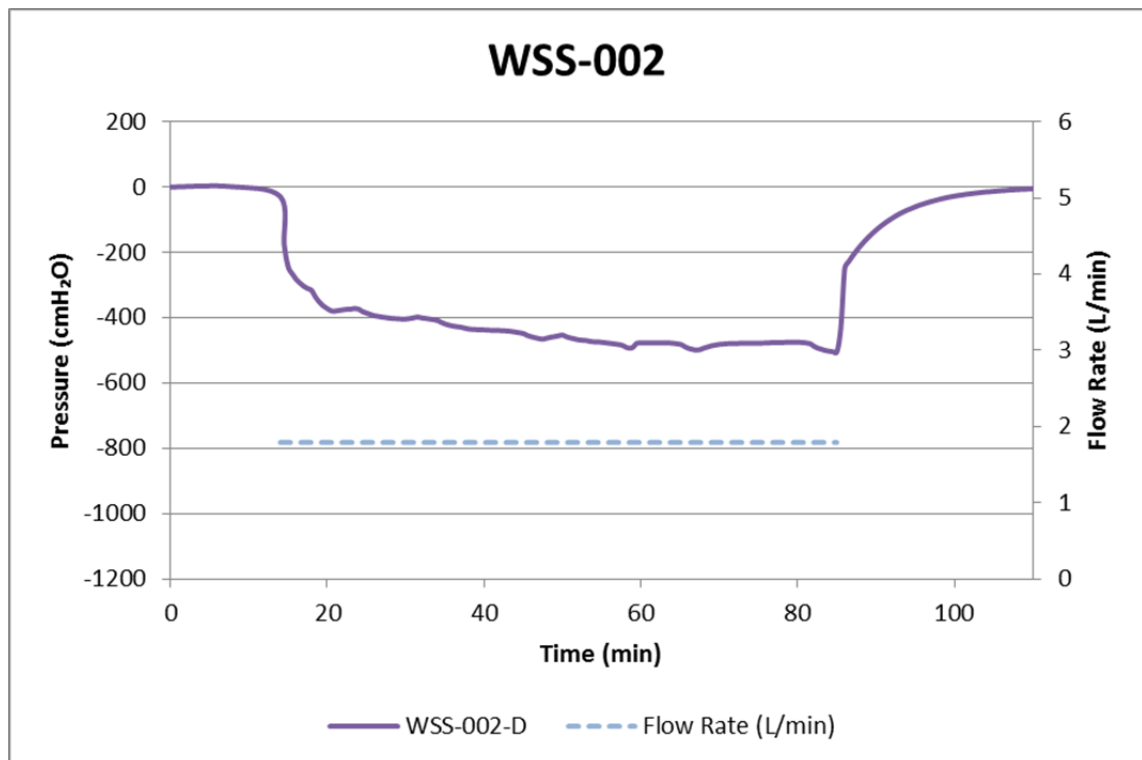
The portable Mount Sopris logging system was used to collect geophysical data from bore WSS-002-F, the deepest peizometer. The 2PGS probe was used to collect natural gamma measurements, and the 2PIA probe was used to measure conductivity/induced resistivity.

WSS-002-F



Pumping Test

A constant flow rate test was conducted in piezometer WSS-002-D, 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-002 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	mg/L
WSS-002-A	5/08/2011	16.91	7.58	2880	19.8	4.4		3.8	<0.2	870	0.8	1.000	83	80.2	10.5	
WSS-002-B	5/08/2011	16.95	7.46	2449	20	4.3		3.4	0.24	710	0.7	0.38	75	88.9	7.82	
WSS-002-C	26/10/2011	17.22	7.35	1800	20.5	5.9		1.5	0.078	470	1.1	36	100	19.3	3.02	
WSS-002-D	11/01/2012	17.51	8.79	1316	20.3	4.7	1391	4.4	0.802	266	0.8	0.232	80	30.14	7.056	
WSS-002-E	3/08/2011	17.54	7.69	1476	20.7	6.1		5.2	0.36	290	<0.2	<0.2	82	43	6.89	
WSS-002-F	3/08/2011	16.98	7.64	1554	21	5.1		4.4	0.390	330	<0.2	<0.2	100	44.2	5.98	
							Well ID	Mg mg/L	Na mg/L	S mg/L	Al mg/L	As mg/L	B mg/L	Cd mg/L	Co mg/L	Cr mg/L
							WSS-002-A	48	433	22.9	< 0.05	< 0.05	0.526	< 0.05	< 0.05	< 0.05
							WSS-002-B	39.6	338	20.9	< 0.05	< 0.05	0.439	< 0.05	< 0.05	< 0.05
							WSS-002-C	24.2	280	31.3	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05
							WSS-002-D	20.4	212	24.4	0.088	<0.05	0.311	<0.05	<0.05	<0.05
							WSS-002-E	33.4	225	23.6	<0.1	<0.1	0.318	<0.1	<0.1	<0.1
							WSS-002-F	27.7	237	28.5	< 0.05	< 0.05	0.316	< 0.05	< 0.05	< 0.05
							Well ID	Cu mg/L	Fe mg/L	Mn mg/L	Mo mg/L	Ni mg/L	P mg/L	Pb mg/L	Sb mg/L	Se mg/L
							WSS-002-A	< 0.05	<0.1	< 0.05	< 0.05	< 0.05	<0.1	< 0.05	<0.1	< 0.05
							WSS-002-B	< 0.05	<0.1	< 0.05	< 0.05	< 0.05	<0.1	< 0.05	<0.1	< 0.05
							WSS-002-C	<0.05	<0.1	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.1
							WSS-002-D	<0.05	<0.1	<0.05	<0.05	<0.05	<0.1	<0.05	<0.1	<0.05
							WSS-002-E	<0.1	<0.2	<0.1	<0.1	<0.1	0.157	<0.1	<0.2	<0.1
							WSS-002-F	< 0.05	<0.1	< 0.05	< 0.05	< 0.05	0.178	< 0.05	<0.1	< 0.05
							Well ID	Si mg/L	Sr mg/L	Zn mg/L	*after extensive purging, pH in 002-D was still high					
							WSS-002-A	10.4	0.968	< 0.05						
							WSS-002-B	9.94	0.838	< 0.05						
							WSS-002-C	19.4	0.289	<0.05						
							WSS-002-D	11.3	0.313	<0.05						
							WSS-002-E	11.5	0.56	<0.1						
							WSS-002-F	10.6	0.57	< 0.05						

*after extensive purging, pH in 002-D was still high