
Appendix A

Monitoring bore licence



Natural Resources Access Regulator

Contact: Alister Middleton
Phone: 02 6841 7423
Email: alister.middleton@nrar.nsw.gov.au

Our ref: 40BL192733
File No:
Your Ref:

Charlie Litchfield
Snowy Hydro Limited
PO Box 332
COOMA NSW 2630

11 December 2018

By email to: charlie.litchfield@snowyhydro.com.au
cc: kbrodie@emmconsulting.com.au

Dear Mr Litchfield

Re: Part V Water Act 1912 licensing for monitoring bores – MB08A, MB08B, MB10A, MB11A, MB12A & MB12B

Please find attached a copy of your monitoring bore licence which authorises the construction of monitoring bores at the locations specified in your application. Also attached is a Form A template.

Please make sure the completed Form A and plan for this bore is provided to diana.smith@water.nsw.gov.au. Failure to do so could restrict future actions relating to this licence. If you wish to make a photocopy of the completed Form A, you should do so before forwarding the form to WaterNSW.

Your attention is drawn to the nature and description of the work, terms, limitations and conditions under which the licence is issued.

Please note that the bore must be constructed at the location specified on the application being at least 40m from the high bank of any watercourse.

Condition (2) of the licence applies whether the bore is successful or not. The attached Form A has been provided for the recording the details of the proposed bore. The driller is required to record the details of the bore, and provide you with the completed form. The driller is also required to mark the location of the bores site on the attached plan. The sketch is required even though you may have already indicated the site to the Department.

If during construction poor quality water is encountered above the main supply it is essential that the bore be completed in accordance with condition (4). This will prevent contamination and pollution of the supply and ensure maximum useful life of the bore by protecting the casing and equipment against corrosion.

Please show the licence to the driller so that they are aware of any conditions affecting the construction of the bore. The driller must have a current driller's licence issued by the Department.

Yours sincerely

 for

Rachel Daly
A/Senior Water Regulation Officer – Water Regulatory Operations - West
Natural Resource Access Regulator

NSW Office of Water

Murrumbidgee Region
Yanco Agricultural Institute Pri
2198 Irrigation Way East
Yanco NSW 2703
Phone: (02) 69512611

BORE LICENSE CERTIFICATE UNDER SECTION 115 OF THE WATER ACT, 1912

40BL192733



Snowy Hydro Limited
Po Box 332
Cooma NSW 2630

LICENSE NUMBER	
40BL192733	
DATE LICENSE VALID FROM	
27-Nov-2018	
DATE LICENSE VALID TO	
PERPETUITY	
FEE	
\$151.00	PAID

ABN 72189919072 GST NIL

LOCATION OF WORKS

<u>Portion(s) or Lot/Section/DP</u>	<u>PARISH</u>	<u>COUNTY</u>
R	Yarrangobilly	Buccleuch
R	Tantangara	Wallace
R	Gooandra	Wallace

<u>TYPE OF WORKS</u>	<u>PURPOSE(S) FOR WHICH WATER MAY BE USED</u>
Bore	Monitoring Bore

CONDITIONS APPLYING TO THIS LICENSE ARE

As shown on the attached Condition Statement

ORIGINAL



Natural Resources Access Regulator

Contact: Alister Middleton
Phone: 02 6841 7423
Email: alister.middleton@nrar.nsw.gov.au

Our ref: 40BL192723
File No:
Your Ref:

Charlie Litchfield
Snowy Hydro Limited
PO Box 332
COOMA NSW 2630

21 November 2018

By email to: charlie.litchfield@snowyhydro.com.au
cc: kbrodie@emmconsulting.com.au

Dear Mr Litchfield

Re: Part V Water Act 1912 licensing for test bores – PB06, PB09 & PB10

Please find attached a copy of your test bore licence which authorises the construction of test bores at locations as specified in your application. Also attached is a Form A template.

Please make sure the completed Form As and plans for these bores are provided to diana.smith@water.nsw.gov.au. Failure to do so could restrict future actions relating to this licence. If you wish to make a photocopy of the completed Form A, you should do so before forwarding the form to the Department.

Your attention is drawn to the nature and description of the work, terms, limitations and conditions under which the licence is issued.

Please note that the bores must be constructed at the locations specified on the application being at least 40m from the high bank of any watercourse.

Should you wish to convert any or all of the test bores for basic rights or production purposes, you will need to make applications & gain the appropriate approvals under the *Water Management Act, 2000*.

If any of the test bores are to be converted to a production bore, the relevant distance restrictions of the *Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources 2011* (Attachment A) will apply. A water supply work approval will be required to be submitted and the bore will be assessed against the relevant conditions.

Condition (2) of the licence applies whether the bore is successful or not. The attached Form A has been provided for the recording the details of the proposed bore. The driller is required to record the details of the bore, and provide you with the completed form. The driller is also required to mark the location of the bores site on the attached plan. The sketch is required even though you may have already indicated the site to the Department.

If during construction poor quality water is encountered above the main supply it is essential that the bore be completed in accordance with condition (4). This will prevent contamination and pollution of the supply and ensure maximum useful life of the bore by protecting the casing and equipment against corrosion.

Please show the licence to the driller so that they are aware of any conditions affecting the construction of the bore. The driller must have a current driller's licence issued by the Department.

Yours sincerely

for 

Chris Binks

A/Senior Water Regulation Officer – Water Regulatory Operations - West
Natural Resource Access Regulator

Attachment A. 'Distance conditions of the *Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources 2011*'.

Please note there may be other conditions and restrictions which are relevant if the test bore is to be converted to a production bore via a Water Supply Work Approval. The information below is accurate as at 21/11/2018. Water Sharing Plans are updated periodically and are subject to change.

Part 9 Rules for water supply work approvals

Notes.

- 1 This Part is made in accordance with sections 5, 21 and 95 of the Act.
- 2 Part 12 allows for amendments to be made to Part 9.

35 General

The rules in this Part apply to water supply work approvals for a water supply work that may be used to take water from these groundwater sources.

36 Rules for amending water supply work approvals for replacement groundwater works

- (1) The Minister may amend a water supply work approval to alter the water supply work to which the approval relates if the Minister is satisfied that the amendment is to authorise a replacement groundwater work.
- (2) For the purpose of this Plan, **replacement groundwater work** means a water supply work that replaces an existing water supply work constructed and used for the purpose of taking water from an aquifer where:
 - (a) the existing water supply work is authorised by a water supply work approval under the Act,
 - (b) the replacement groundwater work is to be constructed to extract water from the same groundwater source as the existing water supply work,
 - (c) the replacement groundwater work is to be constructed to extract water from:
 - (i) the same depth as the existing water supply work, or
 - (ii) a different depth if the Minister is satisfied that doing so will result in no greater impact on a groundwater source or its dependent ecosystems,
 - (d) the replacement groundwater work is to be located:
 - (i) within 20 metres of the existing water supply work, or
 - (ii) more than 20 metres from the existing water supply work if the Minister is satisfied that doing so will result in no greater impact on a groundwater source or its dependent ecosystems,
 - (e) if the existing water supply work is located within 40 metres of the high bank of a river, the replacement groundwater work is to be located:
 - (i) within 20 metres of the existing water supply work but no closer to the high bank of the river, or
 - (ii) more than 20 metres from the existing water supply work, but no closer to the high bank of the river if the Minister is satisfied that doing so will result in no greater impact on a groundwater source or its dependent ecosystems, and

(f) the replacement groundwater work must not have a greater internal diameter or excavation footprint than the existing water supply work, except where the internal diameter of the casing of the existing water supply work is no longer manufactured, in which case the internal diameter of the replacement groundwater work is to be no greater than 110% of the internal diameter of the existing water supply work it replaces. For the purpose of this paragraph, **internal diameter** means the diameter of the inside of the casing of the water supply work which is a water bore and **excavation footprint** means the authorised dimensions of a water supply work which is an unlined excavation constructed for the purpose of water supply only.

(3) For the purpose of subclause (2) (c) (ii), the Minister may require that the applicant submit a hydrogeological study, assessed as adequate by the Minister, to demonstrate that the construction of the water supply work at a different depth to the existing water supply work will result in no greater impact on a groundwater source or its dependent ecosystems.

(4) For the purpose of subclauses (2) (d) (ii) or (e) (ii), the Minister may require that the applicant submit a hydrogeological study, assessed as adequate by the Minister, to demonstrate that the location of the water supply work at a distance greater than 20 metres from the existing water supply work will result in no greater impact on a groundwater source or its dependent ecosystems.

Note.

The Minister may amend an approval on the application of the holder of the approval under section 107 of the Act. The operation of section 107 (3) of the Act may further restrict the replacement of an existing water supply work.

37 Rules to minimise interference between water supply works

(1) A water supply work approval must not be granted or amended to authorise the construction of a water supply work which, in the Minister's opinion, is located within:

(a) 400 metres of a water supply work on another landholding that is authorised to take water from the same groundwater source pursuant to an access licence,

(b) 200 metres of a water supply work on another landholding that is authorised to take water from the same groundwater source pursuant to basic landholder rights,

(c) 200 metres from the boundary of the land, on which the water supply work is located, unless the owner of the land adjoining the boundary has provided consent in writing,

(d) 500 metres of a water supply work authorised to take water from the same groundwater source by a local water utility or a major utility, unless the local water utility or major utility has provided consent in writing, or

(e) 400 metres of a NSW Office of Water observation or monitoring bore, unless the Minister has provided consent in writing.

(2) The distance restrictions specified in subclause (1) do not apply to the grant or amendment of a water supply work approval if the Minister is satisfied that:

(a) the water supply work is solely for basic landholder rights,

(b) the water supply work is a replacement groundwater work,

(c) the water supply work is for the purpose of monitoring, environmental management or remedial works, or

(d) the location of the water supply work at a lesser distance would result in no more than minimal impact on existing extractions within these groundwater sources.

(3) For the purpose of subclause (2) (d), the Minister may request the applicant to undertake a hydrogeological study, submitted by the applicant and assessed as adequate by the Minister, to demonstrate that the location of the water supply work at a lesser

distance would result in no more than minimal impact on existing extractions within these water sources.

(4) If an approval is granted under circumstances where subclause (2) (d) applies, the approval must be subject to a requirement that, when directed by the Minister by notice in writing, the approval holder must carry out all actions required by the Minister and specified in the notice, to minimise the impact of the water supply work on existing water levels or extraction, if the Minister is satisfied that the location of the water supply work is causing more than minimal impact on existing water levels or extraction.

38 Rules for water supply works located near contamination sources

(1) A water supply work approval must not be granted or amended to authorise the construction of a water supply work which, in the Minister's opinion is located:

(a) within 250 metres of the plume associated with a contamination source listed in Schedule 2,

(b) between 250 metres and 500 metres of the plume associated with a contamination source listed in Schedule 2, unless the Minister is satisfied that no drawdown of water will occur within 250 metres of that plume, or

(c) at a distance that is more than 500 metres from the plume associated with a contamination source listed in Schedule 2, if a greater distance is determined by the Minister to be necessary to protect the water source, the environment or public health and safety.

(2) The distance restrictions specified in subclause (1) do not apply to the grant or amendment of a water supply work approval if the Minister is satisfied that:

(a) the proposed distance is adequate to protect the groundwater source, its dependent ecosystems and public health and safety, or

(b) the water supply work is for the purpose of monitoring, environmental management or remedial works.

(3) For the purpose of subclause (2) (a), the Minister may request the applicant to undertake a hydrogeological study, submitted by the applicant and assessed as adequate by the Minister, to demonstrate that the location of the water supply work at a lesser distance would result in no greater impact on dependent ecosystems and public health and safety.

39 Rules for water supply works located near sensitive environmental areas

(1) A water supply work approval must not be granted or amended to authorise the construction of a water supply work which, in the Minister's opinion, is located:

(a) within 100 metres of a high priority groundwater dependent ecosystem listed in clause 1 of Schedule 3 in the case of a water supply work used solely to take water pursuant to basic landholder rights,

(b) within 200 metres of a high priority groundwater dependent ecosystem listed in clause 1 of Schedule 3 in the case of a water supply work not used solely to take water pursuant to basic landholder rights,

(c) at a distance that is more than 200 metres from a high priority groundwater dependent ecosystem listed in clause 1 of Schedule 3, excluding water supply works used solely to take water pursuant to basic landholder rights, if the Minister is satisfied that the water supply work is likely to cause more than minimal drawdown at the perimeter of any high priority groundwater dependent ecosystem listed in clause 1 of Schedule 3,

(d) within 500 metres of a high priority karst environment groundwater dependent ecosystem listed in clause 2 of Schedule 3,

(e) within 500 metres from the edge of an escarpment, where the location of the water supply work is to be above the escarpment, or

(f) within 40 metres of the top of the high bank of a river.

(2) The distance restrictions specified in subclause (1) (a) and (b) do not apply to the grant or amendment of a water supply work approval if the Minister is satisfied that no more than minimal drawdown of water will occur at the perimeter of any high priority groundwater dependent ecosystem in clause 1 of Schedule 3.

(3) The distance restrictions specified in subclause (1) (a) and (b) do not apply to the grant or amendment of a water supply work approval where the water supply work being used to take groundwater is constructed and maintained using an impermeable pressure cement seal constructed between the casing and the bore hole from the surface of the land to a minimum depth of 30 metres or a greater depth if required by the Minister.

(4) The distance restrictions specified in subclause (1) do not apply to the grant or amendment of a water supply work approval if the Minister is satisfied that:

(a) the water supply work is for the purpose of monitoring, environmental management or remedial works,

(b) the water supply work replaces an existing water supply work that is part of a bore network for a major utility or a local water utility for the purpose of town water supply,

(c) the water supply work is a replacement groundwater work, or

(d) the location of the water supply work at a lesser distance would result in no greater impact on these groundwater sources and their dependent ecosystems.

(5) The Minister may request the applicant to undertake a hydrogeological study, submitted by the applicant and assessed as adequate by the Minister, to demonstrate that:

(a) for the purpose of subclause (2), no more than minimal drawdown of water will occur at the perimeter of any high priority groundwater dependent ecosystem listed in Schedule 3, or

(b) for the purpose of subclause (4) (d), the location of the water supply work at a lesser distance would result in no greater impact on these groundwater sources and their dependent ecosystems.

40 Rules for water supply works located near groundwater dependent culturally significant sites

(1) A water supply work approval must not be granted or amended to authorise the construction of a water supply work which, in the Minister's opinion, is located within:

(a) 100 metres of a groundwater dependent culturally significant site in the case of a water supply work used solely to take water pursuant to basic landholder rights, or

(b) 200 metres of a groundwater dependent culturally significant site in the case of a water supply work not used solely to take water pursuant to basic landholder rights.

41 Rules for the use of water supply works located within restricted distances

(1) Subject to subclauses (2) and (3), a water supply work that is located within a restricted distance specified in clauses 37 to 40, must not, in any water year, be used to take more water than the volume of water that is equal to the sum of the share components of the access licences nominating that water supply work at the commencement of this Plan.

(2) Subject to subclause (3), a water supply work that becomes located within a restricted distance specified in clauses 37 to 40 as a result of an amendment to this Plan, must not, in any water year, be used to take more water than the volume of water that is equal to the sum of share components of access licences nominating that water supply work at the date of the amendment.

(3) Subclause (1) and (2) do not apply where a restricted distance does not apply in accordance with clauses 37 to 40.

Note.

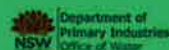
The water quality from any bore can be affected by land use activities and inherent water quality in the aquifer. Water quality cannot be guaranteed and extracted water may be unsuitable for human consumption and other uses. The quality of water extracted should be tested before being used and appropriately treated. Such testing and treatment is the responsibility of the licence holder.

NSW Office of Water

Murrumbidgee Region
Yanco Agricultural Institute Pri
2198 Irrigation Way East
Yanco NSW 2703
Phone: (02) 69512611

BORE LICENSE CERTIFICATE UNDER SECTION 115 OF THE WATER ACT, 1912

40BL192723



Snowy Hydro Limited
Po Box 332
Cooma NSW 2630

LICENSE NUMBER
40BL192723
DATE LICENSE VALID FROM
21-Nov-2018
DATE LICENSE VALID TO
PERPETUITY
FEE
\$0.00

ABN 72189919072 GST NIL

LOCATION OF WORKS

<u>Portion(s) or Lot/Section/DP</u>	<u>PARISH</u>	<u>COUNTY</u>
R	Yarrangobilly	Buccleuch
R	Tantangara	Wallace

<u>TYPE OF WORKS</u>	<u>PURPOSE(S) FOR WHICH WATER MAY BE USED</u>
Test Bore	Test Bore

CONDITIONS APPLYING TO THIS LICENSE ARE

As shown on the attached Condition Statement

ORIGINAL

Appendix B

Form A's

Driller's Licence No:	DL1913	1
Class of Licence:	Class 4	
Driller's Name:	Ian Palk	
Assistant Driller:	Wayne Spratley	
Contractor:	Highland Drilling	
New bore	<input checked="" type="checkbox"/>	Replacement bore <input type="checkbox"/>
Deepened	<input type="checkbox"/>	Enlarged <input type="checkbox"/>
Reconditioned	<input type="checkbox"/>	Other (specify) <input type="checkbox"/>
Final Depth	318 m	

Work Licence No:	40BL192723	2
Name of Licensee:	Snowy Hydro Limited	
Intended Use:	Monitoring Bore	
Completion Date:	5/11/18	

DRILLING DETAILS				3
From (m)	To (m)	Hole Diameter (mm)	Drilling Method See Code 3	
0	30	200	9	
30	298	190.5	9	
298	318	99	9	

WATER BEARING ZONES												4
From (m)	To (m)	Thickness (m)	S W L (m)	Estimated Yield (L/s)		Test method		D D L at end of test (m)	Duration		Salinity (Conductivity or TDS)	
				Individual Aquifer	Cumulative	See Code 4			Hrs	min	Cond (μS/cm)	TDS (mg/L)
59	60	1		0.07	0.07	1	A				150.8	
71	72	1		0.03	0.1	1	A				152.3	
155	156	1		0.4	0.5	1	A				160.2	

CASING / LINER DETAILS													5	
Material	OD	Wall Thickness	From	To	Method Fixing	Casing support method			See Code 5		6			
Code 5	(mm)	(mm)	(m)	(m)	Code 5	Type of casing bottom			See Code 5		1			
9	219	4.2	0	30	6	Centralisers installed	{Yes/No}		(indicate on sketch)					
9	130	4.2	0	298	6	Sump installed	{Yes/No}	No	From		m	To		m
						Pressure cemented	{Yes/No}		From		m	To		m
						Casing Protector cemented in place								

WATER ENTRY DESIGN											6
General							Screen	Slot Details			
Material	OD	Wall Thickness	From	To	Opening type	Fixing	Aperture	Length	Width	Alignment	
Code 5	(mm)	(mm)	(m)	(m)	See Code 6	See Code 5	(mm)	(mm)	(mm)	See Code 6	
		open hole	298	318			Open hole	no casing			

GRAVEL PACK										7
Type		Grade		Grain size (mm)		Depth (m)		Quantity		
				From	To	From	To	Litres	m ³	
Rounded		Graded		No	Gravel Pack	Open hole				
Crushed		Ungraded								
Bentonite/Grout seal		(Yes/No)	Yes							
Method of placement of Gravel Pack				See Code 7		1				

For Departmental use only: **G W** ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Work Licence No: 40BL192723

BORE DEVELOPMENT

8

Chemical used for breaking down drilling mud (Yes/No) <input checked="" type="checkbox"/> No		Name: _____	
Method	Bailing/Surging <input type="checkbox"/>	Jetting <input type="checkbox"/>	Airlifting <input checked="" type="checkbox"/>
Duration	_____ hrs	_____ hrs	0.5 hrs

DISINFECTION ON COMPLETION

9

Chemical(s) used	Quantity applied (Litres)	Method of application
_____	_____	_____

PUMPING TESTS ON COMPLETION

10

Test type	Date	Pump intake depth (m)	Initial Water Level (SWL) (m)	Pumping rate (L/s)	Water Level at end of pumping (DDL) (m)	Duration of Test (hrs)	Recovery	
							Water level (m)	Time taken (hrs) (mins)
Multi stage (stepped drawdown)	Stage 1							
	Stage 2							
	Stage 3							
	Stage 4							
Single stage (constant rate)								
Height of measuring point above ground level		_____ m		Test Method		_____	See Code 4	

WORK PARTLY BACKFILLED OR ABANDONED

11

Original depth of work: _____ m	Is work partly backfilled: (Yes/No) <input type="checkbox"/>
Is work abandoned: (Yes/No) <input type="checkbox"/>	Method of abandonment: Backfilled <input type="checkbox"/> Plugged <input type="checkbox"/> Capped <input type="checkbox"/>
Has any casing been left in the work (Yes/No) <input type="checkbox"/>	From _____ m To _____ m
Sealing / fill type	From depth (m)
See Code 11	To depth (m)

Site chosen by: Hydrogeologist <input checked="" type="checkbox"/>	Geologist <input type="checkbox"/>	Driller <input type="checkbox"/>	Diviner <input type="checkbox"/>	Client <input type="checkbox"/>	Other <input type="checkbox"/>
--	------------------------------------	----------------------------------	----------------------------------	---------------------------------	--------------------------------

12

Lot No National Park	DP No National Park
Work Location Co ordinates	Easting 643796.8
GPS: (Yes/No) <input checked="" type="checkbox"/>	Northings 6038289.1
	Zone 55
	(See explanation)

13

Please mark the work site with "X" on the CLID provided map.

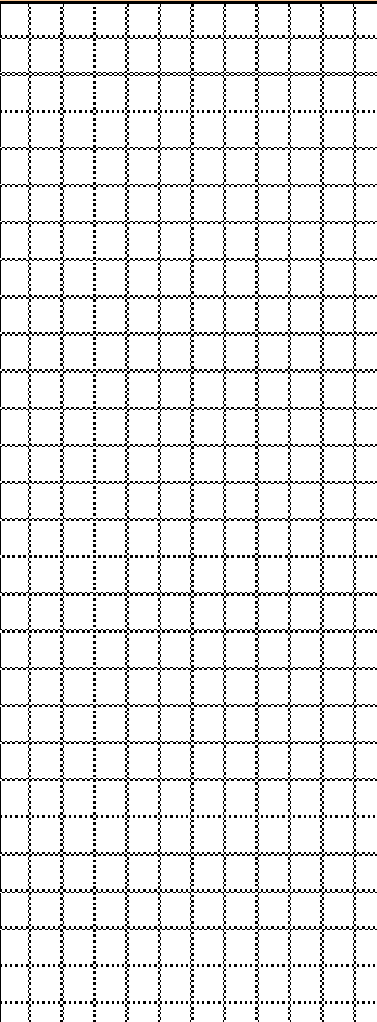
Indicate also the distances in metres from two (2) adjacent boundaries, and attach the map to this Form A package.

Signatures:

Driller: _____
Date: 24/01/2019

Licensee: _____
Date: _____

Work Licence No: 40BL192723

DRILLER'S ROCK/STRATA DESCRIPTION (LITHOLOGY)			15
Depth		Description See Code 15	
From (m)	To (m)		
		See attachment	<div>WORK CONSTRUCTION SKETCH</div> 

WORK NOT CONSTRUCTED BY DRILLING RIG								16
Method of excavation: Hand dug <input type="checkbox"/> Back hoe <input type="checkbox"/> Dragline <input type="checkbox"/> Dozer <input type="checkbox"/> Other <input type="text"/>								
Depth (m)	Length (m)	Width (m)	Diameter (m)	Lining material	Dimensions of liner (m)	From Depth (m)	To Depth (m)	

Please attach copies of the following if available						17		
Geologist log	(Yes/No)	<input checked="" type="checkbox"/> Yes	Laboratory analysis of water Sample	(Yes/No)	<input type="checkbox"/>	Pumping test(s)	(Yes/No)	<input type="checkbox"/>
Geophysical log	(Yes/No)	<input type="checkbox"/>	Sieve analysis of aquifer material	(Yes/No)	<input type="checkbox"/>	Installed Pump details	(Yes/No)	<input type="checkbox"/>

Depth_From	Depth_To	Lithology	Description
0.00	1.00	SANDSTONE	SANDSTONE very fine to fine grained , light brownish grey, highly oxidised, SOIL, 40% fine grained, dark brown
1.00	2.00	SANDSTONE	SANDSTONE very fine to fine grained , light brownish orange, highly oxidised, CLAY, 40% fine grained, medium orange, highly oxidised
2.00	3.00	SANDSTONE	SANDSTONE very fine to fine grained , light bluish grey, highly oxidised, CLAY, 30% fine grained, medium orange, highly oxidised, 10% quartz
3.00	4.00	SANDSTONE	SANDSTONE very fine to fine grained , light brownish orange, highly oxidised, CLAY, 30% fine grained, medium orange, highly oxidised
4.00	5.00	SANDSTONE	SANDSTONE very fine to fine grained , light bluish grey, moderately oxidised
5.00	6.00	SANDSTONE	SANDSTONE very fine to fine grained , light bluish grey, highly oxidised
6.00	7.00	SANDSTONE	SANDSTONE very fine to fine grained , light brownish orange, highly oxidised
7.00	8.00	SANDSTONE	SANDSTONE very fine to fine grained , light bluish grey, moderately oxidised
8.00	9.00	SANDSTONE	SANDSTONE very fine to fine grained , light bluish grey, moderately oxidised, 2% quartz
9.00	10.00	SANDSTONE	SANDSTONE very fine to fine grained , light bluish grey, moderately oxidised, 2% quartz
10.00	11.00	SANDSTONE	SANDSTONE very fine to fine grained , light brownish orange, highly oxidised, 2% quartz
11.00	12.00	SANDSTONE	SANDSTONE very fine to fine grained , light brownish orange, highly oxidised, 2% quartz
12.00	13.00	SANDSTONE	SANDSTONE very fine to fine grained , light brownish orange, highly oxidised, 2% quartz
13.00	14.00	SANDSTONE	SANDSTONE very fine to fine grained , light brownish orange, highly oxidised, 1% quartz
14.00	15.00	SANDSTONE	SANDSTONE very fine to fine grained , light orangey grey, highly oxidised, 1% quartz
15.00	16.00	SANDSTONE	SANDSTONE very fine to fine grained , light orangey grey, moderately oxidised
16.00	17.00	SANDSTONE	SANDSTONE very fine to fine grained , light brownish grey, slightly oxidised
17.00	18.00	SANDSTONE	SANDSTONE very fine to fine grained , light brownish grey, slightly oxidised
18.00	19.00	SANDSTONE	SANDSTONE very fine to fine grained , light brownish grey, slightly oxidised, 2% quartz
19.00	20.00	SANDSTONE	SANDSTONE very fine to fine grained , light brownish grey, slightly oxidised, 10% quartz, Turned on water to suppress dust and received large coarse sandstone chips.
20.00	21.00	SANDSTONE	SANDSTONE very fine to fine grained , light brownish grey, slightly oxidised, SLATE, 30% very fine grained , light brown, slightly oxidised, platy, 5% quartz
21.00	22.00	SANDSTONE	SANDSTONE very fine to fine grained , light brownish grey, slightly oxidised, SLATE, 30% very fine grained , light brown, slightly oxidised, platy, 1% quartz

22.00	23.00	SANDSTONE	SANDSTONE very fine to fine grained , light brownish grey, slightly oxidised, SLATE, 40% very fine grained , medium greyish brown, slightly oxidised, platy
23.00	24.00	SLATE	SLATE very fine grained , medium greyish brown, slightly oxidised, SANDSTONE, 40% very fine to fine grained , light brownish grey, slightly oxidised
24.00	25.00	SLATE	SLATE very fine grained , medium greyish brown, slightly oxidised, SANDSTONE, 40% very fine to fine grained , light brownish grey, slightly oxidised
25.00	26.00	SLATE	SLATE very fine grained , medium greyish brown, slightly oxidised, SANDSTONE, 40% very fine to fine grained , light brownish grey, slightly oxidised, 1% quartz
26.00	27.00	SLATE	SLATE very fine grained , medium greyish brown, slightly oxidised, SANDSTONE, 30% very fine to fine grained , light brownish grey, slightly oxidised
27.00	28.00	SLATE	SLATE very fine grained , medium greyish brown, slightly oxidised, SANDSTONE, 30% very fine to fine grained , light brownish grey, slightly oxidised
28.00	29.00	SLATE	SLATE very fine grained , medium greyish brown, slightly oxidised, SANDSTONE, 30% very fine to fine grained , light brownish grey, slightly oxidised
29.00	30.00	SLATE	SLATE very fine grained , medium greyish brown, slightly oxidised, SANDSTONE, 20% very fine to fine grained , light brownish grey, slightly oxidised, SILTSTONE, 20% fine to medium grained, medium grey, 1% quartz
30.00	31.00	SILTSTONE	SILTSTONE very fine grained , medium grey, slightly oxidised, SANDSTONE, 20% very fine to fine grained , light brownish grey, slightly oxidised, 1% quartz
31.00	32.00	SILTSTONE	SILTSTONE very fine grained , medium grey, slightly oxidised, SANDSTONE, 20% very fine to fine grained , light brownish grey, slightly oxidised
32.00	33.00	SILTSTONE	SILTSTONE very fine grained , medium grey, slightly oxidised, SANDSTONE, 20% very fine to fine grained , light brownish grey, slightly oxidised, SLATE, 10% fine to medium grained, medium grey, platy
33.00	34.00	SILTSTONE	SILTSTONE very fine grained , medium grey, slightly oxidised, SANDSTONE, 20% very fine to fine grained , light brownish grey, slightly oxidised, SLATE, 10% fine to medium grained, medium grey, platy
34.00	35.00	SILTSTONE	SILTSTONE very fine grained , medium grey, slightly oxidised, SANDSTONE, 20% very fine to fine grained , light brownish grey, slightly oxidised, SLATE, 10% fine to medium grained, medium grey, platy, 1% quartz
35.00	36.00	SILTSTONE	SILTSTONE very fine grained , medium grey, slightly oxidised, SANDSTONE, 20% very fine to fine grained , light brownish grey, slightly oxidised, SLATE, 10% fine to medium grained, medium grey, platy, 1% quartz
36.00	37.00	SILTSTONE	SILTSTONE very fine grained , medium grey, Despite no water flowing from the hole, I assume this is the SWL
37.00	38.00	SILTSTONE	SILTSTONE very fine grained , medium grey
38.00	39.00	SILTSTONE	SILTSTONE very fine grained , medium grey
39.00	40.00	SILTSTONE	SILTSTONE very fine grained , medium grey

40.00	41.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
41.00	42.00	SILTSTONE	SILTSTONE very fine grained , medium grey
42.00	43.00	SILTSTONE	SILTSTONE very fine grained , medium grey
43.00	44.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
44.00	45.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
45.00	46.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered
46.00	47.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered
47.00	48.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 2% quartz
48.00	49.00	SILTSTONE	SILTSTONE very fine grained , medium grey
49.00	50.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
50.00	51.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
51.00	52.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 10% quartz
52.00	53.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 30% quartz, rare pyrite
53.00	54.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
54.00	55.00	SILTSTONE	SILTSTONE very fine grained , medium grey
55.00	56.00	SILTSTONE	SILTSTONE very fine grained , medium grey
56.00	57.00	SILTSTONE	SILTSTONE very fine grained , medium grey
57.00	58.00	SILTSTONE	SILTSTONE very fine grained , light grey, 80% quartz, rare pyrite
58.00	59.00	SILTSTONE	SILTSTONE very fine grained , medium grey
59.00	60.00	SILTSTONE	SILTSTONE very fine grained , medium grey
60.00	61.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
61.00	62.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
62.00	63.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
63.00	64.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 2% quartz, rare pyrite
64.00	65.00	SILTSTONE	SILTSTONE very fine grained , medium grey
65.00	66.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 2% quartz, rare pyrite
66.00	67.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 10% quartz
67.00	68.00	SLATE	SLATE very fine grained , dark grey, platy
68.00	69.00	SLATE	SLATE very fine grained , dark grey, platy, SILTSTONE, 10% very fine grained , medium grey
69.00	70.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , dark grey
70.00	71.00	SILTSTONE	SILTSTONE very fine grained , medium grey
71.00	72.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 5% quartz
72.00	73.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
73.00	74.00	SILTSTONE	SILTSTONE very fine grained , medium grey
74.00	75.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 40% quartz
75.00	76.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 10% quartz
76.00	77.00	SLATE	SLATE very fine grained , dark grey, platy, SILTSTONE, 10% very fine grained , medium grey, 1% quartz, rare pyrite
77.00	78.00	SLATE	SLATE very fine grained , dark grey, platy, 5% quartz, rare pyrite
78.00	79.00	SLATE	SLATE very fine grained , dark grey, platy, SILTSTONE, 10% very fine grained , medium grey

79.00	80.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 5% quartz, rare pyrite
80.00	81.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 30% very fine grained , dark grey, platy, 2% quartz
81.00	82.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz, rare pyrite
82.00	83.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 20% very fine grained , dark grey, platy, 1% quartz
83.00	84.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
84.00	85.00	SILTSTONE	SILTSTONE very fine grained , medium grey
85.00	86.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
86.00	87.00	SILTSTONE	SILTSTONE very fine grained , medium grey
87.00	88.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 10% quartz
88.00	89.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
89.00	90.00	SILTSTONE	SILTSTONE very fine grained , medium grey
90.00	91.00	SILTSTONE	SILTSTONE very fine grained , medium grey
91.00	92.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 40% very fine grained , dark grey, platy
92.00	93.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 40% very fine grained , dark grey, platy, 1% quartz
93.00	94.00	SLATE	SLATE very fine grained , dark grey, platy, 1% quartz
94.00	95.00	SLATE	SLATE very fine grained , dark grey, platy, SILTSTONE, 10% very fine grained , medium grey, 1% quartz, rare pyrite
95.00	96.00	SLATE	SLATE very fine grained , dark grey, platy
96.00	97.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , dark grey, platy
97.00	98.00	SILTSTONE	SILTSTONE very fine grained , medium grey
98.00	99.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
99.00	100.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
100.00	101.00	SILTSTONE	SILTSTONE very fine grained , medium grey
101.00	102.00	SILTSTONE	SILTSTONE very fine grained , medium grey
102.00	103.00	SILTSTONE	SILTSTONE very fine grained , medium grey
103.00	104.00	SLATE	SLATE very fine grained , dark grey, platy, rare pyrite
104.00	105.00	SLATE	SLATE very fine grained , dark grey, platy
105.00	106.00	SLATE	SLATE very fine grained , dark grey, platy
106.00	107.00	SLATE	SLATE very fine grained , dark grey, platy, SILTSTONE, 10% very fine grained , medium grey, 1% quartz
107.00	108.00	SLATE	SLATE very fine grained , dark grey, platy, SILTSTONE, 20% very fine grained , medium grey
108.00	109.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 5% quartz
109.00	110.00	SILTSTONE	SILTSTONE very fine grained , medium grey
110.00	111.00	SILTSTONE	SILTSTONE very fine grained , medium grey
111.00	112.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 20% quartz
112.00	113.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 10% quartz
113.00	114.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 10% quartz
114.00	115.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 30% quartz, INCLUDING ROSE QUARTZ

115.00	116.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 20% quartz
116.00	117.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 5% quartz
117.00	118.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 5% quartz
118.00	119.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered
119.00	120.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 5% quartz
120.00	121.00	SILTSTONE	SILTSTONE very fine grained , medium grey
121.00	122.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 10% quartz
122.00	123.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 10% quartz, rare pyrite
123.00	124.00	SLATE	SLATE very fine grained , dark grey, platy, SILTSTONE, 10% very fine grained , medium grey, rare pyrite
124.00	125.00	SLATE	SLATE very fine grained , dark grey, platy, SILTSTONE, 20% very fine grained , medium grey
125.00	126.00	SLATE	SLATE very fine grained , dark grey, platy, SILTSTONE, 40% very fine grained , medium grey, 1% quartz
126.00	127.00	SLATE	SLATE very fine grained , dark grey, platy, SILTSTONE, 20% very fine grained , medium grey
127.00	128.00	SILTSTONE	SILTSTONE very fine grained , medium grey
128.00	129.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , dark grey
129.00	130.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , dark grey, 1% quartz
130.00	131.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , dark grey, 1% quartz
131.00	132.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 2% quartz
132.00	133.00	SILTSTONE	SILTSTONE very fine grained , medium grey
133.00	134.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 10% quartz
134.00	135.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 10% quartz
135.00	136.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 10% quartz
136.00	137.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered
137.00	138.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 20% quartz, rare pyrite, INCLUDING ROSE QUARTZ
138.00	139.00	SILTSTONE	SILTSTONE very fine grained , medium grey
139.00	140.00	SILTSTONE	SILTSTONE very fine grained , medium grey, rare pyrite
140.00	141.00	SILTSTONE	SILTSTONE very fine grained , light grey, chlorite, altered; 10% quartz
141.00	142.00	SILTSTONE	SILTSTONE very fine grained , light grey, chlorite, altered; 20% quartz
142.00	143.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , dark grey, 10% quartz, rare pyrite
143.00	144.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 50% very fine grained , dark grey, 1% quartz

144.00	145.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 20% very fine grained , dark grey, 1% quartz, rare pyrite
145.00	146.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , dark grey, 5% quartz
146.00	147.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 30% very fine grained , dark grey, 1% quartz, rare pyrite
147.00	148.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 40% very fine grained , dark grey, 1% quartz, rare pyrite
148.00	149.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 20% very fine grained , dark grey, 1% quartz, rare pyrite
149.00	150.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 20% very fine grained , dark grey, 1% quartz
150.00	151.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 5% quartz
151.00	152.00	SILTSTONE	SILTSTONE very fine grained , light grey, chlorite, altered; 50% quartz, rare pyrite
152.00	153.00	SILTSTONE	SILTSTONE very fine grained , light grey, chlorite, altered; 50% quartz, rare pyrite
153.00	154.00	SILTSTONE	SILTSTONE very fine grained , light grey, chlorite, altered; 50% quartz, rare pyrite
154.00	155.00	SLATE	SLATE very fine grained , dark grey, SILTSTONE, 10% very fine grained , medium grey, 1% quartz
155.00	156.00	SLATE	SLATE very fine grained , dark grey, SILTSTONE, 20% very fine grained , medium grey, rare pyrite
156.00	157.00	SLATE	SLATE very fine grained , dark grey
157.00	158.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , dark grey, 1% quartz
158.00	159.00	SILTSTONE	SILTSTONE very fine grained , medium grey
159.00	160.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
160.00	161.00	SILTSTONE	SILTSTONE very fine grained , medium grey
161.00	162.00	SILTSTONE	SILTSTONE very fine grained , medium grey
162.00	163.00	SILTSTONE	SILTSTONE very fine grained , medium grey
163.00	164.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 20% quartz, rare pyrite
164.00	165.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 10% quartz
165.00	166.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered
166.00	167.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 20% very fine grained , dark grey
167.00	168.00	SLATE	SLATE very fine grained , dark grey, platy
168.00	169.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
169.00	170.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 10% quartz
170.00	171.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 20% quartz, rare pyrite
171.00	172.00	SLATE	SLATE very fine grained , medium grey, SILTSTONE, 20% very fine grained , medium grey, 1% quartz
172.00	173.00	SLATE	SLATE very fine grained , medium grey, SILTSTONE, 10% very fine grained , medium grey
173.00	174.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 40% very fine grained , medium grey, 10% quartz
174.00	175.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 20% very fine grained , medium grey




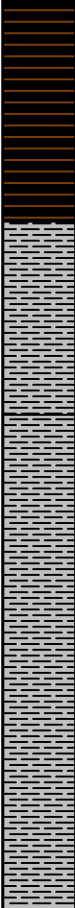
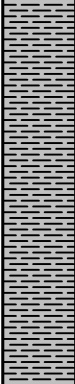
175.00	176.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 20% very fine grained , medium grey, 1% quartz
176.00	177.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 5% quartz
177.00	178.00	SILTSTONE	SILTSTONE very fine grained , medium grey
178.00	179.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 10% quartz, rare pyrite
179.00	180.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 10% quartz, rare pyrite
180.00	181.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
181.00	182.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
182.00	183.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
183.00	184.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 30% very fine grained , medium grey
184.00	185.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , medium grey
185.00	186.00	SILTSTONE	SILTSTONE very fine grained , medium grey
186.00	187.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
187.00	188.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 10% quartz
188.00	189.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 20% quartz
189.00	190.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 40% very fine grained , medium grey, 5% quartz
190.00	191.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , medium grey, 20% quartz
191.00	192.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , medium grey, 1% quartz
192.00	193.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 30% very fine grained , medium grey
193.00	194.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 30% very fine grained , medium grey
194.00	195.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 30% very fine grained , medium grey
195.00	196.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 40% very fine grained , medium grey, 10% quartz
196.00	197.00	SLATE	SLATE very fine grained , medium grey, SILTSTONE, 20% very fine grained , medium grey, 1% quartz
197.00	198.00	SILTSTONE	SILTSTONE very fine grained , medium grey
198.00	199.00	SILTSTONE	SILTSTONE very fine grained , medium grey
199.00	200.00	SLATE	SLATE very fine grained , medium grey, SILTSTONE, 30% very fine grained , medium grey, 2% quartz
200.00	201.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
201.00	202.00	SILTSTONE	SILTSTONE very fine grained , medium grey
202.00	203.00	SILTSTONE	SILTSTONE very fine grained , medium grey
203.00	204.00	SILTSTONE	SILTSTONE very fine grained , medium grey
204.00	205.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 20% very fine grained , medium grey
205.00	206.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
206.00	207.00	SILTSTONE	SILTSTONE very fine grained , medium grey
207.00	208.00	SILTSTONE	SILTSTONE very fine grained , medium grey
208.00	209.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 20% very fine grained , medium grey, 1% quartz
209.00	210.00	SILTSTONE	SILTSTONE very fine grained , medium grey
210.00	211.00	SILTSTONE	SILTSTONE very fine grained , medium grey

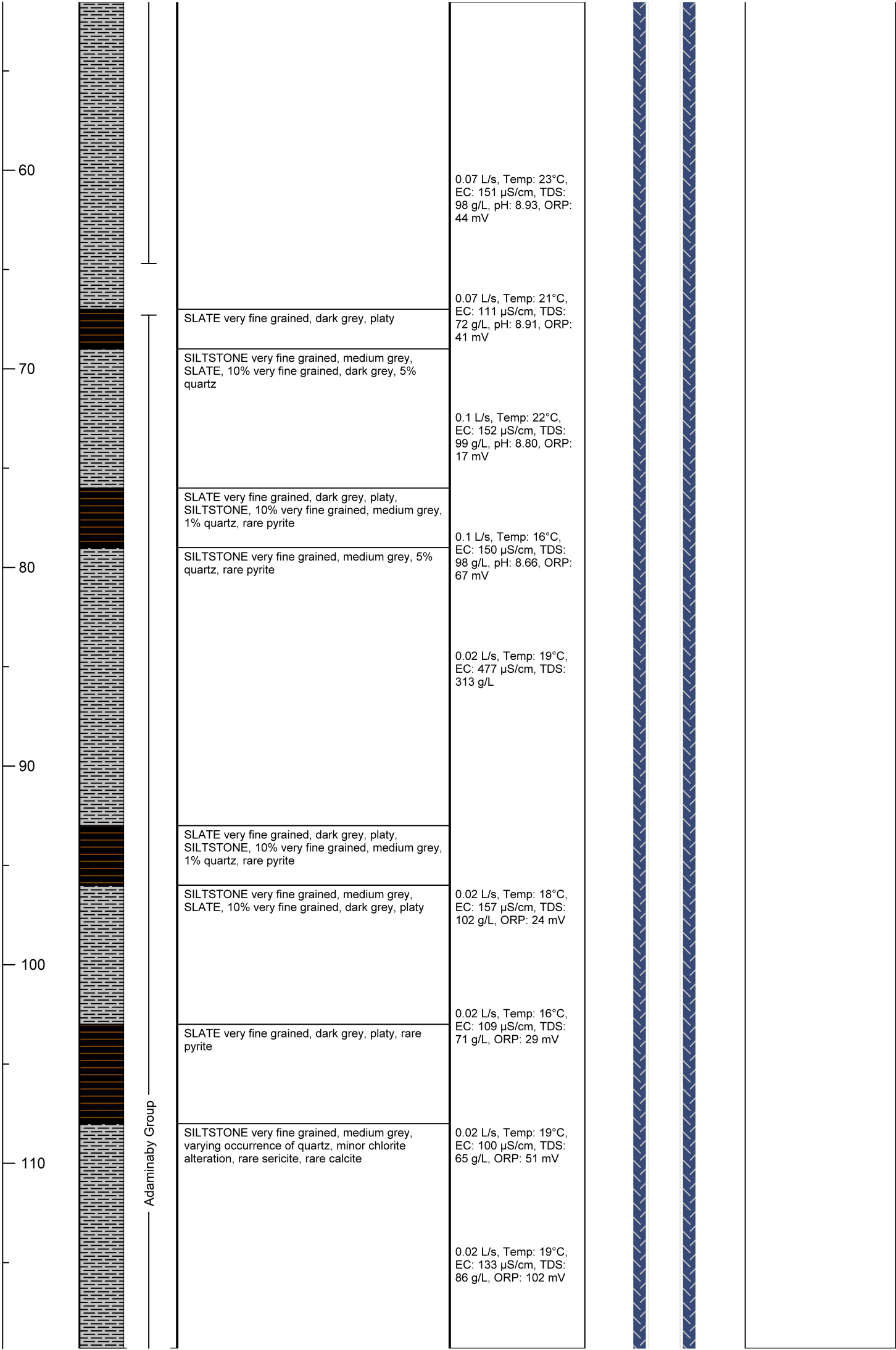
211.00	212.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
212.00	213.00	SILTSTONE	SILTSTONE very fine grained , medium grey
213.00	214.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 5% quartz
214.00	215.00	SILTSTONE	SILTSTONE very fine grained , medium grey
215.00	216.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 10% quartz, rare pyrite
216.00	217.00	SILTSTONE	SILTSTONE very fine grained , medium grey
217.00	218.00	SILTSTONE	SILTSTONE very fine grained , medium grey
218.00	219.00	SILTSTONE	SILTSTONE very fine grained , medium grey
219.00	220.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 30% very fine grained , medium grey
220.00	221.00	SILTSTONE	SILTSTONE very fine grained , light grey, 20% quartz, rare pyrite
221.00	222.00	SILTSTONE	SILTSTONE very fine grained , medium grey
222.00	223.00	SILTSTONE	SILTSTONE very fine grained , medium grey
223.00	224.00	SILTSTONE	SILTSTONE very fine grained , medium grey
224.00	225.00	SILTSTONE	SILTSTONE very fine grained , medium grey
225.00	226.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
226.00	227.00	SILTSTONE	SILTSTONE very fine grained , medium grey
227.00	228.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , dark grey, 1% quartz
228.00	229.00	SLATE	SLATE very fine grained , dark grey, SILTSTONE, 10% very fine grained , medium grey
229.00	230.00	SLATE	SLATE very fine grained , dark grey, chlorite, altered; SILTSTONE, 20% very fine grained , medium grey, 10% quartz, rare pyrite
230.00	231.00	SLATE	SLATE very fine grained , dark grey, SILTSTONE, 10% very fine grained , medium grey
231.00	232.00	SLATE	SLATE very fine grained , dark grey, SILTSTONE, 40% very fine grained , medium grey
232.00	233.00	SILTSTONE	SILTSTONE very fine grained , medium grey
233.00	234.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
234.00	235.00	SILTSTONE	SILTSTONE very fine grained , medium grey
235.00	236.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 5% quartz
236.00	237.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz, rare pyrite
237.00	238.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 30% quartz, rare pyrite
238.00	239.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 2% quartz
239.00	240.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 2% quartz
240.00	241.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; SLATE, 10% very fine grained , medium grey, 5% quartz
241.00	242.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , medium grey
242.00	243.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , medium grey
243.00	244.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , medium grey
244.00	245.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , medium grey

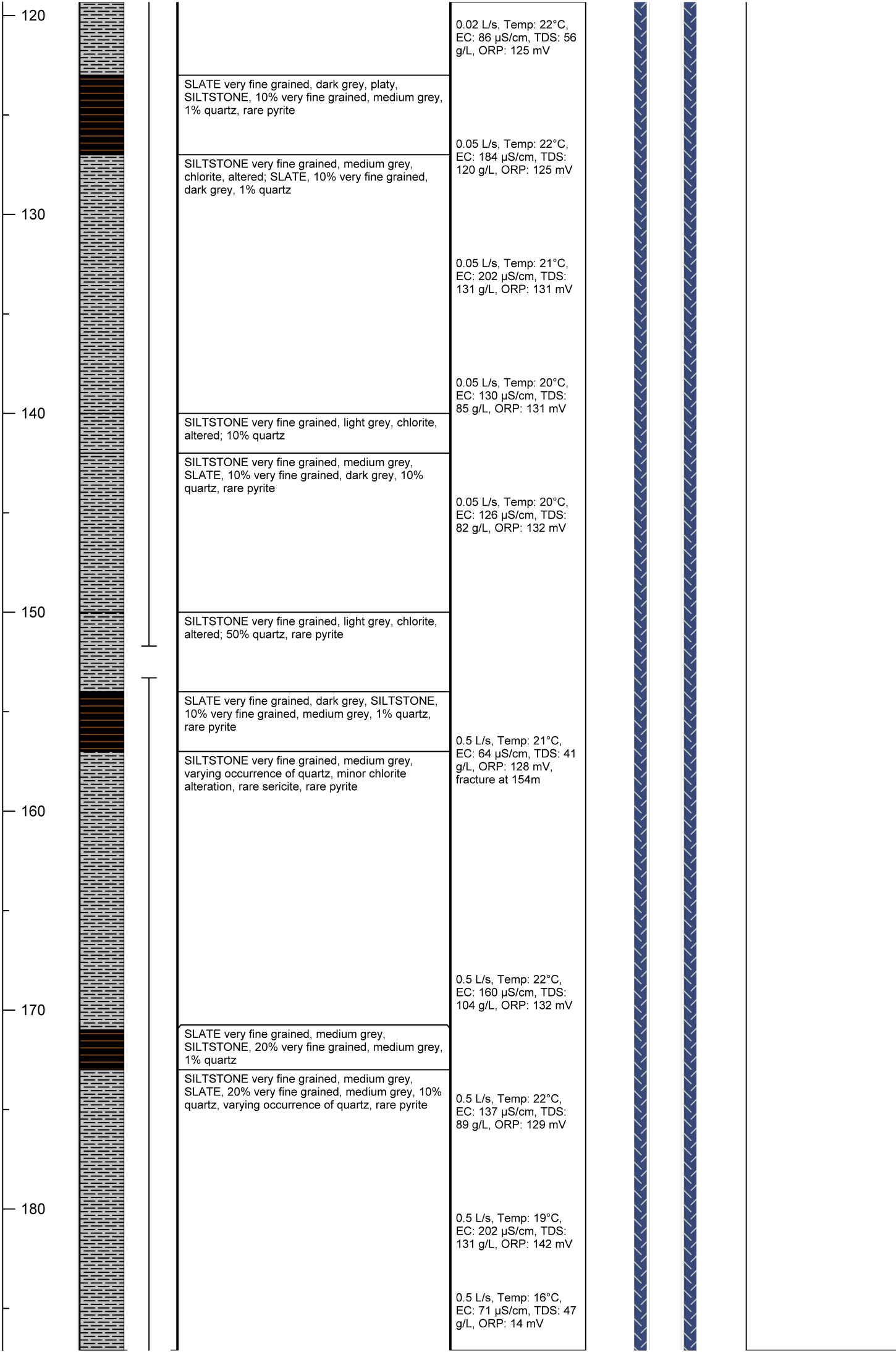
245.00	246.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , medium grey
246.00	247.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 5% quartz
247.00	248.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , medium grey
248.00	249.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , medium grey
249.00	250.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 10% quartz, rare pyrite
250.00	251.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 10% quartz, rare pyrite
251.00	252.00	SILTSTONE	SILTSTONE very fine grained , medium grey
252.00	253.00	SILTSTONE	SILTSTONE very fine grained , medium grey, rare quartz, rare pyrite
253.00	254.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 5% quartz, rare pyrite
254.00	255.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 5% quartz
255.00	256.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 10% quartz
256.00	257.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 1% quartz
257.00	258.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , medium grey
258.00	259.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; SLATE, 10% very fine grained , medium grey, 1% quartz
259.00	260.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
260.00	261.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
261.00	262.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
262.00	263.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 2% quartz, rare pyrite
263.00	264.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; SLATE, 10% very fine grained , medium grey, 1% quartz
264.00	265.00	SILTSTONE	SILTSTONE very fine grained , medium grey
265.00	266.00	SLATE	SLATE very fine grained , medium grey, rare pyrite
266.00	267.00	SLATE	SLATE very fine grained , medium grey
267.00	268.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , medium grey
268.00	269.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
269.00	270.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; SLATE, 20% very fine grained , medium grey, 2% quartz
270.00	271.00	SLATE	SLATE very fine grained , medium grey, SILTSTONE, 20% very fine grained , medium grey, rare pyrite
271.00	272.00	SLATE	SLATE very fine grained , medium grey, SILTSTONE, 10% very fine grained , medium grey
272.00	273.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; SLATE, 10% very fine grained , medium grey, 5% quartz
273.00	274.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 10% quartz, rare pyrite
274.00	275.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz

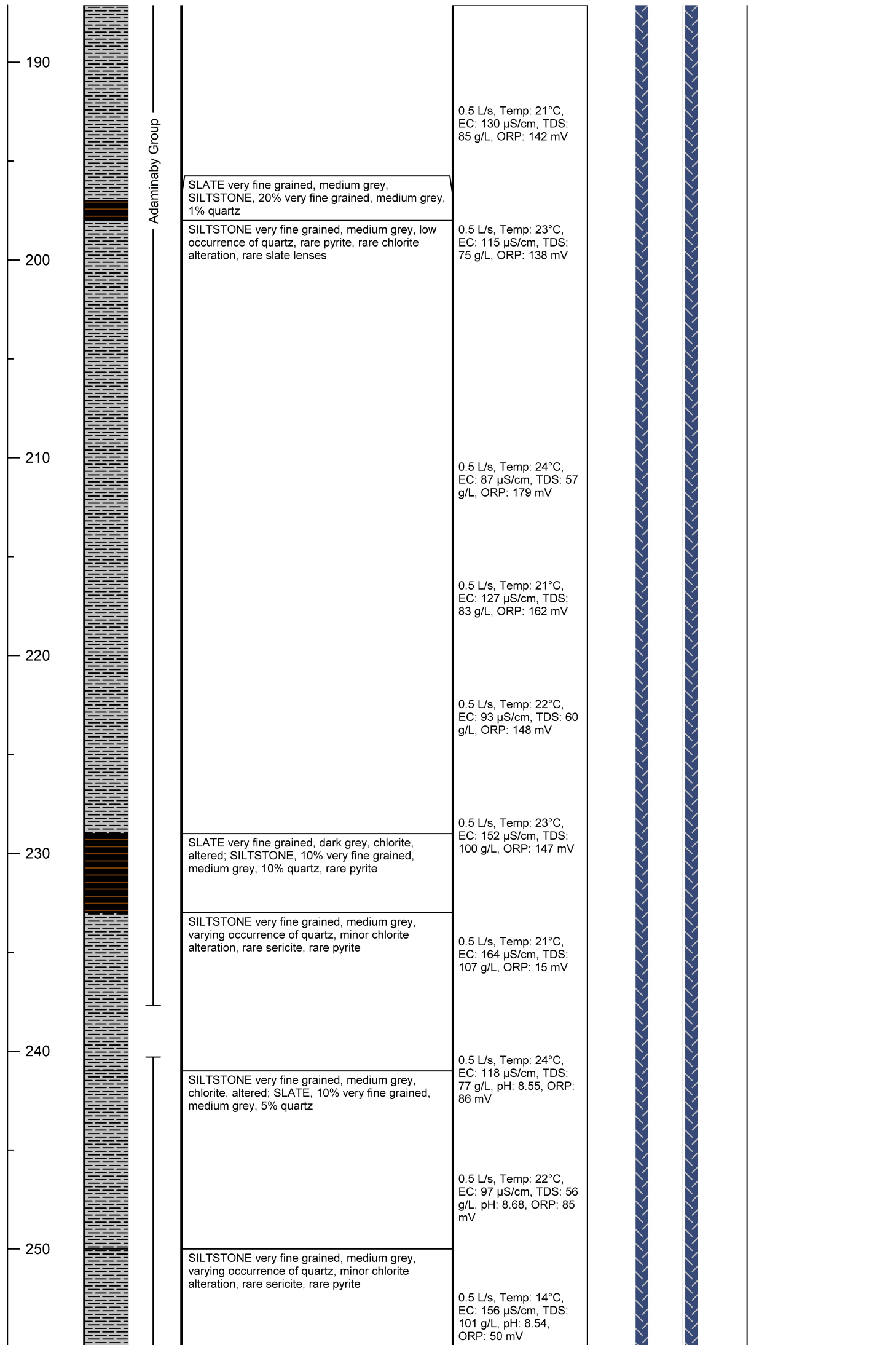
275.00	276.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
276.00	277.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
277.00	278.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
278.00	279.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 20% very fine grained , medium grey, 1% quartz, rare pyrite
279.00	280.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 20% very fine grained , medium grey
280.00	281.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 20% very fine grained , medium grey
281.00	282.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 20% very fine grained , medium grey, 1% quartz
282.00	283.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 2% quartz
283.00	284.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 10% quartz, rare pyrite
284.00	285.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , medium grey, 1% quartz, rare pyrite
285.00	286.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , medium grey
286.00	287.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; SLATE, 5% very fine grained , medium grey, 10% quartz, rare pyrite
287.00	288.00	SLATE	SLATE very fine grained , medium grey, 1% quartz
288.00	289.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 30% very fine grained , medium grey, 1% quartz, rare pyrite
289.00	290.00	SLATE	SLATE very fine grained , medium grey, SILTSTONE, 10% very fine grained , medium grey, 1% quartz
290.00	291.00	SLATE	SLATE very fine grained , medium grey, SILTSTONE, 40% very fine grained , medium grey, 1% quartz
291.00	292.00	SLATE	SLATE very fine grained , medium grey, SILTSTONE, 10% very fine grained , medium grey, 1% quartz
292.00	293.00	SLATE	SLATE very fine grained , medium grey, SILTSTONE, 10% very fine grained , medium grey, 5% quartz, rare pyrite
293.00	294.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 10% quartz
294.00	295.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 10% quartz
295.00	296.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 20% very fine grained , medium grey
296.00	297.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 40% very fine grained , medium grey
297.00	298.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , medium grey
298.00	299.00	SILTSTONE	SILTSTONE very fine grained , medium grey
299.00	300.00	SILTSTONE	SILTSTONE very fine grained , medium grey, rare pyrite
300.00	301.00	SILTSTONE	SILTSTONE very fine grained , medium grey
301.00	302.00	SILTSTONE	SILTSTONE very fine grained , medium grey
302.00	303.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz
303.00	304.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 10% very fine grained , medium grey, 1% quartz

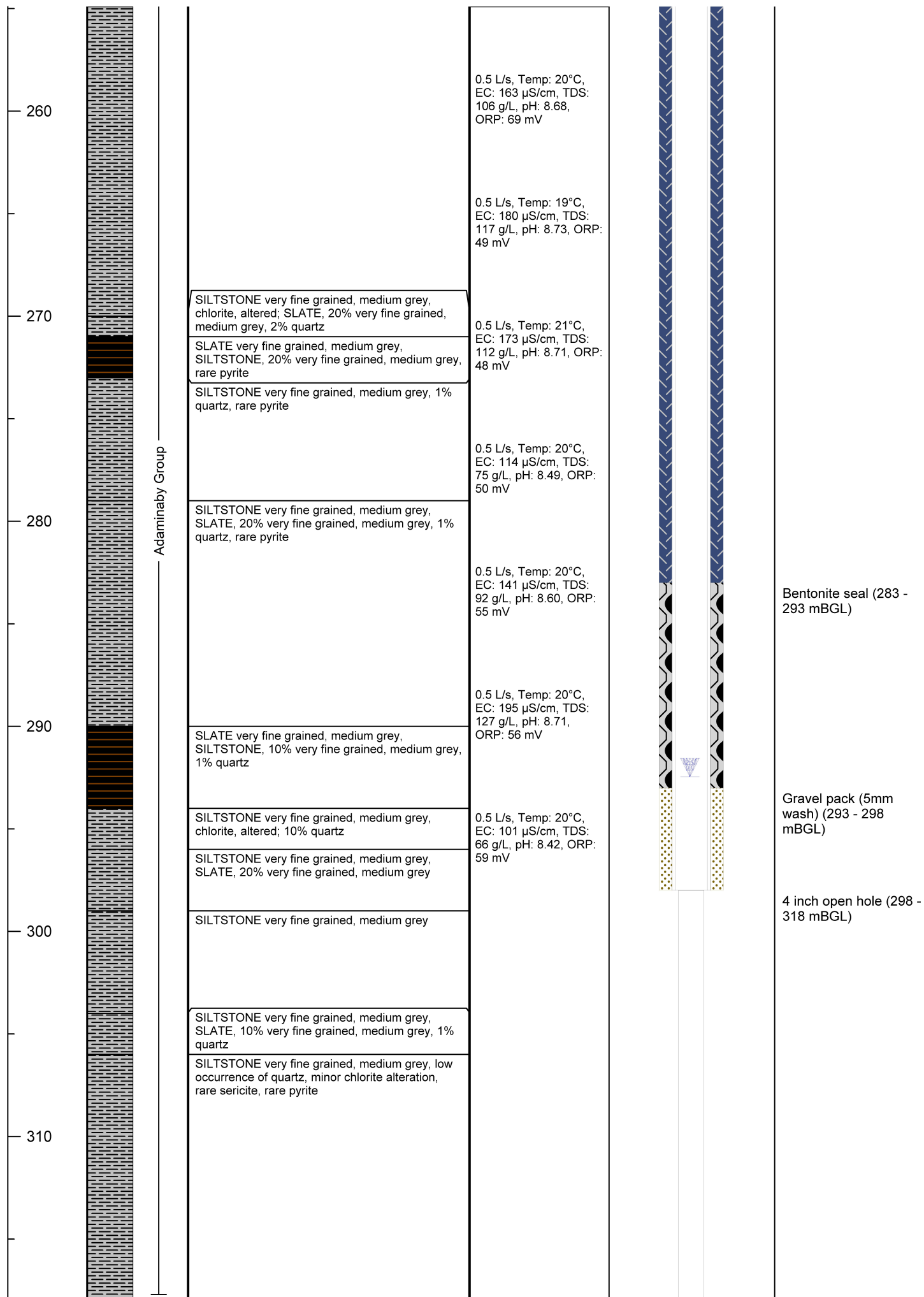
304.00	305.00	SILTSTONE	SILTSTONE very fine grained , medium grey, SLATE, 20% very fine grained , medium grey, 1% quartz
305.00	306.00	SILTSTONE	SILTSTONE very fine grained , medium grey
306.00	307.00	SILTSTONE	SILTSTONE very fine grained , medium grey
307.00	308.00	SILTSTONE	SILTSTONE very fine grained , medium grey
308.00	309.00	SILTSTONE	SILTSTONE very fine grained , medium grey
309.00	310.00	SILTSTONE	SILTSTONE very fine grained , medium grey
310.00	311.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 10% quartz
311.00	312.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 1% quartz, rare pyrite
312.00	313.00	SILTSTONE	SILTSTONE very fine grained , medium grey
313.00	314.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 1% quartz, rare pyrite
314.00	315.00	SILTSTONE	SILTSTONE very fine grained , medium grey, chlorite, altered; 2% quartz, rare pyrite
315.00	316.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 5% quartz, rare pyrite
316.00	317.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 2% quartz, rare pyrite
317.00	318.00	SILTSTONE	SILTSTONE very fine grained , medium grey, 1% quartz, rare pyrite

 www.emmconsulting.com.au Suite 01, 20 Chandos Street St Leonards NSW 2065 T: 02 9493 9500 F: 02 9493 9599		WATER MONITORING BORE LOG		Bore ID: PB06	
		Client: Snowy Hydro Limited		Project: Snowy 2.0	
		Date completed: 6/11/2018		Project number: J17188	
		Drilling contractor: Highland Drilling		Elevation: 1435.5mAHD	
		Drilling method: Air Rotary		Easting: 643796.8	
		Hydrogeologist: Kaitlyn Brodie		Northing: 6038289.1	
Static Water Level: 292mBGL		Screened Formation: Adaminaby Group		Date: 21/11/2018	
Total depth: 318m		Screened depth: 298 - 318m open hole		Casing: 5.5 inch steel	
Depth (mbgl)	Lithology Graphic	Description	Drilling Notes	Bore Completion	
				Diagram	Design notes
0		SANDSTONE very fine to fine grained, light brownish grey, highly oxidised, SOIL, 40% fine grained, dark brown	Turned on water to suppress dust and received large coarse sandstone chips		Cement grout (0 - 1 mBGL)
		SANDSTONE very fine to fine grained, light brownish orange, highly oxidised, CLAY, 40% fine grained, medium orange, highly oxidised			10 inch diameter borehole (0 - 30 mBGL)
		SANDSTONE very fine to fine grained, light bluish grey, moderately oxidised, 2% quartz			8 inch steel surface casing (0 - 30 mBGL)
10		SANDSTONE very fine to fine grained, light brownish orange, highly oxidised, 2% quartz			
		SANDSTONE very fine to fine grained, light orangey grey, highly oxidised, 1% quartz			
		SANDSTONE very fine to fine grained, light brownish grey, slightly oxidised			
20		SANDSTONE very fine to fine grained, light brownish grey, slightly oxidised, SLATE, 30% very fine grained, light brown, slightly oxidised, platy, 5% quartz			
		SLATE very fine grained, medium greyish brown, slightly oxidised, SANDSTONE, 40% very fine to fine grained, light brownish grey, slightly oxidised, 1% quartz			
30		SILTSTONE very fine grained, medium grey, slightly oxidised, SANDSTONE, 20% very fine to fine grained, light brownish grey, slightly oxidised, SLATE, 10% fine to medium grained, medium grey, platy, 1% quartz			Blue metal gravel backfill (5-8mm wash) (1 - 283 mBGL)
		SILTSTONE very fine grained, medium grey, low occurrence of quartz, rare pyrite, minor chlorite alteration, rare sericite			7.5 inch diameter borehole (30 - 298 mBGL)
40					5.5 inch steel casing (0 - 298 mBGL)
50					









Driller's Licence No:	DL1913	1
Class of Licence:	Class 4	
Driller's Name:	Ian Palk	
Assistant Driller:	Wayne Spratley	
Contractor:	Highland Drilling	
New bore	<input checked="" type="checkbox"/>	Replacement bore <input type="checkbox"/>
Deepened	<input type="checkbox"/>	Enlarged <input type="checkbox"/>
Reconditioned	<input type="checkbox"/>	Other (specify) <input type="checkbox"/>
Final Depth	30 m	

Work Licence No:	40BL192733	2
Name of Licensee:	Snowy Hydro Limited	
Intended Use:	Monitoring Bore	
Completion Date:		

DRILLING DETAILS				3
From (m)	To (m)	Hole Diameter (mm)	Drilling Method See Code 3	
0	30	140	9	

WATER BEARING ZONES												4
From (m)	To (m)	Thickness (m)	S W L (m)	Estimated Yield (L/s)		Test method See Code 4	D D L at end of test (m)	Duration		Salinity (Conductivity or TDS)		
				Individual Aquifer	Cumulative			Hrs	min	Cond (µS/cm)	TDS (mg/L)	
Drilled	Dry		22.2			1 A						
						1 A						
						1 A						

CASING / LINER DETAILS												5		
Material	OD	Wall Thickness	From	To	Method Fixing	Casing support method See Code 5 2								
Code 5	(mm)	(mm)	(m)	(m)	Code 5	Type of casing bottom See Code 5 2								
8	60.2	5	0	21	5	Centralisers installed	{Yes/No}	No	(indicate on sketch)					
						Sump installed	{Yes/No}	No	From		m	To		m
						Pressure cemented	{Yes/No}	No	From		m	To		m
						Casing Protector cemented in place								

WATER ENTRY DESIGN											6
General							Screen	Slot Details			
Material	OD	Wall Thickness	From	To	Opening type	Fixing	Aperture	Length	Width	Alignment	
Code 5	(mm)	(mm)	(m)	(m)	See Code 6	See Code 5	(mm)	(mm)	(mm)	See Code 6	
8	60.2	5	21	30	5	5	0.4	20	10	H	

GRAVEL PACK										7
Type		Grade	Grain size (mm)		Depth (m)		Quantity			
			From	To	From	To	Litres	m ³		
Rounded	<input checked="" type="checkbox"/>	Graded	<input checked="" type="checkbox"/>	3	5	20	30			
Crushed	<input type="checkbox"/>	Ungraded	<input type="checkbox"/>							
Bentonite/Grout seal (Yes/No)			Yes			0	20			
Method of placement of Gravel Pack				See Code 7		1				

For Departmental use only: **G W** ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Work Licence No: 40BL192733

BORE DEVELOPMENT

8

Chemical used for breaking down drilling mud (Yes/No) <input checked="" type="checkbox"/> No		Name: _____	
Method	Bailing/Surging <input type="checkbox"/>	Jetting <input type="checkbox"/>	Airlifting <input checked="" type="checkbox"/>
Duration	_____ hrs	_____ hrs	0.5 hrs
			Backwashing <input type="checkbox"/>
			Pumping <input type="checkbox"/>
			Other: _____

DISINFECTION ON COMPLETION

9

Chemical(s) used	Quantity applied (Litres)	Method of application
_____	_____	_____

PUMPING TESTS ON COMPLETION

10

Test type	Date	Pump intake depth (m)	Initial Water Level (SWL) (m)	Pumping rate (L/s)	Water Level at end of pumping (DDL) (m)	Duration of Test (hrs)	Recovery	
							Water level (m)	Time taken (hrs) (mins)
Multi stage (stepped drawdown)	Stage 1							
	Stage 2							
	Stage 3							
	Stage 4							
Single stage (constant rate)								
Height of measuring point above ground level		_____ m		Test Method		_____	See Code 4	

WORK PARTLY BACKFILLED OR ABANDONED

11

Original depth of work: _____ m	Is work partly backfilled: (Yes/No) <input type="checkbox"/>
Is work abandoned: (Yes/No) <input type="checkbox"/>	Method of abandonment: Backfilled <input type="checkbox"/> Plugged <input type="checkbox"/> Capped <input type="checkbox"/>
Has any casing been left in the work (Yes/No) <input type="checkbox"/>	From _____ m To _____ m
Sealing / fill type	From depth (m)
See Code 11	To depth (m)
	Sealing / fill type
	From depth (m)
	To depth (m)

Site chosen by:	Hydrogeologist <input type="checkbox"/>	Geologist <input type="checkbox"/>	Driller <input type="checkbox"/>	Diviner <input type="checkbox"/>	Client <input type="checkbox"/>	Other <input type="checkbox"/>
-----------------	---	------------------------------------	----------------------------------	----------------------------------	---------------------------------	--------------------------------

Lot No	National Park	DP No	National Park
Work Location Co ordinates	Easting	643789.6	Northing
			6038268.2
GPS: (Yes/No) <input checked="" type="checkbox"/> Yes	>>	AMG/AGD <input type="checkbox"/>	or MGA/GDA <input checked="" type="checkbox"/>
			Zone 55
			(See explanation)

Please mark the work site with "X" on the CLID provided map.

Indicate also the distances in metres from two (2) adjacent boundaries, and attach the map to this Form A package.

Signatures:

Driller: _____

Licensee: _____

Date: 24/01/2019

Date: _____

Work Licence No: 40BL192733

[illegible]

Depth_From	Depth_To	Lithology	Description
0.00	1.00	CLAY	CLAY fine to medium grained, light brownish grey, highly oxidised, highly weathered, very poorly sorted
1.00	2.00	SANDSTONE	SANDSTONE fine to medium grained, light brownish grey, highly oxidised, highly weathered, CLAY, 40% fine grained, medium orange, highly oxidised
2.00	3.00	SANDSTONE	SANDSTONE fine to medium grained, light brownish grey, highly oxidised, highly weathered, CLAY, 30% fine grained, medium orange, highly oxidised, 10% quartz
3.00	4.00	SANDSTONE	SANDSTONE fine to medium grained, light bluish grey, highly oxidised, moderately weathered, CLAY, 10% fine grained, medium orange, highly oxidised
4.00	5.00	SANDSTONE	SANDSTONE fine to medium grained, light bluish grey, highly oxidised, moderately weathered
5.00	6.00	SANDSTONE	SANDSTONE fine to medium grained, light brownish grey, highly oxidised, moderately weathered
6.00	7.00	SANDSTONE	SANDSTONE fine to medium grained, light brownish grey, moderately oxidised, moderately weathered
7.00	8.00	SANDSTONE	SANDSTONE fine to medium grained, light brownish grey, highly oxidised, moderately weathered
8.00	9.00	SANDSTONE	SANDSTONE fine to medium grained, light orangey grey, highly oxidised, moderately weathered
9.00	10.00	SANDSTONE	SANDSTONE fine to medium grained, light orangey grey, moderately oxidised, slightly weathered
10.00	11.00	SANDSTONE	SANDSTONE fine to medium grained, light orangey grey, moderately oxidised, slightly weathered
11.00	12.00	SANDSTONE	SANDSTONE fine to medium grained, light orangey grey, moderately oxidised, moderately weathered
12.00	13.00	SANDSTONE	SANDSTONE fine to medium grained, light orangey grey, moderately oxidised, slightly weathered
13.00	14.00	SANDSTONE	SANDSTONE fine to medium grained, light orangey grey, moderately oxidised, slightly weathered
14.00	15.00	SANDSTONE	SANDSTONE fine to medium grained, light orangey grey, moderately oxidised, slightly weathered
15.00	16.00	SANDSTONE	SANDSTONE fine to medium grained, light orangey grey, moderately oxidised, slightly weathered
16.00	17.00	SANDSTONE	SANDSTONE fine to medium grained, light orangey grey, slightly oxidised, slightly weathered
17.00	18.00	SANDSTONE	SANDSTONE fine to medium grained, light orangey grey, slightly oxidised, slightly weathered
18.00	19.00	SANDSTONE	SANDSTONE fine to medium grained, light orangey grey, slightly oxidised, slightly weathered
19.00	20.00	SANDSTONE	SANDSTONE fine to medium grained, light brownish grey, slightly oxidised, slightly weathered, 10% quartz
20.00	21.00	SANDSTONE	SANDSTONE fine to medium grained, light brownish grey, slightly oxidised, moderately weathered, SLATE, 30% fine to medium grained, medium brownish grey, slightly oxidised, 5% quartz
21.00	22.00	SLATE	SLATE fine to medium grained, light brownish grey, slightly oxidised, interbedded, platy; SANDSTONE, 30% fine to medium grained, medium brownish grey

22.00	23.00	SLATE	SLATE fine to medium grained, medium brownish grey, slightly oxidised, interbedded, platy; SANDSTONE, 30% fine to medium grained, medium brownish grey
23.00	24.00	SLATE	SLATE fine to medium grained, medium brownish grey, slightly oxidised, interbedded
24.00	25.00	SLATE	SLATE fine to medium grained, medium brownish grey, slightly oxidised, interbedded, platy; SANDSTONE, 20% fine to medium grained, medium brownish grey
25.00	26.00	SLATE	SLATE fine to medium grained, medium brownish grey, slightly oxidised, interbedded, platy; SANDSTONE, 30% fine to medium grained, medium brownish grey
26.00	27.00	SLATE	SLATE fine to medium grained, medium brownish grey, slightly oxidised, platy
27.00	28.00	SLATE	SLATE fine to medium grained, medium brownish grey, slightly oxidised, interbedded, platy; SANDSTONE, 30% fine to medium grained, medium brownish grey
28.00	29.00	SLATE	SLATE fine to medium grained, medium brownish grey, slightly oxidised, interbedded, platy; SANDSTONE, 40% fine to medium grained, medium brownish grey
29.00	30.00	SANDSTONE	SANDSTONE fine to medium grained, medium brownish grey, slightly oxidised



Bore ID: MB08A

Project: Snowy 2.0

Project number: J17188

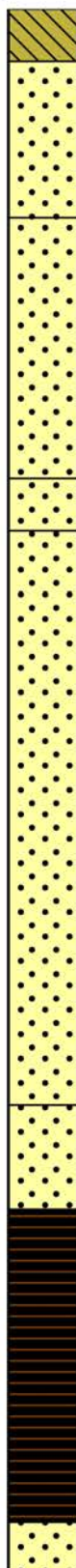

Elevation: 1435.2 mAHD

Easting: 643789.6

Northing: 6038268.2

Date: 21/11/2018

Casing: 50mm PVC

Depth (mbgl)	Lithology Graphic	Description	Drilling Notes	Bore Completion	
				Diagram	Design notes
0		CLAY fine to medium grained, light brownish grey, highly oxidised, highly weathered, very poorly sorted	Drilled dry. No groundwater samples during drilling		Cement grout (0 - 1 mBGL)
SANDSTONE fine to medium grained, light brownish grey, highly oxidised, highly weathered, CLAY, 30% fine grained, medium orange, highly oxidised		7.5 inch diameter borehole (0 - 6 mBGL)			
SANDSTONE fine to medium grained, light brownish grey, highly oxidised, moderately weathered		6 inch PVC surface casing (0 - 6 mBGL)			
SANDSTONE fine to medium grained, light orangey grey, highly oxidised, moderately weathered		Blue metal gravel backfill (5-8mm wash) (1 - 14 mBGL)			
SANDSTONE fine to medium grained, light orangey grey, moderately oxidised, slightly weathered		5.5 inch diameter borehole (6 - 30 mBGL)			
		50mm blank PN18 U-PVC casing (0 - 19 mBGL)			
		Bentonite seal (14 - 19 mBGL)			
		Gravel pack (5mm wash) (19 - 30 mBGL)			
10					
20					
30					

Driller's Licence No:	DL1913	1
Class of Licence:	Class 4	
Driller's Name:	Ian Palk	
Assistant Driller:	Wayne Spratley	
Contractor:	Highland Drilling	
New bore	<input checked="" type="checkbox"/>	Replacement bore <input type="checkbox"/>
Deepened	<input type="checkbox"/>	Enlarged <input type="checkbox"/>
Reconditioned	<input type="checkbox"/>	Other (specify) <input type="checkbox"/>
Final Depth	298 m	

Work Licence No:	40BL192733	2
Name of Licensee:	Snowy Hydro Limited	
Intended Use:	Monitoring Bore	
Completion Date:	17/10/18	

DRILLING DETAILS				3
From (m)	To (m)	Hole Diameter (mm)	Drilling Method See Code 3	
0	30	200	9	
30	298	140	9	

WATER BEARING ZONES											4
From (m)	To (m)	Thickness (m)	S W L (m)	Estimated Yield (L/s)		Test method See Code 4	D D L at end of test (m)	Duration		Salinity (Conductivity or TDS)	
				Individual Aquifer	Cumulative			Hrs	min	Cond (µS/cm)	TDS (mg/L)
			22.44			1 A					
				See	Attachment	1 A					
						1 A					

CASING / LINER DETAILS											5	
Material	OD (mm)	Wall Thickness (mm)	From (m)	To (m)	Method Fixing Code 5	Casing support method See Code 5 2						
Code 5	(mm)	(mm)	(m)	(m)	Code 5	Type of casing bottom See Code 5 2						
5	160.25	4.2	0	30	4	Centralisers installed	{Yes/No}	No	(indicate on sketch)			
8	60.2	5	0	279	5	Sump installed	{Yes/No}	Yes	From	297 m	To	298 m
8	60.2	5	297	294		Pressure cemented	{Yes/No}	No	From		To	
						Casing Protector cemented in place						

WATER ENTRY DESIGN											6
General							Screen	Slot Details			
Material	OD (mm)	Wall Thickness (mm)	From (m)	To (m)	Opening type See Code 6	Fixing See Code 5	Aperture (mm)	Length (mm)	Width (mm)	Alignment See Code 6	
Code 5	(mm)	(mm)	(m)	(m)	See Code 6	See Code 5	(mm)	(mm)	(mm)		
8	60.2	5	279	297	5	5	0.4	20	10	H	

GRAVEL PACK											7
Type		Grade	Grain size (mm)		Depth (m)		Quantity				
			From	To	From	To	Litres	m ³			
Rounded	<input checked="" type="checkbox"/>	Graded	<input checked="" type="checkbox"/>	3	5	275	298				
Crushed	<input type="checkbox"/>	Ungraded	<input type="checkbox"/>								
Bentonite/Grout seal (Yes/No)			Yes			265	275				
Method of placement of Gravel Pack			See Code 7		1						

For Departmental use only: **G W** ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Work Licence No: 40BL192733

BORE DEVELOPMENT

8

Chemical used for breaking down drilling mud (Yes/No) <input checked="" type="checkbox"/> No		Name: _____	
Method	Bailing/Surging <input type="checkbox"/>	Jetting <input type="checkbox"/>	Airlifting <input checked="" type="checkbox"/>
Duration	_____ hrs	_____ hrs	0.5 hrs

DISINFECTION ON COMPLETION

9

Chemical(s) used	Quantity applied (Litres)	Method of application
_____	_____	_____

PUMPING TESTS ON COMPLETION

10

Test type	Date	Pump intake depth (m)	Initial Water Level (SWL) (m)	Pumping rate (L/s)	Water Level at end of pumping (DDL) (m)	Duration of Test (hrs)	Recovery	
							Water level (m)	Time taken (hrs) (mins)
Multi stage (stepped drawdown)	Stage 1							
	Stage 2							
	Stage 3							
	Stage 4							
Single stage (constant rate)								
Height of measuring point above ground level		_____ m		Test Method		_____	See Code 4	

WORK PARTLY BACKFILLED OR ABANDONED

11

Original depth of work: _____ m	Is work partly backfilled: (Yes/No) <input type="checkbox"/>
Is work abandoned: (Yes/No) <input type="checkbox"/>	Method of abandonment: Backfilled <input type="checkbox"/> Plugged <input type="checkbox"/> Capped <input type="checkbox"/>
Has any casing been left in the work (Yes/No) <input type="checkbox"/>	From _____ m To _____ m
Sealing / fill type	From depth (m)
See Code 11	To depth (m)

Site chosen by:	Hydrogeologist <input type="checkbox"/>	Geologist <input type="checkbox"/>	Driller <input type="checkbox"/>	Diviner <input type="checkbox"/>	Client <input type="checkbox"/>	Other <input type="checkbox"/>
-----------------	---	------------------------------------	----------------------------------	----------------------------------	---------------------------------	--------------------------------

12

Lot No	National Park	DP No	National Park
Work Location Co ordinates	Easting	643789.6	Northing
			6038276.7
GPS: (Yes/No) <input checked="" type="checkbox"/> Yes	>>	AMG/AGD <input type="checkbox"/>	or MGA/GDA <input checked="" type="checkbox"/>
			Zone 55
			(See explanation)

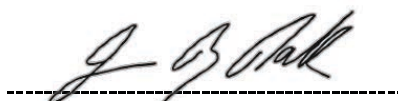
13

Please mark the work site with "X" on the CLID provided map.

Indicate also the distances in metres from two (2) adjacent boundaries, and attach the map to this Form A package.

Signatures:

Driller:



Licensee:

Date:

24/01/2019

Date:




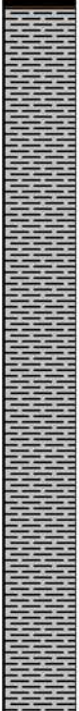
Work Licence No: 40BL192733

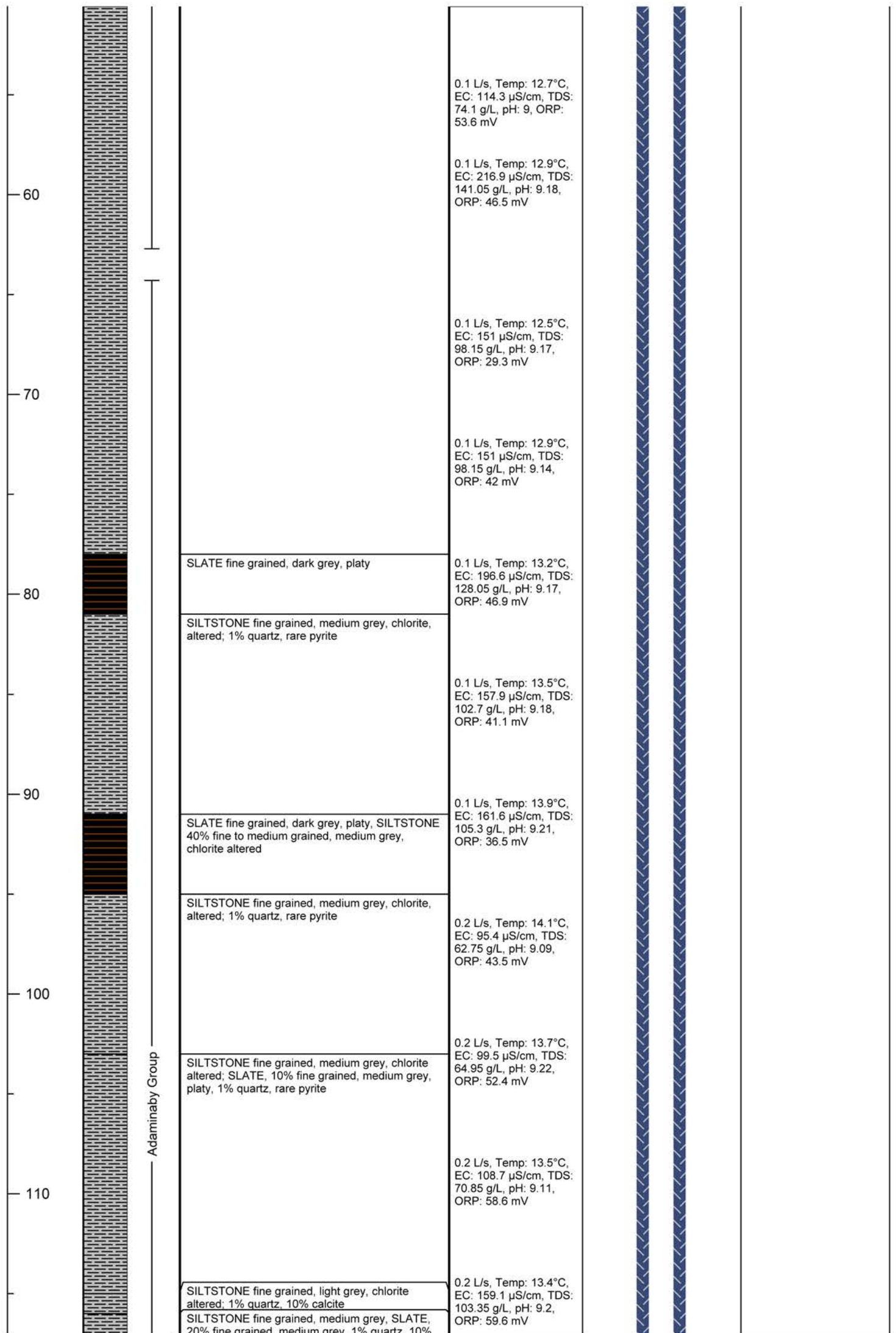
[illegible]

Top	Base	Lithology	Description
0	1	CLAY	CLAY fine to medium grained, medium brownish grey, highly oxidised, highly weathered, very poorly sorted
1	4	SANDSTONE	SANDSTONE fine to medium grained, light brownish grey, moderately oxidised, highly weathered
4	5	SANDSTONE	SANDSTONE fine to medium grained, light orangey grey, highly oxidised, moderately weathered
5	11	SANDSTONE	SANDSTONE fine to medium grained, medium orangey brown, highly oxidised, moderately weathered
11	12	SANDSTONE	SANDSTONE fine to medium grained, light bluish grey, slightly oxidised, moderately weathered
12	20	SANDSTONE	SANDSTONE fine to medium grained, medium bluish grey, moderately oxidised, slightly weathered
20	21	SANDSTONE	SANDSTONE fine to medium grained, medium brownish grey, slightly oxidised, moderately weathered, slate, 10% fine to medium grained, medium brownish grey, slightly oxidised
21	29	SLATE	SLATE fine to medium grained, medium brownish grey, slightly oxidised, interbedded, platy; sandstone, 10% fine to medium grained, medium brownish grey
29	78	SILTSTONE	SILTSTONE fine grained, medium brownish grey, varying quartz content, rare pyrite, minor chlorite alteration, and rare sericite
78	81	SLATE	SLATE fine grained, dark grey, platy
81	91	SILTSTONE	SILTSTONE fine grained, medium grey, chlorite, altered; 1% quartz, rare pyrite
91	95	SLATE	SLATE fine grained, dark grey, platy, siltstone, 40% fine to medium grained, medium grey, chlorite, altered
95	103	SILTSTONE	SILTSTONE fine grained, medium grey, chlorite, altered; 1% quartz, rare pyrite
103	115	SILTSTONE	SILTSTONE fine grained, medium grey, chlorite, altered; slate, 10% fine grained, medium grey, platy, 1% quartz, rare pyrite
115	116	SILTSTONE	SILTSTONE fine grained, light grey, chlorite, altered; 1% quartz, 10% calcite
116	122	SILTSTONE	SILTSTONE fine grained, medium grey, slate, 20% fine grained, medium grey, 1% quartz, 10% calcite
122	125	SLATE	SLATE fine grained, dark grey, chlorite, altered; siltstone, 10% fine grained, medium grey
125	129	SILTSTONE	SILTSTONE fine grained, medium grey, chlorite, altered; slate, 10% fine grained, medium grey, rare pyrite
129	143	SILTSTONE	SILTSTONE fine grained, medium grey, varying quartz content, rare pyrite, minor chlorite alteration, rare sericite, rare calcite
143	144	SLATE	SLATE fine grained, dark grey, chlorite, altered; siltstone, 40% fine grained, medium grey, 1% quartz
144	145	SILTSTONE	SILTSTONE fine grained, medium grey, 1% quartz
145	146	SLATE	SLATE fine grained, medium grey, 2% quartz
146	150	SILTSTONE	SILTSTONE fine grained, medium grey, chlorite, altered; slate, 10% fine grained, medium grey, 2% quartz, 1% calcite, rare pyrite
150	158	SLATE	SLATE fine grained, medium grey, siltstone, 10% fine grained, medium grey, 1% quartz, rare pyrite
158	165	SILTSTONE	SILTSTONE fine grained, medium grey, varying quartz content, rare pyrite, minor chlorite alteration, rare sericite
165	169	SLATE	SLATE fine grained, medium grey, siltstone, 40% fine grained, medium grey, 1% quartz, rare pyrite, rare calcite

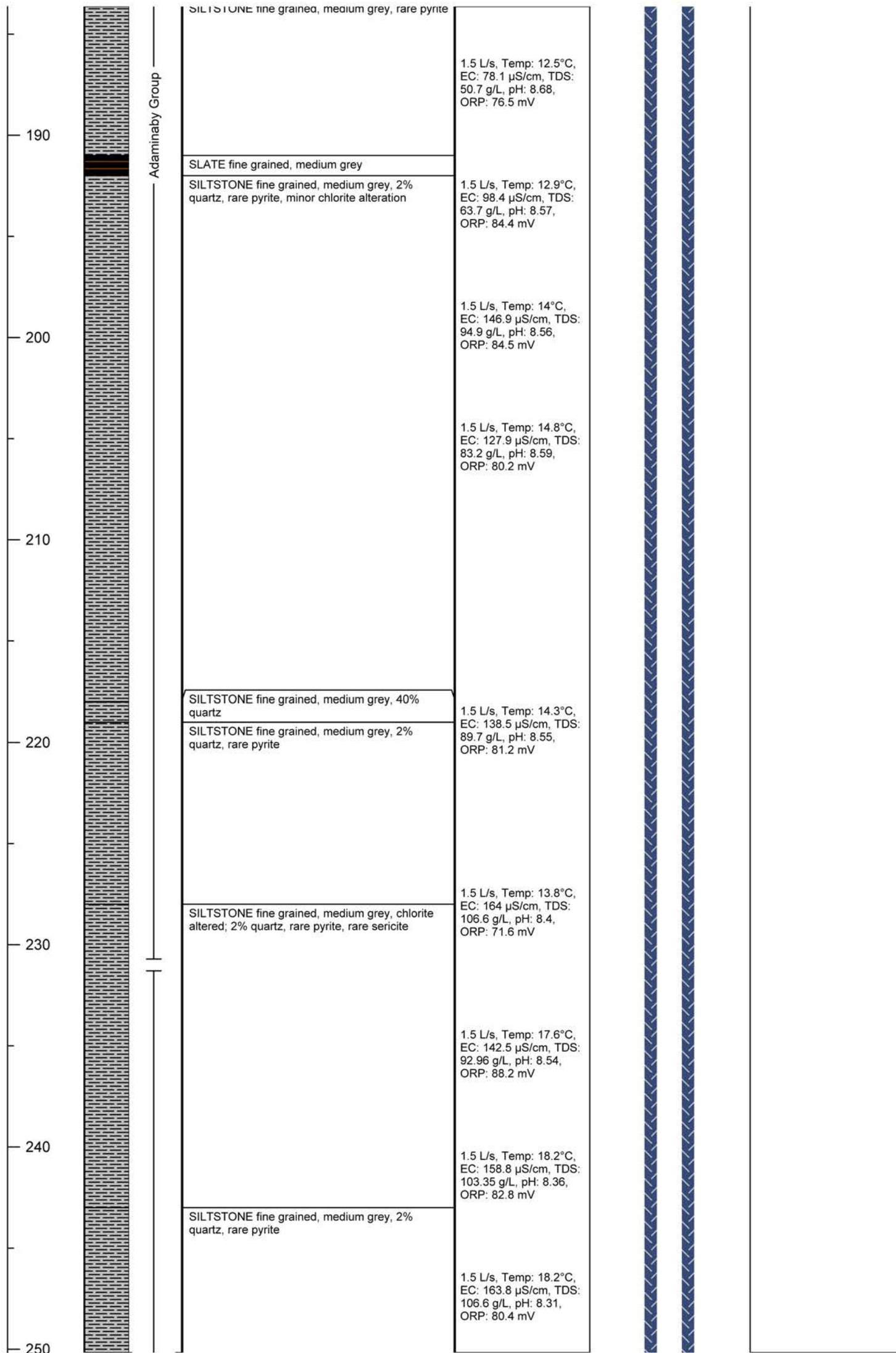
169	171	SILTSTONE	SILTSTONE fine grained, medium grey, chlorite, altered; slate, 10% fine grained, medium grey, 1% quartz, rare pyrite
171	173	SLATE	SLATE fine grained, medium grey, siltstone, 10% fine grained, medium grey, 1% quartz, rare pyrite
173	176	SILTSTONE	SILTSTONE fine grained, medium grey, chlorite, altered
176	178	SLATE	SLATE fine grained, medium grey, siltstone, 10% fine grained, medium grey
178	183	SILTSTONE	SILTSTONE fine grained, medium grey, chlorite, altered; 2% quartz, rare pyrite
183	191	SILTSTONE	SILTSTONE fine grained, medium grey, rare pyrite
191	192	SLATE	SLATE fine grained, medium grey
192	218	SILTSTONE	SILTSTONE fine grained, medium grey, 2% quartz, rare pyrite, varying quartz content, rare pyrite, minor chlorite alteration
218	219	SILTSTONE	SILTSTONE fine grained, medium grey, 40% quartz
219	228	SILTSTONE	SILTSTONE fine grained, medium grey, 2% quartz, rare pyrite
228	243	SILTSTONE	SILTSTONE fine grained, medium grey, chlorite, altered; 2% quartz, rare pyrite, varying quartz content, rare pyrite, minor chlorite alteration, rare sericite
243	274	SILTSTONE	SILTSTONE fine grained, medium grey, 2% quartz, rare pyrite
274	298	SILTSTONE	SILTSTONE fine grained, medium grey, 5% quartz, rare pyrite, varying quartz content, rare pyrite, minor chlorite alteration, rare sericite

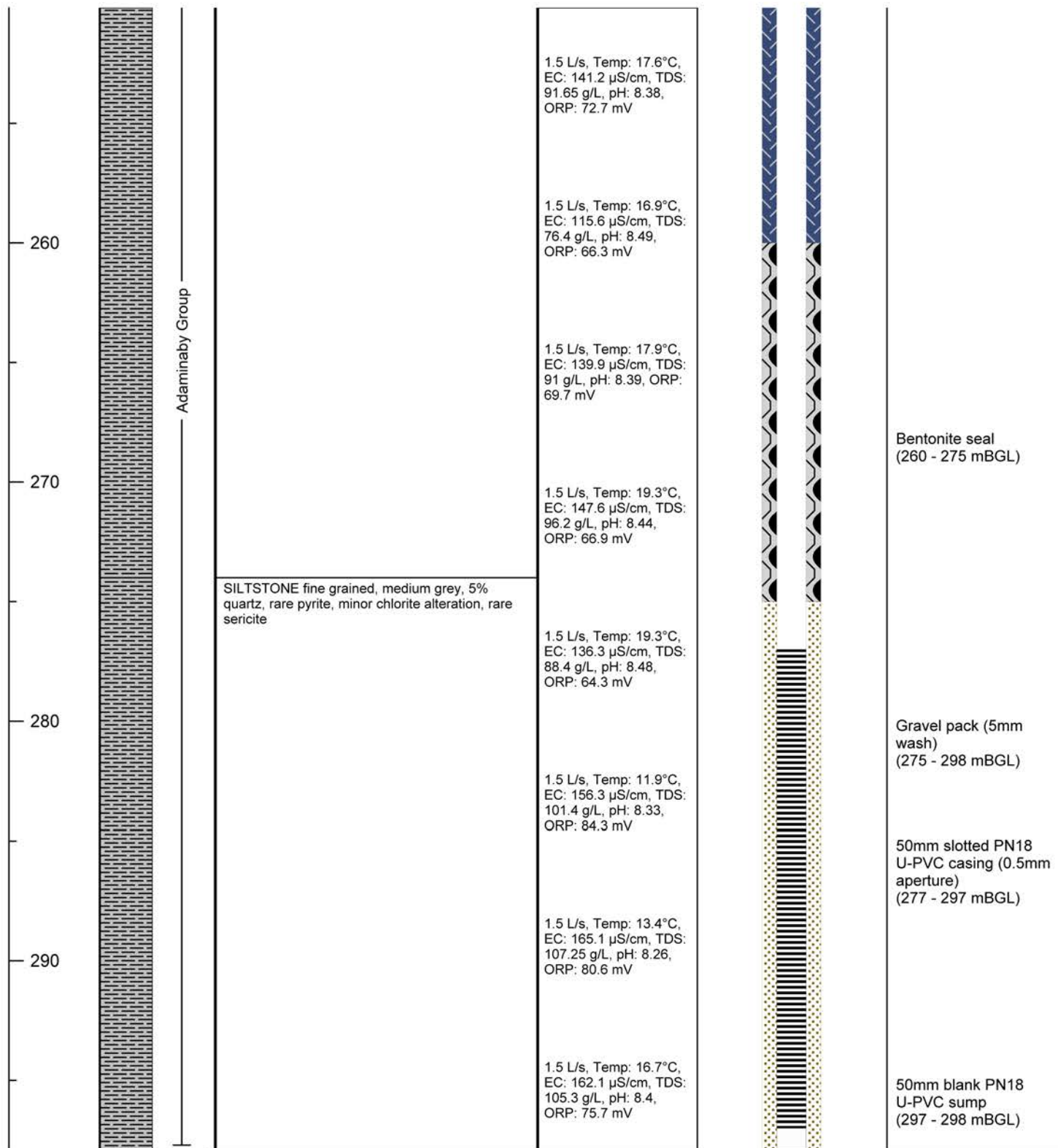
WATER BEARING ZONES												4
From (m)	To (m)	Thickness (m)	S W L (m)	Estimated Yield (L/s)		Test method		D D L at end of test (m)	Duration		Salinity (Conductivity or TDS)	
				Individual Aquifer	Cumulative	See Code 4			Hrs	min	Cond (μS/cm)	TDS (mg/L)
29	30	1	22.44	0.1	0.1	1	A				1136	
95	96	1		0.1	0.2	1	A				95	
125	126	1		0.1	0.3	1	A				81	
137	138	1		0.5	0.8	1	A				155	
155	156	1		1	1.5	1	A				154	
						1	A					

 www.emmconsulting.com.au Suite 01, 20 Chandos Street St Leonards NSW 2065 T: 02 9493 9500 F: 02 9493 9599		WATER MONITORING BORE LOG		Bore ID: MB08B	
		Client: Snowy Hydro Limited		Project: Snowy 2.0	
		Date completed: 17/10/2018		Project number: J17188	
Drilling contractor: Highland Drilling		Elevation: 1435.6 mAHD		Eastings: 643789.6	
Drilling method: Air Rotary		Northing: 6038276.7			
Hydrogeologist: Kaitlyn Brodie					
Static Water Level: 22.44 mBGL		Screened Formation: Adaminaby Group		Date: 21/11/2018	
Total depth: 298 m		Screened depth: 278 - 298 mBGL		Casing: 50 mm threaded PVC	
Depth (mBGL)	Lithology Graphic	Description	Drilling Notes	Bore Completion	
				Diagram	Design notes
0		CLAY fine to medium grained, medium brownish grey, highly oxidised, highly weathered, very poorly sorted			Cement grout (0 - 1 mBGL)
		SANDSTONE fine to medium grained, light brownish grey, moderately oxidised, highly weathered			
		SANDSTONE fine to medium grained, light orangey grey, highly oxidised, moderately weathered			7.5 inch diameter borehole (0 - 24 mBGL)
		SANDSTONE fine to medium grained, medium orangey brown, highly oxidised, moderately weathered			
10		SANDSTONE fine to medium grained, light bluish grey, slightly oxidised, moderately weathered			
		SANDSTONE fine to medium grained, medium bluish grey, moderately oxidised, slightly weathered			
					6 inch steel surface casing (0 - 24 mBGL)
20		SANDSTONE fine to medium grained, medium brownish grey, slightly oxidised, moderately weathered, SLATE, 10% fine to medium grained, medium brownish grey, slightly oxidised			
		SLATE fine to medium grained, medium brownish grey, slightly oxidised, interbedded, platy; SANDSTONE, 10% fine to medium grained, medium brownish grey			
					Blue metal gravel backfill (5-8mm wash) (1 - 260 mBGL)
30		SILTSTONE fine grained, medium brownish grey, varying quartz content, rare pyrite, minor chlorite alteration, and rare sericite	0.1 L/s, Temp: 12.2°C, EC: 1136 µS/cm, TDS: 738 g/L, pH: 11.8, ORP: -62.8 mV		5.5 inch diameter borehole (24 - 298 mBGL)
			0.1 L/s, Temp: 14.6°C, EC: 838 µS/cm, TDS: 539.5 g/L, pH: 11.11, ORP: -42.8 mV		
40			0.1 L/s, Temp: 18.5°C, EC: 280.9 µS/cm, TDS: 183.95 g/L, pH: 9.73, ORP: 19.9 mV		50mm blank PN18 U-PVC casing (0 - 277 mBGL)
50			0.1 L/s, Temp: 12.4°C, EC: 155.5 µS/cm, TDS: 101.4 g/L, pH: 9.17, ORP: 43.6 mV		



120		20% fine grained, medium grey, 1% quartz, 10% calcite	0.2 L/s, Temp: 14.6°C, EC: 171.5 µS/cm, TDS: 111.8 g/L, pH: 8.93, ORP: 58.9 mV			
		SLATE fine grained, dark grey, chlorite altered; SILTSTONE, 10% fine grained, medium grey				
		SILTSTONE fine grained, medium grey, chlorite altered; SLATE, 10% fine grained, medium grey, rare pyrite				
130		SILTSTONE fine grained, medium grey, varying quartz content, rare pyrite, minor chlorite alteration, rare sericite, rare calcite	0.3 L/s, Temp: 16.5°C, EC: 81.4 µS/cm, TDS: 52.65 g/L, pH: 9.21, ORP: 44.8 mV			
		SILTSTONE fine grained, medium grey, varying quartz content, rare pyrite, minor chlorite alteration, rare sericite, rare calcite				0.3 L/s, Temp: 18.1°C, EC: 156.2 µS/cm, TDS: 101.4 g/L, pH: 9.21, ORP: 46.7 mV
		SILTSTONE fine grained, medium grey, varying quartz content, rare pyrite, minor chlorite alteration, rare sericite, rare calcite				
140		SILTSTONE fine grained, medium grey, varying quartz content, rare pyrite, minor chlorite alteration, rare sericite, rare calcite	0.8 L/s, Temp: 14.8°C, EC: 155.3 µS/cm, TDS: 100.75 g/L, pH: 8.83, ORP: 68.5 mV			
		SLATE fine grained, dark grey, chlorite altered; SILTSTONE, 40% fine grained, medium grey, 1% quartz				0.8 L/s, Temp: 12.8°C, EC: 217 µS/cm, TDS: 141.05 g/L, pH: 8.83, ORP: 72.9 mV
		SILTSTONE fine grained, medium grey, 1% quartz				
150		SLATE fine grained, medium grey, 2% quartz	0.8 L/s, Temp: 14.3°C, EC: 153.3 µS/cm, TDS: 99.45 g/L, pH: 8.78, ORP: 68.9 mV			
		SILTSTONE fine grained, medium grey, chlorite altered; SLATE, 10% fine grained, medium grey, 2% quartz, 1% calcite, rare pyrite				
		SLATE fine grained, medium grey, SILTSTONE, 10% fine grained, medium grey, 1% quartz, rare pyrite				
160		SILTSTONE fine grained, medium grey, varying quartz content, rare pyrite, minor chlorite alteration, rare sericite	0.8 L/s, Temp: 12.7°C, EC: 109.4 µS/cm, TDS: 70.85 g/L, pH: 8.73, ORP: 74.2 mV			
		SILTSTONE fine grained, medium grey, varying quartz content, rare pyrite, minor chlorite alteration, rare sericite				1.5 L/s, Temp: 7.6°C, EC: 154.1 µS/cm, TDS: 100.1 g/L, pH: 8.57, ORP: 113.5 mV
		SILTSTONE fine grained, medium grey, varying quartz content, rare pyrite, minor chlorite alteration, rare sericite				
170		SLATE fine grained, medium grey, SILTSTONE, 40% fine grained, medium grey, 1% quartz, rare pyrite, rare calcite	1.5 L/s, Temp: 10.1°C, EC: 151.8 µS/cm, TDS: 98.8 g/L, pH: 8.56, ORP: 104.9 mV			
		SILTSTONE fine grained, medium grey, chlorite altered; SLATE, 10% fine grained, medium grey, 1% quartz, rare pyrite				
		SLATE fine grained, medium grey, SILTSTONE, 10% fine grained, medium grey, 1% quartz, rare pyrite				
180		SILTSTONE fine grained, medium grey, chlorite altered	1.5 L/s, Temp: 12.1°C, EC: 145.5 µS/cm, TDS: 94.25 g/L, pH: 8.6, ORP: 92 mV			
		SLATE fine grained, medium grey, SILTSTONE, 10% fine grained, medium grey		1.5 L/s, Temp: 10°C, EC: 147.4 µS/cm, TDS: 95.55 g/L, pH: 8.59, ORP: 88.9 mV		
		SILTSTONE fine grained, medium grey, chlorite altered; 2% quartz, rare pyrite				
		SILTSTONE fine grained, medium grey, rare pyrite				





Driller's Licence No:	DL1913	1
Class of Licence:	Class 4	
Driller's Name:	Ian Palk	
Assistant Driller:	Wayne Spratley	
Contractor:	Highland Drilling	
New bore	<input checked="" type="checkbox"/>	Replacement bore <input type="checkbox"/>
Deepened	<input type="checkbox"/>	Enlarged <input type="checkbox"/>
Reconditioned	<input type="checkbox"/>	Other (specify) <input type="checkbox"/>
Final Depth	300 m	

Work Licence No:	40BL192723	2
Name of Licensee:	Snowy Hydro Limited	
Intended Use:	Monitoring Bore	
Completion Date:	18/12/18	

DRILLING DETAILS				3
From (m)	To (m)	Hole Diameter (mm)	Drilling Method	
0	30	254	See Code 3	9
30	200	190.5		9
200	300	99		9

WATER BEARING ZONES												4
From (m)	To (m)	Thickness (m)	S W L (m)	Estimated Yield (L/s)		Test method	D D L at end of test (m)	Duration		Salinity (Conductivity or TDS)		
				Individual Aquifer	Cumulative			Hrs	min	Cond (µS/cm)	TDS (mg/L)	
				See	Attached	1 A						

CASING / LINER DETAILS													5	
Material	OD	Wall Thickness	From	To	Method Fixing	Casing support method			See Code 5		6			
Code 5	(mm)	(mm)	(m)	(m)	Code 5	Type of casing bottom			See Code 5		1			
9	219	4.2	0	30	6	Centralisers installed	{Yes/No}	No	(indicate on sketch)					
9	130	4.2	0	200	6	Sump installed	{Yes/No}	No	From		m	To		m
						Pressure cemented	{Yes/No}	No	From		m	To		m
						Casing Protector cemented in place								

WATER ENTRY DESIGN												6
General							Screen	Slot Details				
Material	OD	Wall Thickness	From	To	Opening type	Fixing	Aperture	Length	Width	Alignment		
Code 5	(mm)	(mm)	(m)	(m)	See Code 6	See Code 5	(mm)	(mm)	(mm)	See Code 6		
		open hole	200	300			Open hole	no casing				

GRAVEL PACK												7
Type		Grade		Grain size (mm)		Depth (m)		Quantity				
				From	To	From	To	Litres		m ³		
Rounded		Graded		No	Gravel Pack	Open hole						
Crushed		Ungraded										
Bentonite/Grout seal		(Yes/No)		Yes								
Method of placement of Gravel Pack				See Code 7		1						

For Departmental use only: **G W** ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Work Licence No: 40BL192723

BORE DEVELOPMENT

8

Chemical used for breaking down drilling mud (Yes/No) <input checked="" type="checkbox"/> No		Name: _____	
Method	Bailing/Surging <input type="checkbox"/>	Jetting <input type="checkbox"/>	Airlifting <input checked="" type="checkbox"/>
Duration	_____ hrs	_____ hrs	0.5 hrs

DISINFECTION ON COMPLETION

9

Chemical(s) used	Quantity applied (Litres)	Method of application
_____	_____	_____

PUMPING TESTS ON COMPLETION

10

Test type	Date	Pump intake depth (m)	Initial Water Level (SWL) (m)	Pumping rate (L/s)	Water Level at end of pumping (DDL) (m)	Duration of Test (hrs)	Recovery	
							Water level (m)	Time taken (hrs) (mins)
Multi stage (stepped drawdown)	Stage 1							
	Stage 2							
	Stage 3							
	Stage 4							
Single stage (constant rate)								
Height of measuring point above ground level		_____ m		Test Method		_____	See Code 4	

WORK PARTLY BACKFILLED OR ABANDONED

11

Original depth of work: _____ m	Is work partly backfilled: (Yes/No) <input type="checkbox"/>
Is work abandoned: (Yes/No) <input type="checkbox"/>	Method of abandonment: Backfilled <input type="checkbox"/> Plugged <input type="checkbox"/> Capped <input type="checkbox"/>
Has any casing been left in the work (Yes/No) <input type="checkbox"/>	From _____ m To _____ m
Sealing / fill type	From depth (m)
See Code 11	(m)
Sealing / fill type	From depth (m)
See Code 11	(m)

Site chosen by: Hydrogeologist <input checked="" type="checkbox"/>	Geologist <input type="checkbox"/>	Driller <input type="checkbox"/>	Diviner <input type="checkbox"/>	Client <input type="checkbox"/>	Other <input type="checkbox"/>
--	------------------------------------	----------------------------------	----------------------------------	---------------------------------	--------------------------------

12

Lot No National Park	DP No National Park
Work Location Co ordinates	Easting 632503.2
GPS: (Yes/No) <input checked="" type="checkbox"/>	AMG/AGD <input type="checkbox"/>
	or MGA/GDA <input checked="" type="checkbox"/>
	Zone 55
	(See explanation)

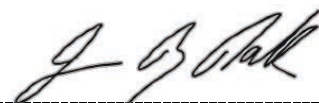
13

Please mark the work site with "X" on the CLID provided map.

Indicate also the distances in metres from two (2) adjacent boundaries, and attach the map to this Form A package.

Signatures:

Driller:



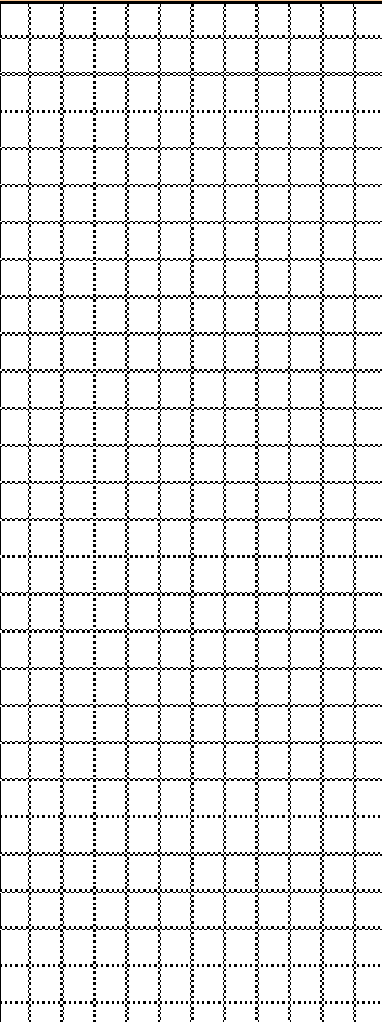
Licensee:

Date:

24/01/2019

Date:

Work Licence No: 40BL192723

DRILLER'S ROCK/STRATA DESCRIPTION (LITHOLOGY)			15
Depth		Description See Code 15	
From (m)	To (m)		
		See attachment	<div>WORK CONSTRUCTION SKETCH</div> 


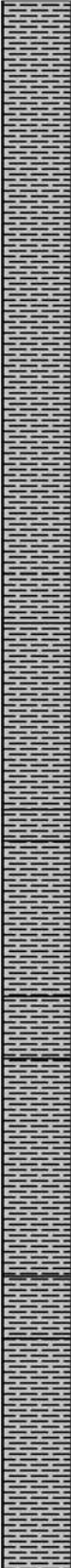

WORK NOT CONSTRUCTED BY DRILLING RIG								16
Method of excavation: Hand dug <input type="checkbox"/> Back hoe <input type="checkbox"/> Dragline <input type="checkbox"/> Dozer <input type="checkbox"/> Other <input type="text"/>								
Depth (m)	Length (m)	Width (m)	Diameter (m)	Lining material	Dimensions of liner (m)	From Depth (m)	To Depth (m)	

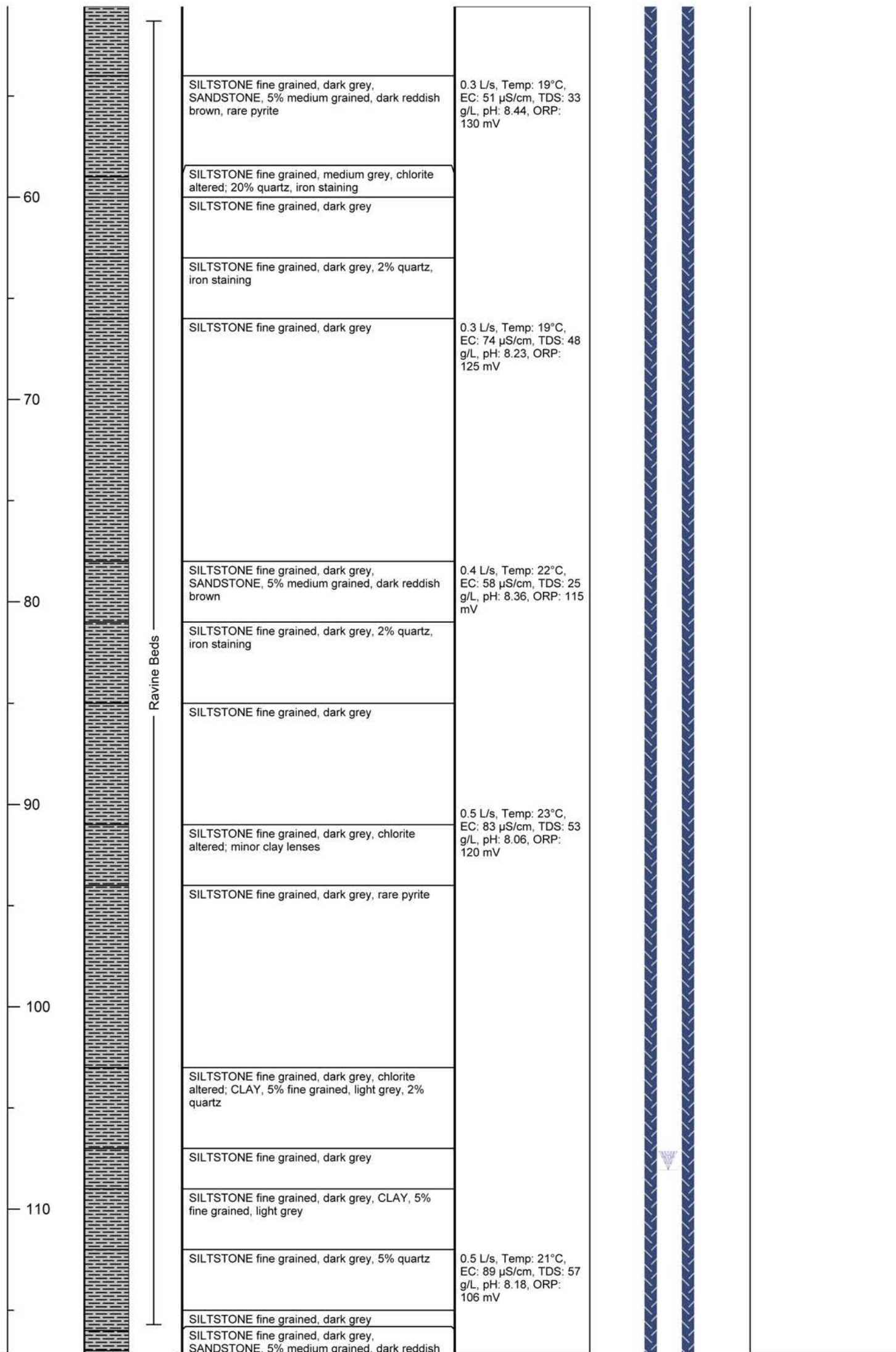
Please attach copies of the following if available						17		
Geologist log	(Yes/No)	<input checked="" type="checkbox"/> Yes	Laboratory analysis of water Sample	(Yes/No)	<input type="checkbox"/>	Pumping test(s)	(Yes/No)	<input type="checkbox"/>
Geophysical log	(Yes/No)	<input type="checkbox"/>	Sieve analysis of aquifer material	(Yes/No)	<input type="checkbox"/>	Installed Pump details	(Yes/No)	<input type="checkbox"/>

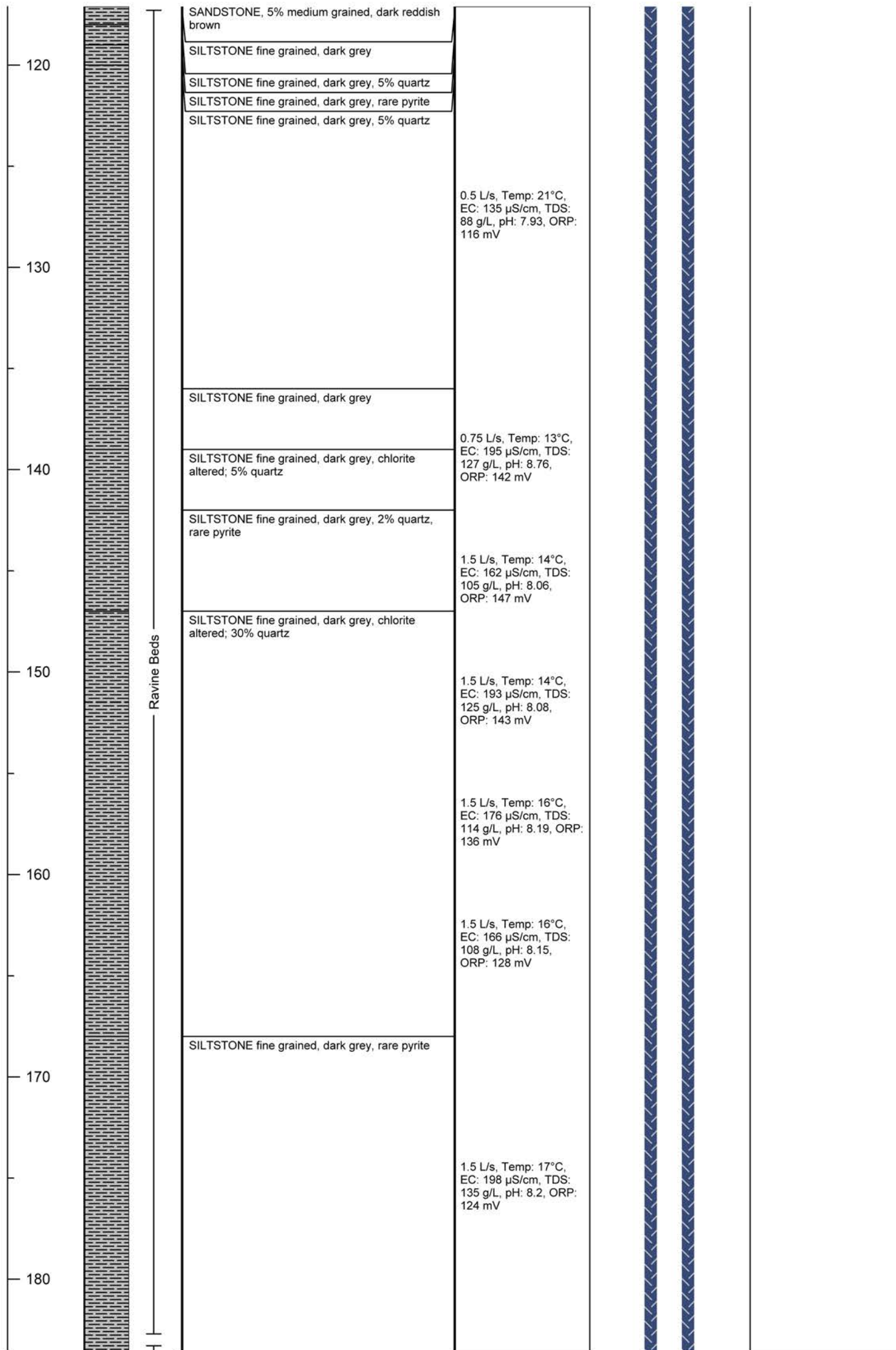
Top	Base	Lithology	Description
0.00	20.00	SILTSTONE	SILTSTONE very fine to fine grained , medium brownish grey, moderately oxidised
20.00	26.00	SILTSTONE	SILTSTONE very fine to fine grained , medium grey, slightly oxidised
26.00	27.00	SILTSTONE	SILTSTONE very fine to fine grained , medium brownish grey, slightly oxidised, 5% quartz
27.00	32.00	SILTSTONE	SILTSTONE very fine to fine grained , medium brownish grey, slightly oxidised
32.00	34.00	SILTSTONE	SILTSTONE very fine to fine grained , medium brownish grey, slightly oxidised, 10% quartz
34.00	41.00	SILTSTONE	SILTSTONE very fine to fine grained , medium brownish grey
41.00	43.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, Redish staining
43.00	54.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, rare pyrite
54.00	59.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, SANDSTONE, 5% medium grained , dark reddish brown, rare pyrite
59.00	60.00	SILTSTONE	SILTSTONE very fine to fine grained , medium grey, chlorite, altered; 20% quartz, Redish staining
60.00	63.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey
63.00	66.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, 2% quartz, Redish staining
66.00	78.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey
78.00	81.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, SANDSTONE, 5% medium grained , dark reddish brown
81.00	85.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, 2% quartz, Redish staining
85.00	91.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey
91.00	94.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, chlorite, altered; Minor clay lenses
94.00	103.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, rare pyrite
103.00	107.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, chlorite, altered; CLAY, 5% very fine to fine grained , light grey, 2% quartz
107.00	109.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey
109.00	112.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, CLAY, 5% very fine to fine grained , light grey
112.00	115.00	SILTSTONE	SILTSTONE, very fine to fine grained, dark grey
115.00	116.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, 5% quartz
116.00	117.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey
117.00	118.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, SANDSTONE, 5% medium grained , dark reddish brown
118	119	SILTSTONE	SILTSTONE very fine to fine grained , dark grey
119.00	120.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, 5% quartz
120.00	136.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, rare pyrite
136.00	139.00	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, 5% quartz
139	142	SILTSTONE	SILTSTONE very fine to fine grained , dark grey
142	147	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, chlorite, altered; 5% quartz
147	168	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, 2% quartz, rare pyrite
168	184	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, chlorite, altered; 30% quartz
184	199	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, rare pyrite

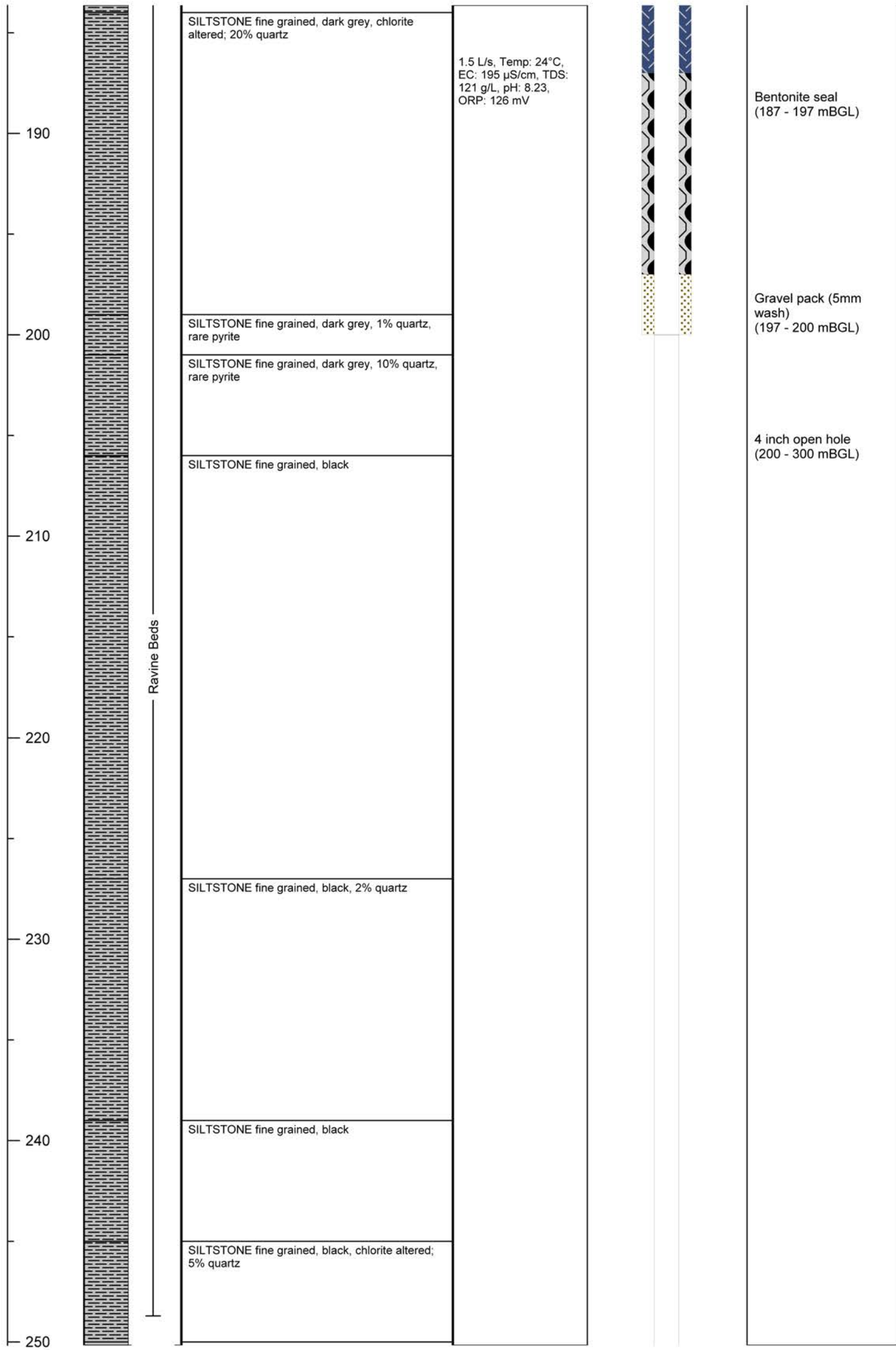
199	201	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, chlorite, altered; 20% quartz
201	206	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, 1% quartz, rare pyrite
206	227	SILTSTONE	SILTSTONE very fine to fine grained , dark grey, 10% quartz, rare pyrite
227	239	SILTSTONE	SILTSTONE very fine to fine grained , dark black
239	245	SILTSTONE	SILTSTONE very fine to fine grained , dark black, 2% quartz
245	250	SILTSTONE	SILTSTONE very fine to fine grained , dark black
250	268	SILTSTONE	SILTSTONE very fine to fine grained , dark black, chlorite, altered; 5% quartz
268	269	SILTSTONE	SILTSTONE very fine to fine grained , dark black, CLAY, 50% very fine to fine grained , light grey
269	270	SILTSTONE	SILTSTONE very fine to fine grained , dark black, chlorite, altered; CLAY, 5% very fine to fine grained , light grey
270	281	SILTSTONE	SILTSTONE very fine to fine grained , dark black
281	300	SILTSTONE	SILTSTONE very fine to fine grained , dark black, chlorite, altered; 1% quartz, rare pyrite

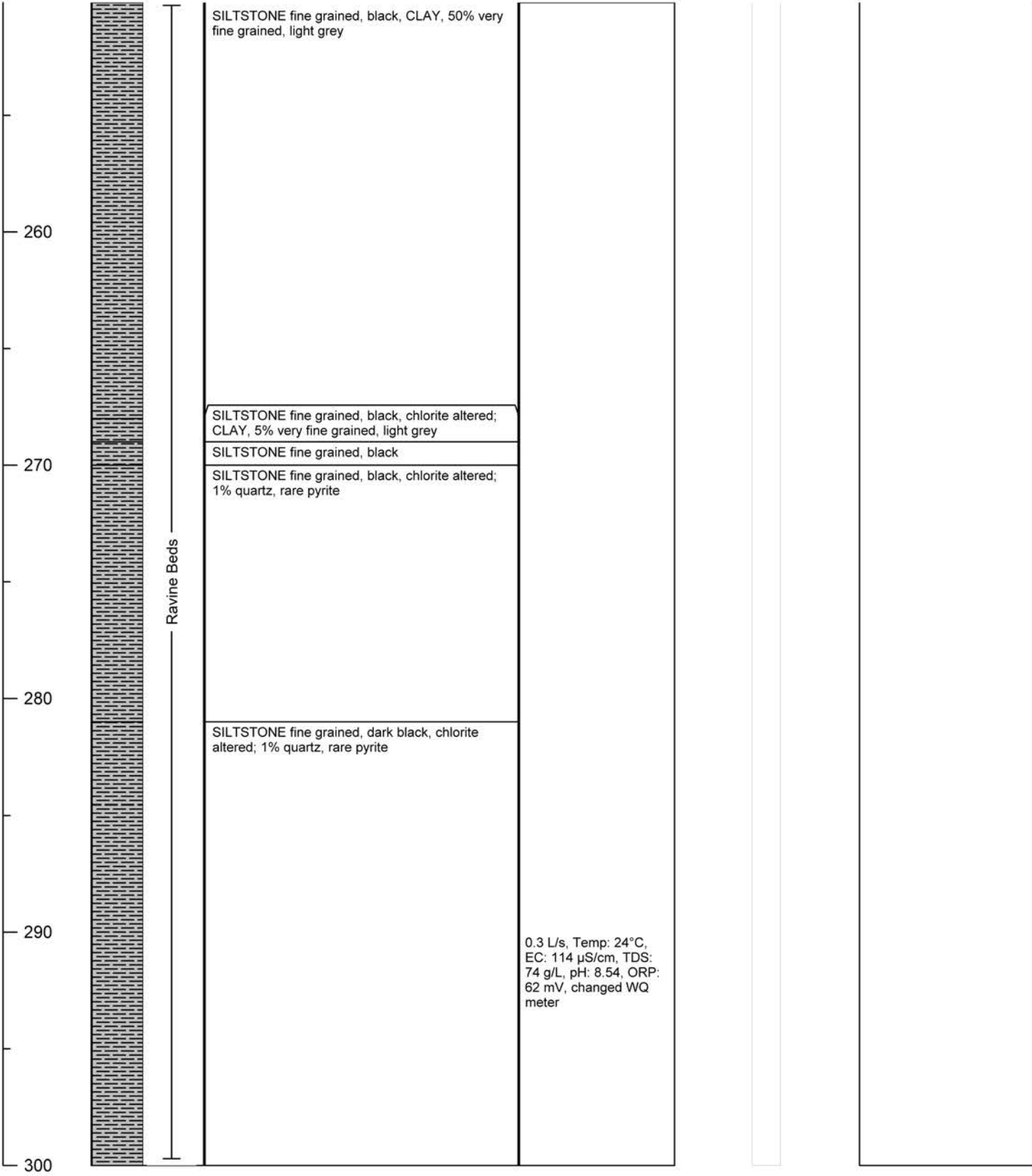
WATER BEARING ZONES													4
From (m)	To (m)	Thickness (m)	S W L (m)	Estimated Yield (L/s)		Test method		D D L at end of test (m)	Duration		Salinity (Conductivity or TDS)		
				Individual Aquifer	Cumulative	See Code 4			Hrs	min	Cond (μS/cm)	TDS (mg/L)	
35	36	1	107.6	0.3	0.3	1	A				131.7		
77	78	1		0.1	0.4	1	A				57.7		
89	90	1		0.1	0.5	1	A				82.5		
137	138	1		0.25	0.75	1	A				194.9		
143	144	1		0.75	1.5	1	A				161.5		
						1	A						

 www.emmconsulting.com.au Suite 01, 20 Chandos Street St Leonards NSW 2065 T: 02 9493 9500 F: 02 9493 9599		WATER MONITORING BORE LOG		Bore ID: PB09	
		Client: Snowy Hydro Limited		Project: Snowy 2.0	
		Date completed: 14/12/2018		Project number: J17188	
Drilling contractor: Highland Drilling		Elevation: 1330.0 mAHD		Eastings: 632503.2	
Drilling method: Air Rotary		Northing: 6038542.1			
Hydrogeologist: Kaitlyn Brodie					
Static Water Level: 107.6 mBGL		Screened Formation: Ravine Beds		Date: 20/12/2018	
Total depth: 300m		Screened depth: 200 - 300m open hole		Casing: 5.5 inch steel casing	
Depth (mbgl)	Lithology Graphic	Description	Drilling Notes	Bore Completion	
				Diagram	Design notes
0		SILTSTONE fine grained, medium brownish grey, moderately oxidised			Cement grout (0 - 1 mBGL)
10					10 inch diameter borehole (0 - 30 mBGL)
					8 inch steel surface casing (0 - 30 mBGL)
20		SILTSTONE fine grained, medium grey, slightly oxidised			
		SILTSTONE fine grained, medium brownish grey, slightly oxidised, 5% quartz			Blue metal gravel backfill (5-8mm wash) (1 - 187 mBGL)
30		SILTSTONE fine grained, medium brownish grey, slightly oxidised			
		SILTSTONE fine grained, medium brownish grey, slightly oxidised, 10% quartz			7.5 inch diameter borehole (30 - 200 mBGL)
		SILTSTONE fine grained, medium brownish grey			
40		SILTSTONE fine grained, dark grey, iron staining	0.3 L/s, Temp: 20°C, EC: 132 µS/cm, TDS: 29 g/L, pH: 9.57, ORP: 68 mV		5.5 inch steel casing (0 - 200 mBGL)
		SILTSTONE fine grained, dark grey, rare pyrite	0.3 L/s, Temp: 18°C, EC: 45 µS/cm, TDS: 29 g/L, pH: 8.34, ORP: 129 mV		
50			0.3 L/s, Temp: 17°C, EC: 45 µS/cm, TDS: 29 g/L, pH: 8.48, ORP: 145 mV		









Driller's Licence No:	DL1913	1
Class of Licence:	Class 4	
Driller's Name:	Ian Palk	
Assistant Driller:	Wayne Spratley	
Contractor:	Highland Drilling	
New bore	<input checked="" type="checkbox"/>	Replacement bore <input type="checkbox"/>
Deepened	<input type="checkbox"/>	Enlarged <input type="checkbox"/>
Reconditioned	<input type="checkbox"/>	Other (specify) <input type="checkbox"/>
Final Depth	36 m	

Work Licence No:	40BL192733	2
Name of Licensee:	Snowy Hydro Limited	
Intended Use:	Monitoring Bore	
Completion Date:	18/12/18	

DRILLING DETAILS				3
From (m)	To (m)	Hole Diameter (mm)	Drilling Method See Code 3	
0	36	140	9	

WATER BEARING ZONES											4		
From (m)	To (m)	Thickness (m)	S W L (m)	Estimated Yield (L/s)		Test method		D D L at end of test (m)	Duration		Salinity (Conductivity or TDS)		
				Individual Aquifer	Cumulative	See Code 4			Hrs	min	Cond (µS/cm)	TDS (mg/L)	
35	36	1	26.25			1	A					156.9	
						1	A						
						1	A						

CASING / LINER DETAILS											5			
Material	OD (mm)	Wall Thickness (mm)	From (m)	To (m)	Method Fixing	Casing support method		See Code 5						
Code 5					Code 5	Type of casing bottom		See Code 5						
5	60.2	5	0	26	6	Centralisers installed	{Yes/No}	No	(indicate on sketch)					
5	60.2	5	35	36		Sump installed	{Yes/No}	Yes	From	35	m	To	36	m
						Pressure cemented	{Yes/No}	No	From		m	To		m
						Casing Protector cemented in place								

WATER ENTRY DESIGN											6
General							Screen	Slot Details			
Material	OD (mm)	Wall Thickness (mm)	From (m)	To (m)	Opening type	Fixing	Aperture (mm)	Length (mm)	Width (mm)	Alignment	
Code 5					See Code 6	See Code 5	(mm)	(mm)	(mm)	See Code 6	
8	60.2	5	26	35	5	5	0.4	20	10	H	

GRAVEL PACK											7
Type		Grade	Grain size (mm)		Depth (m)		Quantity				
			From	To	From	To	Litres	m ³			
Rounded	<input checked="" type="checkbox"/>	Graded	<input checked="" type="checkbox"/>	3	5	25	36				
Crushed	<input type="checkbox"/>	Ungraded	<input type="checkbox"/>								
Bentonite/Grout seal (Yes/No)			Yes			21	25				
Method of placement of Gravel Pack				See Code 7		1					

For Departmental use only: **G W** ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Work Licence No: 40BL192733

BORE DEVELOPMENT

8

Chemical used for breaking down drilling mud (Yes/No) <input checked="" type="checkbox"/> No		Name: _____	
Method	Bailing/Surging <input type="checkbox"/>	Jetting <input type="checkbox"/>	Airlifting <input checked="" type="checkbox"/>
Duration	_____ hrs	_____ hrs	0.5 hrs

DISINFECTION ON COMPLETION

9

Chemical(s) used	Quantity applied (Litres)	Method of application
_____	_____	_____

PUMPING TESTS ON COMPLETION

10

Test type	Date	Pump intake depth (m)	Initial Water Level (SWL) (m)	Pumping rate (L/s)	Water Level at end of pumping (DDL) (m)	Duration of Test (hrs)	Recovery	
							Water level (m)	Time taken (hrs) (mins)
Multi stage (stepped drawdown)	Stage 1							
	Stage 2							
	Stage 3							
	Stage 4							
Single stage (constant rate)								
Height of measuring point above ground level		_____ m		Test Method		_____	See Code 4	

WORK PARTLY BACKFILLED OR ABANDONED

11

Original depth of work: _____ m	Is work partly backfilled: (Yes/No) <input type="checkbox"/>
Is work abandoned: (Yes/No) <input type="checkbox"/>	Method of abandonment: Backfilled <input type="checkbox"/> Plugged <input type="checkbox"/> Capped <input type="checkbox"/>
Has any casing been left in the work (Yes/No) <input type="checkbox"/>	From _____ m To _____ m
Sealing / fill type	From depth (m)
See Code 11	To depth (m)

Site chosen by:	Hydrogeologist <input type="checkbox"/>	Geologist <input type="checkbox"/>	Driller <input type="checkbox"/>	Diviner <input type="checkbox"/>	Client <input type="checkbox"/>	Other <input type="checkbox"/>
-----------------	---	------------------------------------	----------------------------------	----------------------------------	---------------------------------	--------------------------------

Lot No	National Park	DP No	National Park
Work Location Co ordinates	Easting	632508	Northing
GPS: (Yes/No) <input checked="" type="checkbox"/> Yes	AMG/AGD <input type="checkbox"/>	or	MGA/GDA <input checked="" type="checkbox"/>
			Zone 55

Please mark the work site with "X" on the CLID provided map.

Indicate also the distances in metres from two (2) adjacent boundaries, and attach the map to this Form A package.

Signatures:

Driller:



Licensee:


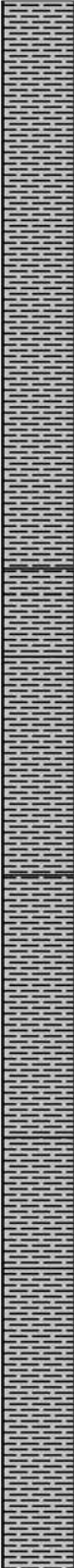

Date:

24/01/2019

Date:

Work Licence No: 40BL192733

[illegible]

 www.emmconsulting.com.au Suite 01, 20 Chandos Street St Leonards NSW 2065 T: 02 9493 9500 F: 02 9493 9599		WATER MONITORING BORE LOG		Bore ID: MB12A	
		Client: Snowy Hydro Limited		Project: Snowy 2.0	
		Date completed: 18/12/2018		Project number: J17188	
Drilling contractor: Highland Drilling		Elevation: 1329.9 mAHD		Drilling method: Air Rotary	
Drilling method: Air Rotary		Easting: 632508.0		Hydrogeologist: Kaitlyn Brodie	
Hydrogeologist: Kaitlyn Brodie		Northing: 6038549.3		Static Water Level: 26.25 mBGL	
Screened Formation: Adaminaby Group		Date: 20/12/2018		Total depth: 36m	
Screened depth: 26 - 35 mBGL		Casing: 50mm threaded PVC			
Depth (mbgl)	Lithology Graphic	Description	Drilling Notes	Bore Completion	
				Diagram	Design notes
0		SILTSTONE very fine to fine grained , medium brownish grey, moderately oxidised, 2% quartz, minor organic matter present			Cement grout (0 - 1 mAHD)
					5.5 inch diameter borehole (0 - 36 mBGL)
10					Blue metal gravel backfill (5-8mm wash) (1 - 21 mBGL)
		SILTSTONE very fine to fine grained , medium brownish grey, highly oxidised, 30% quartz			50mm blank PN18 U-PVC casing (threaded) (0 - 26 mBGL)
		SILTSTONE very fine to fine grained , medium brownish grey, highly oxidised			Bentonite seal (21 - 25 mBGL)
20		SILTSTONE very fine to fine grained , medium brownish grey, slightly oxidised, 20% quartz			Gravel pack (5mm wash) (25 - 36 mBGL)
		SILTSTONE very fine to fine grained , medium brownish grey, slightly oxidised			50mm slotted PN18 U-PVC casing (0.5mm aperture) (26 - 35 mBGL)
30		SILTSTONE very fine to fine grained , medium grey			50mm blank PN18 U-PVC sump (threaded) (35 - 36 mBGL)
			Temp: 23°C, EC: 157 µS/cm, TDS: 102 g/L, pH: 6.55, ORP: 150 mV, injected water to <5mins before reading may have altered pH and ORP		

Driller's Licence No:	DL1913	1
Class of Licence:	Class 4	
Driller's Name:	Ian Palk	
Assistant Driller:	Wayne Spratley	
Contractor:	Highland Drilling	
New bore	<input checked="" type="checkbox"/>	Replacement bore <input type="checkbox"/>
Deepened	<input type="checkbox"/>	Enlarged <input type="checkbox"/>
Reconditioned	<input type="checkbox"/>	Other (specify) <input type="checkbox"/>
Final Depth	180 m	

Work Licence No:	40BL192733	2
Name of Licensee:	Snowy Hydro Limited	
Intended Use:	Monitoring Bore	
Completion Date:	3/12/18	

DRILLING DETAILS				3
From (m)	To (m)	Hole Diameter (mm)	Drilling Method See Code 3	
0	12	200	9	
12	180	140	9	

WATER BEARING ZONES												4
From (m)	To (m)	Thickness (m)	S W L (m)	Estimated Yield (L/s)		Test method See Code 4	D D L at end of test (m)	Duration		Salinity (Conductivity or TDS)		
				Individual Aquifer	Cumulative			Hrs	min	Cond (µS/cm)	TDS (mg/L)	
				See	Attachment	1	A					
						1	A					
						1	A					

CASING / LINER DETAILS												5
Material	OD (mm)	Wall Thickness (mm)	From (m)	To (m)	Method Fixing Code 5	Casing support method See Code 5		Type of casing bottom See Code 5				
Code 5												
9	168	4.2	0	12	6	Centralisers installed	{Yes/No}	No	(indicate on sketch)			
8	60.2	5	0	149	5	Sump installed	{Yes/No}	Yes	From	179	m To 180 m	
8	60.2	5	179	180	5	Pressure cemented	{Yes/No}	No	From		m To	
						Casing Protector cemented in place						

WATER ENTRY DESIGN										6
General							Screen	Slot Details		
Material	OD (mm)	Wall Thickness (mm)	From (m)	To (m)	Opening type See Code 6	Fixing See Code 5	Aperture (mm)	Length (mm)	Width (mm)	Alignment See Code 6
Code 5										
8	60.2	5	149	179	5	5	0.4	20	10	H

GRAVEL PACK										7
Type		Grade	Grain size (mm)		Depth (m)		Quantity			
			From	To	From	To	Litres	m ³		
Rounded	<input checked="" type="checkbox"/>	Graded	<input checked="" type="checkbox"/>	3	5	147	180			
Crushed	<input type="checkbox"/>	Ungraded	<input type="checkbox"/>							
Bentonite/Grout seal (Yes/No)			Yes			140	147			
Method of placement of Gravel Pack				See Code 7	1					

For Departmental use only: **G W** ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Work Licence No: 40BL192733

BORE DEVELOPMENT

8

Chemical used for breaking down drilling mud (Yes/No) <input checked="" type="checkbox"/> No		Name: _____	
Method	Bailing/Surging <input type="checkbox"/>	Jetting <input type="checkbox"/>	Airlifting <input checked="" type="checkbox"/>
Duration	_____ hrs	_____ hrs	0.5 hrs
			Backwashing <input type="checkbox"/>
			Pumping <input type="checkbox"/>
			Other: _____

DISINFECTION ON COMPLETION

9

Chemical(s) used	Quantity applied (Litres)	Method of application
_____	_____	_____

PUMPING TESTS ON COMPLETION

10

Test type	Date	Pump intake depth (m)	Initial Water Level (SWL) (m)	Pumping rate (L/s)	Water Level at end of pumping (DDL) (m)	Duration of Test (hrs)	Recovery	
							Water level (m)	Time taken (hrs) (mins)
Multi stage (stepped drawdown)	Stage 1							
	Stage 2							
	Stage 3							
	Stage 4							
Single stage (constant rate)								
Height of measuring point above ground level		_____ m		Test Method		_____	See Code 4	

WORK PARTLY BACKFILLED OR ABANDONED

11

Original depth of work: _____ m	Is work partly backfilled: (Yes/No) <input type="checkbox"/>
Is work abandoned: (Yes/No) <input type="checkbox"/>	Method of abandonment: Backfilled <input type="checkbox"/> Plugged <input type="checkbox"/> Capped <input type="checkbox"/>
Has any casing been left in the work (Yes/No) <input type="checkbox"/>	From _____ m To _____ m
Sealing / fill type	From depth (m)
See Code 11	To depth (m)
	Sealing / fill type
	From depth (m)
	To depth (m)

Site chosen by:	Hydrogeologist <input type="checkbox"/>	Geologist <input type="checkbox"/>	Driller <input type="checkbox"/>	Diviner <input type="checkbox"/>	Client <input type="checkbox"/>	Other <input type="checkbox"/>
-----------------	---	------------------------------------	----------------------------------	----------------------------------	---------------------------------	--------------------------------

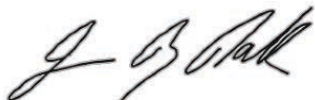
Lot No	National Park	DP No	National Park
Work Location Co ordinates	Easting	632514.8	Northing
GPS: (Yes/No) <input checked="" type="checkbox"/> Yes	AMG/AGD <input type="checkbox"/>	or	MGA/GDA <input checked="" type="checkbox"/>
			Zone 55

Please mark the work site with "X" on the CLID provided map.

Indicate also the distances in metres from two (2) adjacent boundaries, and attach the map to this Form A package.

Signatures:

Driller:



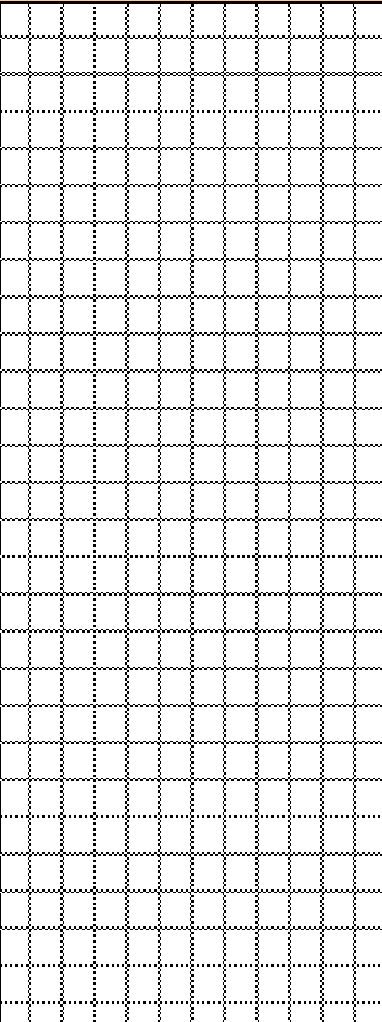
Licensee:

Date:

24/01/2019

Date:

Work Licence No: 40BL192733

DRILLER'S ROCK/STRATA DESCRIPTION (LITHOLOGY)			15
Depth		Description See Code 15	
From (m)	To (m)		
		See attachment	


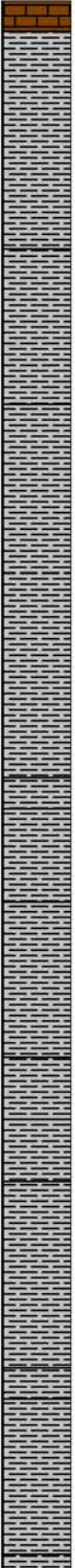

WORK NOT CONSTRUCTED BY DRILLING RIG								16
Method of excavation: Hand dug <input type="checkbox"/> Back hoe <input type="checkbox"/> Dragline <input type="checkbox"/> Dozer <input type="checkbox"/> Other <input type="text"/>								
Depth (m)	Length (m)	Width (m)	Diameter (m)	Lining material	Dimensions of liner (m)	From Depth (m)	To Depth (m)	

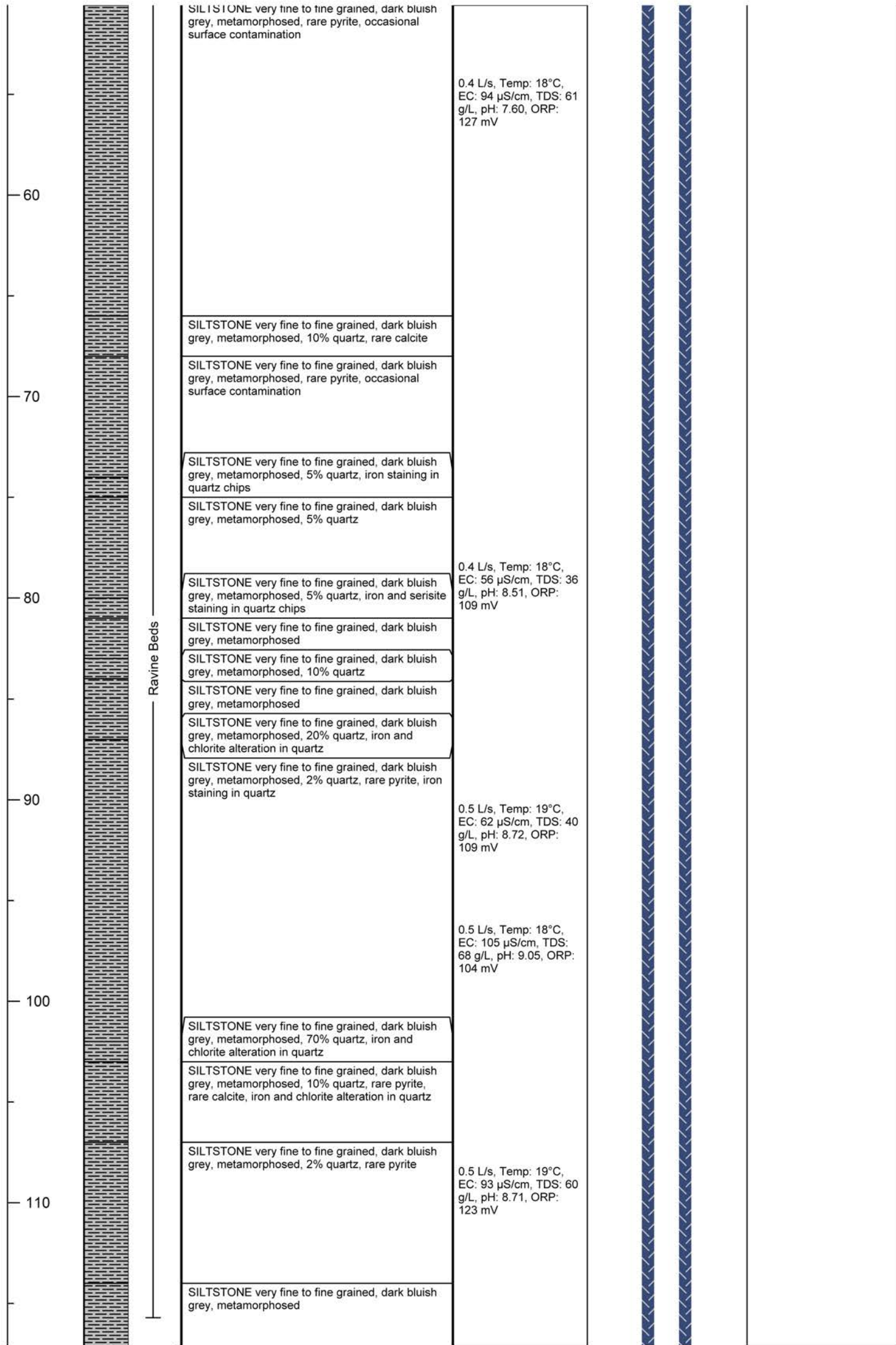
Please attach copies of the following if available						17		
Geologist log	(Yes/No)	<input checked="" type="checkbox"/>	Laboratory analysis of water Sample	(Yes/No)	<input type="checkbox"/>	Pumping test(s)	(Yes/No)	<input type="checkbox"/>
Geophysical log	(Yes/No)	<input type="checkbox"/>	Sieve analysis of aquifer material	(Yes/No)	<input type="checkbox"/>	Installed Pump details	(Yes/No)	<input type="checkbox"/>

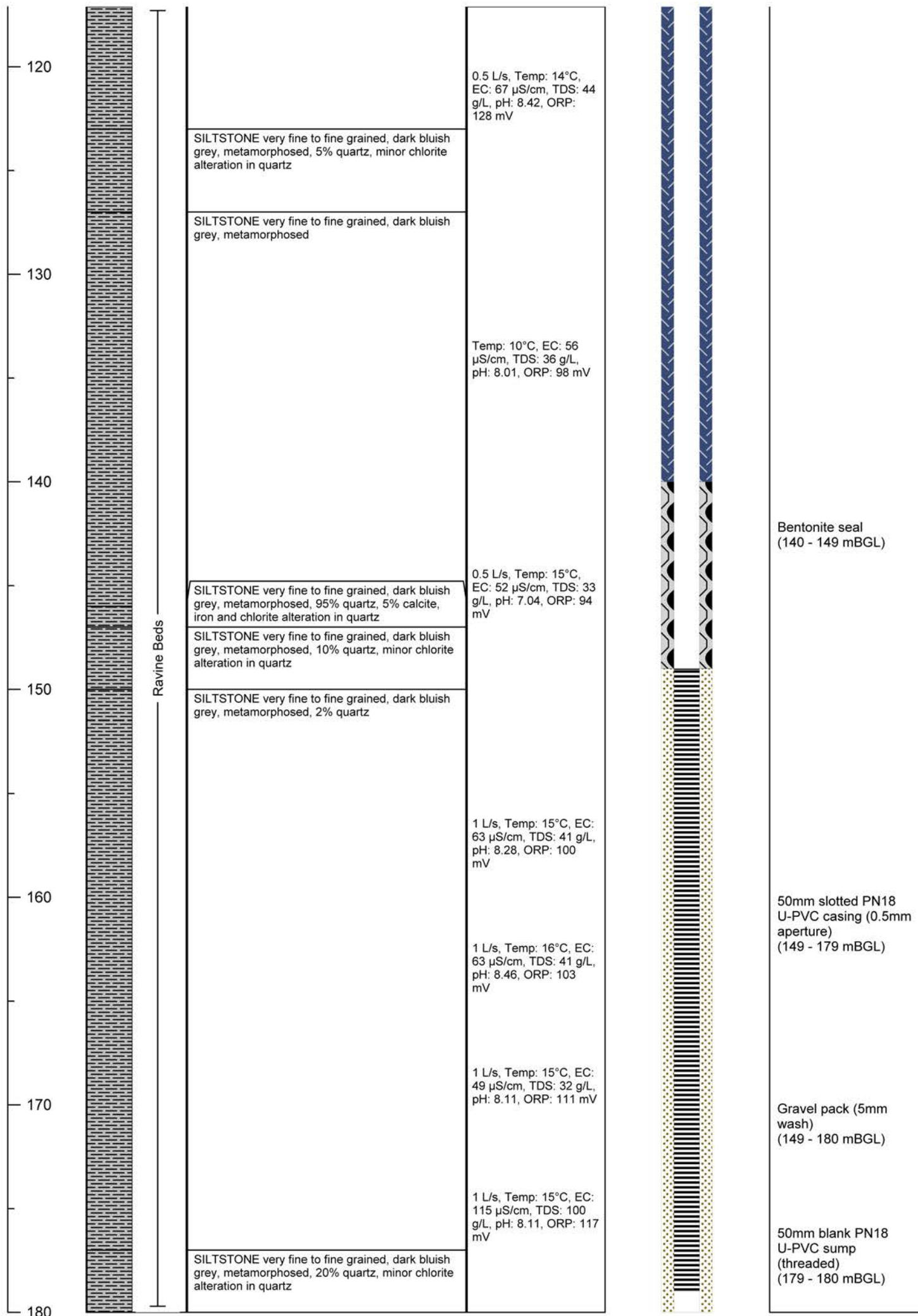
Top	Base	Lithology	Description
0.00	1.00	SOIL	SOIL fine to coarse grained, medium orangey brown, highly oxidised
1.00	8.00	SILTSTONE	SILTSTONE very fine to fine grained , medium bluish grey, highly oxidised, 5% quartz
8.00	13.00	SILTSTONE	SILTSTONE very fine to fine grained , medium brownish grey, highly oxidised, large chips
13.00	25.00	SILTSTONE	SILTSTONE very fine to fine grained , medium bluish grey, slightly oxidised
25.00	26.00	SILTSTONE	SILTSTONE very fine to fine grained , medium bluish grey, slightly oxidised, 40% quartz
26.00	29.00	SILTSTONE	SILTSTONE very fine to fine grained , medium brownish grey, slightly oxidised, 5% quartz
29.00	34.00	SILTSTONE	SILTSTONE very fine to fine grained , medium brownish grey, slightly oxidised
34.00	36.00	SILTSTONE	SILTSTONE very fine to fine grained , medium brownish grey, Water level
36.00	38.00	SILTSTONE	SILTSTONE very fine to fine grained , medium brownish grey, 20% quartz
38.00	44.00	SILTSTONE	SILTSTONE very fine to fine grained , medium brownish grey, 5% quartz, rare pyrite, Iron staining in quartz chips
44.00	45.00	SILTSTONE	SILTSTONE very fine to fine grained , medium brownish grey, 20% quartz, Iron staining in quartz chips
45.00	50.00	SILTSTONE	SILTSTONE very fine to fine grained , medium brownish grey, rare quartz
50.00	66.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, rare pyrite, Occasional surface contamination
66.00	68.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, 10% quartz, rare calcite
68.00	74.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, rare pyrite, Occasional surface contamination
74.00	75.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, 5% quartz, Iron staining in quartz chips
75.00	80.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, 5% quartz
80.00	81.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, 5% quartz, Iron and serisite staining in quartz chips
81.00	83.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed
83.00	84.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, 10% quartz
84.00	86.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed
86.00	87.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, 20% quartz, Iron and chlorite alteration in quartz
87.00	102.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, 2% quartz, rare pyrite, Iron staining in quartz chips

102.00	103.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, 70% quartz, Iron and chlorite alteration in quartz
103.00	107.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, 10% quartz, rare pyrite, rare calcite, Iron and chlorite alteration in quartz
107.00	114.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, 2% quartz, rare pyrite
114.00	123.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed
123.00	127.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, 5% quartz, Minor chlorite alteration in quartz
127.00	146.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed
146.00	147.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, 95% quartz, 5% calcite, Iron and chlorite alteration in quartz
147.00	150.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, 10% quartz, Minor chlorite alteration in quartz
150.00	177.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, 2% quartz
177.00	180.00	SILTSTONE	SILTSTONE very fine to fine grained , dark bluish grey, metamorphosed, 20% quartz, Minor chlorite alteration in quartz

WATER BEARING ZONES													4
From (m)	To (m)	Thickness (m)	S W L (m)	Estimated Yield (L/s)		Test method		D D L at end of test (m)	Duration		Salinity (Conductivity or TDS)		
				Individual Aquifer	Cumulative	See Code 4			Hrs	min	Cond (µS/cm)	TDS (mg/L)	
35	36	1	32.53	0.3	0.3	1	A				131.7		
77	78	1		0.1	0.4	1	A				57.7		
89	90	1		0.1	0.5	1	A				82.5		
137	138	1		0.25	0.75	1	A				194.9		
143	144	1		0.75	1.5	1	A				161.5		
						1	A						

 www.emmconsulting.com.au Suite 01, 20 Chandos Street St Leonards NSW 2065 T: 02 9493 9500 F: 02 9493 9599		WATER MONITORING BORE LOG		Bore ID: MB12B	
		Client: Snowy Hydro Limited		Project: Snowy 2.0	
		Date completed: 3/12/2018		Project number: J17188	
Drilling contractor: Highland Drilling		Elevation: 1330.5mAHD		Eastings: 632514.8	
Drilling method: Air Rotary		Northing: 6038541.6			
Hydrogeologist: Kaitlyn Brodie					
Static Water Level: 32.53mBGL		Screened Formation: Ravine Beds		Date: 20/12/2018	
Total depth: 180m		Screened depth: 149 - 179mBGL		Casing: 50mm threaded PVC	
Depth (mbgl)	Lithology Graphic	Description	Drilling Notes	Bore Completion	
				Diagram	Design notes
0	 Ravine Beds	SOIL fine to coarse grained, medium orangey brown, highly oxidised	0.4 L/s, Temp: 27°C, EC: 34 µS/cm, TDS: 22 g/L, pH: 8.16, ORP: 46 mV		Cement grout (0 - 1 mBGL)
		SILTSTONE very fine to fine grained, medium bluish grey, highly oxidised, 5% quartz			
10		SILTSTONE very fine to fine grained, medium brownish grey, highly oxidised, large chips			7.5 inch diameter borehole (0 - 30 mBGL)
		SILTSTONE very fine to fine grained, medium bluish grey, slightly oxidised			6 inch PVC surface casing (0 - 30 mBGL)
20					
		SILTSTONE very fine to fine grained, medium bluish grey, slightly oxidised, 40% quartz			Blue metal gravel backfill (5-8mm wash) (1 - 140 mBGL)
		SILTSTONE very fine to fine grained, medium brownish grey, slightly oxidised, 5% quartz			
30		SILTSTONE very fine to fine grained, medium brownish grey, slightly oxidised			5.5 inch diameter borehole (30 - 180 mBGL)
		SILTSTONE very fine to fine grained, medium brownish grey, water cut			
		SILTSTONE very fine to fine grained, medium brownish grey, 20% quartz			50mm blank PN18 U-PVC casing (0 - 149 mBGL)
40		SILTSTONE very fine to fine grained, medium brownish grey, 5% quartz, rare pyrite, iron staining in quartz chips			
		SILTSTONE very fine to fine grained, medium brownish grey, 20% quartz, iron staining in quartz chips			
		SILTSTONE very fine to fine grained, medium brownish grey, rare quartz			
50		SILTSTONE very fine to fine grained, dark bluish			







Office
of Water

Form A Particulars of completed work

Page 1

Driller's Licence No: 1738 **1**

Class of Licence: 4

Driller's Name: KEN ADAMS

Assistant Driller: JAMES TAYLOR

Contractor:

New bore ☒ Replacement bore ☐

Deepened ☐ Enlarged ☐

Reconditioned ☐ Other (specify) ☐

Final Depth 230 m

Work Licence No: 40 BL 192733 **2**

Name of Licensee: Snowy Hydro

Intended Use: Production

Completion Date:

DRILLING DETAILS 3			
From (m)	To (m)	Hole Diameter (mm)	Drilling Method See Code 3
<u>0</u>	<u>12</u>	<u>250</u>	<u>9</u>
<u>12</u>	<u>210</u>	<u>177</u>	<u>9</u>
<u>210</u>	<u>230</u>	<u>125</u>	<u>9</u>

WATER BEARING ZONES											4
From (m)	To (m)	Thickness (m)	S W L (m)	Estimated Yield (L/s)		Test method See Code 4	D D L at end of test (m)	Duration		Salinity (Conductivity or TDS)	
				Individual Aquifer	Cumulative			Hrs	min	Cond (μS/cm)	TDS (mg/L)
210	230	20				1					

CASING / LINER DETAILS 5										
Material	OD (mm)	Wall Thickness (mm)	From (m)	To (m)	Method Fixing Code 5	Casing support method See Code 5 <u>2</u>				
Code 5	(mm)	(mm)	(m)	(m)	Code 5	Type of casing bottom See Code 5 <u>1</u>				
<u>9</u>	<u>200</u>	<u>3</u>	<u>0</u>	<u>12</u>	<u>6</u>	Centralisers installed (Yes/No) <u>N</u> (indicate on sketch)				
<u>9</u>	<u>125</u>	<u>5</u>	<u>0</u>	<u>210</u>	<u>6</u>	Sump installed (Yes/No) <u>N</u> From <u> </u> m To <u> </u> m				
						Pressure cemented (Yes/No) <u>N</u> From <u> </u> m To <u> </u> m				
						Casing Protector cemented in place <u>YES</u>				

WATER ENTRY DESIGN 6										
Material	OD (mm)	Wall Thickness (mm)	From (m)	To (m)	Opening type	Fixing	Screen Aperture (mm)	Slot Details		
					See Code 6	See Code 5		Length (mm)	Width (mm)	Alignment See Code 6
<u>12</u>	<u>125</u>		<u>210</u>	<u>230</u>	<u>OPEN</u>					
					<u>Hole</u>					

GRAVEL PACK 7										
Type	Grade	Grain size (mm)		Depth (m)		Quantity		Litres	m ³	
		From	To	From	To					
<u>Rounded</u>	<u>Graded</u>									
<u>Crushed</u>	<u>Ungraded</u>									
Bentonite/Grout seal (Yes/No) <u> </u>										
Method of placement of Gravel Pack See Code 7 <u> </u>										

For Departmental use only: **G W** ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Form A Particulars of completed work

Page 2

Work Licence No:

BORE DEVELOPMENT

8

Chemical used for breaking down drilling mud (Yes/No) ☒ Name: _____

Method Bailing/Surging ☐ Jetting ☐ Airlifting ☒ Backwashing ☐ Pumping ☐ Other: _____

Duration _____ hrs _____ hrs _____ hrs _____ hrs _____ hrs _____ hrs

DISINFECTION ON COMPLETION

9

Chemical(s) used _____ Quantity applied (Litres) _____ Method of application _____

PUMPING TESTS ON COMPLETION

10

Test type	Date	Pump intake depth (m)	Initial Water Level (SWL) (m)	Pumping rate (L/s)	Water Level at end of pumping (DDL) (m)	Duration of Test (hrs)	Recovery	
							Water level (m)	Time taken (hrs) (mins)
Multi stage (stepped drawdown)	Stage 1							
	Stage 2							
	Stage 3							
	Stage 4							
Single stage (constant rate)								

Height of measuring point above ground level _____ m Test Method _____ See Code 4

WORK PARTLY BACKFILLED OR ABANDONED

11

Original depth of work: _____ m Is work partly backfilled: (Yes/No) ☐

Is work abandoned: (Yes/No) ☐ Method of abandonment: Backfilled ☐ Plugged ☐ Capped ☐

Has any casing been left in the work (Yes/No) ☐ From _____ m To _____ m

Sealing / fill type See Code 11	From depth (m)	To depth (m)	Sealing / fill type See Code 11	From depth (m)	To depth (m)
3	210	205	8	205	15

Site chosen by: Hydrogeologist ☐ Geologist ☒ Driller ☐ Diviner ☐ Client ☐ Other ☐

Lot No _____ DP No _____

Work Location Co ordinates Easting _____ Northing _____ Zone _____

GPS: (Yes/No) ☐ >> AMG/AGD ☐ or MGA/GDA ☐ (See explanation)

Please mark the work site with "X" on the CLUD provided map.

Indicate also the distances in metres from two (2) adjacent boundaries, and attach the map to this Form A package.

Drilled By JARROLD TAYLOR
Supervised By KEN ADAMS

Signatures:

Driller: LYNDA 1738

Licensee:

Date: _____

Date: _____

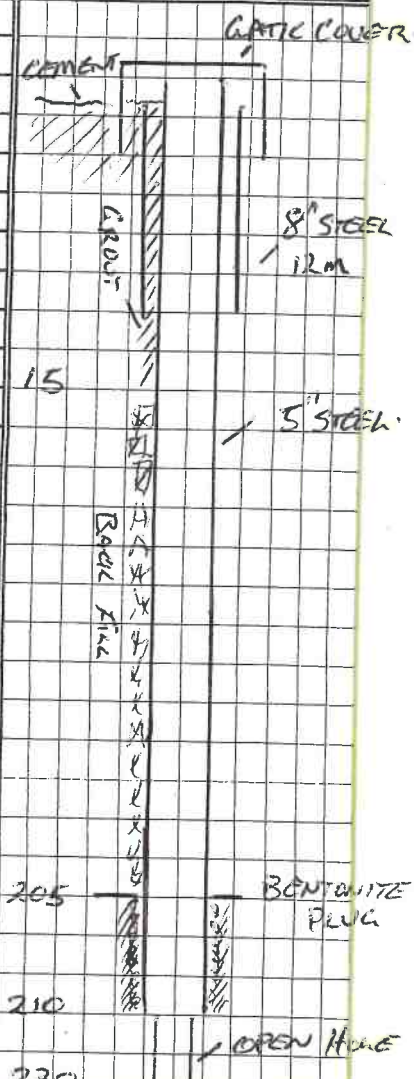
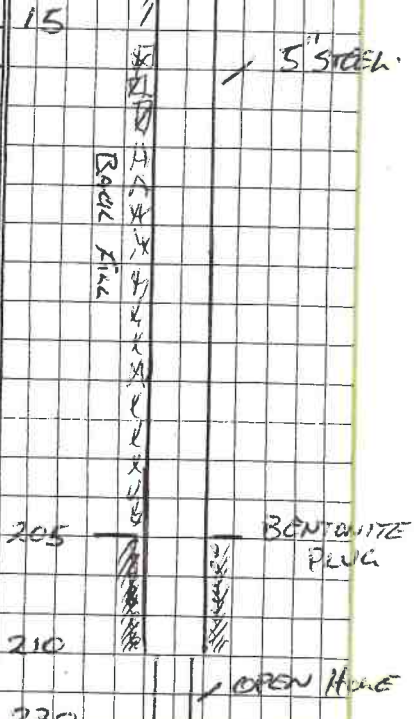
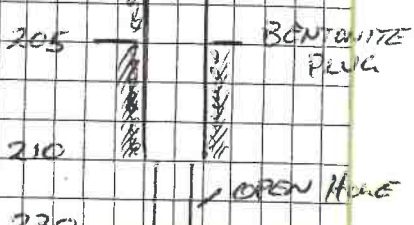
Form A Particulars of completed work

Page 3

Work Licence No:

DRILLER'S ROCK/STRATA DESCRIPTION (LITHOLOGY)

15

Depth		Description <small>See Code 15</small>	WORK CONSTRUCTION SKETCH
From (m)	To (m)		
0	12	WEATHERED BROWN GRANITE.	
12	230	GREY GRANITE.	
			
			

WORK NOT CONSTRUCTED BY DRILLING RIG

16

Method of excavation: Hand dug ☐ Back hoe ☐ Dragline ☐ Dozer ☐ Other ☐

Depth (m)	Length (m)	Width (m)	Diameter (m)	Lining material	Dimensions of liner (m)	From Depth (m)	To Depth (m)

Please attach copies of the following if available

17

Geologist log (Yes/No) ☐ Laboratory analysis of water Sample (Yes/No) ☐ Pumping test(s) (Yes/No) ☐
 Geophysical logs ☐ Geologic analysis of aquifer material ☐ Installed Pump details ☐



Office
of Water

Form A Particulars of completed work

Page 1

Driller's Licence No: 1738 **1**

Class of Licence: 4

Driller's Name: KEN ADAMS

Assistant Driller: SARROD TAUNTON

Contractor:

New bore ☒ Replacement bore ☐

Deepened ☐ Enlarged ☐

Reconditioned ☐ Other (specify) ☐

Final Depth 60 m

Work Licence No: 40BL192733 **2**

Name of Licensee: Snowy Hydro

Intended Use: monitoring

Completion Date:

DRILLING DETAILS **3**

From (m)	To (m)	Hole Diameter (mm)	Drilling Method
<u>0</u>	<u>60</u>	<u>150</u>	<u>9</u>

WATER BEARING ZONES

From (m)	To (m)	Thickness (m)	S W L (m)	Estimated Yield (L/s)		Test method	D D L at end of test (m)	Duration		Salinity (Conductivity or TDS)	
				Individual Aquifer	Cumulative			Hrs	min	Cond (µS/cm)	TDS (mg/L)
<u>50</u>	<u>59</u>	<u>9</u>	<u>6.2</u>		<u>3</u>	<u>1</u>					<u>120 EC</u>

CASING / LINER DETAILS

5

Material	OD (mm)	Wall Thickness (mm)	From (m)	To (m)	Method Fixing	Casing support method
Code 5	(mm)	(mm)	(m)	(m)	Code 5	See Code 5 <u>2</u>
<u>6</u>	<u>50</u>	<u>3</u>	<u>0</u>	<u>50</u>	<u>5</u>	Type of casing bottom See Code 5 <u>2</u>
						Centralisers installed (Yes/No) <u>Y</u> (indicate on sketch)
						Sump installed (Yes/No) <u>Y</u> From <u>59</u> m To <u>60</u> m
						Pressure cemented (Yes/No) <u>N</u> From m To m
						Casing Protector cemented in place <u>YES</u>

WATER ENTRY DESIGN

6

General							Screen	Slot Details		
Material	OD (mm)	Wall Thickness (mm)	From (m)	To (m)	Opening type	Fixing	Aperture (mm)	Length (mm)	Width (mm)	Alignment
Code 5	(mm)	(mm)	(m)	(m)	See Code 6	See Code 5	(mm)	(mm)	(mm)	See Code 6
<u>6</u>	<u>50</u>	<u>3</u>	<u>50</u>	<u>59</u>	<u>5</u>	<u>5</u>	<u>5</u>			<u>H</u>

GRAVEL PACK

7

Type	Grade	Grain size (mm)		Depth (m)		Quantity	
		From	To	From	To	Litres	m ³
Rounded	Graded	<u>X</u>	<u>8/16</u>	<u>60</u>	<u>47</u>	<u>300</u>	
Crushed	Ungraded						

Bentonite/Grout seal (Yes/No) YES

Method of placement of Gravel Pack See Code 7 111

For Departmental use only:

GW

Form A Particulars of completed work

Page 2

Work Licence No:

BORE DEVELOPMENT

8

Chemical used for breaking down drilling mud (Yes/No) ☒ Name: _____

Method Bailing/Surging ☐ Jetting ☐ Airlifting ☒ Backwashing ☐ Pumping ☐ Other: _____

Duration _____ hrs _____ hrs _____ hrs _____ hrs _____ hrs _____ hrs

DISINFECTION ON COMPLETION

9

Chemical(s) used _____ Quantity applied (Litres) _____ Method of application _____

PUMPING TESTS ON COMPLETION

10

Test type	Date	Pump intake depth (m)	Initial Water Level (SWL) (m)	Pumping rate (L/s)	Water Level at end of pumping (DDL) (m)	Duration of Test (hrs)	Recovery	
							Water level (m)	Time taken (hrs) (mins)
Multi stage (stepped drawdown)	Stage 1							
	Stage 2							
	Stage 3							
	Stage 4							
Single stage (constant rate)								

Height of measuring point above ground level _____ m Test Method _____ See Code 4

WORK PARTLY BACKFILLED OR ABANDONED

11

Original depth of work: 60 m Is work partly backfilled: (Yes/No) No

Is work abandoned: (Yes/No) No Method of abandonment: Backfilled ☐ Plugged ☐ Capped ☐

Has any casing been left in the work (Yes/No) Yes From _____ m To _____ m

Sealing / fill type	From depth (m)	To depth (m)	Sealing / fill type	From depth (m)	To depth (m)
See Code 11			See Code 11		

Site chosen by: Hydrogeologist ☐ Geologist ☒ Driller ☐ Diviner ☐ Client ☐ Other ☐ 12

Lot No _____ DP No _____ 13

Work Location Co ordinates Easting _____ Northing _____ Zone _____

GPS: (Yes/No) ☐ >> AMG/AGD ☐ or MGA/GDA ☐ (See explanation)

Please mark the work site with "X" on the CLID provided map.

Indicate also the distances in metres from two (2) adjacent boundaries, and attach the map to this Form A package.

DRILLED BY JARROLD TOWNTON Signatures:
SUPERVISED BY KEN ADAMS.

Driller: LIC NO 1738

Licensee: _____

Date: _____

Date: _____

Form A Particulars of completed work

Page 3

Work Licence No:

Work Licence No. _____

DRILLER'S ROCK/STRATA DESCRIPTION (LITHOLOGY)			15	
Depth		Description	WORK CONSTRUCTION SKETCH	
From (m)	To (m)	See Code 15		
0	10	Brown WEATHERED GRANITE		
10	60	GREY GRANITE		

16

WORK NOT CONSTRUCTED BY DRILLING RIG

Method of excavation: Hand dug ☐ Back hoe ☐ Dragline ☐ Dozer ☐ Other

Depth (m)	Length (m)	Width (m)	Diameter (m)	Lining material	Dimensions of liner (m)	From Depth (m)	To Depth (m)

17

Please attach copies of the following if available

Geologist log <input type="checkbox"/>	Laboratory analysis of water Sample <input type="checkbox"/>	Pumping test(s) <input type="checkbox"/>	
Geophysical logs <input type="checkbox"/>	Core analysis of aquifer material <input type="checkbox"/>	Installed Pump details <input type="checkbox"/>	



Office
of Water

Form A Particulars of completed work

Page 1

Driller's Licence No: 1738 **1**

Class of Licence: 4

Driller's Name: KEN ADAMS

Assistant Driller: JARROLD TAUNTON

Contractor:

New bore ☒ Replacement bore ☐

Deepened ☐ Enlarged ☐

Reconditioned ☐ Other (specify) ☐

Final Depth 190 m

Work Licence No: 40 BL 192723 **2**

Name of Licensee: Snay Hydro

Intended Use: Monitoring

Completion Date:

DRILLING DETAILS **3**

From (m)	To (m)	Hole Diameter (mm)	Drilling Method See Code 3
<u>0</u>	<u>190</u>	<u>150</u>	<u>9</u>

WATER BEARING ZONES **4**

From (m)	To (m)	Thickness (m)	S W L (m)	Estimated Yield (L/s)		Test method See Code 4	D D L at end of test (m)	Duration		Salinity (Conductivity or TDS)	
				Individual Aquifer	Cumulative			Hrs	min	Cond (µS/cm)	TDS (mg/L)
<u>177</u>	<u>189</u>	<u>12</u>	<u>3.8</u>		<u>0.3</u>	<u>1</u>		<u>1</u>			<u>120 EC</u>

CASING / LINER DETAILS **5**

Material	OD	Wall Thickness	From	To	Method	Casing support method
Code 5	(mm)	(mm)	(m)	(m)	Fixing Code 5	See Code 5 <u>2</u>
<u>6</u>	<u>50</u>	<u>3</u>	<u>0</u>	<u>177</u>	<u>5</u>	Type of casing bottom See Code 5 <u>2</u>
Centralisers installed (Yes/No) <u>Y</u> (Indicate on sketch)						
Sump installed (Yes/No) <u>Y</u> From <u>189</u> m To <u>190</u> m						
Pressure cemented (Yes/No) <u>N</u> From <u></u> m To <u></u> m						
Casing Protector cemented in place <u>YES</u>						

WATER ENTRY DESIGN **6**

General							Screen	Slot Details		
Material	OD	Wall Thickness	From	To	Opening type	Fixing	Aperture	Length	Width	Alignment
Code 5	(mm)	(mm)	(m)	(m)	See Code 6	See Code 5	(mm)	(mm)	(mm)	See Code 6
<u>6</u>	<u>50</u>	<u>3</u>	<u>177</u>	<u>189</u>	<u>5</u>	<u>5</u>	<u>0.5</u>			<u>H</u>

GRAVEL PACK **7**

Type	Grade	Grain size (mm)		Depth (m)		Quantity	
		From	To	From	To	Litres	m ³
Rounded	Graded <input checked="" type="checkbox"/>		<u>8/16</u>	<u>190</u>	<u>174</u>	<u>320</u>	
Crushed	Ungraded <input type="checkbox"/>						
Bentonite/GROUT seal (Yes/No) <u>Y</u>							
Method of placement of Gravel Pack See Code 7 <u>111</u>							

For Departmental use only:

GW

--	--	--	--	--	--	--	--



Form A Particulars of completed work

Page 2

Work Licence No:

BORE DEVELOPMENT

8

Chemical used for breaking down drilling mud (Yes/No) <input checked="" type="checkbox"/>		Name:				
Method	Bailing/Surging <input type="checkbox"/>	Jetting <input type="checkbox"/>	Airlifting <input checked="" type="checkbox"/>	Backwashing <input type="checkbox"/>	Pumping <input type="checkbox"/>	Other:
Duration	<input type="text"/> hrs	<input type="text"/> hrs	<input type="text"/> hrs	<input type="text"/> hrs	<input type="text"/> hrs	<input type="text"/> hrs

DISINFECTION ON COMPLETION

9

Chemical(s) used	Quantity applied (Litres)	Method of application
<input type="text"/>	<input type="text"/>	<input type="text"/>

PUMPING TESTS ON COMPLETION

10

Test type	Date	Pump intake depth (m)	Initial Water Level (SWL) (m)	Pumping rate (L/s)	Water Level at end of pumping (DDL) (m)	Duration of Test (hrs)	Recovery	
							Water level (m)	Time taken (hrs) (mins)
Multi stage (stepped drawdown)	Stage 1							
	Stage 2							
	Stage 3							
	Stage 4							
Single stage (constant rate)								
Height of measuring point above ground level		<input type="text"/> m	Test Method		<input type="text"/>	See Code 4		

WORK PARTLY BACKFILLED OR ABANDONED

11

Original depth of work:	<input type="text"/> m	Is work partly backfilled:	(Yes/No) <input type="checkbox"/>		
Is work abandoned:	(Yes/No) <input type="checkbox"/>	Method of abandonment:	Backfilled <input type="checkbox"/> Plugged <input type="checkbox"/> Capped <input type="checkbox"/>		
Has any casing been left in the work	(Yes/No) <input type="checkbox"/>	From	<input type="text"/> m To <input type="text"/> m		
Sealing / fill type	From depth (m)	To depth (m)	Sealing / fill type	From depth (m)	To depth (m)
See Code 11			See Code 11		

Site chosen by:	Hydrogeologist <input type="checkbox"/>	Geologist <input checked="" type="checkbox"/>	Driller <input type="checkbox"/>	Diviner <input type="checkbox"/>	Client <input type="checkbox"/>	Other <input type="text"/>
-----------------	---	---	----------------------------------	----------------------------------	---------------------------------	----------------------------

13

Lot No	<input type="text"/>	DP No	<input type="text"/>
Work Location Co ordinates	Easting	Northing	Zone
GPS: (Yes/No) <input type="checkbox"/>	>>	AMG/AGD <input type="checkbox"/>	or MGA/GDA <input type="checkbox"/>
(See explanation)			

Please mark the work site with "X" on the CLID provided map.

Indicate also the distances in metres from two (2) adjacent boundaries, and attach the map to this Form A package.

Drilled By JARROLD AUNTON Signatures:

Supervised By KEN ADAMS

Driller: W4 No 1738

Licensee: _____

Date: _____

Date: _____

Form A Particulars of completed work

Page 3

Work Licence No:

Work Licence No:
15

DRILLER'S ROCK/STRATA DESCRIPTION (LITHOLOGY)			WORK CONSTRUCTION SKETCH
Depth		Description <div style="border: 1px solid black; padding: 2px; font-size: small;">See Code 15</div>	
From (m)	To (m)		
0	12	WEATHERED BROWN GRANITE	
12	190	GREY GRANITE.	

WORK NOT CONSTRUCTED BY DRILLING RIG

Method of excavation: Hand dug ☐ Back hoe ☐ Dragline ☐ Dozer ☒ Other

Depth (m)	Length (m)	Width (m)	Diameter (m)	Lining material	Dimensions of liner (m)	From Depth (m)	To Depth (m)

16

Please attach copies of the following if available

Geologist log <input type="checkbox"/>	Laboratory analysis of water Sample <input type="checkbox"/>	Pumping test(s) <input type="checkbox"/>
Geophysical log <input type="checkbox"/>	Gravel analysis of aquifer material <input type="checkbox"/>	Installed Pump details <input type="checkbox"/>

17