

Appendix L

Bore logs

BORE COMPLETION REPORT

Lithology Key



Basalt



Granite



Sandstone



Carbonaceous Shale



Mudstone



Shale



Clay



No sample



Siltstone



Claystone



Peat



Topsoil



Coal



Quartz



Tuff



Conglomerate



Sand



Unknown

Formation Key



Robertson Basalt



Farmborough Claystone Member



Wianamatta Group



Tongarra Seam



Hawkesbury Sandstone



Illawarra Coal Measures



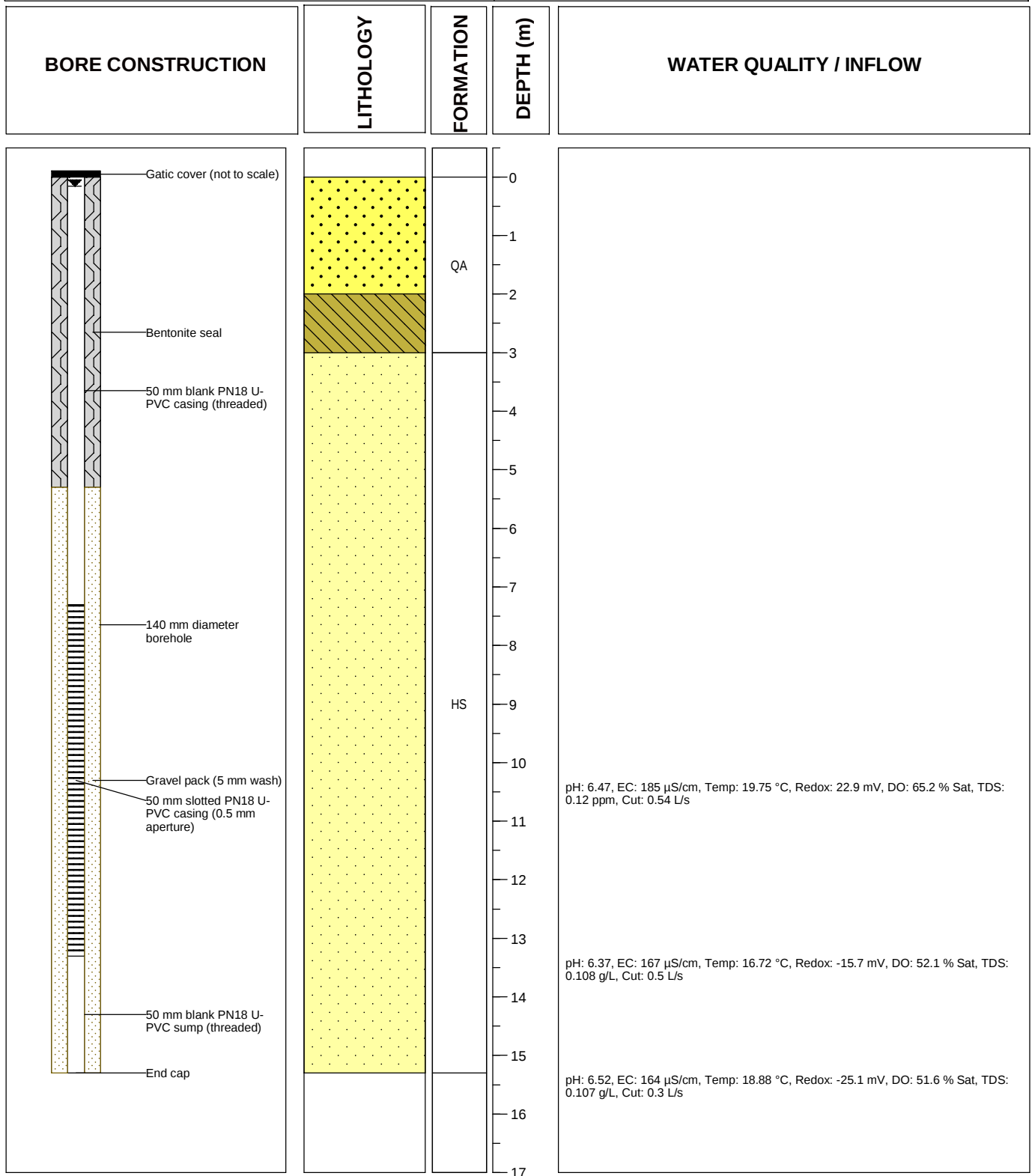
Wongawilli Seam

BORE COMPLETION REPORT

HU00118PZA

Project: Hume Coal Project
Easting: 240529 **Northing:** 6166811 (MGA Zone 56)
Top of casing: 612.415 mAHD
Ground level: 612.5 mAHD
Static water level: 0.16 mbgl **Date:** 1/12/2014

Completion date: 22/01/2014
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 7.3 - 13.3 mbgl
Gravel pack: 5.3 - 15.3 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU00118PZA - Bore construction

Revision: A	Date drawn: 6/11/14
Drawn by: K. Maher	Checked by: E. Kwantes
Project No. 2172599A	



HUMECOAL
PROJECT

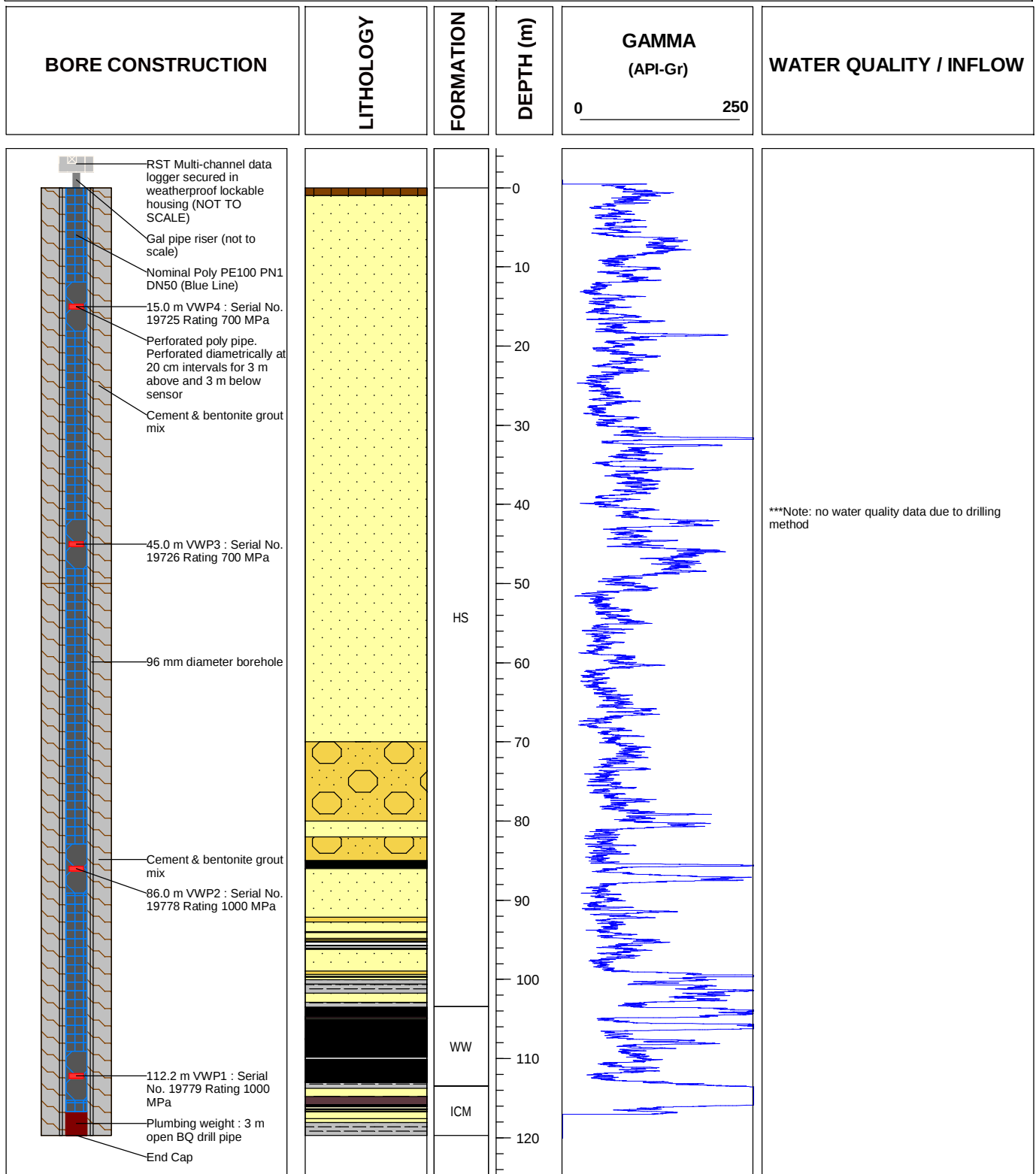
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0122CH

Project: Hume Coal Project
Easting: 250352 **Northing:** 6175286 (MGA Zone 56)
Top of casing: n/a
Ground level: 634.5 mAHD
Static water level: n/a **Date:** n/a

Completion date: 08/05/2014
Drilling company: Highland Drilling
Drilling method: Patrial core
Screened interval: n/a (VWP array)
Gravel pack: n/a (VWP array)



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0122CH - VWP construction

Revision: A	Date drawn: 27/3/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



HUMECOAL
PROJECT

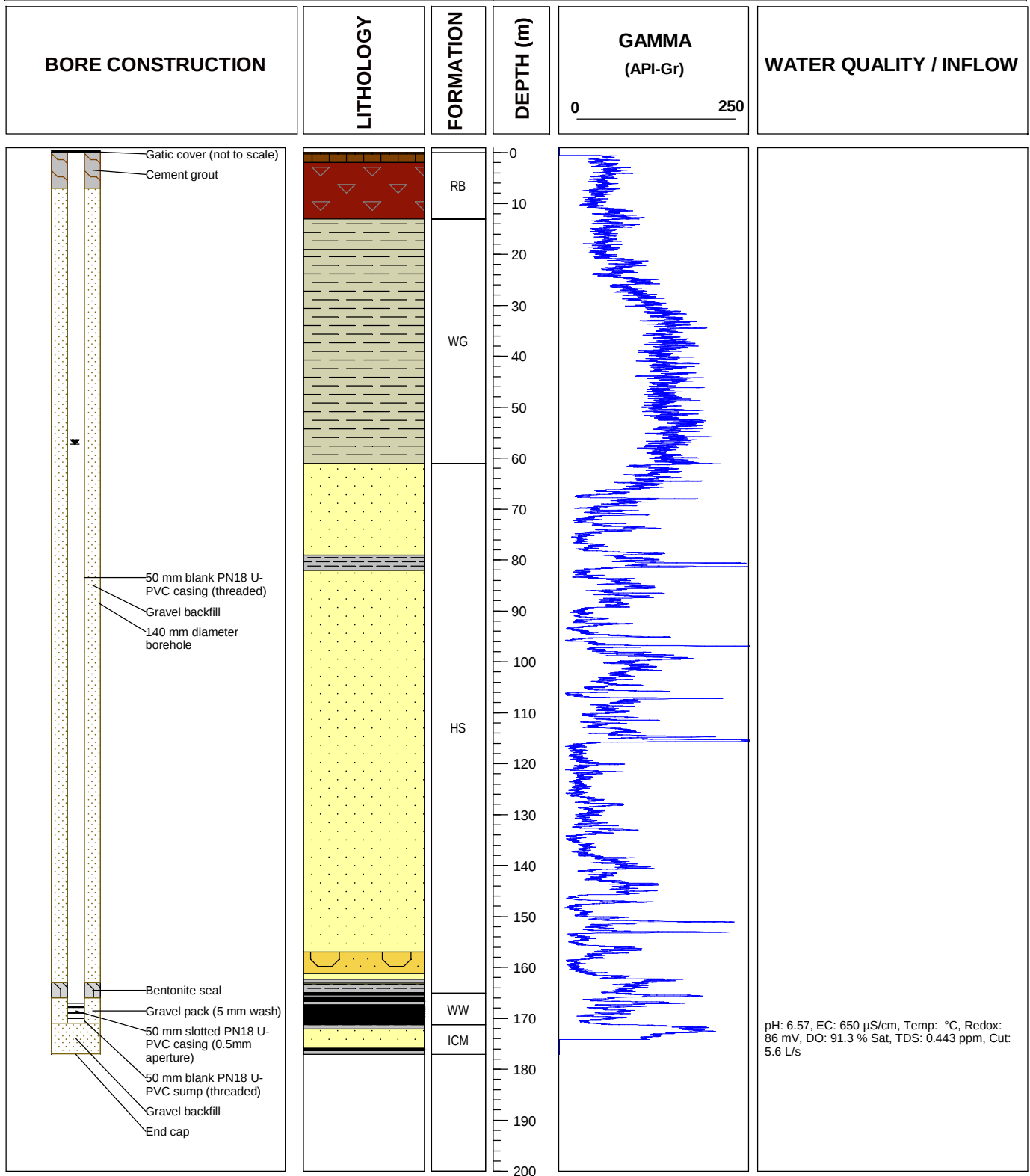
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0129PZA

Project: Hume Coal Project
Easting: 253042 **Northing:** 6171301 (MGA Zone 56)
Top of casing: 679.035 mAHD
Ground level: 679.1 mAHD
Static water level: 57.235 mbgl **Date:** 14/11/2014

Completion date: 11/3/2014
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 167 - 170 mbgl
Gravel pack: 166 - 171 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0129PZA - Bore construction

Revision: A	Date drawn: 30/6/2014
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



HUMECOAL
PROJECT

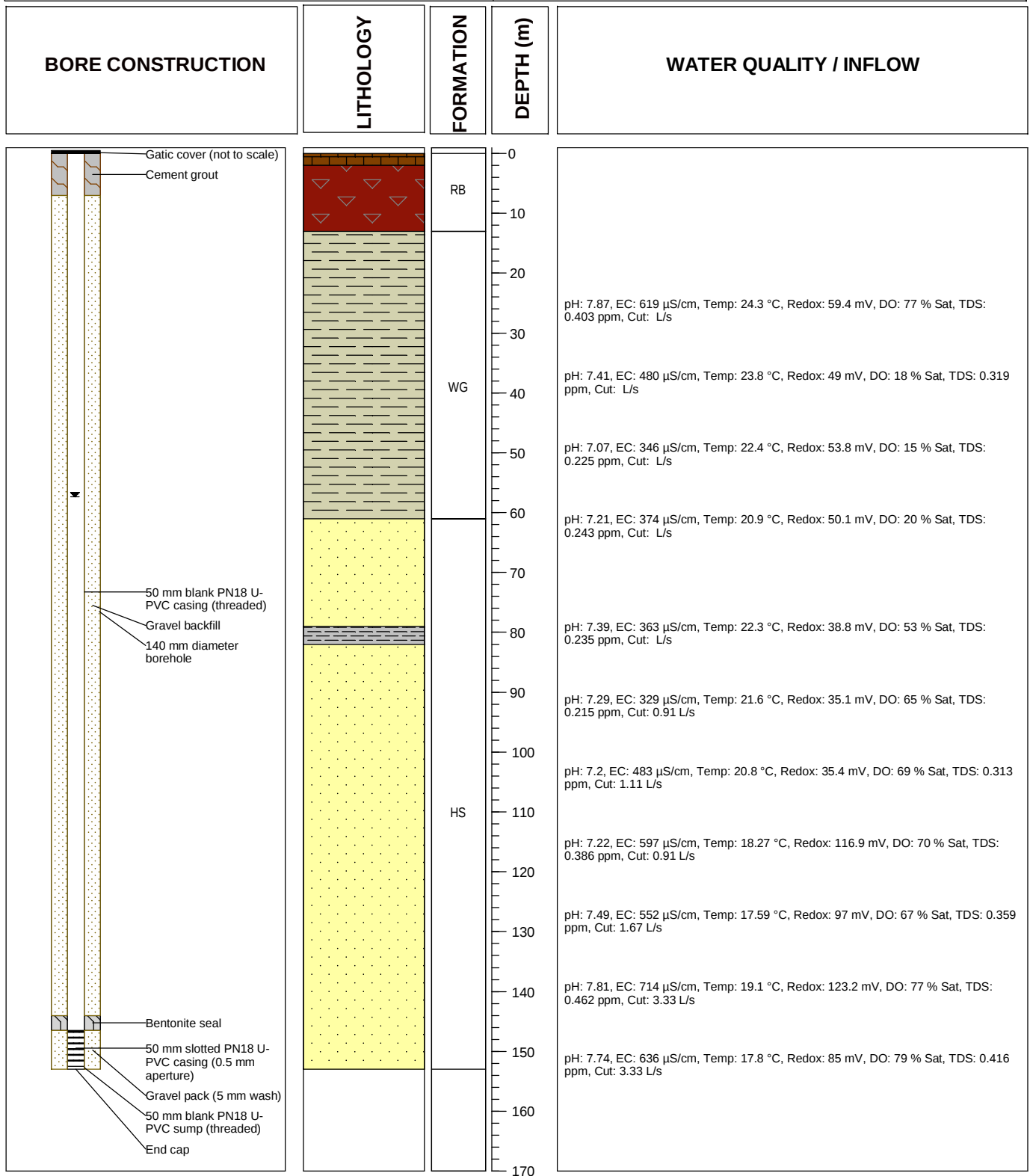
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0129PZB

Project: Hume Coal Project
Easting: 253044 **Northing:** 6171306 (MGA Zone 56)
Top of casing: 679.11 mAHD
Ground level: 679.2 mAHD
Static water level: 57.36 mbgl **Date:** 14/11/2014

Completion date: 01/04/2014
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 146.5 - 152.5 mbgl
Gravel pack: 146.5 - 153 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0129PZB - Bore construction

Revision: A	Date drawn: 30/6/2014
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



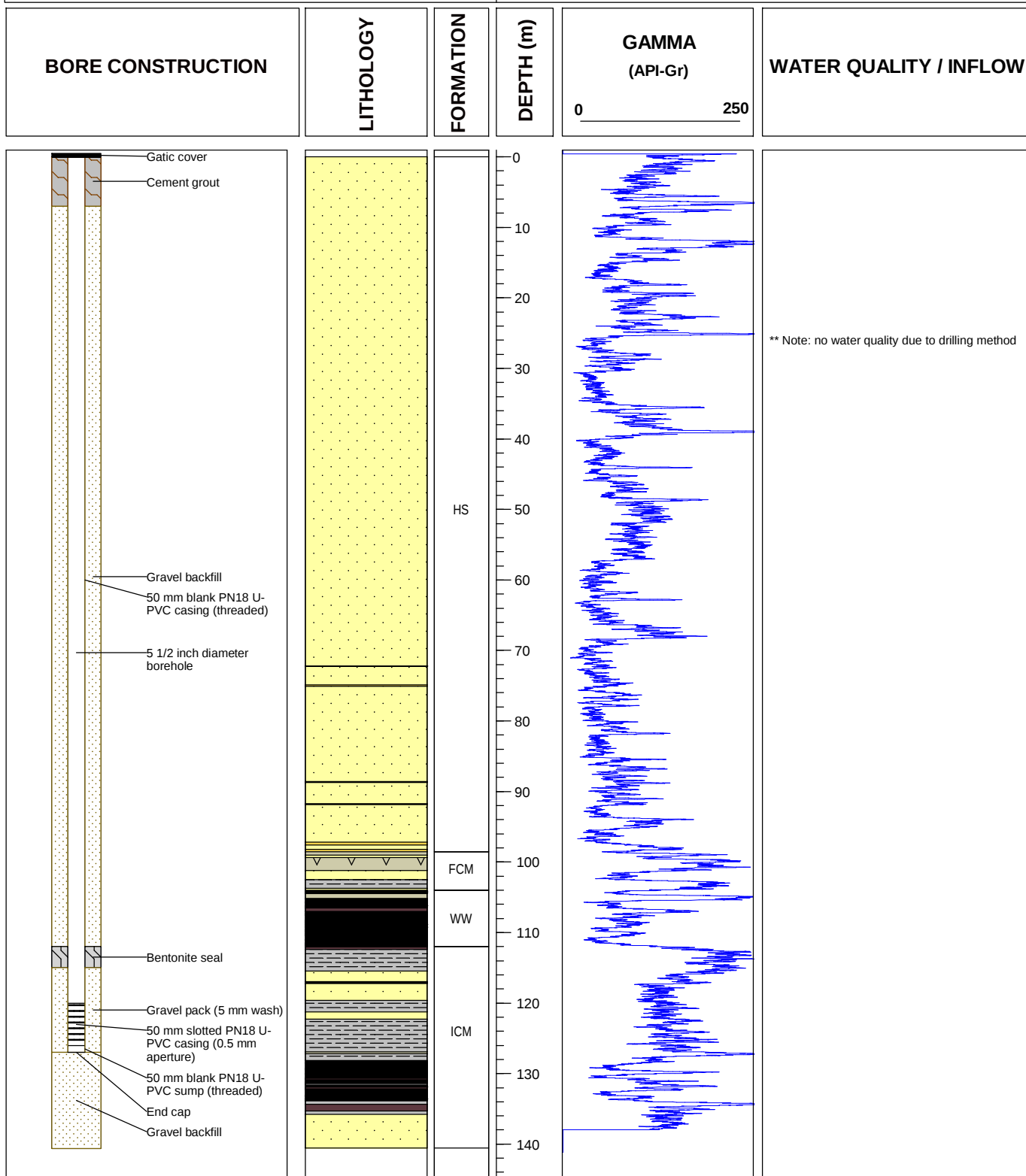
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0133PZA (Decommissioned)

Project: Hume Coal Project
Easting: 249685 **Northing:** 6176683 (MGA Zone 56)
Top of casing: 647.98 mAHD
Ground level: 648.15 mbgl
Static water level: 22.265 mbgl **Date:** 21/05/2014

Completion date: 29/4/14
Drilling company: Highland Drilling
Drilling method: Patial core
Screened interval: 120 - 126 mbgl
Gravel pack: 115 - 127 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0133PZA - Bore construction

Revision: A

Date drawn: 2/6/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



HUMECOAL
PROJECT

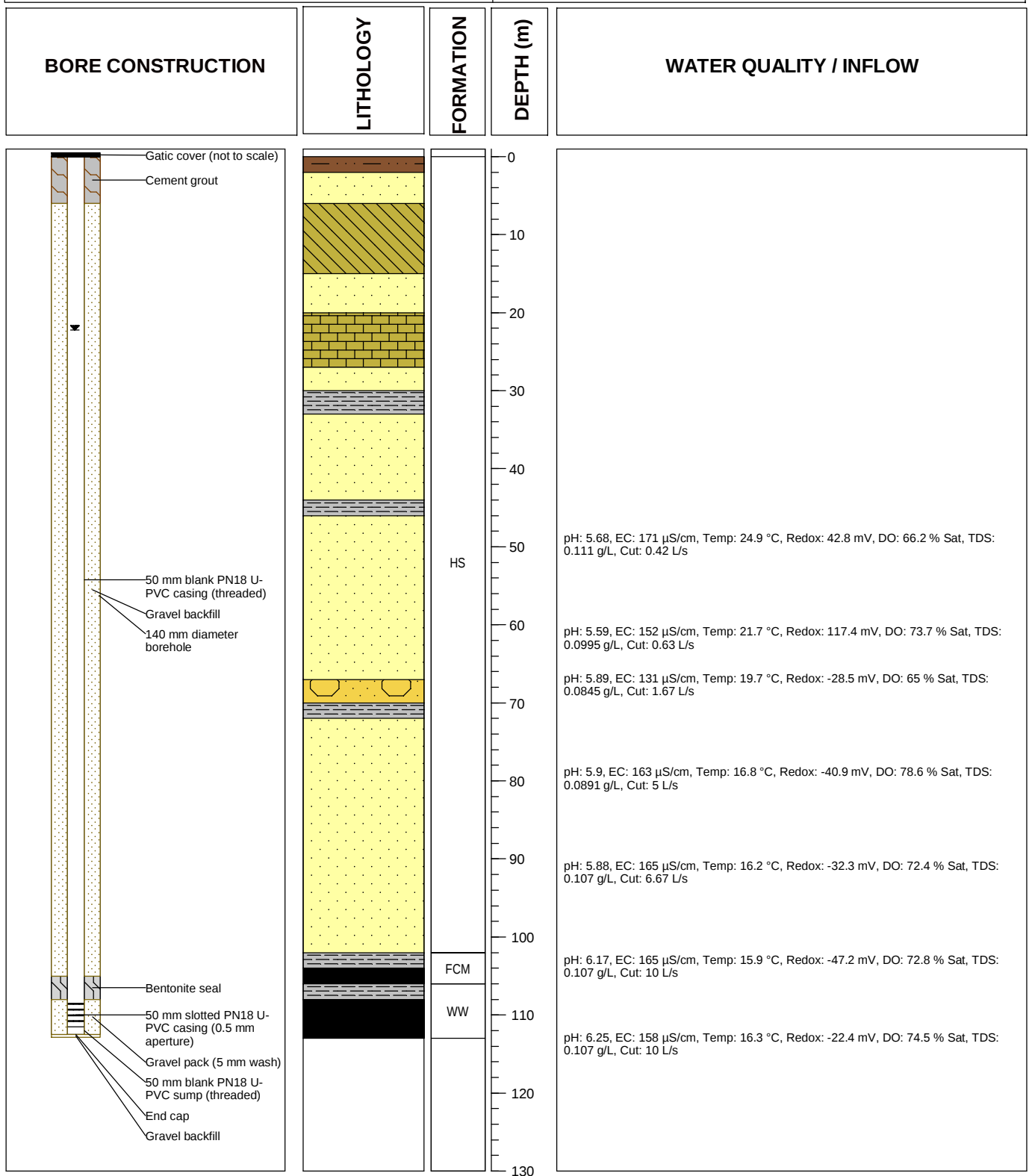
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0133PZB (Decommissioned)

Project: Hume Coal Project
Easting: 249688 **Northing:** 6176688 (MGA Zone 56)
Top of casing: 648.07 mAHD
Ground level: 648.2 mAHD
Static water level: 22.22 mbgl **Date:** 21/05/2014

Completion date: 29/4/2014
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 108.5 - 111.5 mbgl
Gravel pack: 108 - 112.5 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0133PZB - Bore construction

Revision: A

Date drawn: 2/6/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



HUMECOAL
PROJECT

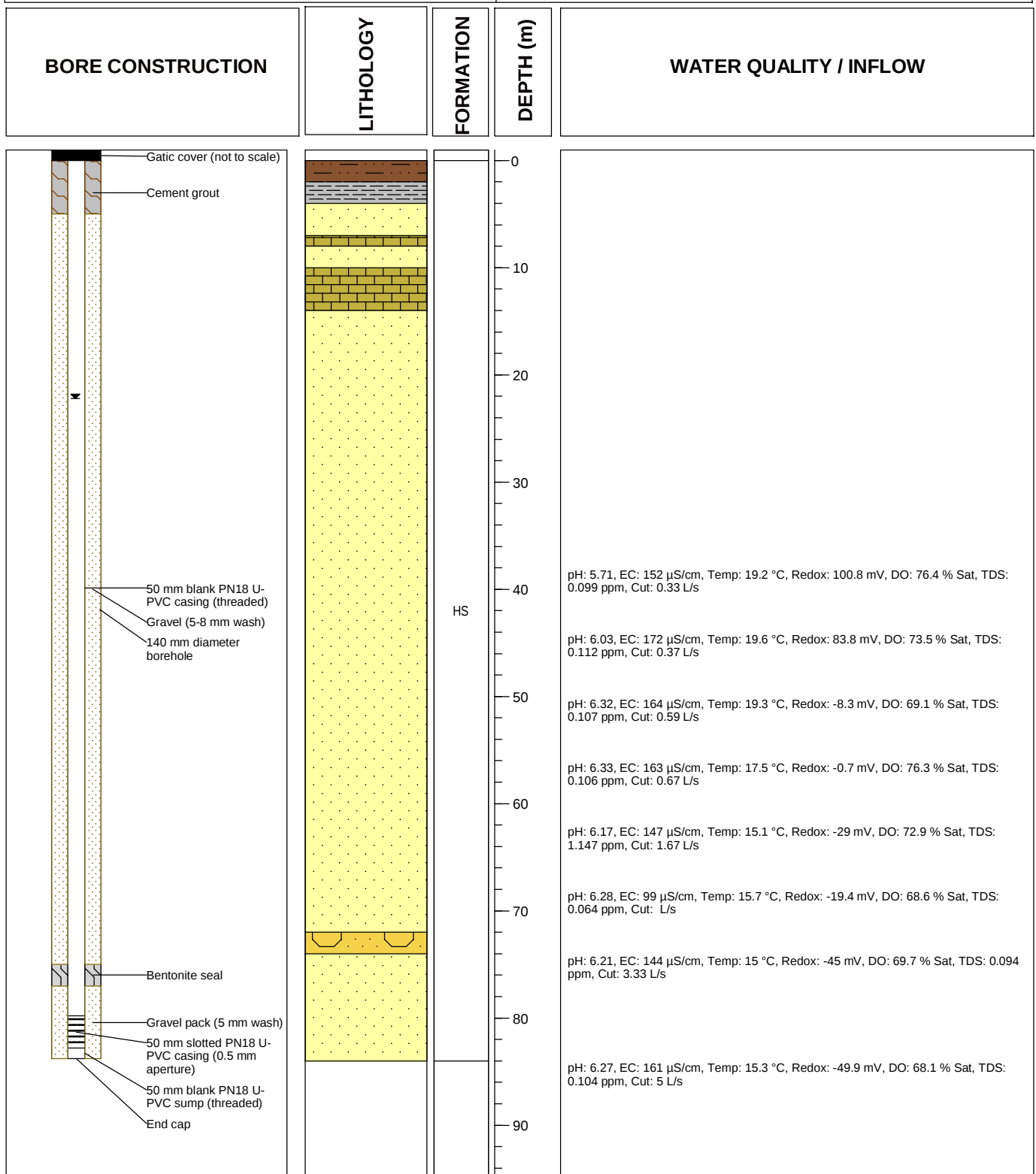
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0133PZC (Decommissioned)

Project: Hume Coal Project
Easting: 249690 **Northing:** 6176694 (MGA Zone 56)
Top of casing: 647.91 mAHD
Ground level: 648 mAHD
Static water level: 22.22 mbgl **Date:** 21/05/2014

Completion date: 05/05/2014
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 79.8 - 82.8 mbgl
Gravel pack: 77 - 83.8 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0133PZC - Bore construction

Revision: A

Date drawn: 2/6/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



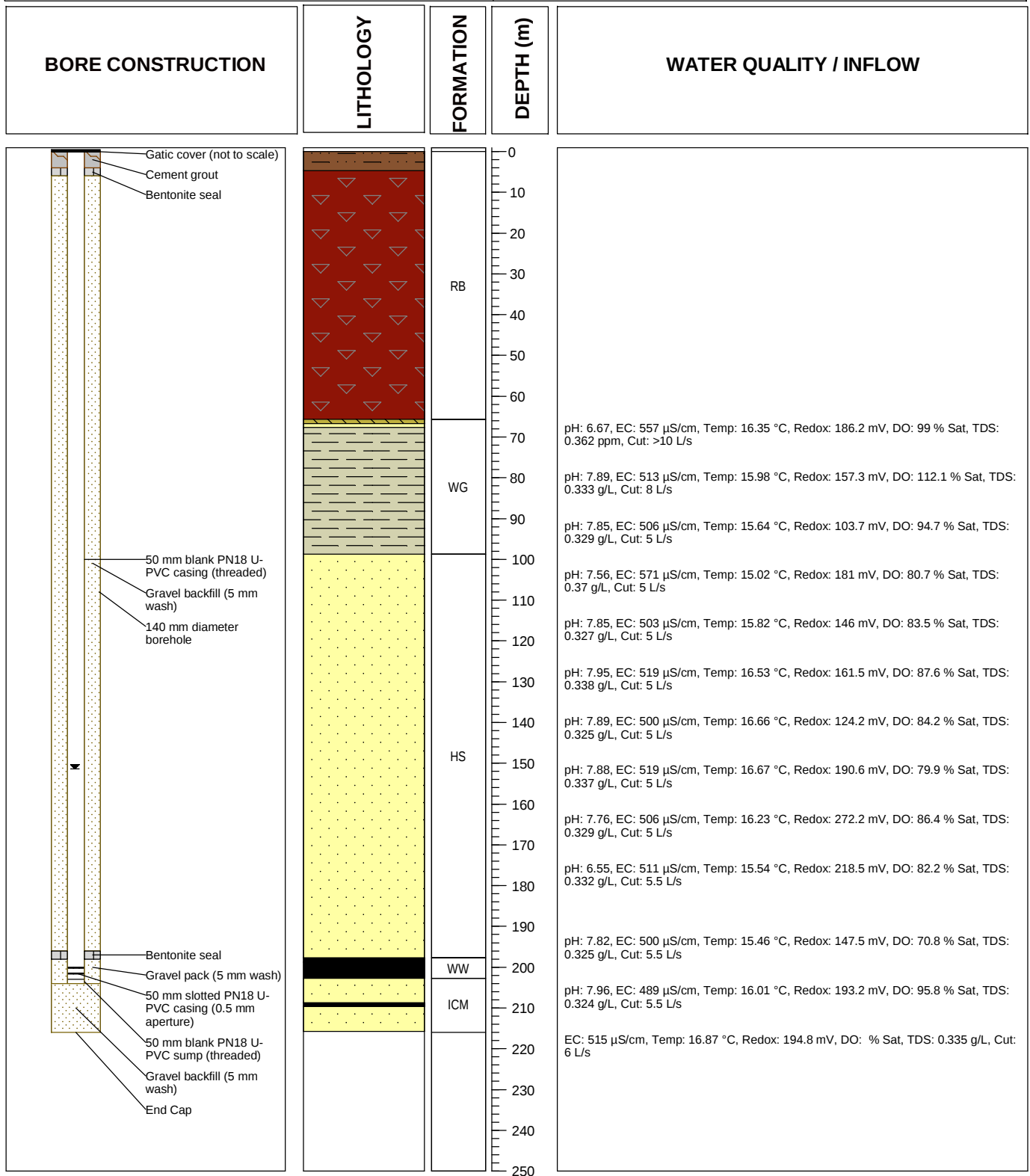
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0136PZA

Project: Hume Coal Project
Easting: 254521 **Northing:** 6166894 (MGA Zone 56)
Top of casing: 718.36 mAHD
Ground level: 718.49 mAHD
Static water level: 151.39 mbgl **Date:** 1/12/2014

Completion date: 29/04/2014
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 200 – 203 mbgl
Gravel pack: 198 - 204 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0136PZA - Bore construction

Revision: A Date drawn: 2/6/14

Drawn by: K. Maher Checked by: L. Rochford

Project No. 2172599A



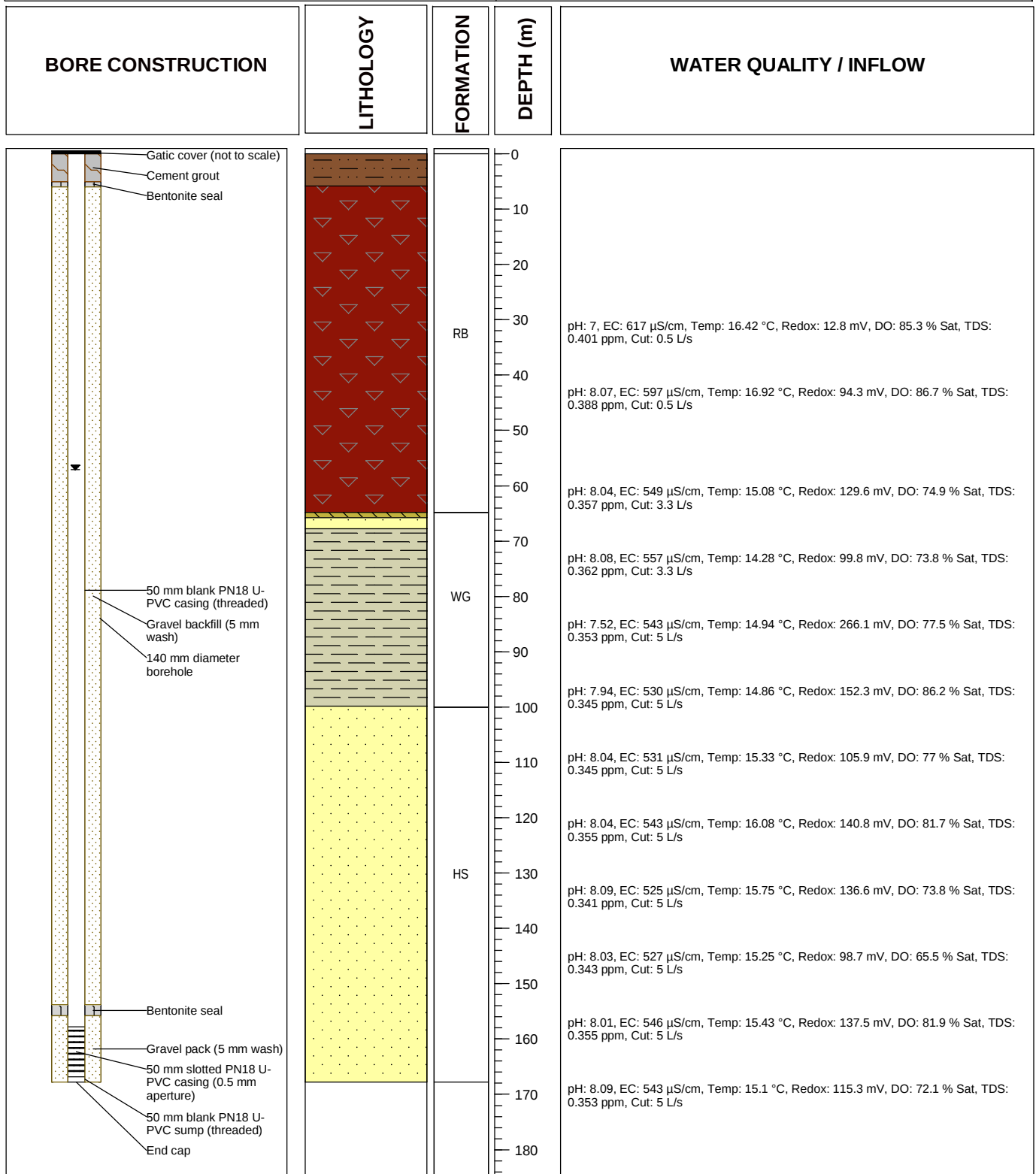
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0136PZB (Decommissioned)

Project: Hume Coal Project
Easting: 254517 **Northing:** 6166890 (MGA Zone 56)
Top of casing: 718.404 mAHD
Ground level: 718.52 mAHD
Static water level: 57.085 mbgl **Date:** 1/12/2014

Completion date: 6/05/2014
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 157.8 - 166.8 mbgl
Gravel pack: 156 - 167.8 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0136PZB - Bore construction

Revision: A	Date drawn: 5/3/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



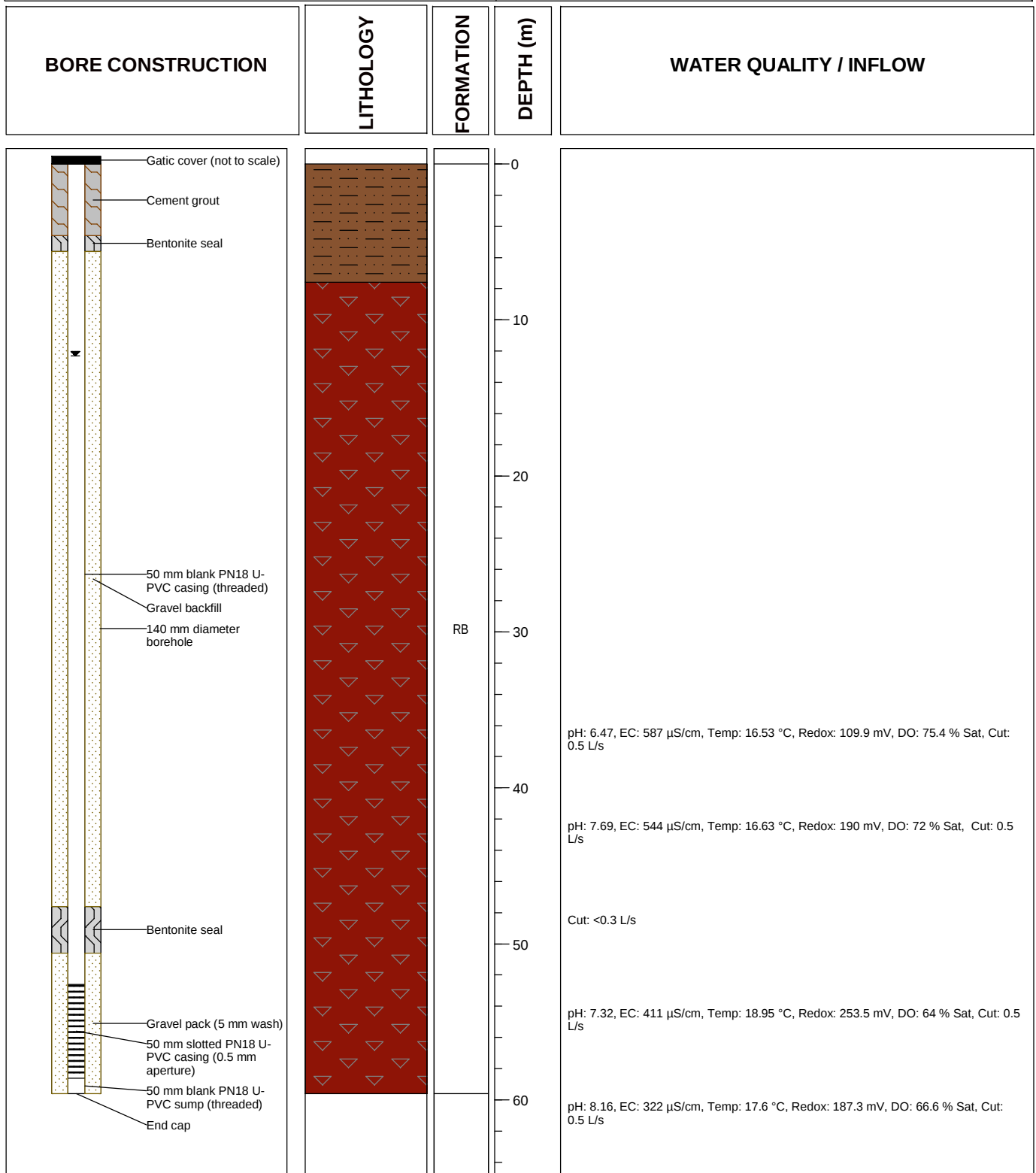
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0136PZC

Project: Hume Coal Project
Easting: 254513 **Northing:** 6166887 (MGA Zone 56)
Top of casing: 718.402 mAHD
Ground level: 718.51 mAHD
Static water level: 12.305 mbgl **Date:** 1/12/2014

Completion date: 9/05/2014
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 52.6 - 58.6 mbgl
Gravel pack: 51 - 59.6 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0136PZC - Bore construction
Revision: A Date drawn: 2/6/14
Drawn by: K. Maher Checked by: L. Rochford
Project No. 2172599A



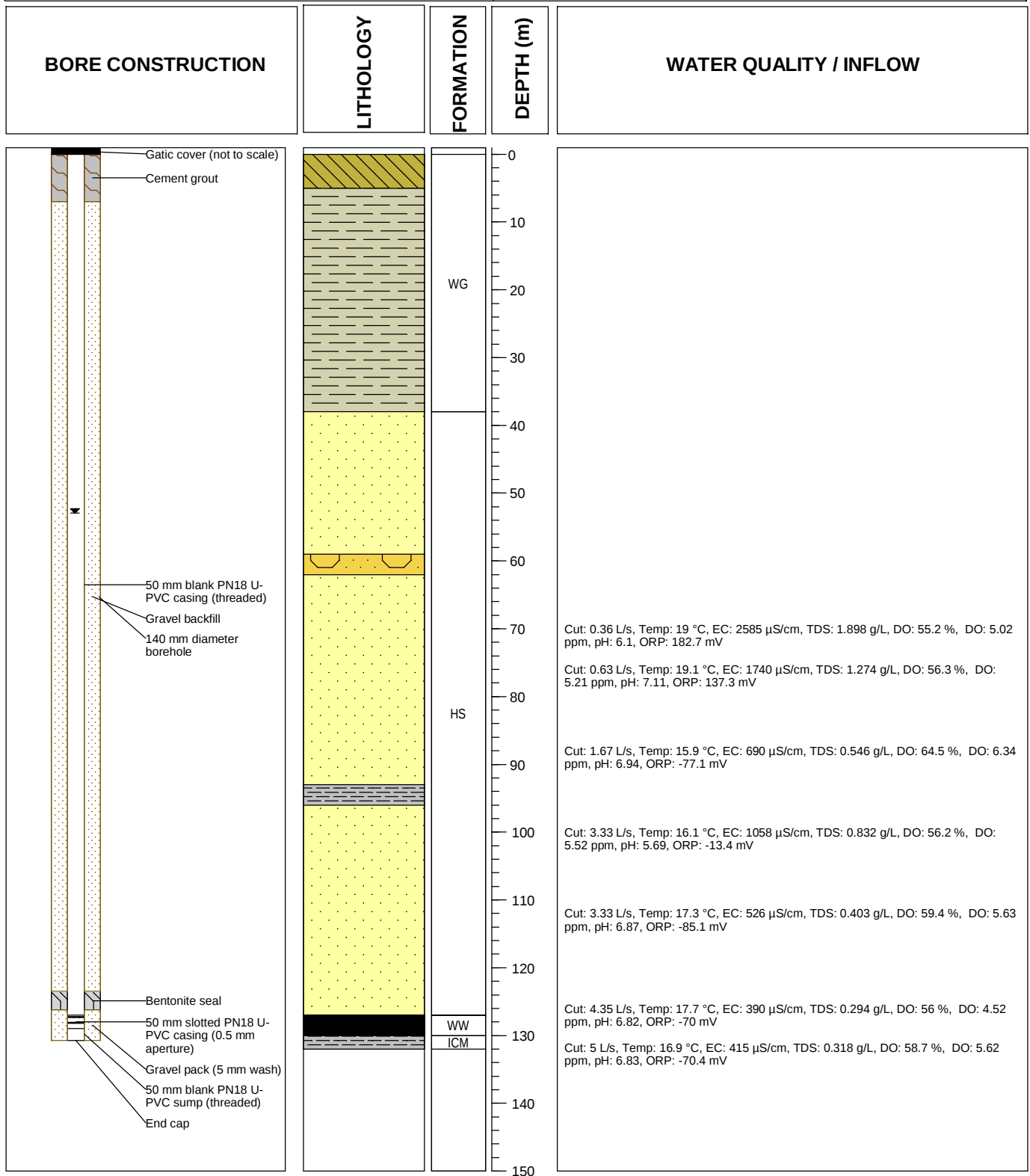
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0142PZA

Project: Hume Coal Project
Easting: 250855.82 **Northing:** 6169880.69 (MGA Zone 56)
Top of casing: 672.34 mAHD
Ground level: 672.43 mAHD
Static water level: 52.95 mbTOC **Date:** 23/09/2014

Completion date: 10/7/2014
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 127 – 129 mbgl
Gravel pack: 126.2 - 130.7 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0133PZA - Bore construction

Revision: A	Date drawn: 22/07/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



Hume Coal Pty Ltd

HU0142PZB

Completion date:	14/07/2014
Drilling company:	Highland Drilling
Drilling method:	Air rotary
Screened interval:	112 - 118 mbgl
Gravel pack:	110 - 119 mbgl

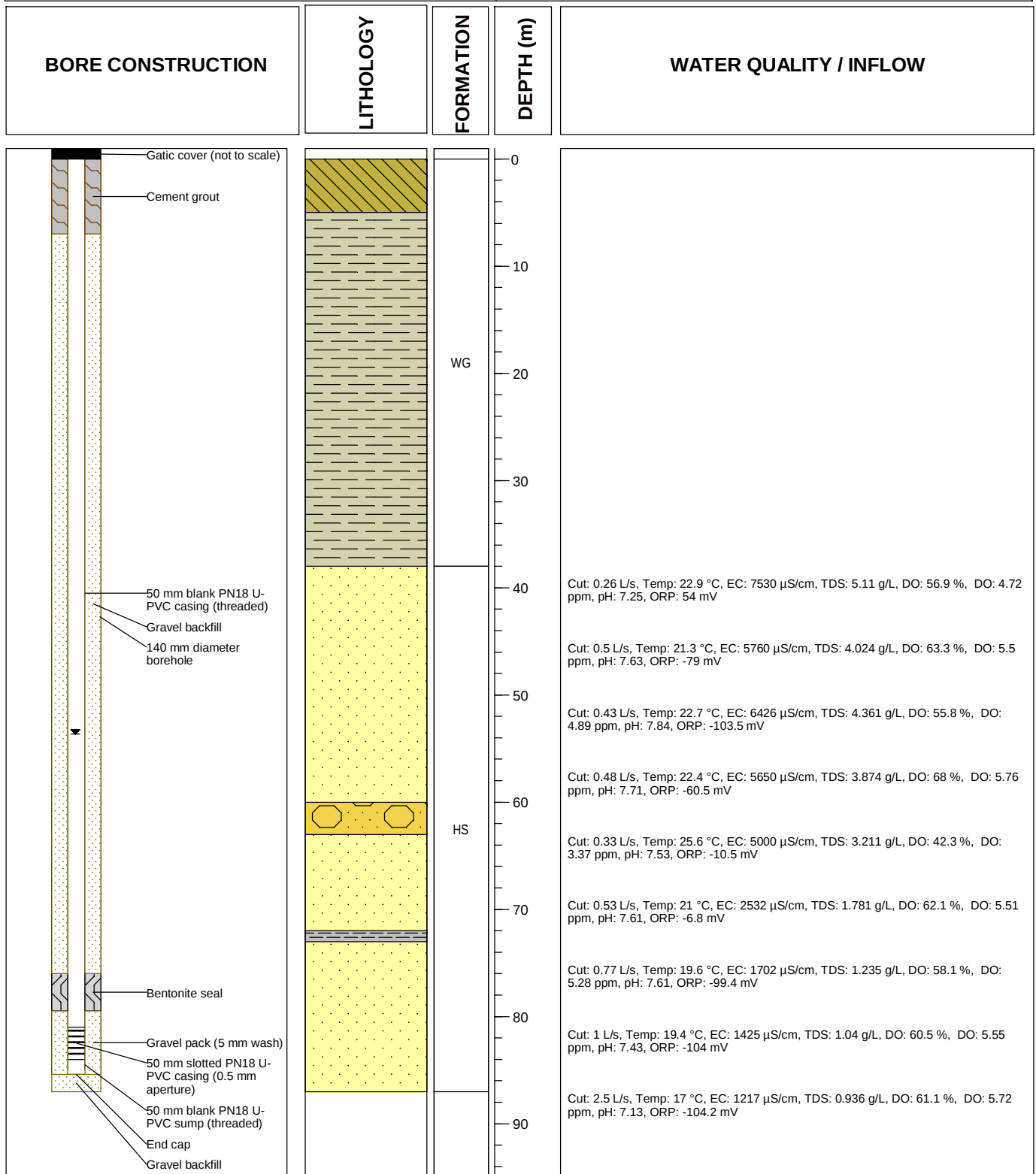


BORE COMPLETION REPORT

HU0142PZC

Project: Hume Coal Project
Easting: 250855 **Northing:** 6169892 (MGA Zone 56)
Top of casing: 672.15 mAHD
Ground level: 672.23 mAHD
Static water level: 53.64 mbTOC **Date:** 23/09/2014

Completion date: 16/07/2014
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 81 - 84 mbgl
Gravel pack: 80 - 85 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0133PZA - Bore construction

Revision: A	Date drawn: 22/07/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



Hume Coal Pty Ltd

HU0143PZA

Completion date:	24/9/14
Drilling company:	Highland Drilling
Drilling method:	Air rotary
Screened interval:	118.8 - 124.8 mbgl
Gravel pack:	116.0 - 125.8 mbgl

[illegible]

HU0143PZB

Completion date:	29/9/14
Drilling company:	Highland Drilling
Drilling method:	Air rotary
Screened interval:	109 - 112 mbgl
Gravel pack:	107 - 113 mbgl

The diagram illustrates a groundwater monitoring well assembly and its corresponding stratigraphic profile. The well assembly on the left includes a Gatic cover (not to scale), Cement grout, a 50 mm blank PN18 U-PVC casing (threaded), Gravel backfill, a 140 mm diameter borehole, a Bentonite seal, a Gravel pack (5 mm wash), a 50 mm slotted PN18 U-PVC casing (0.5 mm aperture), a 50 mm blank PN18 U-PVC sump (threaded), and an End cap. The stratigraphic profile on the right shows a vertical scale from 0 to 120 meters. The well is installed in a sequence of layers: HS (Heavy Sand) from 0 to approximately 95 meters, FCM (Fine Clayey Material) from 95 to 105 meters, and WW (Water) from 105 to 120 meters. The well casing is shown passing through the HS and FCM layers, with a gravel pack at the bottom of the borehole. The well is labeled 'Cut' at various depths, indicating the flow rate, temperature, electrical conductivity (EC), total dissolved solids (TDS), dissolved oxygen (DO), pH, and oxidation-reduction potential (ORP) at those depths.

Depth (m)	Flow Rate (L/s)	Temp (°C)	EC (μS/cm)	TDS (g/L)	DO (%)	pH	ORP (mV)
0	<0.1	20.41	162	0.105	89.1	7.95	-109.8
10	<0.1	25.91	139	0.09	102.6	6.59	5.2
20	0.3	24.97	106	0.069	92.1	5.15	16.4
30	1	20.29	101	0.066	110	6.4	-21.9
40	4.1	16.88	154	0.1	112.1	6.33	-42.5
50	5.5	17.13	159	0.103	101.2	6.27	-42.7
60	3	17.25	166	0.108	95.7	6.32	-47.7
70	5.55	17.8	160	0.104	96.6	6.29	-45.4



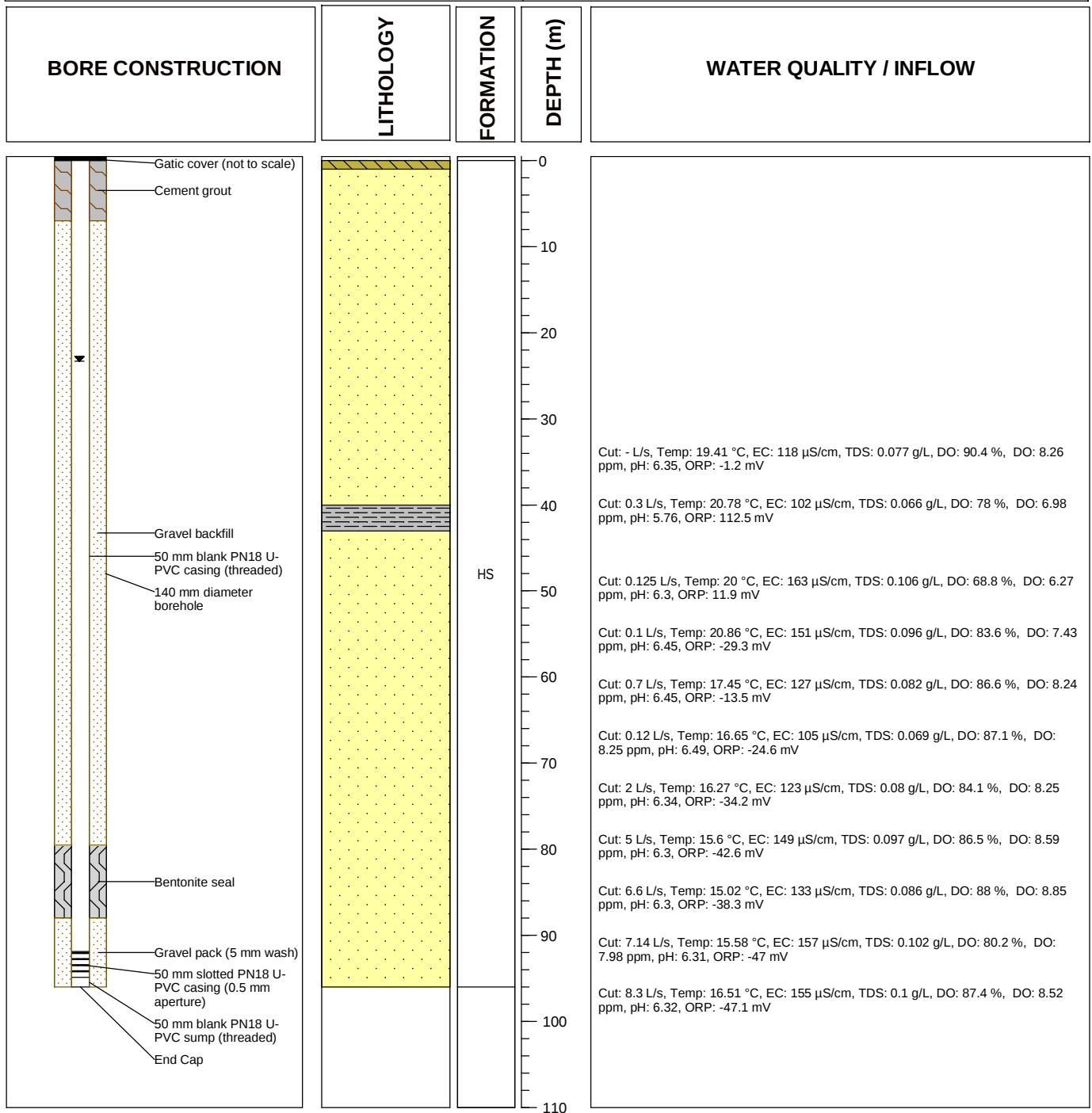
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0143PZC

Project: Hume Coal Project
Easting: 249673 **Northing:** 6176697 (MGA Zone 56)
Top of casing: 649.36 mAHD
Ground level: 649.45 mAHD
Static water level: 23.315 mbTOC **Date:** 25/03/2015

Completion date: 2/10/2014
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 91.9 - 94.9 mbgl
Gravel pack: 88 - 95.9 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0143PZC - Bore construction

Revision: A	Date drawn: 16/10/2015
Drawn by: D. Watson	Checked by: E. Kwantes
Project No. 2172599A	



HUMECOAL
PROJECT

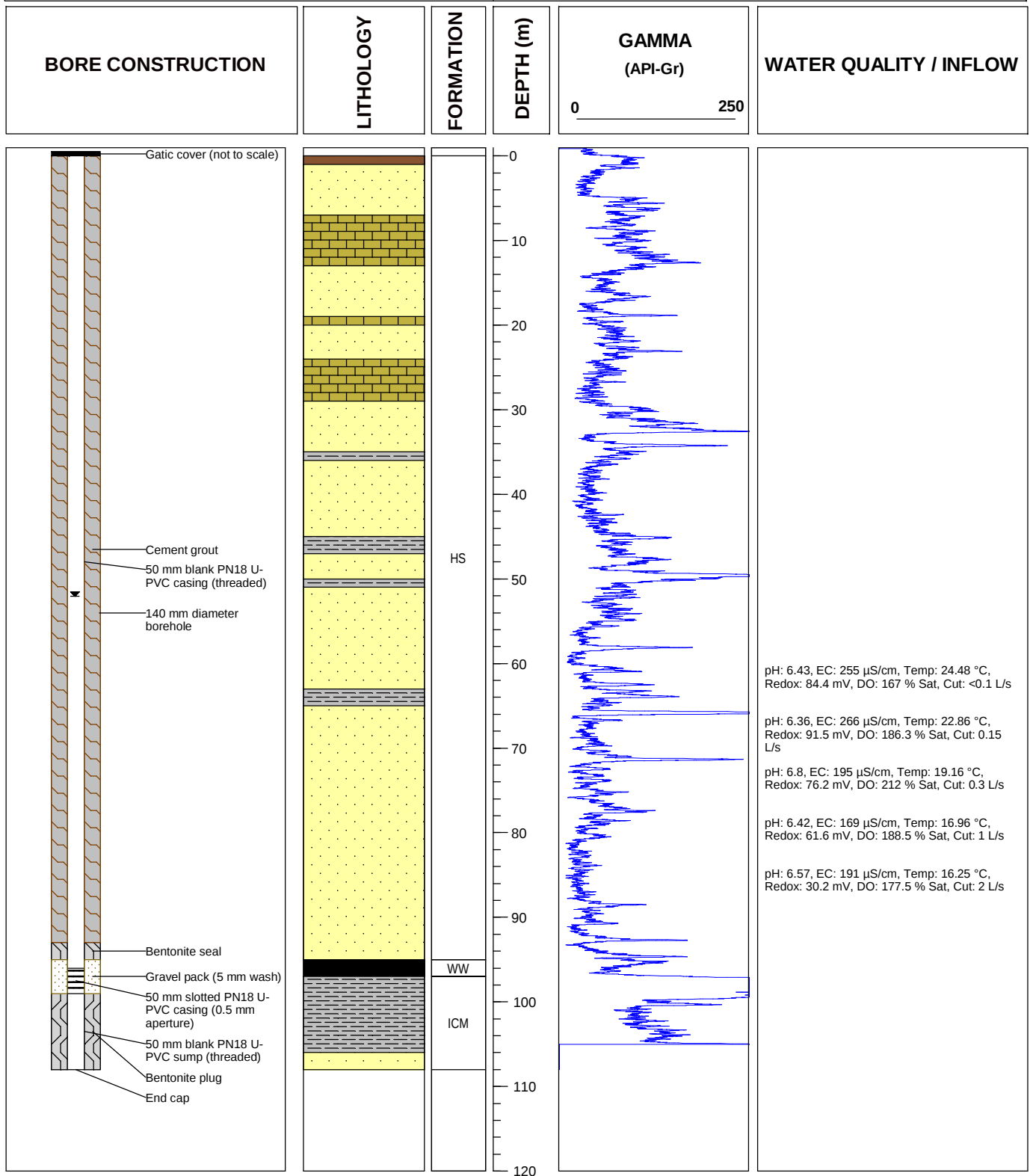
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0018PZA

Project: Hume Coal Project
Easting: 246696 **Northing:** 6174166 (MGA Zone 56)
Top of casing: 691.67 mAHD
Ground level: 691.74 mAHD
Static water level: 52.065 mbgl **Date:** 4/12/2014

Completion date: 20/09/2011
Drilling company: Highland Drilling
Drilling method: Air Rotary
Screened interval: 96 - 99 mbgl
Gravel pack: 95.0 - 99.0 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0018PZA - Bore construction

Revision: A	Date drawn: 5/3/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



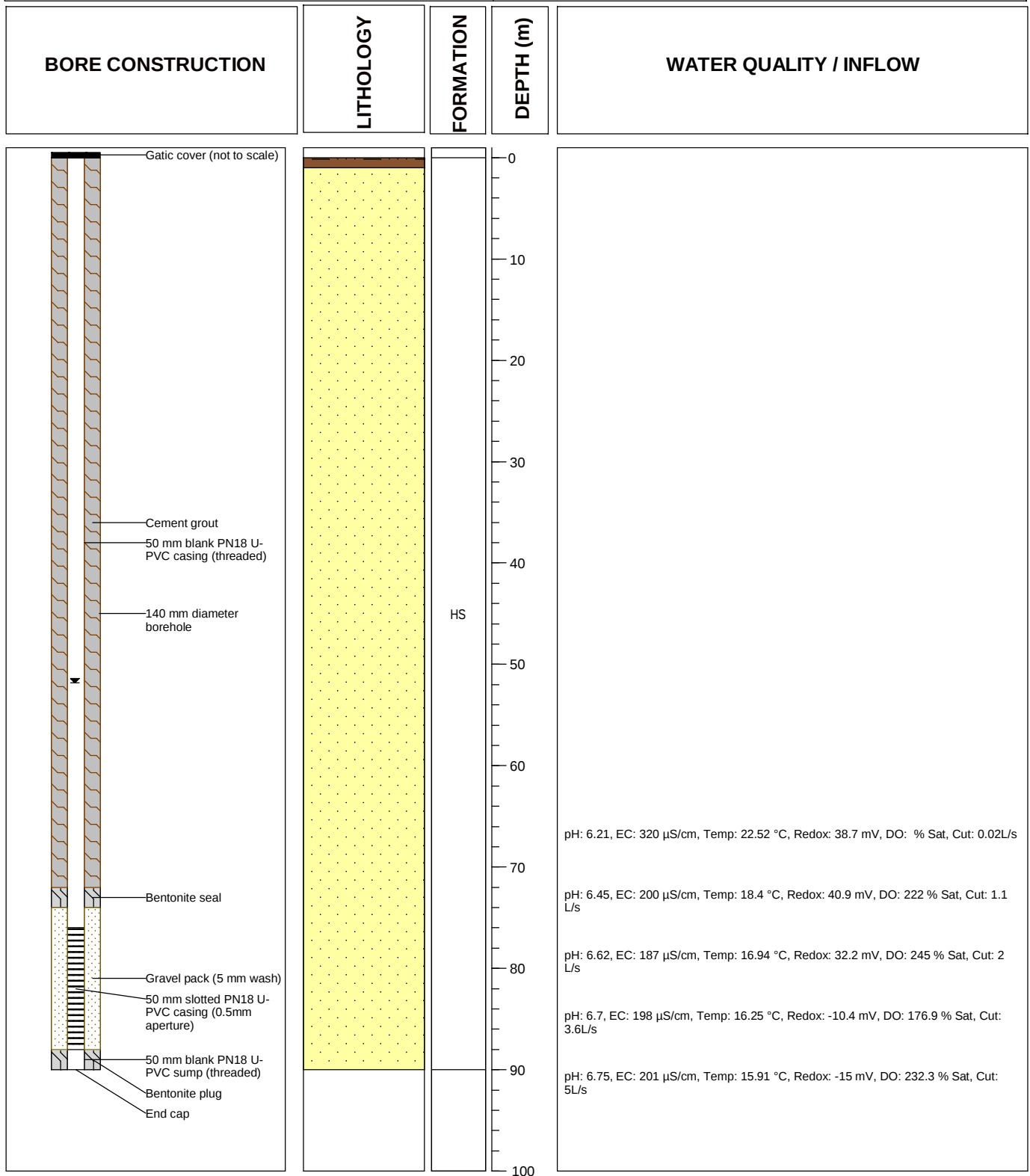
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0018PZB

Project: Hume Coal Project
Easting: 246695 **Northing:** 6174159 (MGA Zone 56)
Top of casing: 691.89 mAHD
Ground level: 691.97 mAHD
Static water level: 51.84 mbgl **Date:** 4/12/2014

Completion date: 20/09/2011
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 76 - 88 mbgl
Gravel pack: 74 - 88 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0018PZB - Bore construction

Revision: A	Date drawn: 5/3/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



HUMECOAL
PROJECT

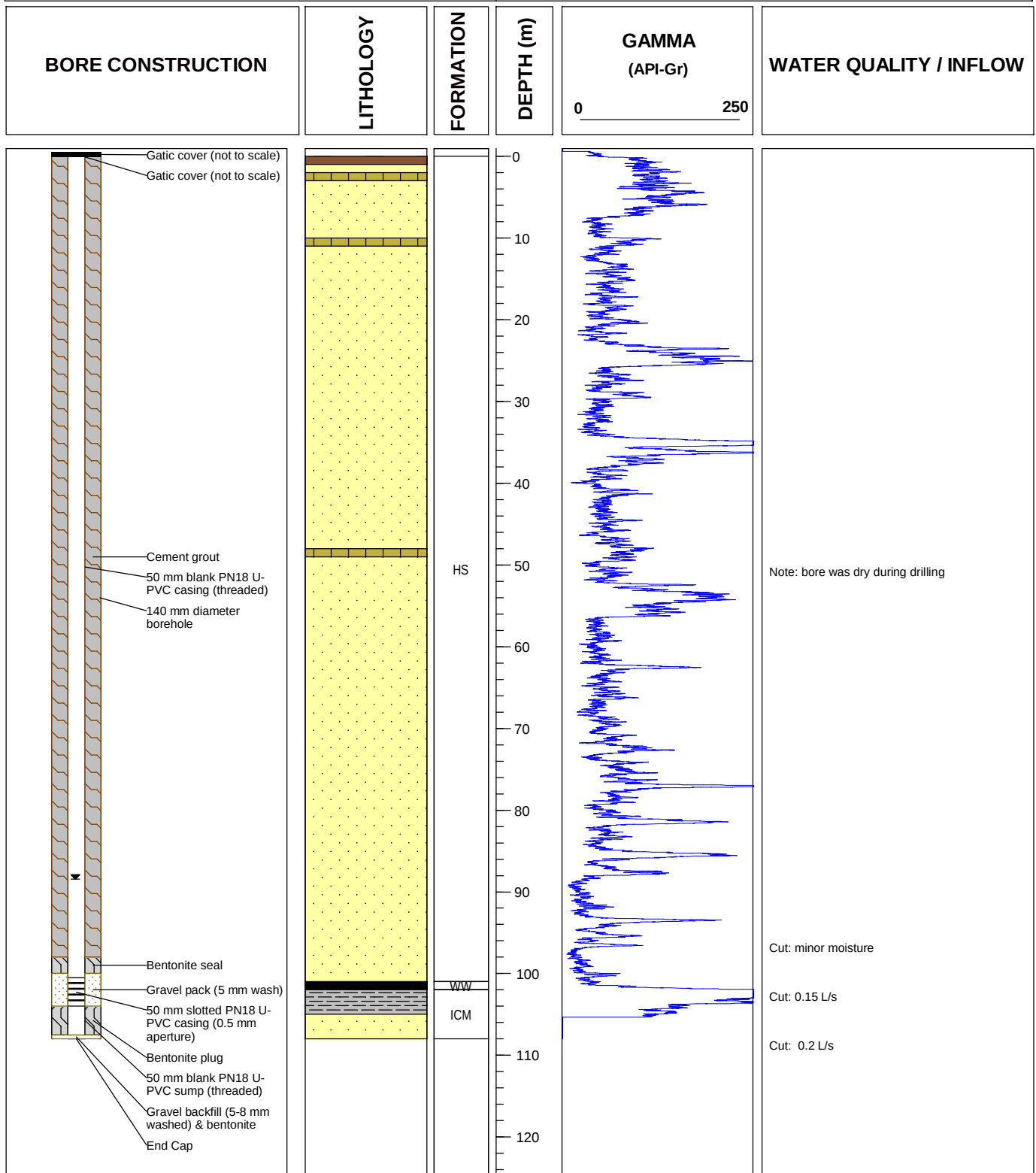
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0019PZA

Project: Hume Coal Project
Easting: 243557 **Northing:** 6174381 (MGA Zone 56)
Top of casing: 720.55 mAHD
Ground level: 720.65 mAHD
Static water level: 88.445 mbgl **Date:** 17/11/2014

Completion date: 23/09/2011
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 100.5 - 103.5 mbgl
Gravel pack: 100 - 107 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0019PZA - Bore Construction

Revision: A	Date drawn: 5/3/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



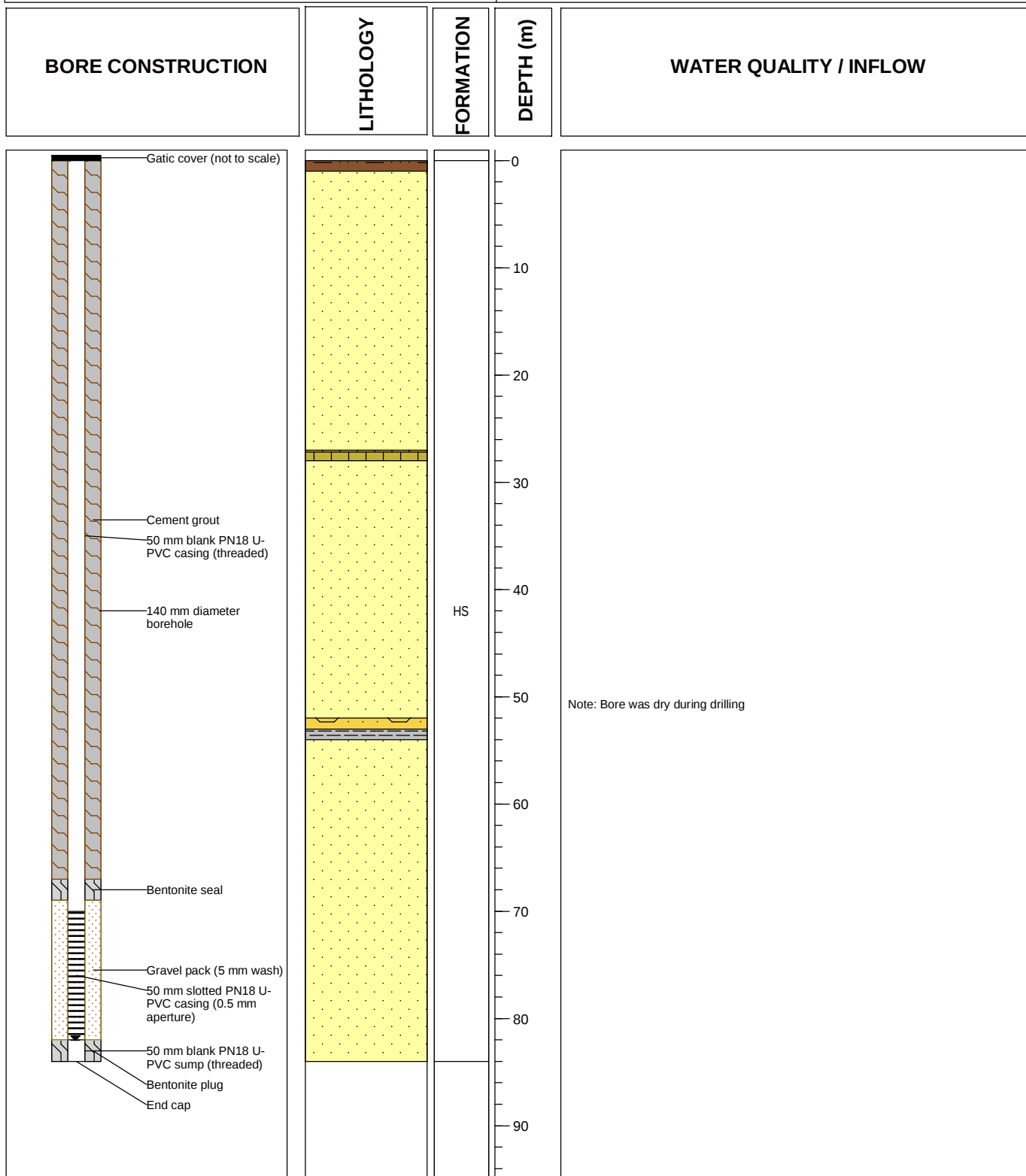
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0019PZB

Project: Hume Coal Project
Easting: 243562 **Northing:** 6174379 (MGA Zone 56)
Top of casing: 720.335 mAHD
Ground level: 720.46 mAHD
Static water level: 82.05 mbgl **Date:** 17/11/2014

Completion date: 26/09/2011
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 70 - 82 mbgl
Gravel pack: 69.0 - 82.5 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0018PZB - Bore Construction

Revision: A

Date drawn: 5/3/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



HUMECOAL
PROJECT

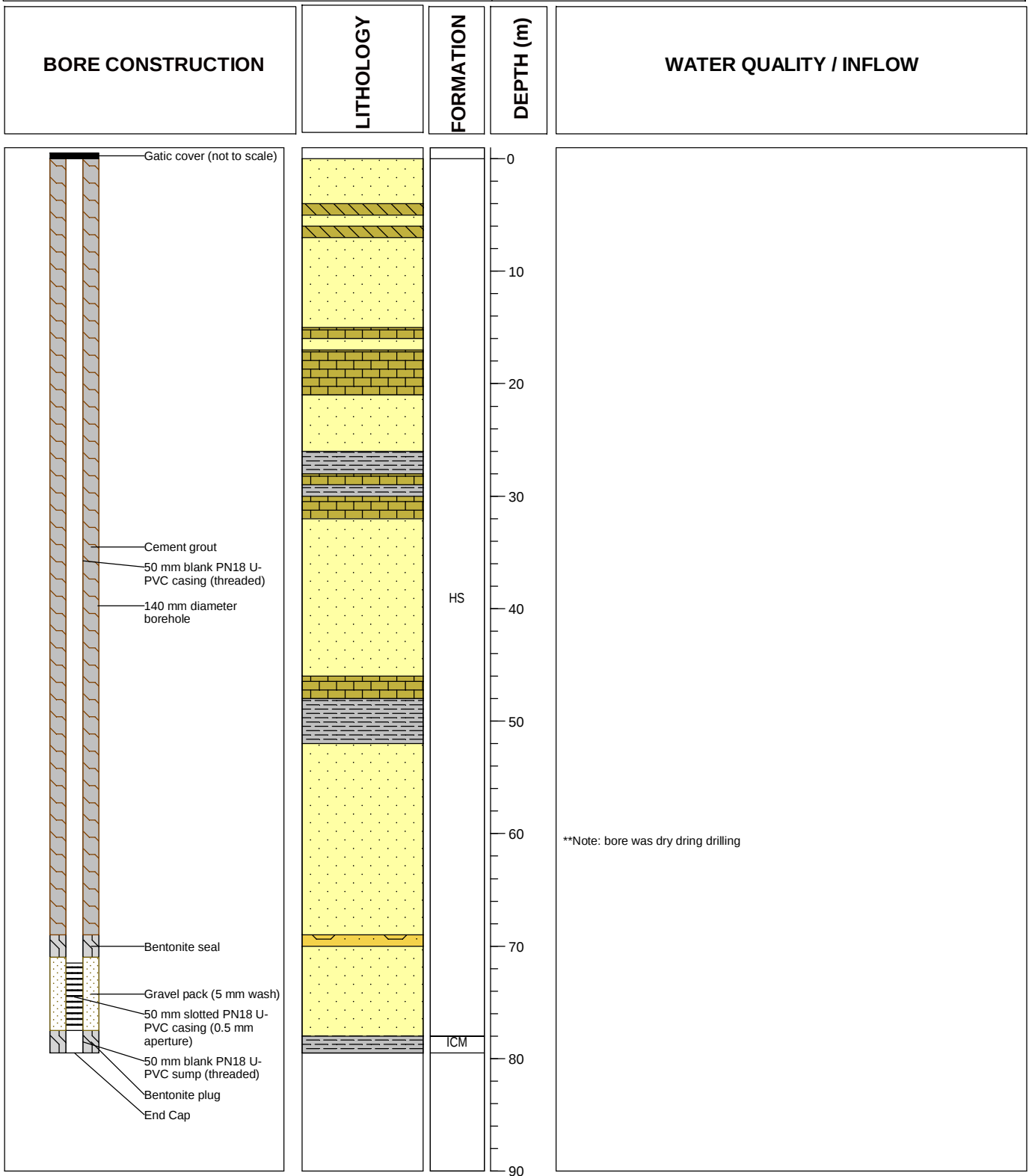
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0020PZA

Project: Hume Coal Project
Easting: 244258 **Northing:** 6176920 (MGA Zone 56)
Top of casing: 703.18 mAHD
Ground level: 703.25 mAHD
Static water level: DRY **Date:** N/A

Completion date: 27/09/2011
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 71.5 - 77.5 mbgl
Gravel pack: 71.0 - 78 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0020PZA - Bore construction

Revision: A	Date drawn: 5/3/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



HUMECOAL
PROJECT

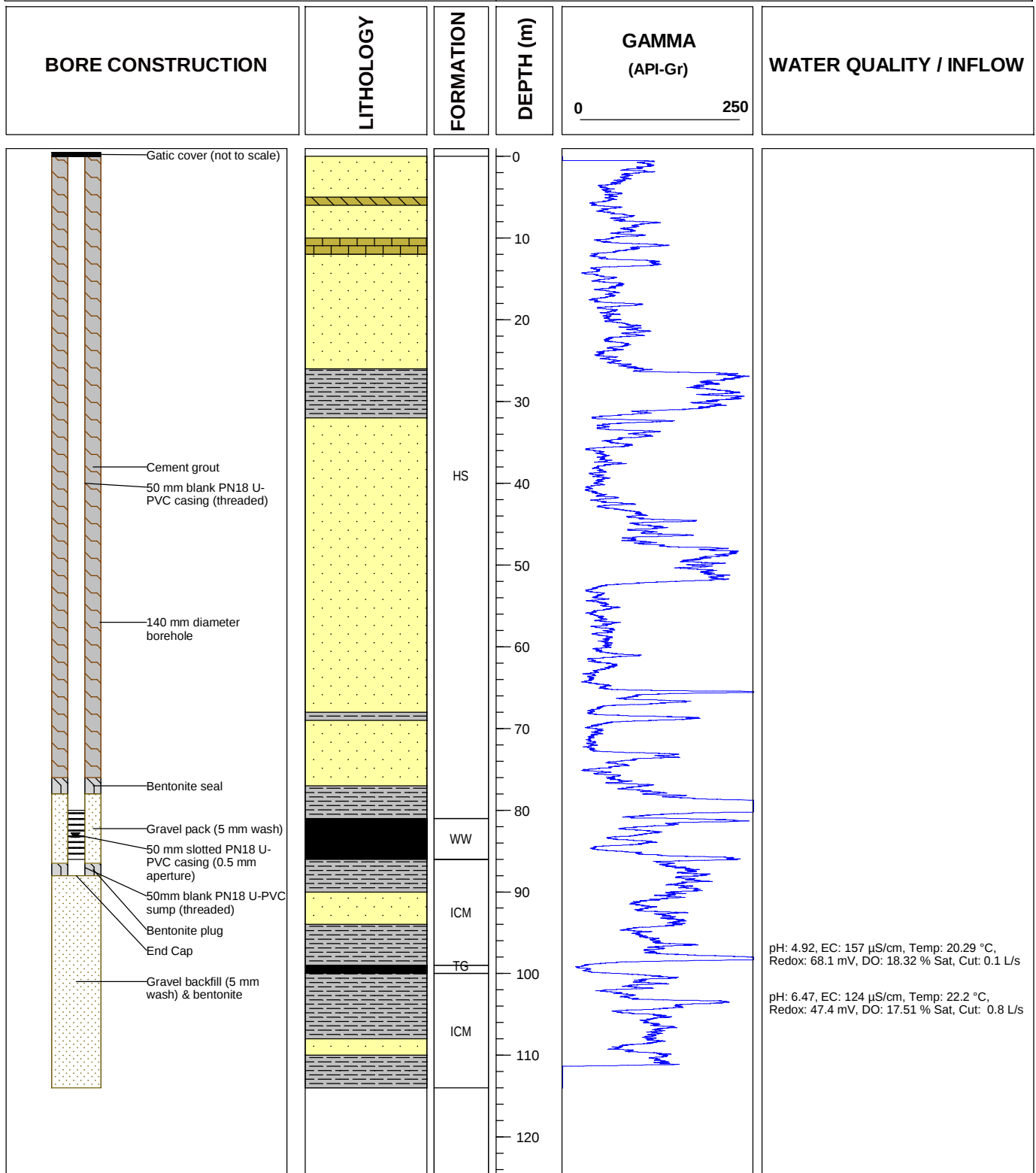
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0020PZB

Project: Hume Coal Project
Easting: 244255 **Northing:** 6176930 (MGA Zone 56)
Top of casing: 703.59 mAHD
Ground level: 703.67 mAHD
Static water level: 83.335 mbgl **Date:** 17/11/2014

Completion date: 28/09/2011
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 80 - 86 mbgl
Gravel pack: 78.0 - 86.5 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0020PZB - Bore construction
 Revision: A Date drawn: 5/3/14
 Drawn by: K. Maher Checked by: L. Rochford
 Project No. 2172599A



HUMECOAL
PROJECT

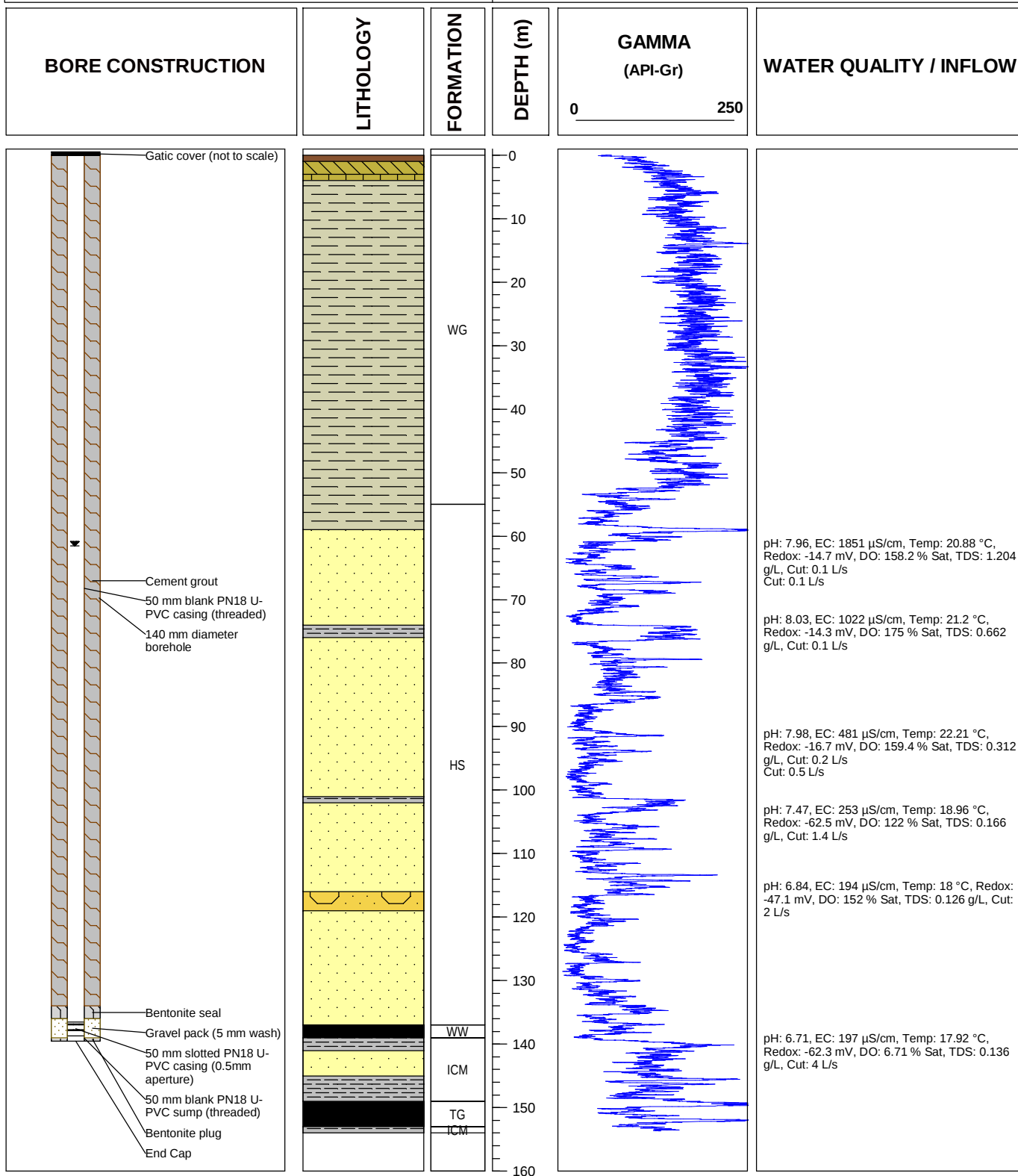
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0023PZA (Decommissioned)

Project: Hume Coal Project
Easting: 250769 **Northing:** 6169622 (MGA Zone 56)
Top of casing: 680.38 mAHD
Ground level: 680.47 mAHD
Static water level: 61.55 mbgl **Date:** 21/05/2014

Completion date: 20/10/2011
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 136.5 - 138.7 mbgl
Gravel pack: 136.0 - 139.0 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0023PZA - Bore construction

Revision: A

Date drawn: 5/3/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



HUMECOAL
PROJECT

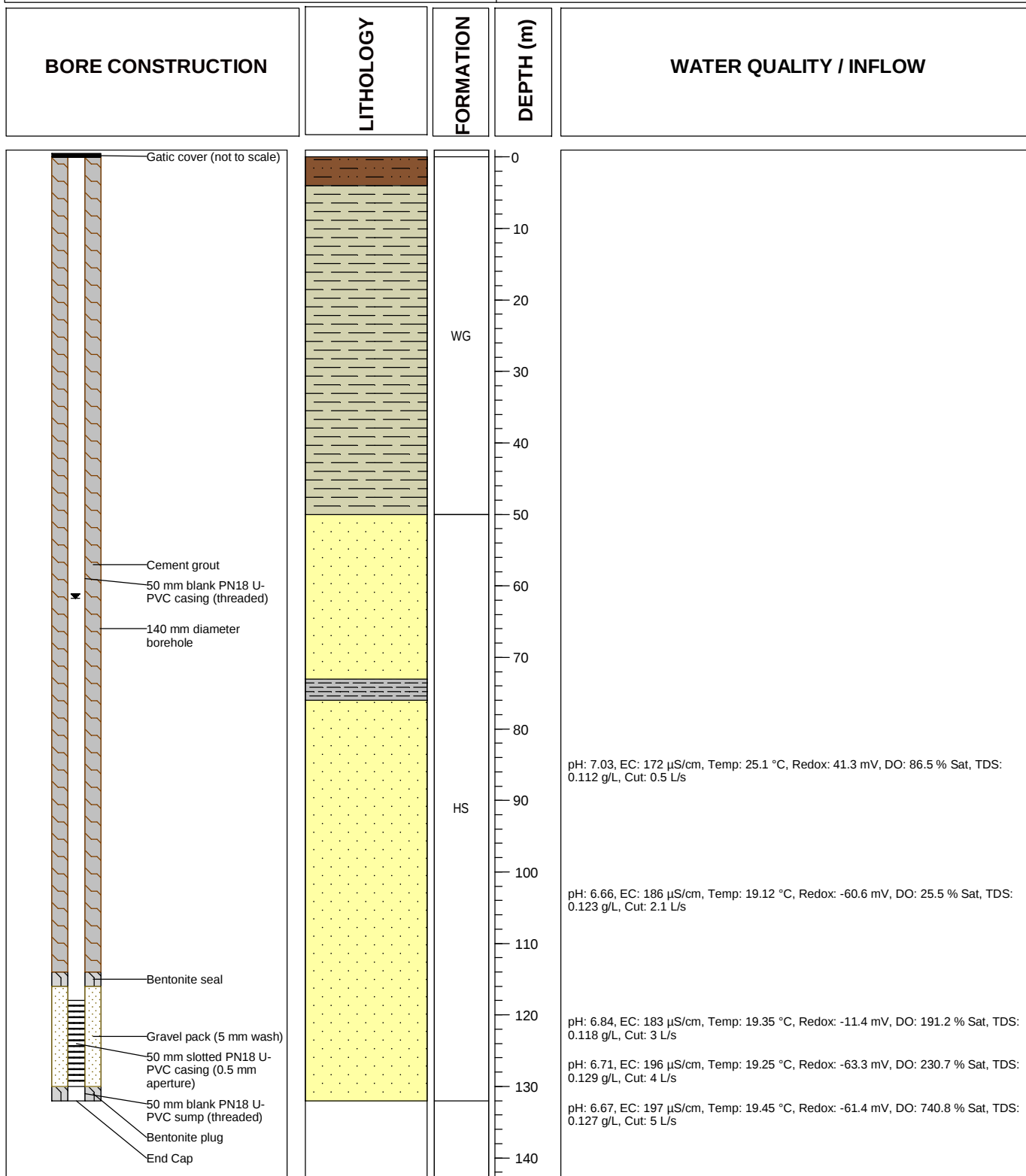
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0023PZB (Decommissioned)

Project: Hume Coal Project
Easting: 250763 **Northing:** 6169620 (MGA Zone 56)
Top of casing: 680.55 mAHD
Ground level: 680.63 mAHD
Static water level: 61.7 mbgl
Date: 21/05/2014

Completion date: 24/10/2011
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 118.0 - 130.0 mbgl
Gravel pack: 116.0 - 130.0 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0023PZB - Bore construction

Revision: A

Date drawn: 5/3/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



HUMECOAL
PROJECT

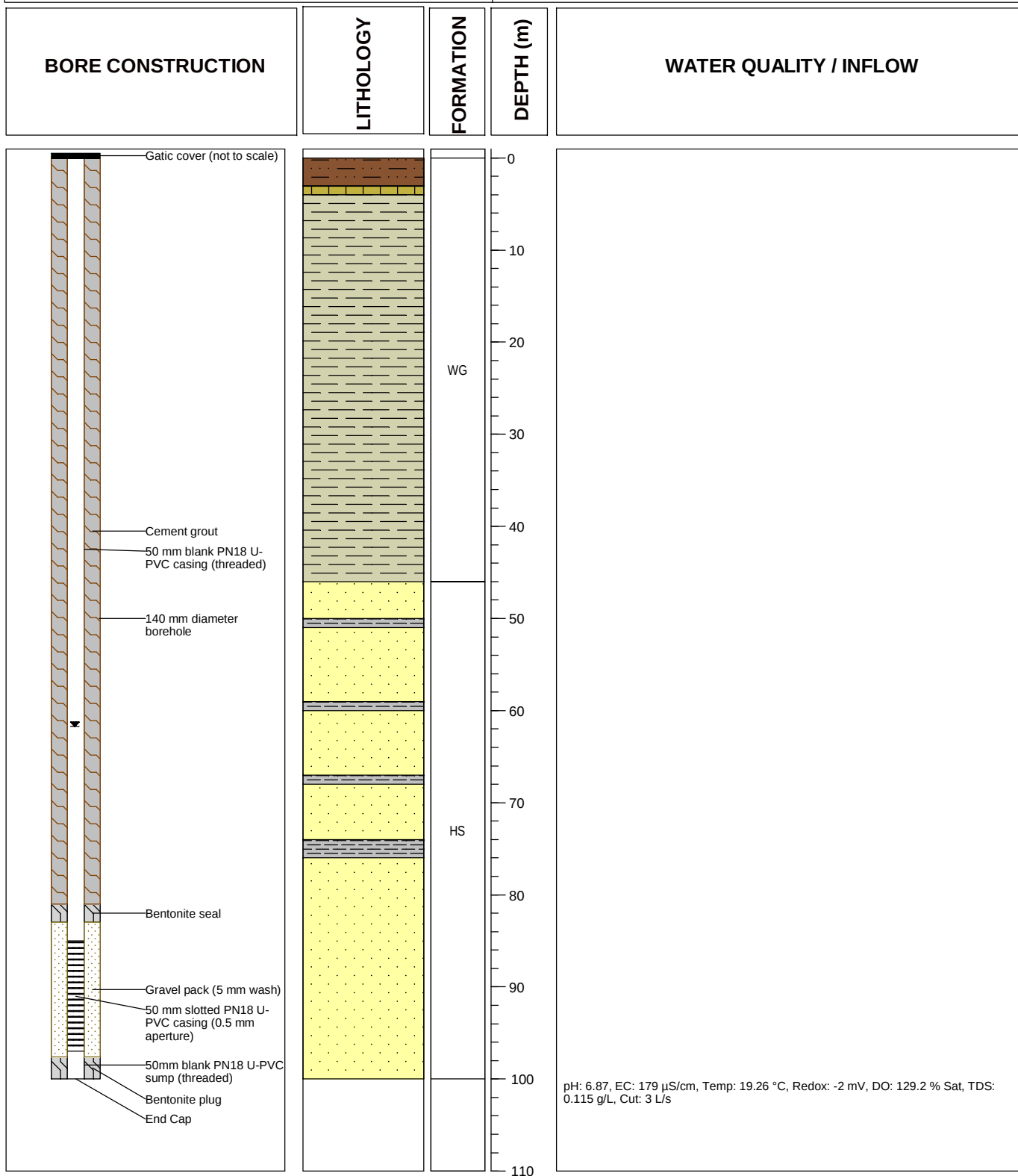
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0023PZC (Decommissioned)

Project: Hume Coal Project
Easting: 250754 **Northing:** 6169617 (MGA Zone 56)
Top of casing: 680.69 mAHD
Ground level: 680.76 mAHD
Static water level: 61.72 mbgl **Date:** 21/05/2014

Completion date: 21/10/2011
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 85.0 - 97.0 mbgl
Gravel pack: 83.0 - 97.6 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0023PZC - Bore construction

Revision: A

Date drawn: 5/3/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



HUMECOAL
PROJECT

Hume Coal Pty Ltd

HU0032LDA/B

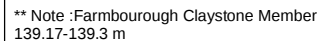
Completion date:	29/03/2012
Drilling company:	Hiland Drilling
Drilling method:	Mud rotary
Screened interval:	B: 58.0 - 88.0 mbgl / A: 108.0 - 114.0 mbgl
Gravel pack:	B: 55.0 - 89.0 mbgl / A: 106.0 - 117.0 mbgl

***Note: no water quality due to drilling method



HU0035PZA

Completion date:	29/03/2012
Drilling company:	Highland Drilling
Drilling method:	Mud rotary
Screened interval:	54 - 78 mbgl
Gravel pack:	52 - 79 mbgl

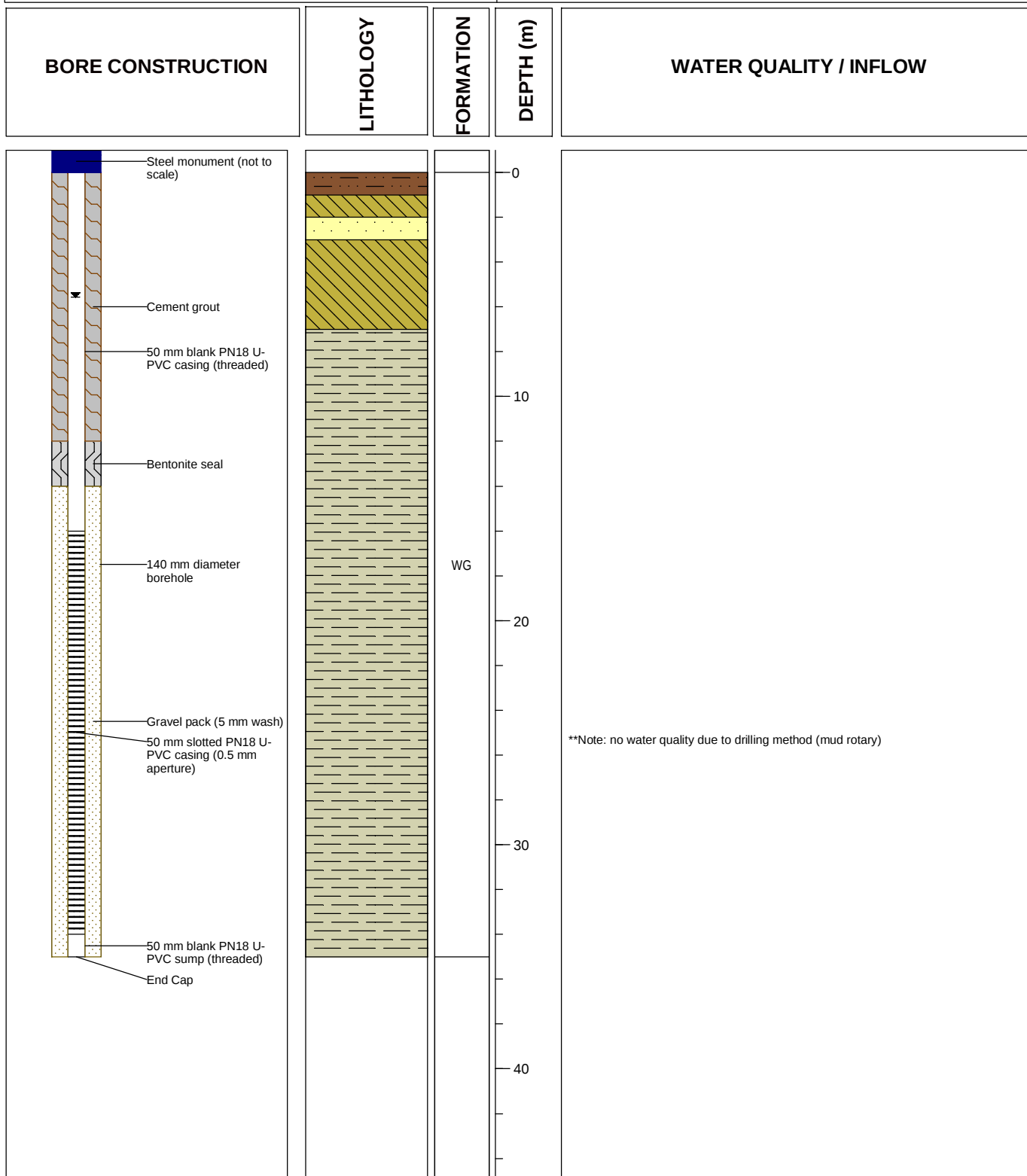


BORE COMPLETION REPORT

HU0035PZB

Project: Hume Coal Project
Easting: 250531 **Northing:** 6172487 (MGA Zone 56)
Top of casing: 681.517 mAHD
Ground level: 680.84 mAHD
Static water level: 5.563 mbgl **Date:** 17/11/2014

Completion date: 29/03/2012
Drilling company: Highland Drilling
Drilling method: Mud rotary
Screened interval: 16 – 34 mbgl
Gravel pack: 14.0 - 35.0 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0035PZB - Bore construction

Revision: A

Date drawn: 5/3/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



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PROJECT

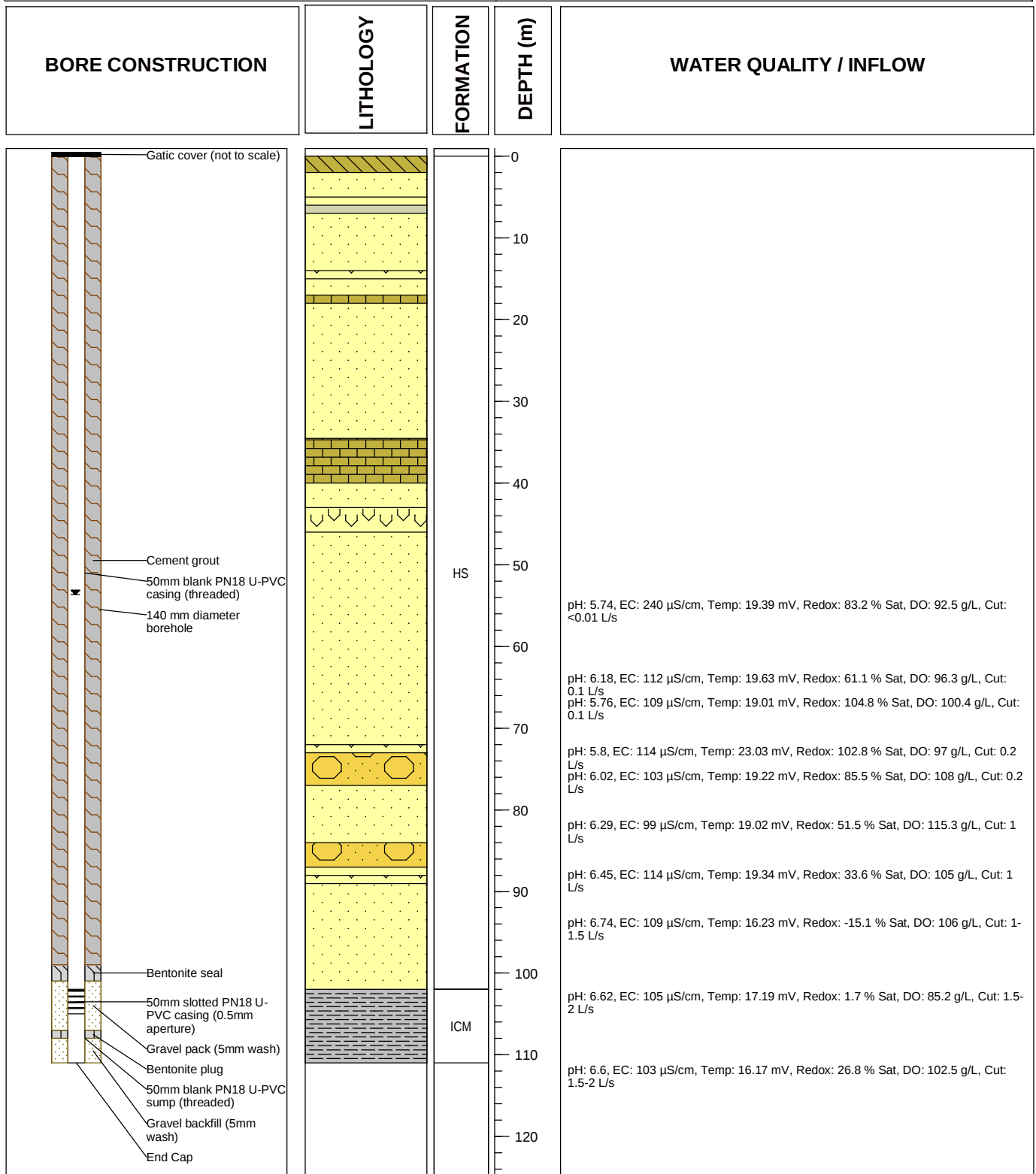
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0037PZA

Project: Hume Coal Project
Easting: 246551 **Northing:** 6167440 (MGA Zone 56)
Top of casing: 703.7 mAHD
Ground level: 703.79 mAHD
Static water level: 53.64 mbgl **Date:** 13/11/2014

Completion date: 20/04/2012
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 102 – 105 mbgl
Gravel pack: 101 - 107 mbgl



**PARSONS
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Drawing No.: HU0037PZA - Bore construction

Revision: A

Date drawn: 5/3/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



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PROJECT

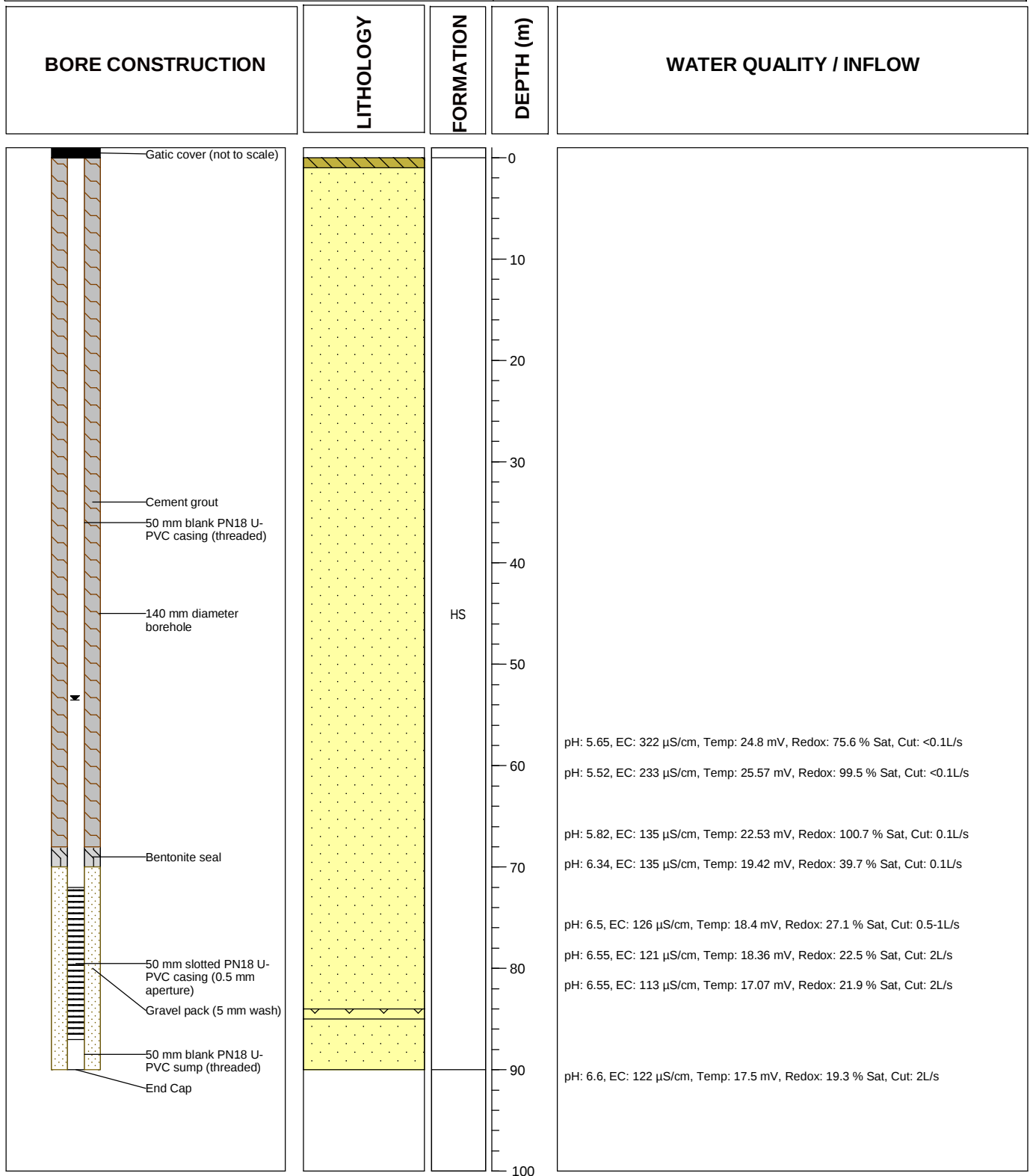
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0037PZB

Project: Hume Coal Project
Easting: 246546 **Northing:** 6167438 (MGA Zone 56)
Top of casing: 703.694 mAHD
Ground level: 703.77 mAHD
Static water level: 53.536 mbgl **Date:** 13/11/2014

Completion date: 20/04/2012
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 72 – 87 mbgl
Gravel pack: 70 - 90 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0037PZB - Bore construction

Revision: A

Date drawn: 5/3/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



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PROJECT

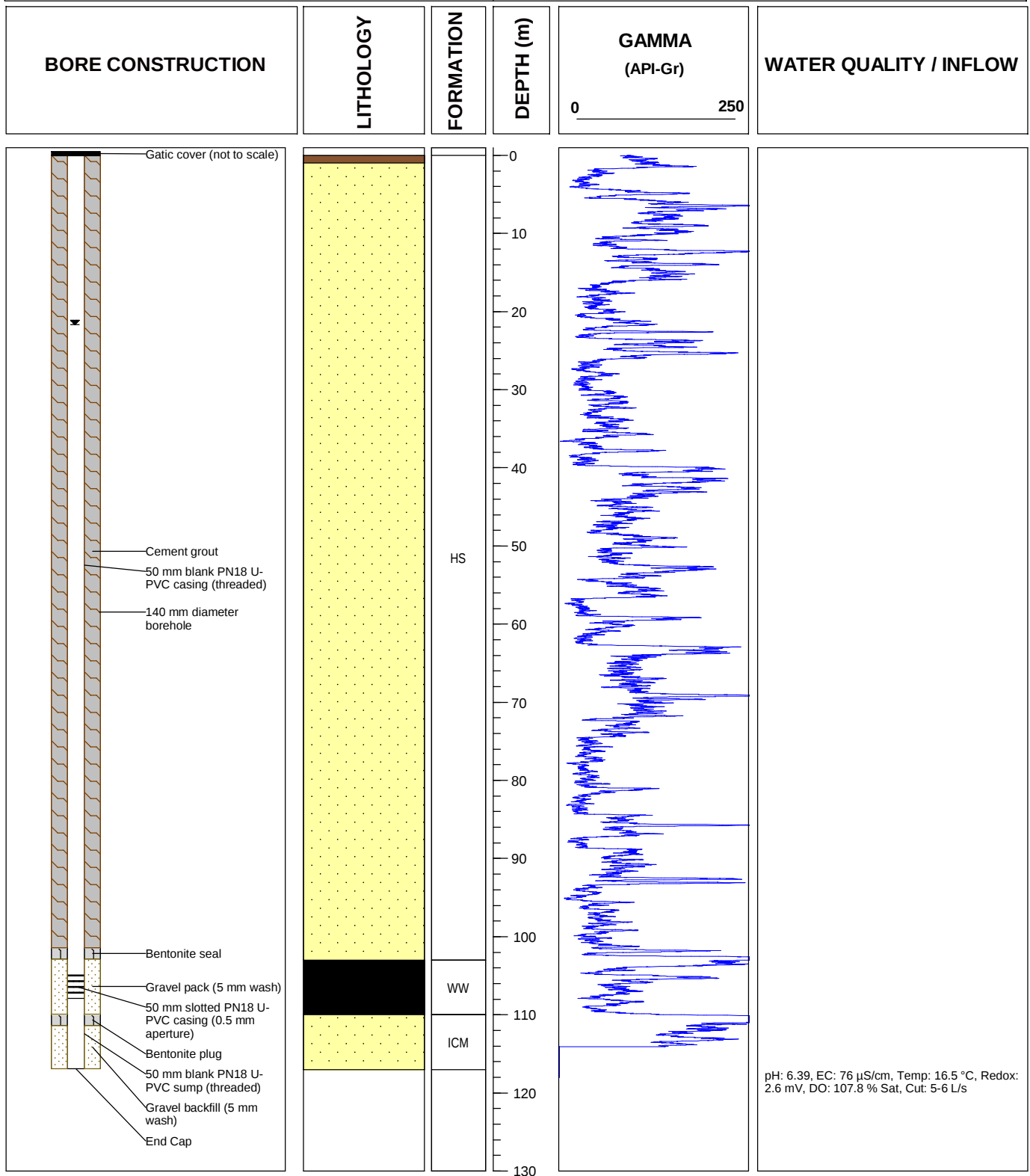
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0038PZA

Project: Hume Coal Project
Easting: 248783 **Northing:** 6175453 (MGA Zone 56)
Top of casing: 658.44 mAHD
Ground level: 658.53 mAHD
Static water level: 20.895 mbgl **Date:** 2/12/2014

Completion date: 8/05/2012
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 104.9 – 107.9 mbgl
Gravel pack: 102.9 - 110 mbgl



**PARSONS
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Drawing No.: HU0038PZA - Bore construction

Revision: A	Date drawn: 5/3/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



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PROJECT

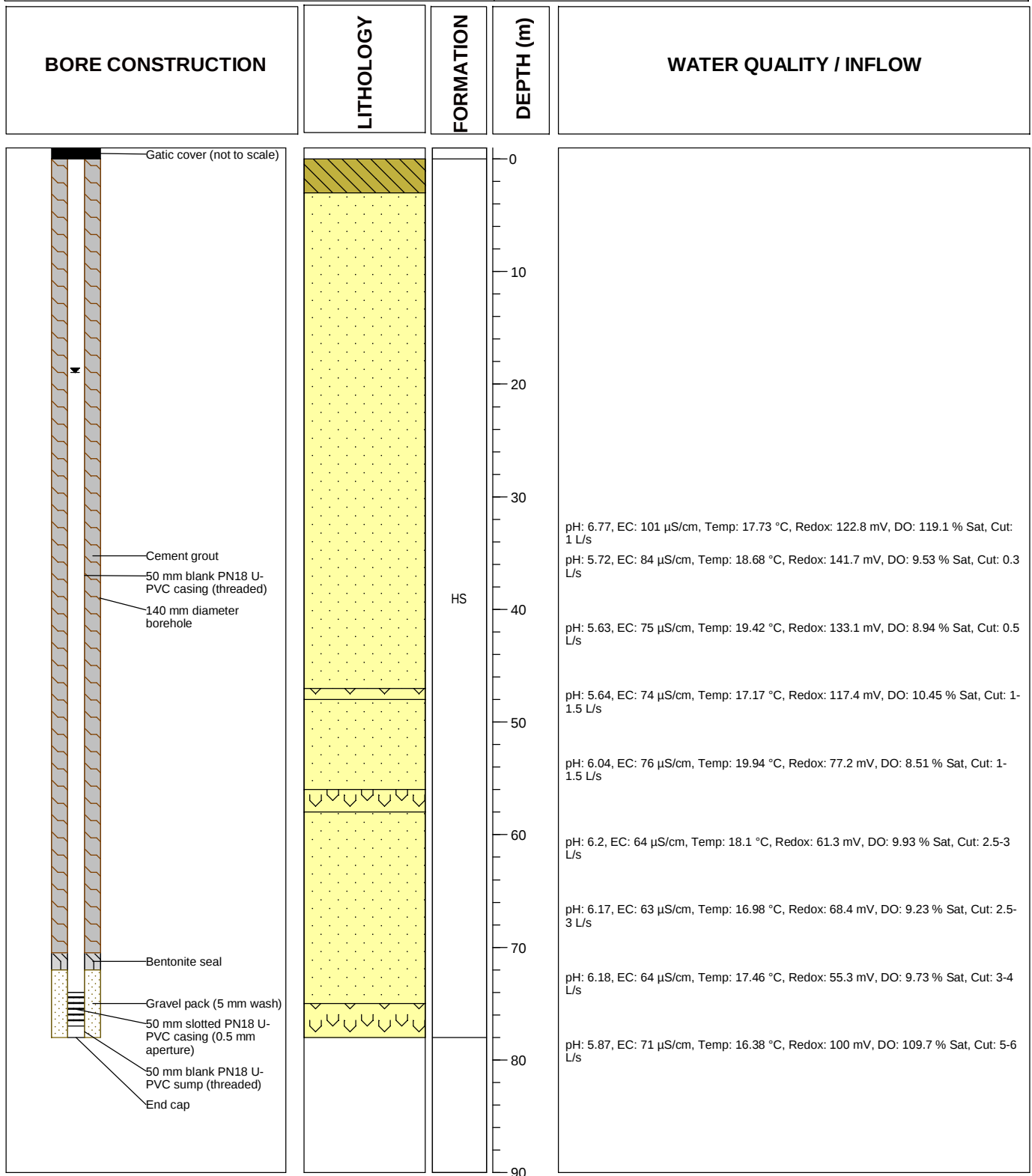
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0038PZB

Project: Hume Coal Project
Easting: 248788 **Northing:** 6175452 (MGA Zone 56)
Top of casing: 658.332 mAHD
Ground level: 658.44 mAHD
Static water level: 18.968 mbgl **Date:** 2/12/2014

Completion date: 10/05/2012
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 74 – 77 mbgl
Gravel pack: 72 - 78 mbgl



**PARSONS
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Drawing No.: HU0038PZB - Bore construction

Revision: A

Date drawn: 5/3/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



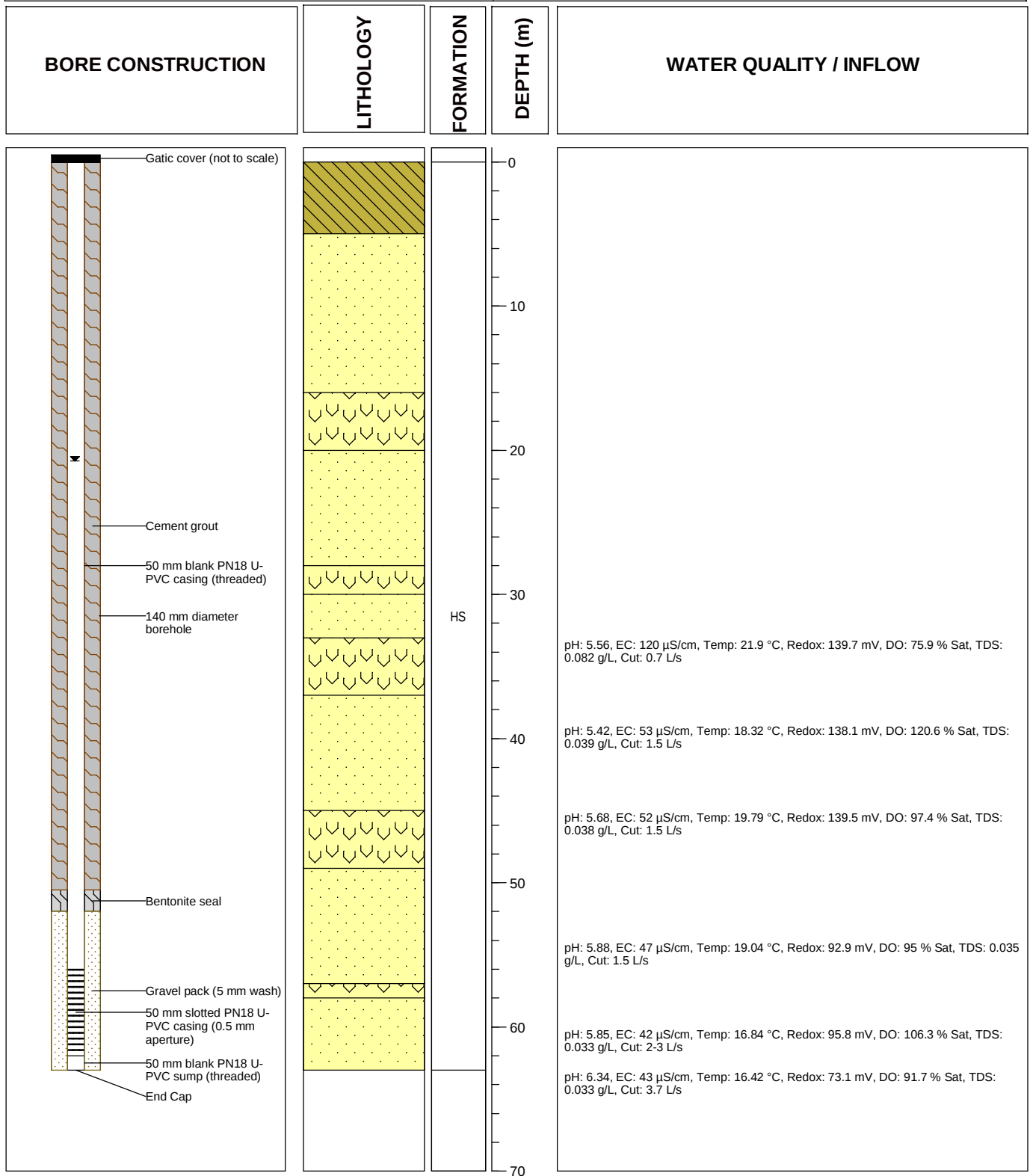
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0038PZC

Project: Hume Coal Project
Easting: 248793 **Northing:** 6175452 (MGA Zone 56)
Top of casing: 658.172 mAHD
Ground level: 658.31 mAHD
Static water level: 20.738 mbgl **Date:** 2/12/2014

Completion date: 15/05/2012
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 56 – 62 mbgl
Gravel pack: 52 - 63 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0038PZC - Bore construction

Revision: A

Date drawn: 5/3/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



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PROJECT

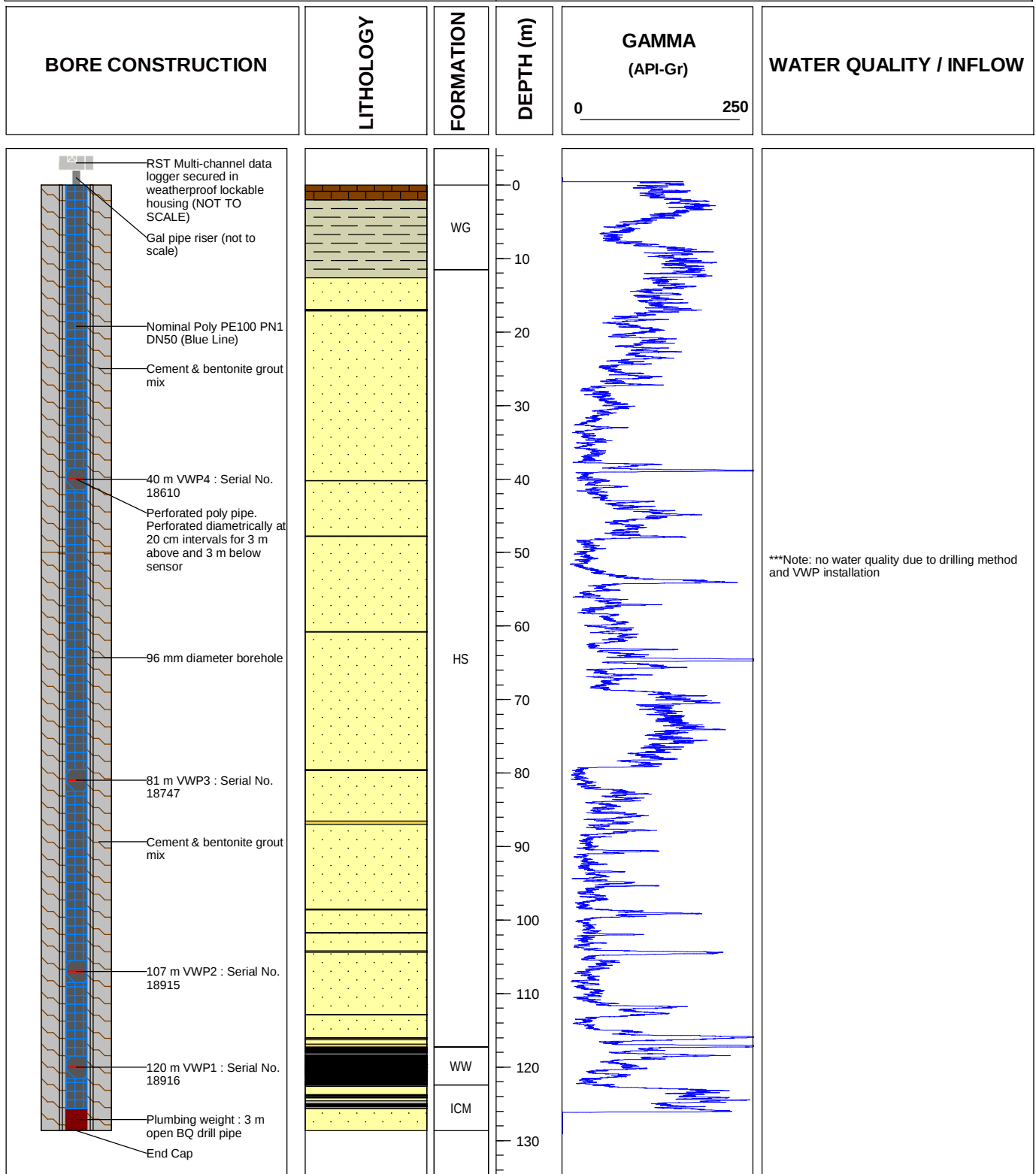
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0040CH

Project: Hume Coal Project
Easting: 251140 **Northing:** 6172143 (MGA Zone 56)
Top of casing: n/a
Ground level: 656.51 mAHD
Static water level: n/a **Date:** n/a

Completion date: 10/9/2013
Drilling company: Highland Drilling
Drilling method: Diamond core
Screened interval: n/a (VWP array)
Gravel pack: n/a (VWP array)



**PARSONS
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Drawing No.: HU0040CH - VWP construction

Revision: A

Date drawn: 5/3/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



HUMECOAL
PROJECT

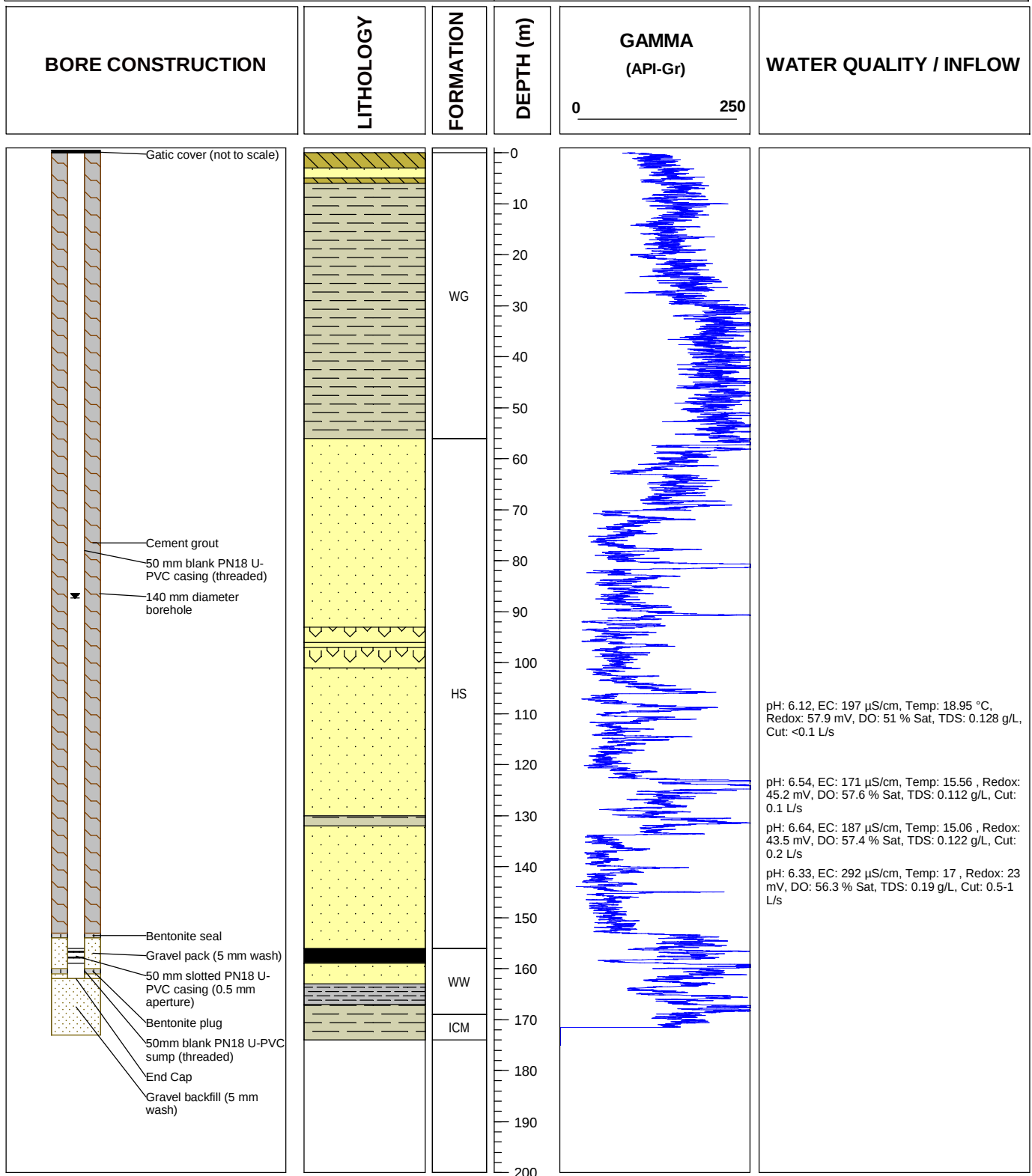
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0042PZA

Project: Hume Coal Project
Easting: 250988 **Northing:** 6166688 (MGA Zone 56)
Top of casing: 702.432 mAHD
Ground level: 702.5 mAHD
Static water level: 87.268 mbgl **Date:** 17/11/2014

Completion date: 25/07/2012
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 156 - 159 mbgl
Gravel pack: 154 - 160 mbgl



**PARSONS
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Drawing No.: HU0042PZA - Bore construction

Revision: A

Date drawn: 5/3/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



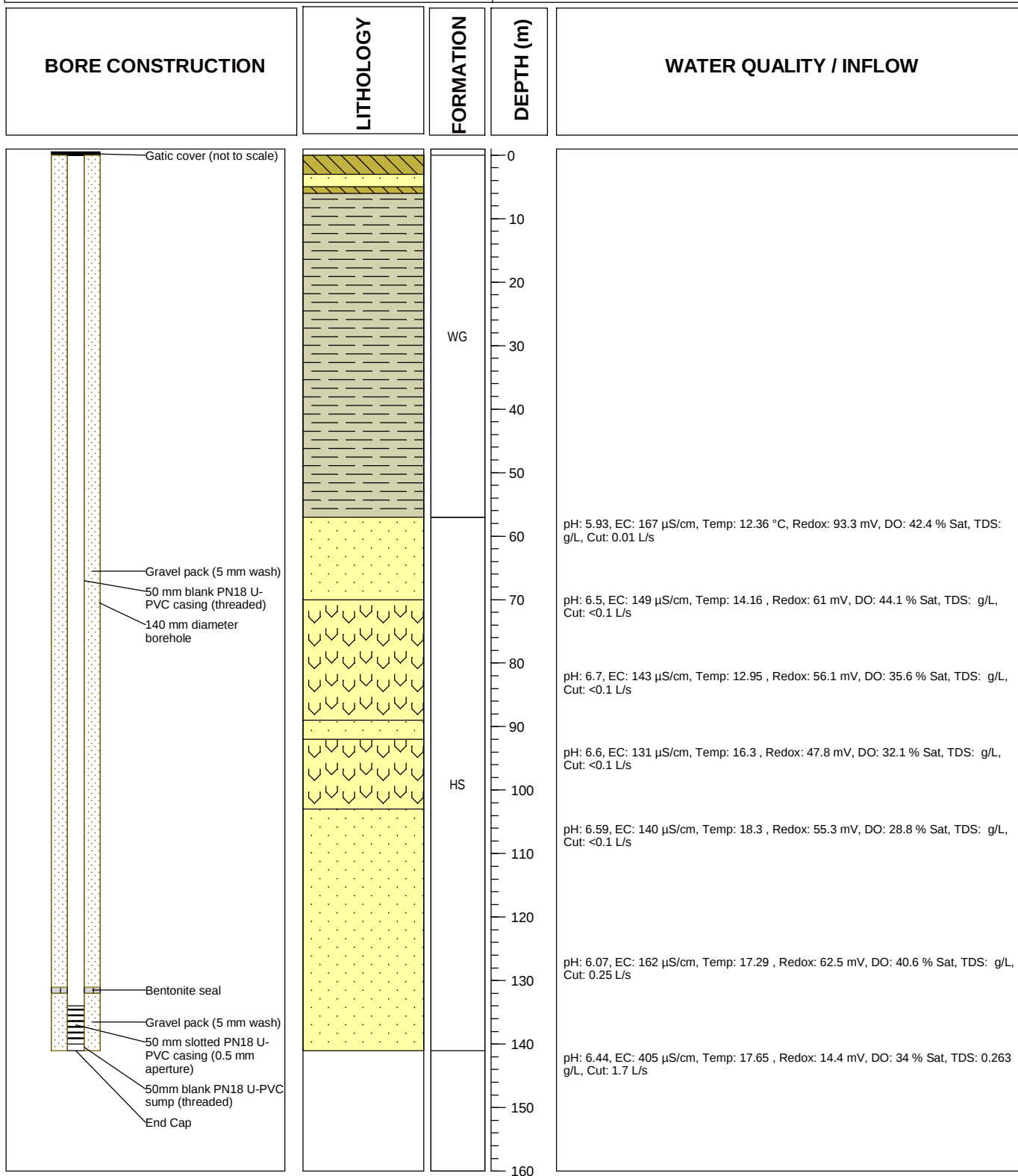
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0042PZB (Abandoned)

Project: Hume Coal Project
Easting: 250990 **Northing:** 6166681 (MGA Zone 56)
Top of casing: 702.63 mAHD
Ground level: 702.7 mAHD
Static water level: n/a **Date:** n/a

Completion date: 30/07/2012
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 134 - 140 mbgl
Gravel pack: 132 - 141 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0042PZB - Bore construction

Revision: A

Date drawn: 5/3/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



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PROJECT

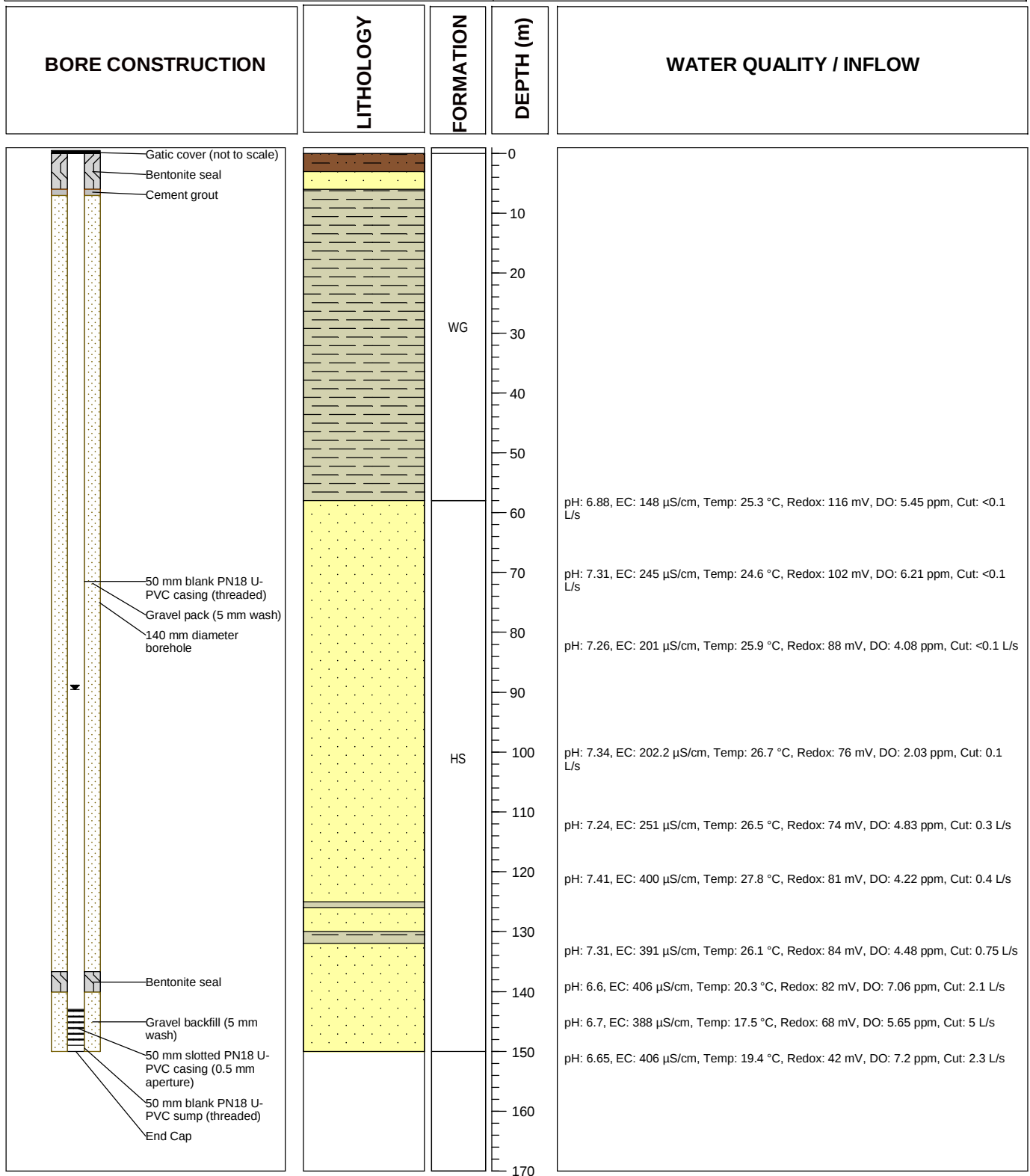
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0042PZC

Project: Hume Coal Project
Easting: 250985 **Northing:** 6166678 (MGA Zone 56)
Top of casing: 701.918 mAHD
Ground level: 702 mAHD
Static water level: 89.517 mbgl **Date:** 17/11/2014

Completion date: 12/02/2013
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 143 - 149 mbgl
Gravel pack: 140 - 150 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0042PZC - Bore construction

Revision: A

Date drawn: 5/3/18

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



HUMECOAL
PROJECT

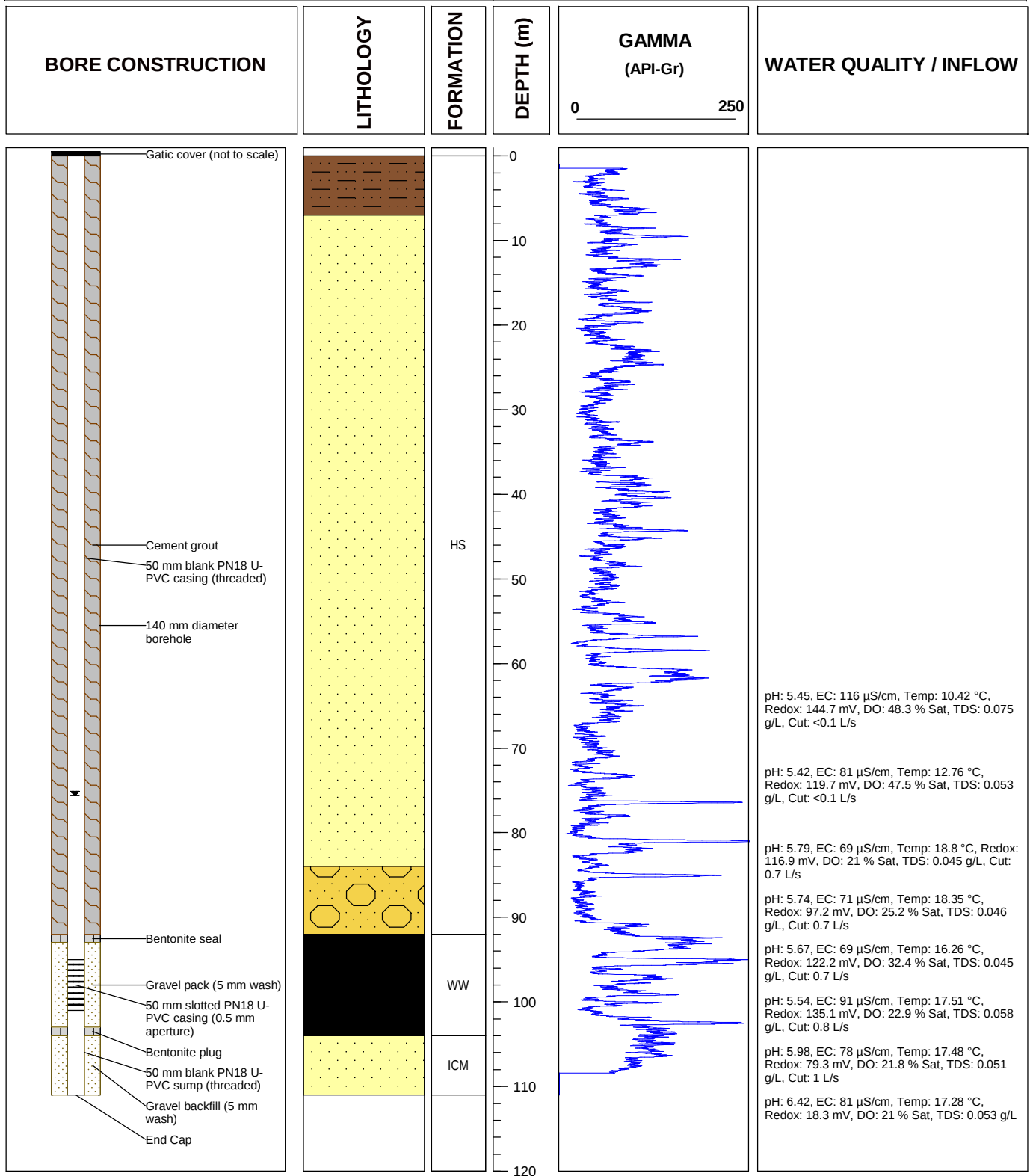
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0043XPZA

Project: Hume Coal Project
Easting: 247147 **Northing:** 6178127 (MGA Zone 56)
Top of casing: 691.96 mAHD
Ground level: 692.04 mAHD
Static water level: 75.62 mbgl **Date:** 5/02/2015

Completion date: 7/08/2012
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 95 - 101 mbgl
Gravel pack: 93 - 103 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0043XPZA - Bore construction

Revision: A	Date drawn: 5/3/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



HUMECOAL
PROJECT

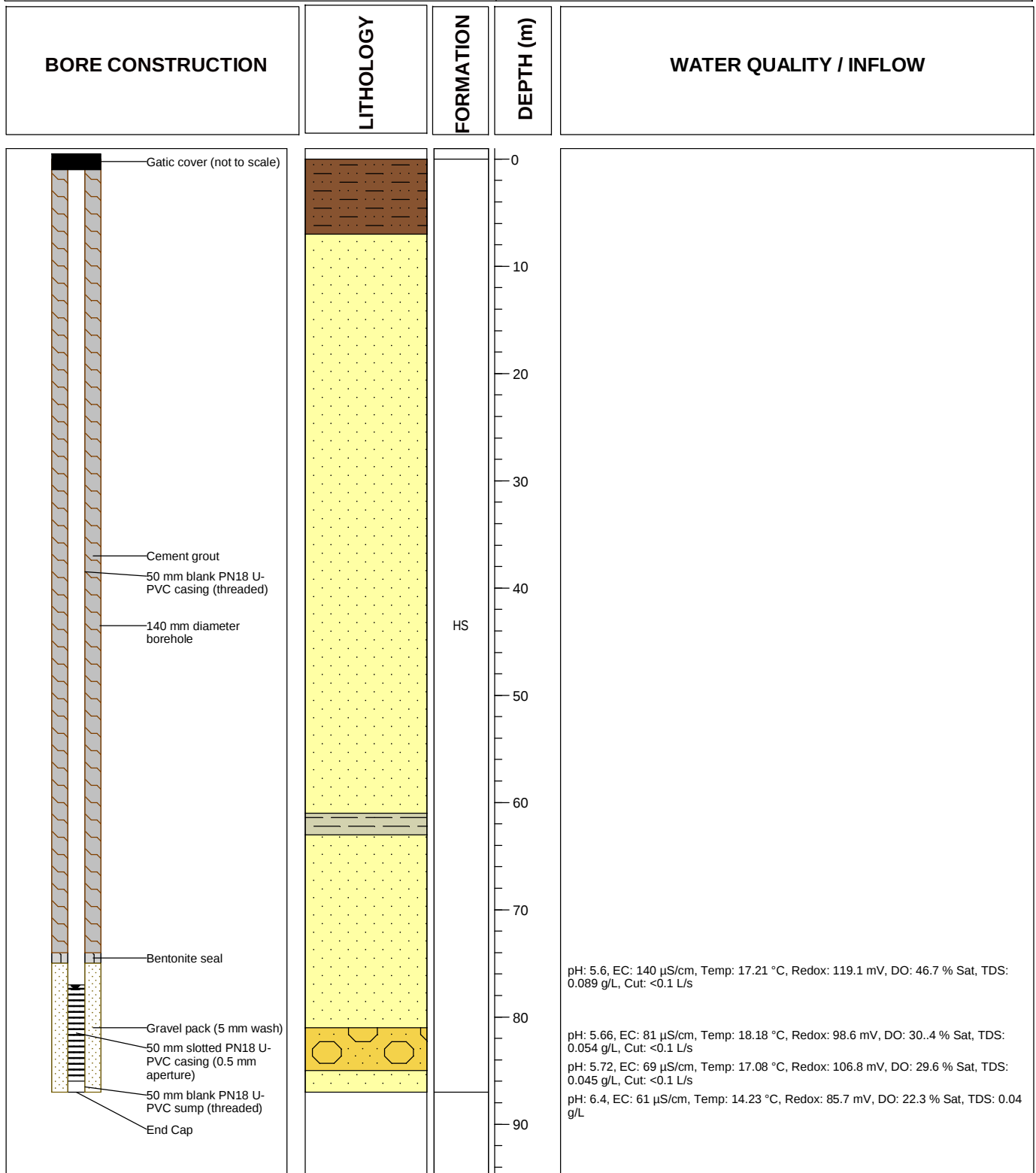
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0043XPZB

Project: Hume Coal Project
Easting: 247152 **Northing:** 6178133 (MGA Zone 56)
Top of casing: 691.69 mAHD
Ground level: 691.77 mAHD
Static water level: 77.465 mbgl **Date:** 5/02/2015

Completion date: 3/08/2012
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 77 - 86 mbgl
Gravel pack: 75 - 87 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0043PZB - Bore construction

Revision: A

Date drawn: 5/3/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



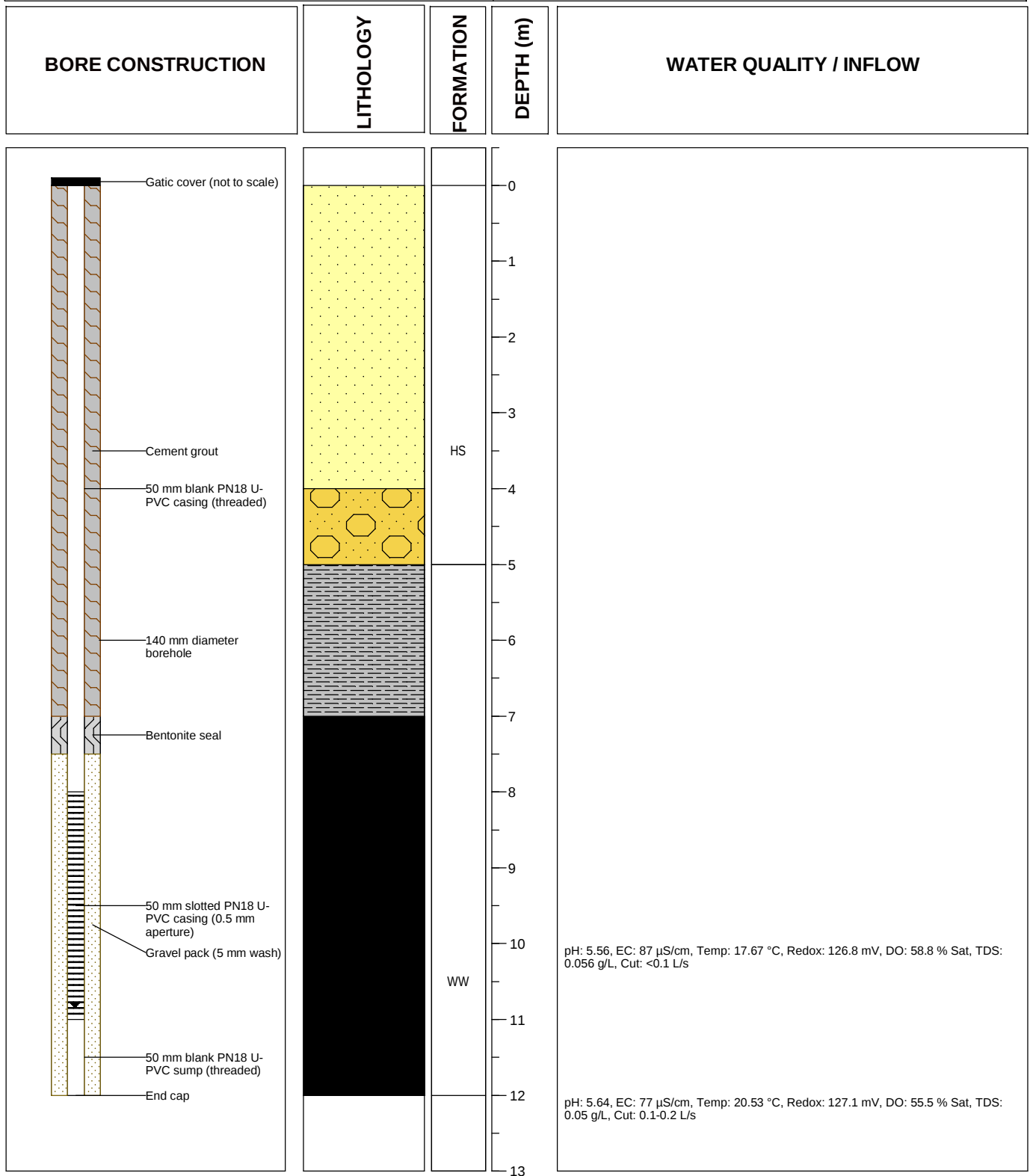
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0044XPZA

Project: Hume Coal Project
Easting: 242285 **Northing:** 6164084 (MGA Zone 56)
Top of casing: 641.915 mAHD
Ground level: 641.94 mAHD
Static water level: 10.84 mbgl **Date:** 13/11/2014

Completion date: 9/08/2012
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 8 – 11 mbgl
Gravel pack: 7.5 - 12.0 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0044XPZA - Bore construction

Revision: A	Date drawn: 5/3/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



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PROJECT

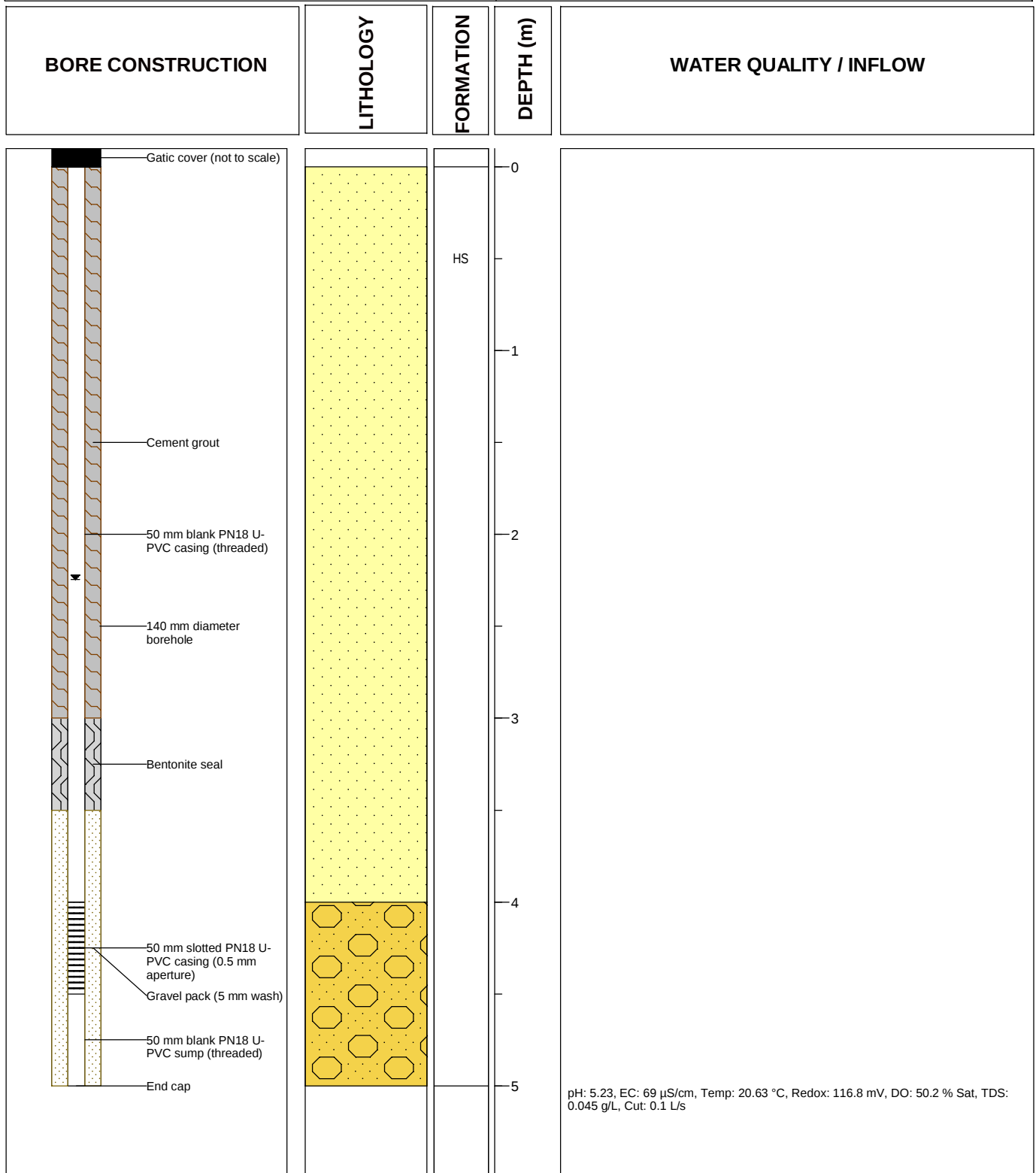
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0044XPZB

Project: Hume Coal Project
Easting: 242281 **Northing:** 6164077 (MGA Zone 56)
Top of casing: 646.96 mAHD
Ground level: 647 mAHD
Static water level: 2.245 mbgl **Date:** 13/11/2014

Completion date: 9/08/2012
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 4 – 4.5 mbgl
Gravel pack: 3.5 - 5.0 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0044XPZB - Bore construction

Revision: A	Date drawn: 5/3/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



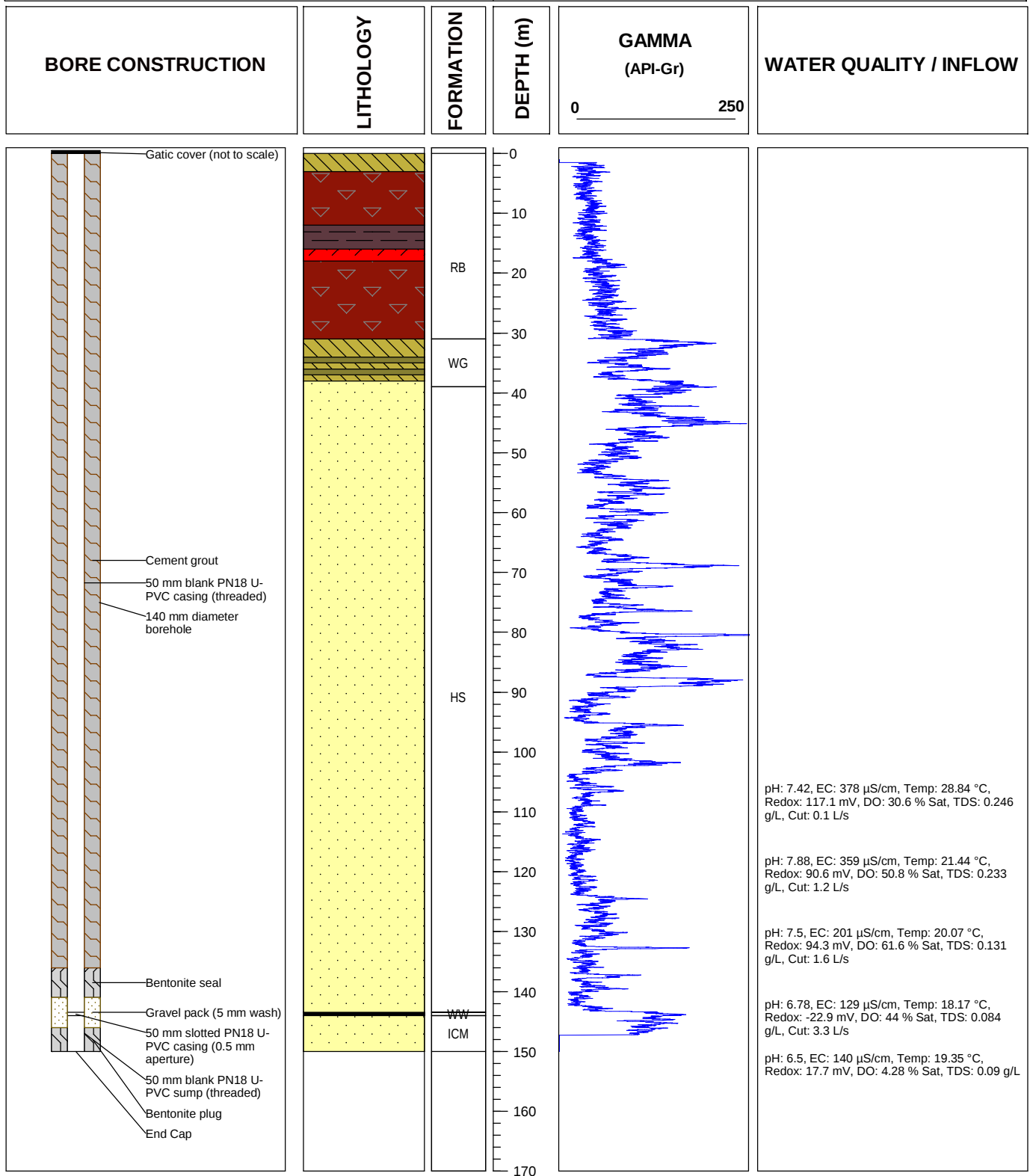
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0056XPZA (Abandoned)

Project: Hume Coal Project
Easting: 245214 **Northing:** 6169199 (MGA Zone 56)
Top of casing: 735.30 mAHD
Ground level: 735.38 mAHD
Static water level: n/a **Date:** n/a

Completion date: 17/10/2012
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 143.5 - 144 mbgl
Gravel pack: 141 - 146 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0056XPZA - Bore construction

Revision: A	Date drawn: 5/3/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



HUMECOAL
PROJECT

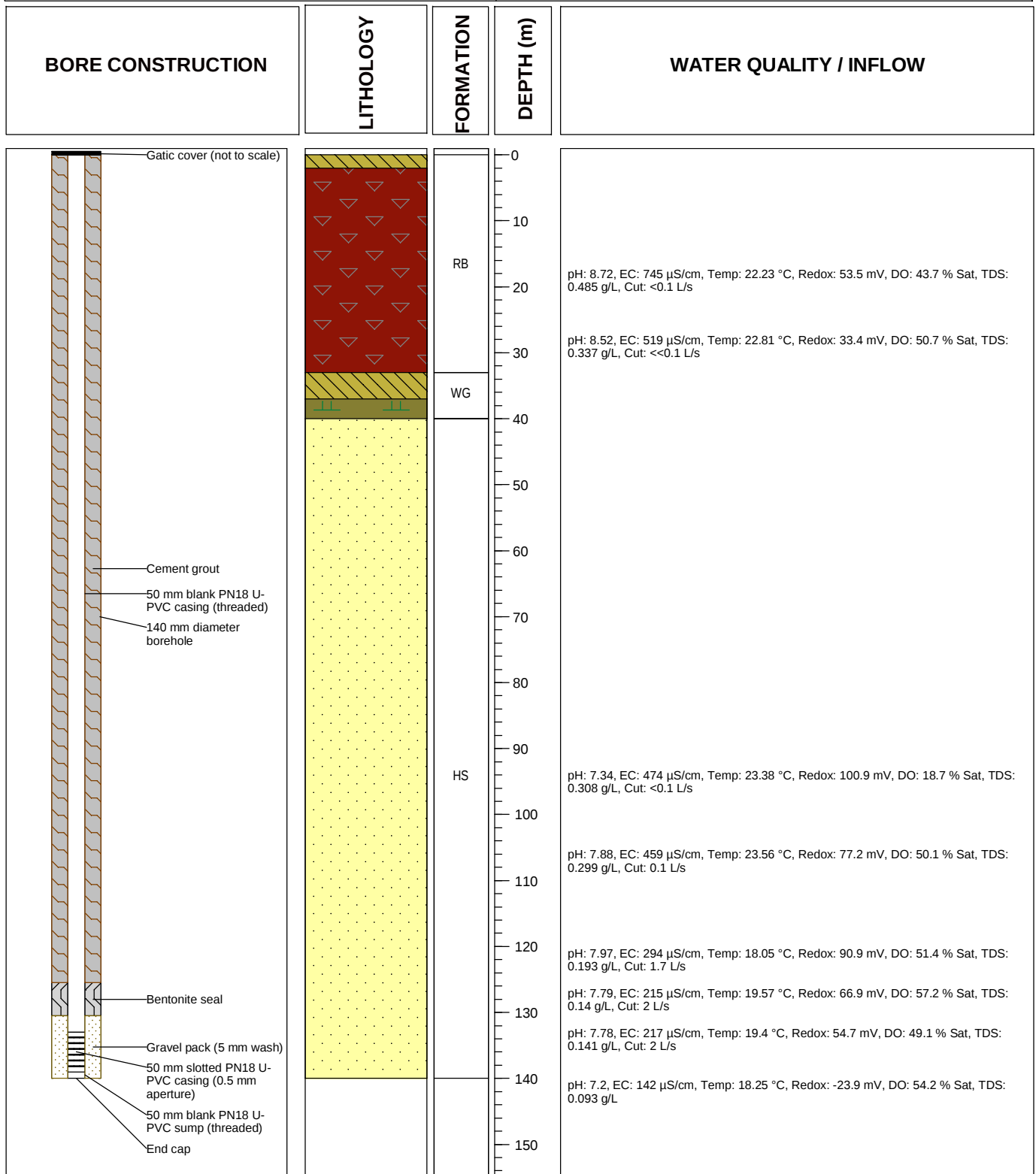
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0056XPZB

Project: Hume Coal Project
Easting: 245225 **Northing:** 6169198 (MGA Zone 56)
Top of casing: 735.37 mAHD
Ground level: 735.45 mAHD
Static water level: 92.01 mbTOC **Date:** 05/02/2015

Completion date: 19/10/2012
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 133 – 139 mbgl
Gravel pack: 130.5 - 140 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0056XPZB - Bore construction

Revision: A	Date drawn: 5/3/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



Hume Coal Pty Ltd

HU0056XPZC

Completion date:	22/10/2012
Drilling company:	Highland Drilling
Drilling method:	Air rotary
Screened interval:	19 – 25 mbgl
Gravel pack:	17 - 26 m

Gatic cover (not to scale)

Cement grout

50 mm blank PN18 U-PVC casing (threaded)

140 mm diameter borehole

Bentonite seal

Gravel pack (5 mm wash)

50 mm slotted PN18 U-PVC casing (0.5 mm aperture)

50 mm blank PN18 U-PVC sump (threaded)

End Cap

RB

0

10

20

pH: 8.13, EC: 725 μ S/cm, Temp: 19.59 $^{\circ}$ C, Redox: 85.9 mV, DO: 47.9 % Sat, TDS: 0.471 g/L, Cut: <0.1 L/s

pH: 8.26, EC: 714 μ S/cm, Temp: 20.89 $^{\circ}$ C, Redox: 83.9 mV, DO: 43.1 % Sat, TDS: 0.464 g/L, Cut: <0.1 L/s

pH: 8.11, EC: 665 μ S/cm, Temp: 21.47 $^{\circ}$ C, Redox: 93 mV, DO: 45.9 % Sat, TDS: 0.433 g/L, Cut: 0.1 L/s

pH: 8.32, EC: 917 μ S/cm, Temp: 21.37 $^{\circ}$ C, Redox: 89.3 mV, DO: 56.4 % Sat, TDS: 0.596 g/L



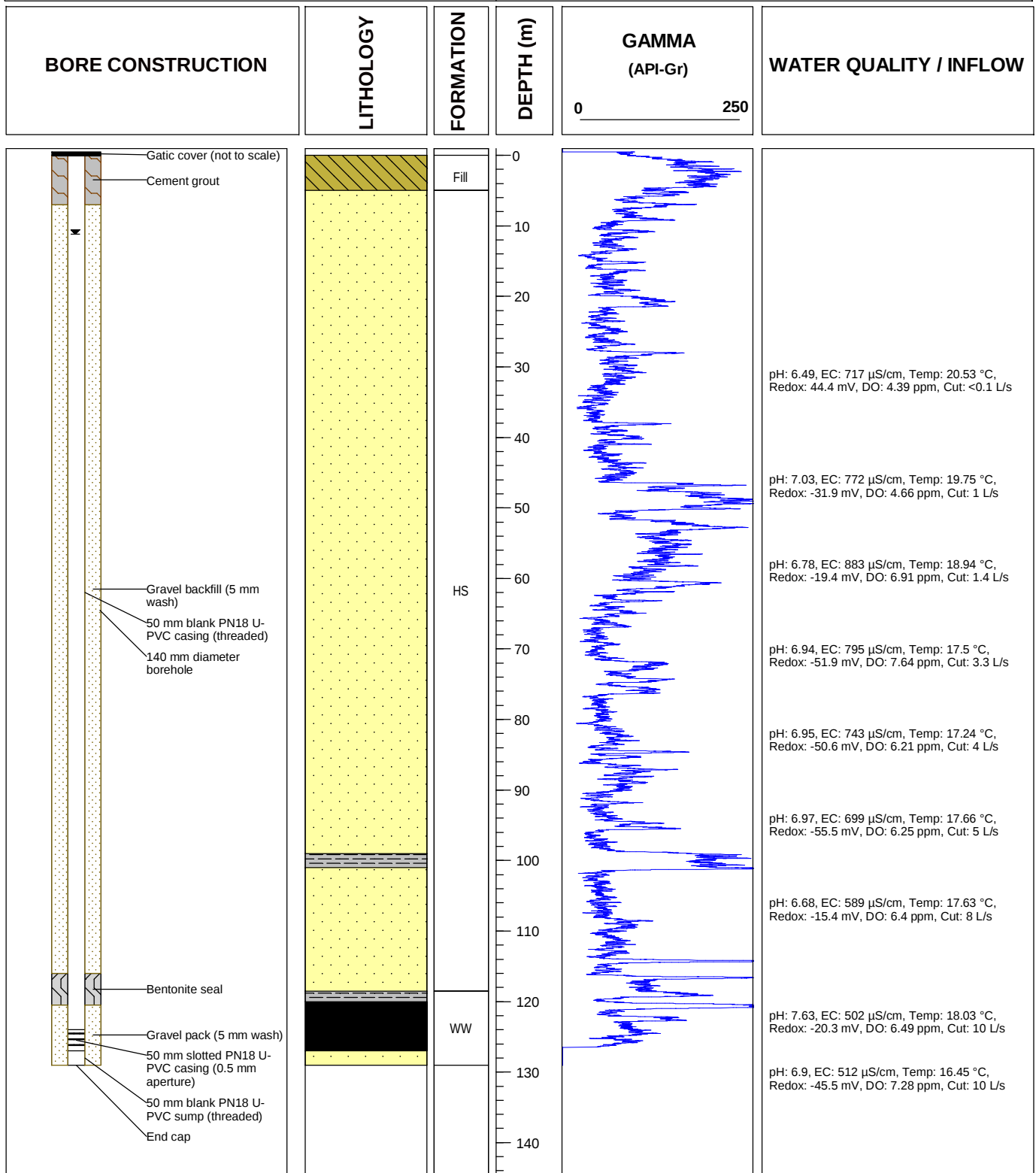
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0072PZA

Project: Hume Coal Project
Easting: 252074 **Northing:** 6177157 (MGA Zone 56)
Top of casing: 640.054 mAHD
Ground level: 640.12 mAHD
Static water level: 11.196 mbgl **Date:** 2/12/2014

Completion date: 19/02/2013
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 124 - 127 mbgl
Gravel pack: 120.5 - 129 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0072PZA- Bore construction
 Revision: A Date drawn: 5/3/14
 Drawn by: K. Maher Checked by: L. Rochford
 Project No. 2172599A



Hume Coal Pty Ltd

HU0072PZB

Completion date:	25/02/2013
Drilling company:	Highland Drilling
Drilling method:	Air rotary
Screened interval:	92 - 98 mbgl
Gravel pack:	88 - 99 mbgl

Figure 1: Schematic diagram of the borehole and log data.

Borehole Components:

- Gatic cover (not to scale)
- Cement grout
- Gravel backfill (5 mm wash)
- 50 mm blank PN18 U-PVC casing (threaded)
- 140 mm diameter borehole
- Bentonite seal
- Gravel pack (5 mm wash)
- 50 mm slotted PN18 U-PVC casing (0.5 mm aperture)
- 50 mm blank PN18 U-PVC sump (threaded)
- End cap

Log Data:

Depth (m)	Lithology	pH	EC ($\mu\text{S/cm}$)	Temp ($^{\circ}\text{C}$)	Redox (mV)	DO (%)	TDS (g/L)	Cut (L/s)
0	Fill							
10	Fill							
20	Fill							
30	HS	5.65	819	26.61	119.3	59.7	0.531	0.2
40	HS	5.9	1288	23.83	35.7	59.5	0.836	0.9
50	HS	6.81	1179	22.07	-42.4	55.4	0.766	1.4
60	HS	7.02	1136	22.92	-47	57.3	0.738	1.2
70	HS	7.13	1029	22.52	-27.4	54	0.668	1.2
80	HS	7.1	851	19.41	-39.6	49.7	0.546	2.5
90	HS	7.11	716	18.6	-48.5	57.6	0.465	5
100	HS	6.98	648	18.77	-40.3	58.6	0.421	10
110	HS	7.15	659	22.26	-13	49.7	0.428	10



HU0072PZC

Completion date:	20/02/2013
Drilling company:	Highland Drilling
Drilling method:	Air rotary
Screened interval:	39 - 45 mbgl
Gravel pack:	35.3 - 46.2 mbgl

The diagram illustrates the components of a groundwater monitoring well and its placement within a borehole. The well assembly includes, from top to bottom: a Gatic cover (not to scale), cement grout, a 50 mm blank PN18 U-PVC casing (threaded), gravel backfill (5 mm wash), a 140 mm diameter borehole, a Bentonite seal, a gravel pack (5 mm wash), a 50 mm slotted PN18 U-PVC sump (0.5mm aperture), another 50 mm blank PN18 U-PVC casing (threaded), and an end cap.

The stratigraphic column is divided into three main layers: Fill (top, 0-10m), HS (middle, 10-40m), and a bottom layer (40-50m). The well is installed in the HS layer, with the gravel pack and sump located between approximately 35m and 40m depth.

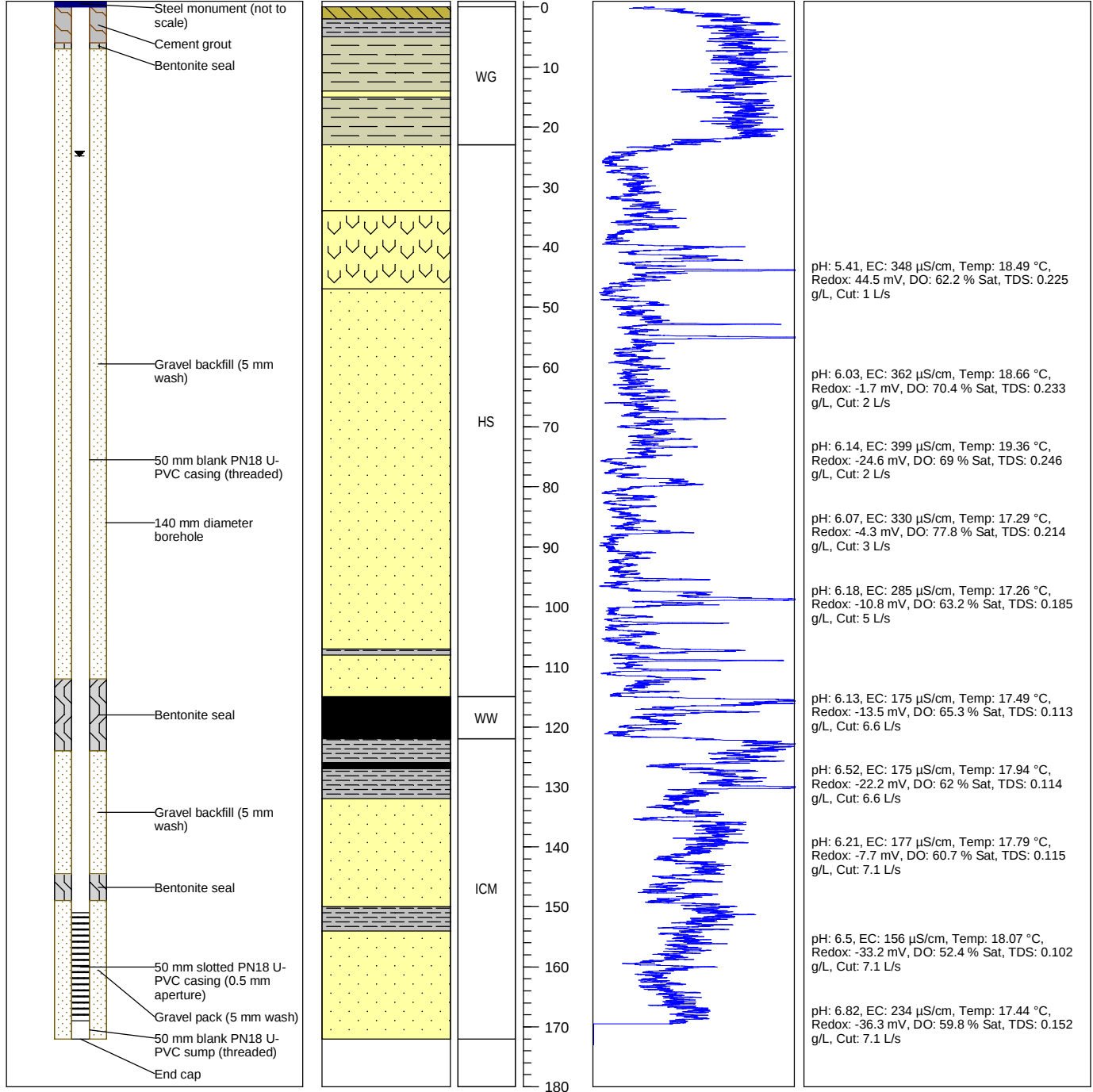
Geological data points are provided for the HS layer:

- At approximately 35m depth: pH: 6.26, EC: 870 $\mu\text{S}/\text{cm}$, Temp: 27.62 $^{\circ}\text{C}$, Redox: 23.7 mV, DO: 57.6 % Sat, TDS: 0.566 g/L, Cut: 0.15 L/s
- At approximately 40m depth: pH: 6.29, EC: 979 $\mu\text{S}/\text{cm}$, Temp: 22.31 $^{\circ}\text{C}$, Redox: -48.8 mV, DO: % Sat, TDS: 0.635 g/L, Cut: 1.5 L/s
- At approximately 45m depth: pH: 6.71, EC: 955 $\mu\text{S}/\text{cm}$, Temp: 20.21 $^{\circ}\text{C}$, Redox: -51.4 mV, DO: 65 % Sat, TDS: 0.62 g/L, Cut: 1.7 L/s
- At approximately 50m depth: pH: 7.04, EC: 945 $\mu\text{S}/\text{cm}$, Temp: 21.81 $^{\circ}\text{C}$, Redox: -54.5 mV, DO: 66.5 % Sat, TDS: 0.614 g/L, Cut: 2 L/s



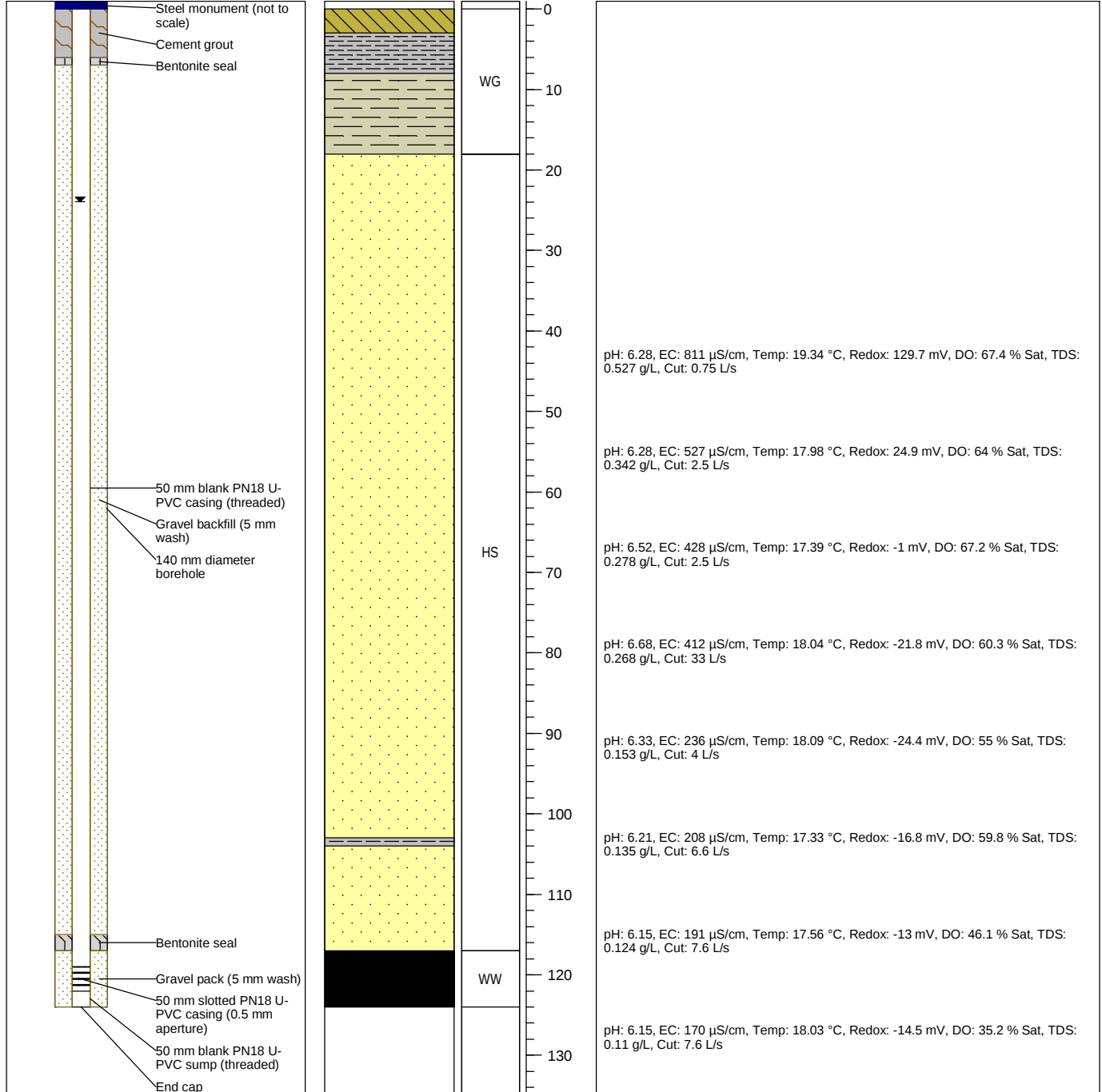
HU0073PZA

Completion date:	28/02/2012
Drilling company:	Highland Drilling
Drilling method:	Air rotary
Screened interval:	151 – 169 mbgl
Gravel pack:	149 - 172 mbgl



HU0073PZB

Completion date:	8/03/2013
Drilling company:	Highland Drilling
Drilling method:	Air rotary
Screened interval:	119 - 122 mbgl
Gravel pack:	117 - 124 mbgl

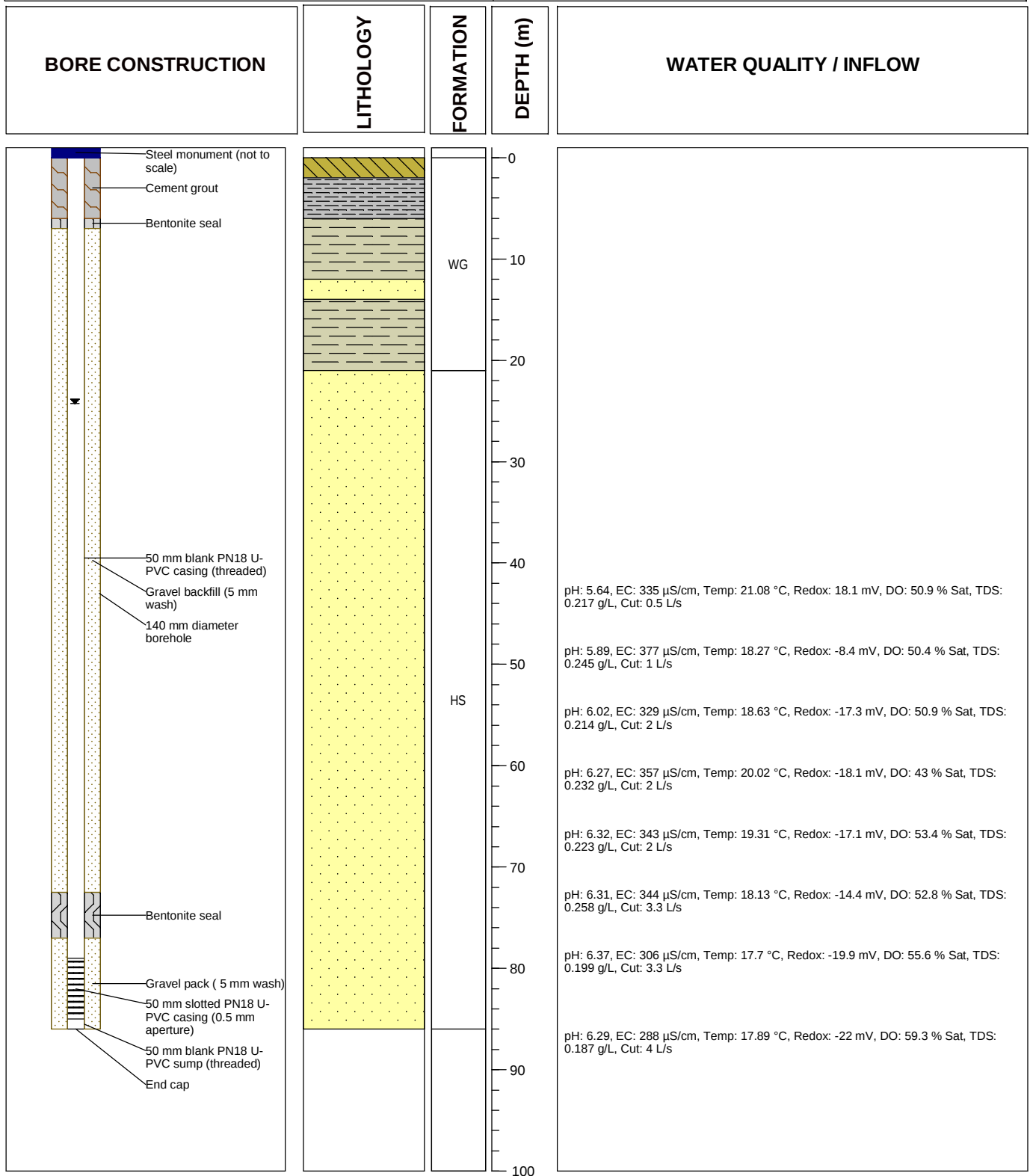


BORE COMPLETION REPORT

HU0073PZC

Project: Hume Coal Project
Easting: 251035 **Northing:** 6172717 (MGA Zone 56)
Top of casing: 655.499 mAHD
Ground level: 654.87 mAHD
Static water level: 24.238 mbgl **Date:** 5/12/2014

Completion date: 3/06/2013
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 79 - 85 mbgl
Gravel pack: 77 - 86 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0073PZC - Bore construction

Revision: A	Date drawn: 5/3/14
Drawn by: K. Maher	Checked by: L. Rochford

Project No. 2172599A



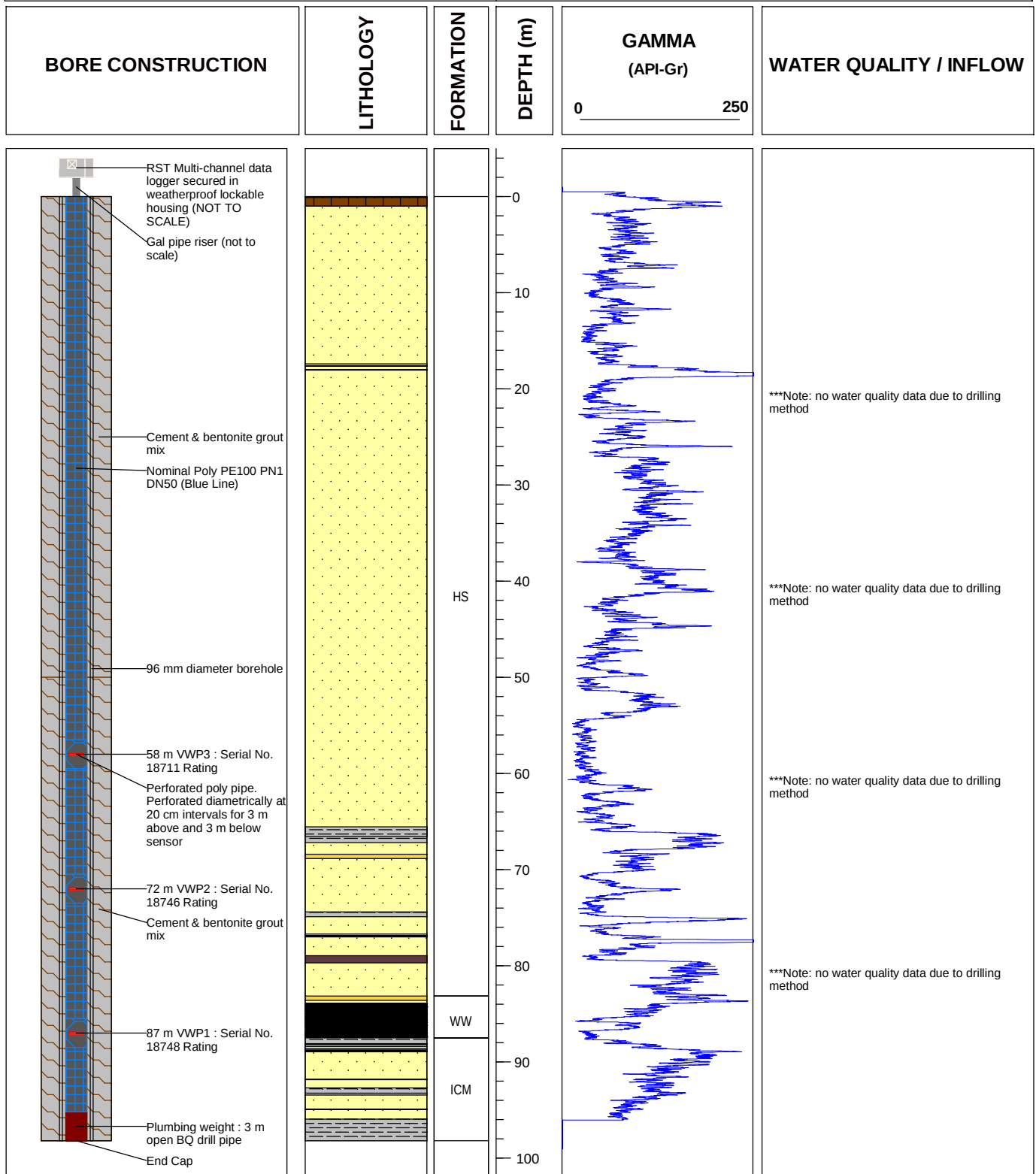
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0077CH

Project: Hume Coal Project
Easting: 246966 **Northing:** 6175811 (MGA Zone 56)
Top of casing: n/a
Ground level: 689.74 mAHd
Static water level: n/a **Date:** n/a

Completion date: 10/09/2013
Drilling company: Highland Drilling
Drilling method: Diamond core
Screened interval: n/a (VWP array)
Gravel pack: n/a (VWP array)



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0040CH - VWP construction

Revision: A	Date drawn: 5/3/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



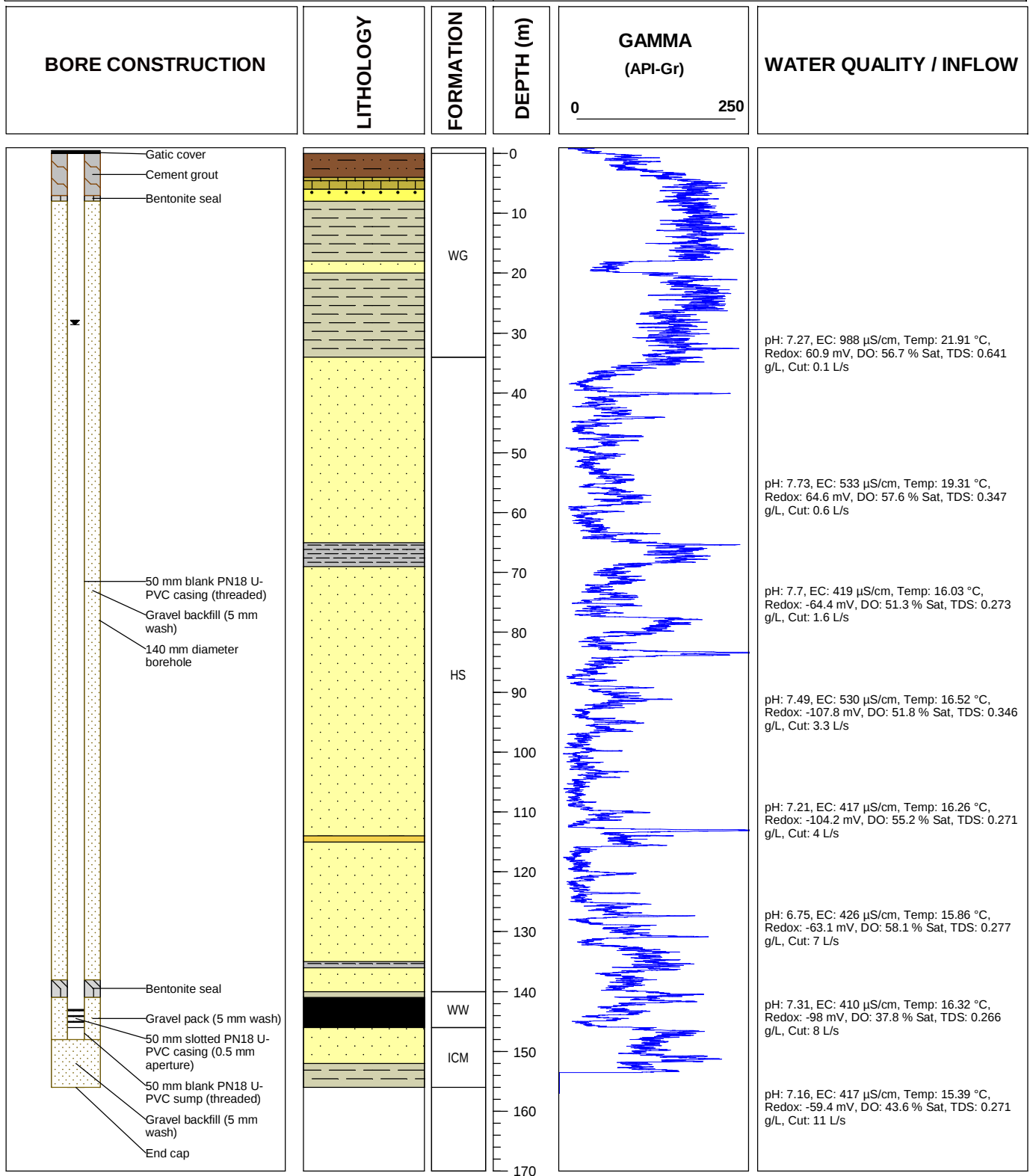
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0088PZA

Project: Hume Coal Project
Easting: 253058.95 **Northing:** 6173143.73 (MGA Zone 56)
Top of casing: 655.37 mAHD
Ground level: 655.44 mAHD
Static water level: 28.63 mbgl **Date:** 3/12/2014

Completion date: 3/06/2013
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 143 - 146 mbgl
Gravel pack: 141 - 148 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU008PZA - Bore construction

Revision: A

Date drawn: 5/3/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



HUMECOAL
PROJECT

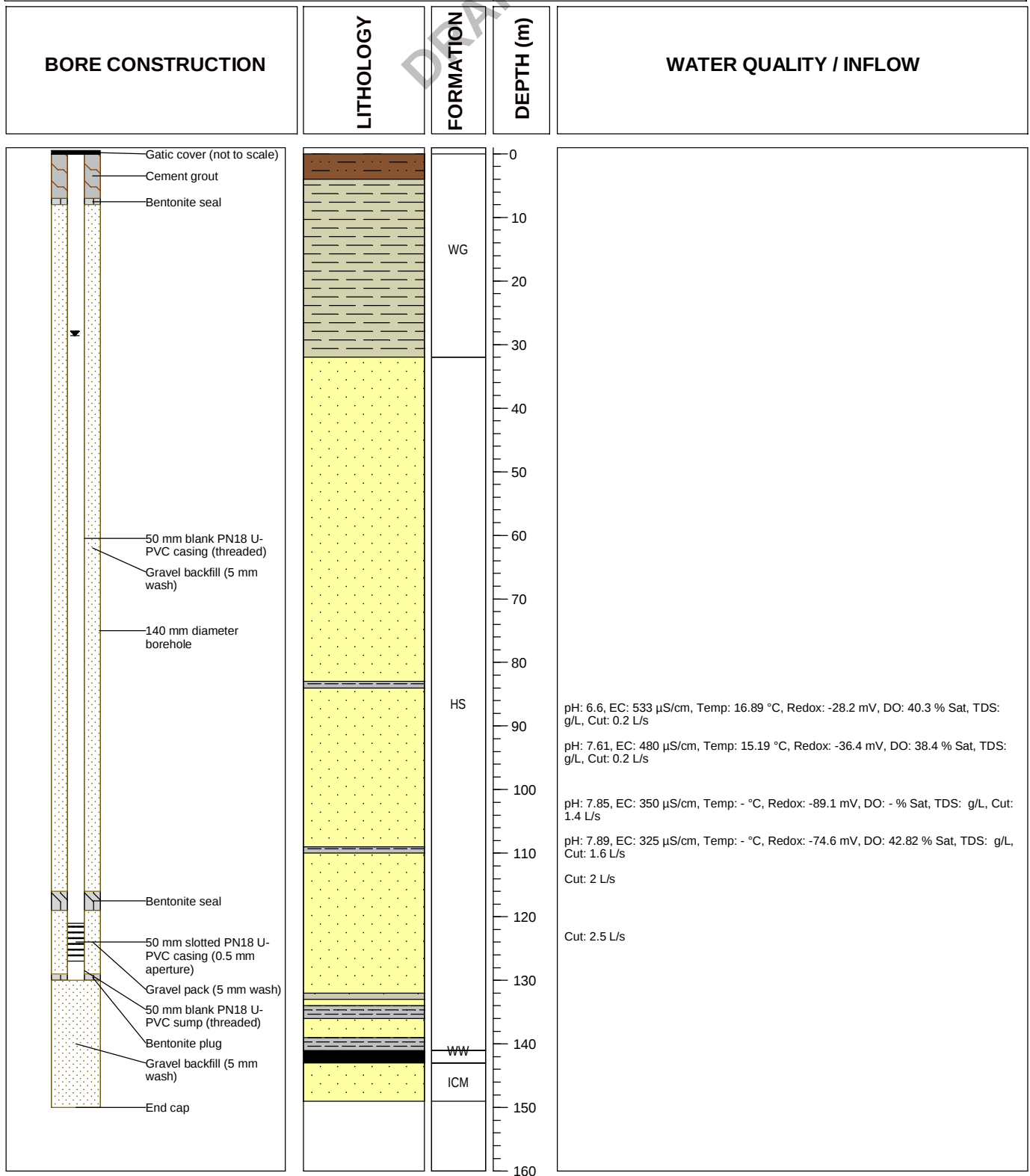
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0088PZB

Project: Hume Coal Project
Easting: 253059 **Northing:** 6173144 (MGA Zone 56)
Top of casing: 655.26 mAHD
Ground level: 655.33 mAHD
Static water level: 28.565 mbgl **Date:** 3/12/2014

Completion date: 4/07/2013
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 121 - 127 mbgl
Gravel pack: 119 - 129 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0088PZB - Bore construction

Revision: A	Date drawn: 5/3/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



HUMECOAL
PROJECT

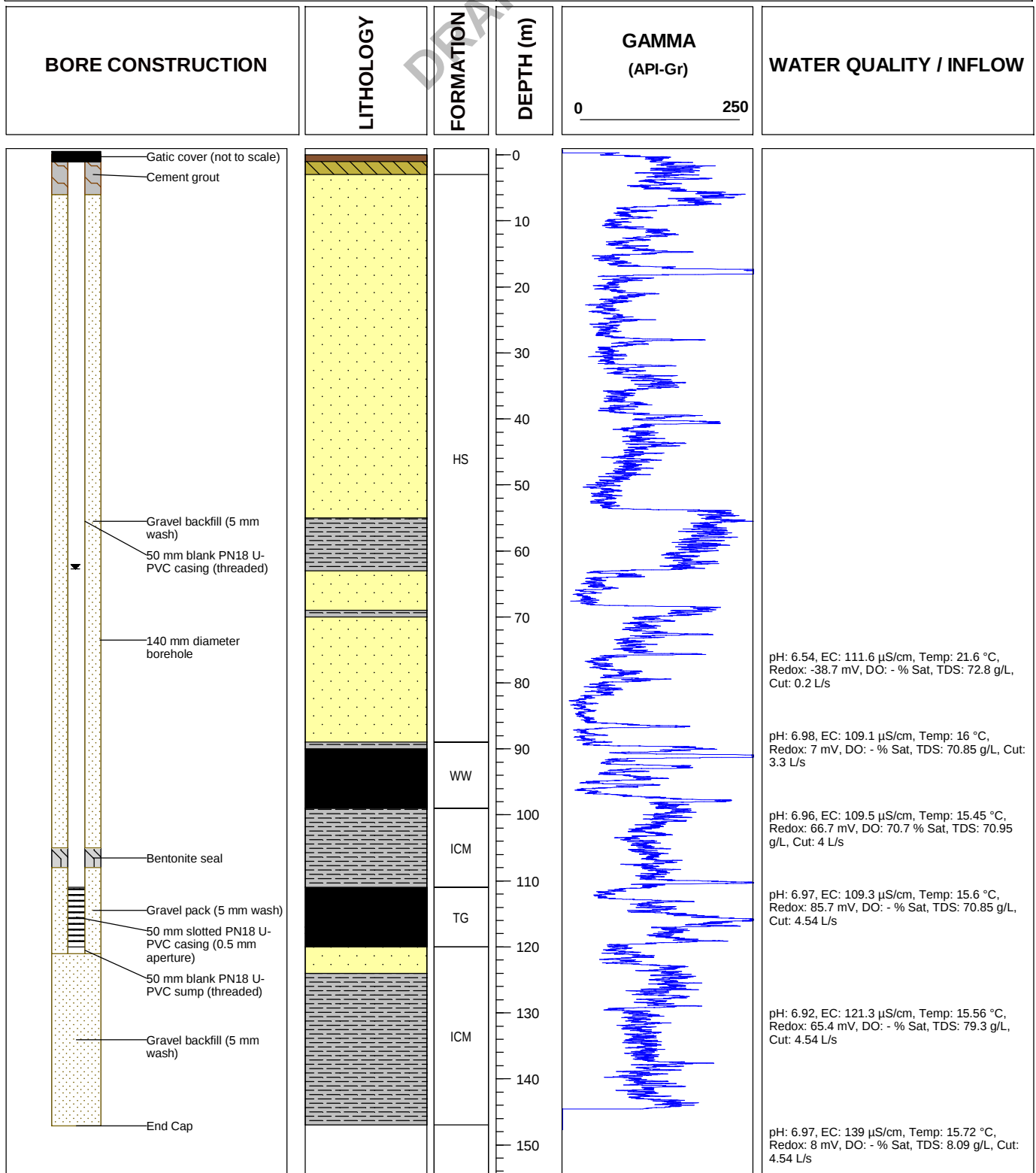
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0096PZA

Project: Hume Coal Project
Easting: 246488.51 **Northing:** 6177025.44 (MGA Zone 56)
Top of casing: 699.14 mAHD
Ground level: 699.21 mAHD
Static water level: 62.76 mbgl **Date:** 5/12/2014

Completion date: 18/03/2013
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 111 - 120 mbgl
Gravel pack: 108 - 121 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0096PZA - Bore construction
 Revision: A Date drawn: 5/3/14
 Drawn by: K. Maher Checked by: L. Rochford
 Project No. 2172599A



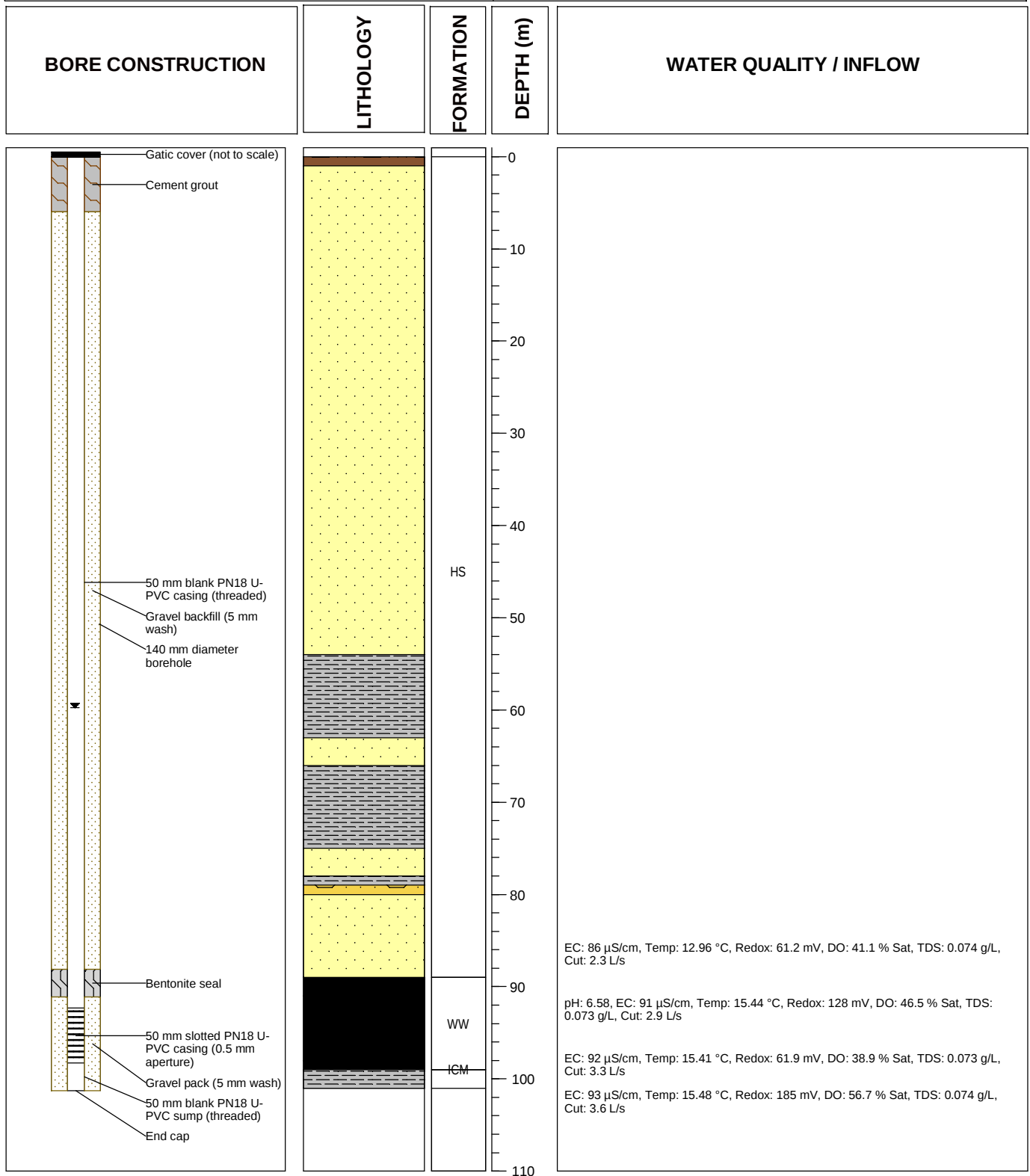
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0096PZB

Project: Hume Coal Project
Easting: 246491 **Northing:** 6177029 (MGA Zone 56)
Top of casing: 699.0 mAHD
Ground level: 699.1 mAHD
Static water level: 59.76 mbgl **Date:** 5/12/2014

Completion date: 23/07/2013
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 92.3 - 98.3 mbgl
Gravel pack: 91.1 - 101.3 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0096PZB - Bore construction

Revision: A

Date drawn: 5/3/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



HUMECOAL
PROJECT

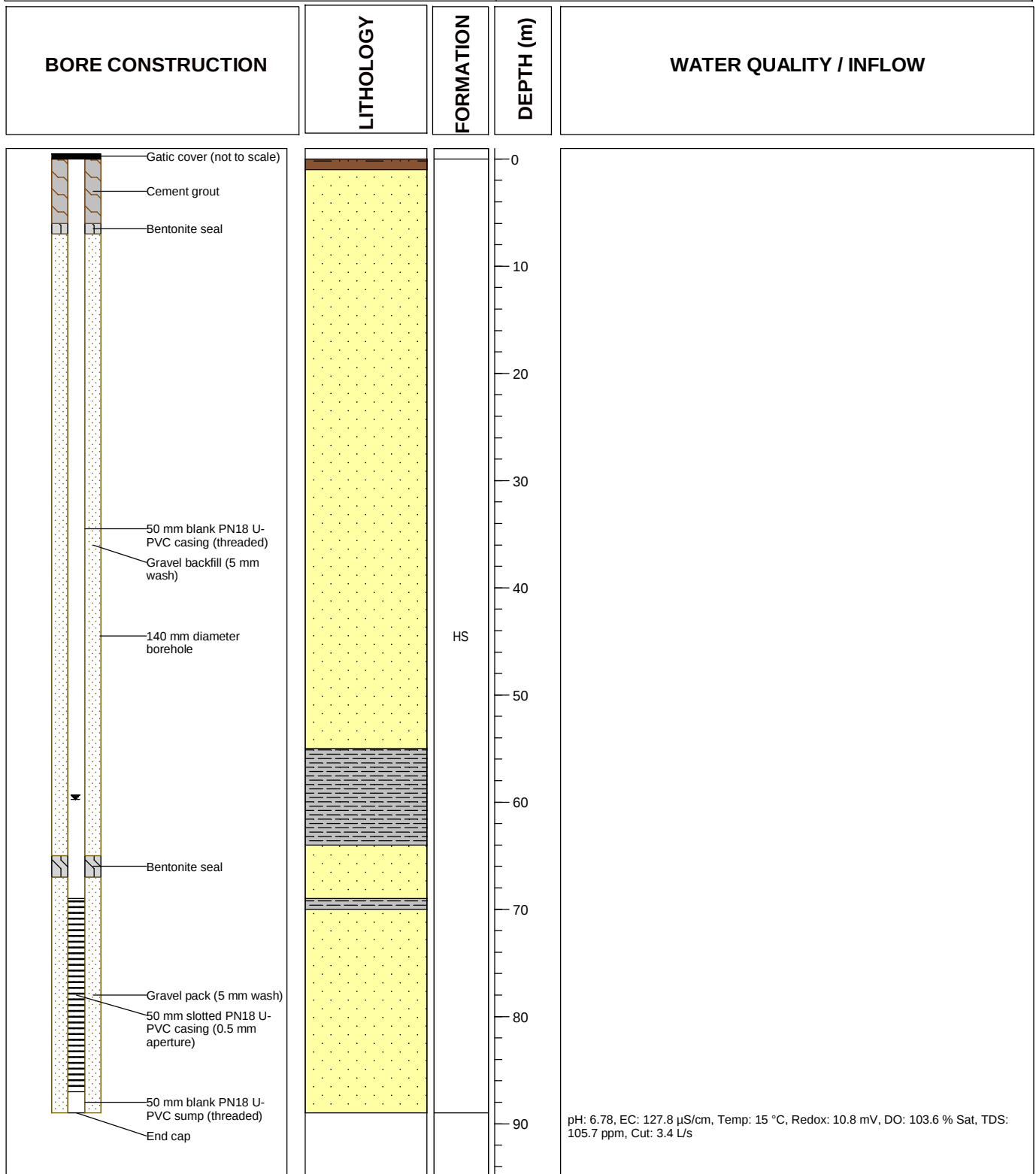
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0096PZC

Project: Hume Coal Project
Easting: 246494 **Northing:** 6177045 (MGA Zone 56)
Top of casing: 698.98 mAHD
Ground level: 699.04 mAHD
Static water level: 59.73 mbgl **Date:** 5/12/2014

Completion date: 25/07/2013
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 69 - 87 mbgl
Gravel pack: 67 - 89 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0096PZC - Bore construction

Revision: A	Date drawn: 5/3/14
Drawn by: K. Maher	Checked by: L. Rochford
Project No. 2172599A	



HUMECOAL
PROJECT

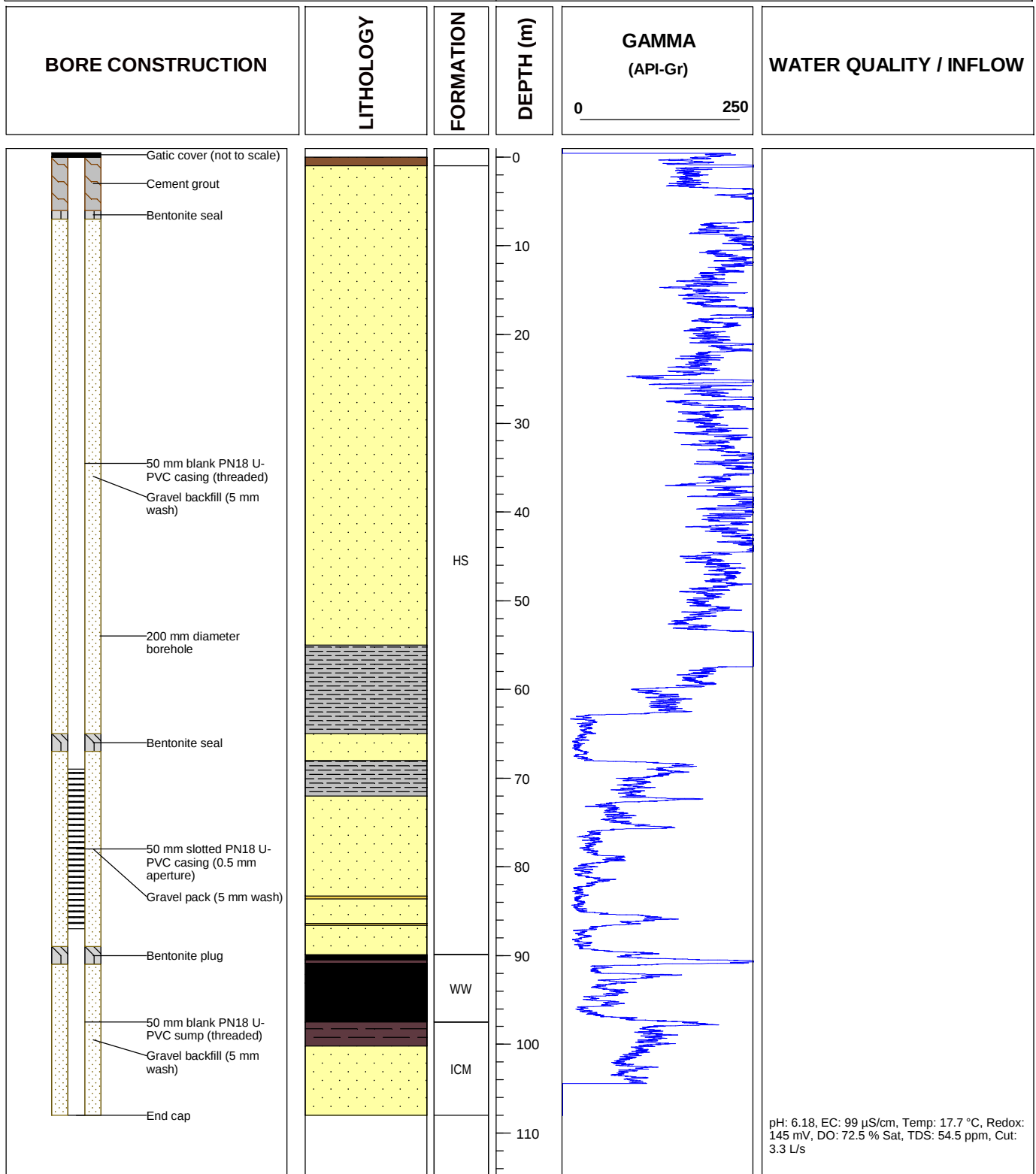
Hume Coal Pty Ltd

BORE COMPLETION REPORT

HU0098LD

Project: Hume Coal Project
Easting: 246477 **Northing:** 6177009 (MGA Zone 56)
Top of casing: -
Ground level: 699.06 mAHD
Static water level: - **Date:** -

Completion date: 05/08/2013
Drilling company: Highland Drilling
Drilling method: Air rotary
Screened interval: 69.0 - 87.0 mbgl
Gravel pack: 67.0 - 89.0 mbgl



**PARSONS
BRINCKERHOFF**

Drawing No.: HU0098LD - Bore construction

Revision: A

Date drawn: 5/3/14

Drawn by: K. Maher

Checked by: L. Rochford

Project No. 2172599A



HUMECOAL
PROJECT

Hume Coal Pty Ltd