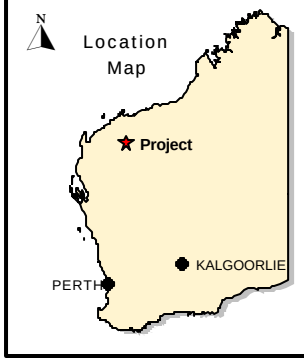
APPENDIX A

INITIAL HYDROGEOLOGICAL ASSESSMENT

MRC066
MRC057
MSD004
MRC061
MRC050
MSD001
MRC029



LEGEND

Falling Head Test Piezometers

Gravity Anomalies

E47_1408 Tenement Area

0 1 2 Km

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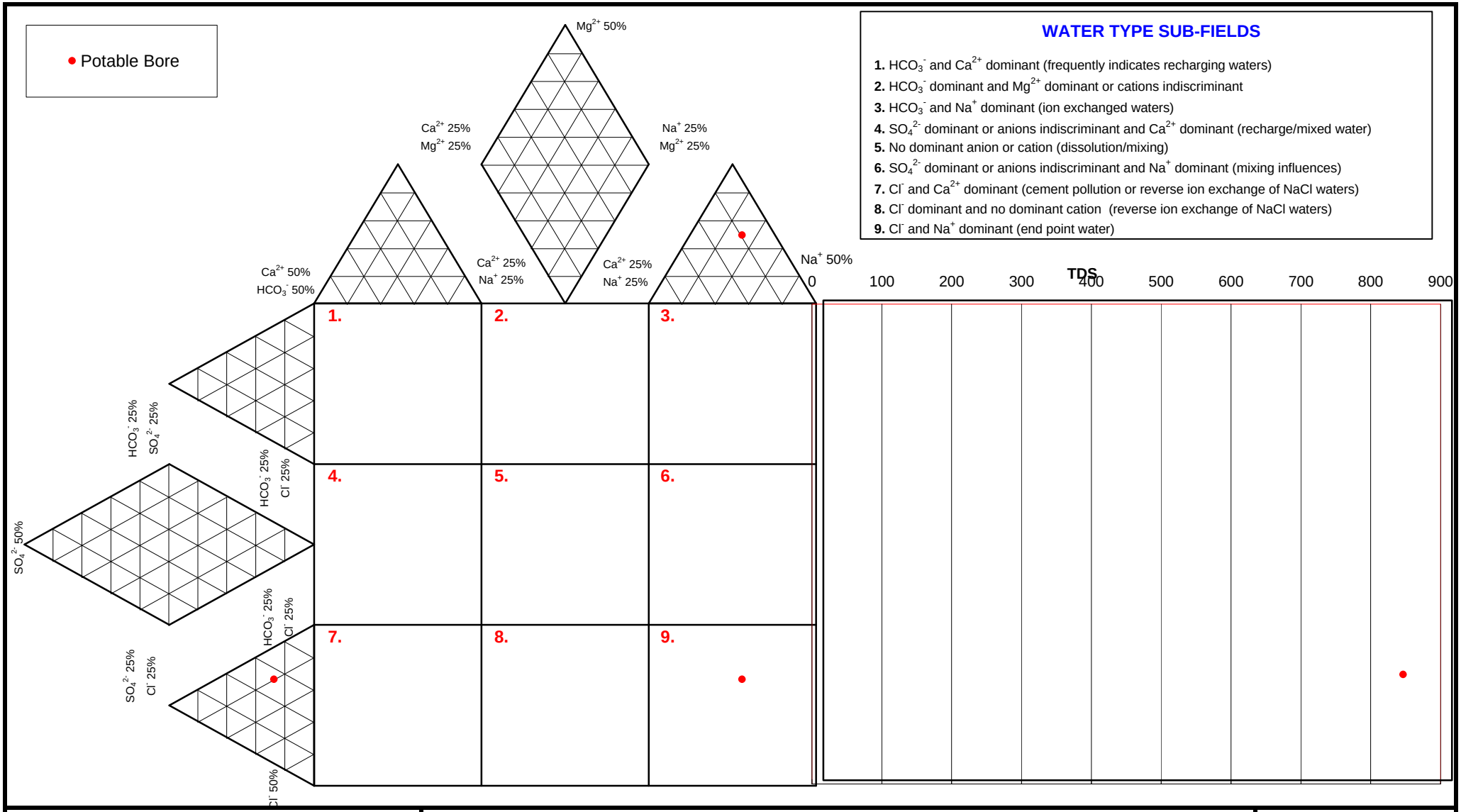
Figure A1 Falling Head Test Sites

Author: MG	Date: 11 January 2008
Drawn: GB	Revised:
Job No: 832	Report No:
Projection: GDA94 Z50	Scale: 1:17,150

F:\Jobs\832\Map Info



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Expanded Durov Diagram

Figure A2

Date:	10/09/08	Project:	Marillana iron Ore project	Description:	Potable Bore - Water Supply
F:\Jobs\832C\C4 - Reporting\Hydrogeological Report\Appensix A\[Figure A2 Durov Plot.xls]EXPANDED DUROV (1)		Project No:	832C	Client:	Brockman Resources Ltd

HydroCHEM 2.0

Department of Water
Government of Western Australia

Our ref: RF3111
WRD36768
Enquiries: Cally Coster
Telephone: (08) 9144 0218

Colin Paterson
Yilgarn Mining (WA) Pty Ltd
Suite 6 Churchill Court
331-335 Hay Street
SUBIACO WA 6008

Dear Mr. Paterson,

Re: Issue of a Licence to Construct or Alter Well
Licence: CAW165750
Expiry: 24 January, 2009
Property: E47/1408

I refer to your application for a 26D Licence to Construct or Alter Wells which was received by the Department of Water on the 14th of January, 2008 for the construction of 17 non-artesian well(s) within tenement E47/1408.

Please find enclosed your Licence, authorising you to Construct or Alter a Well, subject to certain terms, conditions or restrictions.

Preliminary assessment indicates that there are several Department of Environment and Conservation Priority 4 populations of mammals located within the project area. If you encounter any of the above, please contact the Department of Environment and Conservation on (08) 9182 2000.

It is important that you read the conditions of your licence carefully. If you do not understand your licence, please contact the Department as soon as possible, as there are penalties for failing to comply with all of your licence conditions. Under Section 26GI of the *Rights in Water and Irrigation Act 1914*, you have a right to apply to the State Administrative Tribunal for a review of the decision to Issue a *Licence to Construct or Alter a Well*. You have 28 days from the date you received this letter to request that the decision be reviewed.

Pilbara Region
Lot 4608 Cherratta Road KIE
Karratha Western Australia 6714
PO Box 836 Karratha Western Australia 6714
Telephone (08) 9144 2000 Facsimile (08) 9144 2610
www.water.wa.gov.au

For further information please contact the State Administrative Tribunal:

State Administrative Tribunal
12 St Georges Terrace
PERTH WA 6000

GPO Box U1991
PERTH WA 6845

Telephone: (08) 9219 3111
Toll-free: 1300 306 017
Facsimile: (08) 9202 1180
www.sat.justice.wa.gov.au

Under section 21 of the *State Administrative Tribunal Act 2004*, you have a right to request a written statement of reasons for the decision to Issue a *Licence to Construct or Alter a Well*. This request must be made, in writing, to the Department of Water within 28 days after the day on which you received this letter.

Within one month of completing the well, you are required to submit **Form L – Particulars of Completed Borehole** to the Department of Water Office in Karratha. A penalty of $150 applies for failure to submit this Form.

If the water from this well is being improperly used, is being wasted or is having a harmful effect, the Commission may direct the closing of this well.

Compliance with the terms, conditions or restrictions of this licence does not absolve the licensee from responsibility for compliance with the requirements of all Commonwealth and State legislation.

If you have any queries relating to the above matter, please contact Officer Cally Coster on telephone number (08) 9144 0218.

Yours faithfully

Darryl Abbott
District Mangager
Department of Water
Pilbara Region

February 20, 2008

Department of Water
Government of Western Australia

Instrument No. CAW165750(1)

LICENCE TO CONSTRUCT OR ALTER WELL

Granted by the Department under section 26D of the Rights in Water and Irrigation Act 1914

Licensee(s)	Yilgarn Mining (WA) Pty Ltd	
Description of Water Resource	Pilbara Hamersley - Fractured Rock	
Location of Well(s)	E47/1408	
Authorised Activities	**Activity**	**Location of Activity**
	Construct up to 17 non-artesian well(s).	E47/1408
Duration of Licence	From 25 January 2008 to 24 January 2009	

This Licence is subject to the following terms, conditions and restrictions:

1 That water discharged during the pump test, is to be disposed of in such a manner as to cause no undesirable environmental impact

2 The well must be constructed by a driller having a current class 1 water well drillers certificate issued by the Western Australian branch of the Australian Drilling Industry Association or other certification approved by the Department of Water as equivalent.

3 The licensee is required to provide to the Department of Water a completed ' Particulars of Completed Bore Hole Form ' on completion of the approved drilling programme.

4 That no well shall be sunk within 400 metres of an existing well without the written permission of the owner of that well.

5 The water drawn from the bore shall be limited to well development, test pumping and sampling

6 That on completion of the exploratory drilling programme the licensee shall submit two copies of a hydrogeological assessment of the groundwater source, prepared by a competent hydrogeologist.

7 The licence has been issued for testing the viability of a mining operation. The licensee would be required to submit an application for a groundwater production licence if the mining operation proceeds

8 That should there be a detrimental impact on water quality as a result of the licensed activity, the Department of Water may cause the well to be closed.

9 The licensee shall comply with the Contingency Actions as prepared by Yilgarn Mining (WA) Pty Ltd and approved by the Department of Water on 18 February 2008, including any modifications to the Contingency Actions as approved during the term of the licence.

10 No water may be taken from any well where the salinity level is greater than 1818 mS/m measured at 25 deg C

End of terms, conditions and restrictions

This Licence is granted subject to the Rights in Water and Irrigation Regulations 2000.

Table A.1
Summary of Water Quality Parameters

	Units	MRC46	MRC49	MRD53	ADWG	
					Health	Aesthetic
pH	pH Units	7.4	7.7	7.8	a	6.5-8.5
Conductivity @25oC	µS/cm	1300	1500	1400		
Total Dissolved Solids (calc as NaCl)	mg/L	770	910	820	b	500
Sodium, Na	mg/L	140	200	180	b	180
Potassium, K	mg/L	20	22	19		
Calcium, Ca	mg/L	38	32	33		
Magnesium, Mg	mg/L	43	39	34		
Iron, Fe	mg/L	0.02	0.02	<0.02	a	0.3
Chloride, Cl	mg/L	270	320	280	b	250
Bicarbonate, HCO3	mg/L	130	190	170		
Carbonate Co3	mg/L	<1	<1	<1	500	250
Sulphate	mg/L	84	72	90	50	
Cation/anion Balance	%	2	1.7	1.8		
Sum of Ions	Calculation mg/L	728	885	809	a	0.05

a - Insufficient data to set guidelines based in health considerations
b - No health-based guideline is considered necessary

HYDROCHEMISTRY

Water samples from bores MRC46, MRC49 and MRC53 were provided to us by the Client. These have been analysed, but the samples were taken during bore airlifts, are likely to be highly oxidised and may not be fully representative of waters from the aquifer. Also as these bores were not developed drill fluids (Liquipol and Ausdet) are likely to be present in the samples and may explain the possible erroneous results

Table A.2
Summary of Falling Head Tests

Bore ID	K (m/day)	Adopted T (m2/day)	Assumed thickness of test section (m)*
MRC029	8.65E-02	4.15	48
MRC066	6.25E-03	0.22	36
MRC004	1.09E-01	6.01	55
MRC001	5.43E-01	17.90	33
MRC050	5.55E-01	20.55	37
MRC050 (#2)	1.17E-01	4.32	37
MRC057	3.00E-01	9.91	33
MRC061	1.31E-01	6.03	46
MRC061 (#2)	4.62E-02	2.12	46

*assumed as no bore details are available

The results of the falling head test results were analysed using the Hvorslev (1951) method and as the piezometer construction details are absent a number of assumptions had to be made, particularly regarding the screened length of each piezometer.

APPENDIX B

COMPOSITE BORE & PIEZOMETER LOGS

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COMPOSITE WELL LOG

Well No: Potable Bore

Client: Brockman Resources **Project:** Marillana Iron Ore

Commenced: 1 March 2008
Completed: 9 March 2008
Drilled: DGS
Logged By: RS

Method: Mud rotary
Fluid: Bentonite mud
Bit Record: 0-3m 311mm, 3-65m 250mm

Area: Marillana
East: 730059.93 (GDA 9
North: 7498102.95
Elevation: 449.68mAHD F

Static Water Level: 37.42 mbgl **Date:** 9/3/08

Depth (mbgl)	Geology	Graphic Log	Lithological Description	Field Notes	Well Completion: Diagram	Well Completion: Notes
0	TOB		Colluvium: Transported overburden. Red brown poorly consolidated silty sandy colluvial gravel . Gravel clasts (up to 30 cm in mud pit excavation) sub-angular to sub-rounded (but mainly platy) SIF, chert, shale with lesser hematite and maghemite. Rare pisoliths.	Airlift 2.5 L/s at end of development. EC = 1.30 mS/cm pH = 8.32		0.2 magl - 2.8 mbgl 254 mm NB steel surface casing
-10						0.2 magl - 35 mbgl 155 mm NB Class 12 PVC casing
-20						0 - 64 m Graded gravel pack over full length of casing.
-30						
-40	THD		DETRITAL: Transported hematite detritals. Red brown silty detritals with subangular to rounded hematite / maghemite / goethite clasts (3 - 12 mm) and 20 - 40% pisoliths (up to 3 mm). Up to 50% chert / SIF / vein quartz clasts.			35 - 53 m 155 mm NB slotted Class 12 PVC casing
-50	RLT		LATERITE: Residual laterite. Creamy yellow rounded lumps of residual laterite. Harder drilling.			
	SSH		Shale: Dark grey/black shale. Variable hardness.			53 - 56 m 155 mm NB Class 12 PVC sump 56 m PVC endcap
-60	RCL		CLAY: Mottled khaki/yellow residual clay with abundant shale fragments.	EOH 65 m		64 - 65 m Fallback in 250 mm hole

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COMPOSITE WELL LOG

Well No: In Pit (NW) Test Bore

Client: Brockman Resources **Project:** Marillana Iron Ore

Commenced: 04/04/08
Completed: 14/04/08
Drilled: DGS
Logged By: PE

Method: Mud rotary
Fluid: Bentonite mud
Bit Record: 17 1/2" (0-62.07 mbgl)

Area: Marillana
East: 726937.47
North: 7500772.41
Elevation: 444.38mAHD

Static Water Level: 33.70 mbtoc **Date:** 14 April 2008

Depth (mbgl)	Geology	Graphic Log	Lithological Description	Field Notes	Well Completion Diagram	Well Completion Notes
0	TOB		Colluvium: Red / brown and grey poorly sorted silty poorly sorted poorly consolidated colluvial gravel. Clasts are angular to sub rounded, grey and red shale, BIF, chert with minor haematite and maghaematite and rare goethite..	Final development airlift yield = 18l/s EC = 1.87-1.95 ms/cm, pH = 8.06-8.13	0.2 magl - 3 mbgl NB steel surface casing 0 - 21.05mbgl uPVC PN12 250mm Casing 21.05 - 21.85mbgl Connector 21.85 - 58.27mbgl 250mm Stainless Steel Johnson Well Screen 1mm Slot 58.27 - 61.27mbgl stainless steel sump 61.27 - 62.07mbgl concrete plug 62.07 - 65mbgl fallback
10						
20	THD		Detrital: Light brown / red and grey moderately sorted gravel with brown clayey patches. Clasts are subangular to rounded haematite / maghaematite (50-70%) dominant with 20-40% pisolites. Proportion of pisolites increases with depth. Minor shale (10%) and occassional goethite and chert.			
30	THD		Detrital: Light brown / red moderately sorted gravel. Clasts are sub angular to rounded haematite / maghaematite dominant (70-90%) with 30-50% pisoilites. Occasional goethite and shale.			
40	TPS		Detrital: As above with >50% pisolites. Pisolites 2-4mm.			
50	THP		Detrital: Grey moderately sorted sub rounded to rounded gravel grading into light brown and orange clay at base. Clasts are haematite / maghaematite dominant (80%) with 30-40% pisolites and minor goethite (10%). Proportion of goethite increases with depth with distinctive vuggy cavitity filled clasts containing limonite infill in places.			
60	THP		Detrital: Brown / orange and yellow clay	EOH at 65mbgl		

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COMPOSITE WELL LOG

Well No: Piezo Site 1 (Shallow)

Client: Brockman Resources **Project:** Marillana Iron Ore

Commenced: 1 April 2008
Completed: 2 April 2008
Drilled: DGS
Logged By: PE

Method: Mud rotary
Fluid: Bentonite mud
Bit Record: 0-3m (10")
3-62m (6")

Area: Marillana
East: 726938.43
North: 7500765.40
Elevation: 444.61mAHD

Static Water Level: 33.61 (mbtoc) **Date:** 14/4/08

Depth (mbgl)	Geology	Graphic Log	Lithological Description	Field Notes	Well Completion Diagram	Well Completion Notes
0	TOB		Colluvium: Red / brown and grey poorly sorted, poorly consolidated colluvial gravel. Clasts are angular to sub rounded, grey and red shale, BIF, chert with minor haematite and maghaematite and rare goethite..	Final airlift 1-2l/s EC = 1.75-1.77 mS/cm, pH = 8.2		0.2 magl - 2.8 mbgl 254 mm NB steel surface casing
10						0.2magl - 24mbgl ID 52mm Class 12 Plain PVC Casing
20						
30	THD		Detrital: Light brown / red and grey moderately sorted gravel with brown clayey patches. Clasts are subangular to rounded haematite / maghaematite (50-70%) dominant with 20-40% pisolites. Proportion of pisolites increases with depth. Minor shale (10%) and occassional goethite and chert.			
40	THD		Detrital: Light brown / red moderately sorted gravel. Clasts are sub angular to rounded haematite / maghaematite dominant (70-90%) with 30-50% pisoilites. Occasional goethite and shale.			
	TPS		Detrital: As above with >50% pisolites. Pisolites 2-4mm.			
50	THP		Detrital: Grey moderately sorted sub rounded to rounded gravel grading into light brown and orange clay at base. Clasts are haematite / maghaematite dominant (80%) with 30-40% pisolites and minor goethite (10%). Proportion of goethite increases with depth with distinctive vuggy cavitity filled clasts containing limonite infill in places.			1-60mbgl Graded gravel pack 24-59.7mbgl ID 52mm Class 12 Slotted PVC Casing
60	THP		Detrital: Brown / orange and yellow clay	EOH at 62m		PVC End Cap 60-62m Fallback in 150 mm hole

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COMPOSITE WELL LOG

Well No: Piezo Site 1 (Deep)

Client: Brockman Resources **Project:** Marillana Iron Ore

Commenced: 27 March 2008
Completed: 1 April 2008
Drilled: DGS
Logged By: PE

Method: Mud rotary
Fluid: Bentonite mud
Bit Record: 0-3m (12")
3-65m (10")

Area: Marillana
East: 726939
North: 7500764
Elevation: mAHD

Static Water Level: 33.63 mbtc **Date:** 14/4/08

Depth (mbgl)	Geology	Graphic Log	Lithological Description	Field Notes	Well Completion Diagram	Well Completion Notes
0	TOB		Colluvium: Red / brown and grey poorly sorted silty poorly sorted poorly consolidated colluvial gravel. Clasts are angular to sub rounded, grey and red shale, BIF, chert with minor haematite and maghaematite and rare goethite..	Airlift 3-4l/s (visual estimate)	0.2 magl - 2.8 mbgl 254 mm NB steel surface casing
10					
20	THD		Detrital: Light brown / red and grey moderately sorted gravel with brown clayey patches. Clasts are subangular to rounded haematite / maghaematite (50-70%) dominant with 20-40% pisolites. Proportion of pisolites increases with depth. Minor shale (10%) and occassional goethite and chert.	EC = 3.88 - 3.97 mS/cm	
30				pH = 8.3 - 8.31	0.2magl - 69.1mbgl ID 52mm Class 12 Plain PVC Casing
	THD		Detrital: Light brown / red moderately sorted gravel. Clasts are sub angular to rounded haematite / maghaematite dominant (70-90%) with 30-50% pisoilites. Occasional goethite and shale.	EOH at 84m	
40	TPS		Detrital: As above with >50% pisolites. Pisolites 2-4mm.		
	THP		Detrital: Grey moderately sorted sub rounded to rounded gravel grading into light brown and orange clay at base. Clasts are haematite / maghaematite dominant (80%) with 30-40% pisolites and minor goethite (10%). Proportion of goethite increases with depth with distinctive vuggy cavitity filled clasts containing limonite infill in places.		
50					
60	THP		Detrital: Brown / orange and yellow clay		
	RCL		Clay and Shale: Grey and brown clay grading into hard shale.		
	RCL		Clay and Shale: Brown clay and grey shale. Shale becoming harder and greyer with depth. (0.3m in drill bit indicate possible voids or fractures).		
70					68 - 75.1m Graded gravel pack
	SSH		Lost Circulation: Lost circulation: no samples. Smooth drilling with occassional thin (<0.2m) hard drilling - clay with interbedded shales?		69.1 - 75.1mbgl ID 52mm Class 12 Slotted PVC Casing
					PVC End Cap
80					76 - 84m Fallback in 250 mm hole

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COMPOSITE WELL LOG

Well No: Piezo. Site 2 (Shallow)

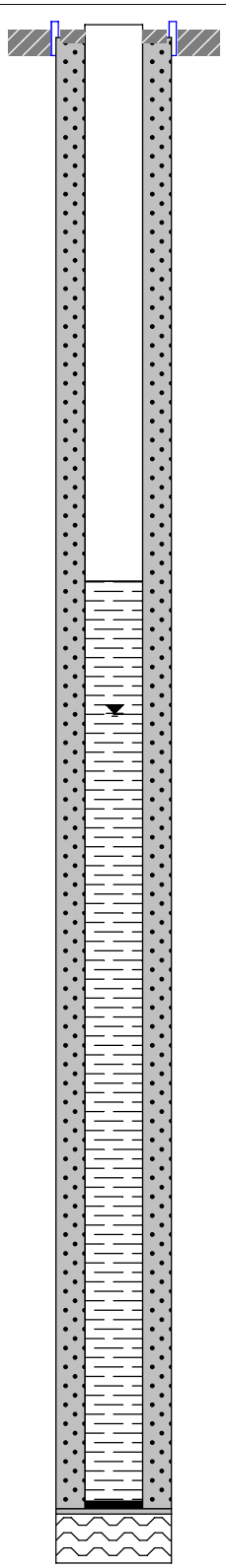
Client: Brockman Resources
Project: Marillana Iron Ore

Commenced: 16/3/08
Completed: 18/3/08
Drilled: DGS
Logged By: RS

Method: Mud rotary
Fluid: Bentonite mud
Bit Record: 0-3m 250mm
3-59.5m 150mm

Area: Marillana
East: 727777.68
North: 7500899.94
Elevation: 437.31mAHD

Static Water Level: 26.53 mbgl
Date: 18/3/08

Depth (mbgl)	Geology	Graphic Log	Lithological Description	Field Notes	Well Completion: Diagram	Well Completion: Notes
0	TOB		Colluvium: Transported overburden. Red brown poorly consolidated silty sandy colluvial gravel . Angular to sub-rounded (but mainly platy) clasts of chert, shale, SIF (up to 10 cm long in mud pit excavation) with lesser hematite and maghemite. Poorly consolidated particularly near ground surface. Limonite / hematite staining on some clast surfaces. Occasional clay bands between 15 and 20 m.	Airlift at 1 L/s with negligible drawdown during development (recovered within 1 minute) Conductivity 1.73 mS/cm pH 8.48		0.32 magl - 1.0 mbgl 155 mm NB steel surface casing with lockable cap. 0.3 magl - 21.4 mbgl 50 mm NB Class 12 PVC casing 0.3 - 57.6 m Graded gravel pack. 21.4 - 57.4 m 50 mm NB slotted Class 12 PVC casing 57.4 m PVC endcap 57.6 - 59.5 m Fallback in 150 mm hole
20	THD		DETRITAL: Transported hematite detritals. Red brown clayey gravel detritals (clays swell during mud drilling). Dominantly sub-angular to rounded hematite / maghemite with approximately 10% goethite. Up to 20% chert / SIF / shale clasts. Approximately 20% pisoliths.			
30			DETRITAL: Transported hematite detritals. Red brown silty gravel detritals (less clay and faster drilling than above). Dominantly sub-angular to rounded hematite / maghemite with approximately 10% goethite, but coarser (up to 8 mm) clasts than above. Up to 20% chert / SIF / shale clasts. 20 - 40% pisoliths. Silt matrix decreasing with depth and drilling speed increases at same time.			
40			DETRITAL: Transported hematite detritals. As above, but with bands of yellow limonite stained chert clasts.			
50			DETRITAL: Transported hematite detritals. Red brown silty hematite detritals (cleaner and less silt than above and clasts generally coarser). Very fast drilling and losing drilling mud, paticularly near bottom. Circulation lost temporarily at 60 - 61 m. Dominantly sub-angular to rounded hematite (30 - 50%) / maghemite ((20 - 40%) with <10% goethite, but coarser (up to 8 mm) clasts than above. Up to 30% chert / SIF / shale clasts. 15 - 30% pisoliths.	EOH 59.5 m		
60						

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COMPOSITE WELL LOG

Well No: Piezo. Site 2 (Deep)

Client: Brockman Resources
Project: Marillana Iron Ore

Commenced: 10/3/08
Completed: 18/3/08
Drilled: DGS
Logged By: RS

Method: Mud rotary
Fluid: Bentonite mud, KCl
Bit Record: 0-2m 250mm
2-76m 150mm

Area: Marillana
East: 727777.84
North: 7500902.38
Elevation: 437.30mAHD

Static Water Level: 26.65 mbgl
Date: 18/3/08

Depth (mbgl)	Geology	Graphic Log	Lithological Description	Field Notes	Well Completion: Diagram	Well Completion: Notes
0	TOB		Colluvium: Transported overburden. Red brown poorly consolidated silty sandy colluvial gravel . Angular to sub-rounded (but mainly platy) clasts of chert, shale, SIF (up to 10 cm long in mud pit excavation) with lesser hematite and maghemite. Poorly consolidated particularly near ground surface. Limonite / hematite staining on some clast surfaces. Occasional clay bands between 15 and 20 m.	Airlift at 1 L/s with negligible drawdown during development (recovered within 1 minute) Conductivity 4.62 mS/cm pH 8.28		0.32 magl - 1.0 mbgl 155 mm NB steel surface casing with lockable cap.
10						
20	THD		DETRITAL: Transported hematite detritals. Red brown clayey gravel detritals (clays swell during mud drilling). Dominantly sub-angular to rounded hematite / maghemite with approximately 10% goethite. Up to 20% chert / SIF /			0.32 magl - 66.5 mbgl 50 mm NB Class 12 PVC casing
30			DETRITAL: Transported hematite detritals. Red brown silty gravel detritals (less clay and faster drilling than above). Dominantly sub-angular to rounded hematite / maghemite with approximately 10% goethite, but coarser (up to 8 mm) clasts than above. Up to 20% chert / SIF / shale clasts. 20 - 40% pisoliths. Silt matrix decreasing with depth and drilling speed increases at same time.	SWL measured in annulus above bentonite plug as 26.12 mbgl on 17/3/08		
40			DETRITAL: Transported hematite detritals. As above, but with bands of yellow limonite stained chert clasts.			
50			DETRITAL: Transported hematite detritals. Red brown silty hematite detritals (cleaner and less silt than above and clasts generally coarser). Very fast drilling and losing drilling mud, paticularly near bottom. Circulation lost temporarily at 60 - 61 m. Dominantly sub-angular to rounded hematite (30 - 50%) / maghemite ((20 - 40%) with <10% goethite, but coarser (up to 8 mm) clasts than above. Up to 30% chert / SIF / shale clasts. 15 - 30% pisoliths.			45 - 64.8 m Bentonite plug
60	RSF?		SHALE AND CLAY: Highly wathered red brown clayey ferruginous shales. Samples contaminated with chert / SIF / shales and pisoliths from above.			
	SSH		Shale: Moderately weathered red brown ferruginous shales. As above but rare clay.			66.5 - 72.5 m 50 mm NB slotted Class 12 PVC casing
70			Lost Circulation: No sample. Drill bit started bouncing at 70.5 m then no mud returns. Soft drilling.	Fracture at 70.5 m		64.8 - 73 m Graded gravel pack. 72.5 m PVC endcap
			Lost Circulation: No sample. Smooth soft drilling.	EOH 76 m		73 - 76 m Fallback in 150 mm hole
80			Lost Circulation: No sample. Hard unfractured drilling.			

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COMPOSITE WELL LOG

Well No: Piezo Site 3 (Shallow)

Client: Brockman Resources **Project:** Marillana Iron Ore

Commenced: 20/04/08
Completed: 22/04/08
Drilled: DGS
Logged By: SKS

Method: Mud Rotary
Fluid: Bentonite mud, KCL
Bit Record: 0-4m drill bit dia. 8"
4-72m drill bit dia. 6"

Area: Marillana
East: 728189.95
North: 7502288.74
Elevation: 424.62mAHD

Static Water Level: 14.80mbtoc **Date:** 22/04/08

Depth (mbgl)	Geology	Graphic Log	Lithological Description	Field Notes	Well Completion Diagram	Well Completion Notes
0	TOB		Colluvium: Transported overburden. Red brown poorly consolidated silty sandy colluvial GRAVEL. Gravel clasts sub angular to sub rounded dominantly platy SIF, chert, shale with lesser hematite and maghematite. Occasional limonite beyond 10m. CLAY bands between 3m to 6m and from 11m to 13m			0-4mbgl 200mm upvc casing
10						0-21.5mbgl = 50mm diameter upvc plain casing (PN12)
20	THD		DETRITAL: Red brown hematite silty detritals with sub angular to rounded hematite/maghemite/goetite clasts <4mm. Rare pisoliths <10%			
30	THP		DETRITAL: Red brown hematite silty detritals with sub angular to rounded hematite/maghemite/goetite clasts <20mm. Rare pisoliths <10%. Occassional yellow limonite staining of clasts.			21.5-36.5mbgl = 50mm diameter upvc screen (PN12 1mm slots)
			DETRITAL: Red brown hematite silty Clay 40% detritals with sub angular to rounded hematite/maghemite/goetite clasts <20mm. Rare pisoliths <10%. Occassional yellow limonite staining of clasts.			36.5-42.5mbgl = 50mm diameter upvc plain casing (PN12)
40			DETRITAL: Red brown hematite silty Clay 60% detritals with sub angular to rounded hematite/maghemite/goetite clasts <20mm. Rare pisoliths <10%. Occassional yellow limonite staining of clasts.			42-43mbgl = bentonite seal
	CL		Clay: Mottled khaki/yellow residual clay with occassional (20%) sub angular to rounded hematite/maghemitete/goetite clasts ,4mm. Rare pisoliths<10%	Over drilled into shales for exploration purposes		
50	Altered Mt McRea/Mt Sylvia		Shale: Highly altered. White with occassional yellow and red brown clay casts. Calcareous clasts less than 3mm in diameter. weathered powdery texture			43-69mbgl = gravel pack
60			CLAY AND GRAVEL: Graphitic grey black clay with 50% angular to sub angular chert and shale and occasional yellow/khaki clay			
70			Clay: Mottled khaki/yellow clay	End Of Hole		69-72mbgl = formation in fill

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COMPOSITE WELL LOG

Well No: Piezo Site 4 (Deep)

Client: Brockman Resources
Project: Marillana Iron Ore

Commenced: 15/04/08
Completed: 20/04/08
Drilled: DGS
Logged By: SKS

Method: Mud Rotary
Fluid: Bentonite mud, KCL
Bit Record: 0-4m drill bit dia. 8"
4-72m drill bit dia. 6"

Area: Marillana
East: 7503163.52
North: 728806.35
Elevation: 418.54mAHD

Static Water Level: 3.31mbtoc
Date: 21/04/08

Depth (mbgl)	Geology	Graphic Log	Lithological Description	Field Notes	Well Completion: Diagram	Well Completion: Notes
0	TOB		Colluvium: Transported overburden. Red brown poorly consolidated silty sandy colluvial GRAVEL. Gravel clasts sub angular to sub rounded dominantly platy SIF, chert, shale. Interbedded with occassional clay horizons between 4m to 23m.		0-4mbgl 200mm upvc casing 0-71mbgl = 50mm diameter upvc plain casing (PN12)	
10						
20						
30	CLAY		CLAY: Red brown clay			
40	THI		DETRITAL: Red brown hematite silty detritals in red brown to khaki clay matrix. Detritals, sub angular to rounded hematite/maghemite/goetite clasts <3mm. Rare pisoliths <10%.			
50	Altered Mt McRea/Mt Sylvia		CLAY AND GRAVEL: Brown clay with sub angular to rounded clasts of chert and shale up to 4mm in dia. Shale: White with occassional yellow and red brown clay casts beyond 50mbgl. Calcrete clasts less than 3mm and 10mm in diamter ' Calcrete weathered powdery texture'.			
60			CLAY WITH GRAVEL: Mottled khaki/yellow residual clay with occassional (20%) sub angular to rounded clasts of chert and shale up to 8mm in dia.			
70			CLAY WITH GRAVEL: Mottled khaki/yellow residual clay with occassional (10%) sub angular to rounded clasts of chert and shale up to 8mm in dia.		71-72mbgl = bentonite seal 72-114mbgl = 50mm diamterr upvc screen (PN12 1 mm slots)	
80			CLAY AND GRAVEL: Grey black clay with 50% angular to sub angular chert and shale gravel clasts up to 5mm dia.			
90	WITTENOOM DOLOMITE		Dolomite: Grey/white crystalline sheared dolomite. Platey.			
100						
110				End Of Hole		

APPENDIX C

AQUIFER ANALYSIS

Source Reliable Output Calculations **Bore No:** Production Bore

Notes:
Calculates SRO and expected pumping water levels for newly constructed bores
Pumping Test Analysis must have been undertaken first
Pumping water levels calculated from assumed average conditions - as seen during drilling
Assumes transient radial flow conditions prevail (eg Theis Equation)

Data Input

Rest Water Level = 33.7 mbgl Top of Aquifer/Max PWL = 45 mbgl

Step Test Data

Enter parameters of step test equation $s=BQ+CQ^2$

B =	6.50E-04	
C =	2.60E-07	
valid time	100	mins

Constant Rate Test Data

Enter parameters from constant rate analysis

T =	270	m^2/d	(transmissivity)
s =	8.00E-03		(storativity)
r =	0.125	m	(radius of bore)

Enter Operational Data

Assumed period between recharge events t2 = 1825 days

Range of discharges to be considered

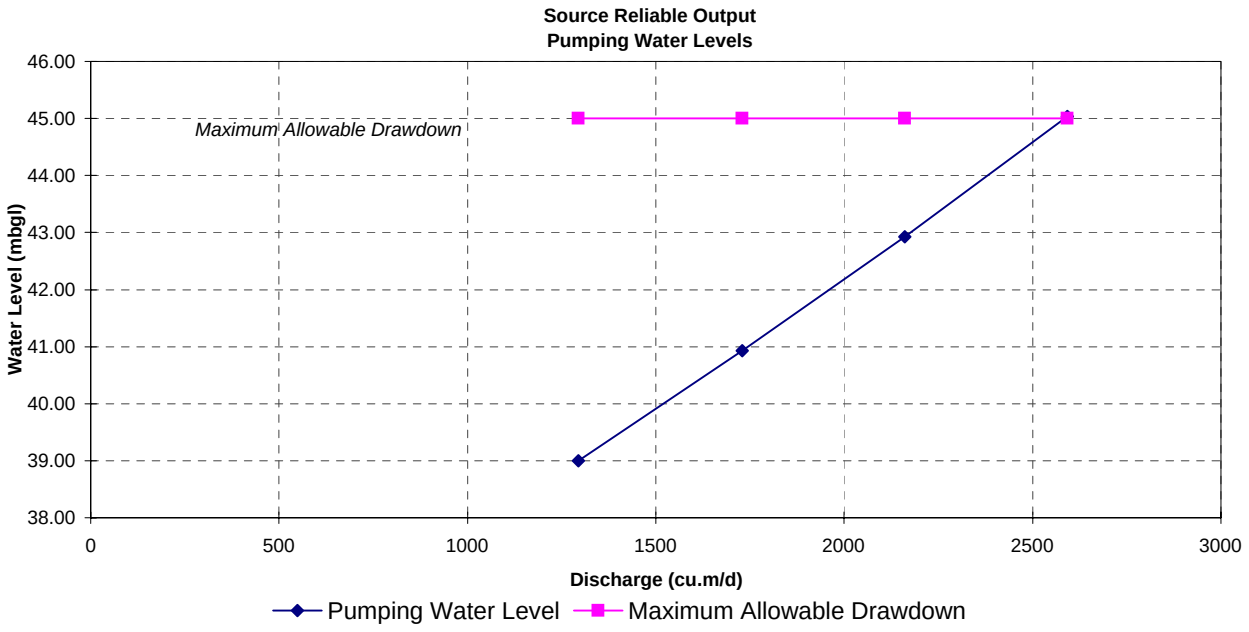
Q1	1295	m^3/d
Q2	1730	m^3/d
Q3	2160	m^3/d
Q4	2592	m^3/d

Are there interference effects (Y/N) Y

Dist to first bore	4000	m
pumping rate	216	m^3/d
Dist to second bore		m
pumping rate		m^3/d

Calculations of Drawdown

Discharge kL/d	Discharge L/s	Short Term Drawdown	Long Term Drawdown	Interference Effects	Total Drawdown	Pumping Water Level
1295	15.0	1.3	3.88	0.14	5.29	38.99
1730	20.0	1.9	5.18	0.14	7.22	40.92
2160	25.0	2.6	6.47	0.14	9.23	42.93
2592	30.0	3.4	7.77	0.14	11.33	45.03



F:\Jobs\832C\C4 - Reporting\Hydrogeological Report\Appendix C\[Appendix C Figure C1 Production Bore Interference 2.5L_sec.xls]Transient Radial Flow

Source Reliable Output Calculations

Bore No: Production Bore

Notes:
Calculates SRO and expected pumping water levels for newly constructed bores
Pumping Test Analysis must have been undertaken first
Pumping water levels calculated from assumed average conditions - as seen during drilling
Assumes transient radial flow conditions prevail (eg Theis Equation)

Data Input

Rest Water Level = 33.7 mbgl Top of Aquifer/Max PWL = 45 mbgl

Step Test Data

Enter parameters of step test equation $s=BQ+CQ^2$

B =	6.50E-04	
C =	2.60E-07	
valid time	100	mins

Constant Rate Test Data

Enter parameters from constant rate analysis

T =	270	m^2/d	(transmissivity)
s =	8.00E-03		(storativity)
r =	0.125	m	(radius of bore)

Enter Operational Data

Assumed period between recharge events t2 = 1825 days

Range of discharges to be considered

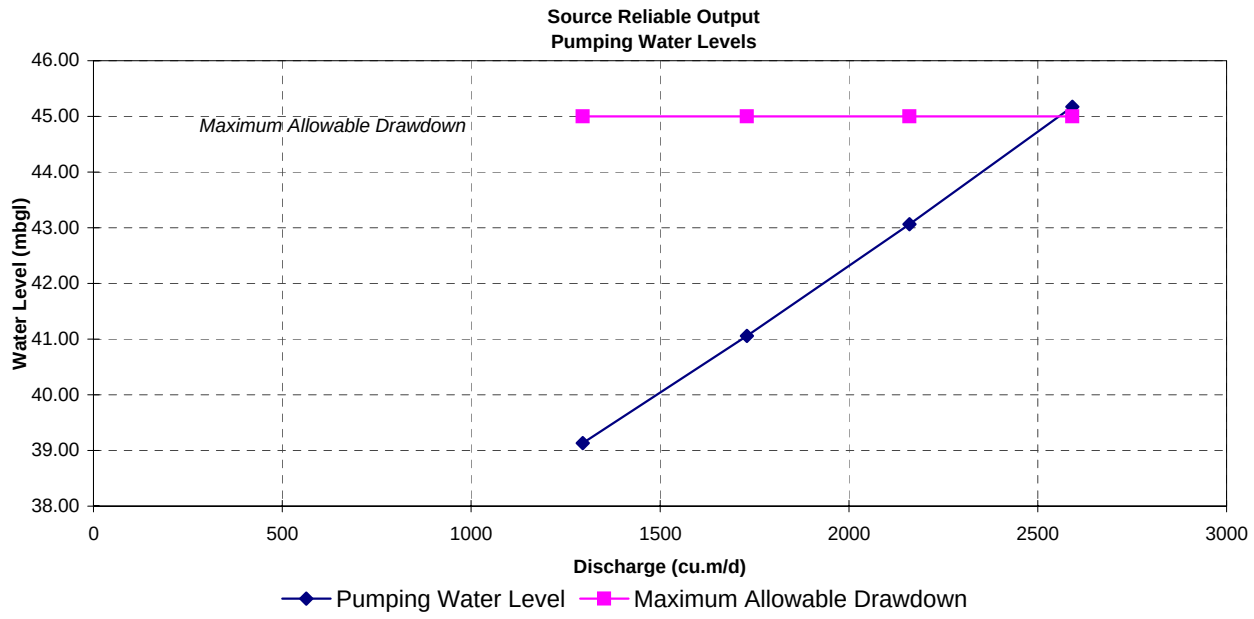
Q1	1295	m^3/d
Q2	1730	m^3/d
Q3	2160	m^3/d
Q4	2592	m^3/d

Are there interference effects (Y/N) Y

Dist to first bore	4000	m
pumping rate	432	m^3/d
Dist to second bore		m
pumping rate		m^3/d

Calculations of Drawdown

Discharge kL/d	Discharge L/s	Short Term Drawdown	Long Term Drawdown	Interference Effects	Total Drawdown	Pumping Water Level
1295	15.0	1.3	3.88	0.27	5.43	39.13
1730	20.0	1.9	5.18	0.27	7.36	41.06
2160	25.0	2.6	6.47	0.27	9.36	43.06
2592	30.0	3.4	7.77	0.27	11.47	45.17



F:\Jobs\832C\C4 - Reporting\Hydrogeological Report\Appendix C\[Appendix C Figure C2 Production Bore Interference 5L_sec.xls]Transient Radial Flow

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Productioin Bore Interface 5L from Figure C2

Source Reliable Output Calculations

Bore No: Production Bore

Notes:
Calculates SRO and expected pumping water levels for newly constructed bores
Pumping Test Analysis must have been undertaken first
Pumping water levels calculated from assumed average conditions - as seen during drilling
Assumes transient radial flow conditions prevail (eg Theis Equation)

Data Input

Rest Water Level = 33.7 mbgl Top of Aquifer/Max PWL = 45 mbgl

Step Test Data

Enter parameters of step test equation $s=BQ+CQ^2$

B =	6.50E-04	
C =	2.60E-07	
valid time	100	mins

Constant Rate Test Data

Enter parameters from constant rate analysis

T =	270	m^2/d	(transmissivity)
s =	8.00E-03		(storativity)
r =	0.125	m	(radius of bore)

Enter Operational Data

Assumed period between recharge events t2 = 1825 days

Range of discharges to be considered

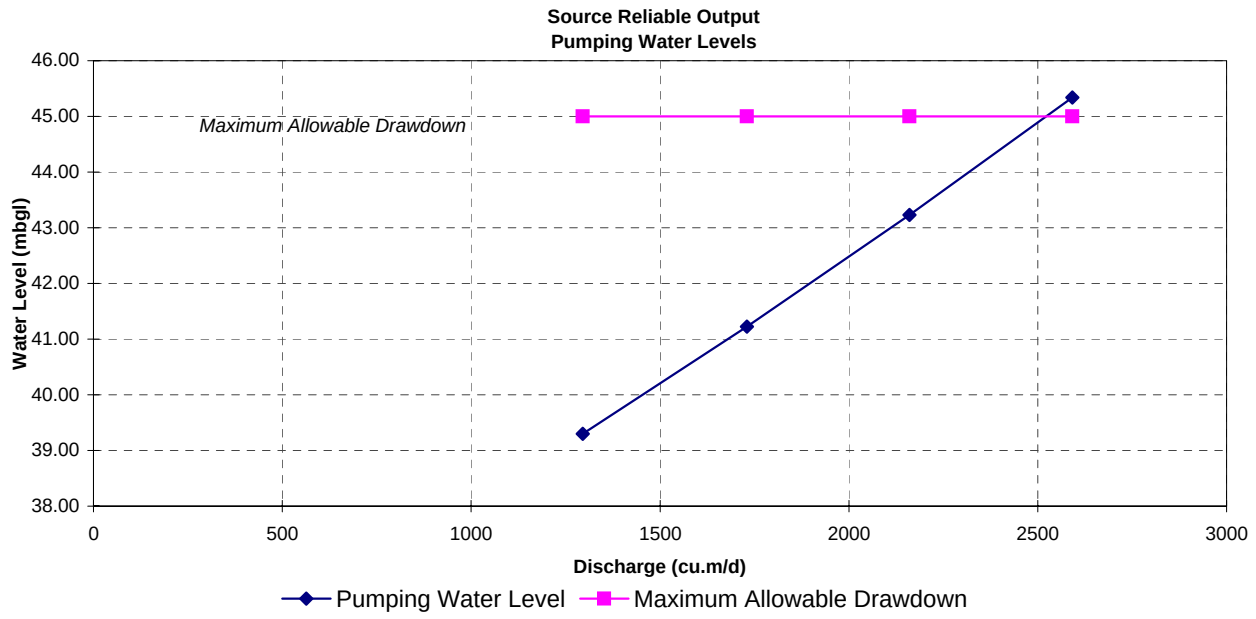
Q1	1295	m^3/d
Q2	1730	m^3/d
Q3	2160	m^3/d
Q4	2592	m^3/d

Are there interference effects (Y/N) Y

Dist to first bore	4000	m
pumping rate	691	m^3/d
Dist to second bore		m
pumping rate		m^3/d

Calculations of Drawdown

Discharge kL/d	Discharge L/s	Short Term Drawdown	Long Term Drawdown	Interference Effects	Total Drawdown	Pumping Water Level
1295	15.0	1.3	3.88	0.44	5.60	39.30
1730	20.0	1.9	5.18	0.44	7.52	41.22
2160	25.0	2.6	6.47	0.44	9.53	43.23
2592	30.0	3.4	7.77	0.44	11.64	45.34



F:\Jobs\832C\C4 - Reporting\Hydrogeological Report\Appendix C\[Appendix C Figure C3 Production Bore Interference 8L_sec.xls]Transient Radial Flow

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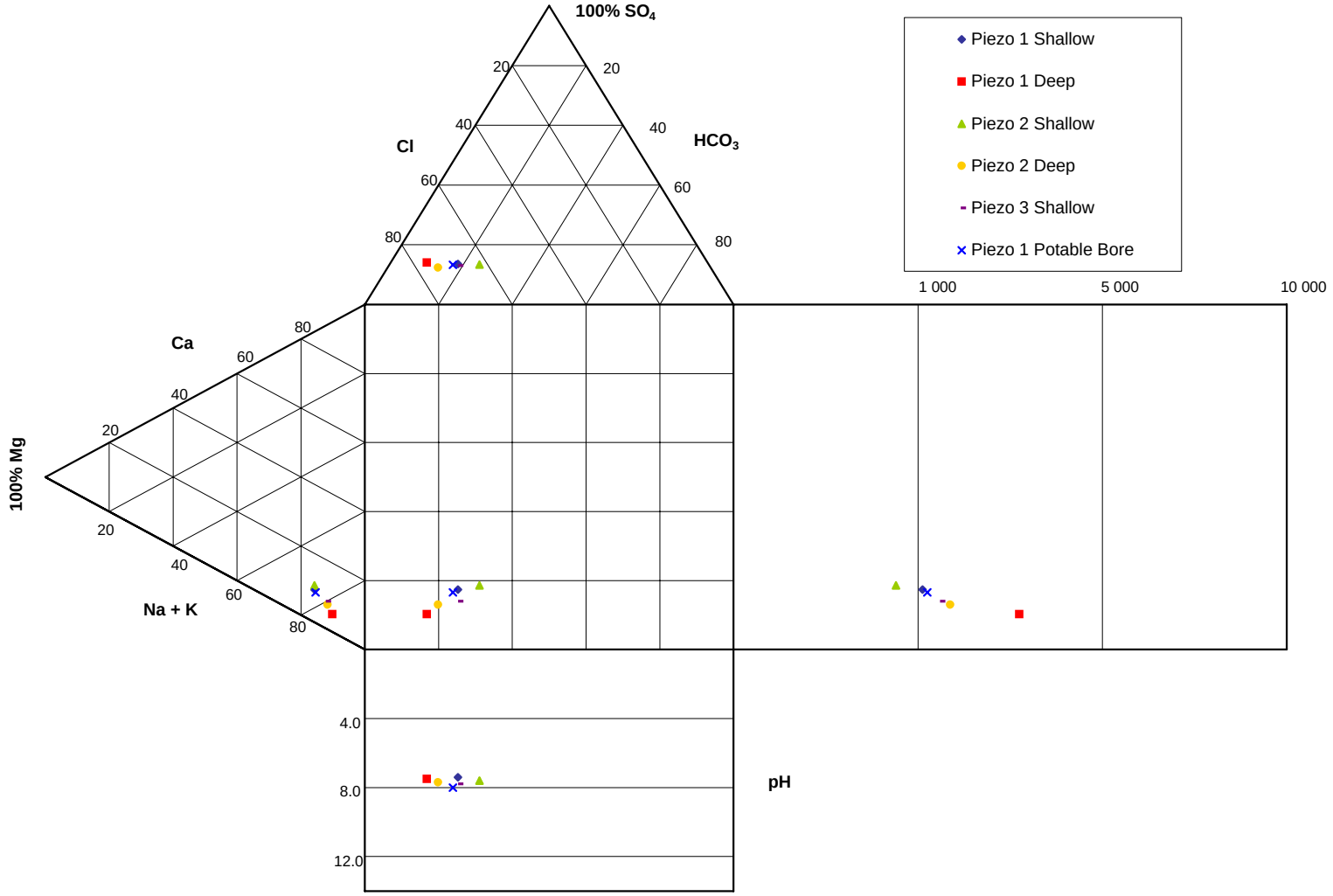
Procution Bore Interface 8L
Figure C3

APPENDIX D

GROUNDWATER QUALITY ANALYSIS



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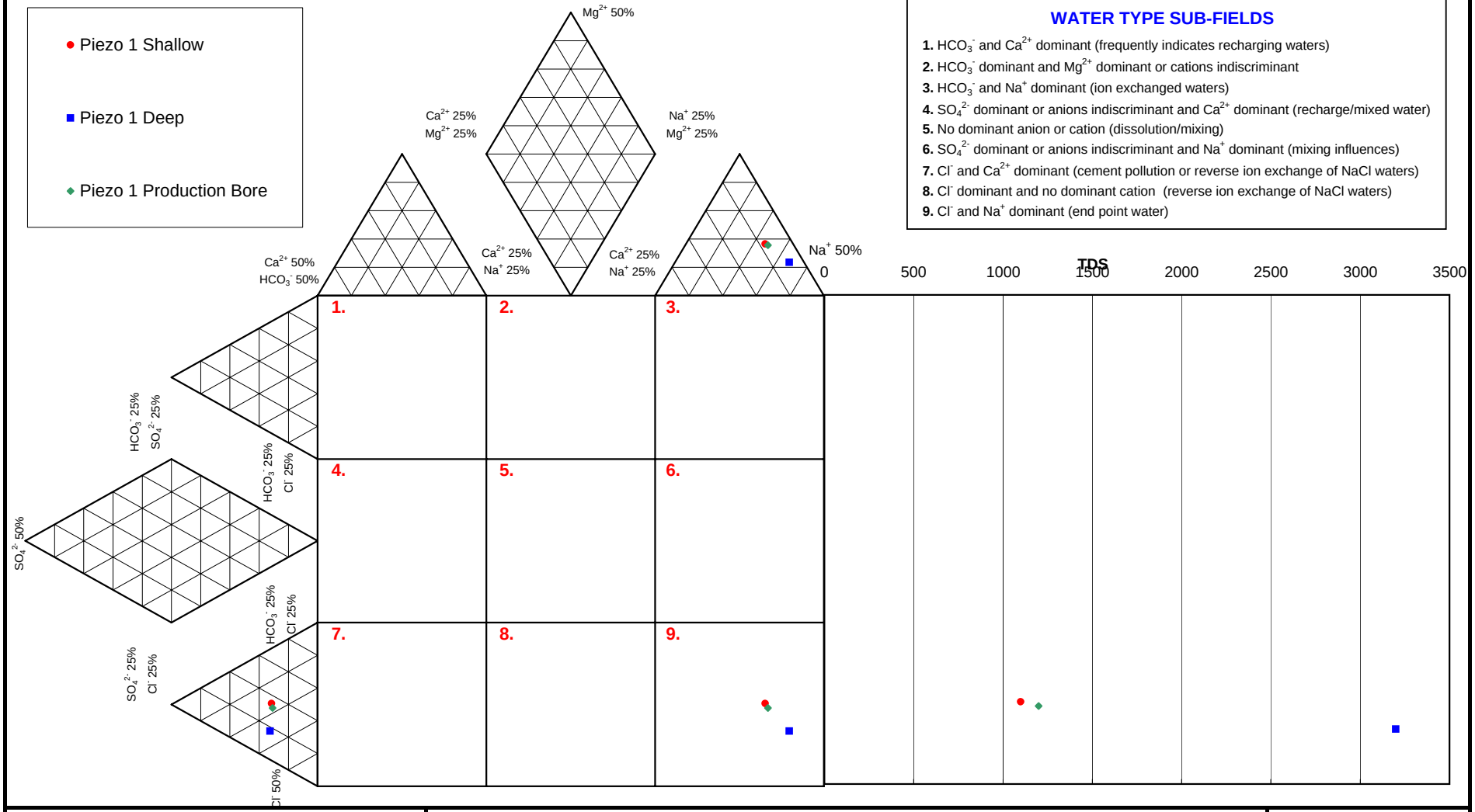
Durov Diagram

Figure D1

Date:	10/09/08	Project:	MIOP	Description:	Pre Aquifer testing June 2008
F:\Jobs\832C\C4 - Reporting\Hydrogeological Report\Appendix D\[Appendix D1 Groundwater chemistry Pre CRT.xls]DUROV		Project No:		Client:	Brockman Resources

HydroCHEM 2.0



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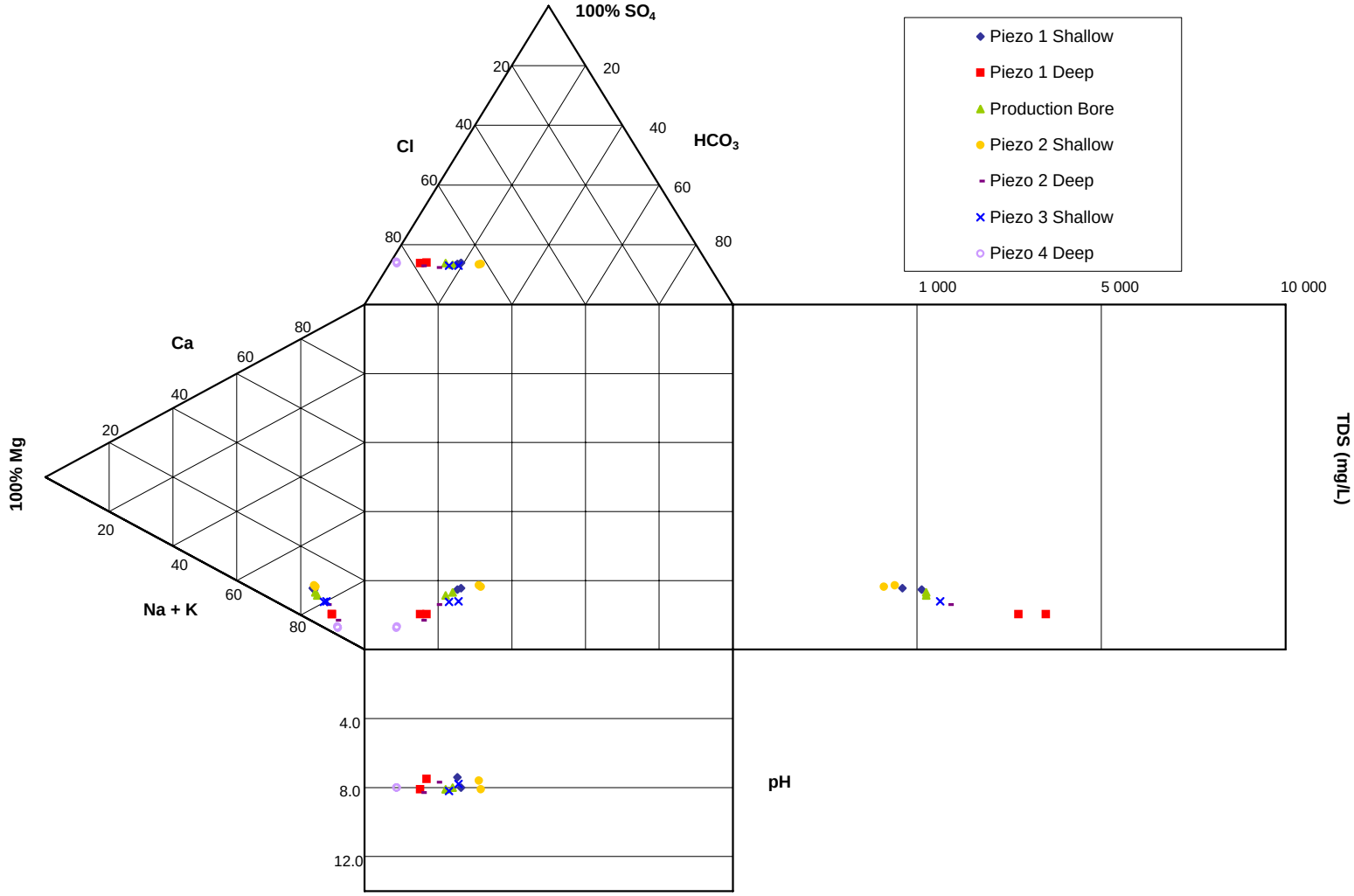
Expanded Durov Diagram

Figure D2

Date:	10/09/08	Project:	Marillana Iron Ore	Description:	Pre Aquifer Test Groundwater Sampling
F:\Jobs\832C\C4 - Reporting\Hydrogeological Report\Appendix D\[D2 Groundwater chemistry analysis Piezo Site 1 June 08.xls]EXPANI		Project No:	832C	Client:	Brockman Resources

HydroCHEM 2.0



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Durov Diagram

Figure D3

Date:	10/09/08	Project:	Marillana Iron Ore Project	Description:	Pre and Post Aquifer Testing GW Results
F:\Jobs\832C\C4 - Reporting\Hydrogeological Report\Appendix D\[D3 Pre and Post Aquifer testing.xls]DUROV		Project No:	832C	Client:	Brockman Resources

HydroCHEM 2.0