

Table 2: Monitoring Well Installation Details and Geology

Monitoring Well Location	Screening interval (m bgl)	Geology
BH102	3.00-6.00	Limestone with layers of calcareous mudstone and siltstone
BH103	3.00-6.00	Limestone with layers of calcareous mudstone and a layer of clay
BH106	4.00-10.00	Limestone with layers of calcareous mudstone
BH107	4.00-10.00	Calcareous mudstone with layers of limestone and clay
BH108	4.00-10.00	Calcareous mudstone with layers of limestone and siltstone

Each test was analysed using the Bower-Rice solution for an unconfined aquifer, partially penetrating well using the AQTESOLV software. The results are summarised below in Table 3 with full detail attached. To account for the uncertainty associated with curve matching to the recovery response, a range of values (minimum and maximum) is presented for each test.

Table 3: Permeability Test Results Summary

Monitoring Well	FH1 (m/d)	RH1 (m/d)	FH2 (m/d)	Geomean (m/d)
BH102	0.08-0.55	0.03-0.58		0.05-0.56
BH103	0.58	0.08-0.52		0.21-0.52
BH106	0.60	0.23	0.55	0.42
BH107	0.19			0.19
BH108	0.10-0.89	0.07-1.30	0.08-1.05	0.09-1.07
Minimum (m/d)				0.03
Maximum (m/d)				1.30
Geomean (m/d)				0.15-0.48

Geometric means of between 0.15 and 0.48 m/d were derived for all boreholes. The boreholes located within the area of rock cutting have a geometric means of 0.19 – 0.44 m/d while the boreholes located within the proposed area of embankment have a geometric means of 0.10 – 0.54 m/d.

The range of permeability results for the limestone dominated strata (BH102, BH103 and BH106) was 0.03 to 0.60 m/d, whilst mudstone dominated strata (BH107, BH108) had a range of permeability of 0.07 to 1.30 m/d.

Permeability test results provide an indication of the strata permeability within a limited zone within proximity to the well only. Permeability within underground strata can vary significantly over relatively short distances, particularly in hard rock aquifers which are often characterised by fracture flow groundwater migration which may not have necessarily been intercepted by monitoring wells.

Attachments

Figures

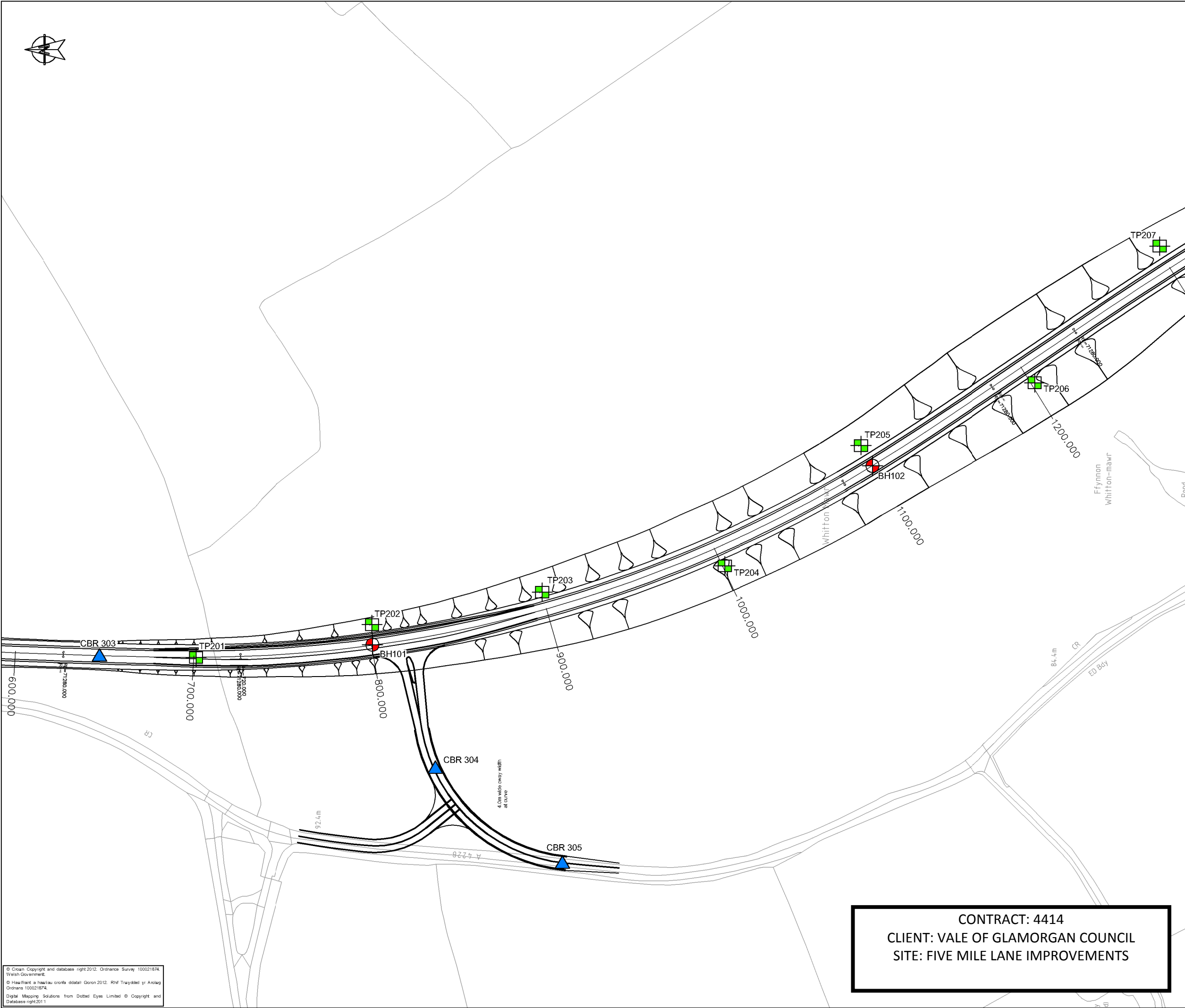
Borehole Logs

Permeability Test Analysis

Drawing Number



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 Login: Johnson, Ben



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 - ALL DIMENSIONS IN METRES UNLESS OTHERWISE STATED.
- KEY - PROPOSED INVESTIGATION**
- TRIAL PIT
 - CBR TEST LOCATION
 - BOREHOLE
 - PHOTOGRAPH NUMBER AND APPROXIMATE ORIENTATION



Rev	Date	Description	By	Chk	App
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FOR INFORMATION



29 Cathedral Road
 Cardiff
 CF11 9HA
 Tel: 44-(0)29-2082-7000
 Fax: 44-(0)29-2082-7001

Client: **WELSH GOVERNMENT**

Site/Project: **FIVE MILE LANE ROAD IMPROVEMENT SCHEME**

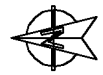
Title: **SCHEME ALIGNMENT AND SITE INVESTIGATION REQUIREMENTS CHAINAGE 600m - 1300m**

Drawn: BMJ	Checked: GJ
Designed: -	Approved:
Date: 27/05/2014	Scale: 1:2000 A3 Sheet: 1 OF 1
Project Number: 3512646D-HHC	Drawing Number: FIGURE 3B
	Revision: -

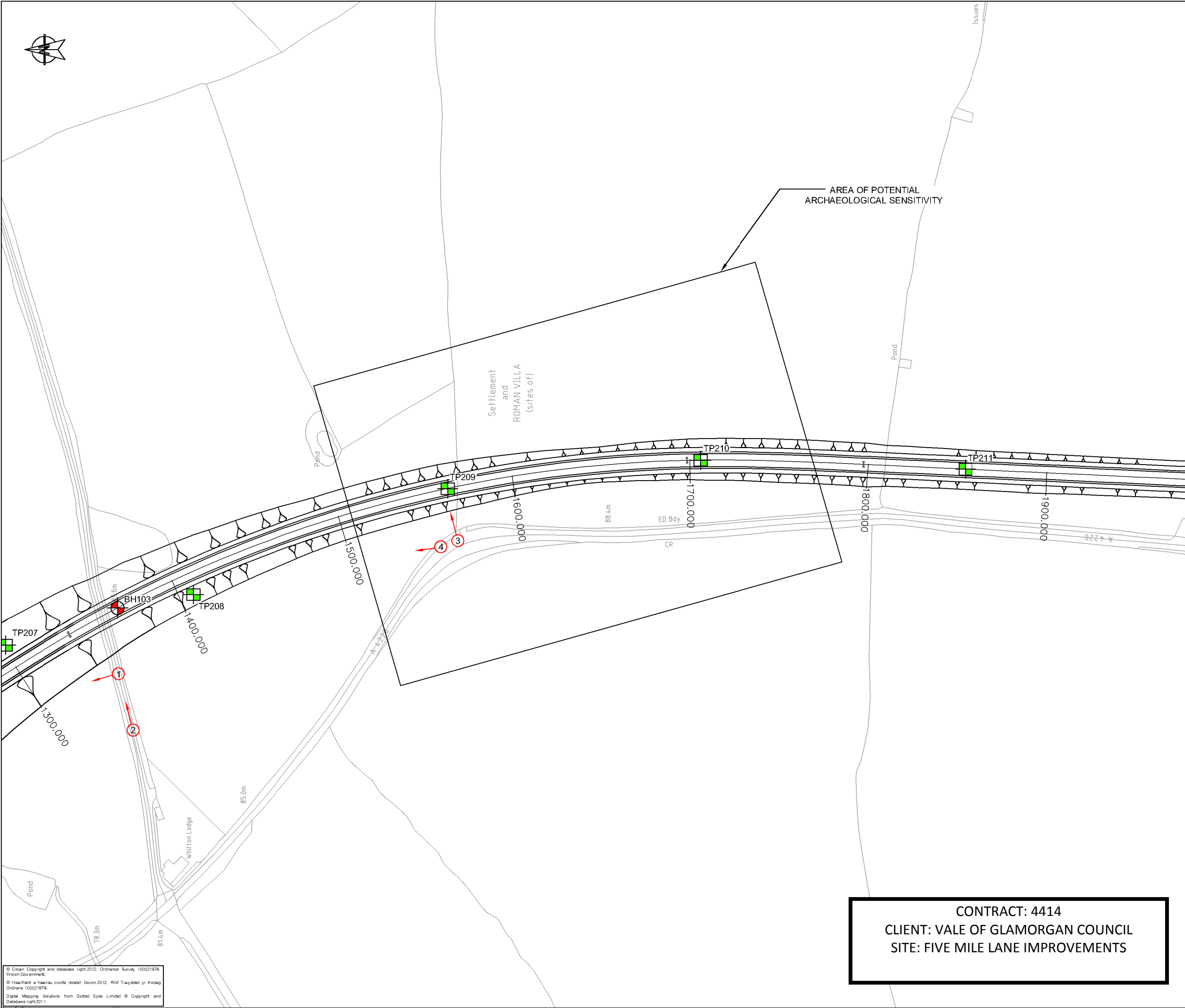
CONTRACT: 4414
CLIENT: VALE OF GLAMORGAN COUNCIL
SITE: FIVE MILE LANE IMPROVEMENTS

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 Date: []



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 Plot Date: 28/05/2014 16:32:16
 File Name: H:\H\H\JOBS\3512646D-HHC Links to St Athan and Cardiff Airport\Acad\Drawings\St Athan\Figure 3 - GI Layout.dwg



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- KEY - PROPOSED INVESTIGATION**
- TRIAL PIT
 - CBR TEST LOCATION
 - BOREHOLE
 - PHOTOGRAPH NUMBER AND APPROXIMATE ORIENTATION



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FOR INFORMATION



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Client: **WELSH GOVERNMENT**

Site/Project: **FIVE MILE LANE ROAD IMPROVEMENT SCHEME**

Title: **SCHEME ALIGNMENT AND SITE INVESTIGATION REQUIREMENTS CHAINAGE 1300m - 1900m**

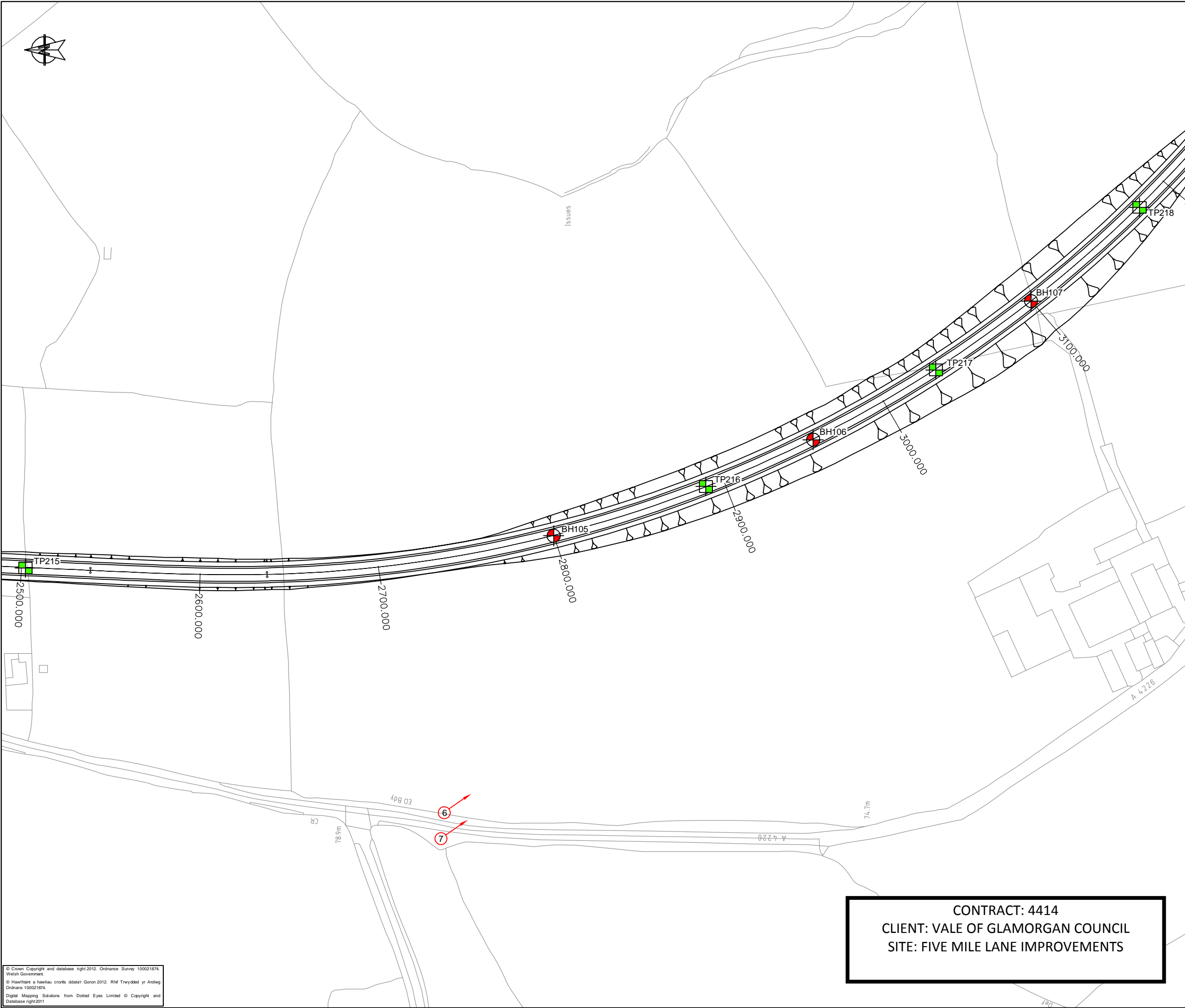
Drawn: BMJ	Checked: GJ		
Designed: -	Approved:		
Date: 27/05/2014	Scale: 1:2000	A3	Sheet: 1 OF 1
Project Number: 3512646D-HHC	Drawing Number: FIGURE 3C	Revision: -	

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- TRIAL PIT
 - CBR TEST LOCATION
 - BOREHOLE
 - PHOTOGRAPH NUMBER AND APPROXIMATE ORIENTATION



Rev	Date	Description	By	Chk	App
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FOR INFORMATION



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Client: **WELSH GOVERNMENT**

Site/Project: **FIVE MILE LANE ROAD IMPROVEMENT SCHEME**

Title: **SCHEME ALIGNMENT AND SITE INVESTIGATION REQUIREMENTS CHAINAGE 2500m - 3200m**

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Designed: -	Approved:
Date: 27/05/2014	Scale: 1:2000 A3 Sheet: 1 OF 1
Project Number:	Drawing Number:

3512646D-HHC **FIGURE 3E** -

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SITE: FIVE MILE LANE IMPROVEMENTS

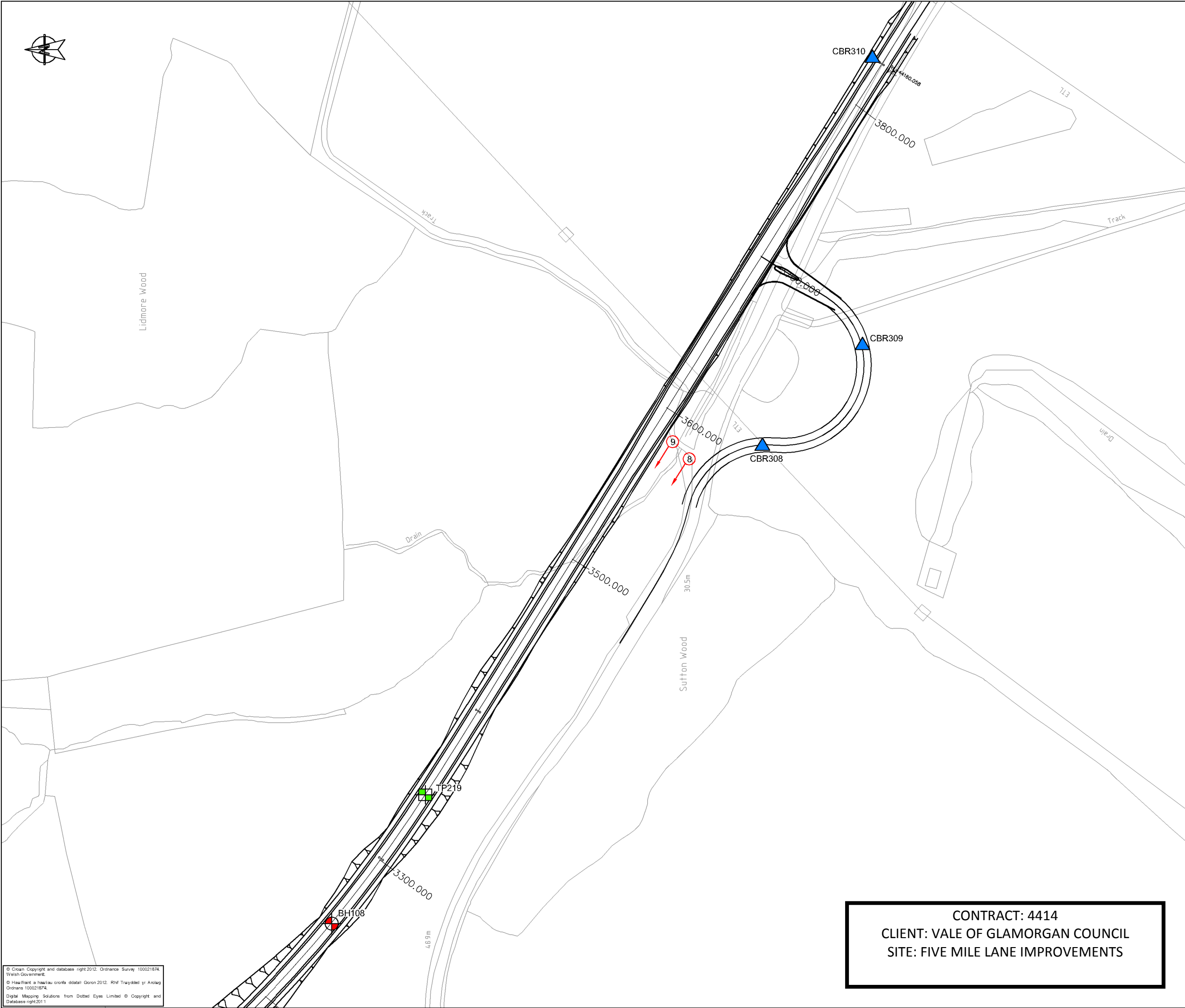
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 Login: Johnson, Ben
 Plot Date: 29/05/2014 09:25:30

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KEY - PROPOSED INVESTIGATION

- TRIAL PIT
- CBR TEST LOCATION
- BOREHOLE
- PHOTOGRAPH NUMBER AND APPROXIMATE ORIENTATION



Rev	Date	Description	By	Chk	App
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FOR INFORMATION



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Client: **WELSH GOVERNMENT**

Site/Project: **FIVE MILE LANE ROAD IMPROVEMENT SCHEME**

Title: **SCHEME ALIGNMENT AND SITE INVESTIGATION REQUIREMENTS CHAINAGE 3200m - 3900m**

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Designed: -	Approved:		
Date: 27/05/2014	Scale: 1:2000	A3	Sheet: 1 OF 1
Project Number: 3512646D-HHC	Drawing Number: FIGURE 3F	Revision: -	

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ROTARY BOREHOLE LOG



Borehole No.

BH102

Sheet 1 of 2

Telephone: 01452 739165 , Fax: 01452 739220 , Email: info@ccground.co.uk

Project Name: Five Mile Lane		Project No: C4414	Co-ords: E 307883 N 171785	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 84.08mAD	Scale 1 : 37.50
Client: Vale of Glamorgan Council			Dates: Start: 17/11/2014 End: 20/11/2014	Logged By PF/RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
1		B	0.30 - 0.50				MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine to medium limestone.	0.10	83.98		
		D	0.30				Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine limestone.	(1.30)			
		ES	0.50				From 0.60m: High cobble content. Cobbles are sub-angular limestone.				
		B	0.70 - 1.10								
2		D	0.70								
		CPT	1.20	C*214			No Recovery.	1.40	82.68		
		C	1.40 - 2.00	C*222		50% 20% 20%		(0.30)			
		CPT	1.40								
3		CS	1.75 - 1.89				Very weak grey mottled black calcareous mudstone COBBLE.	1.70	82.38		
		C	2.00 - 3.00	C**		100% 50% 50%	Strong grey LIMESTONE with subhorizontal very closely spaced undulating rough discontinuities.	1.75	82.33		
		CPT	2.00 - 2.05				1.89-1.90m: Firm orangish brown slightly sandy slightly gravelly clay infill. Gravel is subangular fine limestone.	1.92	82.16		
		C	2.00 - 2.05				Extremely weak orangish brown mottled grey calcareous MUDSTONE with subhorizontal very closely spaced undulating rough discontinuities.	2.00	82.08		
4		CS	2.80 - 3.00				Strong grey LIMESTONE with subhorizontal very closely and closely spaced undulating rough discontinuities with <10mm soft to firm orangish brown silty clay infill.	2.80	81.28		
		C	3.00 - 3.80	C**		94% 56% 56%	2.18-2.22m: Subvertical undulating rough discontinuity.	3.00	81.08		
		CPT	3.00 - 3.04				2.32-2.35m: Non intact, recovered as subangular medium to coarse gravel.	(1.32)			
		CS	3.20 - 3.50				2.35-2.53m: 2 no. very closely spaced undulating rough discontinuities with a little clay smear on discontinuity surfaces.				
5		C	3.80 - 5.00	C**		100% 78% 70%	2.56-2.70m: 2 no. very closely spaced undulating rough discontinuities (one possibly drilling induced).	3.80	79.76		
		CPT	3.80 - 3.85				Weak orangish brown and grey calcareous SILTSTONE with subhorizontal medium spaced undulating rough discontinuities.	4.44	79.64		
		CS	4.44 - 4.61				2.80-3.00m: 2mm wide calcite vein.	(0.61)			
		C	5.00 - 6.00	C**			Strong grey LIMESTONE with subhorizontal very closely and closely spaced undulating rough discontinuities with <10mm soft to firm orangish brown silty clay infill.	5.05	79.03		
6		CPT	5.00 - 5.04				3.10-3.20m: Subvertical undulating rough discontinuity.	5.12	78.96		
		C	5.00 - 6.00				3.57-3.60m: Soft orangish brown mottled grey slightly gravelly clay infill. Gravel is subangular fine limestone.	(0.38)			
		CPT	5.00 - 5.04				3.77-3.80m: Soft orangish brown mottled grey slightly gravelly clay infill. Gravel is subangular fine limestone.				
		CS	5.82 - 6.00				3.87-4.09m: Subvertical 2mm wide calcite vein.	5.50	78.58		
							4.09-4.14m: Stiff orangish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular fine calcareous siltstone.	5.74	78.34		
							4.32-4.40m: 70° undulating rough discontinuity.				
							Weak to medium strong grey locally stained orangish brown calcareous SILTSTONE with horizontal closely spaced planar rough discontinuities.				

REMARKS:

EQUIPMENT: Hand digging tools. Light cable percussion rig. Comacchio MC305 multi-purpose track mounted drilling rig.
 METHOD: Hand dug inspection pit 0.00-1.20m. Cable percussion (150mm) 1.20-1.40m. Waterflush rotary core drilled (116mm) 1.40-6.00m.
 CASING: 150mm diameter to 1.40m. 140mm diameter to 3.00m.
 GROUNDWATER: Groundwater not encountered prior to use of waterflush.
 INSTALLATION: 50mm ID HDPE slotted standpipe: 3.00-6.00m. 50mm ID HDPE plain pipe: 0.00-3.00m Washed gravel response zone: 2.50-6.00m. Bentonite pellet seal: 0.20-2.50m. Concrete and raised cover 0.00-0.20m.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
20/11/2014	6.00	3.00	1.40

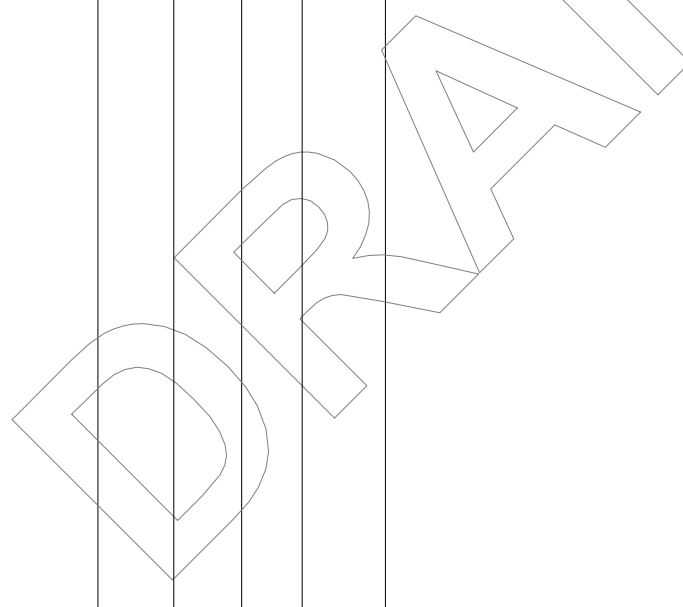


ROTARY BOREHOLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: info@ccground.co.uk

Project Name: Five Mile Lane		Project No: C4414	Co-ords: E 307883 N 171785	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 84.08mAD	Scale 1 : 37.50
Client: Vale of Glamorgan Council			Dates: Start: 17/11/2014 End: 20/11/2014	Logged By PF/RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
		CPT	6.00 - 6.04	C*750				6.00	78.08		
7							4.43-4.44m: Firm orangish brown silty clay infill. Medium strong grey LIMESTONE with subhorizontal closely spaced undulating rough discontinuities with <10mm firm orangish brown silty clay infill. 4.81-4.83m: Firm orangish brown silty clay infill. Very weak orangish brown mottled grey calcareous MUDSTONE with randomly orientated extremely closely spaced undulating rough fractures. Strong grey LIMESTONE with subhorizontal closely spaced undulating rough discontinuities. 5.12-5.22m: Vertical 3mm wide calcite vein. 5.38-5.50m: Discontinuities are randomly orientated extremely to very closely spaced undulating rough. Extremely weak dark grey calcareous MUDSTONE with subhorizontal very closely to closely spaced undulating rough discontinuities. Strong grey LIMESTONE with subhorizontal closely spaced undulating rough discontinuities. 5.81-5.82m: Firm grey clay infill. Borehole completed at 6.00m				
8											
9											
10											
11											
12											
13											



Groundwater:			
Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:			
Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

ROTARY BOREHOLE LOG



Borehole No.

BH103

Sheet 1 of 2

Telephone: 01452 739165 , Fax: 01452 739220 , Email: info@ccground.co.uk

Project Name: Five Mile Lane		Project No: C4414	Co-ords: E 308026 N 171581	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 84.88mAD	Scale 1 : 37.50
Client: Vale of Glamorgan Council			Dates: Start: 17/11/2014 End: 19/11/2014	Logged By PF/RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
1		B	0.30 - 0.60				MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine to medium limestone. Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine limestone. From 0.45m: High cobble content. Cobbles are sub-angular limestone.	0.15	84.73		
		D	0.30								
		B	0.40 - 0.70								
		D	0.40								
		ES	0.50								
		D	0.60								
2		B	0.90 - 1.20					(1.95)			
		CPT	1.20 - 1.70	C 12							
		CPT	1.20 - 1.65								
3		CPT	2.20 - 2.41	C*238			Orangish brown and grey clayey COBBLES. Cobbles are sub-angular limestone.	2.10 (0.30)	82.78		
		C	2.40 - 3.00				Strong grey LIMESTONE with subhorizontal very closely and closely spaced undulating rough discontinuities. 2.40-2.62m: Subvertical undulating rough discontinuity. 2.67-2.70m: Firm orangish brown silty clay infill.	2.40 (0.43)	82.48		
		CS	2.70 - 2.82								
		C	3.00 - 3.30	C**			Weak to medium strong orangish brown mottled grey calcareous MUDSTONE with subhorizontal closely spaced undulating rough discontinuities. 2.86-2.96m: 60° undulating rough discontinuity with a little clay smear on surfaces.	2.83	82.05		
		CPT	3.00 - 3.07								
4		CS	3.15 - 3.26								
		C	3.30 - 3.50				Strong grey LIMESTONE with subhorizontal very closely and closely spaced undulating rough discontinuities. 3.20-3.23m: Firm orangish brown silty clay infill. 3.45-3.50m: Firm orangish brown mottled grey slightly sandy slightly gravelly clay infill. Gravel is subangular fine limestone.	3.05 (0.95)	81.83		
		CS	3.30 - 3.45								
		C	3.50 - 4.00								
		CS	3.58 - 3.80								
		CPT	4.00 - 4.26	C*91			3.50-4.00m: Discontinuities are closely and medium spaced. 3.80-3.82m: Firm orangish brown slightly gravelly clay infill. Gravel is subangular fine limestone.	4.00	80.88		
5		CS	4.27 - 4.45				Stiff grey mottled orangish brown slightly sandy slightly gravel CLAY. Gravel is subangular fine calcareous mudstone.	4.27	80.61		
		C	5.00 - 6.00	C*107			Strong grey LIMESTONE with subhorizontal very closely spaced undulating rough discontinuities. Frequent randomly orientated 2-5mm thick calcite veins and occasional 20mm diameter calcite inclusions. 4.44-4.65m: 4 no. 60° subparallel undulating rough discontinuities with <10mm firm orangish brown slightly sandy clay infill. 4.70-4.78m: Firm orangish brown slightly sandy slightly gravelly clay infill. Gravel is subangular fine limestone.	(1.33)			
		CPT	5.00 - 5.26								
		CS	5.82 - 6.00				5.00-5.15m: Firm orangish brown mottled grey slightly sandy slightly gravelly clay. Gravel is subangular fine limestone.	5.60	79.28		
6								5.82	79.06		

REMARKS:

EQUIPMENT: Hand digging tools. Light cable percussion rig. Comacchio MC305 multi-purpose track mounted drilling rig.
 METHOD: Hand dug inspection pit 0.00-1.20m. Cable percussion (150mm) 1.20-2.40m. Waterflush rotary core drilled (116mm) 1.40-6.00m.
 CASING: 150mm diameter to 1.40m. 140mm diameter to 3.00m.
 GROUNDWATER: Groundwater not encountered prior to use of waterflush.
 INSTALLATION: 50mm ID HDPE slotted standpipe: 3.00-6.00m. 50mm ID HDPE plain pipe: 0.00-3.00m Washed gravel response zone: 2.50-6.00m. Bentonite pellet seal: 0.20-2.50m. Concrete and raised cover 0.00-0.20m.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
19/11/2014	6.00	3.30	1.60



ROTARY BOREHOLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: info@ccground.co.uk

Project Name: Five Mile Lane		Project No: C4414	Co-ords: E 308026 N 171581	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 84.88mAD	Scale 1 : 37.50
Client: Vale of Glamorgan Council			Dates: Start: 17/11/2014 End: 19/11/2014	Logged By PF/RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
7		CPT	6.00 - 6.08	C**			5.15-5.60m: Discontinuities are closely and medium spaced. 5.16-5.40m: Subvertical to 80° undulating rough discontinuity. 5.43-5.50m: Weak thinly and thickly laminated orangish brown and grey calcareous mudstone. 5.40-5.60m: Discontinuities are closely spaced. 3-10mm wide calcite vein. Extremely weak dark grey calcareous MUDSTONE locally tending to very stiff to hard clay, with randomly orientated extremely closely spaced undulating rough discontinuities. Strong grey LIMESTONE with subhorizontal to 10° undulating rough discontinuities. Borehole completed at 6.00m	6.00	78.88		
8											
9											
10											
11											
12											
13											

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
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ROTARY BOREHOLE LOG



Borehole No.

BH106

Sheet 1 of 3

Telephone: 01452 739165 , Fax: 01452 739220 , Email: info@ccground.co.uk

Project Name: Five Mile Lane		Project No: C4414	Co-ords: E 308145 N 169996	Hole Type DS+RC
Location: Five Mile Lane, Cardiff			Level: 65.40mAD	Scale 1 : 37.50
Client: Vale of Glamorgan Council			Dates: Start: 27/11/2014 End: 01/12/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
1		B	0.30				Very soft greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is subangular fine to medium limestone. (TOPSOIL)	0.20	65.20		
		ES	0.50				Soft orangish brown mottled grey slightly sandy gravelly CLAY with a low cobble content. Gravel is angular to subangular fine to coarse limestone. Cobbles are limestone.	(0.30)	64.90		
1		B	0.50 - 1.50			71% 2% 0%	No Recovery.	0.80	64.60		
		C					Firm orangish brown mottled light grey silty CLAY.				
2		C	1.50 - 2.50	C*208		100% 45% 10%	0.90-0.95m: Strong grey Limestone. 0.96-1.02m: Strong grey Limestone. 1.07-1.12m: Strong grey Limestone. 1.20-1.25m: Strong grey Limestone. 1.35-1.50m: Stiff.	(0.90)			
		CPT	1.50 - 1.61								
2		CS	1.70 - 1.78				Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough.	1.70	63.70		
		C					1.85-2.15m: Locally with soft orangish brown slightly gravelly clay infill. Gravel is subangular fine to medium limestone.	(0.68)			
3		C	2.50 - 3.50	C*333		98% 48% 15%	1.90-1.96m: Subvertical undulating rough discontinuity. 2.15-2.26m: Subvertical undulating rough orangish brown stained discontinuity.	2.38	63.02		
		CPT	2.50 - 2.65				2.26-2.33m: Extremely weak to very weak dark grey calcareous mudstone.	2.46	62.94		
3		C					Extremely weak to very weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal extremely closely to closely spaced undulating rough.	2.60	62.80		
		CS	3.35 - 3.50				Weak orangish brown calcareous SILTSTONE. Discontinuities are subhorizontal very closely spaced undulating rough.	(0.47)			
4		C	3.50 - 4.50	C*429		100% 70% 31%	2.50-2.60m: Non intact.	3.07	62.33		
		CPT	3.50 - 3.56				Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough.	3.22	62.18		
4		CS	3.60 - 3.79				2.74-2.87m: Subvertical undulating rough orangish brown stained discontinuity.	(0.70)			
		C					2.87m: Very stiff friable dark grey calcareous clay.				
5		C	4.50 - 6.00	C*429		100% 62% 58%	2.98-3.07m: Subvertical undulating rough orangish brown stained discontinuity.	3.92	61.48		
		CPT	4.50 - 4.56				Medium strong dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough.				
5		C					3.15m: Soft to firm dark grey calcareous clay with occasional fine gravel sized mudstone lithorelicts.	(2.18)			
		CS	5.16 - 5.34				Strong grey LIMESTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough.				
6		C					3.22-3.29m: Subvertical undulating rough orangish brown stained discontinuity.				
		CS	5.85 - 6.00				3.50-3.60m: Stiff thinly laminated dark grey calcareous clay.				
							3.60-4.30m: Subvertical undulating rough orangish brown stained discontinuity.				
							3.81m: Medium strong dark grey calcareous mudstone.				
							4.0m to 4.5m: Very weak dark grey calcareous mudstone.				

REMARKS:

EQUIPMENT: Hand digging tools. Comacchio MC305 multi-purpose track mounted drilling rig.
 METHOD: Hand dug inspection pit 0.00-0.50m. Waterflush rotary core drilled (116mm) 0.50-10.00m.
 CASING: 140mm diameter to 1.50m.
 GROUNDWATER: Groundwater not encountered prior to use of waterflush.
 INSTALLATION: 50mm ID HDPE slotted standpipe: 4.00-10.00m. 50mm ID HDPE plain pipe: 0.00-4.00m Washed gravel response zone: 3.50-10.00m. Bentonite pellet seal: 0.20-3.50m. Concrete and raised cover 0.00-0.20m.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
27/11/2014	0.00		
27/11/2014	0.50	Nil	Dry
28/11/2014	0.50	Nil	Dry



ROTARY BOREHOLE LOG

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Project Name: Five Mile Lane		Project No: C4414	Co-ords: E 308145 N 169996	Hole Type DS+RC
Location: Five Mile Lane, Cardiff			Level: 65.40mAD	Scale 1 : 37.50
Client: Vale of Glamorgan Council			Dates: Start: 27/11/2014 End: 01/12/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
7		C	6.00 - 7.50	C*429	100% 67% 33%		4.30-4.36m: Firm thinly laminated dark grey calcareous clay.	6.10	59.30		
		CPT	6.00 - 6.06				4.50-4.70m: Non intact.	(0.63)	58.67		
		CS	6.23 - 6.32				4.70-5.13m: Subvertical undulating rough orangish brown stained discontinuity.				
8					100% 53% 28%		5.43m: Stiff thinly laminated dark grey calcareous clay.	6.73	58.67		
		CS	7.25 - 7.39				5.65-5.85m: Subvertical undulating rough orangish brown stained discontinuity.				
		C	7.50 - 9.00				5.81-5.88m: Medium strong dark grey calcareous mudstone.				
9					97% 49% 18%		5.85-6.00m: Subvertical undulating rough discontinuity.	(1.65)	57.02		
		CS	8.90 - 9.00				Strong grey LIMESTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough. (continued from previous sheet)				
		C	9.00 - 10.00	C*429			Weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely to closely spaced undulating and planar smooth.				
10					97% 49% 18%		6.20-6.23m: Soft dark grey slightly gravelly clay infill. Gravel is subangular fine mudstone.	8.38	57.02		
		CPT	9.00 - 9.07				6.87-6.90m: Extremely weak dark grey calcareous mudstone.				
		CS	9.22 - 9.37				7.06-7.10m: Extremely weak orangish brown siltstone. Discontinuities are extremely closely spaced undulating rough.				
11					97% 49% 18%		6.53-6.66m: Hard dark grey calcareous clay.	8.80	56.60		
		C	9.00 - 10.00	C*429			Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough.				
		CPT	9.00 - 9.07				7.10-7.45m: Discontinuities are very closely to closely spaced.				
12					97% 49% 18%		7.14-7.24m: Subvertical undulating rough orangish brown stained discontinuity.	(1.20)	55.40		
		C	9.00 - 10.00	C*429			7.45-7.50m: Very weak dark grey calcareous mudstone.				
		CS	9.22 - 9.37				7.55-7.58m: Subvertical undulating rough discontinuity.				
13					97% 49% 18%		7.58-7.70m: Limestone thinly interbedded with medium strong dark grey calcareous mudstone.	10.00	55.40		
		CPT	10.00 - 10.06	C*500			4.70-5.43m: Limestone is locally medium strong. Discontinuities are subhorizontal closely to medium spaced planar and undulating rough.				
		CS	9.22 - 9.37				7.72-7.84m: 70° undulating rough orangish brown stained discontinuity.				
14					97% 49% 18%		7.84-7.97m: Very weak dark grey calcareous mudstone.	(0.42)	56.60		
		C	9.00 - 10.00	C*429			7.84-7.97m: Very weak dark grey calcareous mudstone.				
		CS	9.22 - 9.37				8.15-8.18m: Subhorizontal-60° undulating rough discontinuity.				
15					97% 49% 18%		8.18-8.24m: Stained orangish brown.	8.80	56.60		
		C	9.00 - 10.00	C*429			Medium strong dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough.				
		CS	9.22 - 9.37				8.50-8.54m: Strong grey limestone.				
16					97% 49% 18%		8.62-8.65m: Strong grey limestone.	(1.20)	55.40		
		C	9.00 - 10.00	C*429			8.68-8.80m: 2 no. subvertical undulating rough discontinuities.				
		CS	9.22 - 9.37				Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough.				
17					97% 49% 18%		8.80-9.00m: Medium strong.	(0.42)	56.60		
		C	9.00 - 10.00	C*429			9.00-9.20m: Weak dark grey calcareous mudstone. Discontinuities are extremely closely to closely spaced planar and undulating smooth.				
		CS	9.22 - 9.37				9.05-9.20m: Subvertical-80° undulating smooth discontinuity.				
18					97% 49% 18%		9.22-9.37m: Subvertical closely spaced incipient discontinuity.	8.80	56.60		
		C	9.00 - 10.00	C*429			9.43-9.60m: Weak to medium strong dark grey calcareous mudstone. Discontinuities are subhorizontal very closely to closely spaced undulating rough.				
		CS	9.22 - 9.37				9.51-9.60m: Subvertical undulating rough discontinuity.				
19					97% 49% 18%		9.60-9.69m: 2 no. subparallel subvertical-70° undulating rough discontinuities.	(1.20)	55.40		
		C	9.00 - 10.00	C*429			9.69-9.75m: Weak dark grey calcareous mudstone.				
		CS	9.22 - 9.37				9.75-9.95m: 3 no. subvertical-70° undulating rough				

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
28/11/2014	9.00	Nil	1.20
01/12/2014	9.00	Nil	5.10
01/12/2014	10.00	1.50	2.20

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
28/11/2014	9.00	Nil	1.20
01/12/2014	9.00	Nil	5.10
01/12/2014	10.00	1.50	2.20



ROTARY BOREHOLE LOG

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Project Name: Five Mile Lane	Project No: C4414	Co-ords: E 308145 N 169996	Hole Type DS+RC
Location: Five Mile Lane, Cardiff		Level: 65.40mAD	Scale 1 : 37.50
Client: Vale of Glamorgan Council		Dates: Start: 27/11/2014 End: 01/12/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
14							discontinuities. 9.95-10.00m: Medium strong dark grey calcareous mudstone. Borehole completed at 10.00m				
15											
16											
17											
18											
19											
20											

DRAFT

Groundwater:

Date Strike Depth (m) Casing Depth (m) Depth After Observation (m)

Hole Progress:

Date Hole Depth (m) Casing Depth (m) Water Depth (m)

ROTARY BOREHOLE LOG



Borehole No.

BH107

Sheet 1 of 2

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Project Name: Five Mile Lane		Project No: C4414	Co-ords: E 308240 N 169874	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 57.33mAD	Scale 1 : 37.50
Client: Vale of Glamorgan Council			Dates: Start: 19/11/2014 End: 25/11/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
1	1.1	B	0.30 - 0.60				Soft greyish brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)	0.20	57.13	[Symbol]	
		D	0.50				Very soft to soft orangish brown mottled grey slightly sandy slightly gravelly silty CLAY with occasional rootlets. Gravel is subangular fine mudstone.				
		B	0.80 - 0.90				0.80-2.20m: Gravel is angular to subangular fine to coarse limestone. High cobble content. Cobbles are limestone.				
		D	0.80								
2		B	1.20 - 1.70	C 34			(2.00)	55.13	[Symbol]		
		CPT	1.20 - 1.65								
3		B	2.20 - 2.70	C 46			Firm orangish brown and grey slightly sandy gravelly CLAY with a high cobble content. Gravel is angular to subangular fine to coarse limestone. Cobbles are limestone.	2.20	54.53	[Symbol]	
		CPT	2.20 - 2.65								
3		C	2.90 - 3.20	C*429		0%	Dark grey LIMESTONE, recovered as very clayey gravel and cobbles. Gravel is angular to subangular medium to coarse limestone. Cobbles are limestone.	2.80	54.43	[Symbol]	
		CPT	2.90			0%					
4		C	3.20 - 3.50			0%	No recovery.	(0.60)	53.83	[Symbol]	
		C	3.50 - 4.00			100%	Medium strong dark grey calcareous MUDSTONE. Discontinuities are subhorizontal-20° closely spaced undulating rough.	3.50			
4		CS	3.65 - 3.75			20%		(0.40)	53.43	[Symbol]	
		C	4.00 - 4.80	C*100		100%	3.50-3.60m: Drilling disturbed, recovered as very soft dark grey gravelly clay. Gravel is angular to subangular fine to coarse calcareous mudstone.	3.90			
5		CPT	4.00 - 4.30			20%	3.65-3.75m: Subvertical undulating rough discontinuity.	4.10	53.23	[Symbol]	
		CS	4.17 - 4.25			20%	Firm grey mottled orangish brown silty calcareous CLAY. Hard indistinctly thinly laminated dark grey calcareous CLAY.	4.17			
5		C	4.80 - 6.10	C*273		94%	Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough.	(0.55)	52.48	[Symbol]	
		CPT	4.80 - 4.97			69%	Firm indistinctly thinly laminated dark grey calcareous CLAY with occasional subangular fine gravel sized mudstone lithorelicts.	4.85			
6		CS	5.17 - 5.33			45%	Extremely weak thinly laminated dark grey MUDSTONE. Discontinuities are subhorizontal and randomly orientated extremely closely spaced undulating rough.	5.17	52.16	[Symbol]	
		C					Strong grey LIMESTONE. Discontinuities are subhorizontal very closely and closely spaced undulating rough.	(0.55)			
6							5.17-5.33m: Subvertical undulating rough discontinuity.	5.72	51.61	[Symbol]	
							5.33-5.48m: 20°-subvertical-subhorizontal curved	(0.31)			

REMARKS:

EQUIPMENT: Hand digging tools. Light cable percussion rig. Comacchio MC305 multi-purpose track mounted drilling rig.
 METHOD: Hand dug inspection pit 0.00-0.90m. Cable percussion (150mm) 1.20-2.90m. Waterflush rotary core drilled (116mm) 2.90-10.00m.
 CASING: 150mm diameter to 2.80m. 140mm diameter to 4.50m.
 GROUNDWATER: Seepage at 0.60m. No rise recorded.
 INSTALLATION: 50mm ID HDPE slotted standpipe: 4.00-10.00m. 50mm ID HDPE plain pipe: 0.00-4.00m Washed gravel response zone: 3.50-10.00m. Bentonite pellet seal: 0.20-3.50m. Concrete and raised cover 0.00-0.20m.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
19/11/14	0.60	Nil	0.60

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
19/11/2014	2.90	2.80	2.60
21/11/2014	2.90	Nil	2.60
21/11/2014	4.00	2.90	1.20
24/11/2014	4.00	2.90	2.60

ROTARY BOREHOLE LOG



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Project Name: Five Mile Lane		Project No: C4414	Co-ords: E 308240 N 169874	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 57.33mAD	Scale 1 : 37.50
Client: Vale of Glamorgan Council			Dates: Start: 19/11/2014 End: 25/11/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend	
		No/Type	Depth (m)	Result								
7		CS	6.03 - 6.10	C*600		100%		undulating rough discontinuity, forming boundary with extremely weak orangish brown mudstone. 5.48-5.62m: Weak dark grey calcareous mudstone. 5.62-5.71m: Subvertical undulating rough discontinuity. Extremely weak thinly laminated dark grey calcareous MUDSTONE. Discontinuities are subhorizontal extremely closely spaced undulating rough. (continued from previous sheet)	6.03	51.30		
		C	6.10 - 7.10						68%	6.10		51.23
		CPT	6.10 - 6.21						19%	6.35		50.98
8		CS	6.84 - 6.95	C*426		100%		Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough. Extremely weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely spaced undulating rough.	(1.15)			
		C	7.10 - 7.50						63%			
		CPT	7.10 - 7.22						63%			
9		CS	7.38 - 7.50	C*600		86%		Strong grey LIMESTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough. 6.40-6.57m: Subvertical undulating rough orangish brown stained discontinuity. 6.64-6.69m: Medium strong grey calcareous mudstone. 6.75-7.04m: Weak dark grey calcareous mudstone. 7.10-7.18m: Extremely weak dark grey calcareous mudstone. Discontinuities are randomly orientated extremely closely spaced undulating rough. 7.18-7.26m: Subvertical undulating rough discontinuity. 7.26-7.38m: Extremely weak dark grey calcareous mudstone. Discontinuities are subhorizontal extremely closely to very closely spaced undulating rough.	7.50	49.83		
		C	7.50 - 8.50						51%			
		CPT	8.50 - 8.61						10%			
10		CS	8.41 - 8.50	C*500		91%		Weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal extremely to very closely spaced undulating rough. Strong grey LIMESTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough. 8.03-8.14m: Very weak dark grey calcareous mudstone. Discontinuities are randomly orientated extremely closely spaced undulating rough. 8.14-8.22m: Subvertical undulating rough orangish brown stained discontinuity.	8.22	49.11		
		C	8.50 - 8.90						86%			
		CPT	8.50 - 8.61						0%			
11		CS	8.90 - 10.00	C*500		91%		Weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough. 8.41-8.50m: Strong grey limestone. 8.72-8.73m: Soft orangish brown clay infill. 8.80-8.90m: Medium strong. 8.90-9.07m: Non intact, recovered as angular to subangular fine to coarse gravel. 9.23-9.25m: Soft orangish brown clay infill. 9.50-9.60m: Medium strong. 9.66-9.77m: Subvertical undulating rough orangish brown stained discontinuity. 9.80-9.90m: Subvertical undulating rough orangish brown stained discontinuity. 9.90-9.92m: Soft orangish brown clay infill.	(1.78)			
		C	9.25 - 9.39						86%			
		CPT	9.25 - 9.39						51%			
12		CS	9.92 - 10.00	C*500		91%		Weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough. 8.41-8.50m: Strong grey limestone. 8.72-8.73m: Soft orangish brown clay infill. 8.80-8.90m: Medium strong. 8.90-9.07m: Non intact, recovered as angular to subangular fine to coarse gravel. 9.23-9.25m: Soft orangish brown clay infill. 9.50-9.60m: Medium strong. 9.66-9.77m: Subvertical undulating rough orangish brown stained discontinuity. 9.80-9.90m: Subvertical undulating rough orangish brown stained discontinuity. 9.90-9.92m: Soft orangish brown clay infill.	10.00	47.33		
		C	10.00 - 10.18						86%			
		CPT	10.00 - 10.18						51%			
13												

Groundwater:				Hole Progress:			
Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)	Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
				24/11/2014	8.90	4.50	7.00
				25/11/2014	8.90	4.50	7.90
				25/11/2014	10.00	4.50	8.10

CC ROTARY LOG C4414.GPJ GINT STD AGS 3.1.GDT 12/1/15



ROTARY BOREHOLE LOG

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Project Name: Five Mile Lane		Project No: C4414	Co-ords: E 308330 N 169776	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 44.21mAD	Scale 1 : 37.50
Client: Vale of Glamorgan Council			Dates: Start: 18/11/2014 End: 26/11/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
1		B D ES	0.30 - 0.70 0.40 0.50				Soft greyish brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)	0.20	44.01		
							Soft orangish brown mottled grey silty CLAY with occasional rootlets.	(0.40)			
		B D	0.80 - 1.20 0.80				Firm orangish brown and grey slightly sandy slightly gravelly CLAY with a low cobble content. Gravel is angular to subangular fine to coarse limestone. Cobbles are limestone.	0.60	43.61		
2		B SPT	1.20 - 1.70 1.20 - 1.65	S 18				(2.20)			
		B SPT	2.20 - 2.70 2.20 - 2.65	C 30			2.20-2.80m: High cobble content. Cobbles are limestone.				
3		B SPT	2.80 - 3.20 2.80 - 3.25	S*53			Extremely weak to very weak grey calcareous MUDSTONE, recovered as slightly sandy clayey angular to subangular fine to coarse gravel.	2.80	41.41		
		B	3.20 - 3.70					(0.90)			
4		SPT C	3.70 3.80 - 5.00	S*273	100% 32% 0%		Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough.	3.70	40.51		
							Extremely weak to very weak orangish brown SILTSTONE. Discontinuities are subhorizontal and randomly orientated extremely closely spaced undulating rough with a little clay smear on discontinuity surfaces. 4.08-4.66m: Grey. 4.38-4.52m: Subvertical undulating smooth discontinuity. 4.44-4.49m: Strong grey limestone.	3.88	40.33		
5		CS	4.66 - 4.75					4.66	39.55		
		C CPT	5.00 - 6.20 5.00 - 5.14	C*273	92% 22% 0%		Strong grey LIMESTONE. Discontinuities are subhorizontal extremely closely spaced undulating smooth. 4.66-4.88m: Subvertical undulating rough discontinuity. 4.76-4.79m: Discontinuity infilled with soft clayey gravel. Gravel is subangular fine to medium limestone.	4.88	39.33		
		CS	5.44 - 5.49				Extremely weak grey calcareous MUDSTONE. Discontinuities are randomly orientated extremely closely spaced undulating rough. 5.00-5.25m: Drilling disturbed, recovered as soft slightly gravelly clay. Gravel is angular to subangular fine to medium mudstone.	5.25	38.96		
6								(0.95)			

REMARKS:

EQUIPMENT: Hand digging tools. Light cable percussion rig. Comacchio MC305 multi-purpose track mounted drilling rig.
 METHOD: Hand dug inspection pit 0.00-1.20m. Cable percussion (150mm) 1.20-3.70m. Waterflush rotary core drilled (116mm) 3.70-10.00m.
 CASING: 150mm diameter to 3.00m. 140mm diameter to m.
 GROUNDWATER: Encountered at 3.00m. Rising to 2.45m following twenty minute monitoring period.
 INSTALLATION: 50mm ID HDPE slotted standpipe: 4.00-10.00m. 50mm ID HDPE plain pipe: 0.00-4.00m Washed gravel response zone: 3.50-10.00m. Bentonite pellet seal: 0.20-3.50m. Concrete and raised cover 0.00-0.20m.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
18/11/14	3.00	2.80	2.45

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
18/11/2014	3.20	3.00	2.60
19/11/2014	3.20	3.00	2.40
19/11/2014	3.70	3.00	2.40
25/11/2014	3.80	Nil	0.70



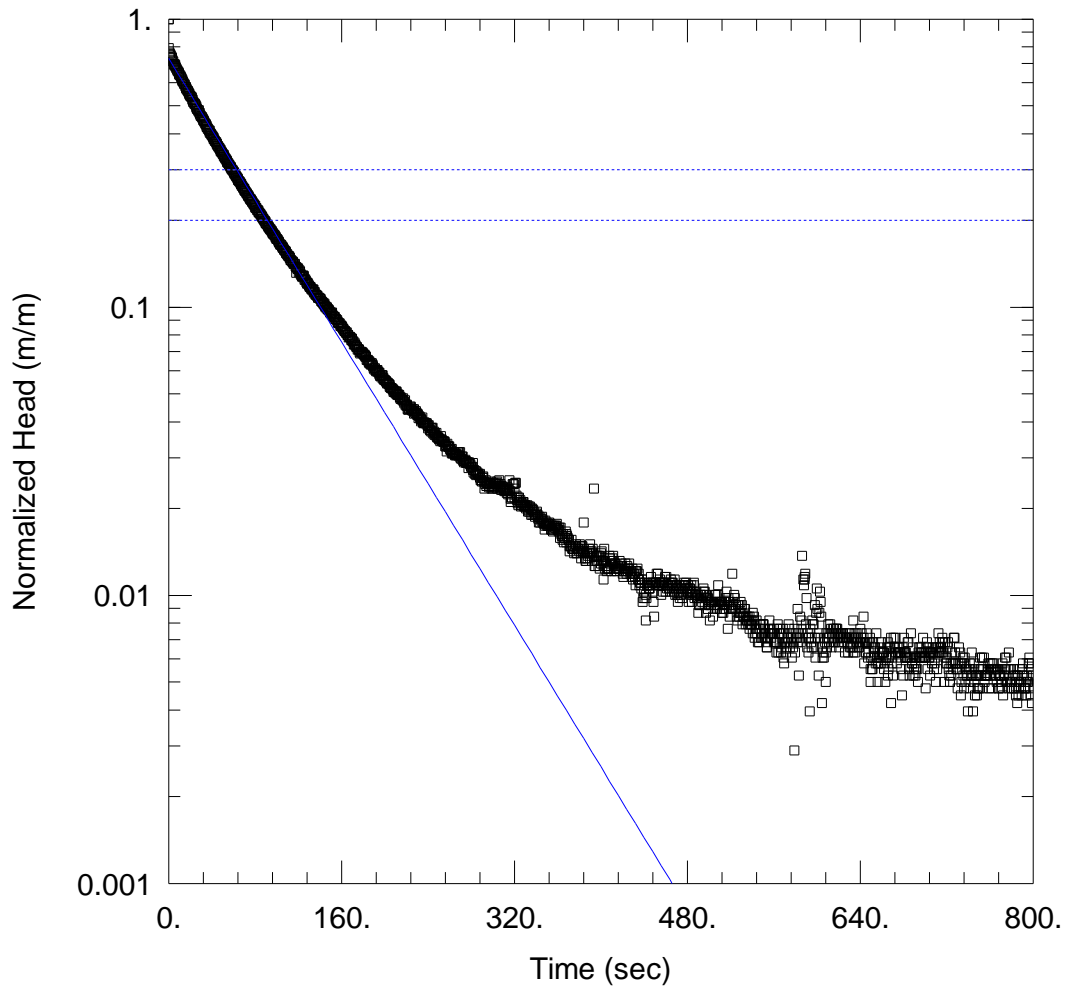
ROTARY BOREHOLE LOG

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Project Name: Five Mile Lane		Project No: C4414	Co-ords: E 308330 N 169776	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 44.21mAD	Scale 1 : 37.50
Client: Vale of Glamorgan Council			Dates: Start: 18/11/2014 End: 26/11/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
7		C CPT	6.20 - 7.50 6.20 - 6.41	C*150	C	77% 32% 18%	[Diagram showing casing and core run]	Very weak to weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal extremely closely to closely spaced undulating rough. Locally planar smooth. With orangish brown staining on discontinuity surfaces. <i>(continued from previous sheet)</i> 5.32-5.38m: Strong dark grey mudstone. 5.64-5.68m: 30° undulating rough discontinuity. 5.80-5.88m: Extremely weak, locally tending to clayey gravel. 6.00-6.04m: Extremely weak, locally tending to clayey gravel. 6.05-6.20m: 45° undulating rough discontinuity. 6.11-6.20m: Extremely weak, locally tending to clayey gravel.	6.20	38.01	[Legend]
		CS C CPT	7.39 - 7.50 7.50 - 8.50 7.50 - 7.70	C*158	C	100% 42% 15%					
8		CS C CPT	8.35 - 8.50 8.50 - 9.40 8.69 - 8.77	C*300	C	83% 37% 11%	[Diagram showing casing and core run]	Very weak to weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough. 6.20-6.65m: Drilling disturbed, recovered as subangular medium to coarse gravel. 6.75-6.83m: Strong grey limestone. 6.83-7.10m: Discontinuities are subhorizontal extremely to very closely spaced undulating rough. 6.95-7.05m: Soft gravelly clay infill. Gravel is subangular fine mudstone. 7.02-7.09m: 2 no. intersecting 45° and 55° undulating rough discontinuities. 7.13-7.30m: Subvertical-80° undulating rough discontinuity. 7.25-7.50m: Medium strong. 7.38-7.39m: Discontinuity infilled with soft gravelly clay. Gravel is subangular fine mudstone. 7.50-7.56m: Strong. 7.77-7.99m: Non intact, recovered as clayey subangular fine to coarse gravel. 8.06-8.13m: 2 no. parallel 60° very closely spaced undulating smooth discontinuities. 8.13-8.23m: Non intact, recovered as clayey subangular fine to coarse gravel. 8.30-8.38m: Non intact, recovered as clayey subangular fine to coarse gravel. 8.38-8.50m: Medium strong. 8.50-8.60m: Drilling disturbed, recovered as subangular medium to coarse gravel. 8.83-8.87m: Strong grey limestone. 8.98-9.02m: Discontinuity infilled with soft gravelly clay. Gravel is subangular fine mudstone. 9.70-9.73m: Discontinuity infilled with soft gravelly clay. Gravel is subangular fine mudstone. 9.78-9.88m: Subvertical undulating rough discontinuity.	(3.80)		[Legend]
		CS C CPT CS	9.88 - 9.97 10.00 - 10.13	C*333	C	100% 50% 0%					
9		C	9.40 - 10.00		C						
10		CS CPT	9.88 - 9.97 10.00 - 10.13	C*333	C				10.00	34.21	
11											
12											
13											

Groundwater:				Hole Progress:			
Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)	Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
				25/11/2014	7.50	3.80	2.40
				26/11/2014	7.50	3.80	2.60
				26/11/2014	10.00	4.50	2.60



FALLING HEAD TEST 1 (MAXIMUM RESULT)

Data Set: A:\FML\BH102_FH1.aqt
 Date: 03/17/15

Time: 14:51:45

PROJECT INFORMATION

Company: Parsons Brinckerhoff Limited
 Client: Vale of Glamorgan
 Project: 3512646D-HHC
 Location: Five Mile Lane, Cardiff
 Test Well: BH102
 Test Date: 27/02/2015

AQUIFER DATA

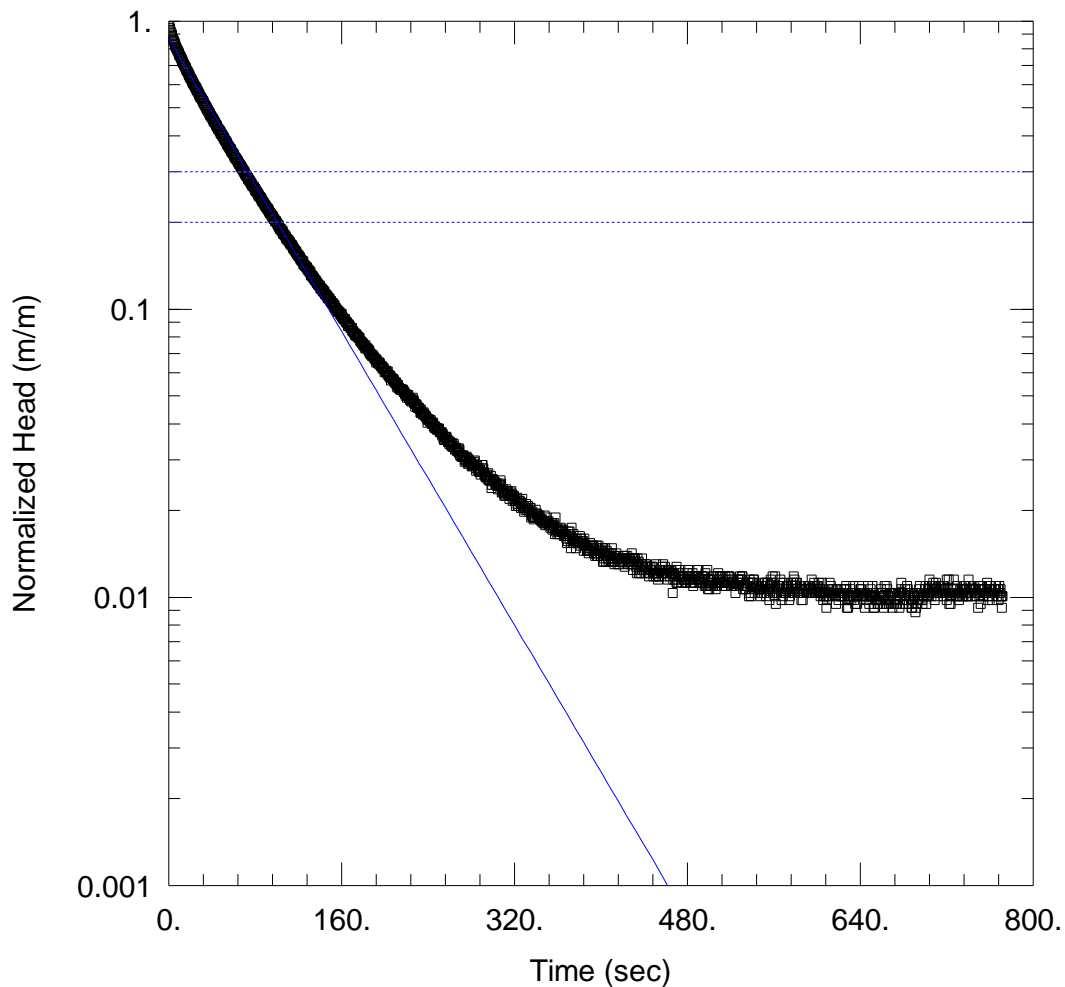
Saturated Thickness: 30. m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH102)

Initial Displacement: 0.3795 m Static Water Column Height: 5.565 m
 Total Well Penetration Depth: 5.565 m Screen Length: 3.21 m
 Casing Radius: 0.025 m Well Radius: 0.025 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 0.5554 m/day y0 = 0.2769 m



RISING HEAD TEST 1(MAXIMUM RESULT)

Data Set: A:\FML\BH102_RH1.aqt

Date: 03/17/15

Time: 17:17:46

PROJECT INFORMATION

Company: Parsons Brinckerhoff Limited

Client: Vale of Glamorgan

Project: 3512646D-HHC

Location: Five Mile Lane, Cardiff

Test Well: BH102

Test Date: 27/02/2015

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH102)

Initial Displacement: 0.338 m

Static Water Column Height: 5.565 m

Total Well Penetration Depth: 5.565 m

Screen Length: 3.21 m

Casing Radius: 0.025 m

Well Radius: 0.025 m

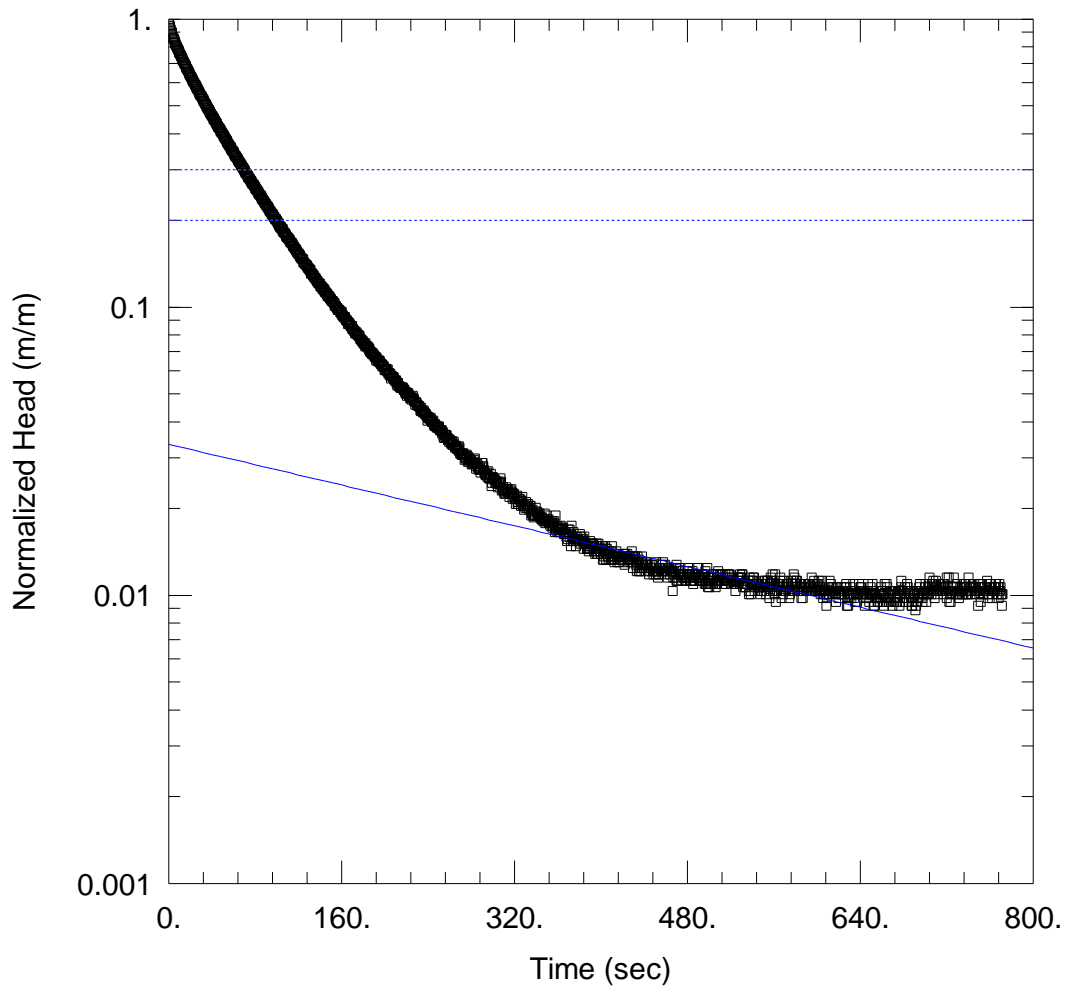
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.5753 m/day

y0 = 0.2954 m



RISING HEAD TEST 1(MINIMUM RESULT)

Data Set: A:\FML\BH102_RH1.aqt

Date: 03/17/15

Time: 17:18:37

PROJECT INFORMATION

Company: Parsons Brinckerhoff Limited

Client: Vale of Glamorgan

Project: 3512646D-HHC

Location: Five Mile Lane, Cardiff

Test Well: BH102

Test Date: 27/02/2015

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH102)

Initial Displacement: 0.338 m

Static Water Column Height: 5.565 m

Total Well Penetration Depth: 5.565 m

Screen Length: 3.21 m

Casing Radius: 0.025 m

Well Radius: 0.025 m

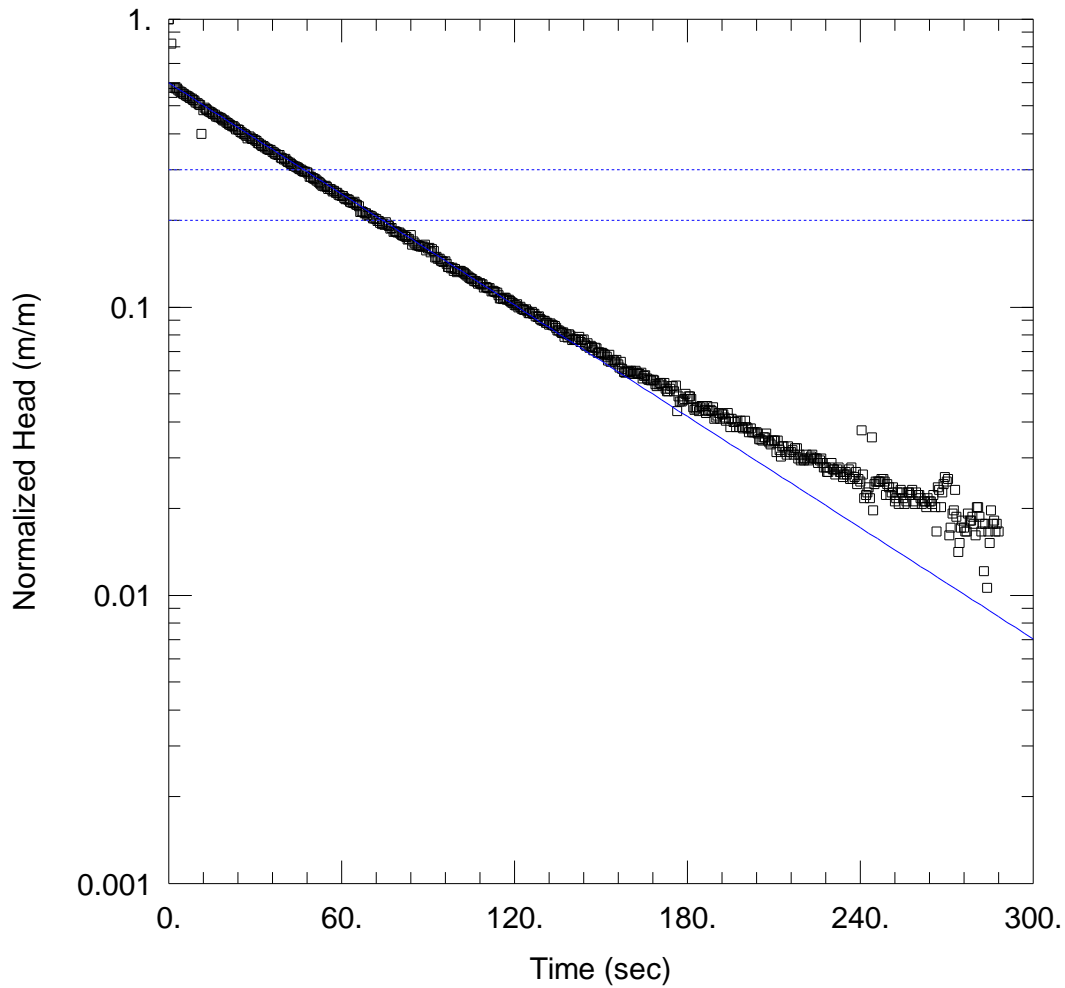
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.07987 m/day

y0 = 0.01129 m



FALLING HEAD TEST 1

Data Set: A:\FML\BH103_FH1.aqt
 Date: 03/17/15

Time: 14:54:40

PROJECT INFORMATION

Company: Parsons Brinckerhoff Limited
 Client: Vale of Glamorgan
 Project: 3512646D-HHC
 Location: Five Mile Lane, Cardiff
 Test Well: BH103
 Test Date: 27/02/2015

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (BH103)

Initial Displacement: 0.198 m
 Total Well Penetration Depth: 5.94 m
 Casing Radius: 0.025 m

Static Water Column Height: 5.587 m
 Screen Length: 3.25 m
 Well Radius: 0.025 m

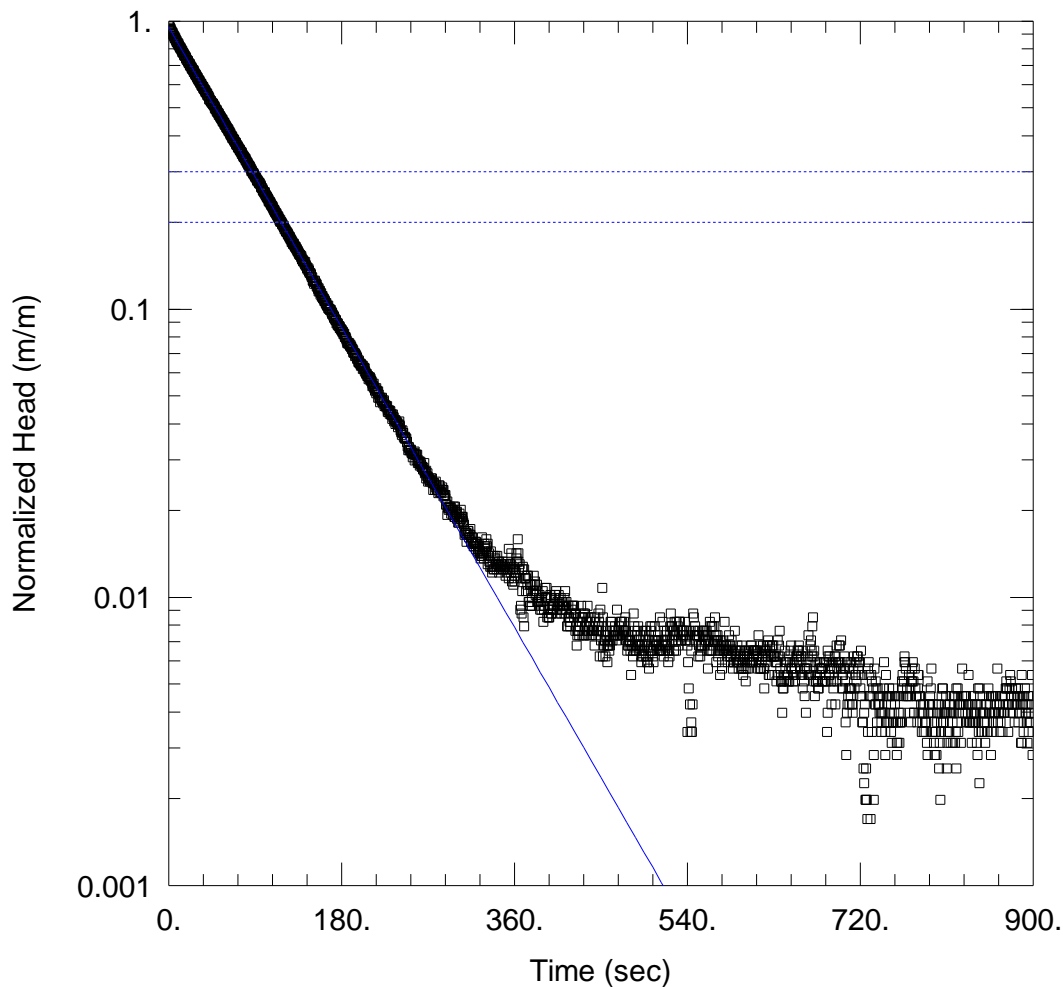
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

$K = 0.5795$ m/day

$y_0 = 0.119$ m



RISING HEAD TEST 1 (MAXIMUM RESULT)

Data Set: A:\FML\BH103_RH1.aqt

Date: 03/17/15

Time: 14:55:20

PROJECT INFORMATION

Company: Parsons Brinckerhoff Limited

Client: Vale of Glamorgan

Project: 3512646D-HHC

Location: Five Mile Lane, Cardiff

Test Well: BH103

Test Date: 27/02/2015

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (BH103)

Initial Displacement: 0.353 m

Static Water Column Height: 5.587 m

Total Well Penetration Depth: 5.94 m

Screen Length: 3.25 m

Casing Radius: 0.025 m

Well Radius: 0.025 m

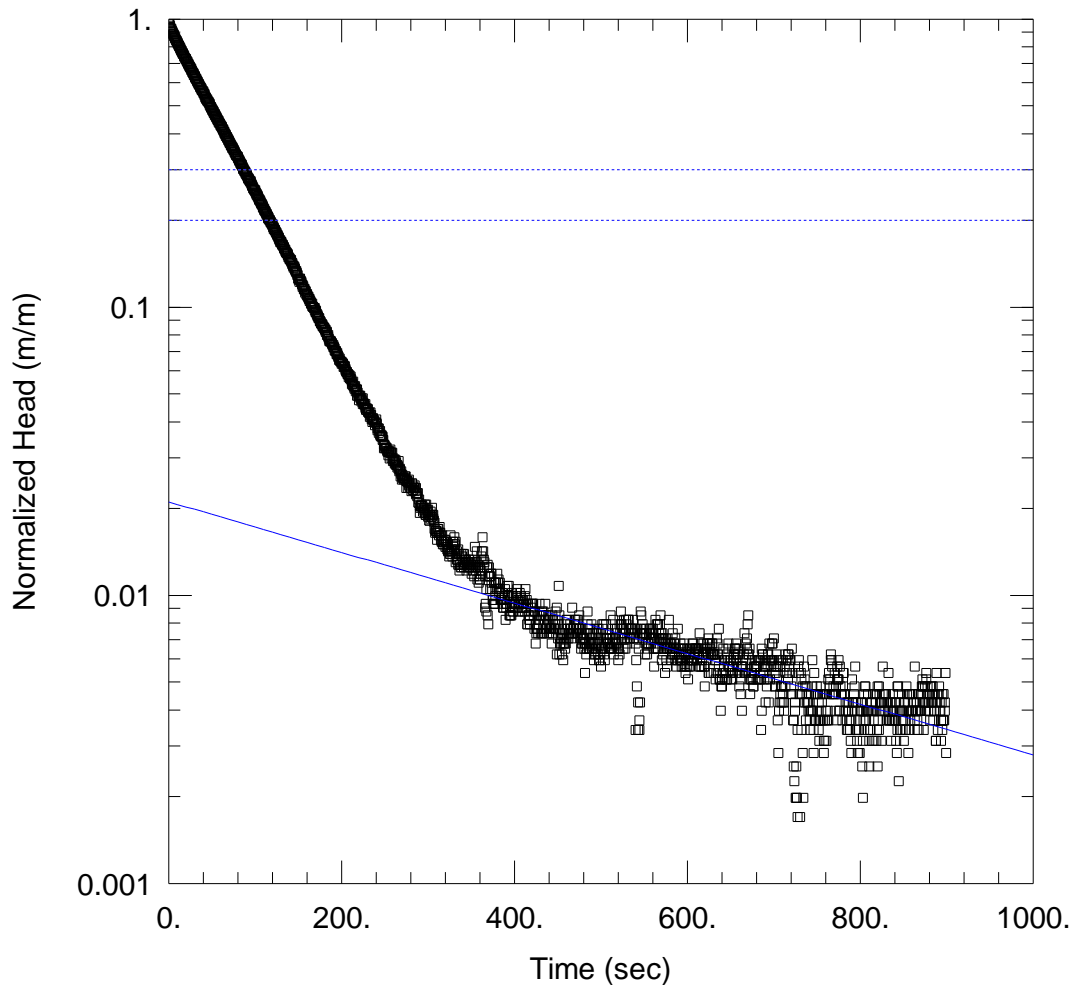
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bower-Rice

$K = 0.5213$ m/day

$y_0 = 0.3366$ m



RISING HEAD TEST 1 (MINIMUM RESULT)

Data Set: A:\FML\BH103_RH1.aqt

Date: 03/17/15

Time: 14:57:08

PROJECT INFORMATION

Company: Parsons Brinckerhoff Limited

Client: Vale of Glamorgan

Project: 3512646D-HHC

Location: Five Mile Lane, Cardiff

Test Well: BH103

Test Date: 27/02/2015

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (BH103)

Initial Displacement: 0.353 m

Static Water Column Height: 5.587 m

Total Well Penetration Depth: 5.94 m

Screen Length: 3.25 m

Casing Radius: 0.025 m

Well Radius: 0.025 m

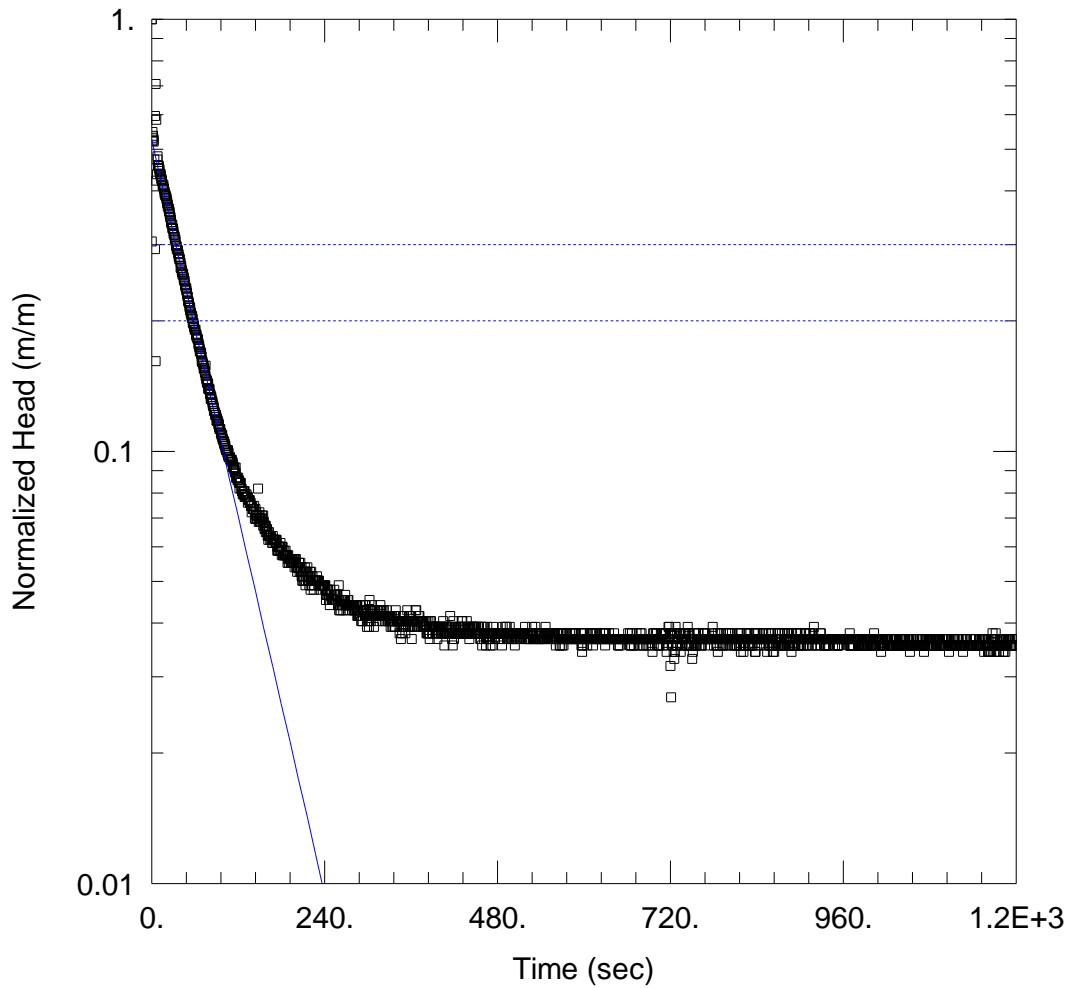
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

$K = 0.07905$ m/day

$y_0 = 0.007446$ m



FALLING HEAD TEST 1

Data Set: A:\FML\BH106_FH1.aqt

Date: 03/17/15

Time: 15:09:59

PROJECT INFORMATION

Company: Parsons Brinckerhoff Limited

Client: Vale of Glamorgan

Project: 3512646D-HHC

Location: Five Mile Lane, Cardiff

Test Well: BH106

Test Date: 27/02/2015

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (BH106)

Initial Displacement: 0.817 m

Static Water Column Height: 3.23 m

Total Well Penetration Depth: 3.23 m

Screen Length: 3.23 m

Casing Radius: 0.025 m

Well Radius: 0.025 m

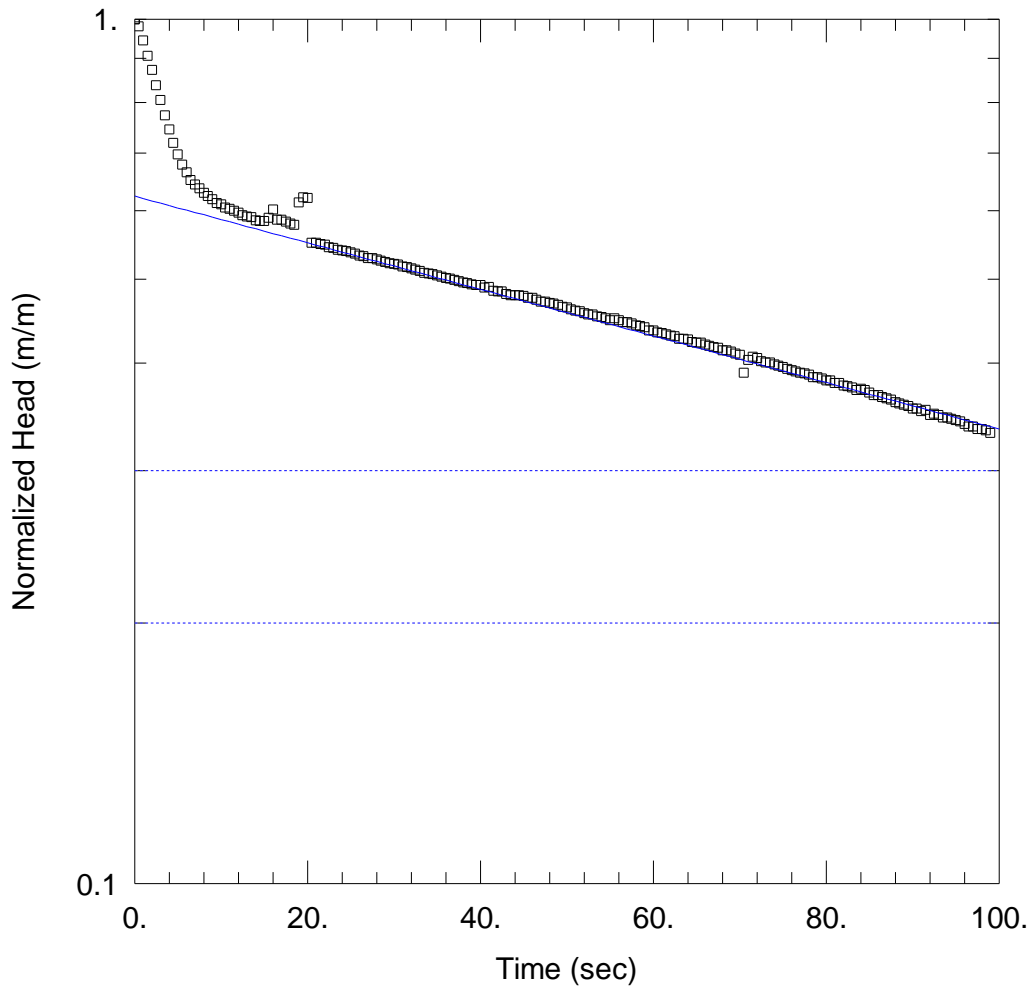
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

$K = 0.6089$ m/day

$y_0 = 0.4298$ m



RISING HEAD TEST 1

Data Set: A:\FML\BH106_RH1.aqt

Date: 03/17/15

Time: 15:10:53

PROJECT INFORMATION

Company: Parsons Brinckerhoff Limited

Client: Vale of Glamorgan

Project: 3512646D-HHC

Location: Five Mile Lane, Cardiff

Test Well: BH106

Test Date: 27/02/2015

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (BH106)

Initial Displacement: 0.841 m

Static Water Column Height: 3.23 m

Total Well Penetration Depth: 3.23 m

Screen Length: 3.23 m

Casing Radius: 0.025 m

Well Radius: 0.025 m

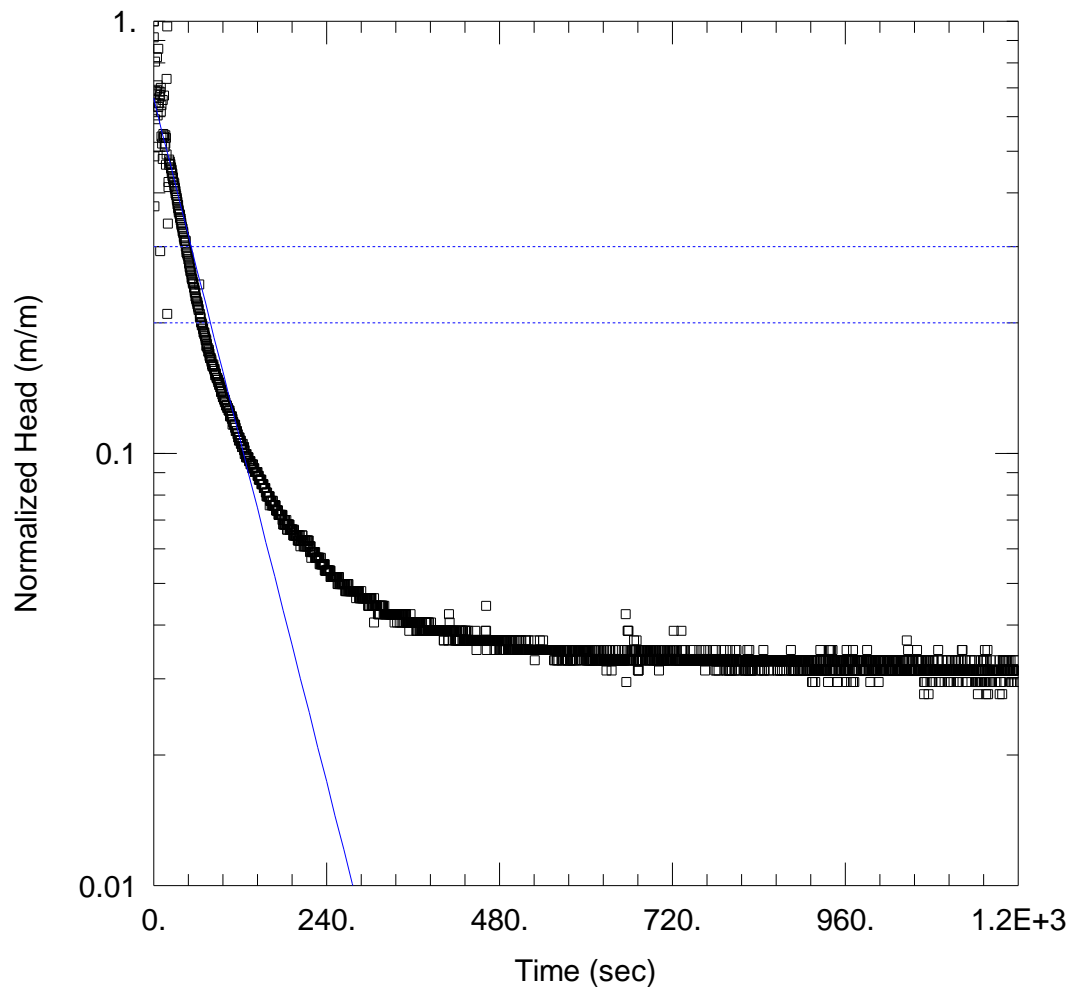
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

$K = 0.2261$ m/day

$y_0 = 0.5245$ m



FALLING HEAD TEST 2

Data Set: A:\FML\BH106_FH2.aqt

Date: 03/17/15

Time: 15:11:56

PROJECT INFORMATION

Company: Parsons Brinckerhoff Limited

Client: Vale of Glamorgan

Project: 3512646D-HHC

Location: Five Mile Lane, Cardiff

Test Well: BH106

Test Date: 27/02/2015

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (BH106)

Initial Displacement: 0.542 m

Static Water Column Height: 3.23 m

Total Well Penetration Depth: 3.23 m

Screen Length: 3.23 m

Casing Radius: 0.025 m

Well Radius: 0.025 m

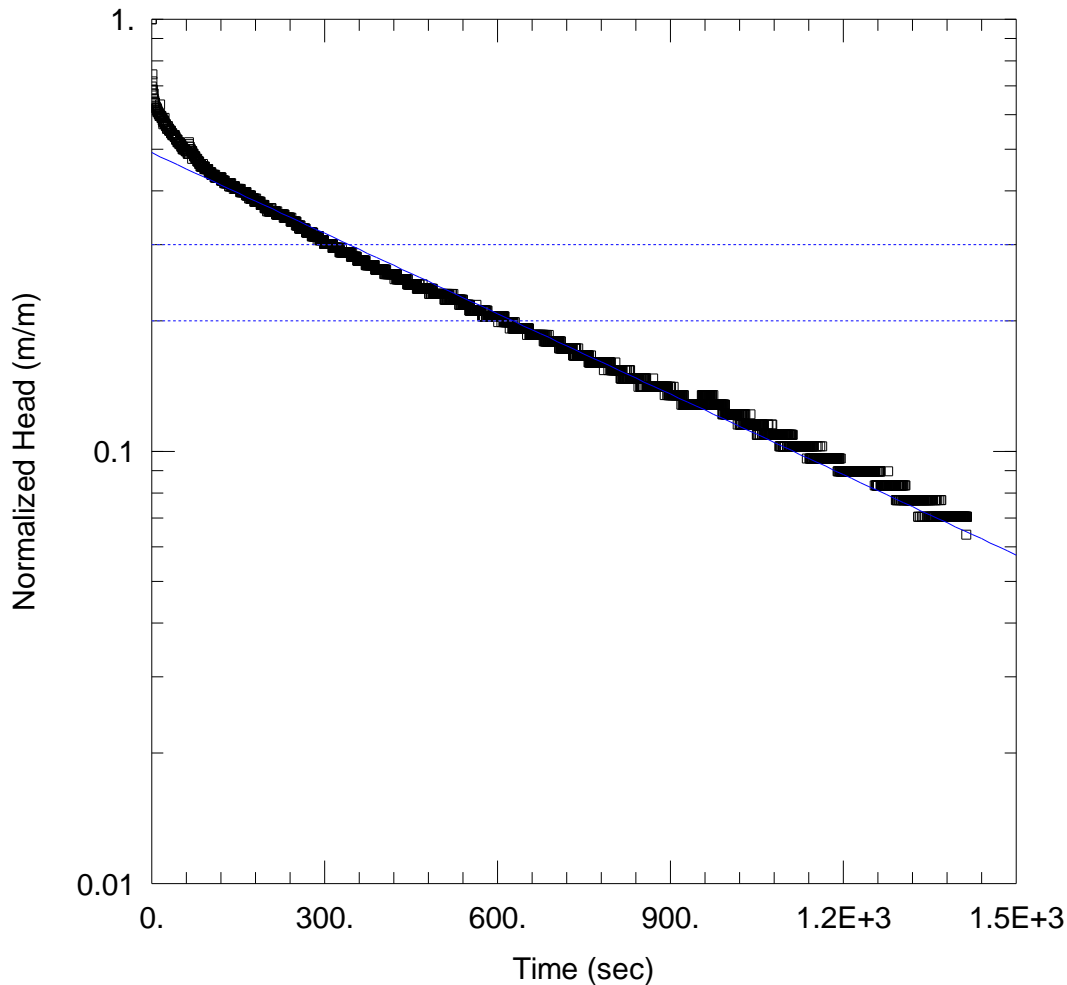
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

$K = 0.5527$ m/day

$y_0 = 0.3591$ m



FALLING HEAD TEST 1

Data Set: A:\FML\BH107_FH1.aqt
 Date: 03/17/15

Time: 15:12:21

PROJECT INFORMATION

Company: Parsons Brinckerhoff Limited
 Client: Vale of Glamorgan
 Project: 3512646D-HHC
 Location: Five Mile Lane, Cardiff
 Test Well: BH107
 Test Date: 25/02/2015

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (BH107)

Initial Displacement: 0.156 m
 Total Well Penetration Depth: 0.56 m
 Casing Radius: 0.025 m

Static Water Column Height: 0.56 m
 Screen Length: 0.56 m
 Well Radius: 0.025 m

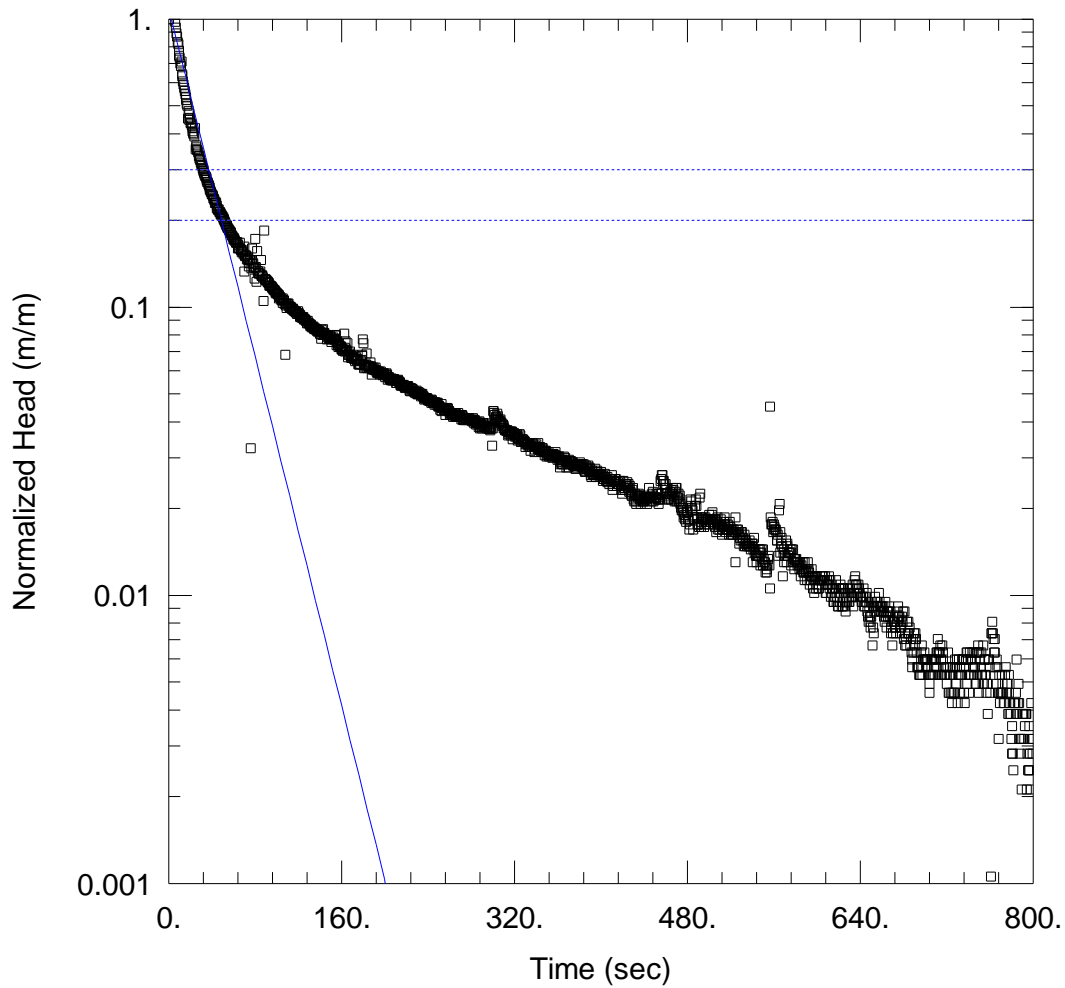
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

$K = 0.1913$ m/day

$y_0 = 0.07647$ m



FALLING HEAD TEST 1(MAXIMUM RESULT)

Data Set: A:\FML\BH108_FH1.aqt

Date: 03/17/15

Time: 15:16:17

PROJECT INFORMATION

Company: Parsons Brinckerhoff Limited

Client: Vale of Glamorgan

Project: 3512646D-HHC

Location: Five Mile Lane, Cardiff

Test Well: BH108

Test Date: 25/02/2015

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH108)

Initial Displacement: 0.2842 m

Static Water Column Height: 5.13 m

Total Well Penetration Depth: 5.13 m

Screen Length: 5.13 m

Casing Radius: 0.025 m

Well Radius: 0.025 m

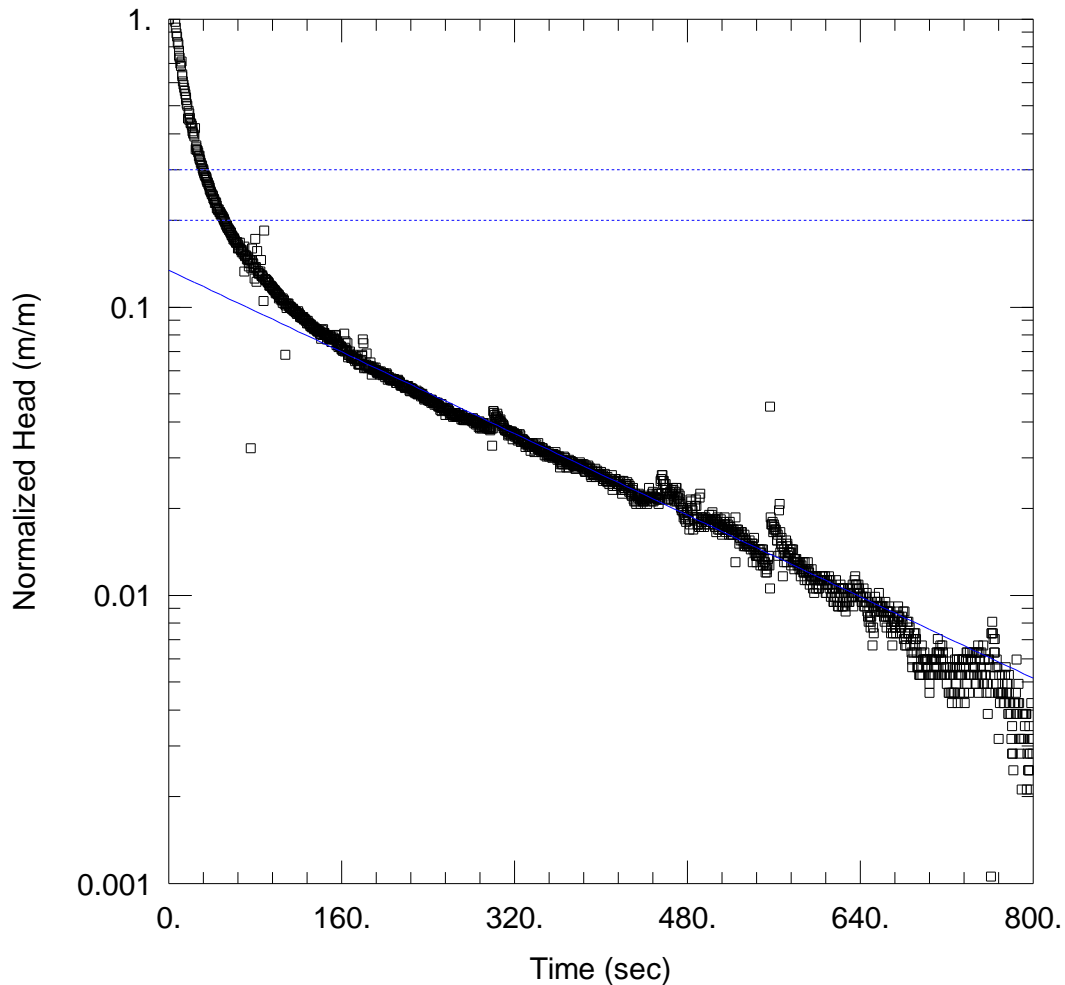
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bower-Rice

K = 0.8933 m/day

y0 = 0.3114 m



FALLING HEAD TEST 1(MINIMUM RESULT)

Data Set: A:\FML\BH108_FH1.aqt

Date: 03/17/15

Time: 15:12:59

PROJECT INFORMATION

Company: Parsons Brinckerhoff Limited

Client: Vale of Glamorgan

Project: 3512646D-HHC

Location: Five Mile Lane, Cardiff

Test Well: BH108

Test Date: 25/02/2015

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (BH108)

Initial Displacement: 0.2842 m

Static Water Column Height: 5.13 m

Total Well Penetration Depth: 5.13 m

Screen Length: 5.13 m

Casing Radius: 0.025 m

Well Radius: 0.025 m

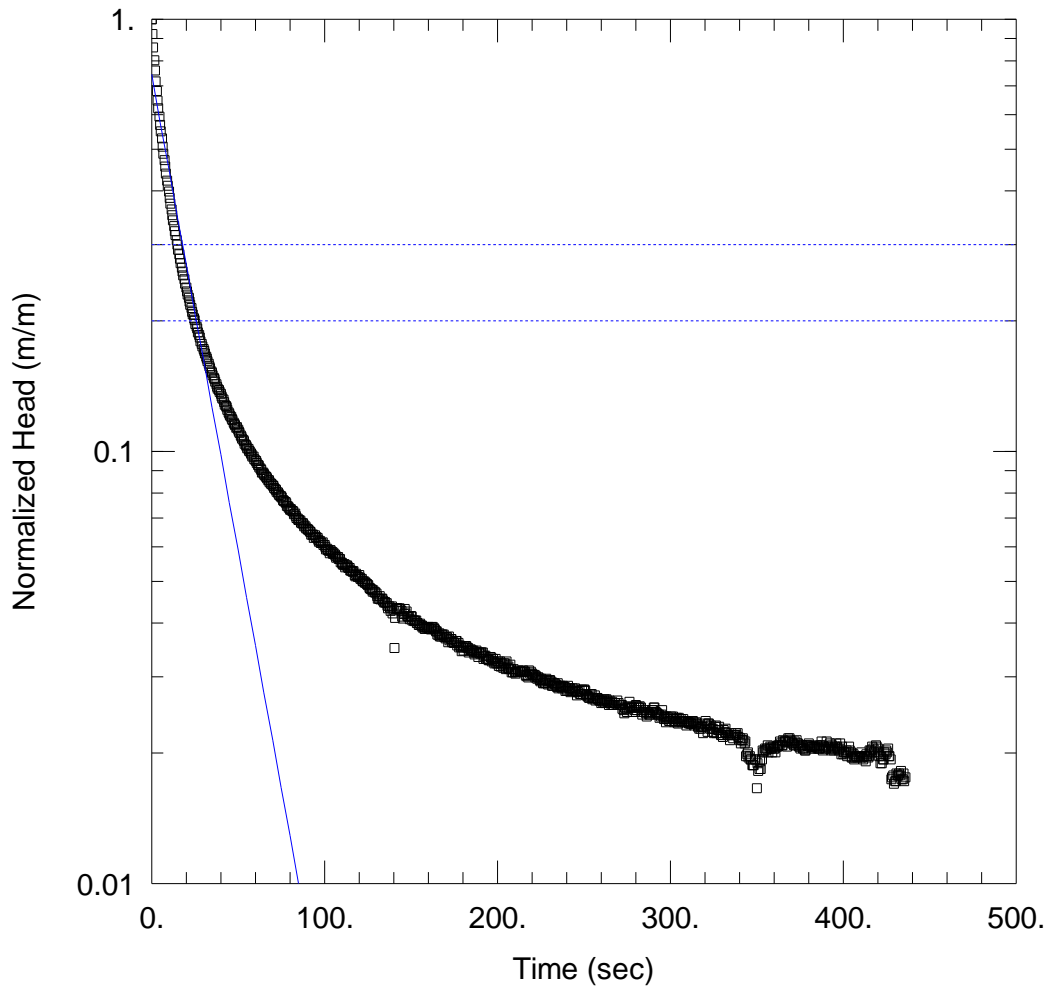
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bower-Rice

$K = 0.1045$ m/day

$y_0 = 0.03814$ m



RISING HEAD TEST 1 (MAXIMUM RESULTS)

Data Set: A:\FML\BH108_RH1.aqt

Date: 03/17/15

Time: 15:17:42

PROJECT INFORMATION

Company: Parsons Brinckerhoff Limited

Client: Vale of Glamorgan

Project: 3512646D-HHC

Location: Five Mile Lane, Cardiff

Test Well: BH108

Test Date: 25/02/2015

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH108)

Initial Displacement: 0.5174 m

Static Water Column Height: 5.13 m

Total Well Penetration Depth: 5.13 m

Screen Length: 5.13 m

Casing Radius: 0.025 m

Well Radius: 0.025 m

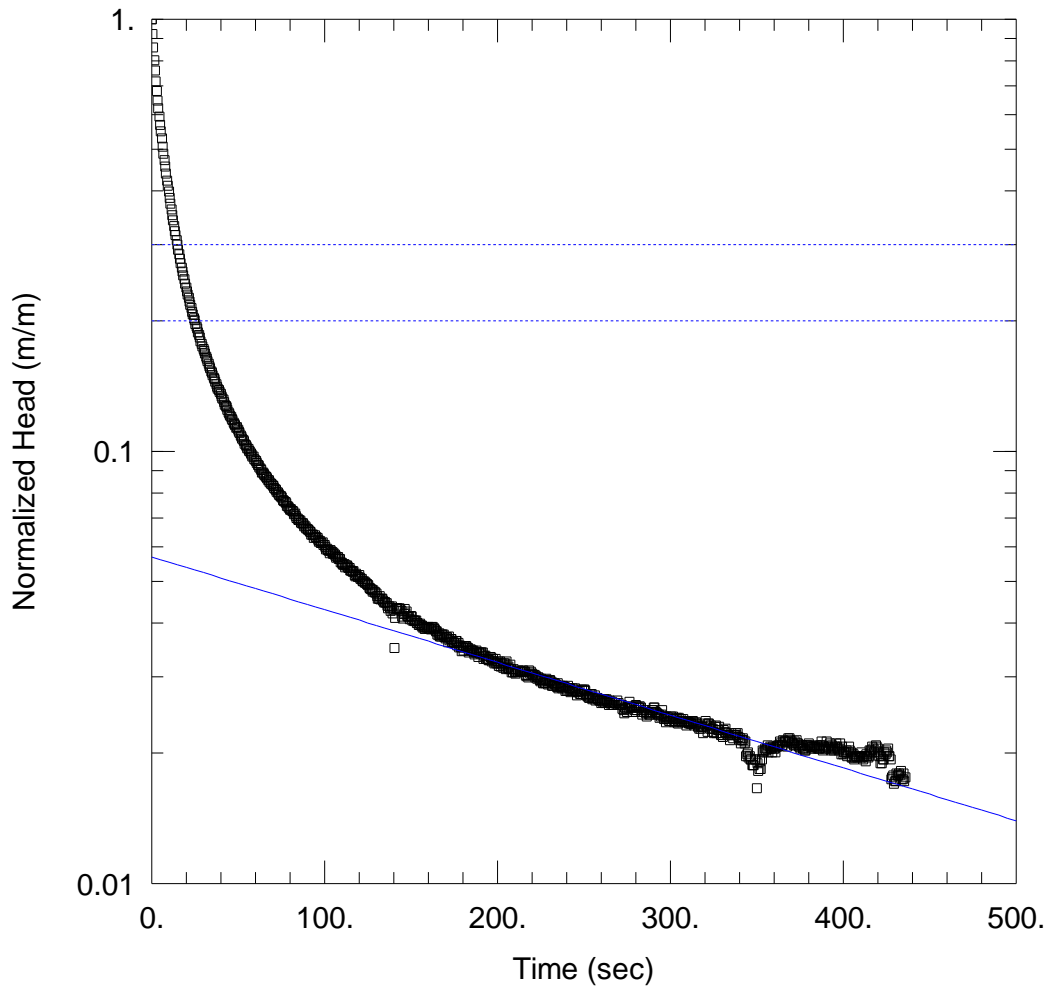
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 1.299 m/day

y0 = 0.3847 m



RISING HEAD TEST 1 (MINIMUM RESULTS)

Data Set: A:\FML\BH108_RH1.aqt

Date: 03/17/15

Time: 15:18:16

PROJECT INFORMATION

Company: Parsons Brinckerhoff Limited

Client: Vale of Glamorgan

Project: 3512646D-HHC

Location: Five Mile Lane, Cardiff

Test Well: BH108

Test Date: 25/02/2015

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (BH108)

Initial Displacement: 0.5174 m

Static Water Column Height: 5.13 m

Total Well Penetration Depth: 5.13 m

Screen Length: 5.13 m

Casing Radius: 0.025 m

Well Radius: 0.025 m

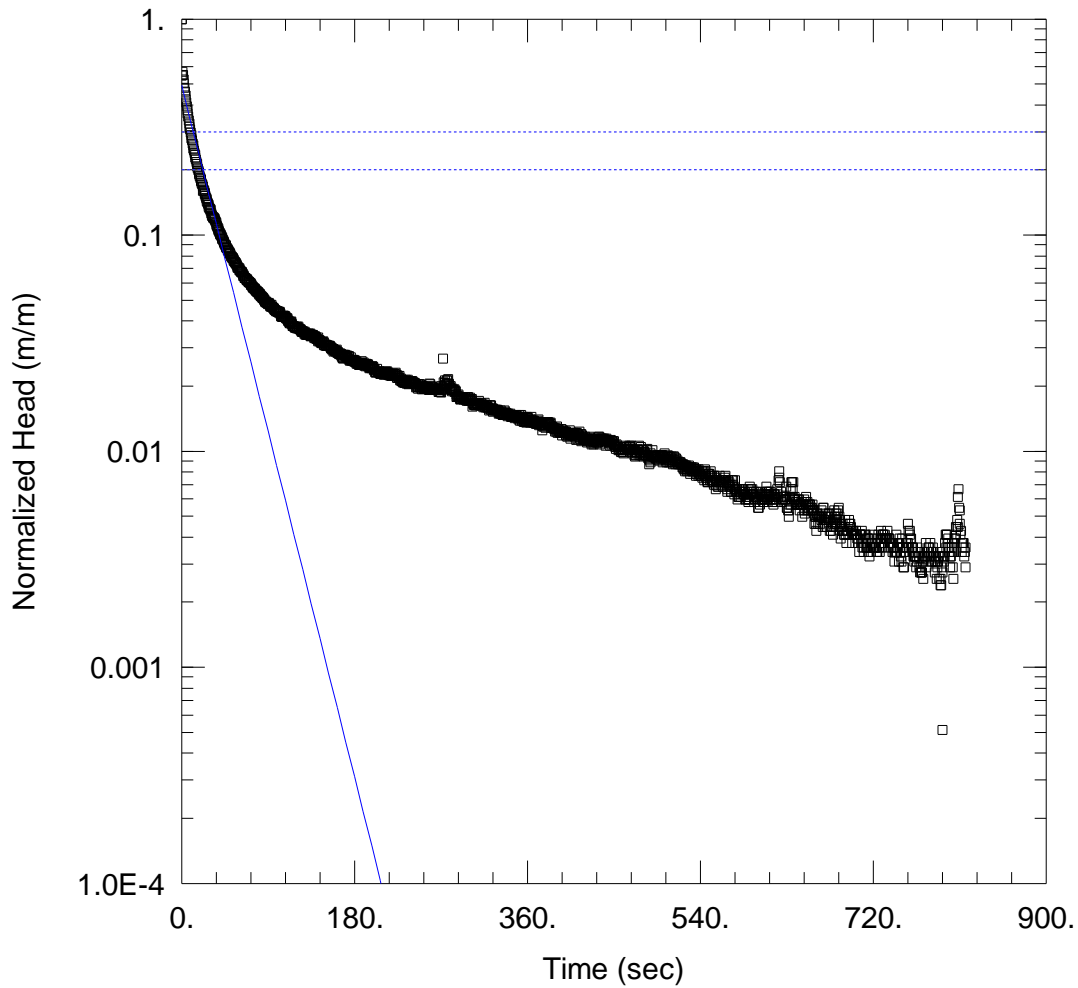
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

$K = 0.07208$ m/day

$y_0 = 0.02946$ m



FALLING HEAD TEST 2 (MAXIMUM RESULTS)

Data Set: A:\FML\BH108_FH2.aqt

Date: 03/17/15

Time: 15:21:18

PROJECT INFORMATION

Company: Parsons Brinckerhoff Limited

Client: Vale of Glamorgan

Project: 3512646D-HHC

Location: Five Mile Lane, Cardiff

Test Well: BH108

Test Date: 25/02/2015

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH108)

Initial Displacement: 0.5846 m

Static Water Column Height: 5.13 m

Total Well Penetration Depth: 5.13 m

Screen Length: 5.13 m

Casing Radius: 0.025 m

Well Radius: 0.025 m

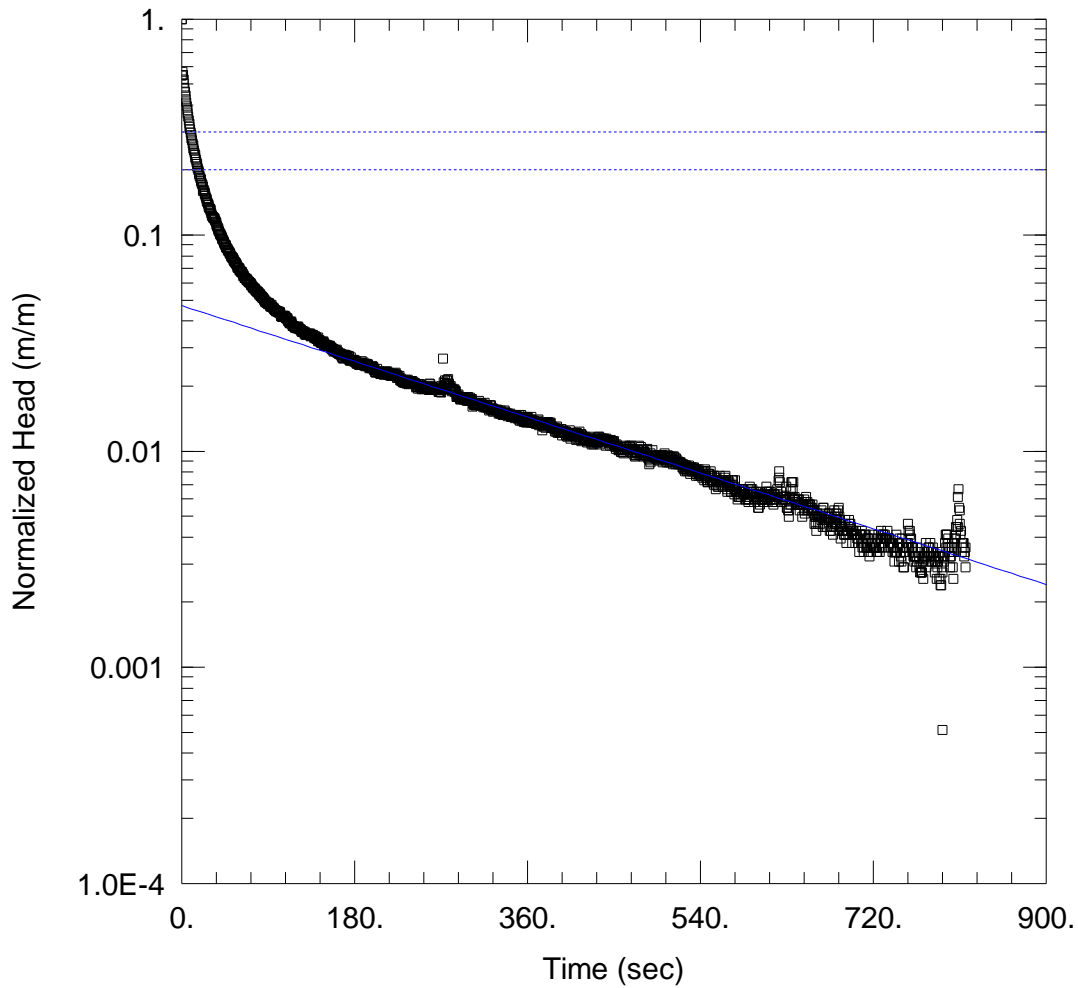
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 1.05 m/day

y0 = 0.2888 m



FALLING HEAD TEST 2 (MINIMUM RESULTS)

Data Set: A:\FML\BH108_FH2.aqt

Date: 03/17/15

Time: 15:19:51

PROJECT INFORMATION

Company: Parsons Brinckerhoff Limited

Client: Vale of Glamorgan

Project: 3512646D-HHC

Location: Five Mile Lane, Cardiff

Test Well: BH108

Test Date: 25/02/2015

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (BH108)

Initial Displacement: 0.5846 m

Static Water Column Height: 5.13 m

Total Well Penetration Depth: 5.13 m

Screen Length: 5.13 m

Casing Radius: 0.025 m

Well Radius: 0.025 m

SOLUTION

Aquifer Model: Unconfined

Solution Method: Bower-Rice

$K = 0.08459$ m/day

$y_0 = 0.02753$ m