P-07-31

Forsmark site investigation

Single-hole injection tests in borehole KFM10A

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February 2007

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ISSN 1651-4416
SKB P-07-31

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Keywords: Forsmark, Hydrogeology, Hydraulic tests, Injection tests, Single-hole tests, Hydraulic parameters, Transmissivity, Hydraulic conductivity, AP PF 400-06-069.

Abstract

Borehole KFM10A is a deep core-drilled borehole within the site investigations in the Forsmark area. The borehole is about 500 m long and it is cased and the gap between the casing and the borehole wall is grouted to about 60 m. The inclination of the borehole is c 50 degrees from the horizontal plane at the surface. The borehole diameter is below casing about 76 mm.

This report presents injection tests performed using the pipe string system PSS3 in borehole KFM10A and the test results.

The main aim of the injection tests in KFM10A was to characterize the hydraulic conditions of the rock adjacent to the borehole on different measurement scales (100 m, 20 m and 5 m). Hydraulic parameters such as transmissivity and hydraulic conductivity were determined using analysis methods for stationary as well as transient conditions together with the dominating flow regime and possible outer hydraulic boundaries. In addition, a comparison with the results of previously performed difference flow logging in KFM10A was made.

The injection tests gave consistent results on the different measurement scales regarding transmissivity. For almost 70% of the tests, some period with pseudo-radial flow could be identified making a relatively straight-forward transient evaluation possible. The sections 84.0–94.0, 99.0–107.9 and 427.9–432.9 m contribute most to the total transmissivity in KFM10A.

The results of the injection tests were generally consistent with the previous difference flow logging in KFM10A. However, the injection tests had in some cases a tendency to provide slightly higher estimated transmissivity values than the difference flow logging.

The injection tests provide a database for statistical analysis of the hydraulic conductivity distribution along the borehole on the different measurement scales. Basic statistical analysis has been made within this project and basic statistical parameters are presented in this report.

Sammanfattning

Borrhål KFM10A är ett djupt kärnborrhål borrat inom ramen för platsundersökningarna i Forsmarksområdet. Borrhålet är ca 500 m långt och det är försett med foderrör samt har spaltinjekterats till ca 60 m. Lutningen i borrhålet är ca 50 grader från horisontalplanet vid ytan och borrhålsdiametern under foderröret är ca 76 mm.

Denna rapport beskriver genomförda injektionstester med rörgångssystemet PSS3 i borrhål KFM10A samt resultaten från desamma.

Huvudsyftet med injektionstesterna var att karaktärisera de hydrauliska förhållandena i berget i anslutning till borrhålet i olika mätskalor (100 m, 20 m och 5 m). Hydrauliska parametrar såsom transmissivitet och hydraulisk konduktivitet tillsammans med dominerande flödes-regim och eventuella yttre hydrauliska randvillkor bestämdes med hjälp av analysmetoder för såväl stationära som transienta förhållanden. En jämförelse med resultaten av den tidigare utförda differensflödesloggningen i KFM10A gjordes också.

Injektionstesterna gav samstämmiga resultat för de olika mätskalorna beträffande transmissivitet. Under närmare 70 % av testen kunde en viss period med pseudoradiellt flöde identifieras vilket möjliggjorde en standardmässig transient utvärdering. Sektionerna 84,0–94,0, 99,0–107,9 samt 427,9–432,9 bidrar mest till den totala transmissiviteten i KFM10A.

Samstämmigheten var bra mellan resultaten från injektionstesterna och den tidigare utförda differensflödesloggningen i KFM10A. Några injektionstester hade dock en tendens att indikera något högre transmissiviteter än differensflödesloggningen.

Resultaten från injektionstesterna utgör en databas för statistisk analys av den hydrauliska konduktivitetens fördelning längs borrhålet i de olika mätskalorna. Viss statistisk analys har utförts inom ramen för denna aktivitet och grundläggande statistiska parametrar presenteras i rapporten.

Contents

1 Introduction

Injection tests were carried out in borehole KFM10A at Forsmark, Sweden, in December 2006 to January 2007, by Geosigma AB. Borehole KFM10A is a deep, cored borehole within the on-going site investigation in the Forsmark area. The location of the borehole is shown in Figure 1-1. The borehole is about 500 m long, cased and grouted to c 60 m and at the collaring inclined c 50 degrees from the horizontal plane. The borehole is designed as a so called telescopic borehole, with an enlarged diameter in the upper approximately 60 m, below which the borehole diameter is c 76 mm.

In KFM10A, difference flow logging was previously performed during June and July 2006. According to the results of this investigation, 56 flowing fractures were detected and the most high-transmissive fracture was found at 431.9 m. Fractures with a relatively high transmissivity were also found at 89.6 m and 106.0 m, Sokolnicki et al. (2006) /1/.

This document reports the results obtained from the injection tests in borehole KFM10A. The activity is performed within the Forsmark site investigation. The work was carried out in compliance with the SKB internal controlling documents presented in Table 1-1. Data and results were delivered to the SKB site characterization database, SICADA, where they are traceable by the Activity Plan number.

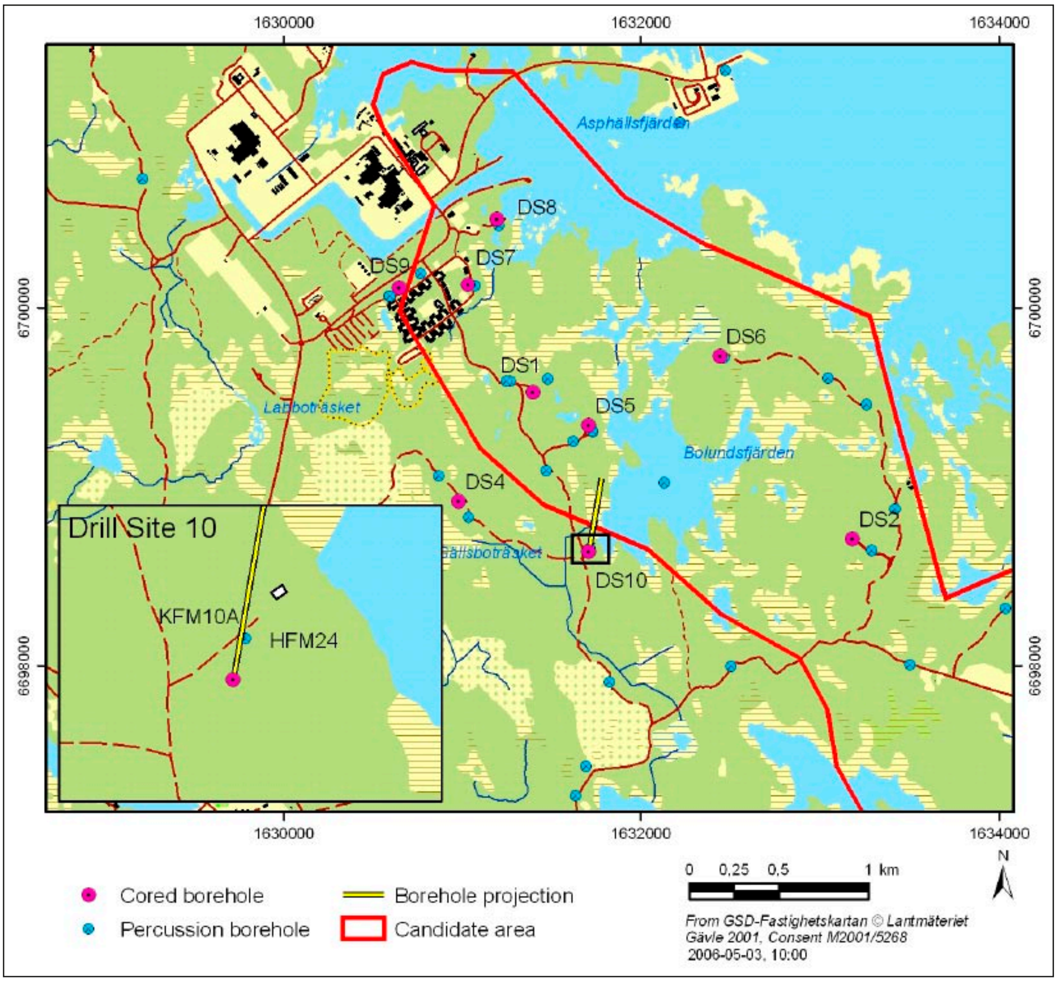

Figure 1-1. *The investigation area at Forsmark including the candidate area selected for more detailed investigations. Borehole KFM10A is situated at drill site DS10.*

Table 1-1. SKB internal controlling documents for performance of the activity.

Activity Plans	Number	Version
Hydraulic injection tests in borehole KFM10A with PSS3	AP PF 400-06-069	1.0
Method documents	**Number**	**Version**
Mätsystembeskrivning (MSB) – Allmän del. Pipe String System (PSS3)	SKB MD 345.100	1.0
Mätsystembeskrivning för: Kalibrering, PSS3	SKB MD 345.122	1.0
Mätsystembeskrivning för: Skötsel, service, serviceprotokoll, PSS3	SKB MD 345.124	1.0
Metodbeskrivning för hydrauliska injektionstester	SKB MD 323.001	1.0
Instruktion för analys av injektions- och enhålspumptester	SKB MD 320.004	1.0
Instruktion för rengöring av borrhålsutrustning och viss markbaserad utrustning	SKB MD 600.004	1.0

2 Objectives

The main aim of the injection tests in borehole KFM10A was to characterize the hydraulic properties of the rock adjacent to the borehole on different measurement scales (100 m, 20 m and 5 m). The primary parameter to be determined was hydraulic transmissivity from which hydraulic conductivity can be derived. The results of the injection tests provide a database which can be used for statistical analyses of the hydraulic conductivity distribution along the borehole on different measurement scales. Basic statistical analyses are presented in this report.

Other hydraulic parameters of interest were flow regimes and outer hydraulic boundaries. These parameters were analysed using transient evaluation on the test responses during the flow- and recovery periods.

A comparison with the results of the previously performed difference flow logging in KFM10A was also included in the activity, as a check of the plausibility of the test results. Further, the combined analysis of the injection tests and the difference flow logging provides a more comprehensive understanding of the hydraulic conditions of boreholes KFM10A.

3 Scope

3.1 Borehole data

Technical data of the tested borehole are shown in Table 3-1 and in Appendix 4. The reference point of the borehole is defined as the centre of top of casing (ToC), given as "Elevation" in the table below. The Swedish National coordinate system (RT90) is used for the horizontal coordinates together with RHB70 for the elevation. "Northing" and "Easting" refer to the top of the boreholes.

Table 3-1. Pertinent technical data of borehole KFM10A (printout from SKB database, SICADA).

Borehole length (m):	500.16				
Drilling Period(s):	**From date**	**To date**	**Secup (m)**	**Seclow (m)**	**Drilling type**
	2005-12-06	2006-02-19	0.00	60.73	Percussion
	2006-03-14	2006-06-01	60.73	500.16	Core drilling
Starting point coordinate:	**Length (m)**	**Northing (m)**	**Easting (m)**	**Elevation**	**Coord system**
	0.00	6698629.17	1631715.90	4.51	RT90-RHB70
	3.00	6698631.07	1631716.25	2.21	RT90-RHB70
Angles:	**Length (m)**	**Bearing**	**Inclination (– = down)**	**Coord system**	
	0.00	10.42	–50.05	RT90-RHB70	
Borehole diameter:	**Secup (m)**	**Seclow (m)**	**Hole diam (m)**		
	0.23	12.32	0.339		
	12.32	60.68	0.244		
	60.68	60.73	0.016		
	60.73	62.68	0.086		
	62.68	500.16	0.076		
Core diameter:	**Secup (m)**	**Seclow (m)**	**Core diam (m)**		
	60.73	62.51	0.060		
	62.51	500.16	0.051		
Casing diameter:	**Secup (m)**	**Seclow (m)**	**Case in (m)**	**Case out (m)**	
	0.00	60.34	0.200	0.208	
	0.23	12.23	0.310	0.323	
	12.23	12.31	0.281	0.339	
	60.34	60.39	0.170	0.208	

3.2 Tests performed

The injection tests in borehole KFM10A, performed according to Activity Plan AP PF 400-06-069 (see Table 1-1), are listed in Table 3-2. The injection tests were carried out with the Pipe String System (PSS3). The test procedure and the equipment are described in the measurement system description for PSS (SKB MD 345.100) and in the corresponding method descriptions for hydraulic injection tests (SKB MD 323.001, Table 1-1).

Some of the tests were not performed as intended because the time required for achieving a constant head in the test section was judged to be too long or, in other cases, equipment malfunctions caused pressure and/or flow rate disturbances. Whenever such disturbances were expected to affect data evaluation, the test was repeated. Test number (Test no in Table 3-2) refers to the number of tests performed in the actual section. For evaluation, data from the last test in each section were used.

The upper and lower packer positions for the injection test sections were, whenever possible, as close as possible to the section limits used during the previous difference flow logging in 5 m sections in KFM10A /1/. Some limits were intentionally shifted from the section limits used during the difference flow logging in order to avoid cavities and major fractures in the borehole. The section limits used for the injection tests and difference flow logging respectively differed with a maximum of 2.10 m along the borehole. However, for about half the number of test sections, the maximum difference was less than 0.20 m.

Table 3-2. Single-hole injection tests performed in borehole KFM10A.

Borehole Bh ID	Test section secup	seclow	Section length	Test type[1] (1–6)	Test no	Test start date, time YYYYMMDD hh:mm	Test stop date, time YYYYMMDD hh:mm
KFM10A	62.90	162.90	100.00	3	1	2006-12-14 11:23	2006-12-14 14:01
KFM10A	162.90	262.90	100.00	3	1	2006-12-14 15:59	2006-12-14 17:48
KFM10A	262.90	362.90	100.00	3	1	2006-12-15 09:55	2006-12-15 11:44
KFM10A	362.90	462.90	100.00	3	1	2006-12-15 13:33	2006-12-15 15:22
KFM10A	62.90	82.90	20.00	3	1	2006-12-19 12:53	2006-12-19 16:02
KFM10A	84.00	104.00	20.00	3	1	2006-12-20 13:05	2006-12-20 14:24
KFM10A	102.90	122.90	20.00	3	1	2006-12-20 14:59	2006-12-20 16:15
KFM10A	122.90	142.90	20.00	3	1	2006-12-20 17:03	2006-12-21 09:18
KFM10A	142.90	162.90	20.00	3	1	2006-12-21 09:42	2006-12-21 10:57
KFM10A	162.90	182.90	20.00	3	1	2006-12-21 11:13	2006-12-21 13:19
KFM10A	182.90	202.90	20.00	3	1	2006-12-21 13:41	2006-12-21 14:32
KFM10A	202.90	222.90	20.00	3	1	2006-12-21 14:48	2006-12-21 15:33
KFM10A	222.90	242.90	20.00	3	1	2006-12-21 15:49	2006-12-21 17:05
KFM10A	242.90	262.90	20.00	3	1	2006-12-22 09:02	2006-12-22 09:49
KFM10A	262.90	282.90	20.00	3	1	2006-12-22 10:13	2006-12-22 11:32
KFM10A	282.90	302.90	20.00	3	1	2006-12-22 11:57	2006-12-22 13:56
KFM10A	282.90	302.90	20.00	3	2	2007-01-04 10:36	2007-01-04 11:51
KFM10A	302.90	322.90	20.00	3	1	2007-01-02 08:29	2007-01-02 10:01
KFM10A	322.90	342.90	20.00	3	1	2007-01-02 10:26	2007-01-02 11:40
KFM10A	342.90	362.90	20.00	3	1	2007-01-02 12:46	2007-01-02 14:06
KFM10A	362.90	382.90	20.00	3	1	2007-01-02 14:21	2007-01-02 15:36
KFM10A	382.90	402.90	20.00	3	1	2007-01-02 15:58	2007-01-02 16:49
KFM10A	402.90	422.90	20.00	3	1	2007-01-03 08:57	2007-01-03 09:46
KFM10A	422.90	442.90	20.00	3	1	2007-01-03 10:03	2007-01-03 11:18
KFM10A	442.90	462.90	20.00	3	1	2007-01-03 11:39	2007-01-03 13:48
KFM10A	462.90	482.90	20.00	3	1	2007-01-03 14:06	2007-01-03 15:20

Borehole Bh ID	Test section secup	seclow	Section length	Test type[1] (1–6)	Test no	Test start date, time YYYYMMDD hh:mm	Test stop date, time YYYYMMDD hh:mm
KFM10A	472.90	492.90	20.00	3	1	2007-01-03 15:38	2007-01-03 16:53
KFM10A	62.90	67.90	5.00	3	1	2007-01-05 13:55	2007-01-05 15:12
KFM10A	67.90	72.90	5.00	3	1	2007-01-05 15:24	2007-01-05 16:45
KFM10A	72.90	77.90	5.00	3	1	2007-01-08 08:35	2007-01-08 09:49
KFM10A	77.90	82.90	5.00	3	1	2007-01-08 10:00	2007-01-08 11:14
KFM10A	79.00	84.00	5.00	3	1	2007-01-08 11:20	2007-01-08 13:32
KFM10A	84.00	89.00	5.00	3	1	2007-01-08 13:46	2007-01-08 14:59
KFM10A	89.00	94.00	5.00	3	1	2007-01-08 15:13	2007-01-08 16:27
KFM10A	94.00	99.00	5.00	3	1	2007-01-08 16:41	2007-01-08 17:55
KFM10A	99.00	104.00	5.00	3	1	2007-01-08 18:07	2007-01-08 19:21
KFM10A	102.90	107.90	5.00	3	1	2007-01-08 19:39	2007-01-08 20:52
KFM10A	107.90	112.90	5.00	3	1	2007-01-09 07:34	2007-01-09 08:50
KFM10A	112.90	117.90	5.00	3	1	2007-01-09 09:05	2007-01-09 10:22
KFM10A	117.90	122.90	5.00	3	1	2007-01-09 10:45	2007-01-09 12:00
KFM10A	122.90	127.90	5.00	3	1	2007-01-09 13:06	2007-01-09 14:47
KFM10A	127.90	132.90	5.00	3	1	2007-01-10 08:23	2007-01-10 09:14
KFM10A	132.90	137.90	5.00	3	1	2007-01-10 09:31	2007-01-10 10:46
KFM10A	137.90	142.90	5.00	3	1	2007-01-10 10:58	2007-01-10 12:39
KFM10A	137.90	142.90	5.00	3	2	2007-01-23 10:51	2007-01-23 13:09
KFM10A	142.90	147.90	5.00	3	1	2007-01-10 12:51	2007-01-10 14:05
KFM10A	145.00	150.00	5.00	3	1	2007-01-10 14:16	2007-01-10 15:40
KFM10A	150.00	155.00	5.00	3	1	2007-01-10 15:51	2007-01-10 16:31
KFM10A	155.00	160.00	5.00	3	1	2007-01-11 08:27	2007-01-11 09:10
KFM10A	157.90	162.90	5.00	3	1	2007-01-11 09:20	2007-01-11 10:03
KFM10A	162.90	167.90	5.00	3	1	2007-01-11 10:17	2007-01-11 11:33
KFM10A	167.90	172.90	5.00	3	1	2007-01-11 12:36	2007-01-11 13:53
KFM10A	172.90	177.90	5.00	3	1	2007-01-11 14:09	2007-01-11 15:24
KFM10A	177.90	182.90	5.00	3	1	2007-01-11 15:37	2007-01-11 16:20
KFM10A	262.90	267.90	5.00	3	1	2007-01-12 08:40	2007-01-12 09:21
KFM10A	267.90	272.90	5.00	3	1	2007-01-12 09:35	2007-01-12 10:49
KFM10A	272.90	277.90	5.00	3	1	2007-01-12 11:02	2007-01-12 12:49
KFM10A	277.90	282.90	5.00	3	1	2007-01-12 13:01	2007-01-12 13:59
KFM10A	282.90	287.90	5.00	3	1	2007-01-12 14:10	2007-01-12 15:01
KFM10A	287.90	292.90	5.00	3	1	2007-01-12 15:11	2007-01-12 15:50
KFM10A	292.90	297.90	5.00	3	1	2007-01-12 16:05	2007-01-12 17:21
KFM10A	297.90	302.90	5.00	3	1	2007-01-15 08:31	2007-01-15 09:45
KFM10A	302.90	307.90	5.00	3	1	2007-01-15 09:58	2007-01-15 11:17
KFM10A	302.90	307.90	5.00	3	2	2007-01-22 16:53	2007-01-23 09:28
KFM10A	307.90	312.90	5.00	3	1	2007-01-15 11:27	2007-01-15 13:33
KFM10A	312.90	317.90	5.00	3	1	2007-01-15 13:45	2007-01-15 15:00
KFM10A	317.90	322.90	5.00	3	1	2007-01-15 15:11	2007-01-15 16:27
KFM10A	322.90	327.90	5.00	3	1	2007-01-15 16:39	2007-01-16 09:17
KFM10A	327.90	332.90	5.00	3	1	2007-01-16 09:34	2007-01-16 10:52
KFM10A	332.90	337.90	5.00	3	1	2007-01-16 11:05	2007-01-16 12:47
KFM10A	332.90	337.90	5.00	3	2	2007-01-22 15:18	2007-01-22 16:32
KFM10A	337.90	342.90	5.00	3	1	2007-01-16 13:01	2007-01-16 14:19
KFM10A	342.90	347.90	5.00	3	1	2007-01-16 14:37	2007-01-16 15:53
KFM10A	347.90	352.90	5.00	3	1	2007-01-16 16:10	2007-01-16 16:53

Borehole Bh ID	Test section secup	seclow	Section length	Test type[1)] (1–6)	Test no	Test start date, time YYYYMMDD hh:mm	Test stop date, time YYYYMMDD hh:mm
KFM10A	352.90	357.90	5.00	3	1	2007-01-17 08:29	2007-01-17 09:46
KFM10A	357.90	362.90	5.00	3	1	2007-01-17 09:57	2007-01-17 10:44
KFM10A	362.90	367.90	5.00	3	1	2007-01-17 10:58	2007-01-17 11:41
KFM10A	367.90	372.90	5.00	3	1	2007-01-17 13:11	2007-01-17 14:29
KFM10A	372.90	377.90	5.00	3	1	2007-01-17 14:41	2007-01-17 15:57
KFM10A	377.90	382.90	5.00	3	1	2007-01-17 16:12	2007-01-17 17:27
KFM10A	422.90	427.90	5.00	3	1	2007-01-18 08:48	2007-01-18 09:33
KFM10A	427.90	432.90	5.00	3	1	2007-01-18 09:50	2007-01-18 11:05
KFM10A	427.90	432.90	5.00	3	2	2007-01-22 13:06	2007-01-22 14:29
KFM10A	432.90	437.90	5.00	3	1	2007-01-18 11:19	2007-01-18 12:32
KFM10A	437.90	442.90	5.00	3	1	2007-01-18 13:34	2007-01-18 14:51
KFM10A	442.90	447.90	5.00	3	1	2007-01-18 15:12	2007-01-18 16:29
KFM10A	447.90	452.90	5.00	3	1	2007-01-18 16:42	2007-01-19 08:06
KFM10A	452.90	457.90	5.00	3	1	2007-01-19 08:18	2007-01-19 09:31
KFM10A	457.90	462.90	5.00	3	1	2007-01-19 09:42	2007-01-19 10:21
KFM10A	462.90	467.90	5.00	3	1	2007-01-19 10:30	2007-01-19 11:44
KFM10A	467.90	472.90	5.00	3	1	2007-01-19 12:28	2007-01-19 13:42
KFM10A	472.90	477.90	5.00	3	1	2007-01-19 13:54	2007-01-19 14:36
KFM10A	477.90	482.90	5.00	3	1	2007-01-19 14:48	2007-01-19 16:04
KFM10A	482.90	487.90	5.00	3	1	2007-01-22 08:26	2007-01-22 09:41
KFM10A	487.90	492.90	5.00	3	1	2007-01-22 09:53	2007-01-22 11:08

[1)] 3: Injection test.

3.3 Equipment checks

The PSS3 equipment was serviced, according to SKB internal controlling documents (SKB MD 345.124, service, and SKB MD 345.122, calibration), in November 2006.

Functioning checks of the equipment were performed during the installation of the PSS equipment at the test site. In order to check the function of the pressure sensors, the air pressure was recorded and found to be as expected. While lowering, the sensors showed good agreement with the total head of water (p/ρg). The temperature sensor displayed expected values in the water.

Simple functioning checks of down-hole sensors were done at every change of test section interval. Checks were also made continuously while lowering the pipe string along the borehole.

4 Description of equipment

4.1 Overview

4.1.1 Measurement container

All of the equipment needed to perform the injection tests is located in a steel container (Figure 4-1). The container is divided into two compartments; a data-room and a workshop. The container is placed on pallets in order to obtain a suitable working level in relation to the borehole casing.

The hoisting rig is of a hydraulic chain-feed type. The jaws, holding the pipe string, are opened hydraulically and closed mechanically by springs. The rig is equipped with a load transmitter and the load limit may be adjusted. The maximum load is 22 kN.

The packers and the test valve are operated hydraulically by water filled pressure vessels. Expansion and release of packers, as well as opening and closing of the test valve, is done using magnetic valves controlled by the software in the data acquisition system.

The injection system consists of a tank, a pump and a flow meter. The injection flow rate may be manually or automatically controlled. At small flow rates, a water filled pressure vessel connected to a nitrogen gas regulator is used instead of the pump.

4.1.2 Down-hole equipment

A schematic drawing of the down-hole equipment is shown in Figure 4-2. The pipe string consists of aluminium pipes of 3 m length, connected by stainless steel taps sealed with double o-rings. Pressure is measured above (P_a), within (P) and below (P_b) the test section, which is isolated by two packers. The groundwater temperature in the test section is also measured. The hydraulic connection between the pipe string and the test section can be closed or opened by a test valve operated by the measurement system.

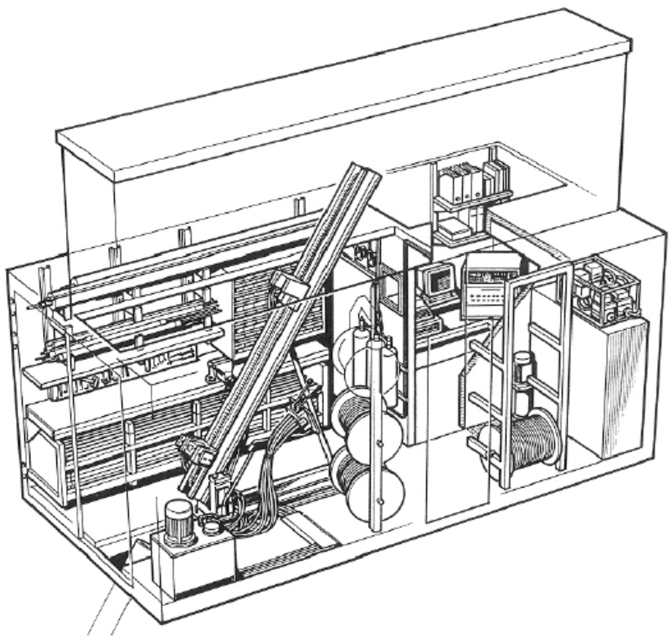

Figure 4-1. *Outline of the PSS3 container with equipment.*

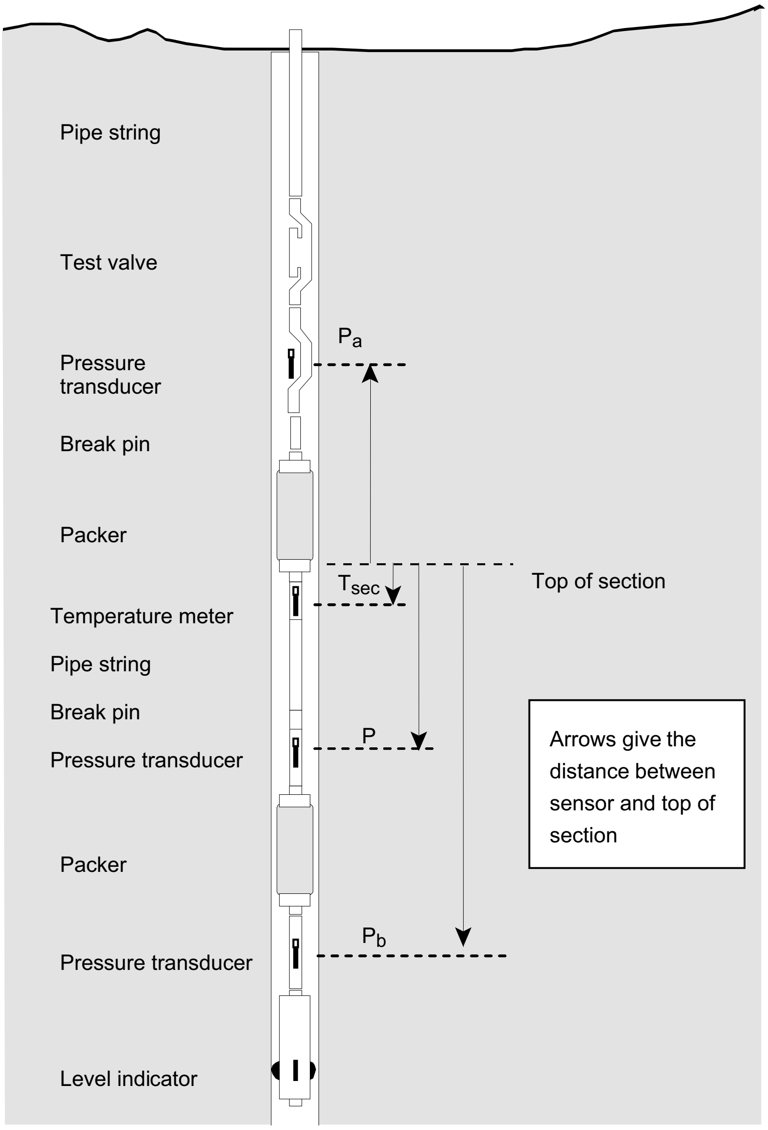

Figure 4-2. *Schematic drawing of the down-hole equipment in the PSS3 system.*

At the lower end of the borehole equipment, a level indicator (calliper type) gives a signal as the reference depth marks along the borehole are passed.

The length of the test section may be varied (5, 20 or 100 metres).

4.2 Measurement sensors

Technical data for the measurement sensors in the PSS system together with corresponding data of the system are shown in Table 4-1. The sensors are components of the PSS system. The accuracy of the PSS system may also be affected by the I/O-unit, cf. Figure 4-3, and the calibration of the system.

Table 4-1. Technical data for sensors together with estimated data for the PSS system (based on current experience).

Technical specification Parameter		Unit	Sensor	PSS	Comments
Absolute pressure	Output signal	mA	4–20		
	Meas. range	MPa	0–13.5		
	Resolution	kPa	< 1.0		
	Accuracy[1)]	% F.S	0.1		
Differential pressure, 200 kPa	Accuracy	kPa		< ±5	Estimated value
Temperature	Output signal	mA	4–20		
	Meas. range	°C	0–32		
	Resolution	°C	< 0.01		
	Accuracy	°C	±0.1		
Flow Qbig	Output signal	mA	4–20		
	Meas. range	m^3/s	$1.67·10^{–5}–1.67·10^{–3}$		The specific accuracy is depending on actual flow
	Resolution	m^3/s	$6.7·10^{–8}$		
	Accuracy[2)]	% O.R	0.15–0.3	< 1.5	
Flow Qsmall	Output signal	mA	4–20		
	Meas. range	m^3/s	$1.67·10^{–8}–1.67·10^{–5}$		The specific accuracy is depending on actual flow
	Resolution	m^3/s	$6.7·10^{–10}$		
	Accuracy[3)]	% O.R	0.1–0.4	0.5–20	

1) 0.1% of Full Scale. Includes hysteresis, linearity and repeatability.

2) Maximum error in % of actual reading (% o.r.).

3) Maximum error in % of actual reading (% o.r.). The higher numbers correspond to the lower flow.

The sensor positions are fixed relative to the top of the test section. In Table 4-2, the position of the sensors is given with top of test section as reference (Figure 4-2).

Table 4-2. Position of sensors in the borehole and displacement volume of equipment in the test section in borehole KFM10A.

Parameter	Length of test section (m) 5 (L)	(m)	20 (L)	(m)	100 (L)	(m)
Equipment displacement volume in test section [1)]	3.6		13		61	
Total volume of test section [2)]	22.6		90.3		451.3	
Position for sensor Pa, pressure above test section, (m above secup) [3)]		1.88		1.88		1.89
Position for sensor P, pressure in test section, (m above secup) [3)]		–4.13		–19.14		–99.13
Position for sensor Tsec, temperature in test section, (m above secup) [3)]		–0.99		–0.99		–0.99
Position for sensor Pb, pressure below test section, (m above secup) [3)]		–6.99		–22.00		–101.99

1) Displacement volume in test section due to pipe string, signal cable, sensors and packer ends (in litres).

2) Total volume of test section (V= section length*π*d^2/4) (in litres).

3) Position of sensor relative top of test section. A negative value indicates a position below top of test section, (secup).

4.3 Data acquisition system

The data acquisition system in the PSS equipment contains a standard office PC connected to an I/O-unit (Datascan 7320). Using the Orchestrator software, pumping and injection tests are monitored and borehole sensor data are collected. In addition to the borehole parameters, packer and atmospheric pressure, container air temperature and water temperature are logged. Test evaluation may be performed on-site after a conducted test. An external display enables monitoring of test parameters.

The data acquisition system may be used to start and stop the automatic control system (computer and servo motors). These are connected as shown in Figure 4-3. The control system monitors the flow regulator and uses differential pressure across the regulating valve together with pressure in test section as input signals.

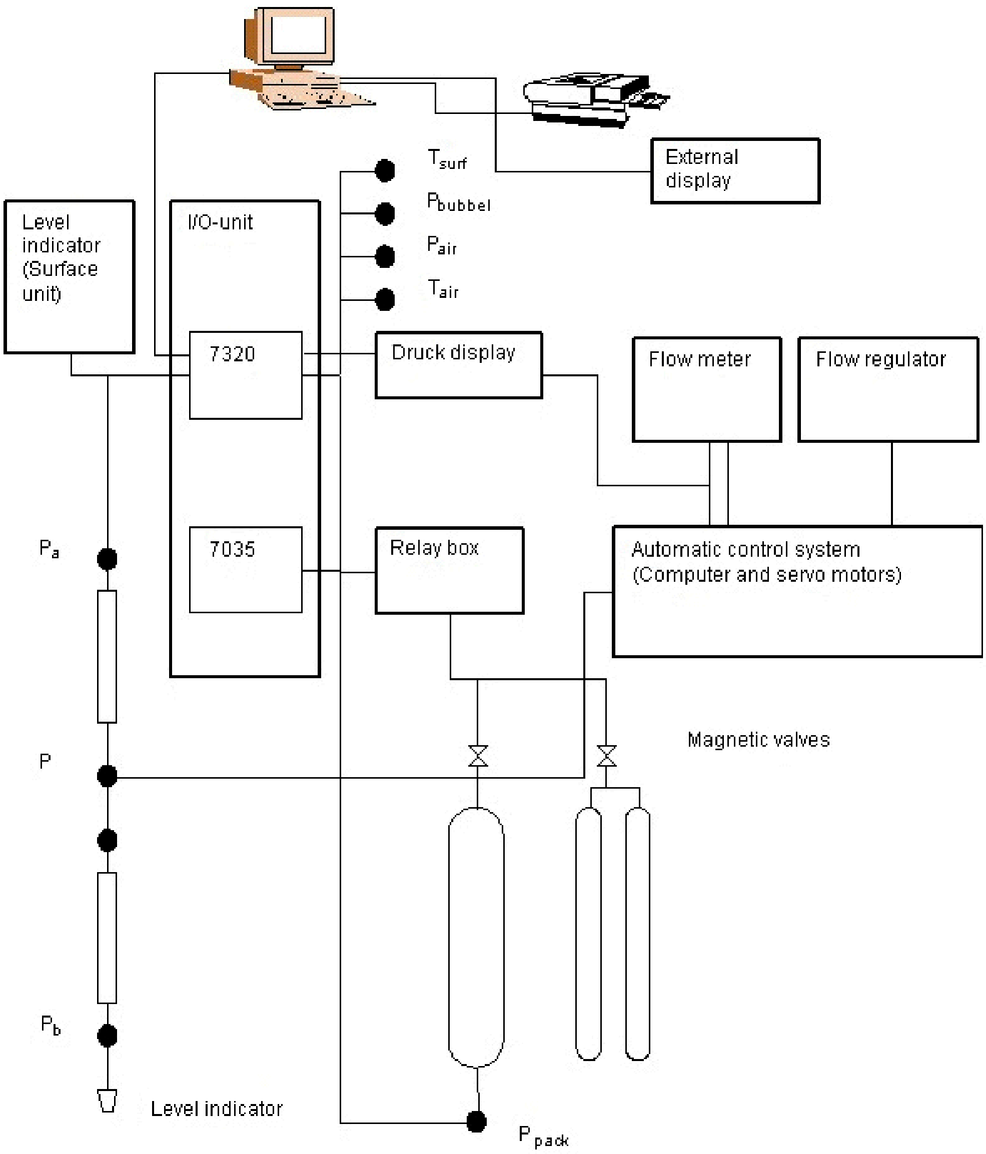

Figure 4-3. *Schematic drawing of the data acquisition system and the automatic control system in PSS.*

5 Execution

5.1 Preparation

5.1.1 Calibration

All sensors included in PSS are calibrated at the Geosigma engineering service station in Uppsala. Calibration is generally performed at least every year. Results from calibration, e.g. calibration constants, of sensors are kept in a document folder in PSS. If a sensor is replaced at the test site, calibration constants are altered as well. If a new, un-calibrated, sensor is to be used, calibration may be performed afterwards and data re-calculated.

5.1.2 Functioning checks

Equipment functioning checks were performed during the establishment of PSS at the test site. Simple function checks of down-hole sensors were done at every change of test section length, as well as while lowering the pipe string along the borehole.

5.1.3 Cleaning of equipment

Cleaning of the borehole equipment was performed according to the cleaning instruction SKB MD 600.004 (see Table 1-1), level 1.

5.2 Test performance

5.2.1 Test principle

The injection tests in KFM10A were carried out while maintaining a constant head of generally 200 kPa (20 m) in the test section. Before start of the injection period, approximately steady-state pressure conditions prevailed in the test section. After the injection period, the pressure recovery was measured.

For injection tests in KFM10A the injection phase was interrupted if the injection flow was clearly below the measurement limit. Thereafter, the recovery was measured for at least 5 minutes to verify the low conductivity of the section.

5.2.2 Test procedure

Generally, the tests were performed according to the Activity Plan AP PF 400-06-069. Exceptions to this are presented in Section 5.5.

A test cycle of a standard injection test includes the following phases: 1) Transfer of down-hole equipment to the next section, 2) Packer inflation, 3) Pressure stabilisation, 4) Injection, 5) Pressure recovery and 6) Packer deflation.

The estimated times for the various phases are presented in Table 5-1. Regarding the packer inflation times and actual injection and recovery times, slightly different procedures were used for the tests in 100 m sections compared to the tests in 20 m and 5 m sections in accordance with AP PF 400-06-069. Furthermore, slightly longer test times were used for the tests in 100 m sections, cf. Table 5-1.

Table 5-1. Packer inflation times, pressure stabilisation times and test times used for the injection tests in KFM10A.

Test section length (m)	Packer inflation time (min)	Time for pressure stabilisation (min)	Injection period (min)	Recovery period (min)	Total time/test (min)[1)]
100	30	15	30	30	105
20	25	5	20	20	70
5	25	5	20	20	70

[1)] Exclusive of trip times in the borehole.

5.2.3 Test strategy

Firstly, tests in 100 m sections were performed within the interval 62.9–462.9 m. The limits of the test sections were, as far as possible, the same as were used by the difference flow logging, to facilitate comparison of the results.

Secondly, since all 100 m sections had a definable flow rate, the 100 m sections were measured in five successive injection tests using 20 m section length. The tests in 20 m sections were carried out with the same intervals as the 100 m sections but also in the interval 462.9–492.9 m. In order to avoid cavities in the borehole some of the section limits were intentionally shifted within the original 100 m test section limits.

Finally, tests with 5 m section length were conducted in the 20 m sections which had a definable flow rate. In order to avoid cavities in the borehole some of the section limits were intentionally shifted within the original 20 m test section limits.

Since the results of the tests in 100 m sections have a strong effect on the continued test program (i.e. whether a 100 m section would be measured with shorter sections as well), it was particularly important to ensure accurate results of these tests, including sections close to the lower measurement limit.

The total number of injection tests was thus dependent on the results of the previous tests.

5.3 Data handling

With the PSS system, primary data are handled using the Orchestrator software (Version 2.3.8). During a test, data are continuously logged in *.odl-files. After the test is finished, a report file (*.ht2) with space separated data is generated. The *.ht2-file (mio-format) contains logged parameters as well as test-specific information, such as calibration constants and background data. The parameters are presented as percentage of sensor measurement range and not in engineering units. The report file in ASCII-format is the raw data file delivered to the data base SICADA.

The *.ht2-files are automatically named with borehole id, top of test section and date and time of test start (as for example _KFM10A_0062.90_200612141123.ht2). The name differs slightly from the convention stated in Instruction for analysis of injection and single-hole pumping tests, SKB MD 320.004. Using the IPPLOT software (Version 3.0), the *.ht2-files are converted to parameter files suitable for plotting using the code SKB-plot and analysis with the AQTESOLV software.

A backup of data files was created on a regular basis by CD-storage and by sending the files to the Geosigma office in Uppsala by a file transfer protocol. A file description table is presented in Appendix 1.

5.4 Analysis and interpretation

5.4.1 General

As described in Section 5.2.1, the injection tests in KFM10A were performed as transient constant head tests followed by a pressure recovery period. From the injection period, the (reciprocal) flow rate versus time was plotted in log-log and lin-log diagrams together with the corresponding derivative. From the recovery period, the pressure was plotted versus Agarwal equivalent time in lin-log and log-log diagrams, respectively, together with the corresponding derivative. The routine data processing of the measured data was done according to the Instruction for analysis of injection and single-hole pumping tests (SKB MD 320.004).

For evaluation of the test data, no corrections of the measured flow rate and absolute pressure data (e.g. due to barometric pressure variations or tidal fluctuations) have been made. For short-time single-hole tests, such corrections are generally not needed, unless very small pressure changes are applied. No subtraction of the barometric pressure from the measured absolute pressure has been made, since the length of the test periods are short relative to the time scale for barometric pressure changes. In addition, pressure differences rather than the pressure magnitudes are used by the evaluation.

5.4.2 Measurement limit for flow rate and specific flow rate

The estimated standard lower measurement limit for flow rate for injection tests with PSS is c 1 mL/min ($1.7 \cdot 10^{-8}$ m^3/s). However, if the flow rate for a test was close to, or below, the standard lower measurement limit, a test-specific estimate of the lower measurement limit of flow rate was made. The test-specific lower limit was based on the measurement noise level of the flow rate before and after the injection period. The decisive factor for the varying lower measurement limit is not identified, but it might be of both technical and hydraulic character.

The lower measurement limit for transmissivity is defined in terms of the specific flow rate (Q/s). The minimum specific flow rate corresponds to the estimated lower measurement limit of the flow rate together with the actual injection pressure during the test, see Table 5-2. The intention during this test campaign was to use a standard injection pressure of 200 kPa (20 m water column). Still, the injection pressure can be considerably different (see Section 6.2.3). An apparently low injection pressure is often the result of a test section of low conductivity due to a pressure increase, caused by packer expansion, before the injection start. A highly conductive section may also result in a low injection pressure due to limited flow capacity of PSS.

Whenever the final flow rate (Q_p) was not defined (i.e. not clearly above the measurement noise before and after the injection period), the estimated lower measurement limit for specific flow rate was based on the estimated lower measurement limit for flow rate for the specific test and a standard injection pressure of 200 kPa. This is done in order to avoid excessively high, apparent estimates of the specific flow rate for these low conductivity sections, which would have resulted if the actual pressure difference at start of injection had been used as injection pressure.

The lower measurement limits for the flow rate correspond to different values of steady-state transmissivity, T_M, depending on the section lengths used in the factor C_M in Moye's formula, as described in the Instruction for analysis of injection and single-hole pumping tests (SKB MD 320.004), see Table 5-2.

The practical upper measurement limit of hydraulic transmissivity for the PSS system is estimated at a flow rate of c 30 L/min ($5 \cdot 10^{-4}$ m^3/s) and an injection pressure of c 1 m. Thus, the upper measurement limit for the specific flow rate is $5 \cdot 10^{-4}$ m^2/s. However, the practical upper measurement limit may vary, depending on e.g. depth of the test section (friction losses in the pipe string).

Table 5-2. Estimated lower measurement limit for specific flow rate and steady-state transmissivity for different injection pressures, measurement scales and estimated lower measurement limits for flow rate for the injection tests in borehole KFM10A.

r_w (m)	L_w (m)	Q-measl-L (m^3/s)	Injection pressure (kPa)	Q/s-measl-L (m^2/s)	Factor C_M in Moye's formula	T_M-measl-L (m^2/s)
0.0379	100	1.7E–08	100	1.6E–09	1.30	2.1E–09
0.0379	100	1.7E–08	200	8.2E–10	1.30	1.1E–09
0.0379	100	1.7E–08	300	5.5E–10	1.30	7.1E–10
0.0379	100	1.2E–08	100	1.1E–09	1.30	1.5E–09
0.0379	100	1.2E–08	200	5.6E–10	1.30	7.4E–10
0.0379	100	1.2E–08	300	3.8E–10	1.30	4.9E–10
0.0379	100	5.0E–09	100	4.9E–10	1.30	6.4E–10
0.0379	100	5.0E–09	200	2.5E–10	1.30	3.2E–10
0.0379	100	5.0E–09	300	1.6E–10	1.30	2.1E–10
0.0379	20	1.7E–08	100	1.6E–09	1.05	1.7E–09
0.0379	20	1.7E–08	200	8.2E–10	1.05	8.6E–10
0.0379	20	1.7E–08	300	5.5E–10	1.05	5.7E–10
0.0379	20	1.2E–08	100	1.2E–09	1.05	1.2E–09
0.0379	20	1.2E–08	200	5.9E–10	1.05	6.2E–10
0.0379	20	1.2E–08	300	3.9E–10	1.05	4.1E–10
0.0379	20	5.0E–09	100	4.9E–10	1.05	5.1E–10
0.0379	20	5.0E–09	200	2.5E–10	1.05	2.6E–10
0.0379	20	5.0E–09	300	1.6E–10	1.05	1.7E–10
0.0379	5	1.7E–08	100	1.6E–09	0.83	1.4E–09
0.0379	5	1.7E–08	200	8.2E–10	0.83	6.8E–10
0.0379	5	1.7E–08	300	5.5E–10	0.83	4.5E–10
0.0379	5	1.2E–08	100	1.2E–09	0.83	9.7E–10
0.0379	5	1.2E–08	200	5.9E–10	0.83	4.9E–10
0.0379	5	1.2E–08	300	3.9E–10	0.83	3.2E–10
0.0379	5	5.0E–09	100	4.9E–10	0.83	4.1E–10
0.0379	5	5.0E–09	200	2.5E–10	0.83	2.0E–10
0.0379	5	5.0E–09	300	1.6E–10	0.83	1.4E–10

5.4.3 Qualitative analysis

Initially, a qualitative evaluation of actual flow regimes, e.g. wellbore storage (WBS), pseudo-linear flow regime (PLF), pseudo-radial flow regime (PRF), pseudo-spherical flow regime (PSF) and pseudo-stationary flow regime (PSS), respectively, was performed. In addition, indications of outer boundary conditions during the tests were identified. The qualitative evaluation was mainly interpreted from the log-log plots of flow rate and pressure together with the corresponding derivatives.

In particular, time intervals with pseudo-radial flow, reflected by a constant (horizontal) derivative in the test diagrams, were identified. Pseudo-linear flow may, at the beginning of the test, be reflected by a straight line of slope 0.5 or less in log-log diagrams, both for the measured variable (flow rate or pressure) and the derivative. A true spherical flow regime is reflected by a straight line with a slope of –0.5 for the derivative. However, other slopes may indicate transitions to pseudo-spherical (leaky) or pseudo-stationary flow. The latter flow regime corresponds to almost stationary conditions with a derivative approaching zero.

The interpreted flow regimes can also be described in terms of the distance from the borehole:

- **Inner zone:** Representing very early responses that may correspond to the fracture properties close to the borehole which may possibly be affected by turbulent head losses. These properties are generally reflected by the skin factor.
- **Middle zone:** Representing the first response from which it is considered possible to evaluate the hydraulic properties of the formation close to the borehole.
- **Outer zone:** Representing the response at late times of hydraulic structure(s) connected to the hydraulic feature for the middle zone. Sometimes it is possible to deduce the possible character of the actual feature or boundary and evaluate the hydraulic properties.

Due to the limited resolution of the flow meter and pressure sensor, the derivative may some times indicate a false horizontal line by the end of periods with pseudo-stationary flow. Apparent no-flow (NFB) and constant head boundaries (CHB), or equivalent boundary conditions of fractures, are reflected by an increase/decrease of the derivative, respectively.

5.4.1 Quantitative analysis

Injection tests

A preliminary steady-state analysis of transmissivity according to Moye's formula (denoted T_M) was made for the injection period for all tests in conjunction with the qualitative analysis according to the following equations:

$$T_M = \frac{Q_p \cdot \rho_w \cdot g}{dp_p} \cdot C_M \qquad (5\text{-}1)$$

$$C_M = \frac{1 + \ln\left(\frac{L_w}{2r_w}\right)}{2\pi} \qquad (5\text{-}2)$$

Q_p = flow rate by the end of the flow period (m^3/s)

ρ_w = density of water (kg/m^3)

g = acceleration of gravity (m/s^2)

C_M = geometrical shape factor (–)

dp_p = injection pressure p_p–p_i (Pa)

r_w = borehole radius (m)

L_w = section length (m)

From the results of the qualitative evaluation, appropriate interpretation models for the quantitative evaluation of the tests were selected. When possible, transient analysis was made on both the injection and recovery periods of the tests.

The transient analysis was performed using a special version of the test analysis software AQTESOLV, which enables both visual and automatic type curve matching. The quantitative transient evaluation is generally carried out as an iterative process of manual type curve matching and automatic matching. For the injection period, a model based on the Jacob and Lohman (1952) /2/ solution was applied for estimating the transmissivity and skin factor for an assumed value on the storativity when a certain period with pseudo-radial flow could be identified. The model is based on the effective wellbore radius concept to account for non-zero (negative) skin factors according to Hurst, Clark and Brauer (1969) /3/.

In borehole KFM10A, the storativity was calculated using an empirical regression relationship between storativity and transmissivity, see Equation 5-3 (Rhén et al. 1997) /4/.

$$S=0.0007 \cdot T^{0.5} \qquad (5\text{-}3)$$

S = storativity (–)

T = transmissivity (m^2/s)

Firstly, the transmissivity and skin factor were obtained by type curve matching on the data curve using a fixed storativity value of 10^{-6}, according to the instruction SKB MD 320.004. From the transmissivity value obtained, the storativity was then calculated according to Equation 5-3 and the type curve matching was repeated. In most cases the change of storativity did not significantly alter the calculated transmissivity by the new type curve matching. Instead, the estimated skin factor, which is strongly correlated to the storativity using the effective borehole radius concept, was altered correspondingly.

For transient analysis of the recovery period, a model presented by Dougherty-Babu (1984) /5/ was used when a certain period with pseudo-radial flow could be identified. In this model, a variety of transient solutions for flow in fractured porous media are available, accounting for e.g. wellbore storage and skin effects, double porosity etc. The solution for wellbore storage and skin effects is analogous to the corresponding solution presented in Earlougher (1977) /6/ based on the effective wellbore radius concept to account for non-zero (negative) skin factors. However, for tests in isolated test sections, wellbore storage are represented by a radius of a fictive standpipe (denoted fictive casing radius, r(c)) connected to the test section, cf. Equation 5-6. This concept is equivalent to calculating the wellbore storage coefficient C from the compressibility in an isolated test section according to Equation 5-5. The storativity was calculated using Equation 5-3 in the same way as described above for the transient analysis of the injection period. In addition, the wellbore storage coefficient was estimated, both from the simulated value on the fictive casing radius r(c) and from the slope of 1:1 in the log-log recovery plots.

For tests characterized by pseudo-spherical (leaky) flow or pseudo-stationary flow during the injection period, a model by Hantush (1959) /7/ for constant head tests was adopted for the evaluation. In this model, the skin factor is not separated but can be calculated from the simulated effective borehole radius according to Equation 5-4. This model also allows calculation of the wellbore storage coefficient according to Equation 5-6. In addition, the leakage coefficient K'/b' can be calculated from the simulated leakage factor r/B. The corresponding model for constant flow rate tests, Hantush (1955) /8/, was applied for evaluation of the recovery period for tests showing pseudo-spherical- or pseudo-stationary flow during this period.

$$\zeta=ln(r_w/r_{wf}) \qquad (5\text{-}4)$$

ζ = skin factor

r_w = borehole radius (m)

r_{wf} = effective borehole radius

Some tests showed fracture responses (initial slope of 0.5 or less in a log-log plot). A model for an equivalent single fracture was then used for the transient analysis as a complement to standard models for pseudo-radial flow. The model presented in Ozkan-Raghavan (1991a) /9/ and (1991b) /10/ for a uniform-flux vertical fracture embedded in a porous medium was employed. With this model the hydraulic conductivity of the rock perpendicular (K_x) and parallel (K_y) to the fracture can be estimated. In this case, the quotient K_x/K_y was assumed to be 1.0 (one). Type curve matching provided values of K_x and L_f assuming a value on the specific storativity S_s based on Equation (5-3), where L_f is the theoretical fracture length. The test section length was then used to convert K_x and S_s to transmissivity $T= K_x \cdot L$ and to storativity $S= S_s \cdot L$, respectively of the rock in analysis by fracture models. Such estimates of transmissivity from fracture models may be compared with corresponding values from models for pseudo-radial flow in the same test section.

The different transient estimates of transmissivity from the injection and recovery period, respectively, were then compared and examined. One of these was chosen as the best representative value of the transient transmissivity of the formation adjacent to the test section. This value is denoted T_T. In cases with more than one pseudo-radial flow regime during the injection or recovery period, the first one is in most cases assumed as the most representative for the hydraulic conditions in the rock close to the tested section.

Finally, a representative value of transmissivity of the test section, T_R, was chosen from T_T and T_M. The latter transmissivity is to be chosen whenever a transient evaluation of the test data is not possible or not being considered as reliable. If the flow rate by the end of an injection period (Q_p) is too low to be defined, and thus neither T_T nor T_M can be estimated, the representative transmissivity for the test section is considered to be less than T_M based on the estimated lower measurement limit for Q/s (i.e. T_R<T_M=Q/s-measl-L·C_M).

Estimated values of the borehole storage coefficient, C, based on actual borehole geometrical data and assumed fluid properties are shown in Table 5-3 together with the estimated effective C_{eff} from laboratory experiments (Ludvigson et al. 2007) /11/. The net water volume in the test section, V_w, has in Table 5-3 been calculated by subtracting the volume of equipment in the test section (pipes and thin hoses) from the total volume of the test section. For an isolated test section, the wellbore storage coefficient, C, may be calculated as by Almén et al. (1986) /12/:

$$C = V_w \cdot c_w = L_w \cdot \pi \cdot r_w^2 \cdot c_w \qquad (5\text{-}5)$$

V_w = water volume in test section (m^3)

r_w = nominal borehole radius (m)

L_w = section length (m)

c_w = compressibility of water (Pa^{-1})

When appropriate, estimation of the actual borehole storage coefficient C in the test sections was made from the recovery period, based on the early borehole response with 1:1 slope in the log-log diagrams. The coefficient C was calculated only for tests with a well-defined line of slope 1:1 in the beginning of the recovery period. In the most conductive sections, this period occurred during very short periods at early test times. The latter values may be compared with the net values of C based on geometry and the value of C_{eff} based on laboratory experiments /11/, (Table 5-3).

Furthermore, when using the model by Dougherty-Babu /5/ or Hantush /8/, a fictive casing radius, r(c), is obtained from the parameter estimation of the recovery period. This value can then be used for calculating C as by Almén et al /12/:

$$C = \frac{\pi \cdot r(c)^2}{\rho \cdot g} \qquad (5\text{-}6)$$

Although this calculation was not done regularly and the results are not presented in this report, the calculations corresponded in most cases well to the value of C obtained from the line of slope 1:1 in the beginning of the recovery period.

Table 5-3. Calculated net values of C, based on the actual geometrical properties of the borehole and equipment configuration in the test section (C_{net}) together with the effective wellbore storage coefficient (C_{eff}) for injection tests from laboratory experiments /11/.

r_w (m)	L_w (m)	Volume of test section (m^3)	Volume of equipment in section (m^3)	V_w (m^3)	C_{net} (m^3/Pa)	C_{eff} (m^3/Pa)
0.0379	100	0.451	0.061	0.390	$1.8\cdot10^{-10}$	$1.9\cdot10^{-10}$
0.0379	20	0.090	0.013	0.077	$3.6\cdot10^{-11}$	$4.3\cdot10^{-11}$
0.0379	5	0.023	0.004	0.019	$8.5\cdot10^{-12}$	$1.6\cdot10^{-11}$

The estimated values of C from the tests may differ from the net values in Table 5-3 based on geometry. For example, the effective compressibility for an isolated test section may sometimes be higher than the water compressibility due to e.g. packer compliance, resulting in increased C-values.

The radius of influence at a certain time may be estimated from Jacob's approximation of the Theis' well function, Cooper and Jacob (1946) /13/:

$$r_i = \sqrt{\frac{2.25Tt}{S}} \qquad (5\text{-}7)$$

T = representative transmissivity from the test (m^2/s)

S = storativity estimated from Equation 5-3

r_i = radius of influence (m)

t = time after start of injection (s)

If a certain time interval of pseudo-radial flow (PRF) from t_1 to t_2 can be identified during the test, the radius of influence is estimated using time t_2 in Equation 5-7. If no interval of PRF can be identified, the actual total flow time t_p is used. The radius of influence can be used to deduce the length of the hydraulic feature(s) tested.

Furthermore, an r_i-index (–1, 0 or 1) is defined to characterize the hydraulic conditions by the end of the test. The r_i-index is defined as shown below. It is assumed that a certain time interval of PRF can be identified between t_1 and t_2 during the test.

- r_i-index = 0: The transient response indicates that the size of the hydraulic feature tested is greater than the radius of influence based on the actual test time (t_2=t_p), i.e. the PRF is continuing at stop of the test. This fact is reflected by a flat derivative at this time.
- r_i-index = 1: The transient response indicates that the hydraulic feature tested is connected to a hydraulic feature with lower transmissivity or an apparent barrier boundary (NFB). This fact is reflected by an increase of the derivative. The size of the hydraulic feature tested is estimated as the radius of influence based on t_2.
- r_i-index = –1: The transient response indicates that the hydraulic feature tested is connected to a hydraulic feature with higher transmissivity or an apparent constant head boundary (CHB). This fact is reflected by a decrease of the derivative. The size of the hydraulic feature tested is estimated as the radius of influence based on t_2.

If a certain time interval of PRF cannot be identified during the test, the r_i-indices –1 and 1 are defined as above. In such cases the radius of influence is estimated using the flow time t_p in Equation 5-7.

In some tests there may be signs of pressure interference in the section above or below the test section due to a hydraulic interconnection of the sections. This kind of pressure interference may result in an overestimation of the transmissivity in the test section. If pressure interference is detected during a test, a qualitative evaluation is performed to determine if it is likely that the estimated transmissivity of the test section is overestimated or not. The qualitative evaluation includes a comparison of the injection pressure and evaluated transmissivity of the test section with the corresponding pressure interference and transmissivity of the borehole interval in which interference is observed. Furthermore, a comparison with transmissivity from tests with other section lengths is made to detect deviating results. The type of dominating flow regime in the test section may also support the qualitative evaluation whether the interference is likely to affect the evaluated transmissivity or not.

5.5 Nonconformities

The test program in KFM10A was carried out according to the Activity Plan AP PF 400-06-069 with the following exceptions:

- Five of the tests listed in Table 3-2 were not used for analysis since they were considered to provide uncertain information. The tests were re-performed when lifting the pipe string again to ensure that the section was undisturbed from the previous, failed, test. These tests were:
  - 282.9–302.9 m (test no 1)
  - 137.9–142.9 m (test no 1)
  - 302.9–307.9 m (test no 1)
  - 332.9–337.9 m (test no 1)
  - 427.9–432.9 m (test no 1)
- Due to major fractures in the borehole, some of the positions of the test sections were shifted. This resulted in some partly overlapping sections as follows:
  - 84.0–104.0 m and 102.9–122.9 m
  - 77.9–82.9 m and 79.0–84.0 m
  - 99.0–104.0 m and 102.9–107.9 m
  - 142.9–147.9 m and 145.0–150.0 m
  - 155.0–160.0 m and 157.9–162.9 m
- Major fractures in the borehole made it impossible to measure the interval 82.9–84.0 m with the 20 m test section. Since this interval was measured with 100 and 5 m test sections, this gap in the measurement was assumed to not affect the results of the tests.
- The pressure sensor in the section below the test section was out of order during the injection tests with the 100 m section. The decision to perform the 100 m tests without replacing the broken sensor was approved by the Investigation Manager. Since the pressure sensor was out of order, the lower part of the borehole, (below 462.9 m), was not measured with the 100 m section. This was due to the risk of a high pressure increase in the section below the test section during the expansion of the packers. An excessively high pressure increase may damage the equipment and without the lower pressure sensor it can not be controlled. However, the interval 462.9–492.9 m was later measured with the 20 m section.
- After 21 injection tests with the 5 m section, the pressure sensor in the section above the tests section broke down. After consulting with the Activity Manager, the remaining tests were performed without replacing the broken sensor. This applies to the 5 m section tests performed below 177.9 m in KFM10A.

6 Results

6.1 Nomenclature and symbols

The nomenclature and symbols used for the results of the injection tests in KFM10A are in accordance with the Instruction for analysis of injection and single-hole pumping tests (SKB MD 320.004). Additional symbols are explained in the text and in Appendix 5. Symbols used by the AQTESOLV software are explained in Appendix 3.

Original data from the reported activity are stored in the primary database SICADA. Data are traceable in SICADA by the Activity Plan number (AP PF 400-06-069). Only data in databases are accepted for further interpretation and modelling. The data presented in this report are regarded as copies of the original data. Data in the databases may be revised, if needed. However, such revision of the database will not necessarily result in a revision of this report.

6.2 Routine evaluation of the single-hole injection tests

6.2.1 General test data

General test data and selected pressure and flow data from all tests are listed in Appendix 2.1 and 2.2, respectively.

6.2.2 Length corrections

The down-hole equipment is supplied with a level indicator located c 3 m below the lower packer in the test section, see Figure 4-2. The level indicator transmits a signal each time a reference mark in the borehole is passed. In KFM10A, reference marks were milled into the borehole wall at approximately every 50 m.

During the injection tests in KFM10A with the PSS, length reference marks were detected as presented in Table 6-1. As seen from Table 6-1, all of the length marks of the borehole were detected, except for the 100 m reference mark which was not measured with the 100 m section since the building of the section was not finished at this level. At each detected mark, the length scale for the injection tests was adjusted according to the reported length to the reference mark.

The largest difference between the reported and measured lengths at the reference marks during the injection tests was 0.16 m, at the 400 m reference mark. The difference between two consecutive measurements over a 50 m borehole interval was 0.06 m or less in all cases. A comparison of the measurements performed with different section lengths results in a maximum difference of 0.01 m.

Since the length scale was adjusted in the field every time a reference mark was detected and since the difference between consecutive marks were small, it was not found worthwhile to make any further adjustments after the measurements, e.g. by linear interpolation between reference marks.

Table 6-1. Detected reference marks during the injection tests and after drilling in KFM10A.

Borehole length (m)	Detected during the injection tests in 100 m sections	Detected during the injection tests in 20 m sections	Detected during the injection tests in 5 m sections
100.0	No[1)]	Yes	Yes
150.0	Yes	Yes	Yes
200.0	Yes	Yes	Yes
250.0	Yes	Yes	Yes
300.0	Yes	Yes	Yes
350.0	Yes	Yes	Yes
400.0	Yes	Yes	Yes
450.0	Yes	Yes	Yes

[1)] Not detected since the building of the 100 m section was not finished at this level.

6.2.3 General results

For the injection tests, transient evaluation was conducted, whenever possible, both on the injection and recovery periods (e.g. transmissivity T_f and T_s, respectively) according to the methods described in Section 5.4.4. The steady-state transmissivity (T_M) was calculated by Moye's formula according to Equation 5-1. Injection tests with a final flow rate below the measurement limit, Q_p, or with a non-definable flow regime were only evaluated by the steady-state method. All other tests were evaluated with both transient and steady-state methods. The quantitative analysis was conducted using the AQTESOLV software. A summary of the results of the routine evaluation of the injection tests can be seen in Table 6-2.

The dominating transient flow regimes during the injection and recovery periods, as interpreted from the qualitative test evaluation, are listed in Table 6-2 and further commented on in Section 6.2.4. The transmissivity considered as the most reliable from the transient evaluation of the flow- and recovery periods of the tests was selected as T_T, see Table 6-2.

For 53 out of 68 tests with a definable final flow rate in KFM10A, the transient evaluation of the injection period was considered to give the most representative transient transmissivity value. The corresponding number for the recovery period was 11. Several of the responses during the recovery period were strongly influenced by wellbore storage effects. On the other hand, during the injection period a certain time interval with pseudo-radial flow could, in about 70% of the tests, be identified. Consequently, standard methods for single-hole tests with wellbore storage and skin effects were commonly used for the routine evaluation of the tests. The approximate start and stop times of the pseudo-radial flow regime used for the transient evaluation are also listed in Table 6-2.

For those tests where transient evaluation was not possible or not considered representative, T_M was chosen as the representative transmissivity value, T_R. In 4 out of 68 tests with a definable final flow rate in KFM10A the steady-state transmissivity, T_M, was chosen as the most representative value. If the final flow rate Q_p was below the actual test-specific measurement limit, the representative transmissivity value was assumed to be less than the estimated T_M, based on Q/s-measl-L.

The estimated standard lower measurement limit for flow rate for injection tests with PSS is c 1 mL/min ($1.7 \cdot 10^{-8}$ m^3/s). However, for approximately 41% of the injection tests in KFM10A, the final flow rate was close to, or below, the standard lower measurement limit. Hence a test-specific estimate of the lower measurement limit of flow rate was made which ranged from $3.6 \cdot 10^{-9}$ m^3/s to $7.6 \cdot 10^{-9}$ m^3/s. The lower measurement limit for transmissivity is defined in terms of the specific flow rate (Q/s), and the overall estimated test specific lower measurement limit for the specific flow rate in KFM10A ranged from $1.6 \cdot 10^{-10}$ m^2/s to $3.4 \cdot 10^{-10}$ m^2/s (see Section 5.4.2).

Selected test diagrams are presented in Appendix 3. In general, one linear diagram showing the entire test sequence together with lin-log and log-log diagrams from the injection and recovery periods, respectively, are presented for the injection tests. The quantitative analysis was performed from such diagrams using the AQTESOLV software. From injection tests with a flow rate below the estimated lower measurement limit for the specific test, only the linear diagram is presented. The results of the routine evaluation of the tests in borehole KFM10A are also compiled in appropriate tables in Appendix 5 to be stored in the SICADA database.

For a few tests, a type curve fit is displayed in the diagrams in Appendix 3 despite the fact that the estimated parameters from the fit are judged as ambiguous or non-representative and not included in the result tables in SICADA. For these tests, the type curve fit is presented as an example, e.g. to illustrate that an assumption of pseudo-radial flow regime is not justified for the test and some other flow regime is dominating or, alternatively, to show one possible fit in the case of unambiguous evaluation. For example, for test responses showing only wellbore storage or no flow boundary response, no unambiguous transient evaluation is possible.

Some of the tests in KFM10A showed unusual responses when tested. They demonstrate initial pseudo-radial flow (PRF) transitioning to flow in an apparent no-flow boundary, followed by slow and limited pressure recovery after the stop of the injection. These tests indicate a flow in fractures of limited extension or decreasing aperture away from the borehole.

Between 62.85 and 145.00 m there is a deformation zone (DZ1) according to the geological single- hole interpretation, Carlsten et al. (2006) /14/. In the borehole interval c 68–123 m located within DZ1 the dominating flow regime during the injection period was PRF associated with calculated high positive skin factors. These values of the skin factor are assumed to be representative in this case rather than caused by higher flow dimensions. However, significant hydraulic interconnection between test sections in this borehole interval was observed, see comments on the tests. The high skin factors may possibly reflect the hydraulic interaction despite that the dominating flow regime still is interpreted as pseudo-radial. Alternatively, the high skin factors may possibly be caused by turbulent flow in high-transmissivity fractures within this borehole interval. After stop of injection, a fast pressure recovery was observed in this interval rapidly approaching a pseudo-steady state (PSS).

In Figure 6-1, a comparison of calculated transmissivities in 5 m sections from steady-state evaluation (T_M) and transmissivity values from the transient evaluation (T_T) is shown. The agreement between the two populations is good. Steady-state analysis of transmissivity according to Moye's formula (denoted T_M) may slightly overestimate the transmissivity if steady-state conditions do not prevail in the borehole. In addition, skin effects (both positive and negative) may cause discrepancies between transient and steady-state evaluation. For example, a test showing a strong negative skin factor (fracture response) with an interpreted PLF from the transient evaluation of the injection period may result in a much higher (c one order of magnitude) steady-state transmissivity. For low values of transmissivity, discrepancies in transmissivity may also occur due to the definition of the lower measurement limit in transient and steady-state evaluation, respectively. In the latter evaluation the measurement limit is based on the test-specific flow rate while in transient evaluation, the transmissivity is based on the change of the (inverse) flow rate during the injection period.

In cases where apparent no-flow boundaries appear at the end of the injection period and transient evaluation is performed on the early part of the data curve, the steady-state transmissivity T_M may be low in comparison with the transient estimate of transmissivity. In this case, two different zones of the bedrock are measured during the early and late parts of the injection period, respectively.

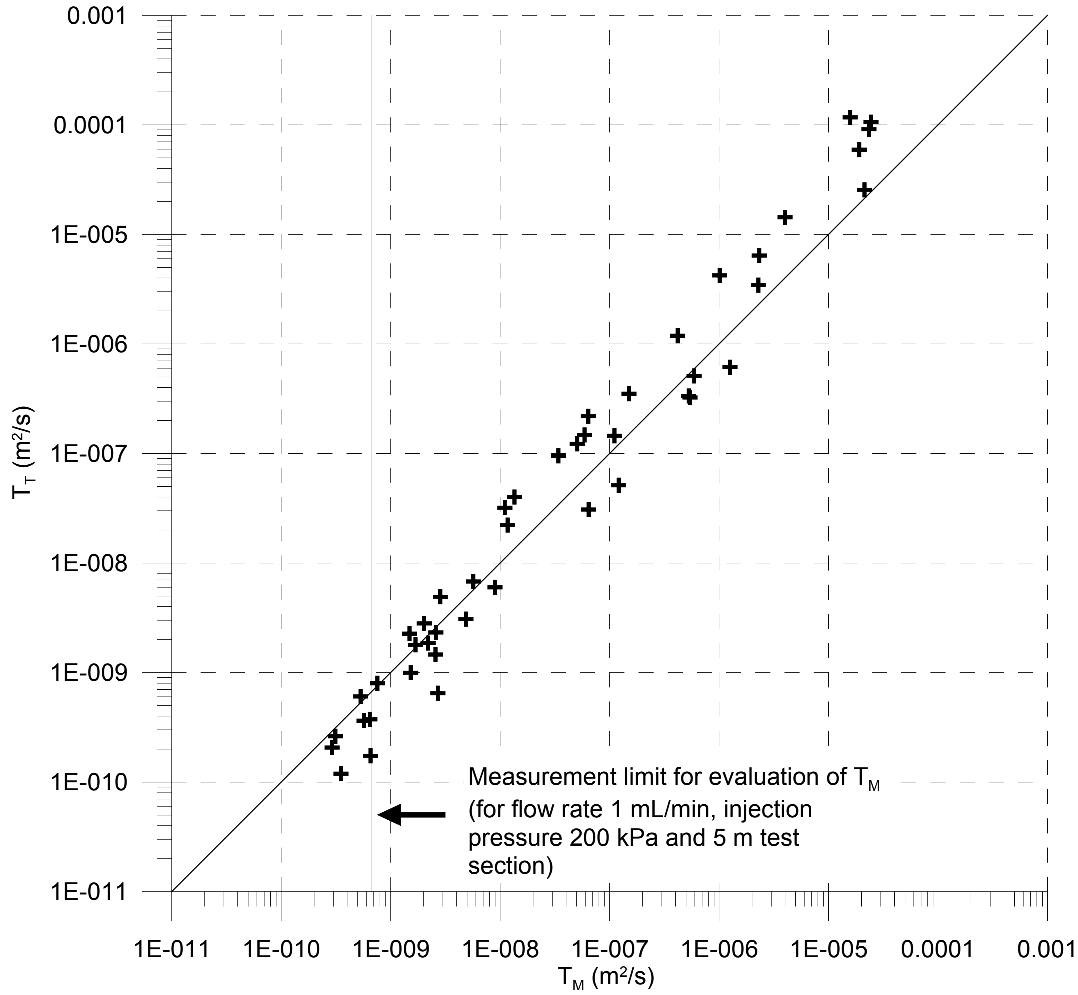

Figure 6-1. *Estimated transmissivities in 5 m sections from steady-state (T_M) and transient (T_T) evaluation for the injection tests in KFM10A.*

The lower standard measurement limit of steady-state transmissivity in 5 m sections based on a flow rate of 1 mL/min and an injection pressure of 20 m is indicated in Figure 6-1. However, for some test sections in KFM10A, the actual injection pressure was considerably different, as previously denoted in Section 5.4.2. The highest injection pressure during the tests in KFM10A was 25.8 m, and for three of the tests the injection pressure was below 10 m in the transient evaluation.

The wellbore storage coefficient, C, was calculated from the straight line with a unit slope in the log-log diagrams from the recovery period, see Table 6-2. The coefficient C was only calculated for tests with a well-defined line of unit slope in the beginning of the recovery period. In the most conductive sections, this period occurred during very short intervals at very early times and is not visible in the diagrams. In sections with a very low transmissivity, the estimates of C may be uncertain due to difficulties in defining an accurate time for the start of the recovery period. Furthermore, the resolution of the pressure sensors causes the recovery to be quite scattered in sections of low transmissivity. The values of C presented in Table 6-2 may

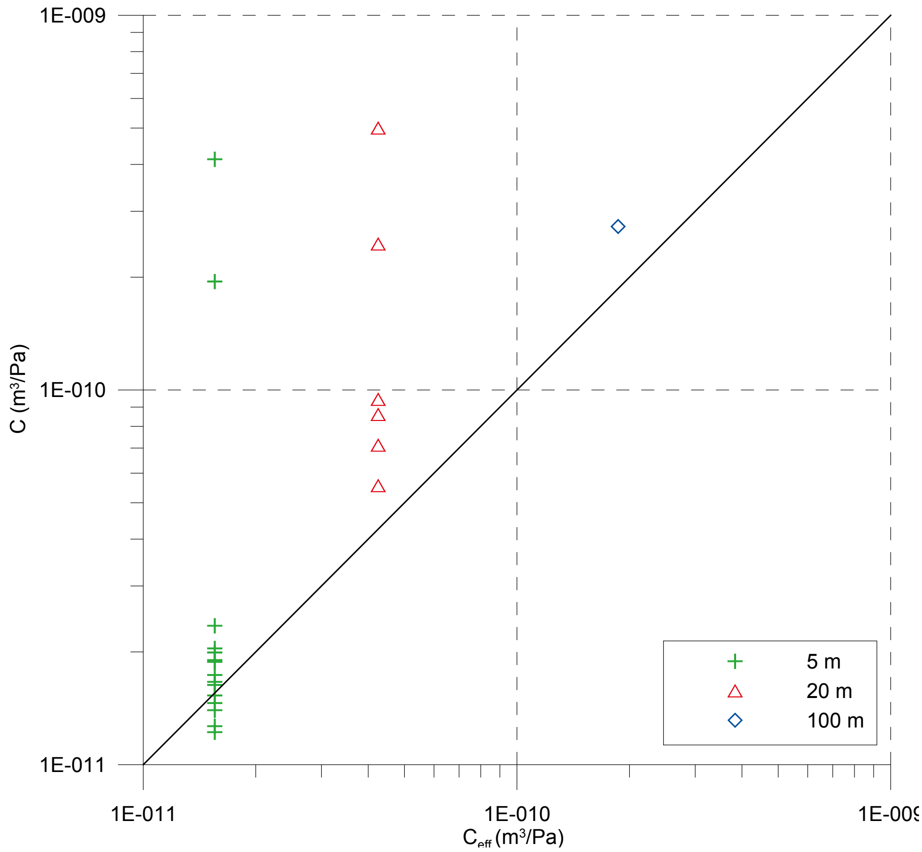

Figure 6-2. *The wellbore storage coefficient calculated from the straight line with a unit slope in the log-log diagrams from the recovery period, C, compared to the wellbore storage coefficient obtained from laboratory experiments, C_{eff}.*

be compared with the net values of C, C_{net} (based on geometry) and the value of C obtained from laboratory experiments, C_{eff} /11/, both found in Table 5-3. Figure 6-2 shows a comparison between the C values calculated from the straight line with a unit slope in the log-log diagrams from the recovery period and the C values obtained from laboratory experiments, $C_{eff.}$

The number of injection tests with a well-defined line of unit slope from which it was possible to calculate C was 1 out of 4 tests with a definable Q_p, when using the 100 m test section. The corresponding numbers for the 20 m tests were 6 out of 17, and for the 5 m tests; 15 out of 47. Table 6-2 and Figure 6-2 shows that the calculated C-values from the tests tend to be slightly higher than the C values obtained from laboratory experiments, $C_{eff..}$ The higher C-values observed in the tests may partly be explained by the compressibility contribution of the rock formation and water in good hydraulic connection (i.e. open fractures or cavities) with the section and partly by uncertainties in the determination of C from the tests.

When constructing 95% confidence intervals (using a t-distribution) from calculated values of C from the tests, the values of C listed in Table 5-3 are within these confidence intervals with 20 m and 5 m section length. The wellbore storage coefficient was also calculated from the simulation of the recovery responses in AQTESOLV based on the estimated radius of the fictive standpipe, r(c), to the test section according to Equation 5-6.

Table 6-2. Summary of the routine evaluation of the single-hole injection tests in borehole KFM10A.

Secup (m)	Seclow (m)	Test start YYYY-MM-DD hh:mm	b (m)	Flow regime [1] injection	Recovery	T_M (m²/s)	T_f (m²/s)	T_s (m²/s)	T_T (m²/s)	T_R [2] (m²/s)	ξ (–)	t_1 (s)	t_2 (s)	dte_1 (s)	dte_2 (s)	C (m³/Pa)	r_i (m)	r_i-index (–)
62.90	162.90	2006-12-14 11:23	100.0	PRF	PRF	1.37E–04	1.39E–04	1.80E–04	1.39E–04	1.39E–04	–0.58	200	1,801	20	1,000		261.11	0
162.90	262.90	2006-12-14 15:59	100.0	PLF/PRF	WBS->PLF/PRF	4.49E–09		1.16E–09	1.16E–09	1.16E–09	–5.60					2.73E–10	13.98	1
262.90	362.90	2006-12-15 09:55	100.0	PLF/PRF->NFB	(WBS)->PLF/PRF	2.05E–06		7.89E–07	7.89E–07	7.89E–07	–6.77						71.90	1
362.90	462.90	2006-12-15 13:33	100.0	PSF	(WBS)->PRF	3.44E–05	2.57E–05	5.02E–05	2.57E–05	2.57E–05	–1.98			30	1,000		171.08	–1
62.90	82.90	2006-12-19 12:53	20.0	PSF	WBS->PSS	4.54E–06	5.19E–06		5.19E–06	5.19E–06	–0.02						93.94	–1
84.00	104.00	2006-12-20 13:05	20.0	PRF	PRF	9.07E–05	1.67E–04	1.94E–04	1.67E–04	1.67E–04	3.38	300	1,208	30	700		224.00	0
102.90	122.90	2006-12-20 14:59	20.0	PSF	PRF?	2.06E–05	3.32E–05		3.32E–05	3.32E–05	2.92						149.58	–1
122.90	142.90	2006-12-20 17:03	20.0	PRF	WBS->	3.01E–09	1.59E–09	1.71E–09	1.59E–09	1.59E–09	–2.44	50	1,220			7.13E–11	12.51	0
142.90	162.90	2006-12-21 09:42	20.0	PRF	WBS->(PRF)	8.62E–09	4.20E–09	5.14E–09	4.20E–09	4.20E–09	–2.87	100	1,220			8.61E–11	15.94	0
162.90	182.90	2006-12-21 11:13	20.0	PRF->NFB	WBS->PRF(->NFB)	4.44E–09	3.33E–09	2.70E–09	3.33E–09	3.33E–09	–2.43	10	100	200	700		4.31	1
182.90	202.90	2006-12-21 13:41	20.0	–	–	<2.00E–10				<2.00E–10							–	–
202.90	222.90	2006-12-21 14:48	20.0	–	–	<3.31E–10				<3.31E–10							–	–
222.90	242.90	2006-12-21 15:49	20.0	PLF->NFB	PLF->	4.84E–10	1.31E–09	8.22E–10	8.22E–10	8.22E–10	–5.09						10.61	1
242.90	262.90	2006-12-22 09:02	20.0	–	–	<2.55E–10				<2.55E–10							–	–
262.90	282.90	2006-12-22 10:13	20.0	PLF->NFB	WBS->PRF->(NFB)	8.59E–09	5.08E–09	8.23E–09	8.23E–09	8.23E–09	–3.26	20	100	50	800	9.45E–11	15.27	1
282.90	302.90	2007-01-04 10:36	20.0	NFB	PLF->	1.44E–07		1.41E–07	1.41E–07	1.41E–07	–7.22						38.09	1
302.90	322.90	2007-01-02 08:29	20.0	PLF->PRF?	PLF->PRF?	1.70E–06	2.19E–07	7.09E–07	7.09E–07	7.09E–07							57.24	1
322.90	342.90	2007-01-02 10:26	20.0	PLF/PRF	WBS->PLF/PRF	7.27E–07	1.16E–07	1.22E–07	1.22E–07	1.22E–07	–6.72						36.82	1
342.90	362.90	2007-01-02 12:46	20.0	PSF	WBS->	1.14E–08	2.85E–09	4.00E–09	2.85E–09	2.85E–09	–4.20			300	900	5.01E–10	14.49	–1
362.90	382.90	2007-01-02 14:21	20.0	PSF	WBS->PSF?	1.52E–08	3.07E–09		3.07E–09	3.07E–09	–4.11					2.46E–10	14.77	–1
382.90	402.90	2007-01-02 15:58	20.0	–	–	<2.55E–10				<2.55E–10							–	–
402.90	422.90	2007-01-03 08:57	20.0	–	–	<1.88E–10				<1.88E–10							–	–
422.90	442.90	2007-01-03 10:03	20.0	PSF	(WBS)->PRF	2.75E–05	1.46E–05	5.02E–05	1.46E–05	1.46E–05	–4.16			50	700		121.40	–1
442.90	462.90	2007-01-03 11:39	20.0	PRF	WBS->PSF?	2.72E–09	2.59E–09	2.32E–09	2.59E–09	2.59E–09	0.19	200	1,224			5.56E–11	14.15	0
462.90	482.90	2007-01-03 14:06	20.0	PRF->PSF	PRF->PSF	8.04E–08	2.20E–08	3.66E–08	2.20E–08	2.20E–08	–4.44	80	300	80	300		11.96	–1
472.90	492.90	2007-01-03 15:38	20.0	PRF->PSF	PRF->(PSF)	9.73E–07	6.10E–07	7.13E–07	6.10E–07	6.10E–07	–3.05	100	800	100	400		44.81	–1
62.90	67.90	2007-01-05 13:55	5.0	PRF->PSF	WBS->PSS	8.98E–09	6.01E–09	4.48E–09	6.01E–09	6.01E–09	–1.95						17.45	0
67.90	72.90	2007-01-05 15:24	5.0	PRF/PSF	WBS->PSS	1.50E–07	3.51E–07	2.13E–07	3.51E–07	3.51E–07	5.24						48.02	0
72.90	77.90	2007-01-08 08:35	5.0	PRF?	WBS->PSS	1.01E–06	4.22E–06	3.85E–06	4.22E–06	4.22E–06	13.73	100	1,218				89.04	0
77.90	82.90	2007-01-08 10:00	5.0	PSF	WBS->PSS	2.29E–06	3.45E–06	3.48E–06	3.45E–06	3.45E–06	0.56						85.27	–1

Secup (m)	Seclow (m)	Test start YYYY-MM-DD hh:mm	b (m)	Flow regime [1] injection	Recovery	T_M (m²/s)	T_f (m²/s)	T_s (m²/s)	T_T (m²/s)	T_R [2] (m²/s)	ξ (–)	t_1 (s)	t_2 (s)	dte_1 (s)	dte_2 (s)	C (m³/Pa)	r_i (m)	r_i-index (–)
79.00	84.00	2007-01-08 11:20	5.0	PSF	WBS->PSS	2.32E–06	6.41E–06	6.36E–06	6.41E–06	6.41E–06	6.74						99.44	–1
84.00	89.00	2007-01-08 13:46	5.0	PRF?	(WBS)->PRF?	2.45E–05	1.06E–04	1.82E–04	1.06E–04	1.06E–04	13.93	300	1,217	50	700		199.32	0
89.00	94.00	2007-01-08 15:13	5.0	PRF?	(WBS)->PRF?	2.34E–05	9.13E–05		9.13E–05	9.13E–05	11.69	200	1,210				193.58	0
94.00	99.00	2007-01-08 16:41	5.0	PRF?	PSS?	4.00E–06	1.43E–05		1.43E–05	1.43E–05	10.51	100	1,209				121.34	0
99.00	104.00	2007-01-08 18:07	5.0	PRF?	PRF?	1.58E–05	1.17E–04		1.17E–04	1.17E–04	29.99	300	1,206				204.26	0
102.90	107.90	2007-01-08 19:39	5.0	PSF	PRF?	1.91E–05	5.93E–05	1.50E–04	5.93E–05	5.93E–05	8.13			20	700		173.06	–1
107.90	112.90	2007-01-09 07:34	5.0	PRF?	WBS->PSS	1.35E–08	4.01E–08		4.01E–08	4.01E–08	8.70	150	1,221				27.79	0
112.90	117.90	2007-01-09 09:05	5.0	PRF	WBS->PSS	5.06E–08	1.23E–07		1.23E–07	1.23E–07	6.44	100	1,223				36.75	0
117.90	122.90	2007-01-09 10:45	5.0	PRF	WBS->PRF?	5.90E–08	1.48E–07		1.48E–07	1.48E–07	5.97	80	1,218				38.49	0
122.90	127.90	2007-01-09 13:06	5.0	PRF->NFB	WBS->	7.59E–10	8.00E–10		8.00E–10	8.00E–10	–0.42	20	300			1.46E–11	5.22	1
127.90	132.90	2007-01-10 08:23	5.0	–	–	<2.02E–10				<2.02E–10							–	–
132.90	137.90	2007-01-10 09:31	5.0	PLF	WBS->PLF	6.56E–10	1.74E–10	2.85E–11	1.74E–10	1.74E–10	–4.19					1.88E–11	7.20	1
137.90	142.90	2007-01-23 10:51	5.0	PRF/PSF	WBS->	3.52E–10	1.20E–10	2.59E–10	1.20E–10	1.20E–10	–3.57	10	1,230			1.53E–11	6.58	0
142.90	147.90	2007-01-10 12:51	5.0	PRF	PRF(->PSF)	4.87E–09	3.08E–09	3.30E–09	3.08E–09	3.08E–09	–2.82	150	1,220	30	400		14.75	0
145.00	150.00	2007-01-10 14:16	5.0	PRF	WBS->	3.13E–10	2.62E–10	1.26E–10	2.62E–10	2.62E–10	–1.03	20	1,222			1.63E–11	7.90	0
150.00	155.00	2007-01-10 15:51	5.0	–	–	<2.06E–10				<2.06E–10							–	–
155.00	160.00	2007-01-11 08:27	5.0	–	–	<2.06E–10				<2.06E–10							–	–
157.90	162.90	2007-01-11 09:20	5.0	–	–	<2.06E–10				<2.06E–10							–	–
162.90	167.90	2007-01-11 10:17	5.0	PRF->NFB	WBS->NFB	2.03E–09	2.82E–09	3.60E–09	2.82E–09	2.82E–09	–0.22	25	150			2.04E–11	5.06	1
167.90	172.90	2007-01-11 12:36	5.0	PRF	WBS->	6.47E–10	3.75E–10	5.93E–10	3.75E–10	3.75E–10	–2.55	10	1,222			1.74E–11	8.64	0
172.90	177.90	2007-01-11 14:09	5.0	PRF->NFB	WBS->(PRF)->NFB	1.49E–09	2.27E–09	1.74E–09	2.27E–09	2.27E–09	–1.12	15	50			1.90E–11	2.77	1
177.90	182.90	2007-01-11 15:37	5.0	–	–	<2.02E–10				<2.02E–10							–	–
262.90	267.90	2007-01-12 08:40	5.0	–	–	<2.53E–10				<2.53E–10							–	–
267.90	272.90	2007-01-12 09:35	5.0	PRF->NFB	WBS->PRF	2.59E–09	2.33E–09	6.46E–09	2.33E–09	2.33E–09	–4.13	25	70	50	700		3.29	1
272.90	277.90	2007-01-12 11:02	5.0	PRF->NFB	WBS->(PSF)->NFB?	2.85E–09	4.92E–09	2.33E–09	4.92E–09	4.92E–09	2.01	10	400			2.35E–11	9.50	1
277.90	282.90	2007-01-12 13:01	5.0	–	–	<2.36E–10				<2.36E–10							–	–
282.90	287.90	2007-01-12 14:10	5.0	–	–	<2.36E–10				<2.36E–10							–	–
287.90	292.90	2007-01-12 15:11	5.0	–	–	<2.36E–10				<2.36E–10							–	–
292.90	297.90	2007-01-12 16:05	5.0	–	–	<2.58E–10				<2.58E–10							–	–
297.90	302.90	2007-01-15 08:31	5.0	NFB	PLF->	1.11E–07		1.45E–07	1.45E–07	1.11E–07	–7.19						36.24	1
302.90	307.90	2007-01-22 16:53	5.0	PRF/PSF->NFB	PSF->NFB	1.11E–08	3.20E–08	3.16E–08	3.20E–08	3.20E–08	7.89						26.50	1

Secup (m)	Seclow (m)	Test start YYYY-MM-DD hh:mm	b (m)	Flow regime [1] injection	Recovery	T_M (m²/s)	T_f (m²/s)	T_s (m²/s)	T_T (m²/s)	T_R [2] (m²/s)	ξ (–)	t_1 (s)	t_2 (s)	dte_1 (s)	dte_2 (s)	C (m³/Pa)	r_i (m)	r_i-index (–)
307.90	312.90	2007-01-15 11:27	5.0	NFB?	PLF->	3.41E–08		9.51E–08	9.51E–08	3.41E–08	–6.30						26.99	1
312.90	317.90	2007-01-15 13:45	5.0	PLF	PLF->(PRF)	1.26E–06		6.14E–07	6.14E–07	6.14E–07	–6.61						55.18	0
317.90	322.90	2007-01-15 15:11	5.0	PRF	WBS->PRF	6.38E–08	2.19E–07	2.83E–07	2.19E–07	2.19E–07	10.70	80	1,223				42.46	0
322.90	327.90	2007-01-15 16:39	5.0	PRF->NFB	PRF->NFB	5.28E–07	3.35E–07	8.36E–07	3.35E–07	3.35E–07	–4.75	30	150	20	100		16.71	1
327.90	332.90	2007-01-16 09:34	5.0	PRF->NFB	WBS->(PRF)->NFB	5.43E–07	3.24E–07	7.19E–07	3.24E–07	3.24E–07	–4.56	50	300	60	100		23.43	1
332.90	337.90	2007-01-22 15:18	5.0	PLF->PRF?	PLF	1.21E–07	2.00E–08	5.14E–08	5.14E–08	5.14E–08	–7.40						29.52	1
337.90	342.90	2007-01-16 13:01	5.0	->(PRF)	WBS->PRF	2.58E–09	6.01E–10	1.47E–09	1.47E–09	1.47E–09	–3.48			100	900		10.52	0
342.90	347.90	2007-01-16 14:37	5.0	PSF	WBS->	2.70E–09	6.48E–10		6.48E–10	6.48E–10	–4.69					4.13E–10	10.04	–1
347.90	352.90	2007-01-16 16:10	5.0	–	–	<2.02E–10				<2.02E–10							–	–
352.90	357.90	2007-01-17 08:29	5.0	PRF	WBS->PRF	5.70E–09	6.79E–09	1.74E–08	6.79E–09	6.79E–09	–0.02	30	1,224				17.82	0
357.90	362.90	2007-01-17 09:57	5.0	–	–	<2.09E–10				<2.09E–10							–	–
362.90	367.90	2007-01-17 10:58	5.0	–	–	<2.02E–10				<2.02E–10							–	–
367.90	372.90	2007-01-17 13:11	5.0	PSF->PSS	WBS->PSF	1.53E–09	9.96E–10		9.96E–10	9.96E–10	–1.21					1.99E–11	11.17	–1
372.90	377.90	2007-01-17 14:41	5.0	PSF->PSS	WBS->	8.95E–09				8.95E–09						1.95E–10	19.32	–
377.90	382.90	2007-01-17 16:12	5.0	NFB?	PLF	2.44E–10				2.44E–10							7.86	–
422.90	427.90	2007-01-18 08:48	5.0	–	–	<2.02E–10				<2.02E–10							–	–
427.90	432.90	2007-01-22 13:06	5.0	PRF->PSF	PRF	2.13E–05	2.55E–05	4.42E–05	2.55E–05	2.55E–05	–1.75	100	300	100	700		69.77	–1
432.90	437.90	2007-01-18 11:19	5.0	PRF->NFB	PSS	4.18E–07	1.19E–06		1.19E–06	1.19E–06	6.61	100	700				49.52	1
437.90	442.90	2007-01-18 13:34	5.0	PRF	PSS	1.17E–08	2.23E–08		2.23E–08	2.23E–08	3.18	100	1,220				23.99	0
442.90	447.90	2007-01-18 15:12	5.0	PRF	WBS->NFB?	1.69E–09	1.79E–09	4.98E–09	1.79E–09	1.79E–09	–0.25	20	1,225			1.66E–11	12.78	0
447.90	452.90	2007-01-18 16:42	5.0	–	–	<2.02E–10				<2.02E–10							–	–
452.90	457.90	2007-01-19 08:18	5.0	PRF	WBS->	2.92E–10	1.48E–10	2.07E–10	2.07E–10	2.07E–10	–1.69	20	1,226			1.22E–11	7.51	–1
457.90	462.90	2007-01-19 09:42	5.0	–	–	<2.02E–10				<2.02E–10							–	–
462.90	467.90	2007-01-19 10:30	5.0	PRF	WBS->PSF	5.33E–10	6.05E–10	5.01E–10	6.05E–10	6.05E–10	0.58	20	1,231			1.27E–11	9.74	0
467.90	472.90	2007-01-19 12:28	5.0	PLF->NFB	PLF	2.20E–09	1.86E–09	5.25E–10	1.86E–09	1.86E–09	–4.60	10	60		2,400		2.88	1
472.90	477.90	2007-01-19 13:54	5.0	–	–	<2.35E–10				<2.35E–10							–	–
477.90	482.90	2007-01-19 14:48	5.0	PRF->PSF	PRF->PSF	6.44E–08	3.09E–08	5.73E–08	3.09E–08	3.09E–08	–3.74	30	150	20	250		9.20	–1
482.90	487.90	2007-01-22 08:26	5.0	PRF->(PSF)	PRF->(PSF)	5.91E–07	5.10E–07	6.61E–07	5.10E–07	5.10E–07	–0.53	50	500	100	400		33.88	–1
487.90	492.90	2007-01-22 09:53	5.0	PRF?	WBS->	5.72E–10	3.64E–10	7.33E–10	3.64E–10	3.64E–10	–1.66	40	700			1.40E–11	6.55	–1

[1] The acronyms in the column "Flow regime" are as follows: wellbore storage (WBS), pseudo-linear flow (PLF), pseudo-radial flow (PRF), pseudo-spherical flow (PSF), pseudo-stationary flow (PSS) and apparent no-flow boundary (NFB). The flow regime definitions are further discussed in Section 5.4.3 above.

[2] For the tests where Q_p was not detected, T_R was assumed to be less than T_M based on the estimated Q/s-measl-L

6.2.4 Comments on the tests

Short comments on each test follow below. Tests were performed within the interval 62.9–492.9 m in KFM10A. Flow regimes and hydraulic boundaries, as discussed in Section 5.4.3, are in the text referred to as:

WBS = Wellbore storage

PRF = Pseudo-radial flow regime

PLF = Pseudo-linear flow regime

PSF = Pseudo-spherical flow regime

PSS = Pseudo-stationary flow regime

NFB = No-flow boundary

CHB = Constant-head boundary

62.9–162.9 m

A clear PRF can be seen in both the injection- and recovery period. The Hurst-Clark-Brauer model for the injection period and the Dougherty-Babu model for the recovery period provide consistent results. The transmissivity value from the injection period is regarded as the most representative.

162.9–262.9 m

Due to an unfortunate change between pressure regulating valves, the injection pressure increased by the end of the injection period. The pressure drift caused an increasing trend in the derivative that may not be representative for the rock formation. Hence the data, especially the flow derivative during the injection period are quite scattered. A possible intermediate between a PLF and PRF may be interpreted during the injection period, though no unambiguous transient evaluation of the injection period is possible. A possible transient evaluation is shown as an example. The recovery period is dominated by initial WBS which subsequently transitions into an intermediate between a PLF and a PRF. The transmissivity value from the recovery period is considered as the most representative.

262.9–362.9 m

During the beginning of the injection period an intermediate between a PLF and a PRF is indicated possibly transitioning to an apparent NFB by the end. Due to an unfortunate change between pressure regulating valves, the injection pressure increased by the end of the period. Hence the data, especially the flow derivative, are quite scattered. No unambiguous transient evaluation of the injection period is possible and therefore only an example of analysis is shown in the appendix. The recovery period displays initial WBS which is then transitioning to an intermediate between a PLF and a PRF. The total pressure recovery is only c 7 m of the applied injection pressure of c 19 m which may indicate a flow feature of limited extent or alternatively, a decreasing aperture away from the borehole. The transient evaluation from the recovery period is chosen as representative for this section.

362.9–462.9 m

The injection period is dominated by a PSF and the model by Hantush shows a good type curve fit. The recovery period shows an initial transition period from WBS to an approximate PRF throughout the period. Since the test valve did not close as intended, the transient evaluation from the injection period is regarded as the most representative in this test section.

62.9–82.9 m

The injection period is dominated by a PSF. The flattening out of the flow rate derivative at intermediate times may possibly depend on a small increase of the flow rate after c 350 s. The pressure recovery is fast and approaching a PSS, preceded by a short period of WBS. No unambiguous transient evaluation is possible on the recovery period. An example of analysis is shown in the appendix assuming the same value on r/B as was obtained from the injection period. The transient evaluation of the injection period is chosen as representative for this section.

84.0–104.0 m

This test section has a high transmissivity. The injection period begins with a transition towards a PRF after c 300 s lasting for the rest of the period. The recovery period is dominated by a PRF throughout the period. Transient evaluation of the injection period was made with a model by Hurst-Clark-Brauer and it is supported by the stationary transmissivity as well as the transient evaluation of the recovery period. Hence, the transient evaluation from the injection period was chosen as representative for this section. The pressure in the section below the test section increased c 5.9 kPa during the injection period. Since the transmissivity in the section below is in the same order of magnitude as the transmissivity in the section 84.0–104.0, this relatively small pressure interference should not have a major impact of the test performed in the section. A consistent pressure interference in the section below was observered also during the test at 99.0–104.0 m, see page 44.

102.9–122.9 m

The tested section has a high transmissivity and is displaying similar features as the previously tested section above, probably due to a major hydraulic interconnection between these two sections. The injection period seems to be dominated by a PSF although the flow rate derivative is apparently flattening out by the end. The recovery seems to be dominated entirely by a PRF. However, a very high positive skin factor together with a significantly higher transmissivity is required to obtain an unambiguous transient evaluation of this period. The results from the injection and recovery period are thus inconsistent. This fact may possibly be due to the assumed hydraulic interconnection to the section above. The results from the recovery period are considered as uncertain. The transient evaluation from the injection period is chosen as representative for this section. The pressure in the section above the test section increased by c 7.6 kPa during the injection period. Since the transmissivity in the section above 102.9 m is higher than the transmissivity in the section 102.9–122.9 m, this pressure interference may have resulted in an overestimation of the transmissivity in this section. On the other hand, the transmissivity considered to be the most representative for this section was derived by using the Hantush model, which to some degree may compensate for leakage. A consistent pressure interference in the section above was observed also during the test at 102.9–107.9 m, see page 44.

122.9–142.9 m

The injection period indicates a PRF from c 50 s lasting throughout the period. During the recovery period an initial WBS and a transition period is observed. The Hurst-Clark-Brauer model for the injection period and the Dougherty-Babu model for the recovery period provide consistent results. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit as well as the flow data were manually elevated by $4.01 \cdot 10^{-9}$ m^3/s. The transient evaluation of the injection period is regarded as the most representative.

142.9–162.9 m

The flow rate derivative in this test is quite scattered. Still, the injection period indicates a PRF from c 100 s lasting throughout the period. During the recovery period an initial WBS is shown which then transitions into an approximate PRF by the end. The results from the injection and recovery period are consistent. Still, the transient evaluation of the injection period is considered to give the most representative transmissivity value for this section.

162.9–182.9 m

The injection period indicates an initial PRF from c 10–100 s transitioning to an apparent NFB by the end. During the recovery period WBS is indicated transitioning to a PRF after c 200 s. By the end of the period weak signs of an apparent NFB are indicated. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit as well as the flow data were manually elevated by $2.73 \cdot 10^{-9}$ m^3/s. The results from the injection and recovery period are consistent, still the transient evaluation from the injection period is chosen as representative for this section.

182.9–202.9 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit as well as the flow data were manually elevated by $4.01 \cdot 10^{-9}$ m^3/s.

202.9–222.9 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit as well as the flow data were manually elevated by $2.73 \cdot 10^{-9}$ m^3/s.

222.9–242.9 m

The injection period indicates an initial PLF transitioning to an apparent NFB during the rest of the period. An approximate transient evaluation of the injection period is only possible on the first phase. During the recovery period a PLF and a transition period is indicated. The pressure recovery was only c 4 m of the applied injection pressure of c 22 m which may indicate the presence of a flow feature of limited extension or alternatively, a decreasing aperture away from the borehole. The transient evaluation of the recovery period was considered to give the most representative transmissivity value for this section.

242.9–262.9 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

262.9–282.9 m

During the beginning of the injection period a PLF is observed which then transitions into an apparent NFB lasting throughout the injection period. An initial WBS is shown during the recovery period followed by a clear PRF. After c 1,000 s of the recovery period, signs of an apparent NFB are indicated. The Hurst-Clark-Brauer model for the injection period and the Dougherty-Babu model for the recovery period provide consistent results, but since the recovery period is showing a clear PRF, the evaluation of this period is regarded as the most representative.

282.9–302.9 m

Due to a much higher initial flow rate than expected, the time to achieve a stable injection pressure was unusually long for this test. The injection period only shows an apparent NFB and hence, no unambiguous transient evaluation was possible for the injection period. An example analysis is shown only for reference purposes. The recovery period indicates a PLF and a transition period. Only a limited pressure recovery (c 3.5 m) of the applied injection pressure of c 22 m was obtained in this rather high-transmissivity section. This fact may possibly indicate the presence of a flow feature of limited extension or alternatively, a flow feature with decreasing aperture away from the borehole. The transient evaluation from the recovery period is regarded as most representative for this test section.

302.9–322.9 m

Due to a poor initial pressure regulation, the time to achieve a stable injection pressure was unusually long for this test. Still, both the injection- and the recovery period display a PLF transitioning towards a possible PRF by the end. Only a limited pressure recovery (c 8 m) of the applied injection pressure of c 18 m was obtained in this rather high-transmissive section. This fact may possibly indicate the presence of a flow feature of limited extension or alternatively, a flow feature with decreasing aperture away from the borehole. The transient evaluation from the recovery period is regarded as most representative for this test section. The recovery period was evaluated by a model assuming PRF as well as a single-fracture model.

322.9–342.9 m

Due to a poor initial pressure regulation, the time to achieve a stable injection pressure was unusually long for this test. In addition, the flow rate is quite unstable during the entire injection period and the flow derivative is therefore scattered. Still, the injection period indicates an intermediate between a PLF and a PRF. The recovery period shows initial WBS followed by a transition to an intermediate between a PRF and a PLF. The Hurst-Clark-Brauer model for the injection period and the Dougherty-Babu model for the recovery period provide consistent results. The transient evaluation from the recovery period is though regarded as most representative for this test section.

342.9–362.9 m

The injection period is dominated by a PSF and the recovery period is displaying an initial WBS followed by a transition period. The Hantush model for the injection period and the Dougherty-Babu model for the recovery period provide consistent results regarding the transmissivity. Still, the transient evaluation of the injection period is regarded as the most representative.

362.9–382.9 m

The injection period shows a PSF and the recovery period is displaying an initial WBS, transitioning into some other flow regime, possibly a PSF. The Hantush model shows a good type curve fit with the data from the injection period. No unambiguous transient evaluation can be made on the recovery period and therefore the transient evaluation of the injection period is regarded as the most representative for this section.

382.9–402.9 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

402.9–422.9 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

422.9–442.9 m

Due to a poor initial pressure regulation, the time to achieve a stable injection pressure was unusually long for this test. Still, the injection period displays a clear PSF. After an initial transition period of WBS during the recovery period, a first PRF with a transition to a second PRF with slightly lower transmissivity after c 100 s is indicated. However, since the transmissivities for the two PRF segments are similar, an approximate PRF is assumed from c 50–700 s during the recovery period. The flow regimes are thus not consistent during the injection and recovery period, possibly due to the observed hydraulic interference with the section below. The transient evaluation from the injection period is considered as the most representative for this section. The pressure in the section below the test section increased by c 21.4 kPa during the injection period. The transmissivity in the section below 442.9 m is lower than the transmissivity in the section 422.9–442.9 m, therefore this relatively high pressure interference should not have resulted in an overestimation of the transmissivity in this section. Also, the transmissivity considered to be the most representative for this section was derived by using the Hantush model, which to some degree may compensate for leakage. A consistent pressure interference in the section below was observed also during the test at 427.9–432.9 m, see page 53.

442.9–462.9 m

Due to a much lower flow rate than expected, the time to achieve a stable injection pressure was unusually long for this test. In addition, the flow rate data are very scattered. Still, the injection period indicates a PRF. The recovery period only shows initial WBS and a transition period into some other flow regime, possibly a PSF. Assuming a PSF during recovery, consistent results are obtained from the injection and recovery period, respectively. The transient evaluation from the injection period is considered to be the most representative for this section.

462.9–482.9 m

During the injection period a PRF is indicated after c 80 s to c 300 s which is then transitioning into a PSF after c 300 s. The recovery period indicates a first PRF with a transition to a possible second PRF with a slightly lower transmissivity. However, since the transmissivities for the two PRF segments are similar, an approximate PRF is assumed from c 80–300 s during the recovery period. After this time a PSF is displayed. Transient evaluations for the injection period are consistent with the results of the recovery period. The transient evaluation from the injection period is regarded as most representative for this test section.

472.9–492.9 m

The injection period indicates a PRF from c 100 to c 1,000 s transitioning to a PSF. During the recovery period a flat derivative is observed during c 100 to c 400 s corresponding to a PRF. By the end of the recovery period a possible PSF is indicated. Transient evaluations for the injection period are consistent with the results of the recovery period. The transient evaluation from the injection period is regarded as most representative for this test section. The pressure in the section below the test section increased c 15.1 kPa during the injection period. The transmissivity in the section below is not known, but this relatively large pressure interference may have resulted in an overestimation of the transmissivity in this section. On the other hand, the transmissivity considered to be the most representative for this section was derived by using the Hantush model, which to some degree may compensate for leakage.

62.9–67.9 m

The injection period is showing an initial PRF which is then followed by a PSF. The recovery period displays initial WBS and a transition state towards a PSS. Transient evaluation with the Hantush model resulted in consistent results from the injection and recovery period, respectively. The transient evaluation of the injection period is regarded as the most representative for the section.

67.9–72.9 m

A PRF/PSF is indicated throughout the injection period. The recovery period is displaying initial WBS transitioning into a PSS by the end of the period. The Hantush model provides consistent results for the injection and recovery period, respectively. The transient evaluation of the injection period is regarded as the most representative for this section.

72.9–77.9 m

An apparent PRF is indicated after c 100 s and throughout the injection period. However, the PRF is associated with a very high positive skin factor which makes the interpretation of a PRF uncertain. The high skin factor may possibly indicate the presence of turbulent flow in fractures during the injection period. The recovery period displays initial WBS which is then followed by a PSS. The observed flow regimes are thus not consistent during the injection and recovery period. Nevertheless, the Hurst-Clark-Brauer model for the injection period and the Hantush model for the recovery period provide similar results. The transient evaluation of the injection period was considered to be the most representative for this section. Since the measurement noise with a zero flow was centred slightly above zero, the flow rate measurement limit as well as the flow data were manually lowered by $1.06 \cdot 10^{-9}$ m^3/s.

77.9–82.9 m

A PSF is indicated after c 90 s and throughout the injection period. The recovery period shows initial WBS which then transitions into a PSS. No unambiguous transient evaluation could be made on the recovery period. An example evaluation of the recovery period is shown, assuming the same value on the parameter r/B as obtained from the injection period. Transient evaluation using the Hantush model on both the injection- and recovery period give consistent results regarding the transmissivity. The transient evaluation of the injection period is considered to be the most representative for the section.

79.0–84.0 m

A PSF is indicated after c 250 s and throughout the injection period. The recovery period shows initial WBS which then transitions into a PSS by the end. No unambiguous transient evaluation could be made on the recovery period. An example evaluation of the recovery period is shown, assuming the same value on the parameter r/B as obtained from the injection period. Transient evaluation using the Hantush model on both the injection- and recovery period give consistent results regarding transmissivity. The estimated skin factor from both periods was high. This fact, together with fast pressure recovery, may possibly indicate the presence of turbulent flow in fractures. The transient evaluation of the injection period is considered to be the most representative for the section.

84.0–89.0 m

Due to a poor initial pressure regulation, the time to achieve a stable injection pressure was unusually long for this test. Still, both the injection- and recovery period are dominated by an apparent PRF, preceded by WBS during the recovery period. However, the PRF is associated with a very high positive skin factor during both periods which makes the interpretation of a PRF uncertain. The estimated high skin factor may possibly indicate turbulent flow in fractures. Alternatively, the high apparent skin may possibly be due to the observed hydraulic interference with the section below the tested section. The Hurst-Clark-Brauer model for the injection period and the Dougherty-Babu model for the recovery period provide consistent results. The transient evaluation of the injection period is regarded as the most representative for the section. The pressure in the section below the test section increased by c 2.5 kPa during the injection period. The transmissivity in the section below 89.0 m is of the same magnitude as the transmissivity in the section 84.0–89.0 m. Hence this pressure interference should not have resulted in an overestimation of the transmissivity in this section.

89.0–94.0 m

This section has a high transmissivity. After about 200 s of the injection period a PRF occurs that dominates the rest of the period. Also the recovery period seems to, after initial WBS, be dominated by an apparent PRF. However, the PRF is associated with a very high positive skin factor during both periods which makes the interpretation of a PRF uncertain. The estimated high skin factor may possibly indicate turbulent flow in fractures. Alternatively, the high apparent skin may possibly be due to the observed hydraulic interference with the borehole intervals above and below the tested section. The transient evaluation of the injection is chosen as the most representative for the section. The transient evaluation of the recovery period is considered as very uncertain and only shown as an example evaluation. The pressure in the section above the test section increased by c 8.5 kPa and the pressure in the section below increased by c 4.0 kPa during the injection period. The transmissivities in the sections above and below section 89.0–94.0 m are of the same order of magnitude as in the section, and hence these relatively small pressure interferences above and below the test section should not have a major impact on the test performed in the section.

94.0–99.0 m

An apparent PRF is indicated after c 100 s and throughout the injection period. However, the PRF is associated with a very high positive skin factor which makes the interpretation of the PRF uncertain. The estimated high skin factor may possibly indicate turbulent flow in fractures. Alternatively, the high apparent skin may possibly be due to the observed hydraulic interference with the borehole intervals above and below the tested section. The pressure recovery is fast towards an apparent PSS. No unambiguous transient evaluation of the recovery period is possible. The transient evaluation of the injection period is chosen as representative for the section. The pressure in the section above the test section increased by c 2.1 kPa during the injection period and the pressure in the section below increased by c 1.2 kPa during the injection period. Since the transmissivities in the sections above and below are higher than the transmissivity in the section 94.0–99.0, these relatively small pressure interferences may have resulted in an overestimation of the transmissivity in this section.

99.0–104.0 m

Both the injection- and recovery period are dominated by an apparent PRF. However, the PRF is associated with very high positive skin factors during both periods which makes the interpretation of the PRF uncertain. The high skin factor may possibly indicate turbulent flow in fractures. Alternatively, the high apparent skin may possibly be due to the observed hydraulic interference with the borehole intervals above and below the tested section. No unambiguous transient evaluation of the recovery period was possible. The transient evaluation of the injection period is chosen as representative for the section. The pressure in the section above the test section increased by c 2.6 kPa during the injection period and the pressure in the section below increased by c. 4.5 kPa during the injection period. The transmissivities in the sections above and below are of the same order of magnitude as the transmissivity in the section 99.0–104.0 m. Hence these relatively small pressure interferences above and below the test section should not have a major impact on the test performed in the section. A consistent pressure interference in the section below was observed also during the test at 84.0–104.0 m, see page 37.

102.9–107.9 m

During the injection period a PSF is dominating. The recovery period shows an apparent PRF. However, the transient evaluations from both periods indicate a very high positive skin factor which makes the interpretations uncertain. The high skin factor may possibly indicate turbulent flow in fractures. Alternatively, the calculated high apparent skin may possibly be due to the observed hydraulic interference with the borehole intervals above and below the tested section. The transient evaluation of the injection period is regarded as the most representative for this section. The pressure in the section above the test section increased by c 7.4 kPa during the injection period. Since the transmissivity in the section above 102.9 m is higher than the transmissivity in the section 102.9–107.9 m, this pressure interference may have resulted in an overestimation of the transmissivity in this section. On the other hand, the transmissivity considered to be the most representative for this section was derived by using the Hantush model, which to some degree may compensate for leakage. A consistent pressure interference in the section above was observed also during the test at 102.9–122.9 m, see page 37.

107.9–112.9 m

The injection period is dominated by an apparent PRF. However, the interpreted PRF is associated with a high positive skin factor which makes it uncertain. The estimated high skin factor may possibly indicate turbulent flow in fractures. The pressure recovery is fast and the recovery period shows initial WBS with a transition to a PSS. No unambiguous transient evaluation is possible on the recovery period. The transient evaluation of the injection period was considered to give the most representative transmissivity value for this section.

112.9–117.9 m

Due to a poor initial pressure regulation the time to achieve a stable injection pressure was unusually long for this test. The injection period is dominated by a PRF. The pressure recovery begins with WBS followed by a fast approach to a PSS by the end. No unambiguous transient evaluation is possible on the recovery period and a demonstrating evaluation of the recovery period is presented. The transient evaluation of the injection period was considered to give the most representative transmissivity value for this section.

117.9–122.9 m

The transient evaluation of the injection indicates a PRF throughout the entire period. The recovery period starts with WBS followed by a transition towards a possible PRF. However, due to an exceedingly high value on the skin factor, no unambiguous transient evaluation is possible and a demonstrating evaluation of the recovery period is presented. The transient evaluation of the injection period was considered to give the most representative transmissivity value for this section.

122.9–127.9 m

The flow rate is low, close to the measurement limit. Hence the data, especially the flow derivative, are quite scattered. Still a PRF is indicated after c 20 s transitioning to an apparent NFB after c 300 s during the injection period. The recovery only displays WBS and a transition period. No unambiguous transient evaluation is possible on the recovery period and an exceedingly high value on the skin factor is indicated and a demonstrating evaluation of the recovery period is presented. The transient evaluation of the injection period was considered to give the most representative transmissivity value for this section.

127.9–132.9 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

132.9–137.9 m

The flow rate is low, close to the measurement limit. Hence the data, especially the flow derivative, are quite scattered. The injection period is dominated by an apparent PLF. The recovery period begins with WBS which then transitions into an apparent PLF. The transient evaluation of the injection period was considered to give the most representative transmissivity value for this section.

137.9–142.9 m

The flow rate is low, close to the measurement limit. Hence the data, especially the flow derivative, are quite scattered. The injection period is dominated by a PRF/PSF throughout the period. The recovery period starts with WBS followed by a transition period. Even though the characteristic features of a PRF were not reached, transient evaluation of the recovery period with the Babu-model gave consistent result with the evaluation of the injection period as well as the stationary transmissivity value TM. The transient evaluation from the injection period is chosen as representative for this section. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit as well as the flow data were manually elevated by $2.73 \cdot 10^{-9}$ m^3/s.

142.9–147.9 m

Transient evaluation of the injection period indicates a PRF after c 150 s lasting for the rest of the period. The recovery period is also dominated by a PRF between c 30–400 s which then smoothly transitions into a PSF by the end of the period. The transient evaluation from the injection period is chosen as representative for this section.

145.0–150.0 m

The flow rate is low, close to the measurement limit. Hence the data, especially the flow derivative, are quite scattered. Still, the injection period seems to be dominated by a PRF. The recovery period only displays WBS and a transition period. The Hurst-Clark-Brauer model for the injection period and the Dougherty-Babu model for the recovery period provide consistent results regarding transmissivity. The transient evaluation of the injection period is regarded as the most representative for the section.

150.0–155.0 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit was manually elevated by $2.73 \cdot 10^{-9}$ m^3/s.

155.0–160.0 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit was manually elevated by $2.73 \cdot 10^{-9}$ m^3/s.

157.9–162.9 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit was manually elevated by $2.73 \cdot 10^{-9}$ m^3/s.

162.9–167.9 m

During the injection period a short period of PRF is indicated after c 25 s transitioning to an apparent NFB after c 150 s. The recovery period is dominated by initial WBS and a transition period. After c 400 s an apparent NFB is indicated. The Hurst-Clark-Brauer model for the injection period and the Dougherty-Babu model for the recovery period provide consistent results. The transient evaluation of the injection period is regarded as the most representative for the section.

167.9–172.9 m

The flow rate is low, close to the measurement limit. Hence the data, especially the flow derivative, are quite scattered. Still, the injection period is dominated by a clear PRF. The recovery displays WBS and a transition period. The Hurst-Clark-Brauer model for the injection period and the Dougherty-Babu model for the recovery period provide consistent results. The transient evaluation of the injection period is regarded as the most representative for the section.

172.9–177.9 m

The flow rate is low, close to the measurement limit. Hence the data, especially the flow derivative, are quite scattered. The injection period indicates an early, short PRF with a transition to an apparent NFB after c 40 s. During the recovery period initial WBS is transitioning into an approximate PRF and then an apparent NFB. The transient evaluation of the injection period is regarded as the most representative for the section.

177.9–182.9 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit was manually elevated by $2.73 \cdot 10^{-9}$ m^3/s.

262.9–267.9 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period.

267.9–272.9 m

The injection period indicates a very short initial period of PRF transitioning to an apparent NFB after c 70 s. During the recovery period WBS transitioning to a PRF is dominating. The transient evaluation of the injection period is chosen as representative for this section.

272.9–277.9 m

During the injection period a PRF is indicated after c 10 s to c 400 s. After 400 s an apparent NFB is observed. The recovery period starts with WBS followed by a transition period towards a possible short PSF and an apparent NFB by the end. The Hurst-Clark-Brauer model on the injection period and the Hantush model on the recovery period give consistent results. The transient evaluation of the injection period is regarded as the most representative for the section.

277.9–282.9 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

282.9–287.9 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

287.9–292.9 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

292.9–297.9 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit was manually elevated by $1.25 \cdot 10^{-9}$ m^3/s.

297.9–302.9 m

The injection period displays signs of an apparent NFB. After c 600 s a transition towards another flow regime may be indicated but is considered as uncertain. No unambiguous transient evaluation was possible for the injection period. The recovery period shows a PLF throughout the period. Only a limited pressure recovery (c 3.5 m) of the applied injection pressure of c 22 m was obtained in this relatively high-transmissivity section. This fact may possibly indicate the presence of a flow feature of limited extension or alternatively, a flow feature with decreasing aperture away from the borehole. Transient evaluation of the recovery period results in a large negative skin value which indicates a major fracture intersecting the section. The transient evaluation from the recovery period is regarded as most representative for this test section.

302.9–307.9 m

The injection period begins with a PRF/PSF. After c 100 s an apparent NFB is indicated lasting throughout the period. The recovery period displays a short initial period of PSF which then transitions into an apparent NFB after c 150 s. Transient evaluation on the first part of the injection and recovery period, respectively provide consistent results. The transient evaluation of the injection period is regarded as the most representative for the section.

307.9–312.9 m

Due to pressure regulation problems, the time to achieve a constant pressure in the test section was rather long. The injection period displays an apparent NFB. No unambiguous transient evaluation is possible on the injection period. The recovery period indicates a PLF and a transition period. Only a limited pressure recovery (c 2 m) of the applied injection pressure of c 14 m was obtained in this relatively high-transmissivity section. This fact may possibly indicate the presence of a flow feature of limited extension or alternatively, a flow feature with decreasing aperture away from the borehole. Transient evaluation of the recovery period results in a large negative skin value which indicates a major fracture intersecting the section. The transient evaluation from the recovery period is regarded as uncertain. The stationary transmissivity TM is considered as the most representative for this test section.

312.9–317.9 m

Due to a much higher initial flow rate than expected, the time to achieve a stable injection pressure was unusually long for this test. Still, a PLF is indicated during the injection period. Hydraulic interference was observed with the borehole interval above the tested section. No unambiguous transient evaluation is possible on the injection period since the PLF does not display sufficient character. During the recovery period a PLF is indicated and after c 600 s the flow makes a transition to an approximate PRF that continues during the rest of the period. Only a limited pressure recovery (c 8 m) of the applied injection pressure of c 19 m was obtained in this relatively high-transmissivity section. This fact may possibly indicate the presence of a flow feature of limited extension or alternatively, a flow feature with decreasing aperture away from the borehole. Transient evaluation of the recovery period results in a large negative skin value which indicates a major fracture intersecting the section. The transient evaluation from the recovery period is regarded as the most representative for the section.

317.9–322.9 m

The injection period indicates a PRF from c 80–1,200 s. Evaluation with the Hurst-Clark-Bauer model results in a very high skin factor, possibly indicating a flow of a higher dimension. However, no unambiguous transient evaluation with a model for PSF is possible. The recovery period begins with WBS with a transition to a PRF at the end of the period. The pressure recovery is fast and transient evaluation of the recovery period also results in a high skin factor. The transient evaluations from the recovery- and injection period show consistent results and the result from the injection is chosen as representative for this section.

322.9–327.9 m

Both the injection and recovery period indicate a PRF transitioning to an apparent NFB. The pressure recovery was not complete in this relatively high-transmissivity section (14 m of the applied injection pressure of c 21 m) which may indicate a flow feature of limited extension, or alternatively, a flow feature with decreasing aperture away from the borehole. The water level in the borehole interval above the tested section slightly rose (c 1 kPa) during the injection period. The transient evaluation of the injection period is chosen as representative for this section.

327.9–332.9 m

During the injection period a PRF transitioning to an apparent NFB by the end is indicated. During the recovery period initial WBS followed by a short period of PRF transitioning to an apparent NFB is observed. The pressure recovery was not complete in this relatively high-transmissivity section (16 m of the applied injection pressure of c 20 m) which may indicate a flow feature of limited extension or alternatively, a flow feature with decreasing aperture away from the borehole. Transient evaluations for the injection and recovery period provide quite consistent results. The transient evaluation of the injection period is regarded as the most representative for the section.

332.9–337.9 m

The injection period shows a PLF transitioning to a possible PRF by the end. Only an approximate transient evaluation was possible of this period. The recovery only displays a PLF and a transition period. The pressure recovery was not complete in this relatively high-transmissivity section (5.5 m of the applied injection pressure of c 25 m) which may indicate a flow feature of limited extension or alternatively, a flow feature with decreasing aperture away from the borehole. The transient evaluation of the recovery period was considered to be the most representative transmissivity value for this section. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit was manually elevated by $1.48 \cdot 10^{-9}$ m^3/s.

337.9–342.9 m

Due to a much lower flow rate than expected, the time to achieve a stable injection pressure was unusually long for this test. Since the flow rate is low the data, especially the flow derivative, are quite scattered. Still, a transition period towards a possible PRF is indicated during the injection period. The recovery period displays initial WBS with a transition period into a PRF. Since the recovery displays a clear PRF, the transient evaluation of this period was considered to give the most representative transmissivity value for the section.

342.9–347.9 m

The injection period shows a PSF from c 200 s to the end of the period. The recovery only displays WBS and a transition period. No unambiguous transient evaluation was possible of the recovery period but a demonstrating, possible evaluation of the recovery period is shown. The transient evaluation of the injection period is regarded as the most representative for the section.

347.9–352.9 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

352.9–357.9 m

A PRF is indicated after c 30 s and throughout the injection period. The recovery period shows initial WBS transitioning to a PRF by the end of the period. The transient evaluation of the injection period was chosen as representative for this section. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit as well as the flow data were manually elevated by $1.48\cdot10^{-9}$ m^3/s.

357.9–362.9 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit was manually elevated by $1.48\cdot10^{-9}$ m^3/s.

362.9–367.9 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period.

367.9–372.9 m

The flow rate is low, close to the measurement limit and hence the data, especially the flow derivative, are quite scattered. Still, a PSF transitioning to a PSS is observed during the injection period. The recovery period shows initial WBS which then transitions into a PSF. Evaluation with the Hantush model for pseudo spherical flow provides a good fit of the injection period.

No unambiguous transient evaluation can be made on the recovery period. A demonstrating evaluation is presented assuming the same transmissivity and storativity as obtained from the injection period. The transient evaluation of the injection period was chosen as representative for this section.

372.9–377.9 m

The injection period indicates a PSF approaching a PSS by the end. The recovery period is only showing initial WBS with a transition period. No unambiguous transient evaluation can be made, neither on the injection period nor on the recovery period. Demonstrating evaluations are shown for both the injection and recovery period, respectively, assuming the stationary transmissivity TM on transmissivity. The stationary transmissivity TM from the injection period is considered to be most representative for this section.

377.9–382.9 m

The flow rate is low, close to the measurement limit. Hence the data, especially the flow derivative, are quite scattered. A strong, apparent NFB is indicated during the entire injection period. No unambiguous transient evaluation was possible on this period. The recovery period is dominated by a PLF but since it does not display sufficient character, no unambiguous transient evaluation was possible of this period either. Since no transient evaluation can be made on neither the injection nor the recovery period, the stationary transmissivity TM is regarded to provide the best estimate of the transmissivity for this section.

422.9–427.9 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

427.9–432.9 m

The injection period is displaying a PRF between c 100–300 s transitioning to a PSF by the end of the period. A significant hydraulic interference occurred with the borehole interval below the tested section during the injection period. The test valve did not close properly directly at stop of the injection period. However, the recovery period shows a clear PRF. Transient evaluations show consistent results from the injection and recovery period, respectively. The transient evaluation of the injection period was chosen as representative for this section. The pressure in the section below the test section increased by c. 36.8 kPa during the injection period. The transmissivity in the section below 432.9 m is lower than the transmissivity in the section 427.9–432.9 m. Therefore this relatively high pressure interference should not have resulted in an overestimation of the transmissivity in this section. Also, the transmissivity considered to be the most representative for this section was derived by using the Hantush model, which to some degree may compensate for leakage. Consistent pressure interference in the section below was observed also during the test at 422.9–442.9 m, see page 41.

432.9–437.9 m

During the injection period a PRF is indicated after c 100 to 700 s. By the end of the injection period an apparent NFB appears. The pressure recovery was very fast and the entire recovery period is dominated by a PSS and no unambiguous transient evaluation was possible on this period. Since the injection period displays a clear PRF, a transient evaluation of the period was considered to give the most representative transmissivity value for this section.

437.9–442.9 m

Due to a poor initial pressure regulation, the time to achieve a stable injection pressure was unusually long for this test. Still, a PRF is indicated after c 100 s and throughout the injection period. The pressure recovery was very fast and the entire recovery period is dominated by a PSS. No unambiguous transient evaluation is possible on the recovery period. An example evaluation is shown assuming the same transmissivity and storativity as obtained from the injection period. Since the injection displays a clear PRF, a transient evaluation of the period was considered to give the most representative transmissivity value for this section.

442.9–447.9 m

The injection period clearly shows a PRF from c 20 s lasting throughout the period. The recovery period, however, indicates initial WBS with a transition period. By the end of the period weak indications of an apparent NFB are shown. The Hurst-Clark-Brauer model for the injection period and the Dougherty-Babu model for the recovery period provide consistent results. The transient evaluation of the injection period is regarded as the most representative for the section.

447.9–452.9 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

452.9–457.9 m

The test section has a low transmissivity, the flow rate at the end of the injection period is just above the measurement limit. Despite the scattered data, signs of a PRF are noticed during the injection period. The recovery period only displays WBS and a transition period but an unambiguous transient evaluation is possible. The transient evaluation of the recovery period is regarded to be the best estimate of the transmissivity for the section.

457.9–462.9 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit was manually elevated by $2.50 \cdot 10^{-9}$ m^3/s.

462.9–467.9 m

The flow rate is low, close to the measurement limit. Hence the data, especially the flow derivative, are quite scattered. Still, a PRF is indicated from c 20 s and throughout the period. The recovery period displays WBS and a transition period. No unambiguous transient evaluation is possible on this period. The transient evaluation of the injection period is regarded as the most representative for the section.

467.9–472.9 m

Due to a drift in the gas pressure regulator, the pressure in the test section decreased by c 2 kPa during the injection period. As a result, reciprocal flow rate was disturbed throughout the injection period. The pressure drift caused an increasing trend in the derivative that may not be representative for the rock formation. Still, a possible early PLF followed by an apparent NFB is indicated during the injection period. The recovery period indicates a PLF during the entire period. The transient evaluation of the injection period is chosen as representative for the section.

472.9–477.9 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-069, the injection time was shortened. As a result TM, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit was manually elevated by $5.70 \cdot 10^{-9}$ m^3/s.

477.9–482.9 m

Both the injection- and recovery periods indicate an initial PRF which then transitions into a PSF. Transient evaluations using the Hurst-Clark-Brauer model and the Hantush model give consistent results for the injection period, though the Hantush model is regarded as the most representative. The model by Dougherty-Babu and the Hantush model for the recovery period support the estimated transmissivity from the injection period. The transient evaluation of the injection period is chosen as representative for the section.

482.9–487.9 m

Both the injection- and recovery period are displaying a clear PRF with weak indications of a transition to a PSF by the end of the period. A slight hydraulic interference with the borehole interval below the test section was observed during the injection period. The transient evaluations from the injection and recovery period provide consistent results. The transient evaluation of the injection period was considered to give the most representative transmissivity value for this section.

487.9–492.9 m

The flow rate is low, close to the measurement limit. Hence the data, especially the flow derivative, are quite scattered. Still, the injection period is assumed to be dominated by a PRF during the entire period. The recovery period is displaying initial WBS and a transition period. The transient evaluation of the injection period is regarded as the most representative for the section.

6.2.5 Flow regimes

A summary of the frequency of identified flow regimes on different scales is presented in Table 6-3, which shows all identified flow regimes during the tests. For example, a pseudo-radial flow regime (PRF) transitioning to a pseudo-spherical flow regime (PSF) will contribute to one observation of PRF and one observation of PSF. The numbers within parenthesis denote the number of tests where the actual flow regime is the only one present.

Table 6-3. Interpreted flow regimes during the injection tests in KFM10A. The figure within the parenthesis shows the number of tests with only one interpreted flow regime.

Section length (m)	Number of tests	Borehole interval (m)	Number of tests with definable Q_p	Injection period					Recovery period					
				PLF	PRF	PSF	PSS	NFB	WBS	PLF	PRF	PSF	PSS	NFB
5	64	62.9–492.9	47	4(2)	35(19)	13(4)	2(0)	13(3)	30(8)	7(5)	17(3)	7(0)	10(3)	7(0)
20	22	62.9–492.9	17	4(0)	9(4)	7(5)	0(0)	4(1)	10(2)	4(2)	10(2)	4(0)	1(0)	2(0)
100	4	62.9–462.9	4	2(0)	3(1)	1(1)	0(0)	1(0)	3(0)	2(0)	4(1)	0(0)	0(0)	0(0)

It should be noted that the interpretation of flow regimes is only tentative and just based on visual inspection of the data curves. It should also be observed that the number of tests with a pseudo-linear flow regime during the beginning of the injection period may be underestimated due to the fact that a certain time is required for achieving a constant pressure, which fact may mask the initial flow regime.

Table 6-3 shows that a certain period of pseudo-radial flow could be identified from the injection period in c 69% of the tests with a definable final flow rate for KFM10A. For the recovery period, the corresponding result is c 46%. It should be observed that the borehole intervals measured with 5 m, 20 m and 100 m sections do not exactly comply with each other in KFM10A, see Chapter 5.5.

For c 41% of the tests in the borehole, more than one flow regime during the injection period could be identified. The following transitions in KFM10A during the injection period were most common: from PRF to NFB and from PRF to PSF. During the recovery period the most common transitions were from WBS to PRF followed by WBS to PSF.

6.3 Comparison of transmissivity values on different test scales

The transmissivity values considered as the most representative, T_R, from the injection tests in KFM10A in the tested sections of 100 m, 20 m and 5 m length, respectively, are shown in Figure 6-3. This figure demonstrates a fairly good agreement between results obtained from tests on different scales in KFM10A. However, some tests in short section lengths display a higher transmissivity than the corresponding longer section length. This discrepancy may be caused by hydraulic interference with adjacent sections. A consistency check of the transmissivity values on the different scales was made by summation of calculated values from smaller scales (20 m and 5 m) and comparing with the estimated values in longer sections (100 m and 20 m). The total transmissivity of KFM10A is dominated by the intervals between 84.0–94.0, 99.0–107.9 and 427.9–432.9 m.

In Table 6-4, estimated transmissivity values in 100 m and 20 m test sections in KFM10A according to steady-state (T_M) and most representative evaluation (T_R) are listed together with summed transmissivities in 20 m and 5 m sections over the corresponding 100 m and 20 m sections. Also, the corresponding sum of transmissivity values from the difference flow logging in 5 m sections is shown. When the transmissivity values are below the measurement limit (Q_p could not be defined), the most representative transmissivity value, T_R, was considered to be less than T_M, based on Q/s-measl-L, for the test section. The measurement limit values are included in the summed values in Table 6-4. This leads to overestimated values of the summed transmissivities.

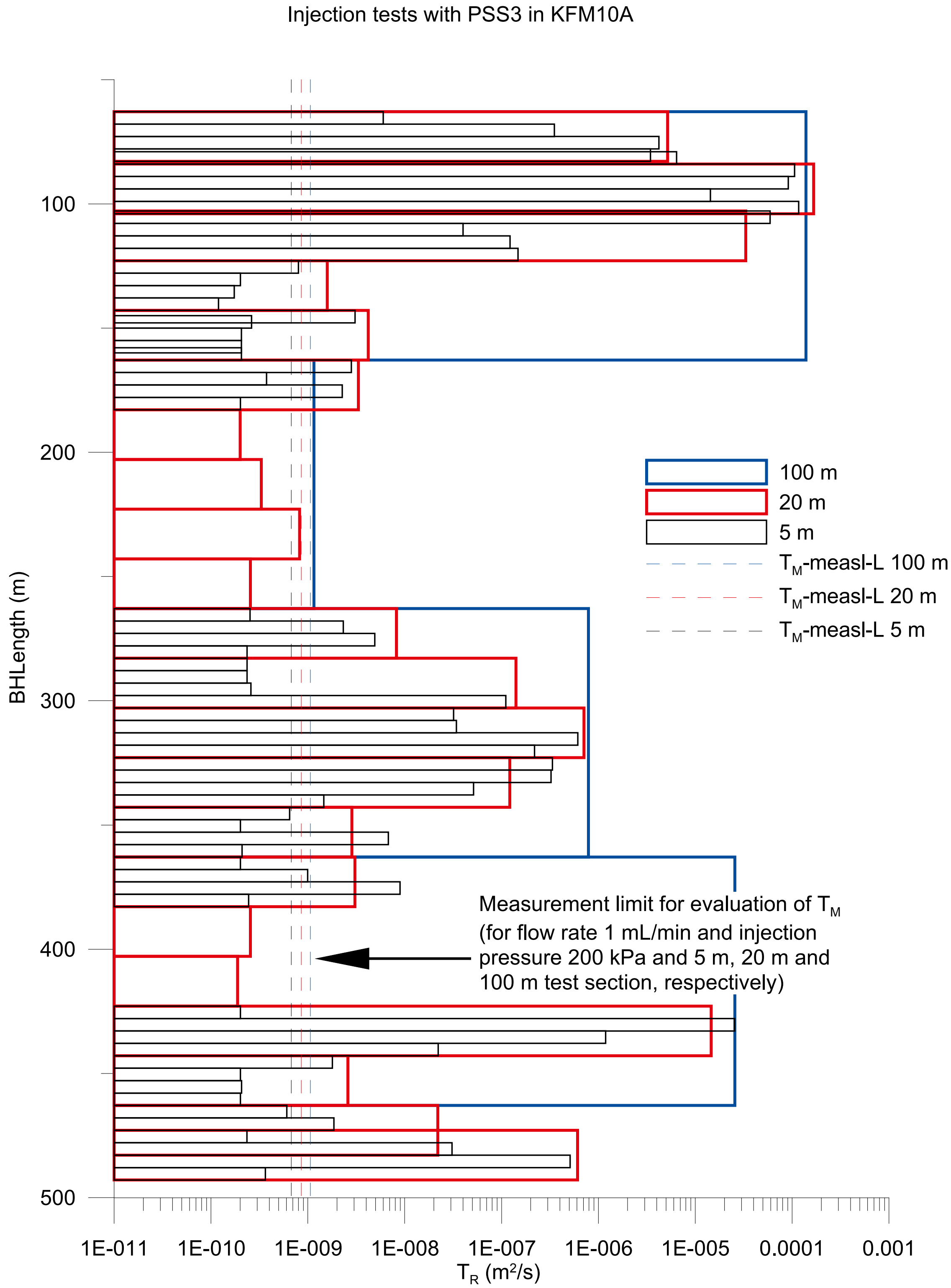

Figure 6-3. *Estimated best representative transmissivity values (T_R) from injection tests for sections of 100 m, 20 m and 5 m length in borehole KFM10A. Estimated transmissivity values for the lower standard measurement limit from stationary evaluation (T_M-measl-L) for different test section lengths are also shown.*

Table 6-4. Estimated transmissivity values in 100 m and 20 m test sections together with summed up transmissivity values in 20 m and 5 m sections in the corresponding borehole intervals from the injection tests in KFM10A. In addition, the corresponding sum of transmissivity values from the difference flow logging in 5 m sections is shown.

Borehole Idcode	Secup inj. tests (m)	Seclow inj. tests (m)	L_w (m)	T_M inj. tests (m^2/ s)	T_R inj. tests (m^2/s)	SUM T_M(20 m) inj. tests (m^2/s)	SUM T_R(20 m) inj. tests (m^2/s)	SUM T_M(5 m) inj. tests (m^2/s)	SUM T_R (5 m) inj. tests (m^2/s)	Secup Diff-flow log (m)	Seclow diff-flow log (m)	SUM-T_D(5 m) diff-flow log (m^2/s)
KFM10A	62.90	162.90	100.00	1.37E–04	1.39E–04	1.16E–04[1)]	2.05E–04[1)]	9.26E–05[2)]	4.03E–04[2)]	62.90	162.90	6.31E–05
KFM10A	162.90	262.90	100.00	4.49E–09	1.16E–09	5.71E–09	4.94E–09	4.36E–09[3)]	5.66E–09[3)]	162.91	262.91	5.28E–08
KFM10A	262.90	362.90	100.00	2.05E–06	7.89E–07	2.60E–06	9.82E–07	2.69E–06	1.74E–06	262.91	363.10	4.96E–07
KFM10A	362.90	462.90	100.00	3.44E–05	2.57E–05	2.76E–05	1.46E–05	2.17E–05[3)]	2.67E–05[3)]	363.12	463.22	3.04E–05
KFM10A	62.90	82.90	20.00	4.54E–06	5.19E–06			3.46E–06	8.03E–06	62.90	82.91	5.34E–06
KFM10A	84.00	104.00	20.00	9.07E–05	1.67E–04			6.76E–05	3.29E–04	82.91	102.90	4.16E–05
KFM10A	102.90	122.90	20.00	2.06E–05	3.32E–05			1.92E–05	5.96E–05	102.90	122.90	1.62E–05
KFM10A	122.90	142.90	20.00	3.01E–09	1.59E–09			1.97E–09	1.30E–09	122.90	142.90	9.60E–09
KFM10A	142.90	162.90	20.00	8.62E–09	4.20E–09			5.81E–09[2)]	3.96E–09[2)]	142.90	162.90	1.59E–08
KFM10A	162.90	182.90	20.00	4.44E–09	3.33E–09			4.36E–09	5.66E–09	162.91	182.91	1.00E–08
KFM10A	182.90	202.90	20.00	<2.00E–10	<2.00E–10			n.m.5 m	n.m.5 m	182.92	202.93	1.03E–08
KFM10A	202.90	222.90	20.00	<3.31E–10	<3.31E–10			n.m.5 m	n.m.5 m	202.92	222.91	1.04E–08
KFM10A	222.90	242.90	20.00	4.84E–10	8.22E–10			n.m.5 m	n.m.5 m	222.91	242.91	1.08E–08
KFM10A	242.90	262.90	20.00	<2.55E–10	<2.55E–10			n.m.5 m	n.m.5 m	242.91	262.91	1.13E–08
KFM10A	262.90	282.90	20.00	8.59E–09	8.23E–09			5.93E–09	7.73E–09	262.91	282.94	1.12E–08
KFM10A	282.90	302.90	20.00	1.44E–07	1.41E–07			1.12E–07	1.12E–07	282.96	302.99	4.25E–08
KFM10A	302.90	322.90	20.00	1.70E–06	7.09E–07			1.37E–06	8.98E–07	303.01	323.04	1.80E–07
KFM10A	322.90	342.90	20.00	7.27E–07	1.22E–07			1.19E–06	7.12E–07	323.06	343.10	2.48E–07
KFM10A	342.90	362.90	20.00	1.14E–08	2.85E–09			8.82E–09	7.84E–09	343.10	363.10	1.48E–08
KFM10A	362.90	382.90	20.00	1.52E–08	3.07E–09			1.09E–08	1.04E–08	363.12	383.14	2.90E–08
KFM10A	382.90	402.90	20.00	<2.55E–10	<2.55E–10			n.m.5 m	n.m.5 m	383.13	403.14	1.20E–08
KFM10A	402.90	422.90	20.00	<1.88E–10	<1.88E–10			n.m.5 m	n.m.5 m	403.15	423.18	1.21E–08
KFM10A	422.90	442.90	20.00	2.75E–05	1.46E–05			2.17E–05	2.67E–05	423.17	443.18	3.03E–05
KFM10A	442.90	462.90	20.00	2.72E–09	2.59E–09			2.39E–09	2.40E–09	443.19	463.22	1.25E–08
KFM10A	462.90	482.90	20.00	8.04E–08	2.20E–08			6.75E–08	3.38E–08	463.22	483.23	5.96E–08
KFM10A	472.90	492.90	20.00	9.73E–07	6.10E–07			5.92E–07	5.10E–07	473.23	493.23	1.05E–06

[1)] Partly overlapping sections and interval only partly measured.
[2)] Partly overlapping sections.
[3)] Interval only partly measured.
n.m. = not measured.

In Figure 6-4, transmissivity values considered as the most representative for 100 m and 20 m sections (T_R-100 m and T_R-20 m, respectively) in KFM10A are plotted versus the sum of the transmissivity values considered most representative in 5 m sections in the corresponding intervals (SUM T_R-5 m). The lower measurement limit of T_M for the different section lengths (Q_p=1 mL/min and an assumed pressure difference of 200 kPa) together with the cumulative measurement limit for the sum of 5 m sections are also shown in the figure.

Figure 6-4 indicates a rather good agreement between estimated transmissivity values in longer sections and summed transmissivity values in corresponding 5 m sections for the injection tests. However, a small tendency of data points being located slightly below the straight line can be observed. This indicates that the sum of the transmissivity from the shorter sections is slightly higher than the estimated transmissivity in longer sections. Hydraulic interference between adjacent sections may contribute to an overestimation of the sum of transmissivity when summing the transmissivity from several sections together. Since the measurement limit values also are summed up, the sum of transmissivity in shorter sections can become higher than the estimated transmissivity value in the longer section for very low conductive sections. There might also be other reasons for discrepancies.

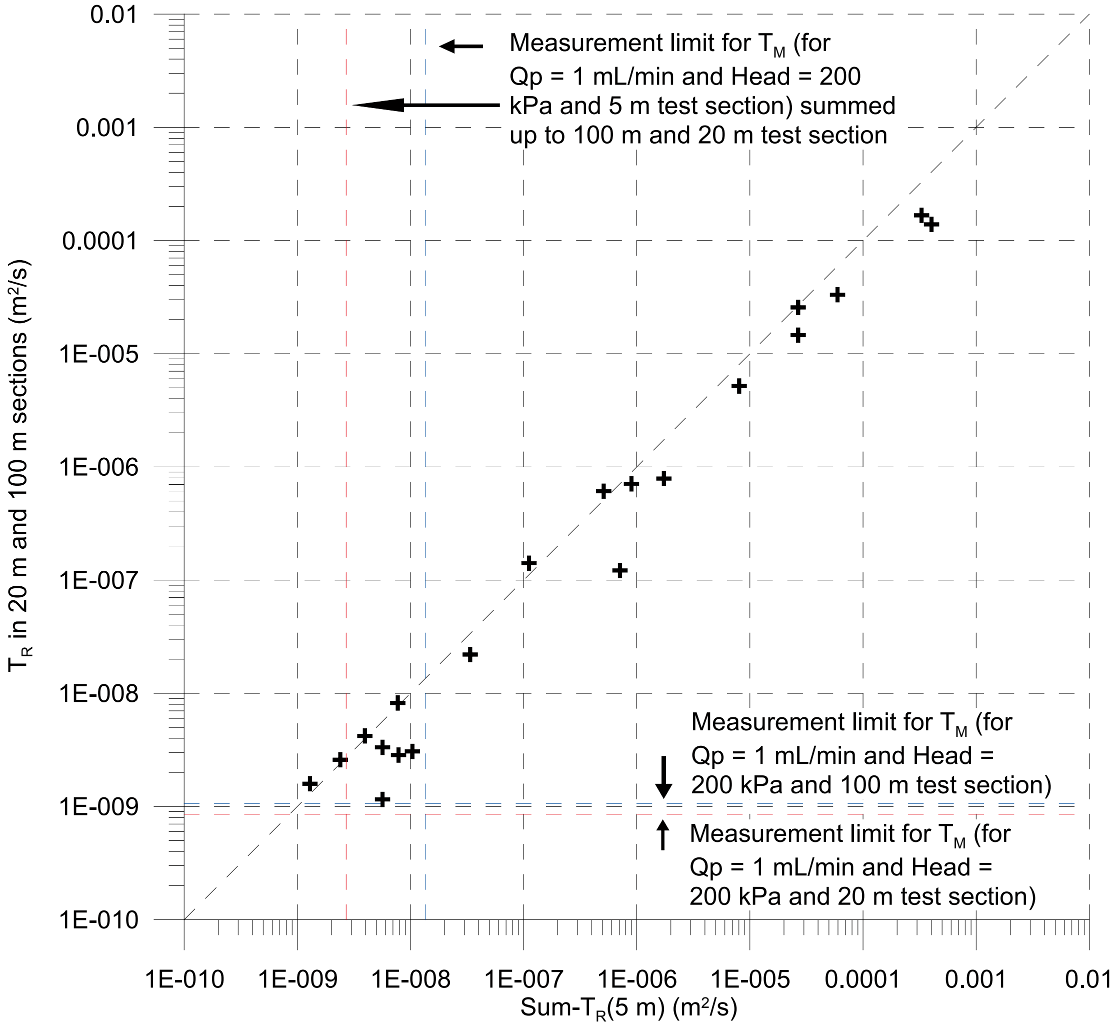

Figure 6-4. *Transmissivity values considered most representative (T_R) for 100 m and 20 m sections versus the sum of most representative transmissivity values (T_R) in 5 m sections in the corresponding borehole intervals from the injection tests in KFM10A together with the standard lower measurement limit at different scales.*

6.4 Comparison with results from the difference flow logging in KFM10A

As discussed in Section 3.2, the position of the measured 5 m sections for the injection tests and the difference flow logging respectively, deviated up to 2.10 m in KFM10A. In sections where the section limits deviated significantly, the sections were shifted so that a reasonable comparison between the difference flow logging and the injection tests could be made. Especially where the transmissive fractures were found during difference flow logging of the anomalies, deviating sections were shifted in order to achieve a reasonable comparison. Once the shifting for fractures was made, the position of the measured 5 m sections for the injection tests and the difference flow logging respectively, deviated up to 2.91 m.

Figure 6-5 shows a comparison of the calculated steady-state- (T_M) and most representative transmissivity (T_R) from the injection tests in 5 m sections with the calculated transmissivity values in the corresponding 5 m sections from the difference flow logging (T_D) in KFM10A. In Figure 6-6, T_R and T_D are plotted versus borehole length. The presented measurement limit for the difference flow logging is the practical lower measurement limit (varying along the borehole) in KFM10A which for most sections was between $2.4 \cdot 10^{-9}$ to $3.2 \cdot 10^{-9}$ m²/s, cf. Figure 6-6. This limit is higher than the corresponding test-specific measurement limit for the injection tests in KFM10A, cf. Table 6-2. This is clearly seen in Figure 6-5 as a difference between T_D, T_M and T_R, respectively, for low transmissivity values.

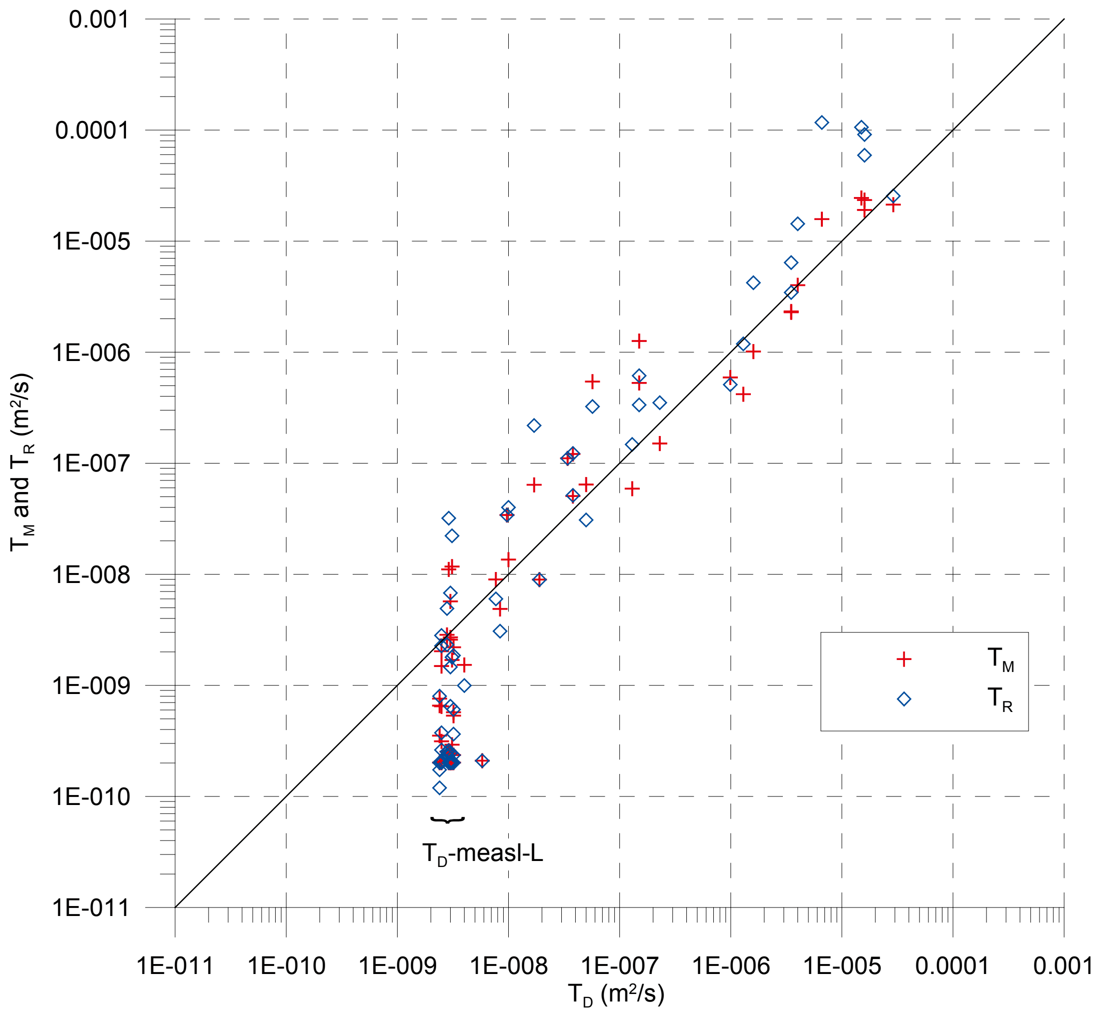

Figure 6-5. *Comparison of estimated steady-state (T_M) from the injection tests and most representative (T_R) transmissivity values from the injection tests in 5 m sections with estimated transmissivity values in the corresponding 5 m sections from the previous difference flow logging (T_D) in KFM10A.*

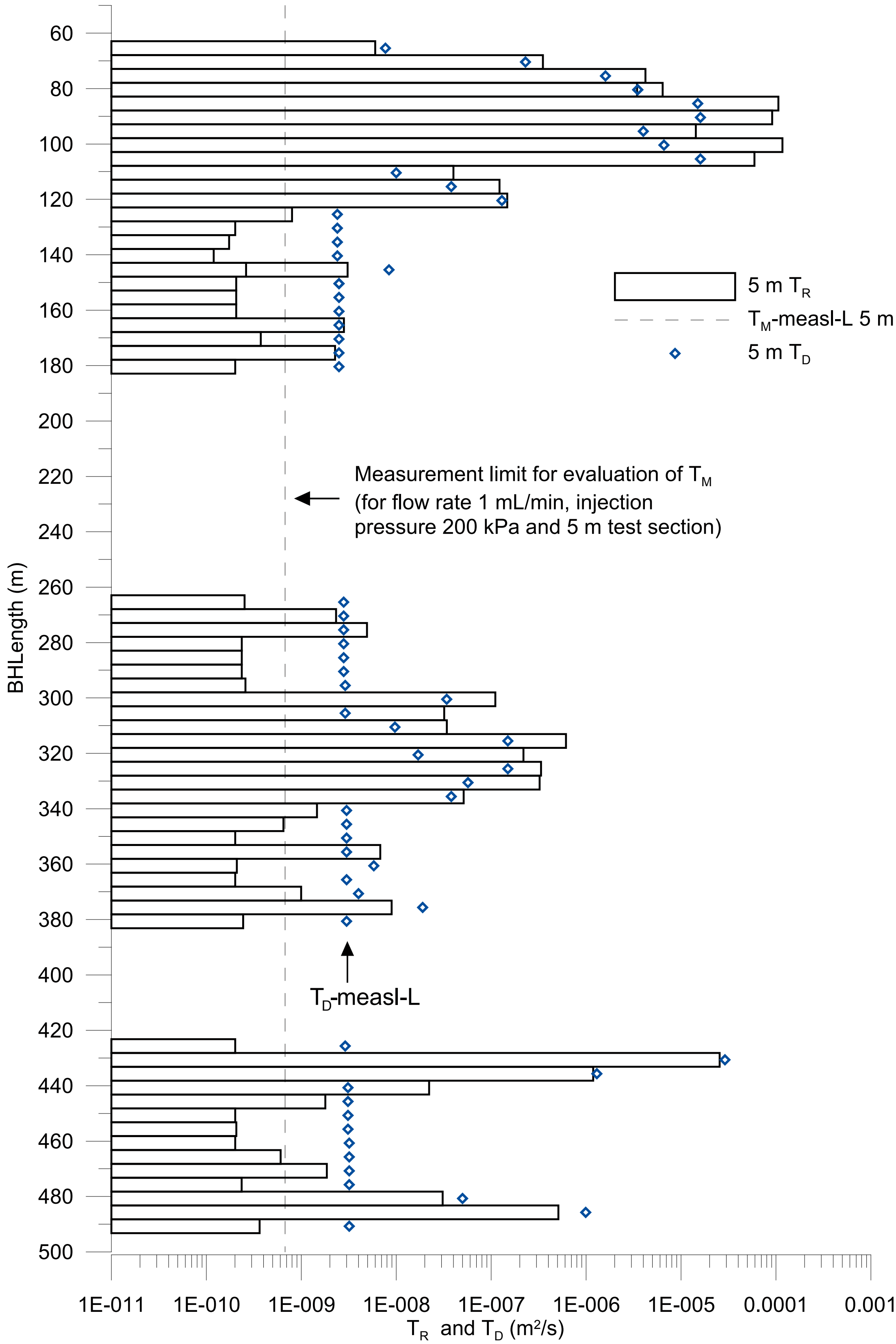

Figure 6-6. *Comparison of most representative (T_R) transmissivity values from the injection tests in 5 m sections with estimated transmissivity values in the corresponding 5 m sections from the previous difference flow logging (T_D) in KFM10A.*

Figure 6-7 shows a comparison of the estimated steady-state transmissivity values from the injection tests in 100 m and 20 m test sections with summed transmissivity values for 5 m sections from the difference flow logging (SUM T_D(5 m)) in the corresponding borehole intervals. The latter sums are shown in Table 6-4. Figure 6-7 demonstrates that the estimated transmissivity values from the injection tests in 100 m and 20 m sections are distributed over a wider range than the sum of transmissivity values from the difference flow logging. This is partly a result of the lower measurement limit values being included in the sum for the difference flow logging. In Figure 6-8, T_R and SUM T_D(5 m) are plotted versus the borehole length for the injection test intervals in 20 m and 100 m sections.

Figures 6-5, 6-6, 6-7 and 6-8 show a rather good agreement between the estimated transmissivity values from the injection test and the difference flow logging. The injection tests reveal slightly higher estimated transmissivities than the results from the difference flow logging. This tendency has been seen in other boreholes in Forsmark, cf. (Hjerne and Ludvigson 2005) /15/ and (Hjerne et al. 2005) /16/ and in some boreholes the tendency is even more obvious, cf. (Walger et al. 2006) /17/. For the difference flow logging, the preceding flow period in the borehole before the flow measurements was much longer than the short flow period for the injection tests. Therefore, the difference flow logging is assumed to predominantly measure interconnected, conductive fracture networks reaching further away from the borehole while the injection tests also may sample fractures with limited extension, close to the borehole. This

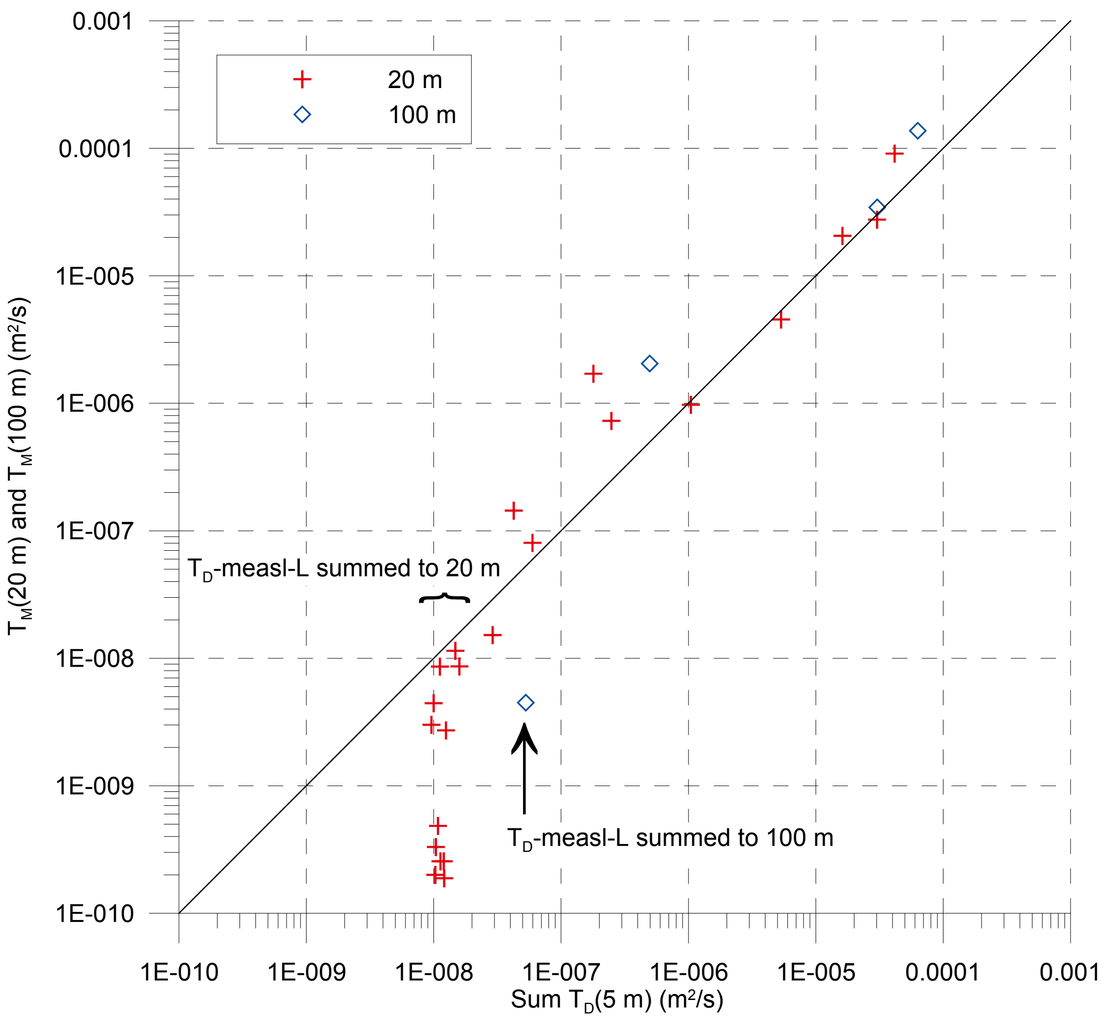

Figure 6-7. *Comparison of estimated steady-state transmissivity values from injection tests in 20 m and 100 m sections with summed transmissivity values in 5 m sections in the corresponding borehole intervals from difference flow logging in KFM10A.*

fact may possibly explain the slightly higher T_R from the injection tests than T_D from difference flow logging in some sections, assuming that the fractures in these sections are of limited extent or with decreasing aperture away from the borehole and not connected to a larger fracture network. Thus, the transmissivity of such fractures is assumed to decrease with increasing flow times, eventually reflected by effects of apparent no-flow boundaries during the injection tests. However, during short injection tests, such effects may not always be seen. It should also be noted that the two methods differ regarding assumptions and associated uncertainties. Potential uncertainties for difference flow logging results are discussed in Ludvigson et al. (2002) /18/ and for injection tests in Andersson et al. (1993) /19/.

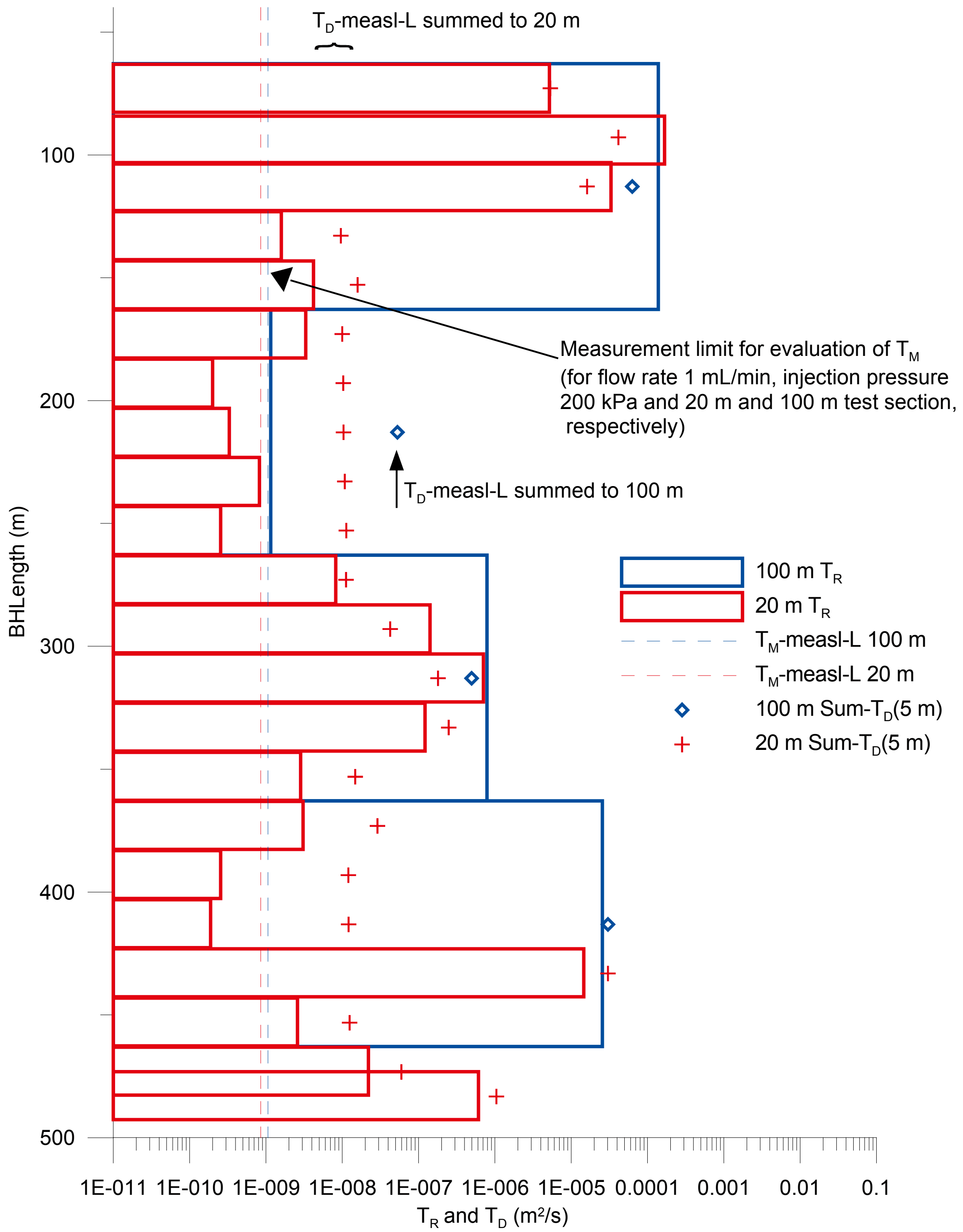

Figure 6-8. *Comparison of most representative (TR) transmissivity values from injection tests in 20 m and 100 m sections with summed transmissivity values in 5 m sections in the corresponding borehole intervals from difference flow logging in KFM10A.*

6.5 Basic statistics of hydraulic conductivity distributions in different scales

Some basic statistical parameters were calculated for the steady-state hydraulic conductivity (K_M) distributions in different scales (100 m, 20 m and 5 m) from the injection tests in borehole KFM10A. The hydraulic conductivity is obtained by dividing the transmissivity by the section length, in this case T_M/L_w. Results from all tests are included in the statistical analyses of both K_R and K_M. Tests below the measurement limit are assigned a transissivity value at the lower measurement limit. The same basic statistical parameters were derived for the hydraulic conductivity considered most representative ($K_R=T_R/L_w$), including all tests. In the statistical analysis, the logarithm (base 10) of K_M and K_R was used. Selected results are shown in Table 6-5. It should be noted that the statistics for the different section lengths is based on different borehole intervals.

6.6 Comparison of results from different hydraulic tests in KFM10A

In Table 6-6 a comparison of the sum of estimated transmissivity values from different hydraulic tests with different section lengths in KFM10A is presented. It should be observed that the summed transmissivity values only include the tests actually performed for each section length. However, the most conductive sections are measured. It is also important to point out that this is a very rough way of comparing the tests in different test scales, since no consideration to overlapping or missing sections is made. The sum of transmissivity from shorter sections is slightly higher than corresponding transmissivity for longer sections. This tendency can be seen between 100 m, 20 m and 5 m sections on T_R in Table 6-6.

Table 6-6 shows that the transmissivity evaluated from the difference flow logging is slightly lower than the transmissivity evaluated from the injection tests, see Section 6.4.

Table 6-5. Basic statistical parameters for steady-state hydraulic conductivity (K_M) and hydraulic conductivity considered most representative (K_R) in borehole KFM10A. L_w=section length, m=arithmetic mean, s=standard deviation.

Parameter	Unit	KFM10A L_w=100 m	KFM10A L_w=20 m [2]	KFM10A L_w=5 m [2][3]
Measured borehole interval	m	62.9–462.9	62.9–492.9	62.9–492.9
Number of tests	–	4	22	64
N:o of tests below E.L.M.L.[1]	–	0	5	17
m (Log10(KM))	Log10(m/s)	–7.59	–8.81	–8.78
s (Log10(KM))	–	1.99	1.83	1.63
m (Log10(KR))	Log10(m/s)	–7.87	–8.97	–8.72
s (Log10(KR))	–	2.25	1.83	1.80

1) Number of tests where Q_p could not be defined (E.L.M.L. = estimated test-specific lower measurement limit).

2) Contains partly overlapping sections, see Chapter 5.5.

3) Sections with very low or non-detectable flow (with 20 m section length) are not measured with 5 m section length.

Table 6-6. Comparison of calculated transmissivity values from different hydraulic tests in borehole KFM10A.

Hydraulic test method		Sum of T (m^2/s)
Injection tests	$\sum T_M$(100 m)[1)]	$1.74 \cdot 10^{-4}$
	$\sum T_R$(100 m)[1)]	$1.65 \cdot 10^{-4}$
	$\sum T_M$(20 m)[1)]	$1.47 \cdot 10^{-4}$
	$\sum T_R$(20 m)[1)]	$2.22 \cdot 10^{-4}$
	$\sum T_M$(5 m)[1)2)]	$1.18 \cdot 10^{-4}$
	$\sum T_R$(5 m)[1)2)]	$4.32 \cdot 10^{-4}$
Difference flow logging	$\sum T_D$(5 m)[3)]	$9.51 \cdot 10^{-5}$
	$\sum T_{Df}$ (flow anomalies)[3)]	$1.05 \cdot 10^{-4}$

1) For actual measured intervals and partly overlapping sections, see Chapter 5.5.

2) Sections with very low or non-detectable flow (with 20 m section length) are not measured with 5 m section length.

3) Actual measured intervals 62.9–493.2 m.

7 References

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8 Appendices

Appendix 1: File description table

Appendix 2.1: General test data

Appendix 2.2: Pressure and flow data

Appendix 3: Test diagrams – Injection tests

Appendix 4: Borehole technical data

Appendix 5: Sicada tables

APPENDIX 1. File description table

Bh id	Test section		Test type	Test no	Test start Date, time	Test stop Date, time	Data files of raw and primary data	Parameters in file	Comments
idcode	(m)	(m)	(1-6)[1)]		YYYYMMDD hh:mm	YYYYMMDD hh:mm	__Borehole id_secup_date and time of test start		
KFM10A	62.90	162.90	3	1	2006-12-14 11:23	2006-12-14 14:01	__KFM10A_0062.90_200612141123.ht2	P, Q, Te	
KFM10A	162.90	262.90	3	1	2006-12-14 15:59	2006-12-14 17:48	__KFM10A_0162.90_200612141559.ht2	P, Q, Te	
KFM10A	262.90	362.90	3	1	2006-12-15 09:55	2006-12-15 11:44	__KFM10A_0262.90_200612150955.ht2	P, Q, Te	
KFM10A	362.90	462.90	3	1	2006-12-15 13:33	2006-12-15 15:22	__KFM10A_0362.90_200612151333.ht2	P, Q, Te	
KFM10A	62.90	82.90	3	1	2006-12-19 12:53	2006-12-19 16:02	__KFM10A_0062.90_200612191253.ht2	P, Q, Te	
KFM10A	84.00	104.00	3	1	2006-12-20 13:05	2006-12-20 14:24	__KFM10A_0084.00_200612201305.ht2	P, Q, Te	
KFM10A	102.90	122.90	3	1	2006-12-20 14:59	2006-12-20 16:15	__KFM10A_0102.90_200612201459.ht2	P, Q, Te	
KFM10A	122.90	142.90	3	1	2006-12-20 17:03	2006-12-21 09:18	__KFM10A_0122.90_200612201703.ht2	P, Q, Te	
KFM10A	142.90	162.90	3	1	2006-12-21 09:42	2006-12-21 10:57	__KFM10A_0142.90_200612210942.ht2	P, Q, Te	
KFM10A	162.90	182.90	3	1	2006-12-21 11:13	2006-12-21 13:19	__KFM10A_0162.90_200612211113.ht2	P, Q, Te	
KFM10A	182.90	202.90	3	1	2006-12-21 13:41	2006-12-21 14:32	__KFM10A_0182.90_200612211341.ht2	P, Q, Te	
KFM10A	202.90	222.90	3	1	2006-12-21 14:48	2006-12-21 15:33	__KFM10A_0202.90_200612211448.ht2	P, Q, Te	
KFM10A	222.90	242.90	3	1	2006-12-21 15:49	2006-12-21 17:05	__KFM10A_0222.90_200612211549.ht2	P, Q, Te	
KFM10A	242.90	262.90	3	1	2006-12-22 09:02	2006-12-22 09:49	__KFM10A_0242.90_200612220902.ht2	P, Q, Te	
KFM10A	262.90	282.90	3	1	2006-12-22 10:13	2006-12-22 11:32	__KFM10A_0262.90_200612221013.ht2	P, Q, Te	
KFM10A	282.90	302.90	3	1	2006-12-22 11:57	2006-12-22 13:56	__KFM10A_0282.90_200612221157.ht2	P, Q, Te	Interrupted[2)]
KFM10A	282.90	302.90	3	2	2007-01-04 10:36	2007-01-04 11:51	__KFM10A_0282.90_200701041036.ht2	P, Q, Te	Reperformed
KFM10A	302.90	322.90	3	1	2007-01-02 08:29	2007-01-02 10:01	__KFM10A_0302.90_200701020829.ht2	P, Q, Te	
KFM10A	322.90	342.90	3	1	2007-01-02 10:26	2007-01-02 11:40	__KFM10A_0322.90_200701021026.ht2	P, Q, Te	
KFM10A	342.90	362.90	3	1	2007-01-02 12:46	2007-01-02 14:06	__KFM10A_0342.90_200701021246.ht2	P, Q, Te	
KFM10A	362.90	382.90	3	1	2007-01-02 14:21	2007-01-02 15:36	__KFM10A_0362.90_200701021421.ht2	P, Q, Te	
KFM10A	382.90	402.90	3	1	2007-01-02 15:58	2007-01-02 16:49	__KFM10A_0382.90_200701021558.ht2	P, Q, Te	
KFM10A	402.90	422.90	3	1	2007-01-03 08:57	2007-01-03 09:46	__KFM10A_0402.90_200701030857.ht2	P, Q, Te	
KFM10A	422.90	442.90	3	1	2007-01-03 10:03	2007-01-03 11:18	__KFM10A_0422.90_200701031003.ht2	P, Q, Te	
KFM10A	442.90	462.90	3	1	2007-01-03 11:39	2007-01-03 13:48	__KFM10A_0442.90_200701031139.ht2	P, Q, Te	
KFM10A	462.90	482.90	3	1	2007-01-03 14:06	2007-01-03 15:20	__KFM10A_0462.90_200701031406.ht2	P, Q, Te	
KFM10A	472.90	492.90	3	1	2007-01-03 15:38	2007-01-03 16:53	__KFM10A_0472.90_200701031538.ht2	P, Q, Te	
KFM10A	62.90	67.90	3	1	2007-01-05 13:55	2007-01-05 15:12	__KFM10A_0062.90_200701051355.ht2	P, Q, Te	
KFM10A	67.90	72.90	3	1	2007-01-05 15:24	2007-01-05 16:45	__KFM10A_0067.90_200701051524.ht2	P, Q, Te	
KFM10A	72.90	77.90	3	1	2007-01-08 08:35	2007-01-08 09:49	__KFM10A_0072.90_200701080835.ht2	P, Q, Te	
KFM10A	77.90	82.90	3	1	2007-01-08 10:00	2007-01-08 11:14	__KFM10A_0077.90_200701081000.ht2	P, Q, Te	
KFM10A	79.00	84.00	3	1	2007-01-08 11:20	2007-01-08 13:32	__KFM10A_0079.00_200701081120.ht2	P, Q, Te	
KFM10A	84.00	89.00	3	1	2007-01-08 13:46	2007-01-08 14:59	__KFM10A_0084.00_200701081346.ht2	P, Q, Te	
KFM10A	89.00	94.00	3	1	2007-01-08 15:13	2007-01-08 16:27	__KFM10A_0089.00_200701081513.ht2	P, Q, Te	
KFM10A	94.00	99.00	3	1	2007-01-08 16:41	2007-01-08 17:55	__KFM10A_0094.00_200701081641.ht2	P, Q, Te	

Bh id	Test section		Test type	Test no	Test start Date, time	Test stop Date, time	Data files of raw and primary data	Parameters in file	Comments
idcode	(m)	(m)	(1-6)[1)]		YYYYMMDD hh:mm	YYYYMMDD hh:mm	__Borehole id_secup_date and time of test start		
KFM10A	99.00	104.00	3	1	2007-01-08 18:07	2007-01-08 19:21	__KFM10A_0099.00_200701081807.ht2	P, Q, Te	
KFM10A	102.90	107.90	3	1	2007-01-08 19:39	2007-01-08 20:52	__KFM10A_0102.90_200701081939.ht2	P, Q, Te	
KFM10A	107.90	112.90	3	1	2007-01-09 07:34	2007-01-09 08:50	__KFM10A_0107.90_200701090734.ht2	P, Q, Te	
KFM10A	112.90	117.90	3	1	2007-01-09 09:05	2007-01-09 10:22	__KFM10A_0112.90_200701090905.ht2	P, Q, Te	
KFM10A	117.90	122.90	3	1	2007-01-09 10:45	2007-01-09 12:00	__KFM10A_0117.90_200701091045.ht2	P, Q, Te	
KFM10A	122.90	127.90	3	1	2007-01-09 13:06	2007-01-09 14:47	__KFM10A_0122.90_200701091306.ht2	P, Q, Te	
KFM10A	127.90	132.90	3	1	2007-01-10 08:23	2007-01-10 09:14	__KFM10A_0127.90_200701100823.ht2	P, Q, Te	
KFM10A	132.90	137.90	3	1	2007-01-10 09:31	2007-01-10 10:46	__KFM10A_0132.90_200701100931.ht2	P, Q, Te	
KFM10A	137.90	142.90	3	1	2007-01-10 10:58	2007-01-10 12:39	__KFM10A_0137.90_200701101058.ht2	P, Q, Te	Interrupted[2)]
KFM10A	137.90	142.90	3	2	2007-01-23 10:51	2007-01-23 13:09	__KFM10A_0137.90_200701231051.ht2	P, Q, Te	Reperformed
KFM10A	142.90	147.90	3	1	2007-01-10 12:51	2007-01-10 14:05	__KFM10A_0142.90_200701101251.ht2	P, Q, Te	
KFM10A	145.00	150.00	3	1	2007-01-10 14:16	2007-01-10 15:40	__KFM10A_0145.00_200701101416.ht2	P, Q, Te	
KFM10A	150.00	155.00	3	1	2007-01-10 15:51	2007-01-10 16:31	__KFM10A_0150.00_200701101551.ht2	P, Q, Te	
KFM10A	155.00	160.00	3	1	2007-01-11 08:27	2007-01-11 09:10	__KFM10A_0155.00_200701110827.ht2	P, Q, Te	
KFM10A	157.90	162.90	3	1	2007-01-11 09:20	2007-01-11 10:03	__KFM10A_0157.90_200701110920.ht2	P, Q, Te	
KFM10A	162.90	167.90	3	1	2007-01-11 10:17	2007-01-11 11:33	__KFM10A_0162.90_200701111017.ht2	P, Q, Te	
KFM10A	167.90	172.90	3	1	2007-01-11 12:36	2007-01-11 13:53	__KFM10A_0167.90_200701111236.ht2	P, Q, Te	
KFM10A	172.90	177.90	3	1	2007-01-11 14:09	2007-01-11 15:24	__KFM10A_0172.90_200701111409.ht2	P, Q, Te	
KFM10A	177.90	182.90	3	1	2007-01-11 15:37	2007-01-11 16:20	__KFM10A_0177.90_200701111537.ht2	P, Q, Te	
KFM10A	262.90	267.90	3	1	2007-01-12 08:40	2007-01-12 09:21	__KFM10A_0262.90_200701120840.ht2	P, Q, Te	
KFM10A	267.90	272.90	3	1	2007-01-12 09:35	2007-01-12 10:49	__KFM10A_0267.90_200701120935.ht2	P, Q, Te	
KFM10A	272.90	277.90	3	1	2007-01-12 11:02	2007-01-12 12:49	__KFM10A_0272.90_200701121102.ht2	P, Q, Te	
KFM10A	277.90	282.90	3	1	2007-01-12 13:01	2007-01-12 13:59	__KFM10A_0277.90_200701121301.ht2	P, Q, Te	
KFM10A	282.90	287.90	3	1	2007-01-12 14:10	2007-01-12 15:01	__KFM10A_0282.90_200701121410.ht2	P, Q, Te	
KFM10A	287.90	292.90	3	1	2007-01-12 15:11	2007-01-12 15:50	__KFM10A_0287.90_200701121511.ht2	P, Q, Te	
KFM10A	292.90	297.90	3	1	2007-01-12 16:05	2007-01-12 17:21	__KFM10A_0292.90_200701121605.ht2	P, Q, Te	
KFM10A	297.90	302.90	3	1	2007-01-15 08:31	2007-01-15 09:45	__KFM10A_0297.90_200701150831.ht2	P, Q, Te	
KFM10A	302.90	307.90	3	1	2007-01-15 09:58	2007-01-15 11:17	__KFM10A_0302.90_200701150958.ht2	P, Q, Te	Interrupted[2)]
KFM10A	302.90	307.90	3	2	2007-01-22 16:53	2007-01-23 09:28	__KFM10A_0302.90_200701221653.ht2	P, Q, Te	Reperformed
KFM10A	307.90	312.90	3	1	2007-01-15 11:27	2007-01-15 13:33	__KFM10A_0307.90_200701151127.ht2	P, Q, Te	
KFM10A	312.90	317.90	3	1	2007-01-15 13:45	2007-01-15 15:00	__KFM10A_0312.90_200701151345.ht2	P, Q, Te	
KFM10A	317.90	322.90	3	1	2007-01-15 15:11	2007-01-15 16:27	__KFM10A_0317.90_200701151511.ht2	P, Q, Te	
KFM10A	322.90	327.90	3	1	2007-01-15 16:39	2007-01-16 09:17	__KFM10A_0322.90_200701151639.ht2	P, Q, Te	
KFM10A	327.90	332.90	3	1	2007-01-16 09:34	2007-01-16 10:52	__KFM10A_0327.90_200701160934.ht2	P, Q, Te	
KFM10A	332.90	337.90	3	1	2007-01-16 11:05	2007-01-16 12:47	__KFM10A_0332.90_200701161105.ht2	P, Q, Te	Interrupted[2)]
KFM10A	332.90	337.90	3	2	2007-01-22 15:18	2007-01-22 16:32	__KFM10A_0332.90_200701221518.ht2	P, Q, Te	Reperformed
KFM10A	337.90	342.90	3	1	2007-01-16 13:01	2007-01-16 14:19	__KFM10A_0337.90_200701161301.ht2	P, Q, Te	
KFM10A	342.90	347.90	3	1	2007-01-16 14:37	2007-01-16 15:53	__KFM10A_0342.90_200701161437.ht2	P, Q, Te	
KFM10A	347.90	352.90	3	1	2007-01-16 16:10	2007-01-16 16:53	__KFM10A_0347.90_200701161610.ht2	P, Q, Te	

Bh id	Test section		Test type	Test no	Test start Date, time	Test stop Date, time	Data files of raw and primary data	Parameters in file	Comments
idcode	(m)	(m)	(1-6)[1]		YYYYMMDD hh:mm	YYYYMMDD hh:mm	__Borehole id_secup_date and time of test start		
KFM10A	352.90	357.90	3	1	2007-01-17 08:29	2007-01-17 09:46	__KFM10A_0352.90_200701170829.ht2	P, Q, Te	
KFM10A	357.90	362.90	3	1	2007-01-17 09:57	2007-01-17 10:44	__KFM10A_0357.90_200701170957.ht2	P, Q, Te	
KFM10A	362.90	367.90	3	1	2007-01-17 10:58	2007-01-17 11:41	__KFM10A_0362.90_200701171058.ht2	P, Q, Te	
KFM10A	367.90	372.90	3	1	2007-01-17 13:11	2007-01-17 14:29	__KFM10A_0367.90_200701171311.ht2	P, Q, Te	
KFM10A	372.90	377.90	3	1	2007-01-17 14:41	2007-01-17 15:57	__KFM10A_0372.90_200701171441.ht2	P, Q, Te	
KFM10A	377.90	382.90	3	1	2007-01-17 16:12	2007-01-17 17:27	__KFM10A_0377.90_200701171612.ht2	P, Q, Te	
KFM10A	422.90	427.90	3	1	2007-01-18 08:48	2007-01-18 09:33	__KFM10A_0422.90_200701180848.ht2	P, Q, Te	
KFM10A	427.90	432.90	3	1	2007-01-18 09:50	2007-01-18 11:05	__KFM10A_0427.90_200701180950.ht2	P, Q, Te	Interrupted[2]
KFM10A	427.90	432.90	3	2	2007-01-22 13:06	2007-01-22 14:29	__KFM10A_0427.90_200701221306.ht2	P, Q, Te	Reperformed
KFM10A	432.90	437.90	3	1	2007-01-18 11:19	2007-01-18 12:32	__KFM10A_0432.90_200701181119.ht2	P, Q, Te	
KFM10A	437.90	442.90	3	1	2007-01-18 13:34	2007-01-18 14:51	__KFM10A_0437.90_200701181334.ht2	P, Q, Te	
KFM10A	442.90	447.90	3	1	2007-01-18 15:12	2007-01-18 16:29	__KFM10A_0442.90_200701181512.ht2	P, Q, Te	
KFM10A	447.90	452.90	3	1	2007-01-18 16:42	2007-01-19 08:06	__KFM10A_0447.90_200701181642.ht2	P, Q, Te	
KFM10A	452.90	457.90	3	1	2007-01-19 08:18	2007-01-19 09:31	__KFM10A_0452.90_200701190818.ht2	P, Q, Te	
KFM10A	457.90	462.90	3	1	2007-01-19 09:42	2007-01-19 10:21	__KFM10A_0457.90_200701190942.ht2	P, Q, Te	
KFM10A	462.90	467.90	3	1	2007-01-19 10:30	2007-01-19 11:44	__KFM10A_0462.90_200701191030.ht2	P, Q, Te	
KFM10A	467.90	472.90	3	1	2007-01-19 12:28	2007-01-19 13:42	__KFM10A_0467.90_200701191228.ht2	P, Q, Te	
KFM10A	472.90	477.90	3	1	2007-01-19 13:54	2007-01-19 14:36	__KFM10A_0472.90_200701191354.ht2	P, Q, Te	
KFM10A	477.90	482.90	3	1	2007-01-19 14:48	2007-01-19 16:04	__KFM10A_0477.90_200701191448.ht2	P, Q, Te	
KFM10A	482.90	487.90	3	1	2007-01-22 08:26	2007-01-22 09:41	__KFM10A_0482.90_200701220826.ht2	P, Q, Te	
KFM10A	487.90	492.90	3	1	2007-01-22 09:53	2007-01-22 11:08	__KFM10A_0487.90_200701220953.ht2	P, Q, Te	

[1] 3: Injection test
[2] The tests were interrupted for various reasons or did not provide satisfying data for the evaluation and were hence re-performed later

Appendix 2.1. General test data

Borehole:	KFM10A
Testtype:	CHir (Constant Head injection and recovery)
Field crew:	C. Hjerne, T. Svensson, J. Harrström, E. Gustavsson, E. Walger, J. Florberger, A. Lindquist
General comment:	

Test section secup	**Test section seclow**	**Test start**	**Start of flow period**	**Stop of flow period**	**Test stop**	**Total flow time t_p**	**Total recovery time t_F**
(m)	(m)	YYYYMMDD hh:mm	YYYYMMDD hh:mm:ss	YYYYMMDD hh:mm:ss	YYYYMMDD hh:mm	(min)	(min)
62.90	162.90	2006-12-14 11:23	2006-12-14 12:58:36	2006-12-14 13:28:37	2006-12-14 14:01	30	30
162.90	262.90	2006-12-14 15:59	2006-12-14 16:46:29	2006-12-14 17:16:51	2006-12-14 17:48	30	30
262.90	362.90	2006-12-15 09:55	2006-12-15 10:42:07	2006-12-15 11:12:00	2006-12-15 11:44	30	30
362.90	462.90	2006-12-15 13:33	2006-12-15 14:20:19	2006-12-15 14:50:17	2006-12-15 15:22	30	30
62.90	82.90	2006-12-19 12:53	2006-12-19 15:19:46	2006-12-19 15:39:51	2006-12-19 16:02	20	20
84.00	104.00	2006-12-20 13:05	2006-12-20 13:41:45	2006-12-20 14:01:53	2006-12-20 14:24	20	20
102.90	122.90	2006-12-20 14:59	2006-12-20 15:32:49	2006-12-20 15:52:57	2006-12-20 16:15	20	20
122.90	142.90	2006-12-20 17:03	2006-12-21 08:35:54	2006-12-21 08:56:14	2006-12-21 09:18	20	20
142.90	162.90	2006-12-21 09:42	2006-12-21 10:14:43	2006-12-21 10:35:03	2006-12-21 10:57	20	20
162.90	182.90	2006-12-21 11:13	2006-12-21 12:37:13	2006-12-21 12:57:33	2006-12-21 13:19	20	20
182.90	202.90	2006-12-21 13:41	2006-12-21 14:13:26	2006-12-21 14:25:20	2006-12-21 14:32	12	5
202.90	222.90	2006-12-21 14:48	2006-12-21 15:19:21	2006-12-21 15:26:07	2006-12-21 15:33	7	5
222.90	242.90	2006-12-21 15:49	2006-12-21 16:23:05	2006-12-21 16:43:27	2006-12-21 17:05	20	20
242.90	262.90	2006-12-22 09:02	2006-12-22 09:37:21	2006-12-22 09:41:42	2006-12-22 09:49	4	5
262.90	282.90	2006-12-22 10:13	2006-12-22 10:49:44	2006-12-22 11:10:04	2006-12-22 11:32	20	20
282.90	302.90	2007-01-04 10:36	2007-01-04 11:08:40	2007-01-04 11:28:47	2007-01-04 11:51	20	20
302.90	322.90	2007-01-02 08:29	2007-01-02 09:18:44	2007-01-02 09:38:46	2007-01-02 10:01	20	20
322.90	342.90	2007-01-02 10:26	2007-01-02 10:58:14	2007-01-02 11:18:17	2007-01-02 11:40	20	20
342.90	362.90	2007-01-02 12:46	2007-01-02 13:23:37	2007-01-02 13:44:02	2007-01-02 14:06	20	20
362.90	382.90	2007-01-02 14:21	2007-01-02 14:53:36	2007-01-02 15:14:01	2007-01-02 15:36	20	20
382.90	402.90	2007-01-02 15:58	2007-01-02 16:33:05	2007-01-02 16:42:12	2007-01-02 16:49	9	5
402.90	422.90	2007-01-03 08:57	2007-01-03 09:32:38	2007-01-03 09:38:30	2007-01-03 09:46	6	5
422.90	442.90	2007-01-03 10:03	2007-01-03 10:36:14	2007-01-03 10:56:14	2007-01-03 11:18	20	20
442.90	462.90	2007-01-03 11:39	2007-01-03 13:05:34	2007-01-03 13:25:58	2007-01-03 13:48	20	20
462.90	482.90	2007-01-03 14:06	2007-01-03 14:37:56	2007-01-03 14:58:06	2007-01-03 15:20	20	20
472.90	492.90	2007-01-03 15:38	2007-01-03 16:10:30	2007-01-03 16:30:40	2007-01-03 16:53	20	20
62.90	67.90	2007-01-05 13:55	2007-01-05 14:30:16	2007-01-05 14:50:37	2007-01-05 15:12	20	20
67.90	72.90	2007-01-05 15:24	2007-01-05 16:02:25	2007-01-05 16:22:36	2007-01-05 16:45	20	20
72.90	77.90	2007-01-08 08:35	2007-01-08 09:07:20	2007-01-08 09:27:38	2007-01-08 09:49	20	20
77.90	82.90	2007-01-08 10:00	2007-01-08 10:32:00	2007-01-08 10:52:18	2007-01-08 11:14	20	20
79.00	84.00	2007-01-08 11:20	2007-01-08 12:49:37	2007-01-08 13:09:52	2007-01-08 13:32	20	20
84.00	89.00	2007-01-08 13:46	2007-01-08 14:17:14	2007-01-08 14:37:31	2007-01-08 14:59	20	20
89.00	94.00	2007-01-08 15:13	2007-01-08 15:44:59	2007-01-08 16:05:09	2007-01-08 16:27	20	20
94.00	99.00	2007-01-08 16:41	2007-01-08 17:12:53	2007-01-08 17:33:02	2007-01-08 17:55	20	20
99.00	104.00	2007-01-08 18:07	2007-01-08 18:39:14	2007-01-08 18:59:20	2007-01-08 19:21	20	20
102.90	107.90	2007-01-08 19:39	2007-01-08 20:10:20	2007-01-08 20:30:30	2007-01-08 20:52	20	20
107.90	112.90	2007-01-09 07:34	2007-01-09 08:08:05	2007-01-09 08:28:26	2007-01-09 08:50	20	20
112.90	117.90	2007-01-09 09:05	2007-01-09 09:39:44	2007-01-09 10:00:07	2007-01-09 10:22	20	20
117.90	122.90	2007-01-09 10:45	2007-01-09 11:17:57	2007-01-09 11:38:15	2007-01-09 12:00	20	20
122.90	127.90	2007-01-09 13:06	2007-01-09 14:04:24	2007-01-09 14:24:48	2007-01-09 14:47	20	20
127.90	132.90	2007-01-10 08:23	2007-01-10 08:55:00	2007-01-10 09:06:45	2007-01-10 09:14	12	5
132.90	137.90	2007-01-10 09:31	2007-01-10 10:03:30	2007-01-10 10:23:54	2007-01-10 10:46	20	20
137.90	142.90	2007-01-23 10:51	2007-01-23 12:26:53	2007-01-23 12:47:23	2007-01-23 13:09	21	20
142.90	147.90	2007-01-10 12:51	2007-01-10 13:22:39	2007-01-10 13:42:59	2007-01-10 14:05	20	20
145.00	150.00	2007-01-10 14:16	2007-01-10 14:58:11	2007-01-10 15:18:33	2007-01-10 15:40	20	20
150.00	155.00	2007-01-10 15:51	2007-01-10 16:22:30	2007-01-10 16:24:23	2007-01-10 16:31	2	5
155.00	160.00	2007-01-11 08:27	2007-01-11 09:01:03	2007-01-11 09:03:27	2007-01-11 09:10	2	5
157.90	162.90	2007-01-11 09:20	2007-01-11 09:53:30	2007-01-11 09:55:52	2007-01-11 10:03	2	5
162.90	167.90	2007-01-11 10:17	2007-01-11 10:50:45	2007-01-11 11:11:07	2007-01-11 11:33	20	20
167.90	172.90	2007-01-11 12:36	2007-01-11 13:11:13	2007-01-11 13:31:35	2007-01-11 13:53	20	20
172.90	177.90	2007-01-11 14:09	2007-01-11 14:41:41	2007-01-11 15:02:06	2007-01-11 15:24	20	20
177.90	182.90	2007-01-11 15:37	2007-01-11 16:10:55	2007-01-11 16:12:59	2007-01-11 16:20	2	5
262.90	267.90	2007-01-12 08:40	2007-01-12 09:12:27	2007-01-12 09:14:13	2007-01-12 09:21	2	5
267.90	272.90	2007-01-12 09:35	2007-01-12 10:07:20	2007-01-12 10:27:45	2007-01-12 10:49	20	20
272.90	277.90	2007-01-12 11:02	2007-01-12 12:07:15	2007-01-12 12:27:35	2007-01-12 12:49	20	20
277.90	282.90	2007-01-12 13:01	2007-01-12 13:35:21	2007-01-12 13:43:37	2007-01-12 13:59	8	14
282.90	287.90	2007-01-12 14:10	2007-01-12 14:42:46	2007-01-12 14:54:20	2007-01-12 15:01	12	5
287.90	292.90	2007-01-12 15:11	2007-01-12 15:42:09	2007-01-12 15:43:14	2007-01-12 15:50	1	5

Test section secup	Test section seclow	Test start	Start of flow period	Stop of flow period	Test stop	Total flow time t_p	Total recovery time t_F
(m)	(m)	YYYYMMDD hh:mm	YYYYMMDD hh:mm:ss	YYYYMMDD hh:mm:ss	YYYYMMDD hh:mm	(min)	(min)
292.90	297.90	2007-01-12 16:05	2007-01-12 16:38:52	2007-01-12 16:59:18	2007-01-12 17:21	20	20
297.90	302.90	2007-01-15 08:31	2007-01-15 09:03:21	2007-01-15 09:23:49	2007-01-15 09:45	20	20
302.90	307.90	2007-01-22 16:53	2007-01-23 08:46:20	2007-01-23 09:06:41	2007-01-23 09:28	20	20
307.90	312.90	2007-01-15 11:27	2007-01-15 12:50:43	2007-01-15 13:11:10	2007-01-15 13:33	20	20
312.90	317.90	2007-01-15 13:45	2007-01-15 14:18:29	2007-01-15 14:38:35	2007-01-15 15:00	20	20
317.90	322.90	2007-01-15 15:11	2007-01-15 15:44:55	2007-01-15 16:05:18	2007-01-15 16:27	20	20
322.90	327.90	2007-01-15 16:39	2007-01-16 08:34:29	2007-01-16 08:55:17	2007-01-16 09:17	21	20
327.90	332.90	2007-01-16 09:34	2007-01-16 10:09:31	2007-01-16 10:29:53	2007-01-16 10:52	20	20
332.90	337.90	2007-01-22 15:18	2007-01-22 15:50:02	2007-01-22 16:10:12	2007-01-22 16:32	20	20
337.90	342.90	2007-01-16 13:01	2007-01-16 13:37:18	2007-01-16 13:57:45	2007-01-16 14:19	20	20
342.90	347.90	2007-01-16 14:37	2007-01-16 15:11:14	2007-01-16 15:31:46	2007-01-16 15:53	21	20
347.90	352.90	2007-01-16 16:10	2007-01-16 16:42:26	2007-01-16 16:45:40	2007-01-16 16:53	3	5
352.90	357.90	2007-01-17 08:29	2007-01-17 09:04:01	2007-01-17 09:24:25	2007-01-17 09:46	20	20
357.90	362.90	2007-01-17 09:57	2007-01-17 10:33:28	2007-01-17 10:36:47	2007-01-17 10:44	3	5
362.90	367.90	2007-01-17 10:58	2007-01-17 11:31:22	2007-01-17 11:33:52	2007-01-17 11:41	3	5
367.90	372.90	2007-01-17 13:11	2007-01-17 13:46:48	2007-01-17 14:07:19	2007-01-17 14:29	21	20
372.90	377.90	2007-01-17 14:41	2007-01-17 15:15:06	2007-01-17 15:35:33	2007-01-17 15:57	20	20
377.90	382.90	2007-01-17 16:12	2007-01-17 16:44:55	2007-01-17 17:05:25	2007-01-17 17:27	21	20
422.90	427.90	2007-01-18 08:48	2007-01-18 09:19:27	2007-01-18 09:25:30	2007-01-18 09:33	6	5
427.90	432.90	2007-01-22 13:06	2007-01-22 13:47:00	2007-01-22 14:07:08	2007-01-22 14:29	20	20
432.90	437.90	2007-01-18 11:19	2007-01-18 11:49:53	2007-01-18 12:10:16	2007-01-18 12:32	20	20
437.90	442.90	2007-01-18 13:34	2007-01-18 14:08:33	2007-01-18 14:28:53	2007-01-18 14:51	20	20
442.90	447.90	2007-01-18 15:12	2007-01-18 15:46:44	2007-01-18 16:07:09	2007-01-18 16:29	20	20
447.90	452.90	2007-01-18 16:42	2007-01-19 07:56:49	2007-01-19 07:59:03	2007-01-19 08:06	2	5
452.90	457.90	2007-01-19 08:18	2007-01-19 08:49:15	2007-01-19 09:09:41	2007-01-19 09:31	20	20
457.90	462.90	2007-01-19 09:42	2007-01-19 10:12:57	2007-01-19 10:14:06	2007-01-19 10:21	1	5
462.90	467.90	2007-01-19 10:30	2007-01-19 11:01:54	2007-01-19 11:22:25	2007-01-19 11:44	21	20
467.90	472.90	2007-01-19 12:28	2007-01-19 13:00:24	2007-01-19 13:20:50	2007-01-19 13:42	20	20
472.90	477.90	2007-01-19 13:54	2007-01-19 14:27:02	2007-01-19 14:29:09	2007-01-19 14:36	2	5
477.90	482.90	2007-01-19 14:48	2007-01-19 15:22:20	2007-01-19 15:42:43	2007-01-19 16:04	20	20
482.90	487.90	2007-01-22 08:26	2007-01-22 08:58:56	2007-01-22 09:19:19	2007-01-22 09:41	20	20
487.90	492.90	2007-01-22 09:53	2007-01-22 10:25:35	2007-01-22 10:46:05	2007-01-22 11:08	21	20
282.90[1)]	302.90	2006-12-22 11:57	2006-12-22 13:14:14	2006-12-22 13:34:47	2006-12-22 13:56	21	20
137.90[1)]	142.90	2007-01-10 10:58	2007-01-10 12:28:29	2007-01-10 12:36:46	2007-01-10 12:39	8	1
302.90[1)]	307.90	2007-01-15 09:58	2007-01-15 10:34:55	2007-01-15 10:55:02	2007-01-15 11:17	20	20
332.90[1)]	337.90	2007-01-16 11:05	2007-01-16 12:27:24	2007-01-16 12:35:59	2007-01-16 12:47	9	7
427.90[1)]	432.90	2007-01-18 09:50	2007-01-18 10:23:24	2007-01-18 10:42:41	2007-01-18 11:05	19	20

[1)] The tests were interrupted for various reasons or did not provide satisfying data for the evaluation and were hence re-performed later

Appendix 2.2 Pressure and flow data

Summary of pressure and flow data for all tests in KFM10A

Test section		Pressure			Flow		
secup	seclow	p_i	p_p	p_F	Q_p 1)	Q_m 1)	V_p 1)
(m)	(m)	(kPa)	(kPa)	(kPa)	(m^3/s)	(m^3/s)	(m^3)
62.90	162.90	517.47	582.82	520.76	0.0007026	0.000734	1.32E+00
162.90	262.90	1215.53	1412.16	1309.46	6.899E-08	1.88E-07	3.43E-04
262.90	362.90	1869.12	2053.12	1983.91	2.951E-05	7.4E-05	1.33E-01
362.90	462.90	2478.23	2625.47	2481.52	0.0003961	0.000415	7.47E-01
62.90	82.90	538.16	750.3	538.30	9.374E-05	9.96E-05	1.20E-01
84.00	104.00	694.28	765.4	695.92	0.0006284	0.00065	7.84E-01
102.90	122.90	833.24	1032.09	835.43	0.0003981	0.000407	4.90E-01
122.90	142.90	977.95	1175.13	991.41	5.77E-08	7.2E-08	8.81E-05
142.90	162.90	1123.23	1321.51	1140.26	1.665E-07	1.99E-07	2.43E-04
162.90	182.90	1266.02	1466.36	1323.15	8.652E-08	1.28E-07	1.56E-04
182.90	202.90	1414.87	1625.78	1616.99			
202.90	222.90	1551.35	1766.38	1760.88			
222.90	242.90	1687.84	1905.34	1869.09	1.026E-08	7.1E-08	8.55E-05
242.90	262.90	1834.47	2046.9	2043.19			
262.90	282.90	1956.55	2178.31	2071.20	1.855E-07	3.29E-07	4.02E-04
282.90	302.90	2086.85	2300.2	2264.53	2.99E-06	1.64E-05	2.00E-02
302.90	322.90	2217.85	2392.91	2318.36	2.906E-05	6.15E-05	7.39E-02
322.90	342.90	2346.92	2566.65	2449.63	1.555E-05	3.16E-05	3.81E-02
342.90	362.90	2473.25	2675.36	2507.29	2.248E-07	3.54E-07	4.34E-04
362.90	382.90	2599.01	2798.93	2604.51	2.958E-07	3.63E-07	4.46E-04
382.90	402.90	2741.54	2941.19	2923.61			
402.90	422.90	2874.73	3064.76	3063.12			
422.90	442.90	2965.21	3120.24	2969.20	0.0004157	0.000438	5.26E-01
442.90	462.90	3086.73	3339.93	3092.77	6.699E-08	8.56E-08	1.05E-04
462.90	482.90	3198.78	3404.05	3204.26	1.606E-06	1.87E-06	2.27E-03
472.90	492.90	3255.75	3453.07	3263.04	0.0000187	2.06E-05	2.50E-02
62.90	67.90	539.78	759.89	540.19	2.438E-07	2.66E-07	3.26E-04
67.90	72.90	577	776.92	577.54	3.712E-06	3.81E-06	4.62E-03
72.90	77.90	613.52	813.17	613.25	2.495E-05	2.57E-05	3.13E-02
77.90	82.90	651.83	859.85	650.59	5.921E-05	6.3E-05	7.67E-02
79.00	84.00	661.03	807.25	658.28	4.194E-05	4.37E-05	5.31E-02
84.00	89.00	695.9	776.37	695.63	0.000247	0.000248	3.02E-01
89.00	94.00	731.88	868.37	733.52	0.0003935	0.000399	4.82E-01
94.00	99.00	769.37	968.21	769.77	9.816E-05	0.0001	1.21E-01
99.00	104.00	806.02	953.419	807.12	0.0002866	0.000289	3.48E-01
102.90	107.90	835.96	981.55	836.78	0.0003445	0.000348	4.21E-01
107.90	112.90	871.39	1082.43	871.93	3.528E-07	3.68E-07	4.51E-04
112.90	117.90	908.18	1054.79	908.18	9.156E-07	8.97E-07	1.10E-03
117.90	122.90	944.43	1163.566	944.99	1.596E-06	1.68E-06	2.05E-03
122.90	127.90	981.78	1233.51	986.73	2.358E-08	3.04E-08	3.73E-05
127.90	132.90	1065.12	1280.15	1224.54			
132.90	137.90	1063.61	1315.75	1109.75	2.041E-08	3.15E-08	3.81E-05
137.90	142.90	1105.9	1333.01	1136.12	9.877E-09	1.06E-08	1.28E-05
142.90	147.90	1127.33	1302.53	1142.71	1.053E-07	1.24E-07	1.52E-04
145.00	150.00	1151.5	1384.36	1161.38	9E-09	1.25E-08	1.50E-05
150.00	155.00	1215.21	1421.17	1436.00			
155.00	160.00	1259.97	1455.77	1469.50			
157.90	162.90	1256.95	1477.74	1482.13			
162.90	167.90	1275.35	1513.02	1322.86	5.939E-08	7.6E-08	9.31E-05
167.90	172.90	1320.66	1548.58	1351.41	1.82E-08	2.58E-08	3.12E-05
172.90	177.90	1354.71	1583.33	1403.58	4.2E-08	5.94E-08	7.30E-05
177.90	182.90	1418.97	1619.99	1634.26			
262.90	267.90	2039.19	2208.21	2234.58			
267.90	272.90	2002.67	2240.61	2173.07	7.6E-08	1.82E-07	2.23E-04
272.90	277.90	2039.88	2275.8	2086.83	8.3E-08	9.63E-08	1.18E-04
277.90	282.90	2073.38	2309.41	2263.14			
282.90	287.90	2123.64	2344.43	2330.69			
287.90	292.90	2166.47	2378.48	2400.99			
292.90	297.90	2175.26	2411.33	2386.17	4.28E-09		
297.90	302.90	2202.17	2415.81	2380.67	2.917E-06	1.59E-05	1.98E-02
302.90	307.90	2234.85	2450.76	2267.54	2.951E-07	3.25E-07	3.98E-04
307.90	312.90	2269.18	2411.6	2392.21	5.993E-07	3.82E-06	4.74E-03
312.90	317.90	2300.63	2487.2	2411.43	2.898E-05	6.33E-05	7.66E-02

Test section		Pressure			Flow		
secup	seclow	p_i	p_p	p_F	Q_p [1)]	Q_m [1)]	V_p [1)]
(m)	(m)	(kPa)	(kPa)	(kPa)	(m^3/s)	(m^3/s)	(m^3)
317.90	322.90	2331.79	2519.08	2333.44	1.475E-06	1.55E-06	1.90E-03
322.90	327.90	2363.1	2565.36	2426.81	1.318E-05	1.88E-05	2.35E-02
327.90	332.90	2404.7	2605.31	2447.68	1.344E-05	1.78E-05	2.17E-02
332.90	337.90	2431.615	2681.667	2628.37	3.737E-06	1.55E-05	1.90E-02
337.90	342.90	2458.25	2668.89	2517.43	6.7E-08	9.87E-08	1.22E-04
342.90	347.90	2494.91	2715.57	2599.28	7.364E-08	2.02E-07	2.49E-04
347.90	352.90	2548.33	2749.62	2732.73			
352.90	357.90	2557.94	2785.73	2565.22	1.602E-07	1.73E-07	2.12E-04
357.90	362.90	2618.63	2810.17	2801.93			
362.90	367.90	2638.81	2844.37	2851.37			
367.90	372.90	2652.27	2879.65	2655.29	4.291E-08	4.94E-08	6.09E-05
372.90	377.90	2683.03	2882.15	2688.79	2.2E-07	2.61E-07	3.21E-04
377.90	382.90	2726.41	2932.12	2845.88	6.2E-09	1.96E-08	2.36E-05
422.90	427.90	3030.28	3206.72	3188.05			
427.90	432.90	3019.7	3183.66	3024.37	0.00043	0.000452	5.46E-01
432.90	437.90	3046.48	3258.21	3046.34	1.091E-05	1.18E-05	1.45E-02
437.90	442.90	3076.55	3315.33	3076.55	3.452E-07	3.68E-07	4.50E-04
442.90	447.90	3113.9	3312.04	3115.55	4.133E-08	4.73E-08	5.80E-05
447.90	452.90	3143.02	3346.77	3340.18			
452.90	457.90	3202.88	3373.69	3234.19	6.16E-09	9.43E-09	1.14E-05
457.90	462.90	3299.95	3402.79	3475.84			
462.90	467.90	3240.78	3431	3248.46	1.25E-08	1.79E-08	2.16E-05
467.90	472.90	3258.35	3457.13	3371.49	5.4E-08	1.28E-07	1.57E-04
472.90	477.90	3294.46	3485.73	3487.93			
477.90	482.90	3311.62	3506.187	3314.37	1.545E-06	1.72E-06	2.10E-03
482.90	487.90	3341.83	3541.2	3347.32	1.454E-05	1.62E-05	1.98E-02
487.90	492.90	3403.76	3598.596	3379.73	1.375E-08	1.54E-08	1.86E-05
282.90 [2)]	302.90	2089.32	2321.93	2284.31	1.204E-06	1.83E-05	2.26E-02
137.90 [2)]	142.90	1092.18	1329.99	1323.96	1.217E-08		
302.90 [2)]	307.90	2223.56	2454.37	2257.10	2.977E-07	3.07E-07	3.74E-04
332.90 [2)]	337.90	2430.1	2683.44	2653.64	2.429E-07	3.22E-05	1.66E-02
427.90 [2)]	432.90	3016.68	3059.928	3018.33	0.000214	0.00021	2.53E-01

[1)] No value indicates a flow below measurement limit (measurement limit is unique for each test but nominally 1.67 E-8 m^3/s).
[2)] The tests were interrupted for various reasons or did not provide satisfying data for the evaluation and were hence re-performed later.

p_i	Pressure in test section before start of flow period
p_p	Pressure in test section before stop of flow period
p_F	Pressure in test section at the end of recovery period
Q_p	Flow rate just before stop of flow period
Q_m	Mean (arithmetic) flow rate during flow period
V_p	Total volume injected during the flow period

Appendix 3. Test diagrams – Injection and pressure pulse tests

In the following pages the selected test diagrams are presented for all test sections. A linear diagram of pressure and flow rate is presented for each test. For most tests are lin-log and log-log diagrams presented, from injection and recovery period respectively. From the tests with a flow rate below the estimated lower measurement limit for the specific test, only the linear diagram is presented. Additionally, for a few tests, a type curve fit is displayed in the diagrams despite the the fact that the estimated parameters from the fit are judged as non-representative. For these tests, the type curve fit is presented, as an example, to illustrate that an assumption of a certain flow regime is not justified for the test. Instead, some other flow regime is likely to dominate.

Nomenclature for Aqtesolv:

T	=	transmissivity (m^2/s)
S	=	storativity (-)
K_z/K_r	=	ratio of hydraulic conductivities in the vertical and radial direction (set to 1)
Sw	=	skin factor
r(w)	=	borehole radius (m)
r(c)	=	effective casing radius (m)
C	=	well loss constant (set to 0)
r/B	=	leakage factor (-)

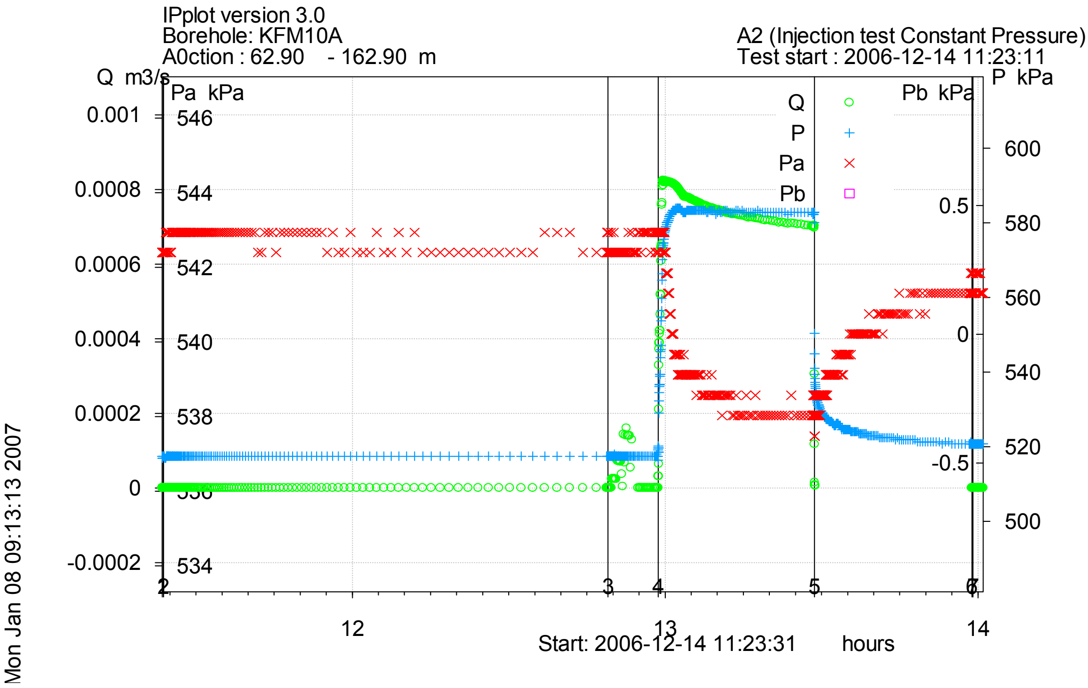


Figure A3-1. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 62.9-162.9 m in borehole KFM10A.*

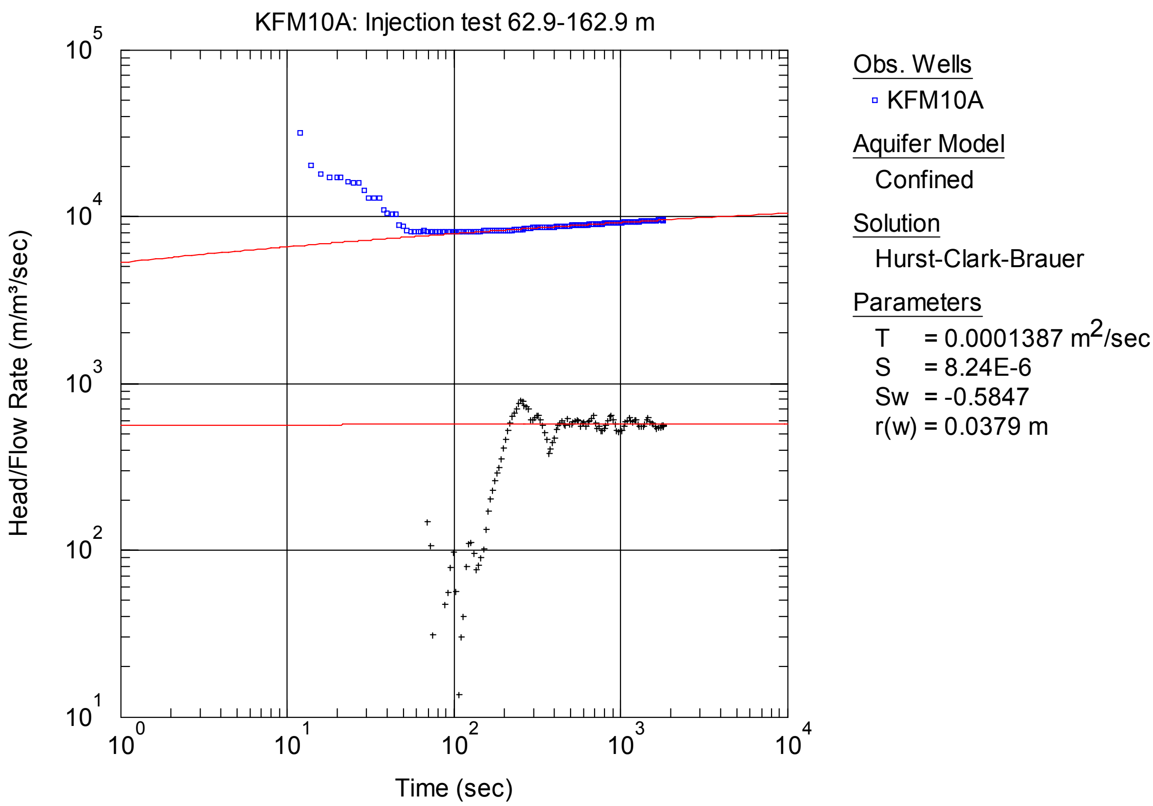


Figure A3-2. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 62.9-162.9 m in KFM10A.*

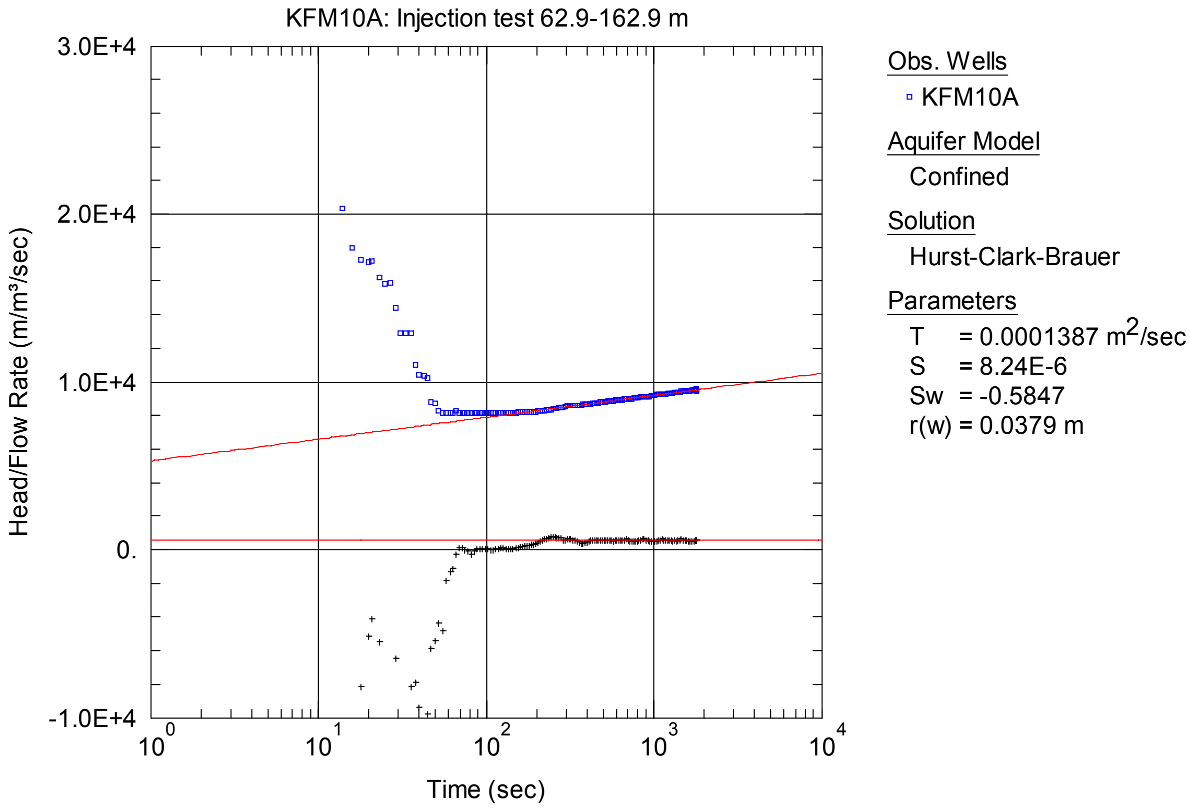


Figure A3-3. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 62.9-162.9 m in KFM10A.*

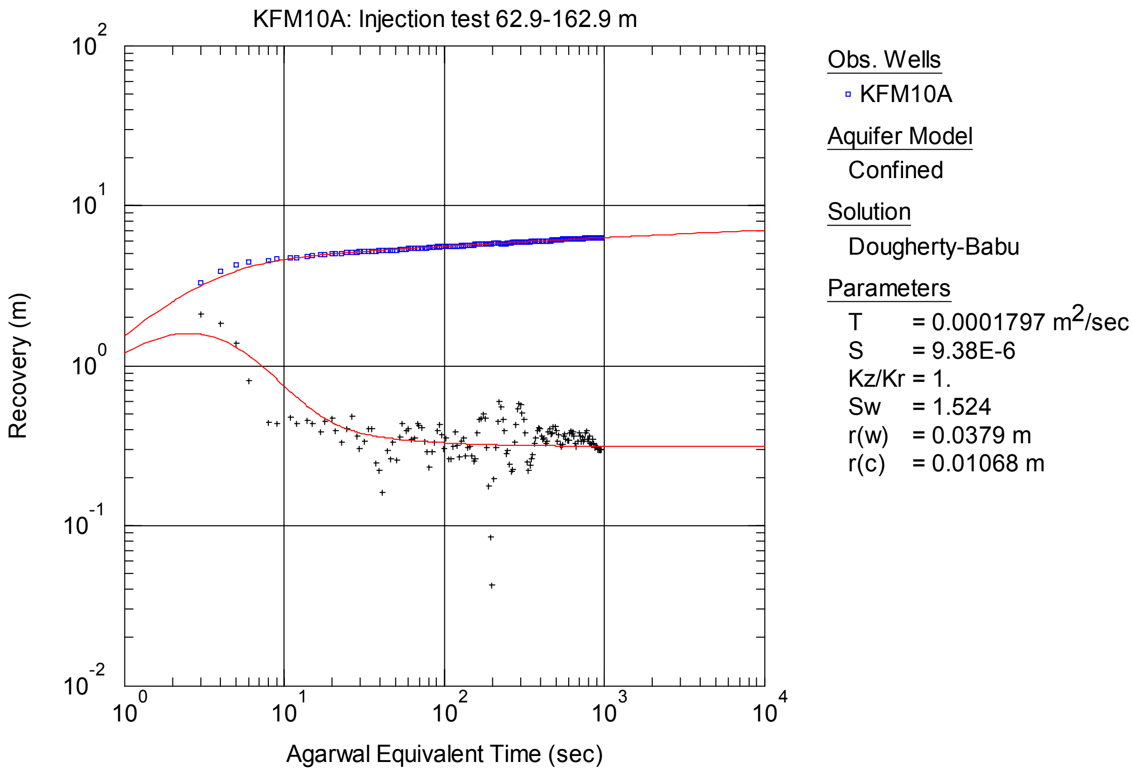


Figure A3-4. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 62.9-162.9 m in KFM10A.*

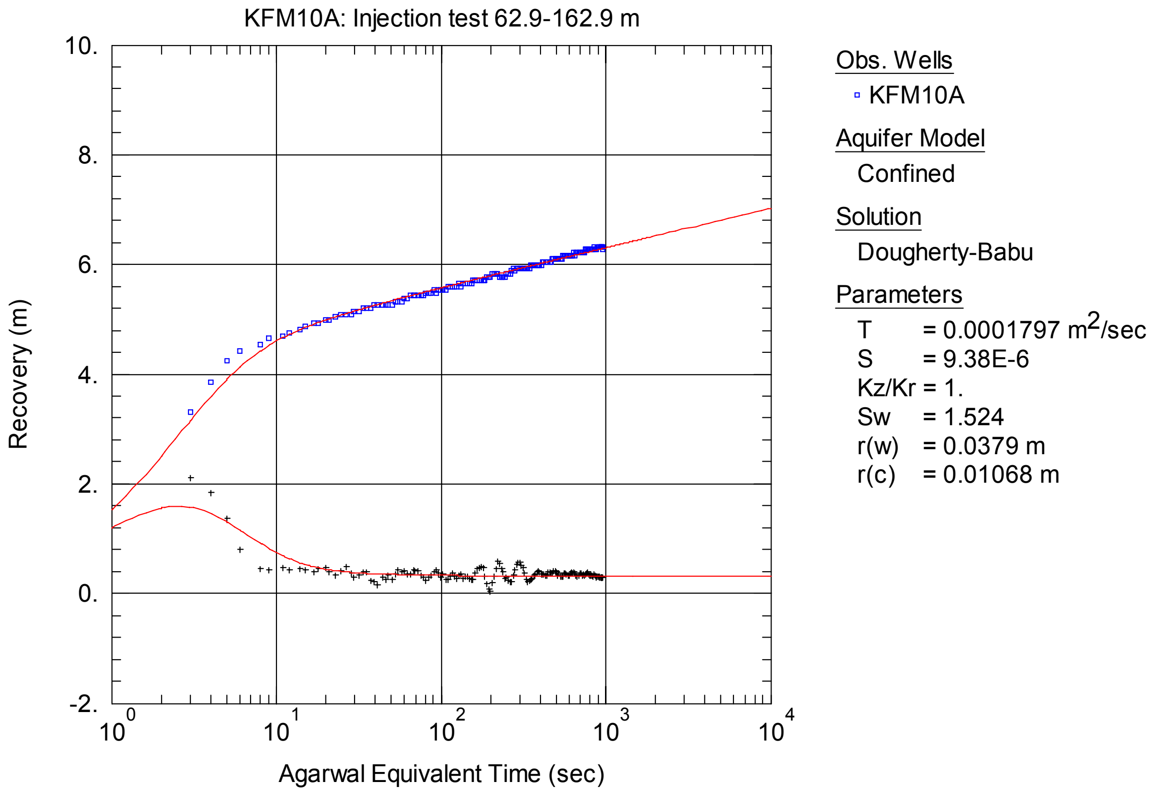


Figure A3-5. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 62.9-162.9 m in KFM10A.*

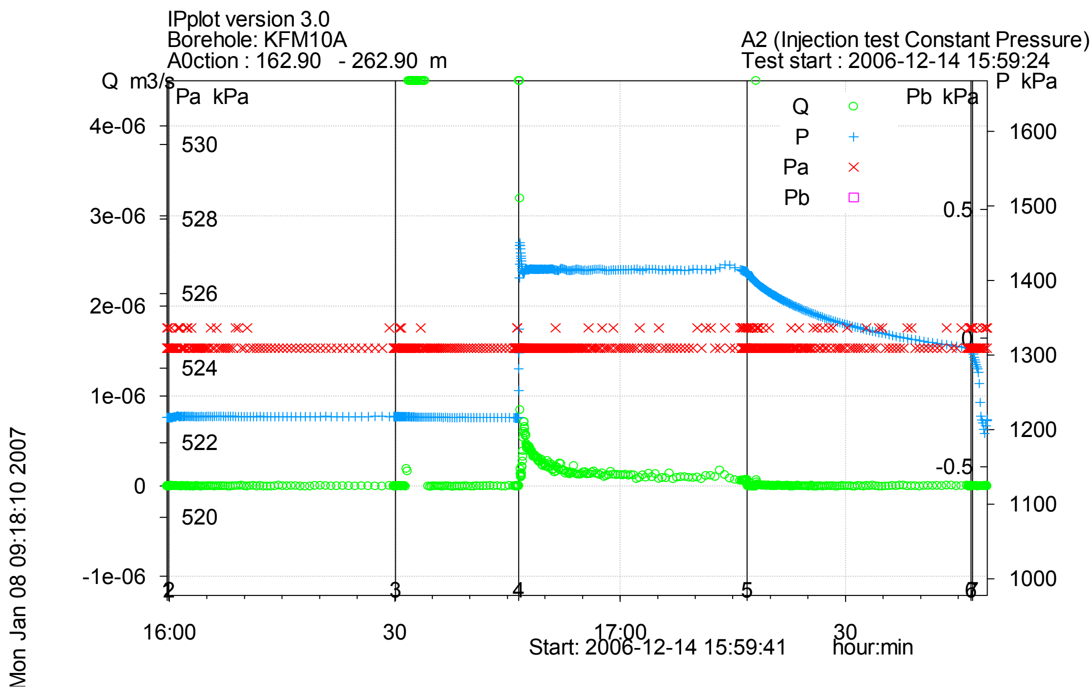


Figure A3-6. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 162.9-262.9 m in borehole KFM10A.*

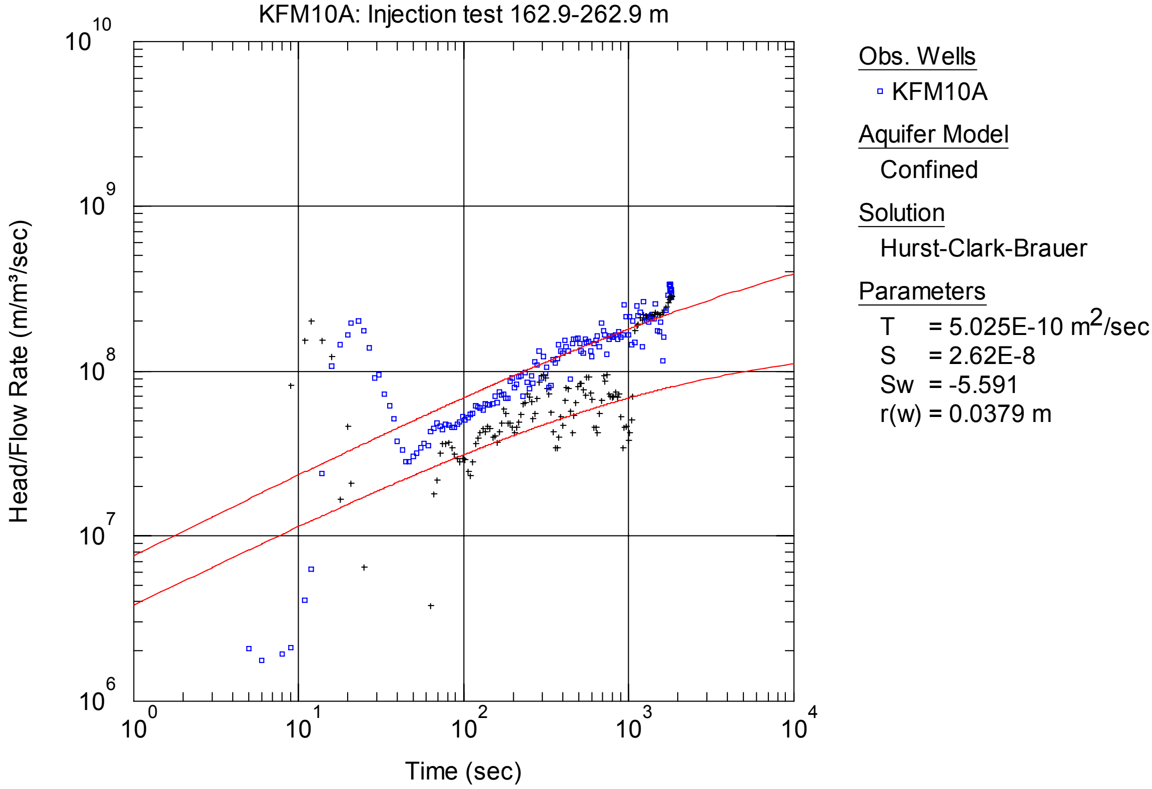


Figure A3-7. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 162.9-262.9 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

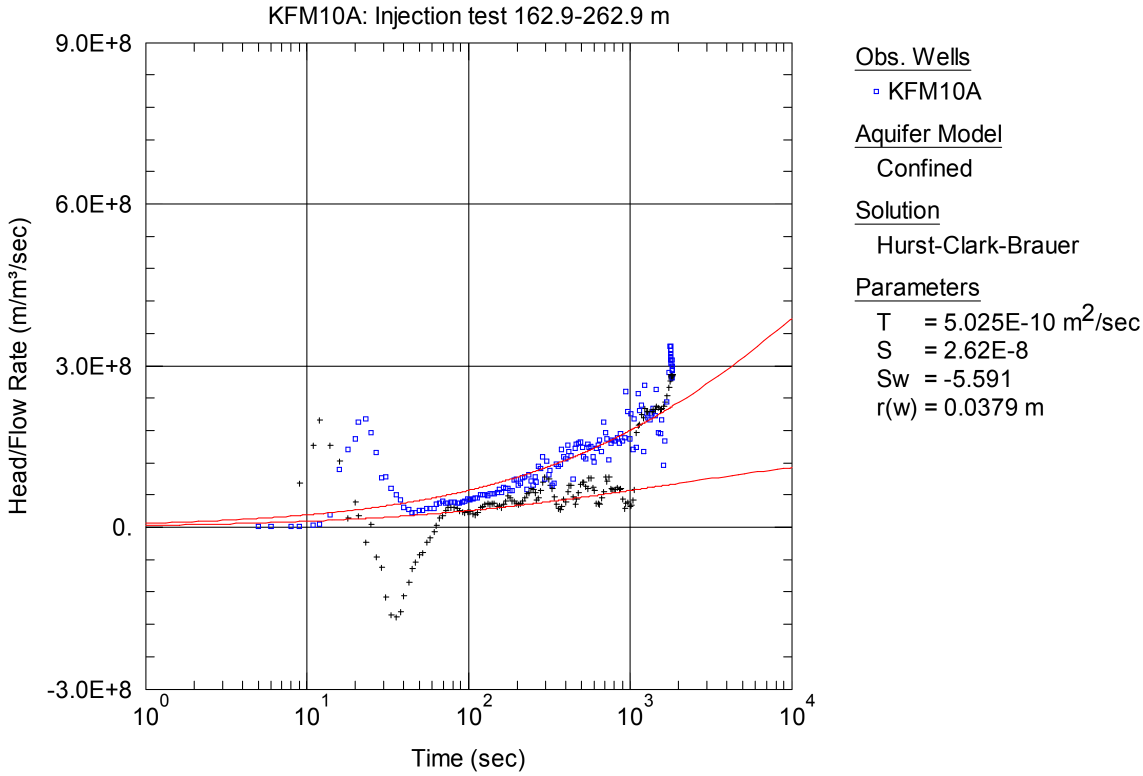


Figure A3-8. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in* section *162.9-262.9* m in *KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation*

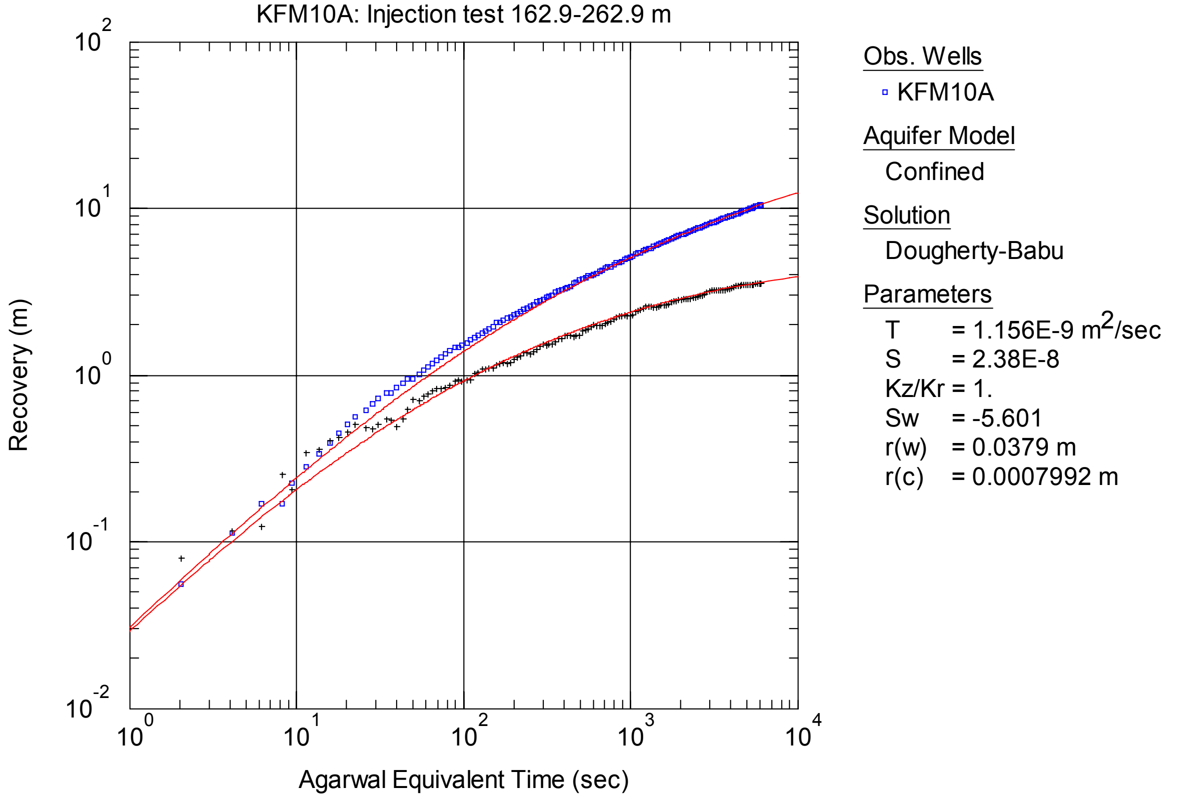


Figure A3-9. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 162.9-262.9 m in KFM10A.*

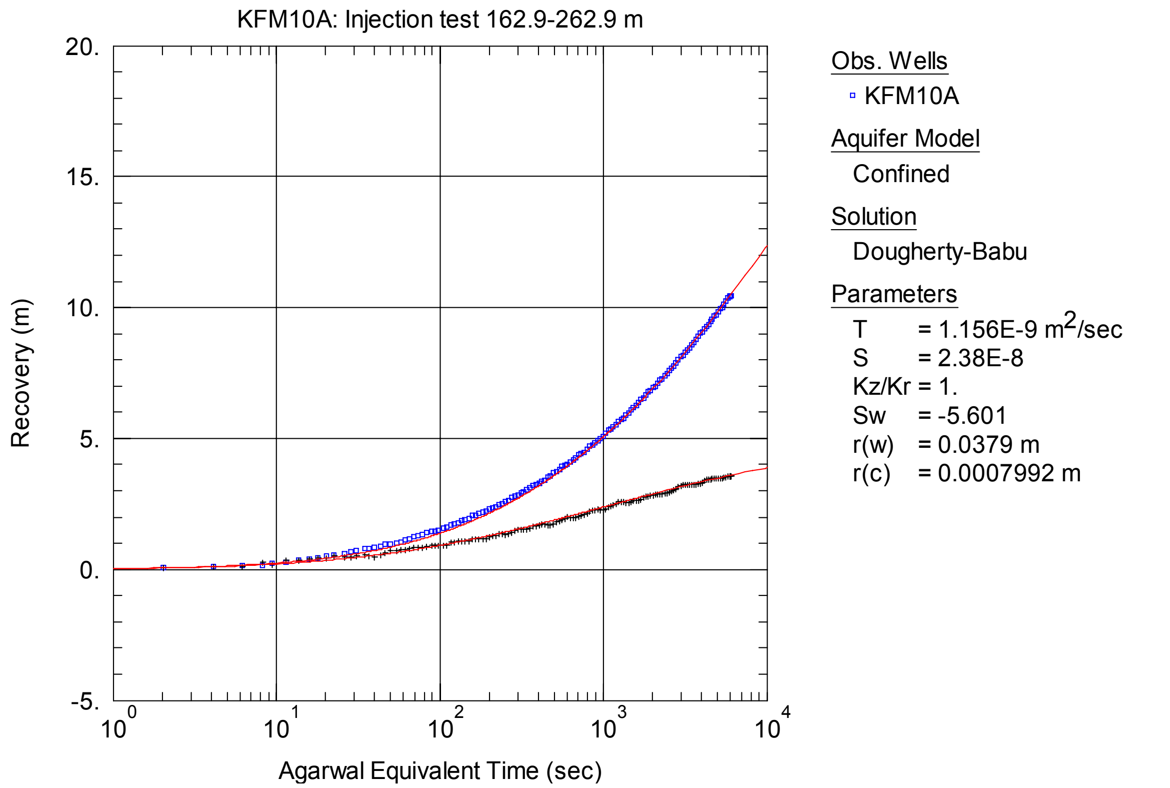


Figure A3-10. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 162.9-262.9 m in KFM10A.*

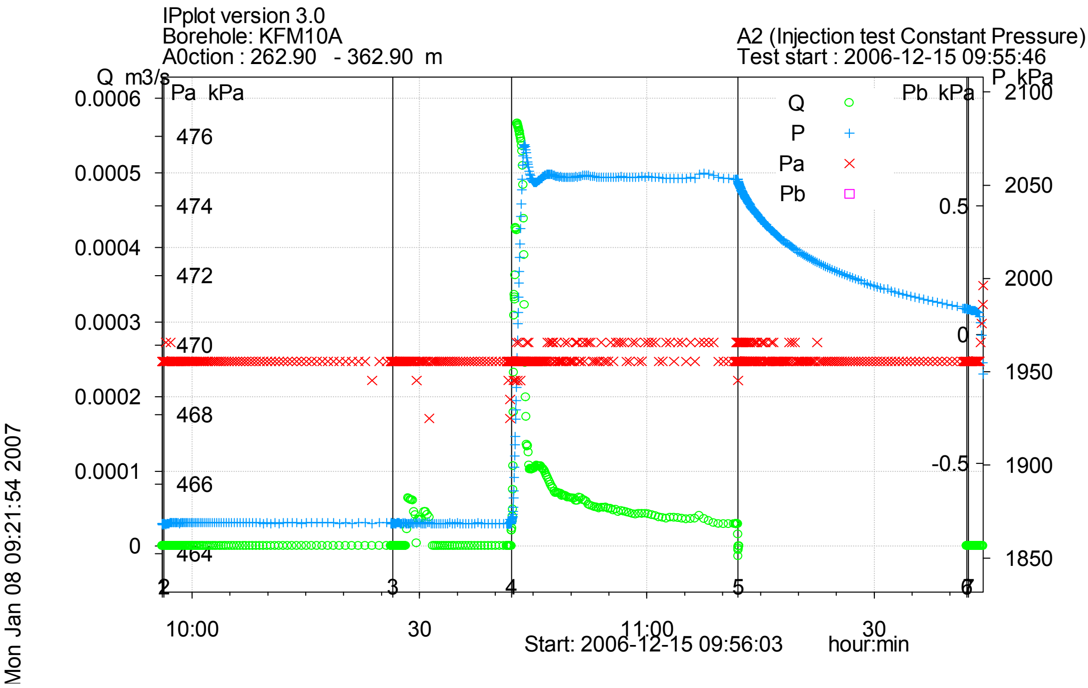


Figure A3-11. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 262.9-362.9 m in borehole KFM10A.*

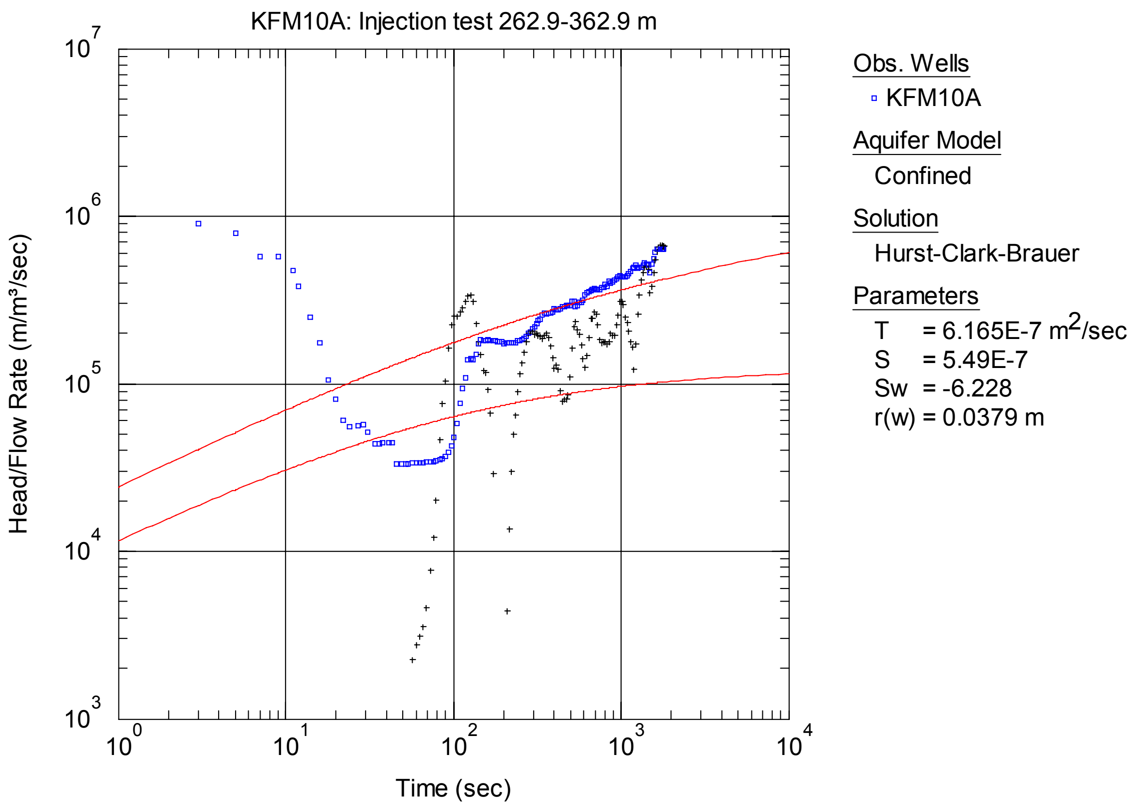


Figure A3-12. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 262.9-362.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

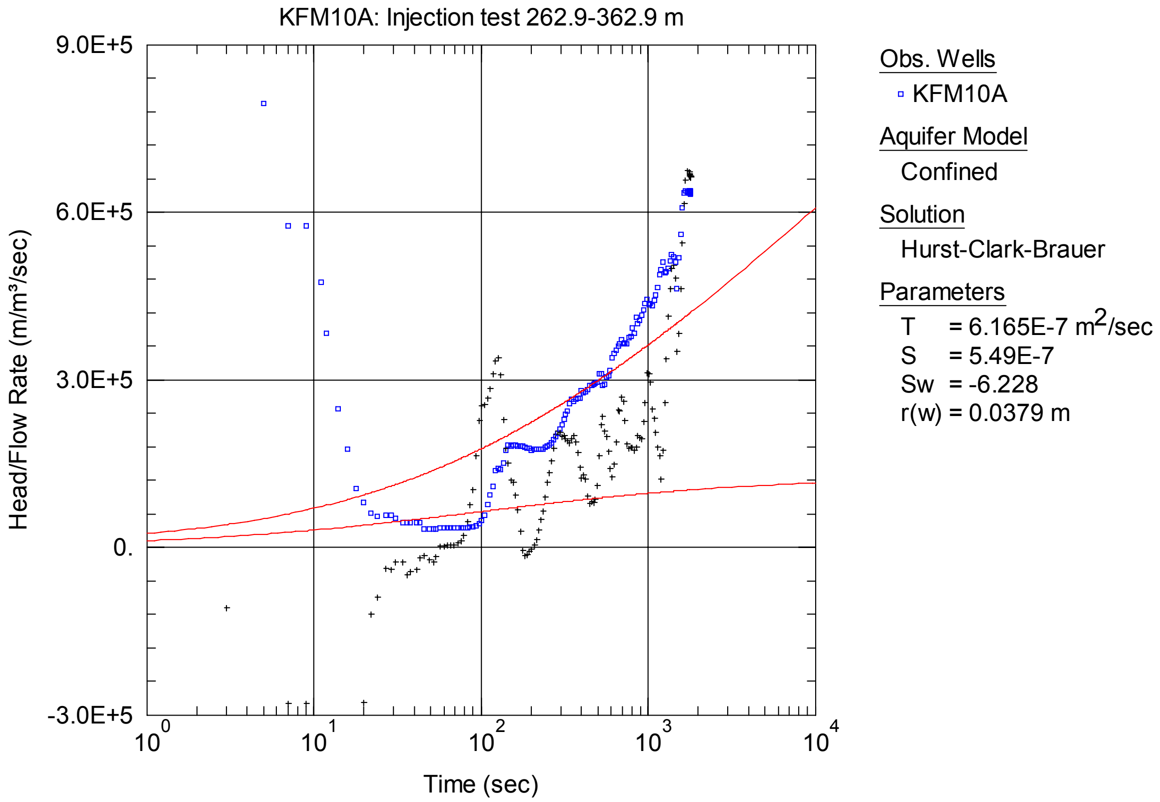


Figure A3-13. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 262.9-362.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

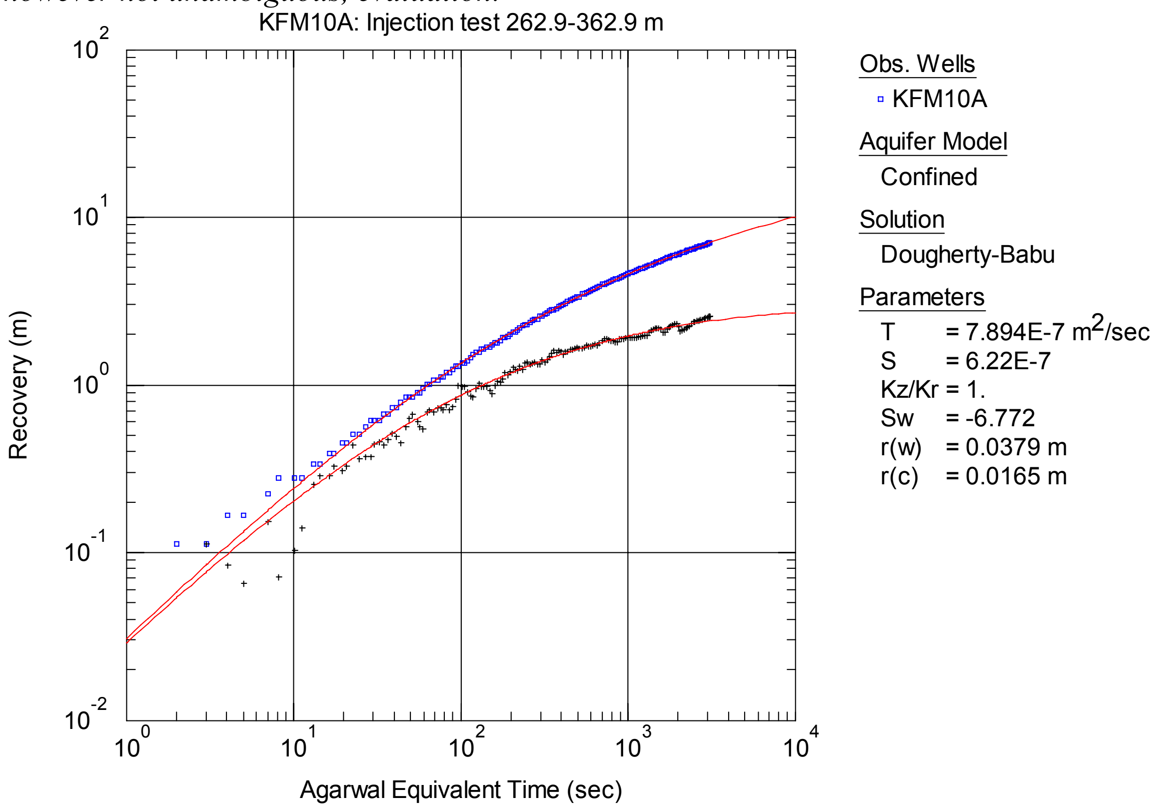


Figure A3-14. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 262.9-362.9 m in KFM10A.*

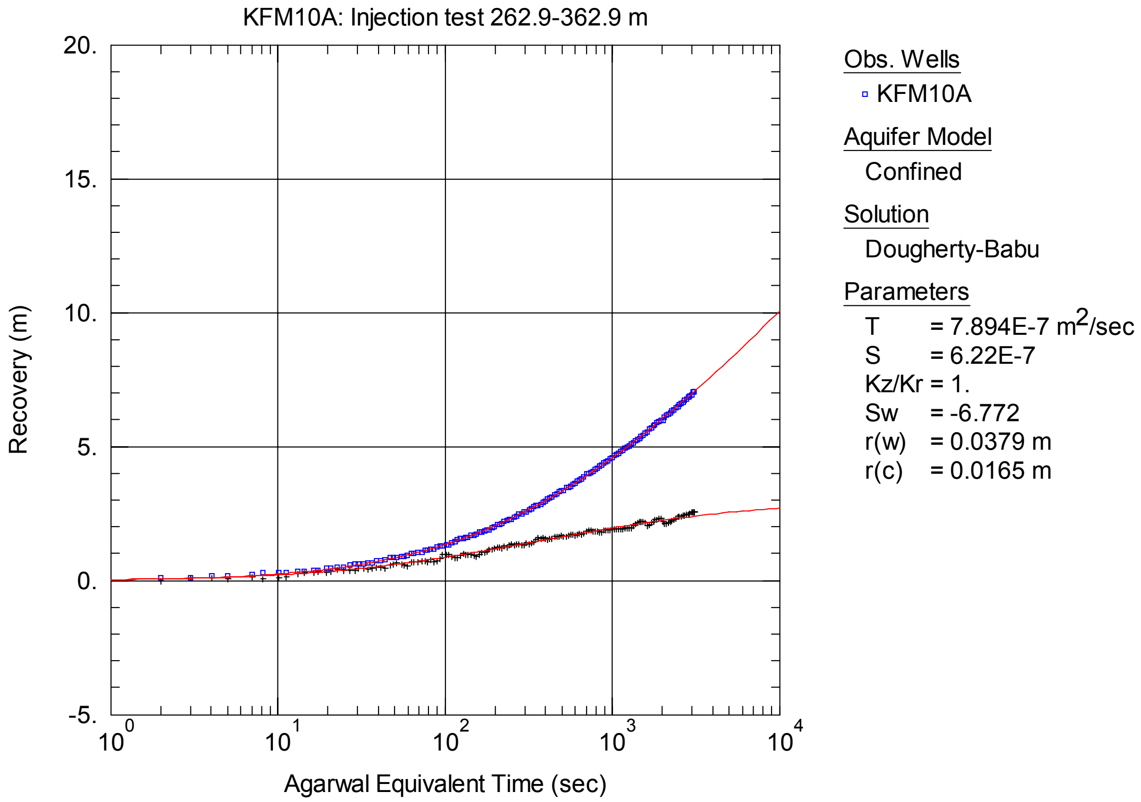


Figure A3-15. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 262.9-362.9 m in KFM10A.*

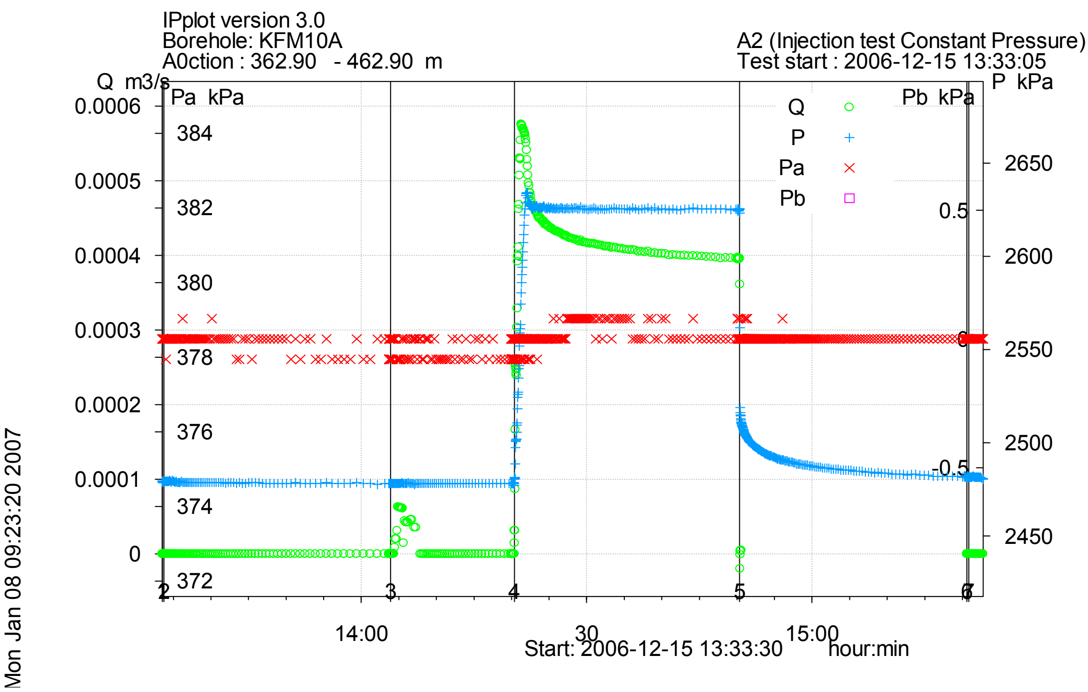


Figure A3-16. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 362.9-462.9 m in borehole KFM10A.*

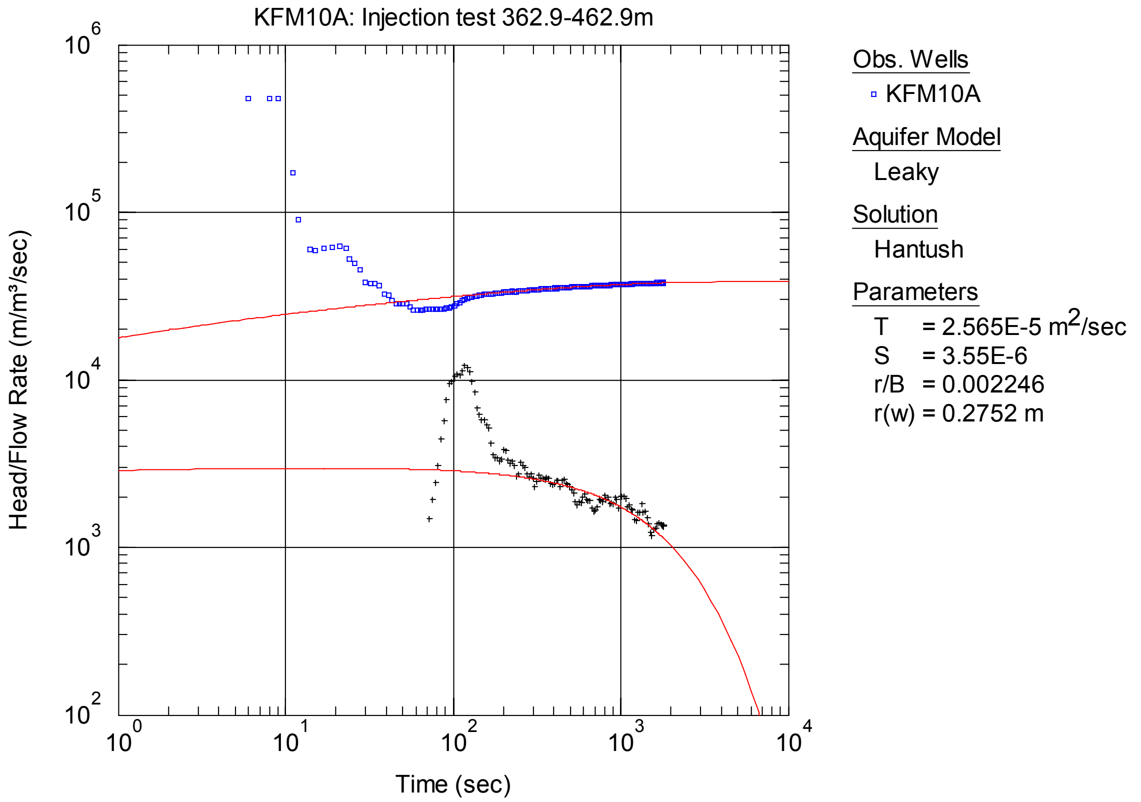


Figure A3-17. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 362.9-462.9 m in KFM10A.*

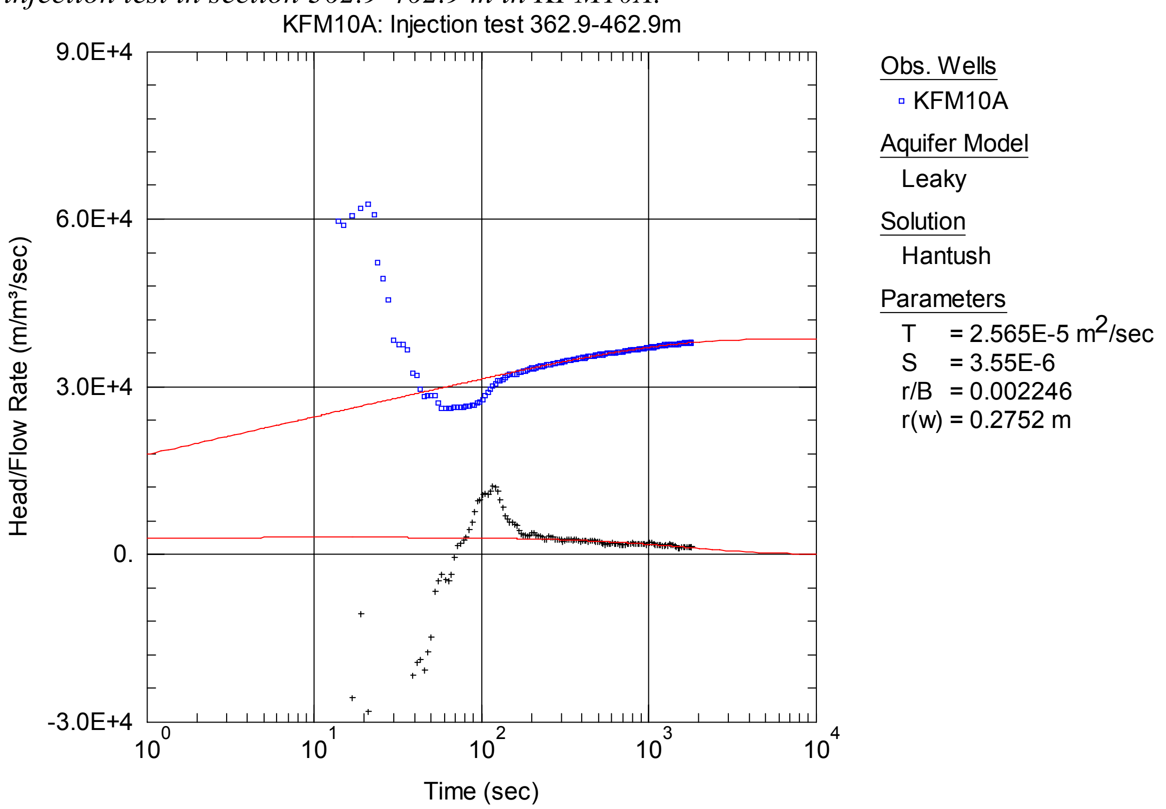


Figure A3-18. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 362.9-462.9 m in KFM10A.*

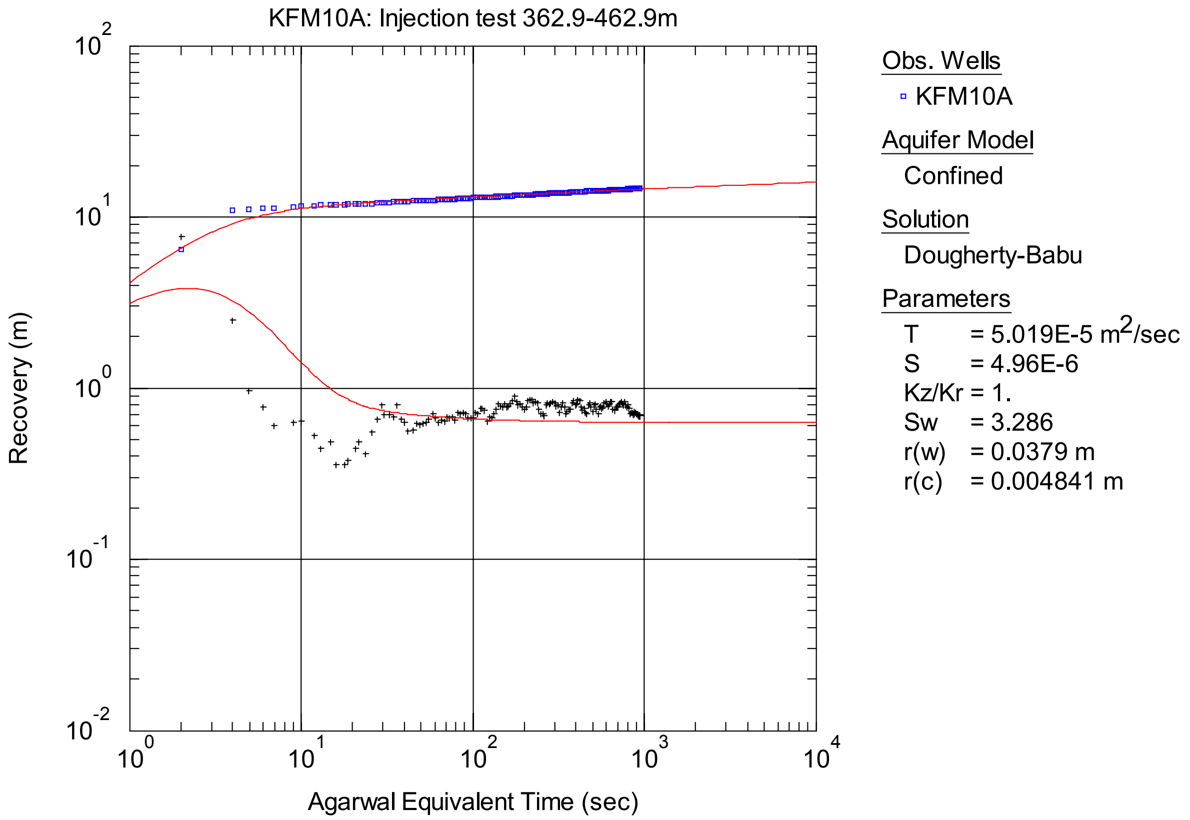


Figure A3-19. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 362.9-462.9 m in KFM10A.*

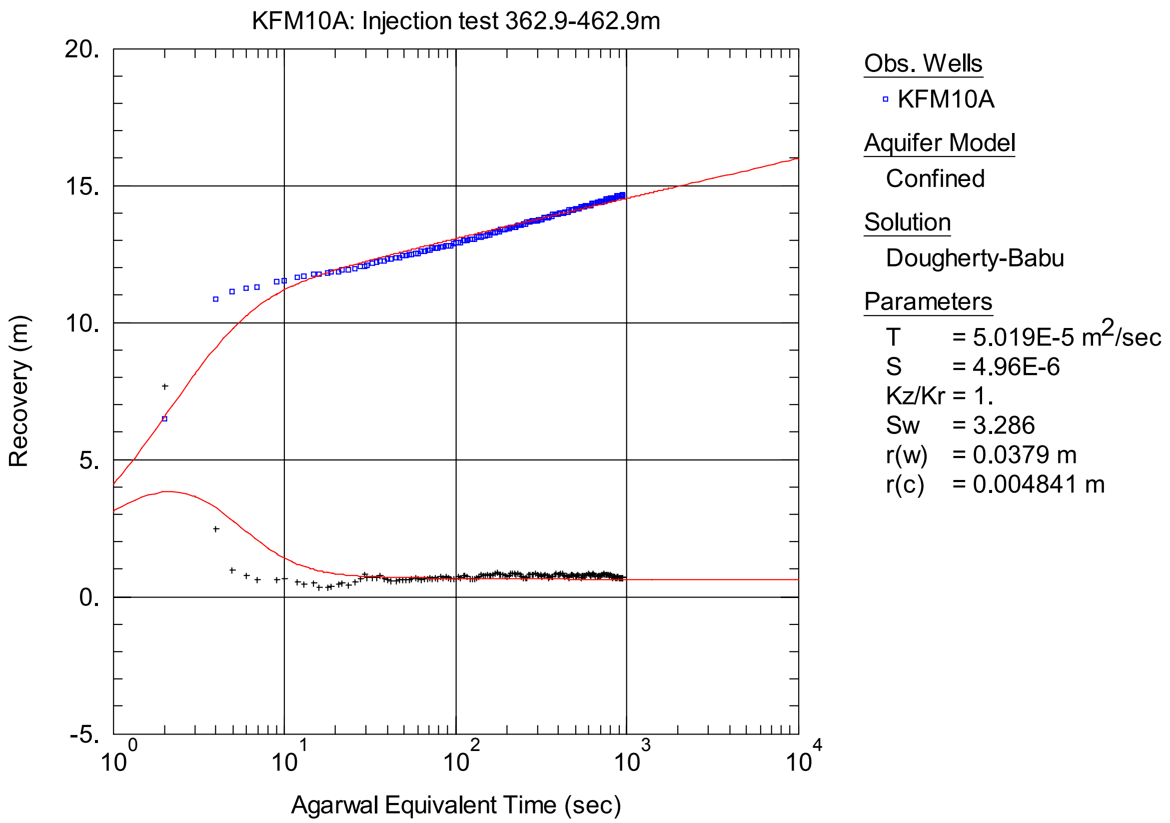


Figure A3-20. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 362.9-462.9 m in KFM10A.*

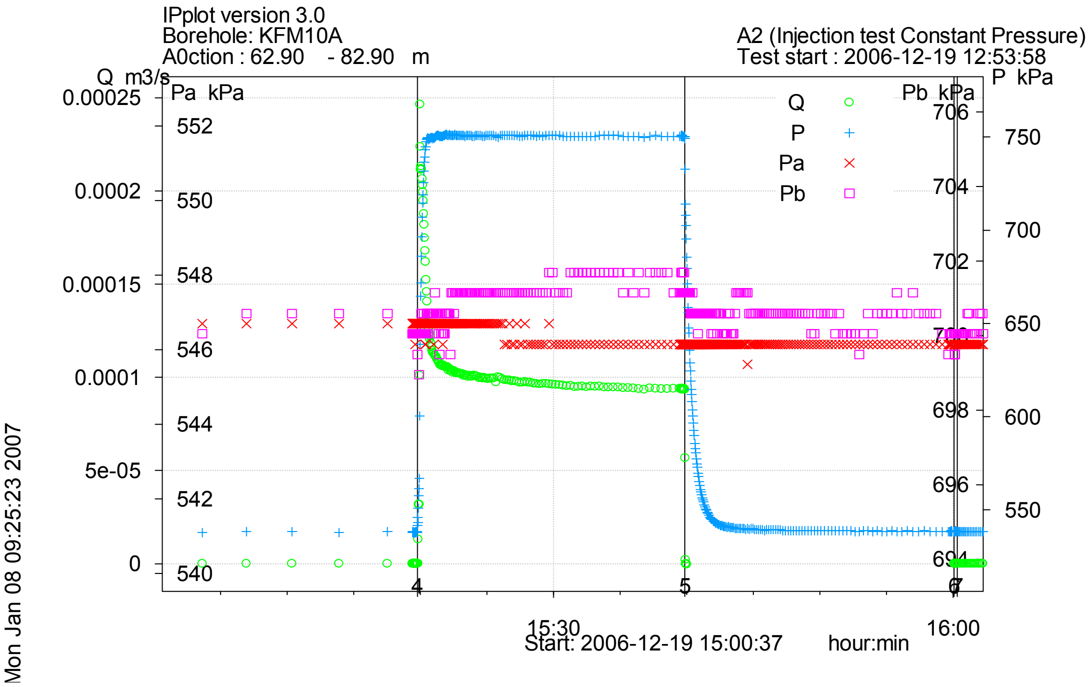


Figure A3-21. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 62.9-82.9 m in borehole KFM10A.*

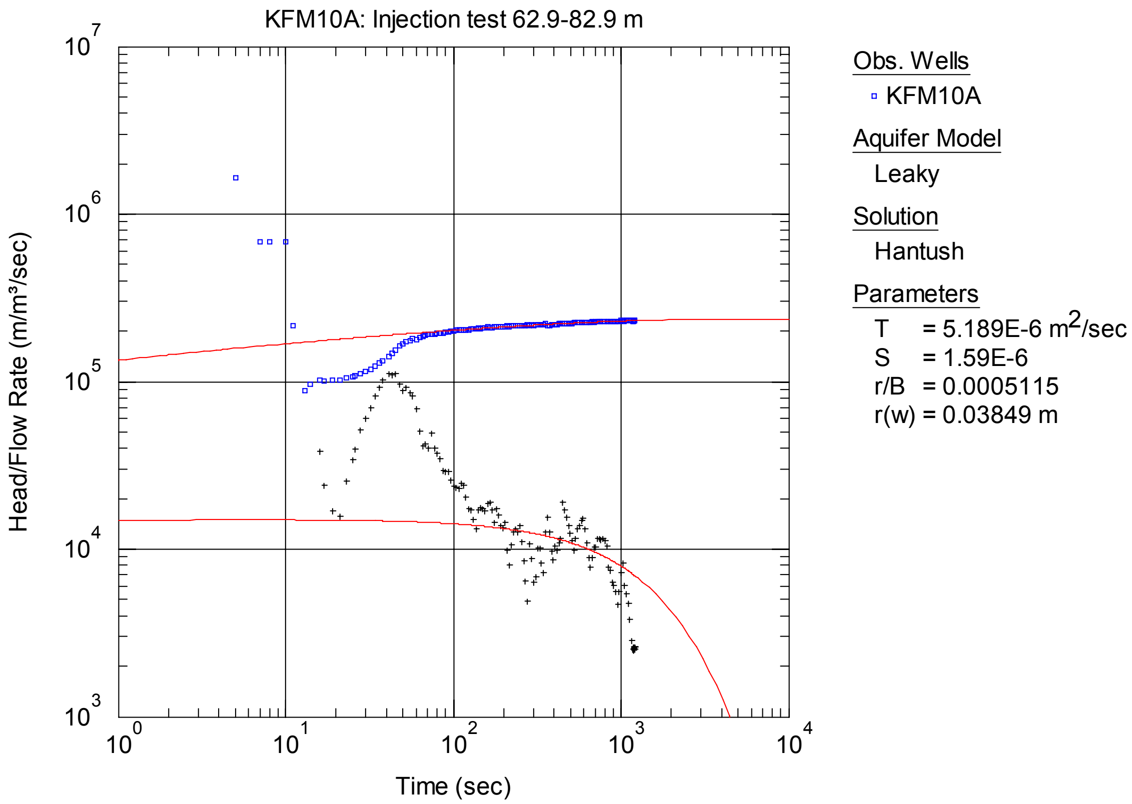


Figure A3-22. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 62.9-82.9 m in KFM10A.*

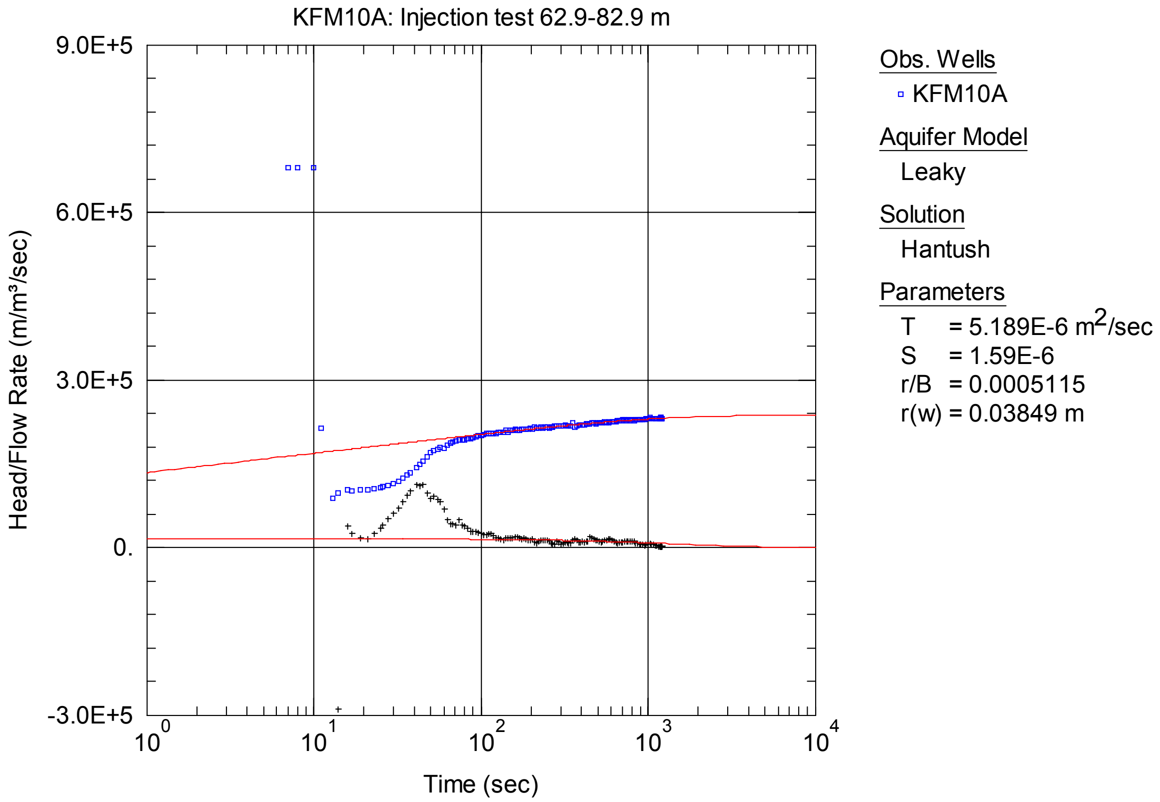


Figure A3-23. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 62.9-82.9 m in KFM10A.*

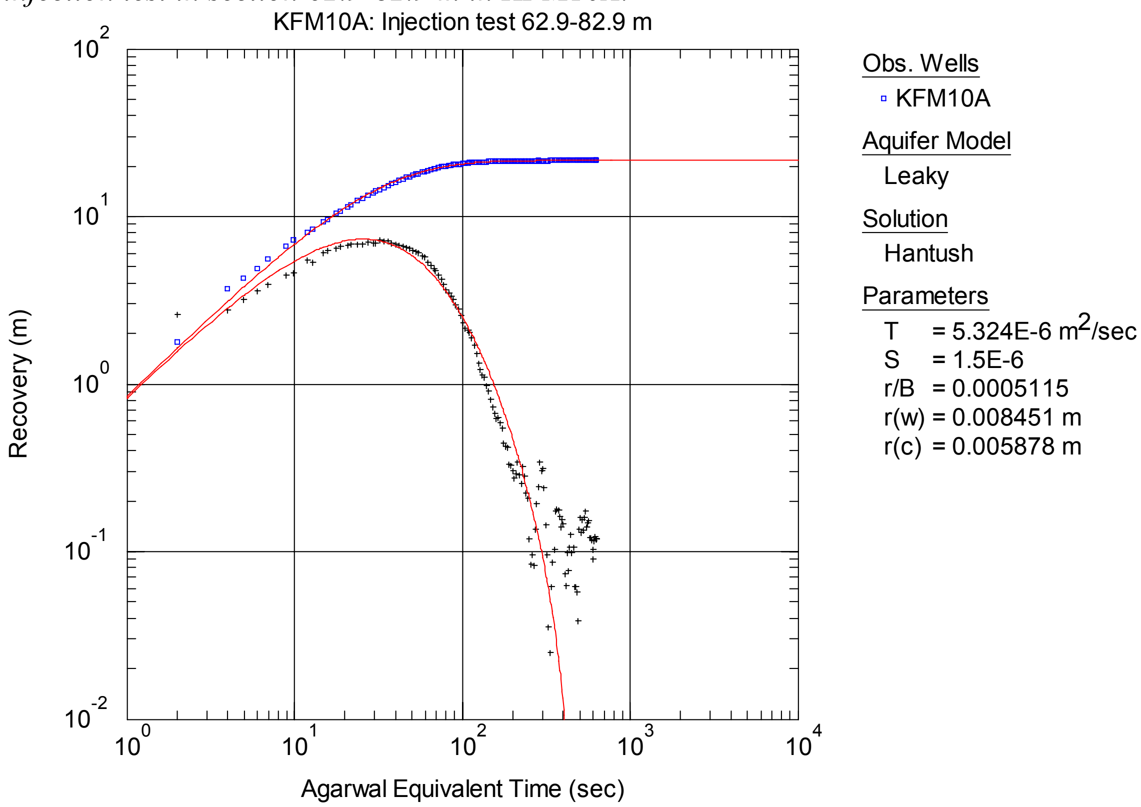


Figure A3-24. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 62.9-82.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

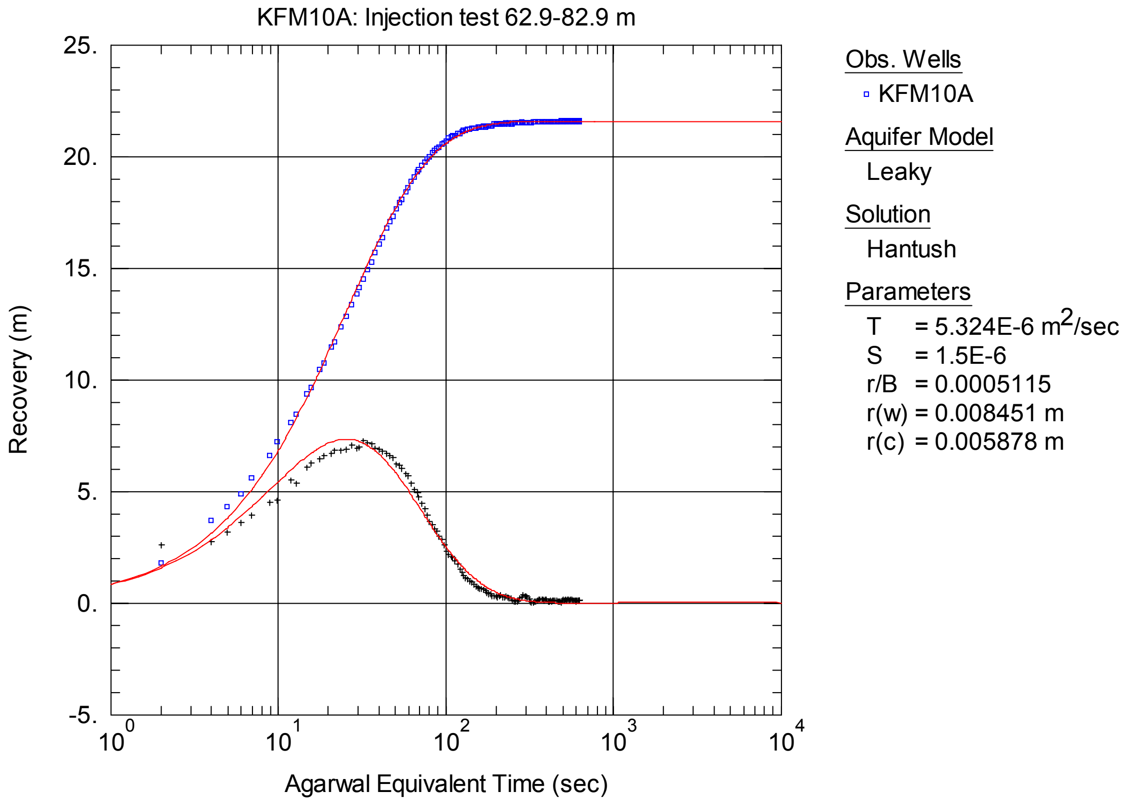


__Figure A3-25.__ Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 62.9-82.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.

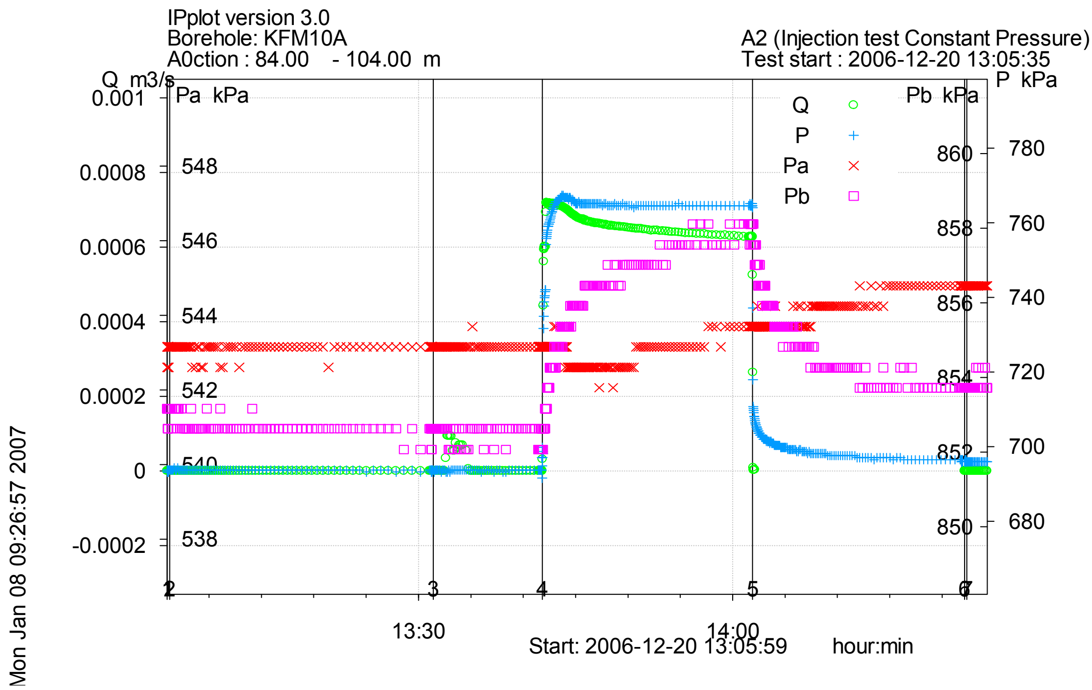


__Figure A3-26.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 84.0-104.0 m in borehole KFM10A.

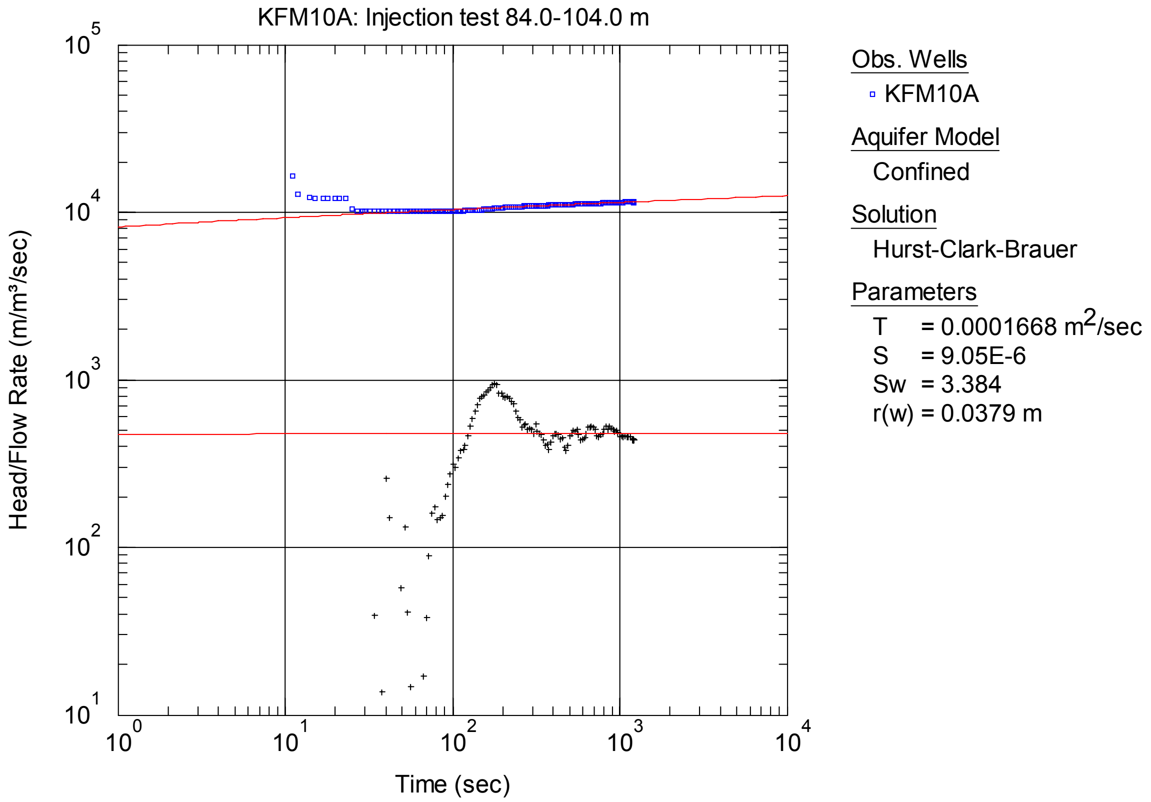


Figure A3-27. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 84.0-104.0 m in KFM10A.*

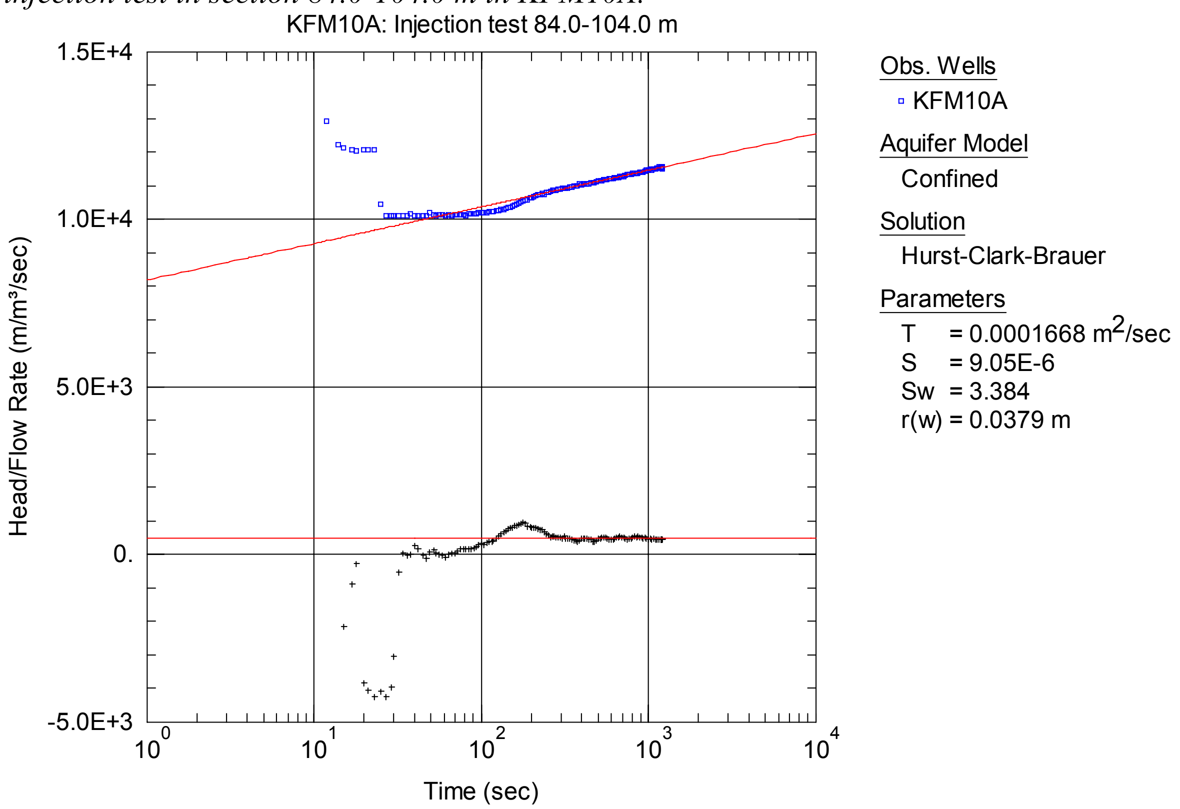


Figure A3-28. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 84.0-104.0 m in KFM10A.*

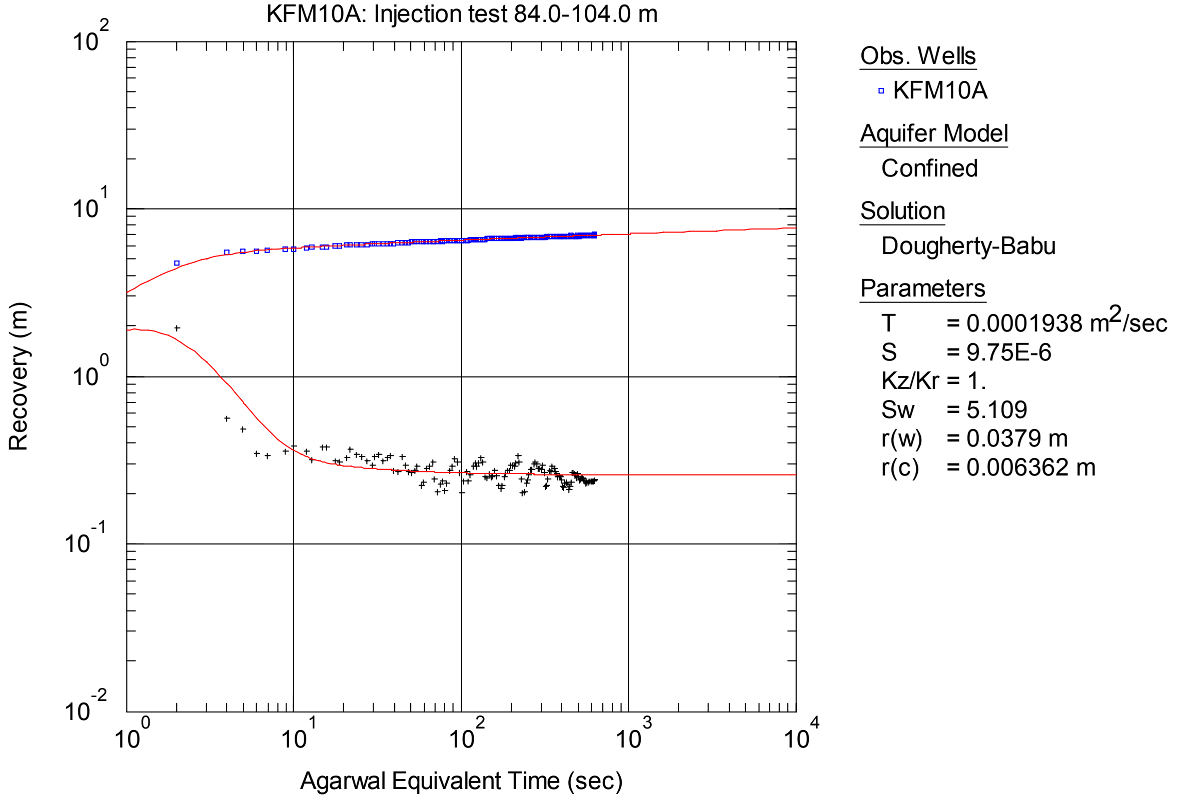


Figure A3-29. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 84.0-104.0 m in KFM10A.*

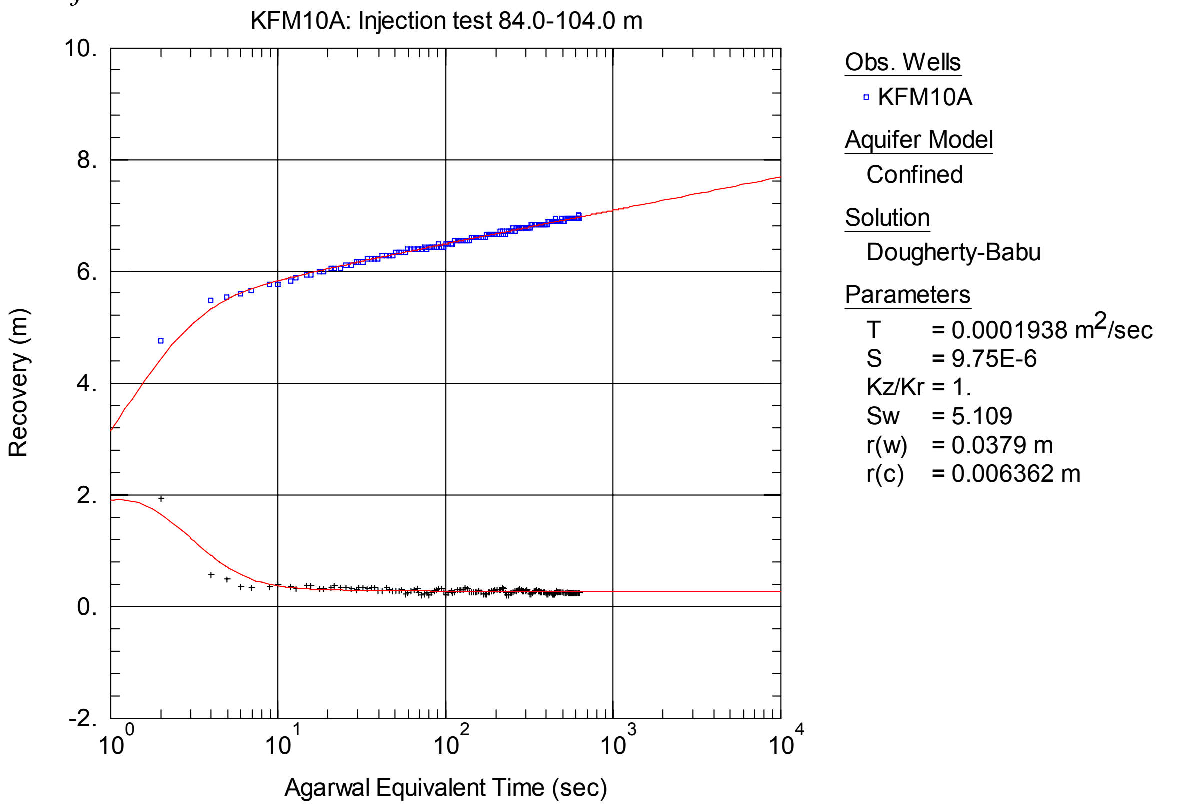


Figure A3-30. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 84.0-104.0 m in KFM10A.*

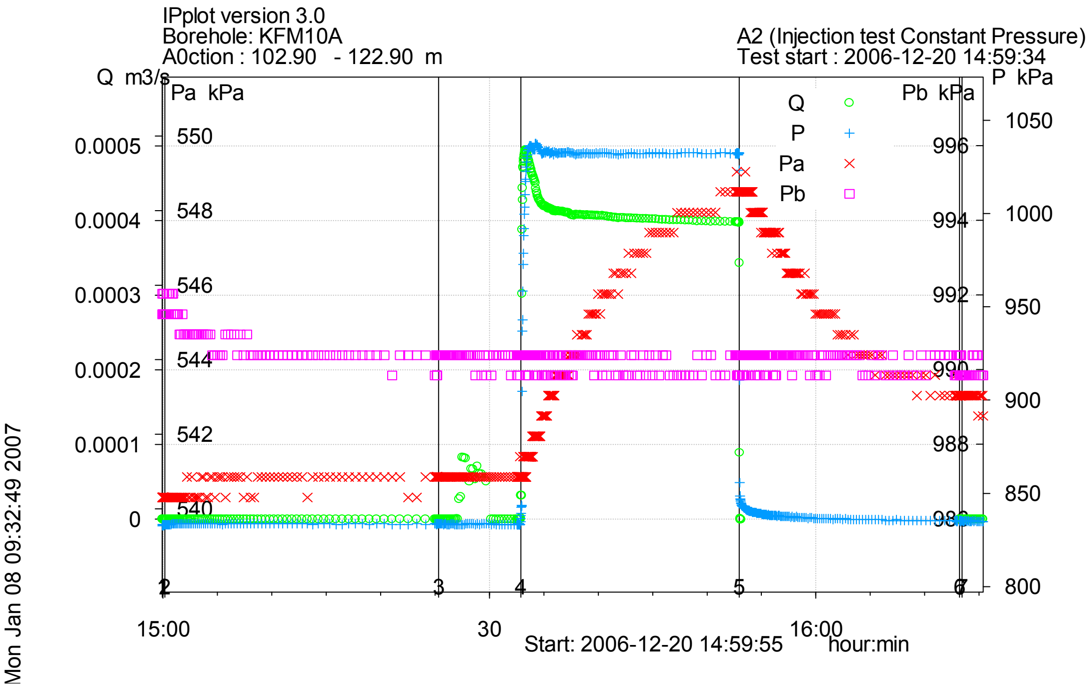


Figure A3-31. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 102.9-122.9 m in borehole KFM10A.*

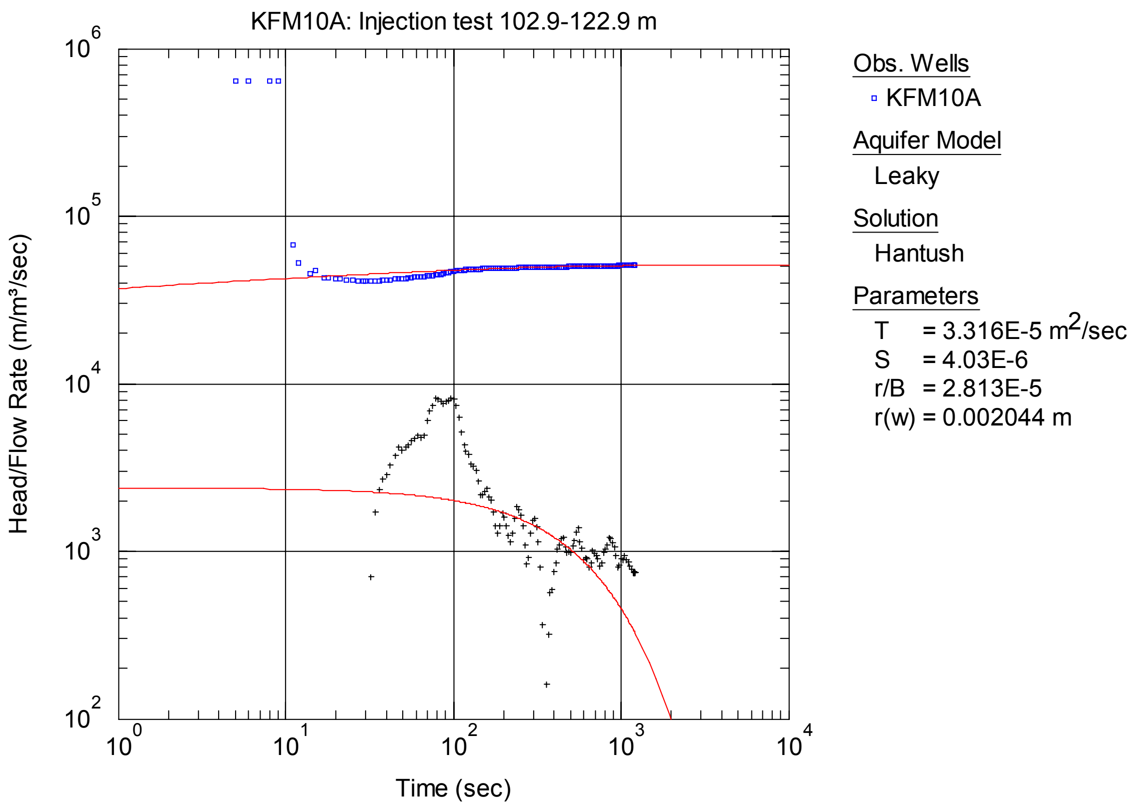


Figure A3-32. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 102.9-122.9 m in KFM10A.*

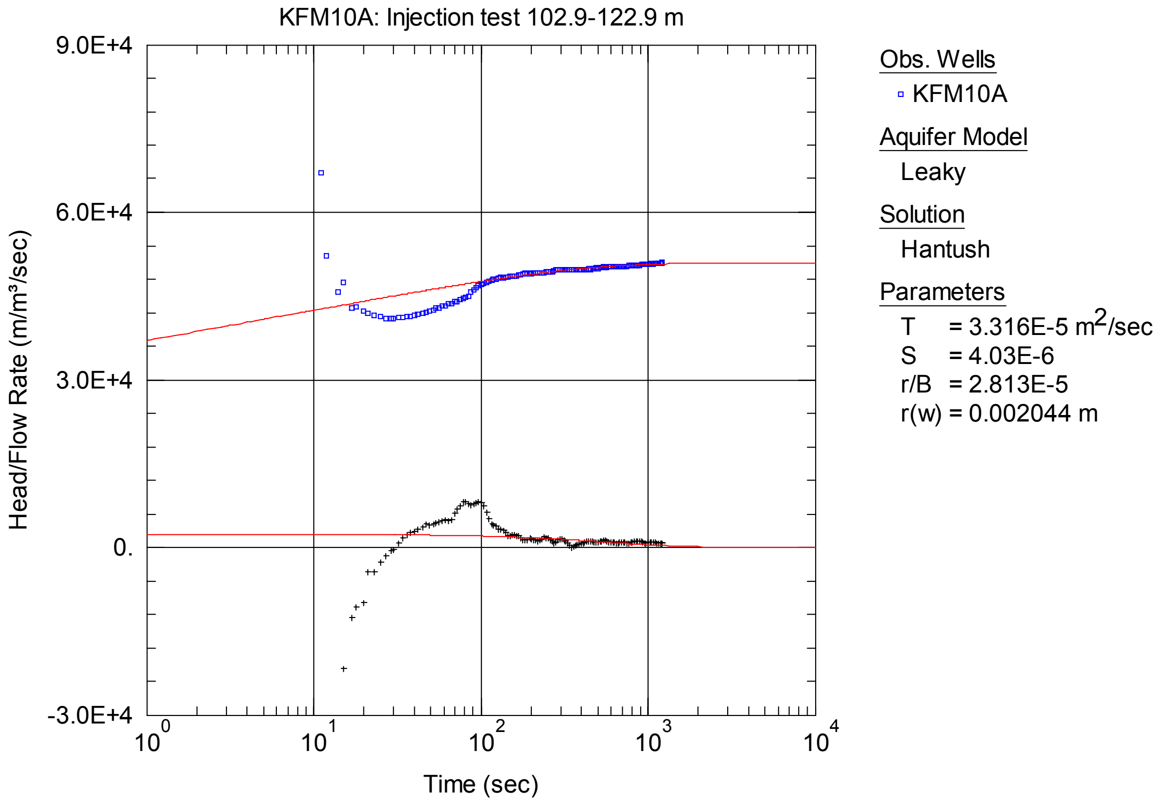


Figure A3-33. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 102.9-122.9 m in KFM10A.*

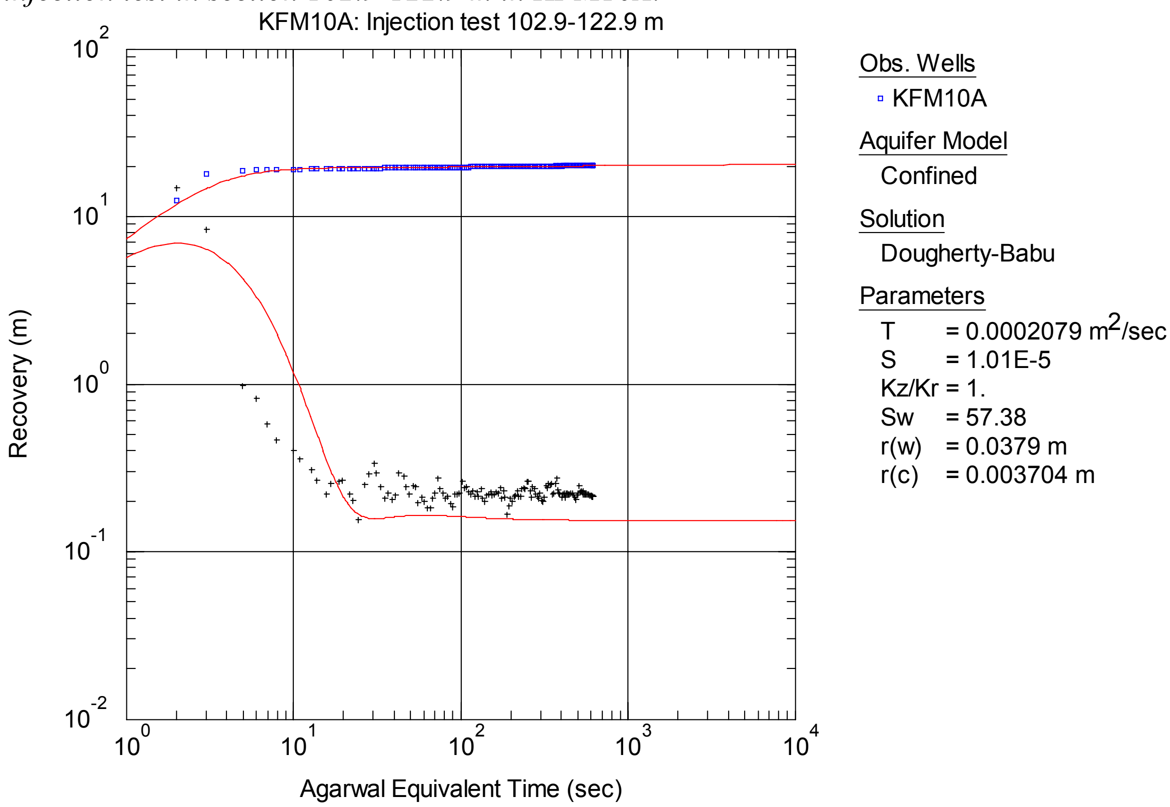


Figure A3-34. *Log-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 102.9-122.9 m in borehole KFM10A. The type curve fit is only to show that an assumption of PRF is not valid.*

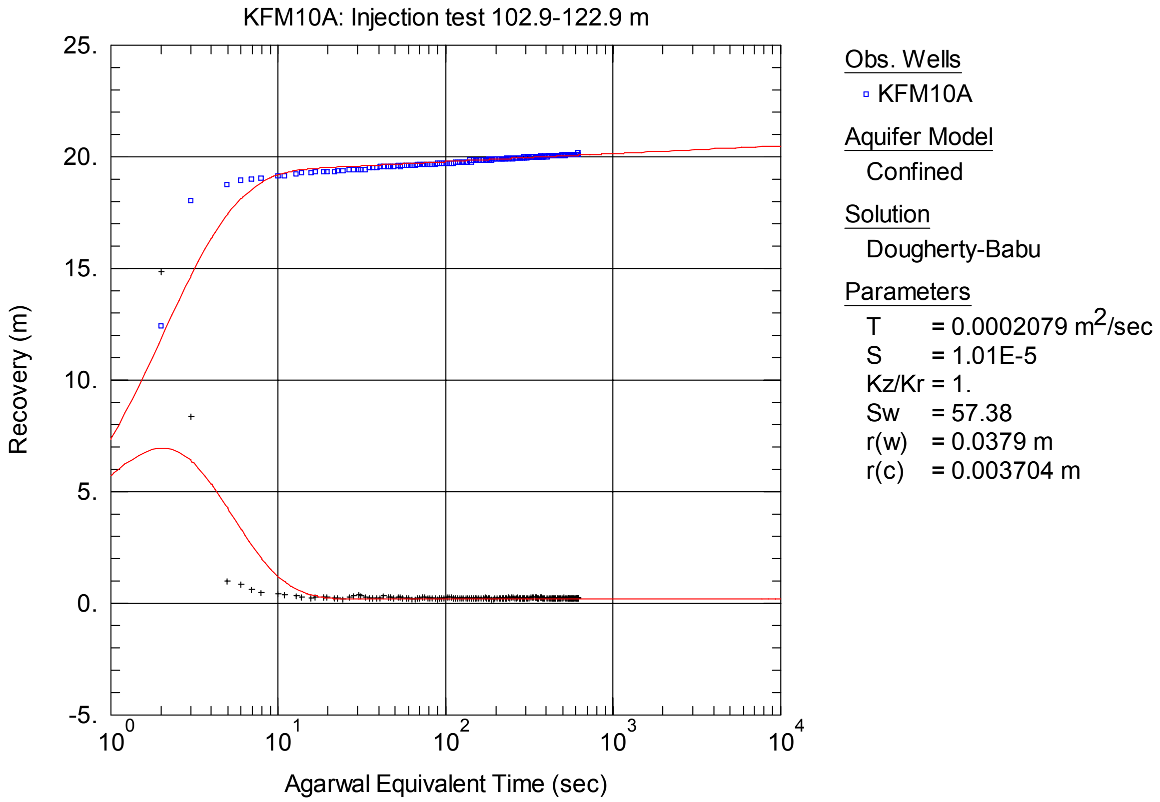


Figure A3-35. *Lin-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 102.9-122.9 m in borehole KFM10A. The type curve fit is only to show that an assumption of PRF is not valid.*

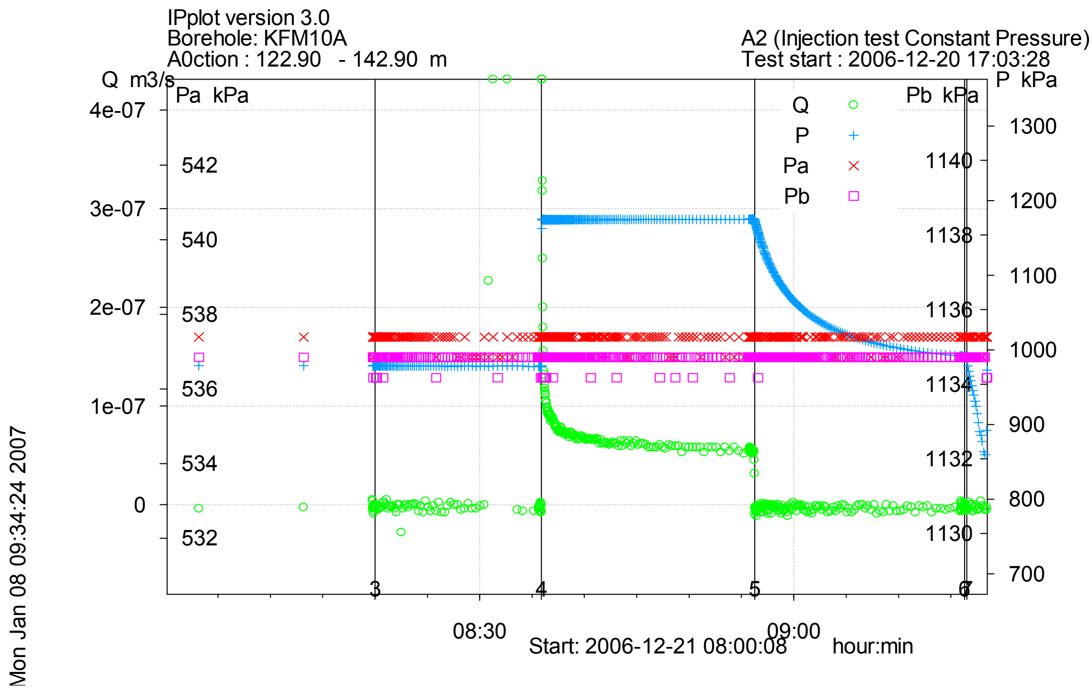


Figure A3-36. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 122.9-142.9 m in borehole KFM10A.*

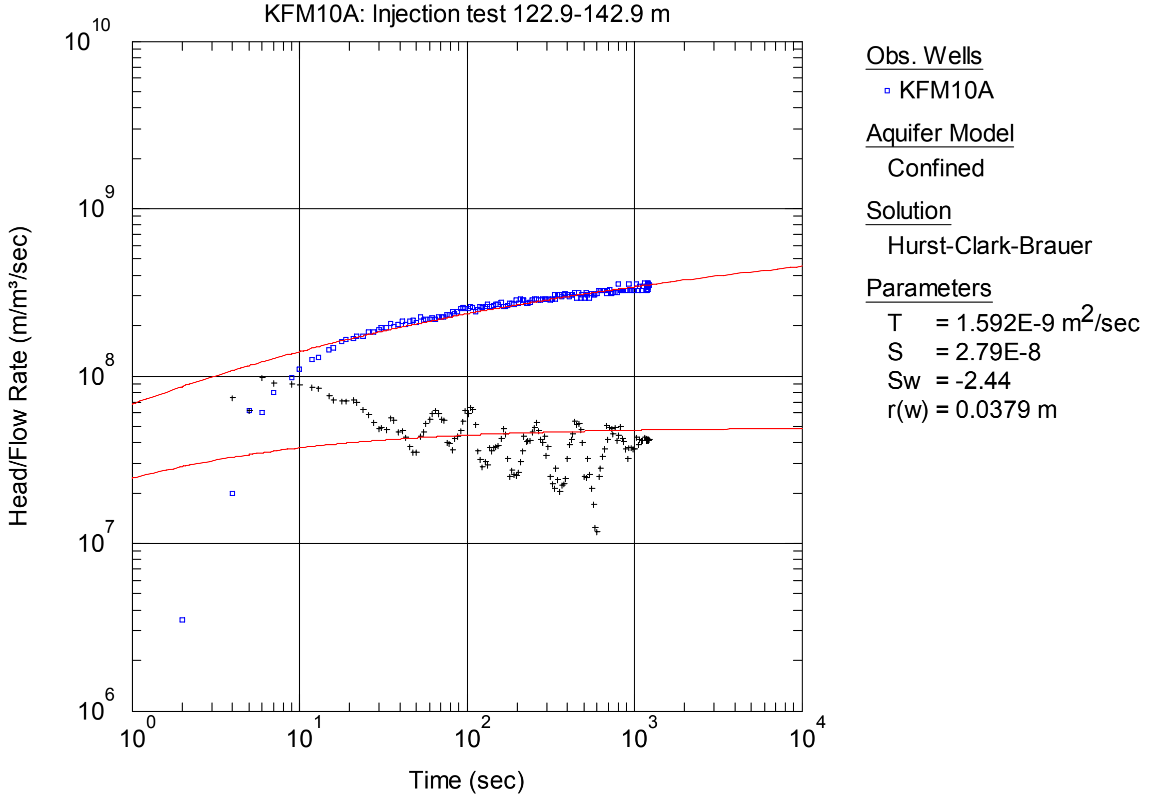


Figure A3-37. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 122.9-142.9 m in KFM10A.*

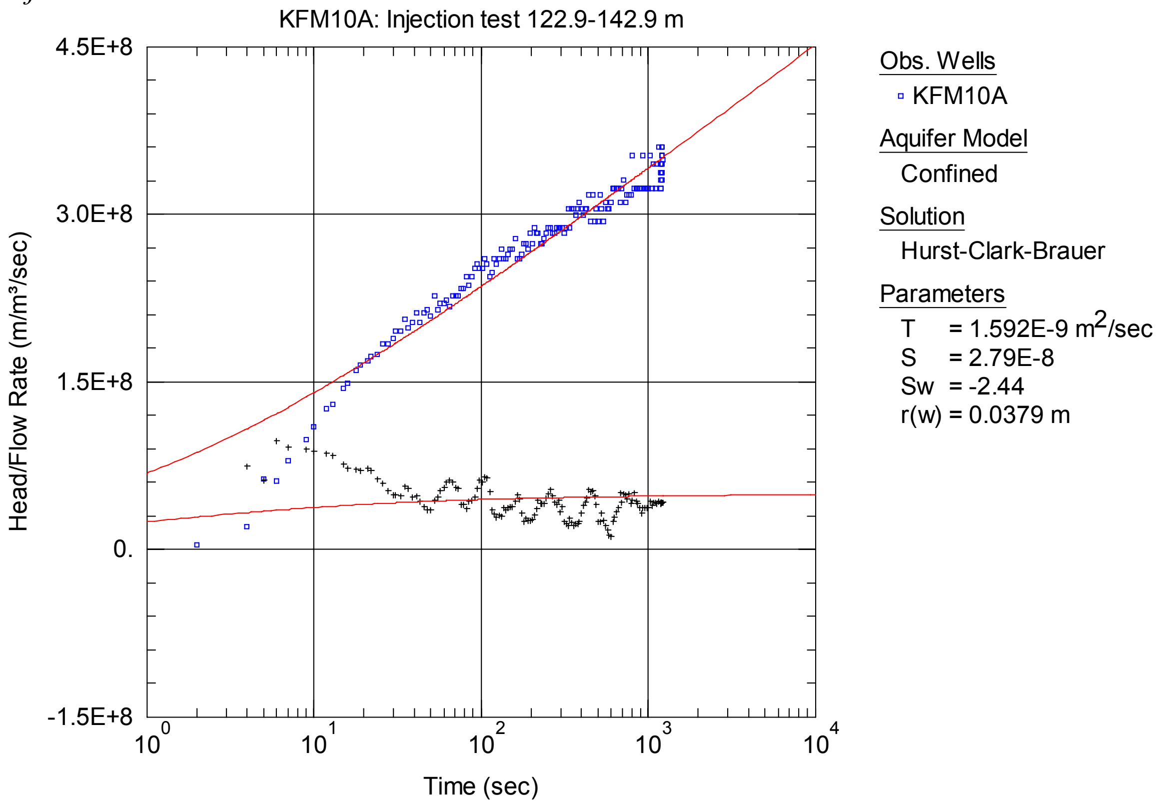


Figure A3-38. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 122.9-142.9 m in KFM10A.*

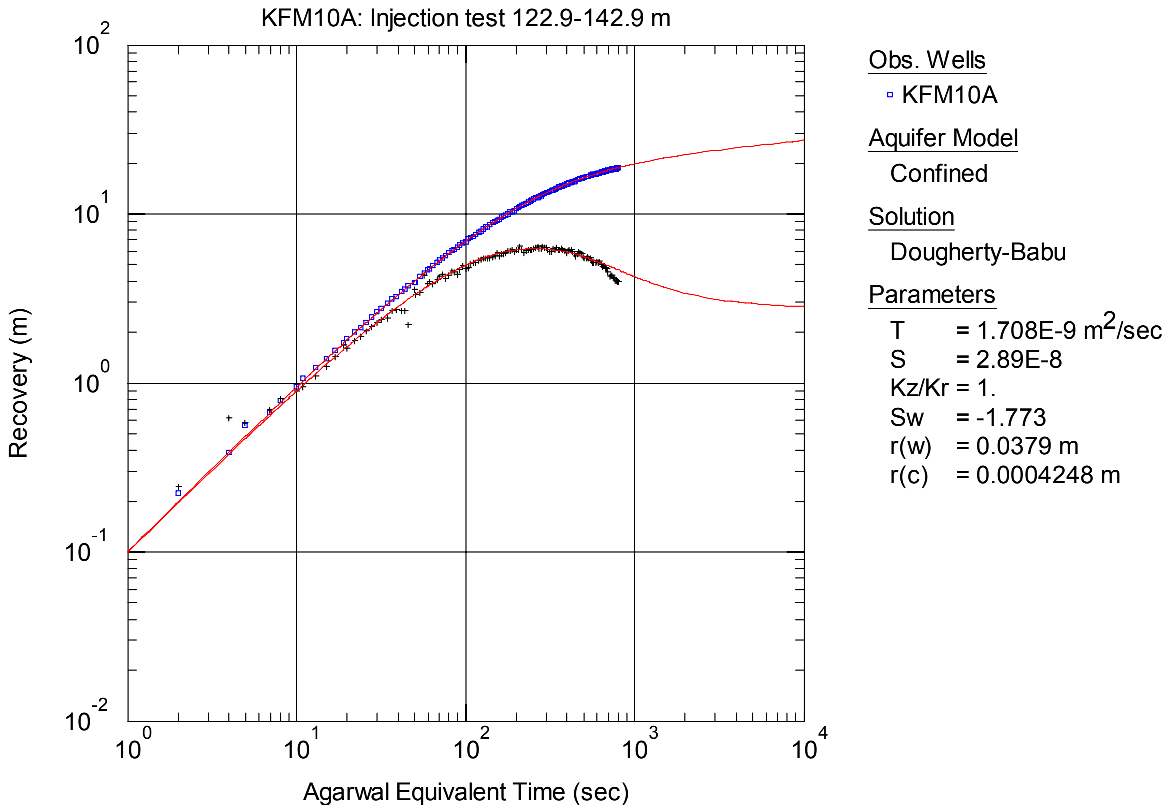


Figure A3-39. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 122.9-142.9 m in KFM10A.*

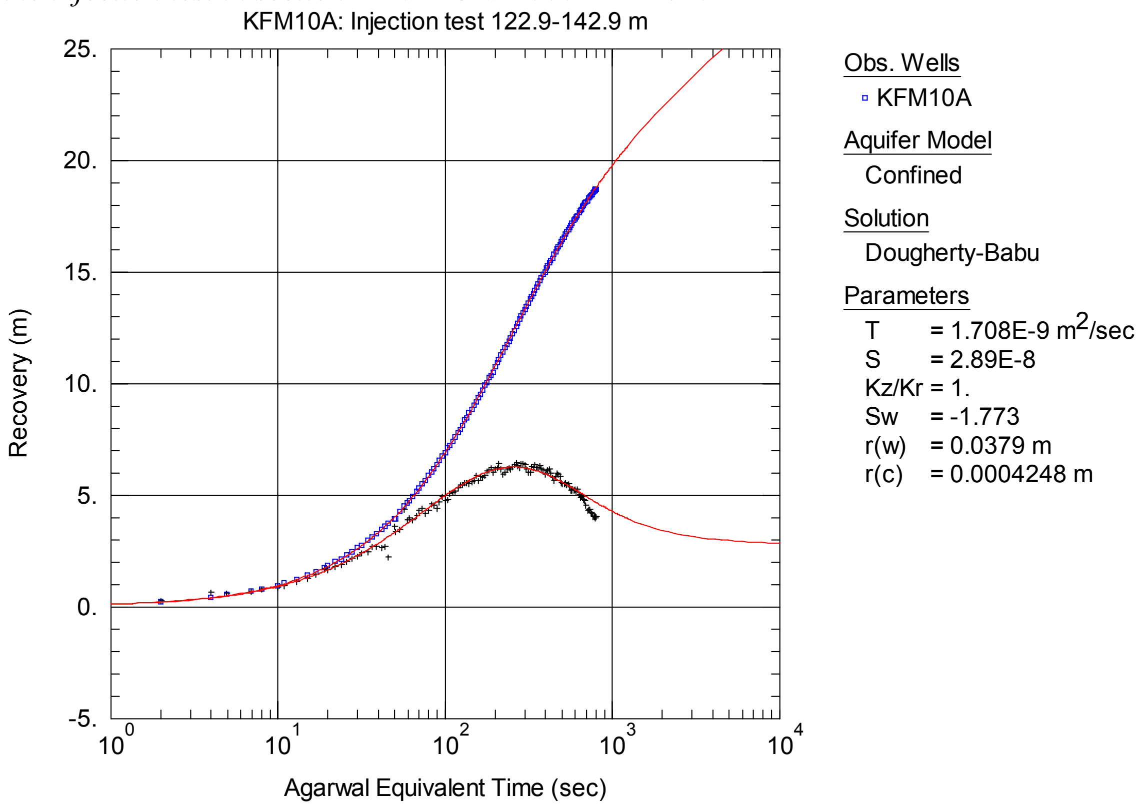


Figure A3-40. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 122.9-142.9 m in KFM10A.*

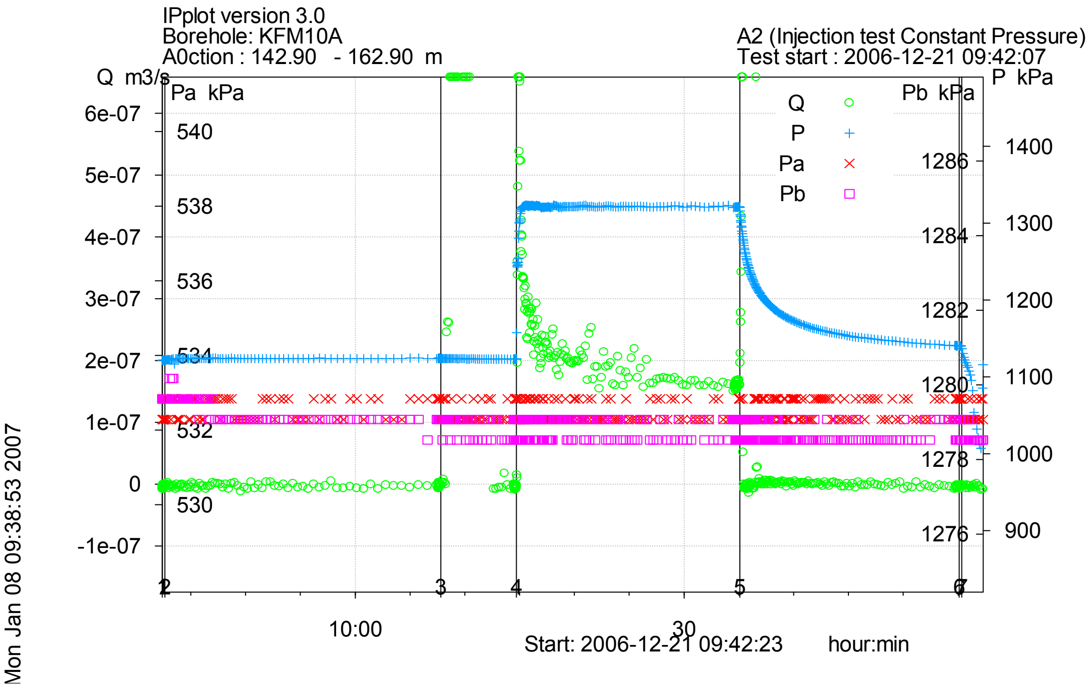


Figure A3-41. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 142.9-162.9 m in borehole KFM10A.*

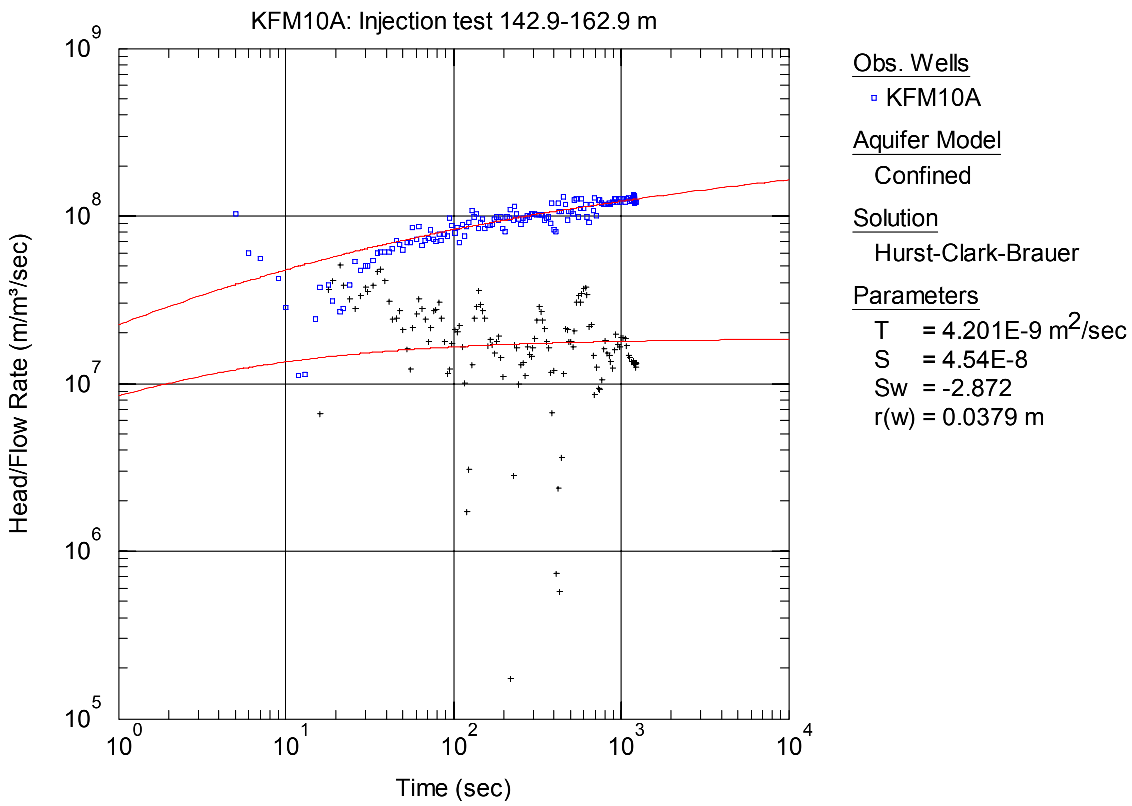


Figure A3-42. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 142.9-162.9 m in KFM10A.*

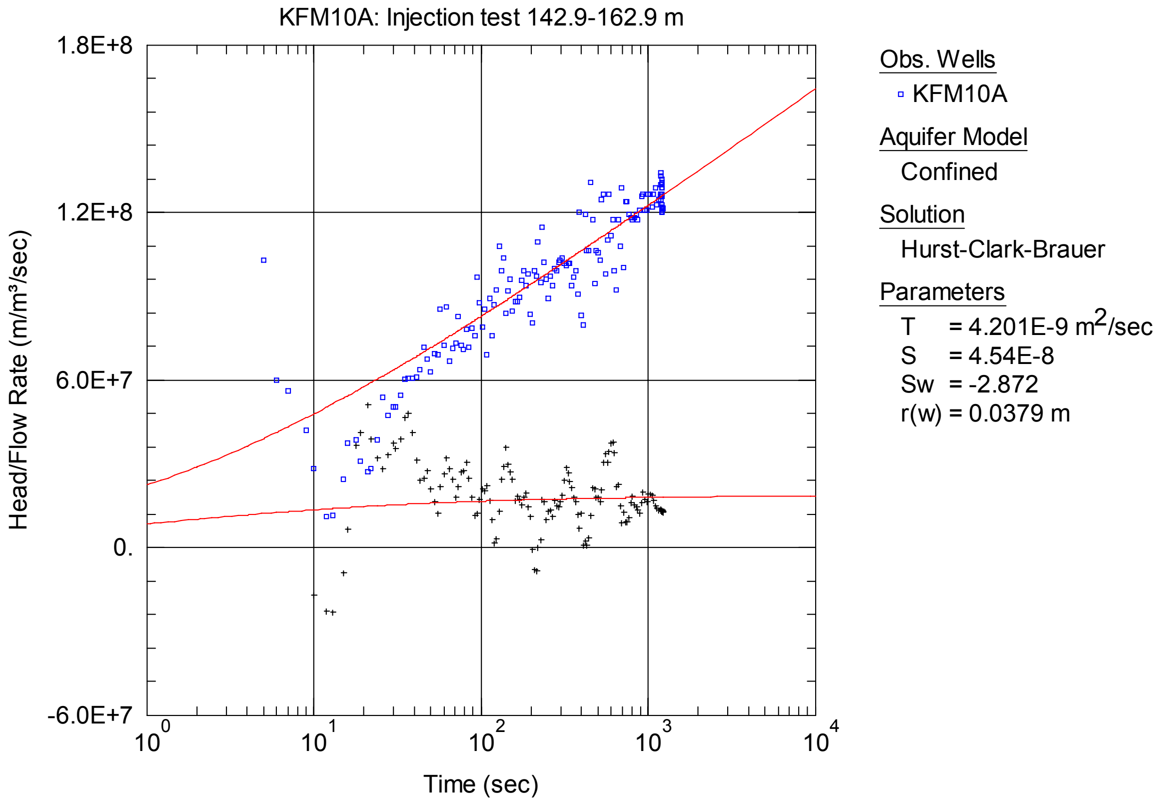


Figure A3-43. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 142.9-162.9 m in KFM10A.*

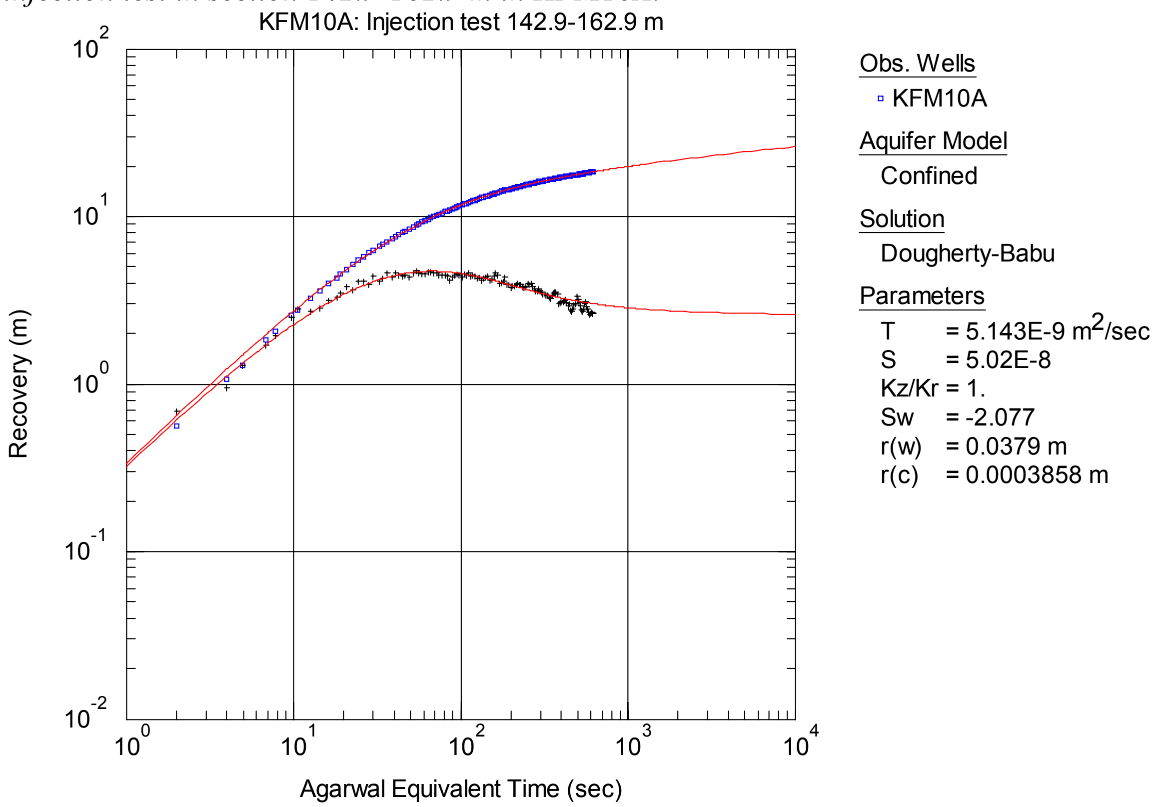


Figure A3-44. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 142.9-162.9 m in KFM10A.*

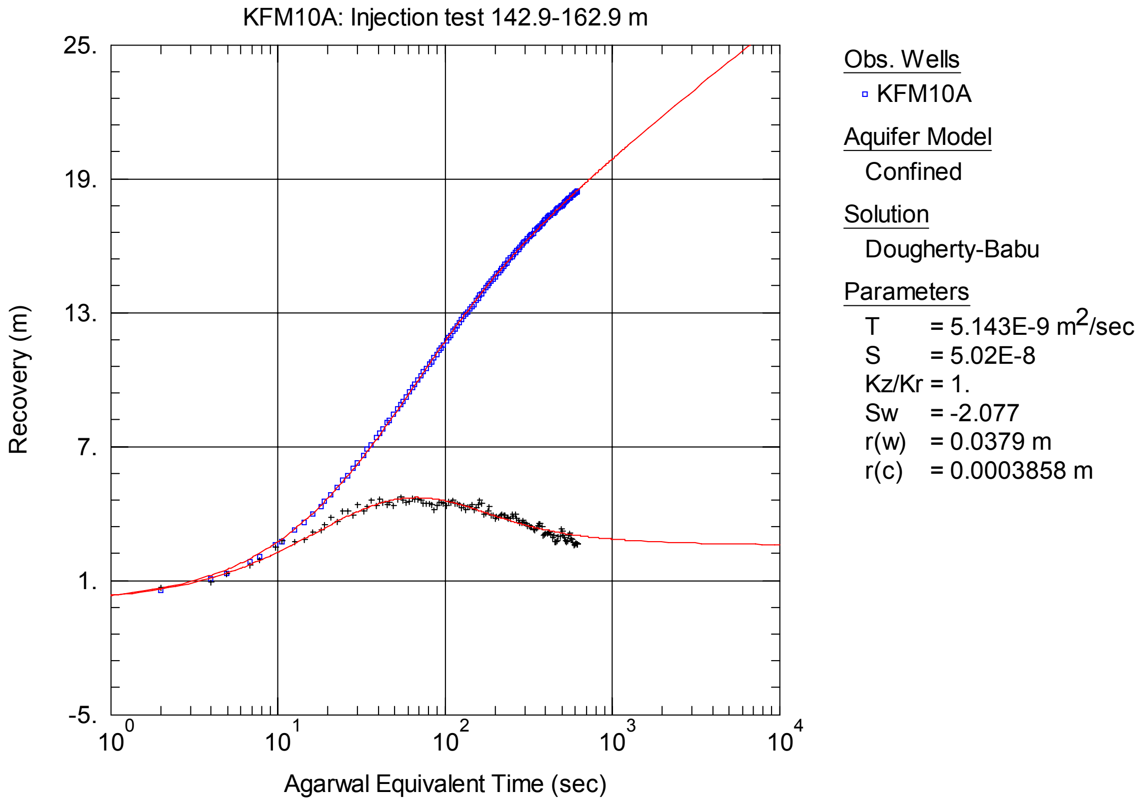


Figure A3-45. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 142.9-162.9 m in KFM10A.*

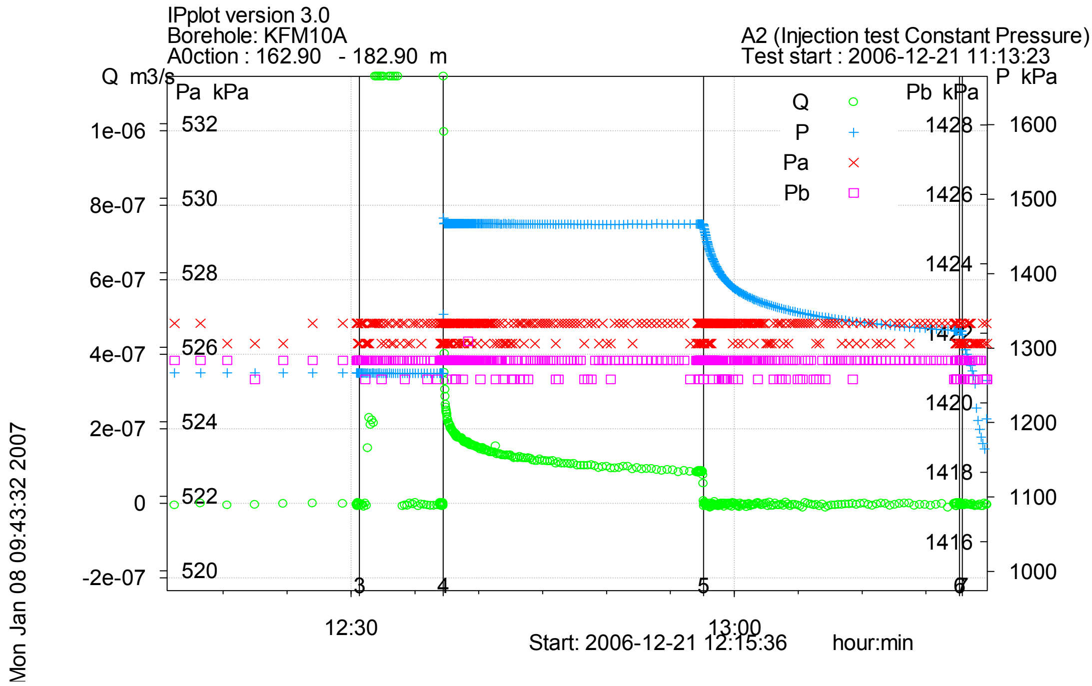


Figure A3-46. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 162.9-182.9 m in borehole KFM10A.*

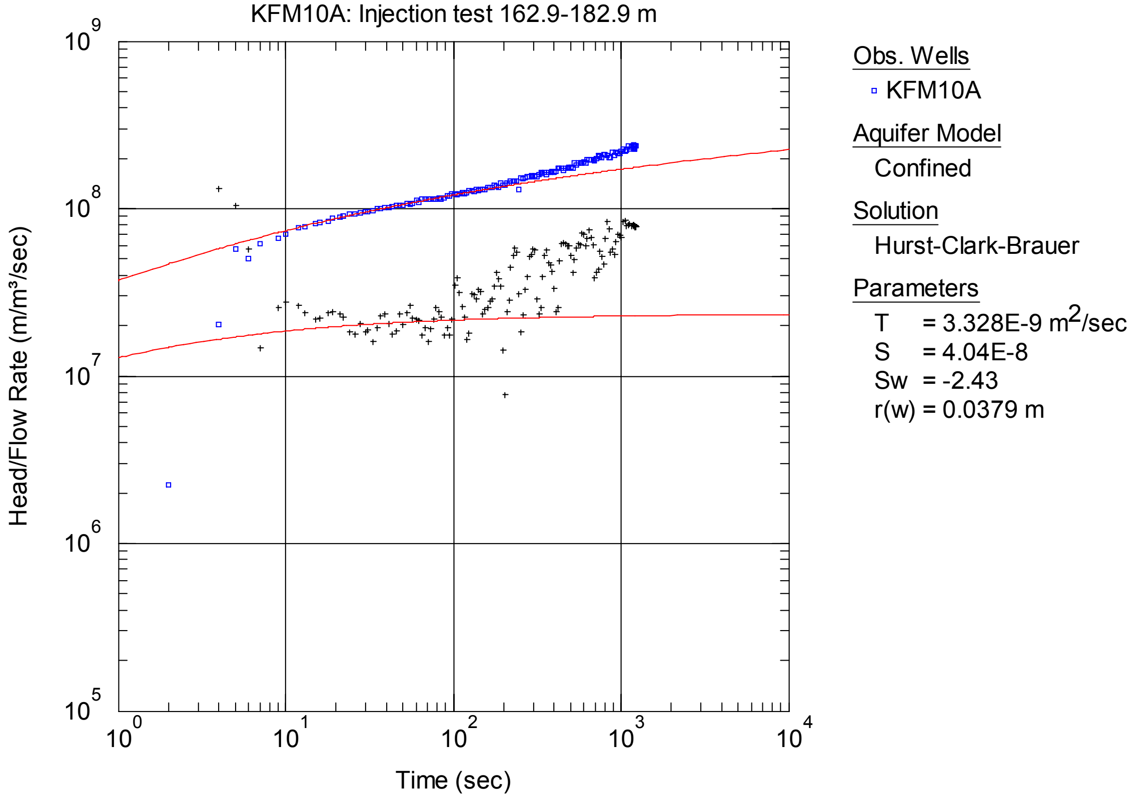


Figure A3-47. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 162.9-182.9 m in KFM10A.*

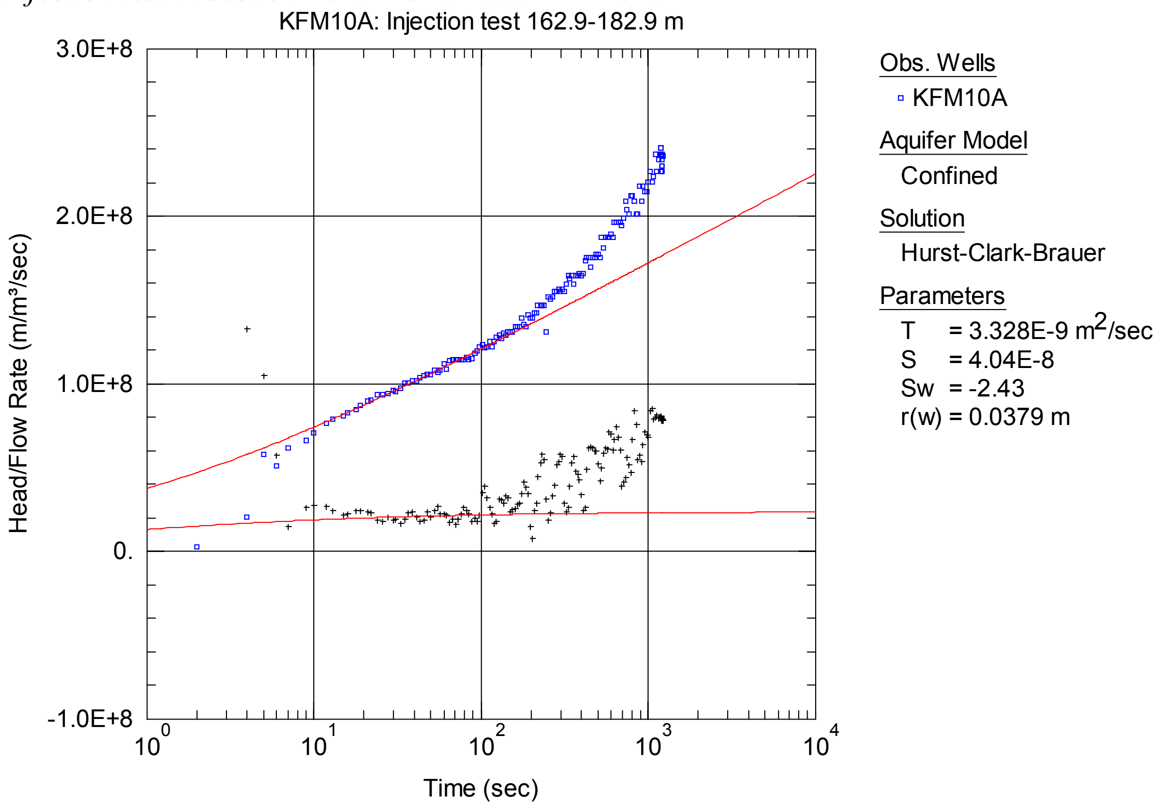


Figure A3-48. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 162.9-182.9 m in KFM10A.*

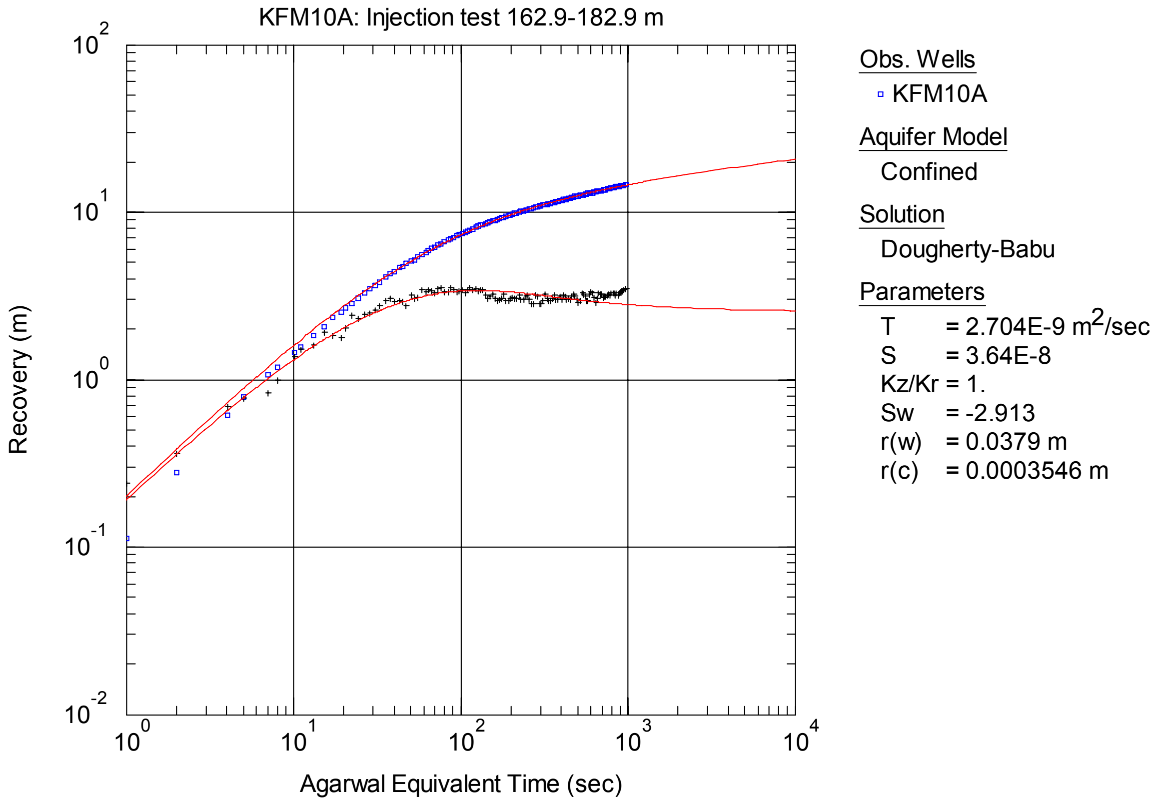


Figure A3-49. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 162.9-182.9 m in KFM10A.*

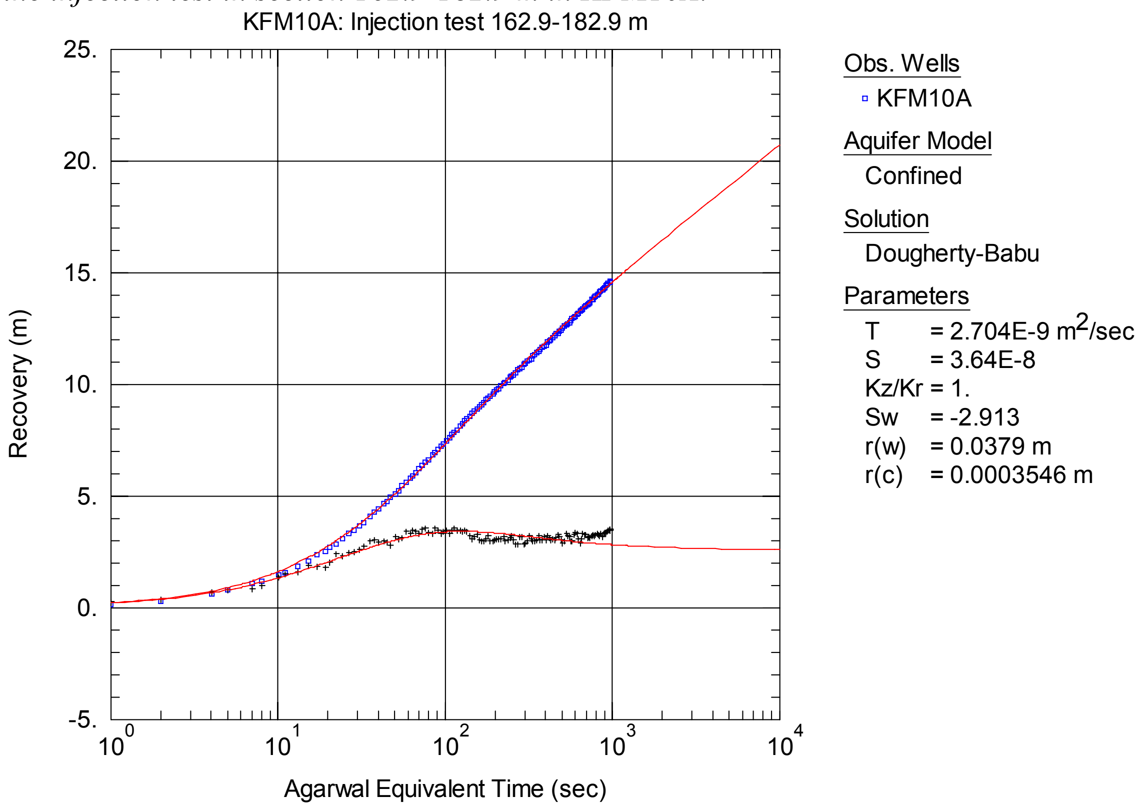


Figure A3-50. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 162.9-182.9 m in KFM10A.*

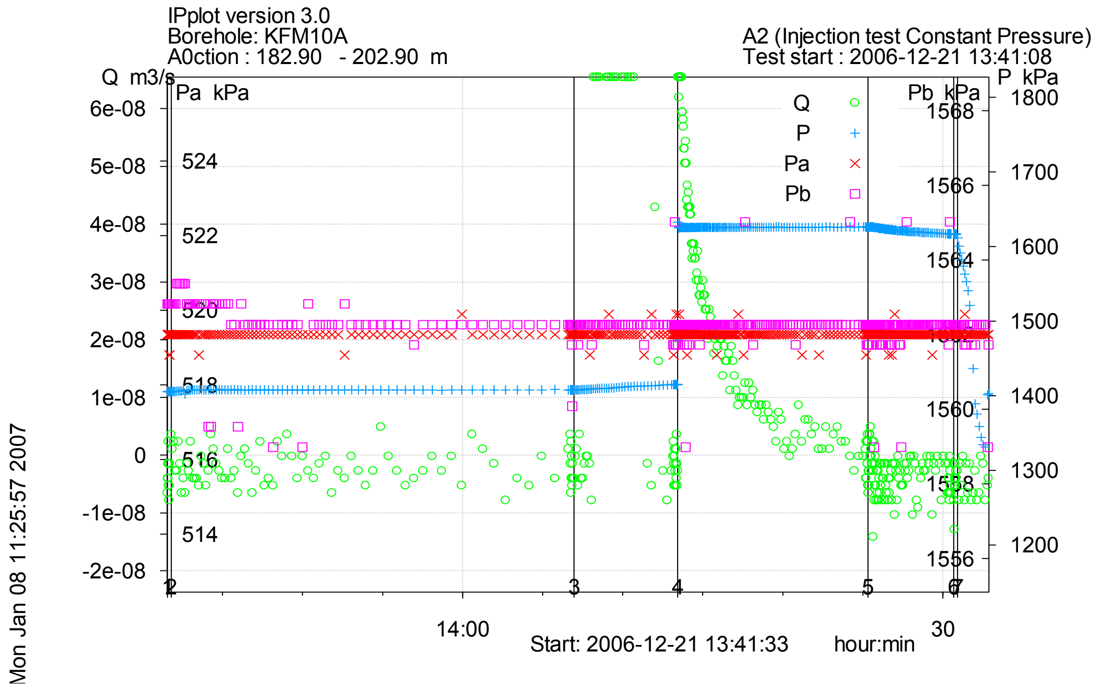


Figure A3-51. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 182.9-202.9 m in borehole KFM10A.*

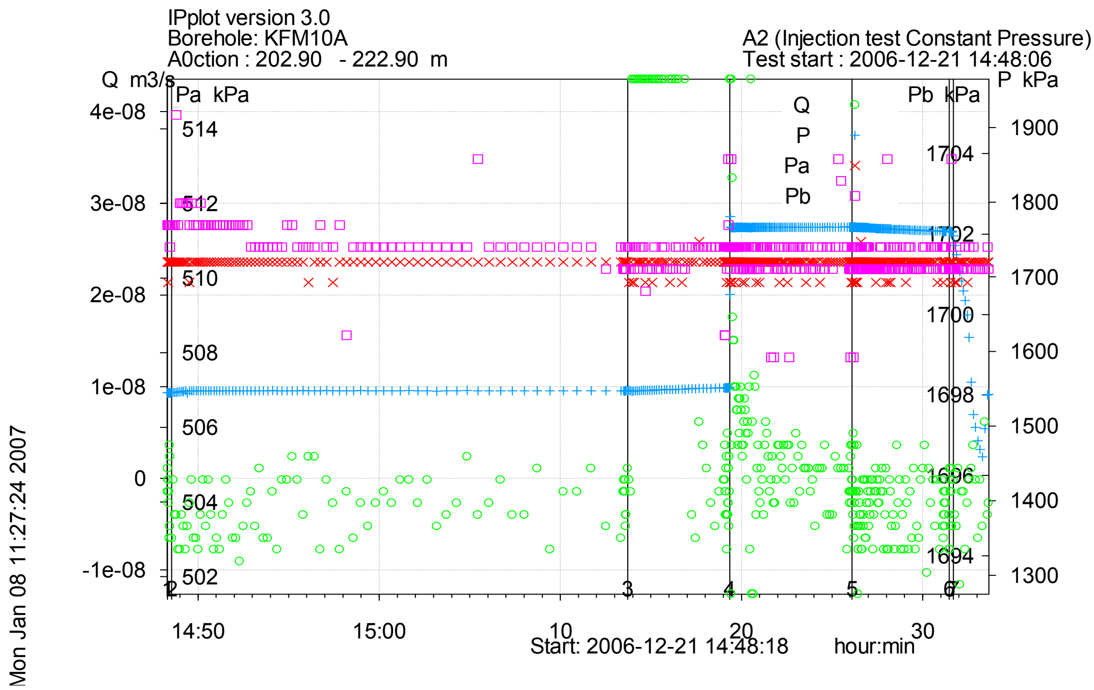


Figure A3-52. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 202.9-222.9 m in borehole KFM10A.*

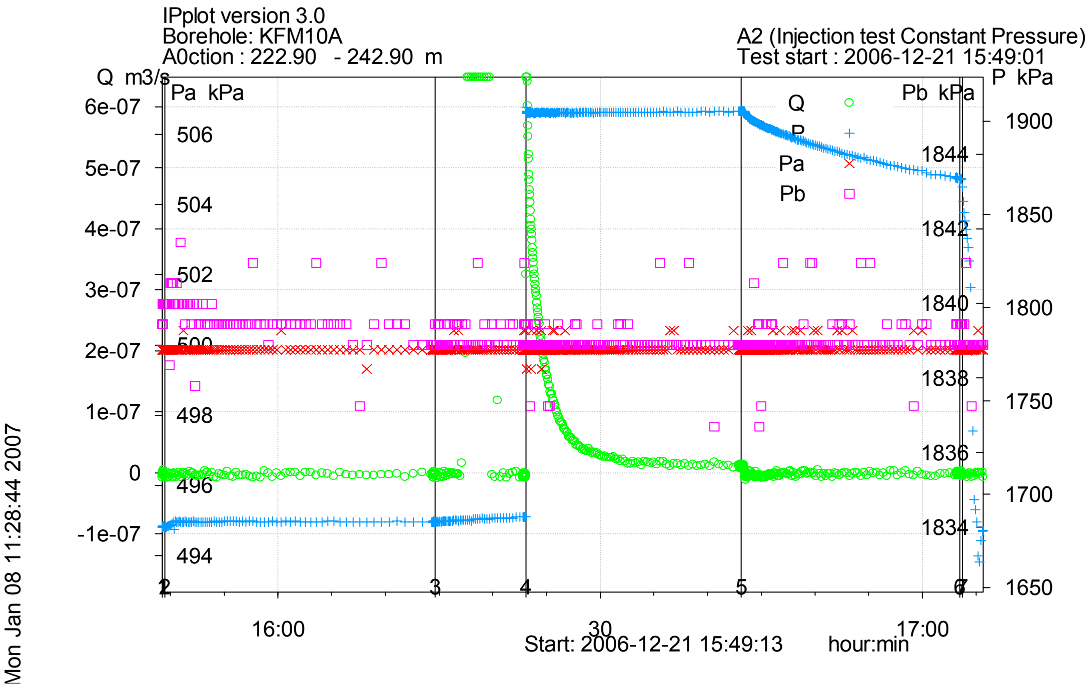


Figure A3-53. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 222.9-242.9 m in borehole KFM10A.

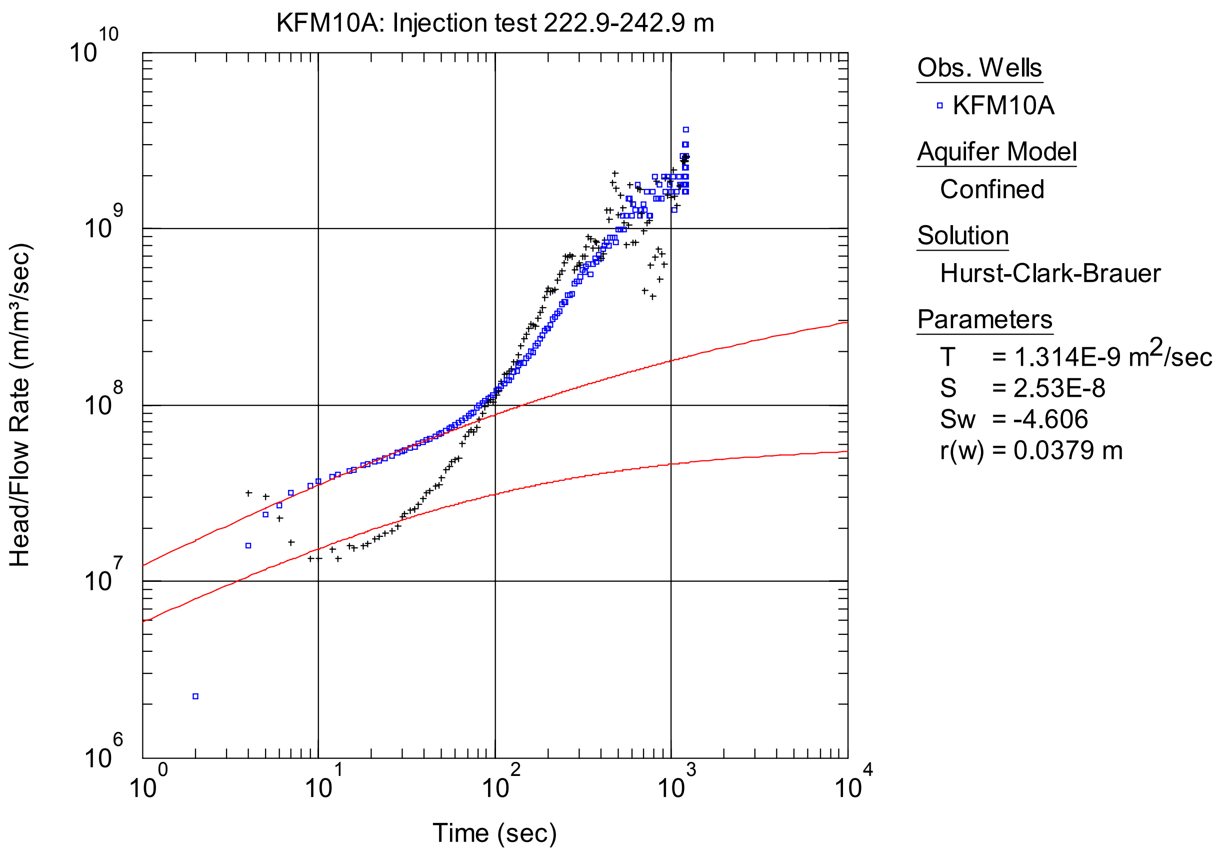


Figure A3-54. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 222.9-242.9 m in KFM10A.

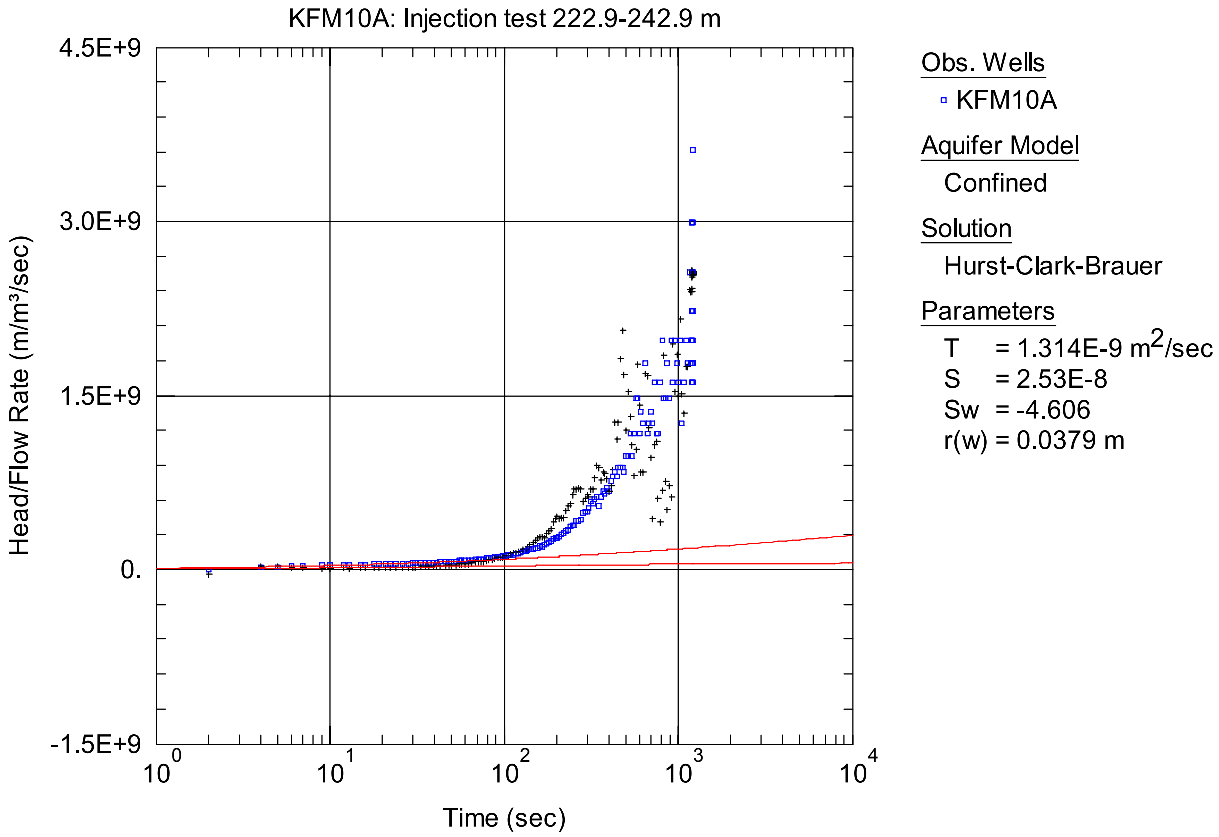


Figure A3-55. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 222.9-242.9 m in KFM10A.*

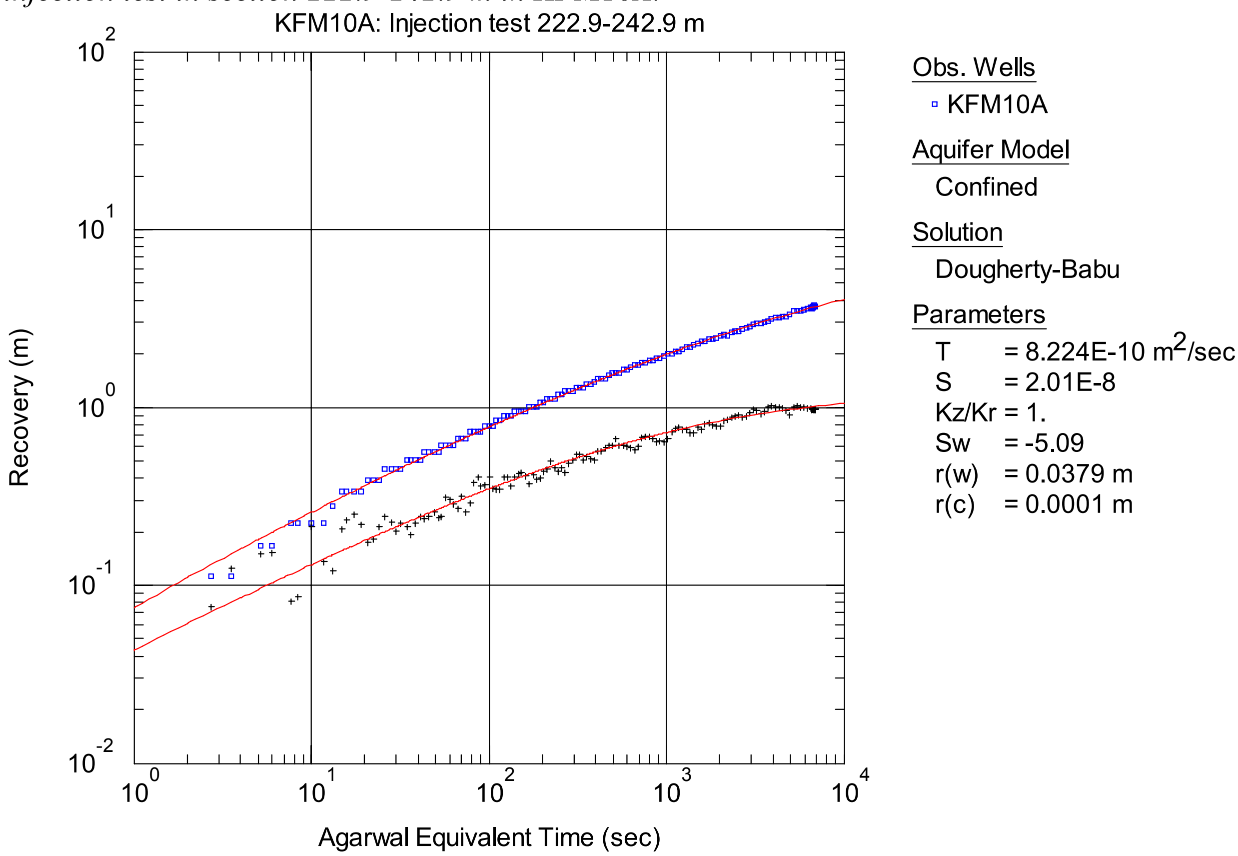


Figure A3-56. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 222.9-242.9 m in KFM10A.*

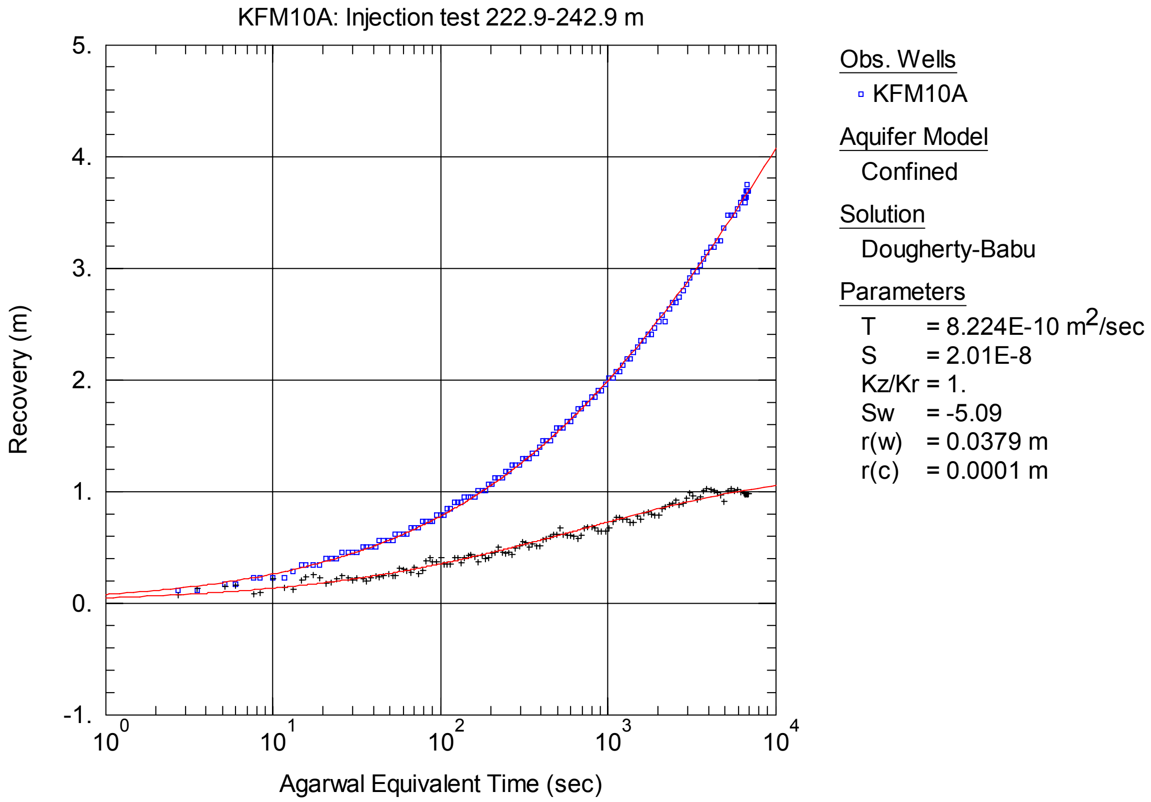


Figure A3-57. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 222.9-242.9 m in KFM10A.*

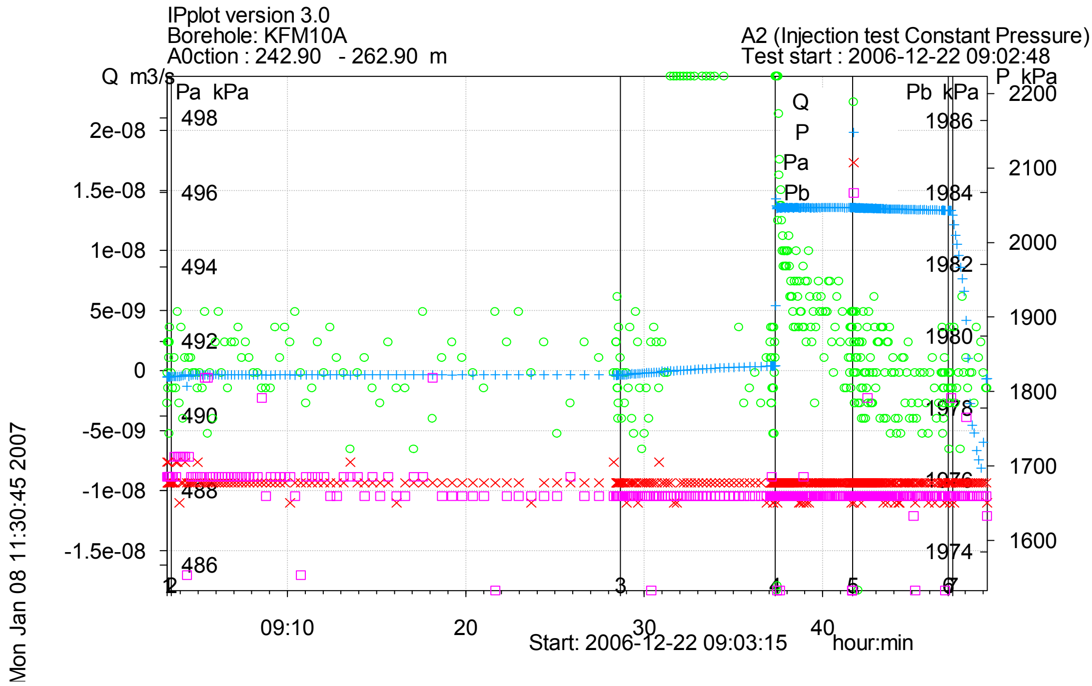


Figure A3-58. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 242.9-262.9 m in borehole KFM10A.*

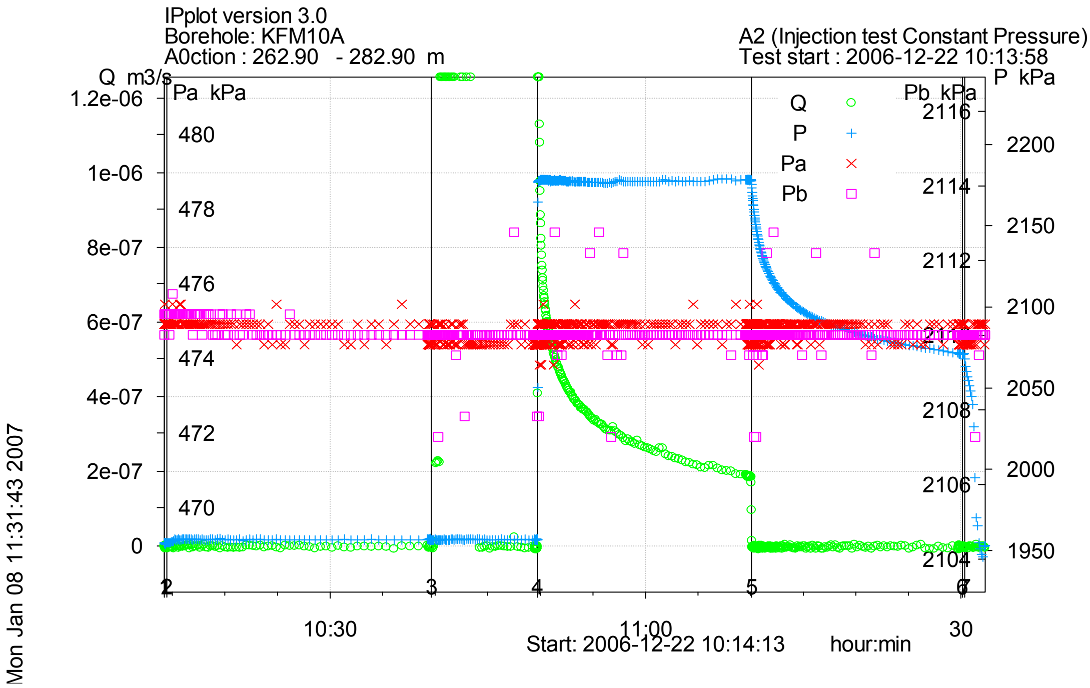


Figure A3-59. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 262.9-282.9 m in borehole KFM10A.*

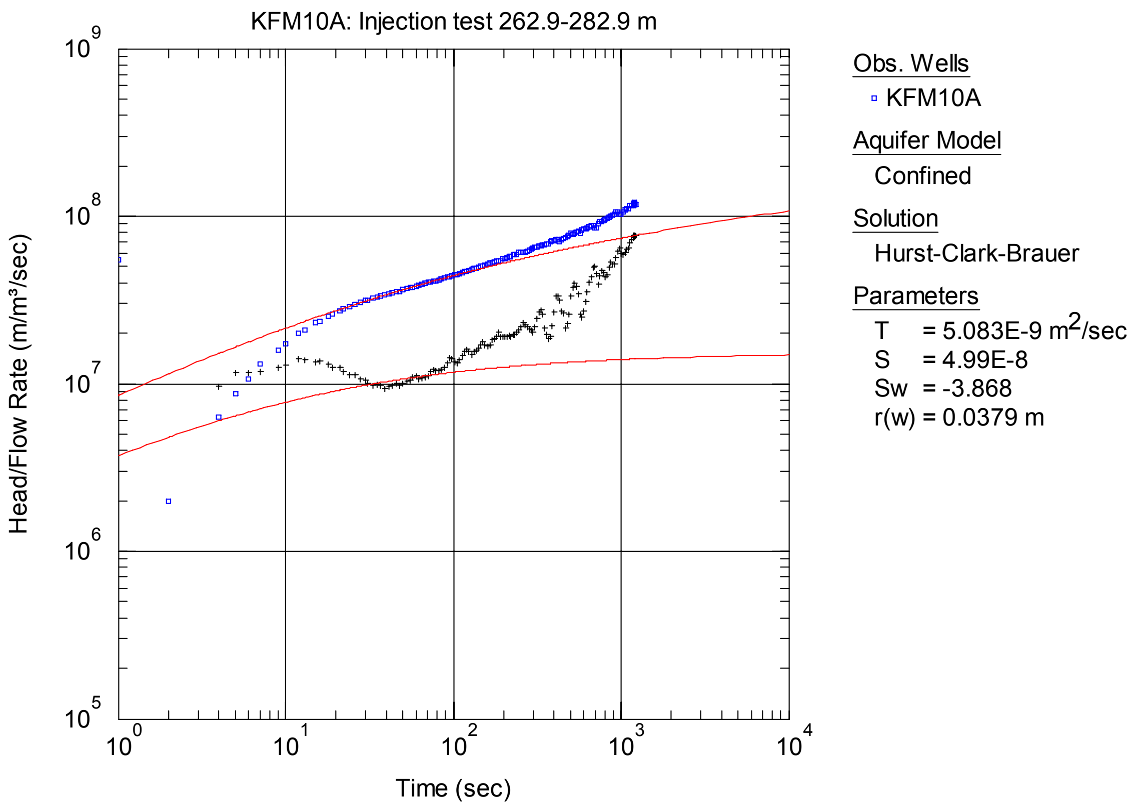


Figure A3-60. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 262.9-282.9 m in KFM10A.*

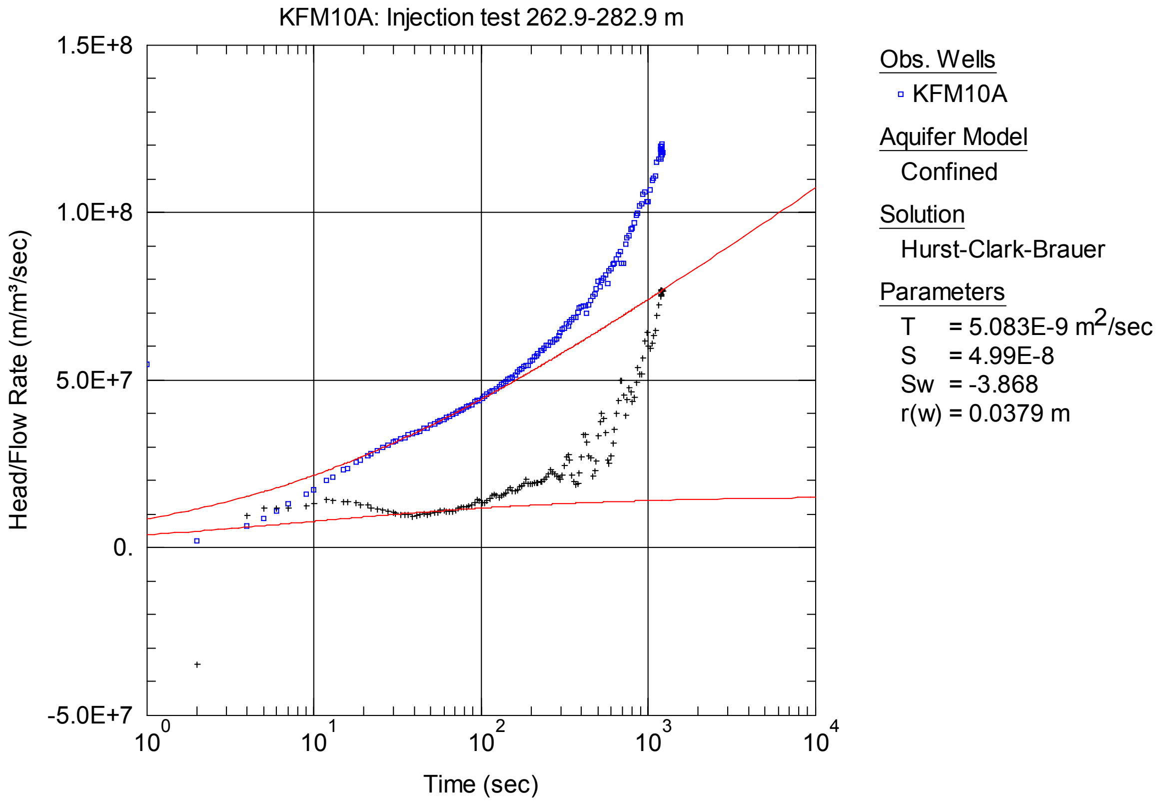


Figure A3-61. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 262.9-282.9 m in KFM10A.*

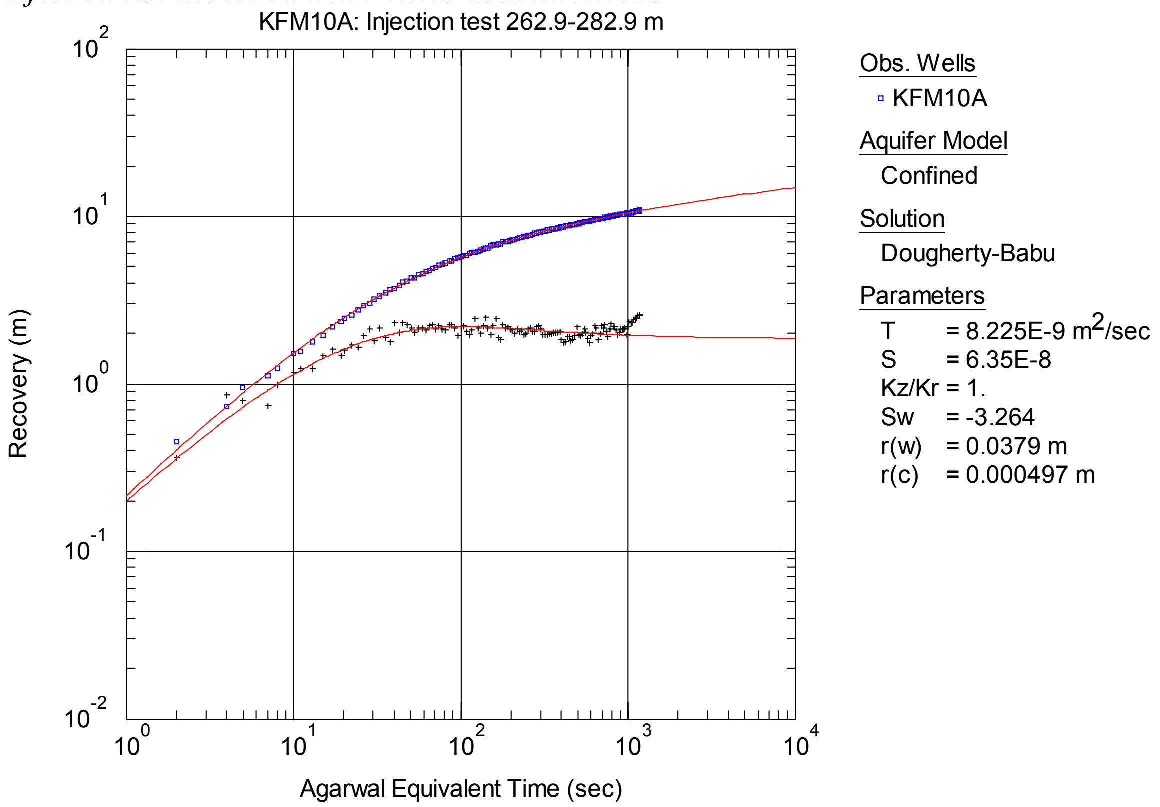


Figure A3-62. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 262.9-282.9 m in KFM10A.*

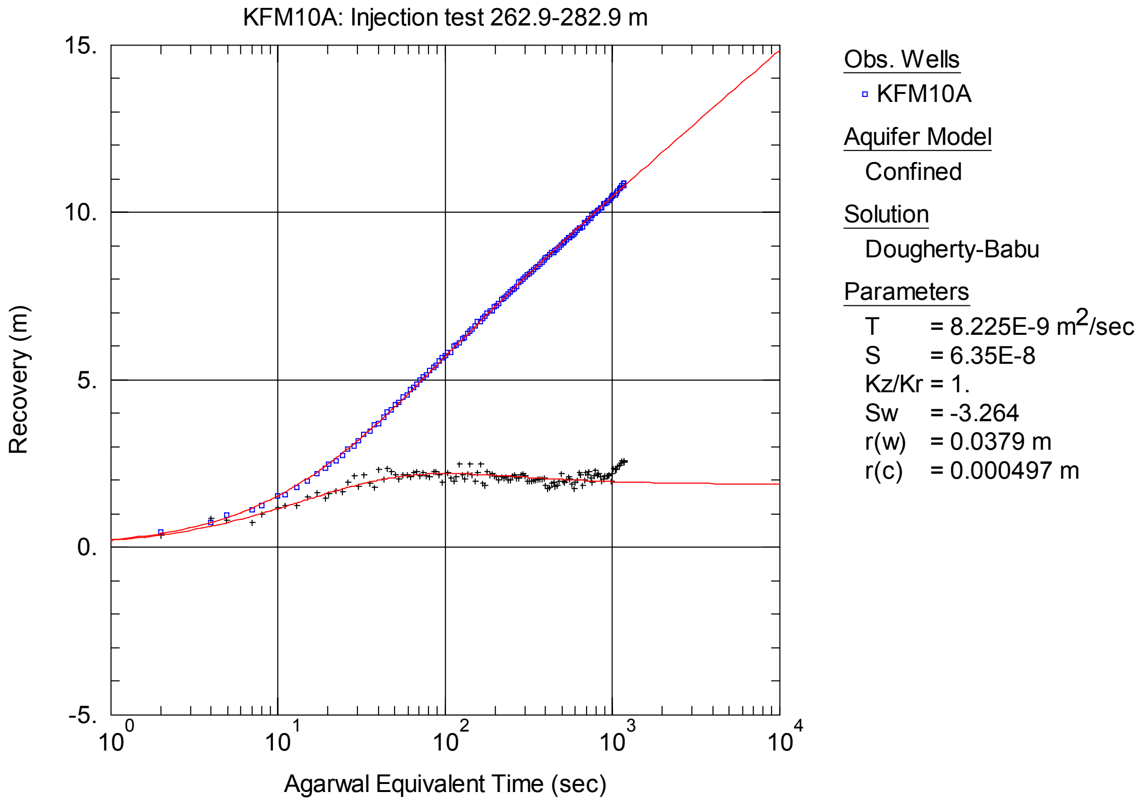


Figure A3-63. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 262.9-282.9 m in KFM10A.*

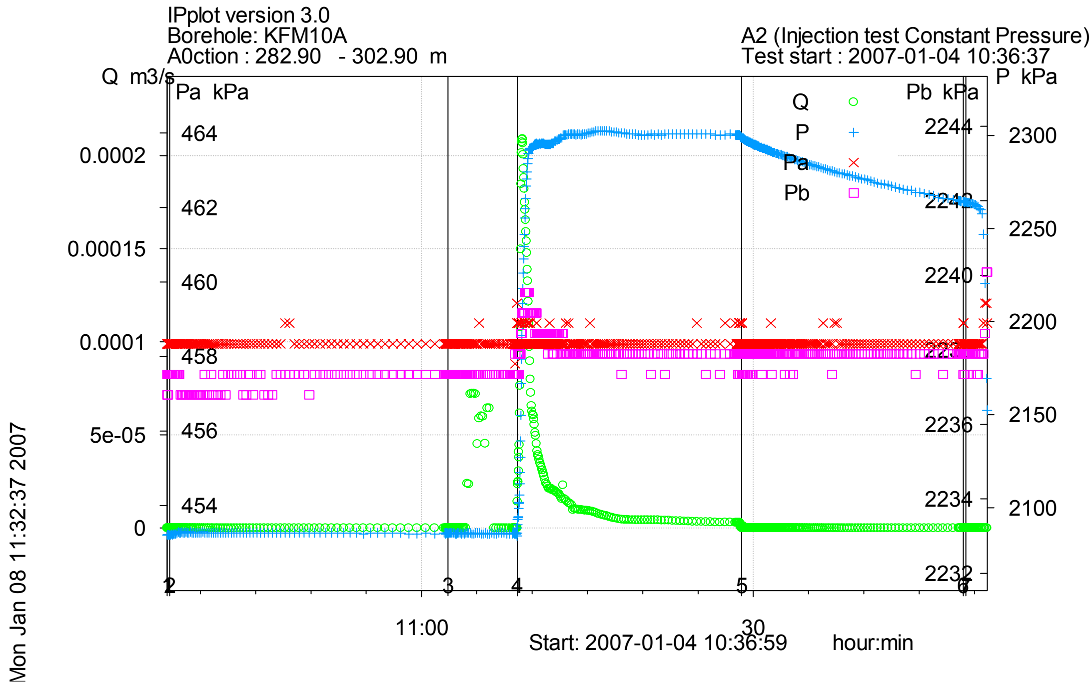


Figure A3-64. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 282.9-302.9 m in borehole KFM10A.*

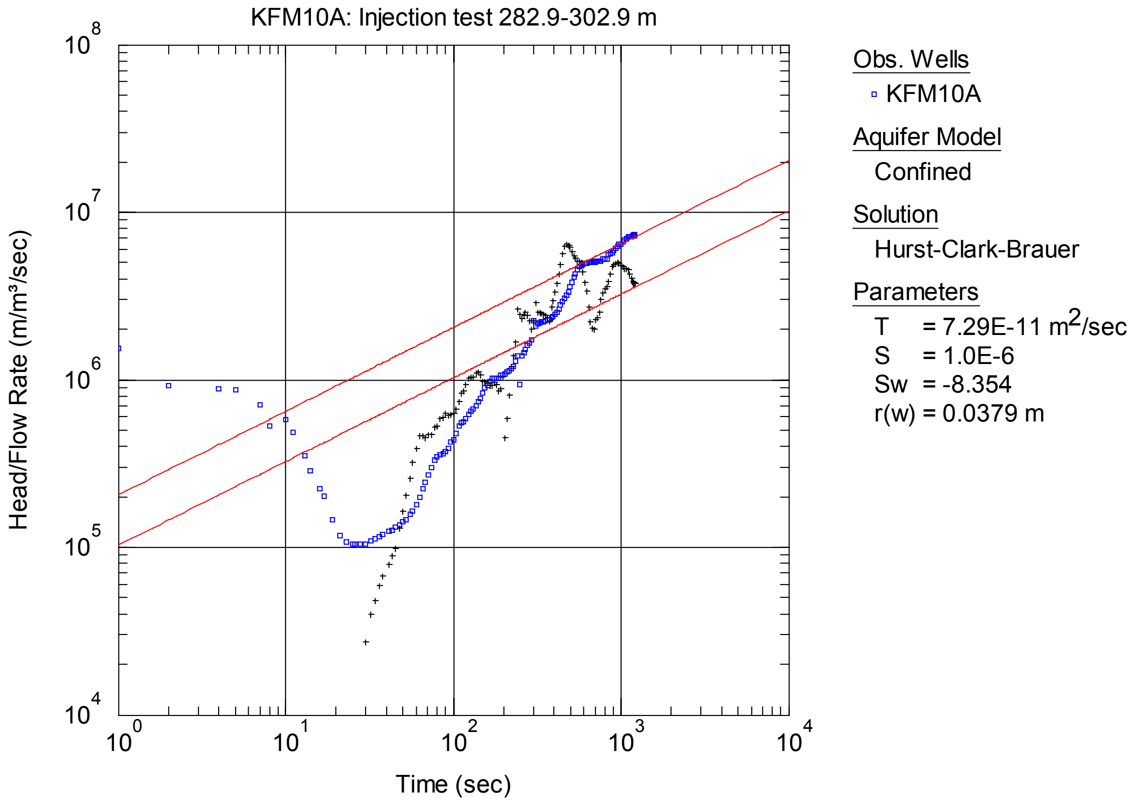


Figure A3-65. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 282.9-302.9 m in KFM10A. The type curve fit is only to show that an assumption of PLF is not valid.*

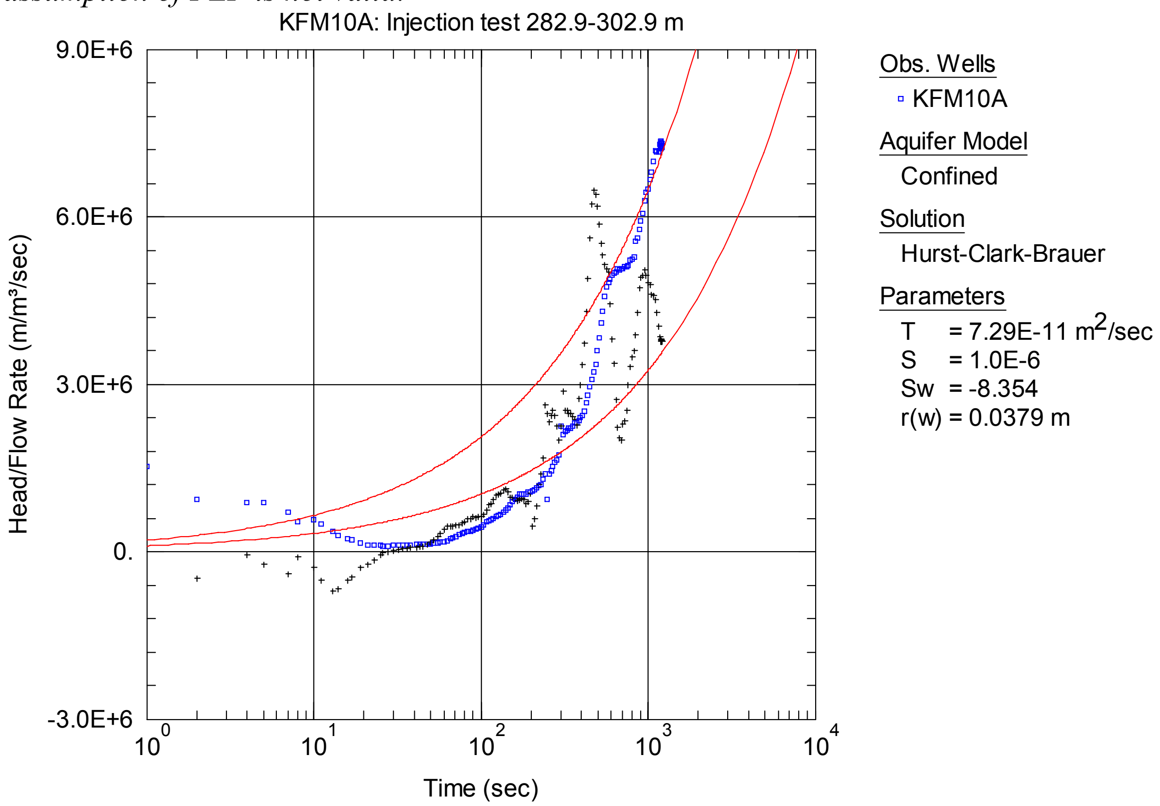


Figure A3-66. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 282.9-302.9 m in KFM10A. The type curve fit is only to show that an assumption of PLF is not valid.*

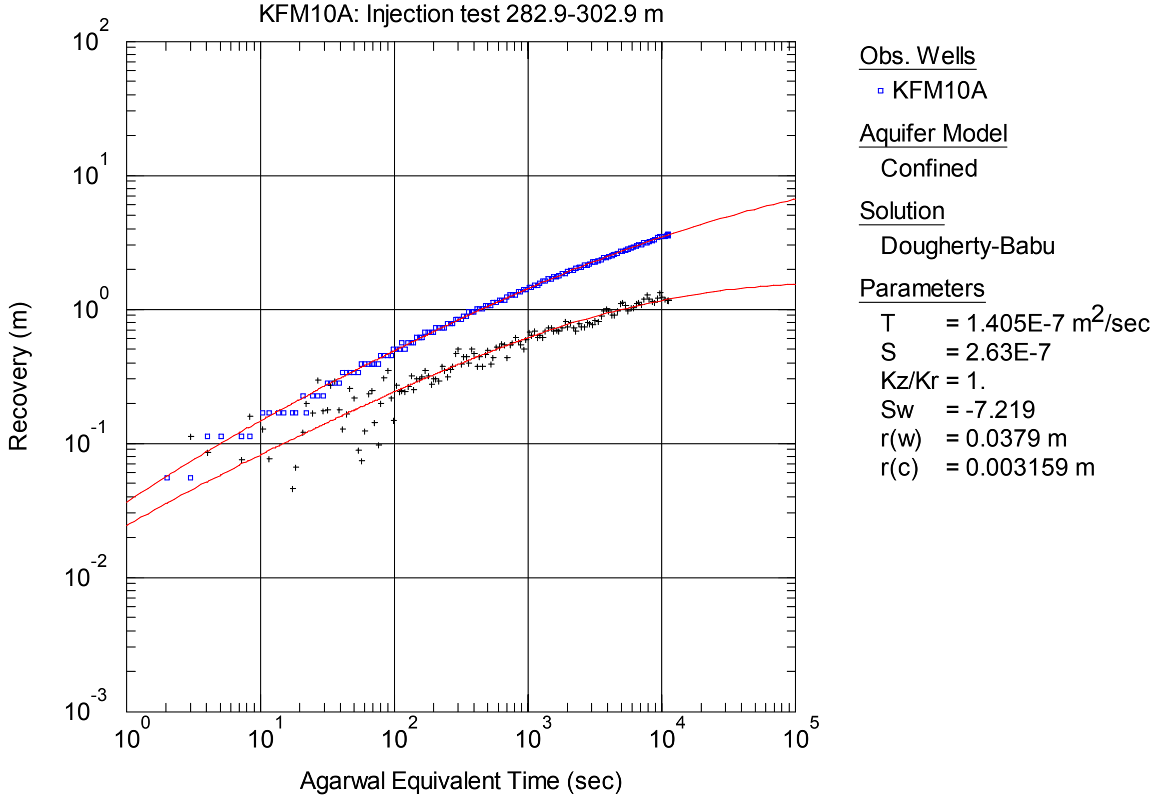


Figure A3-67. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 282.9-302.9 m in KFM10A.*

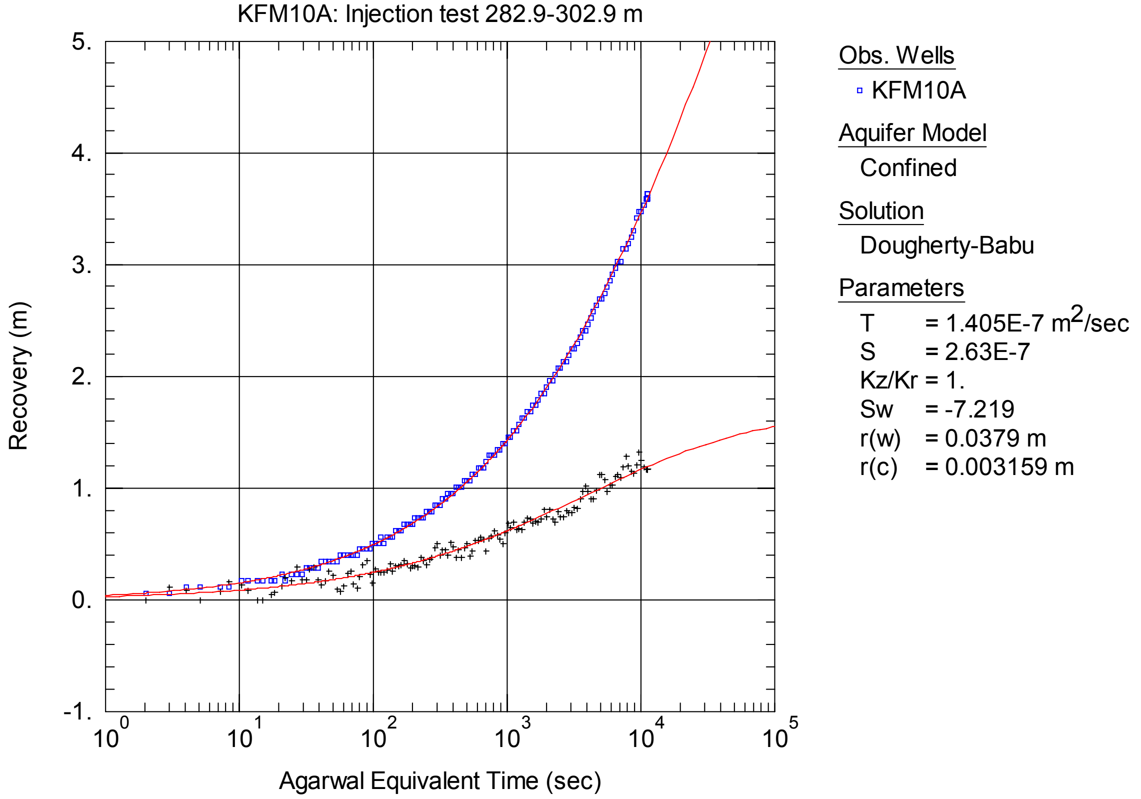


Figure A3-68. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 282.9-302.9 m in KFM10A.*

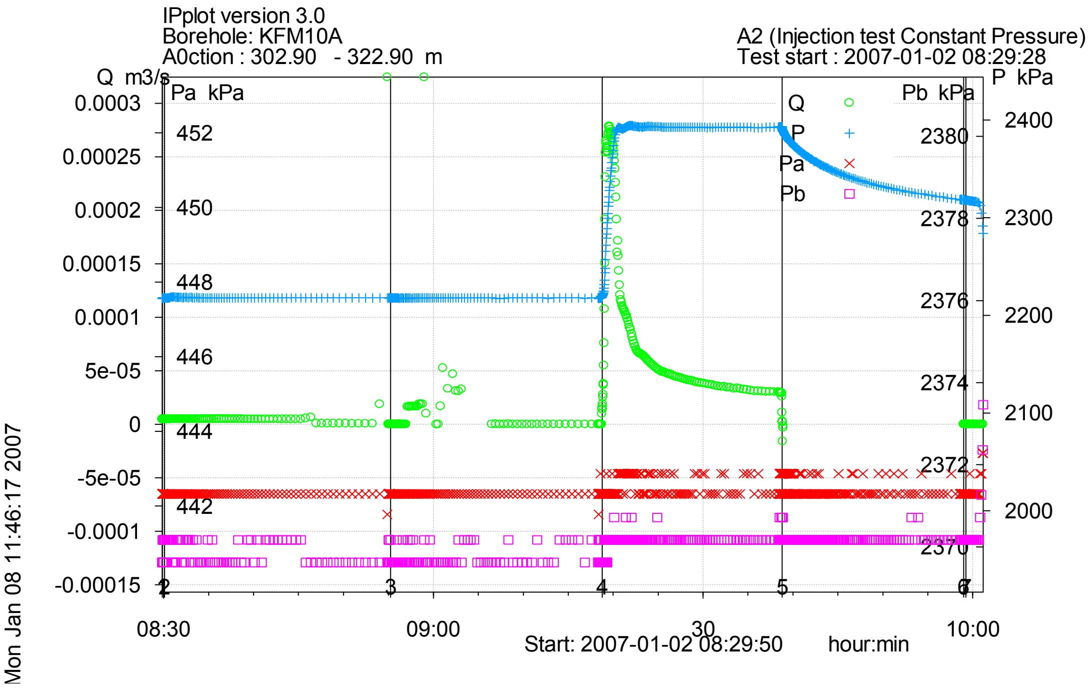


Figure A3-69. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 302.9-322.9 m in borehole KFM10A.*

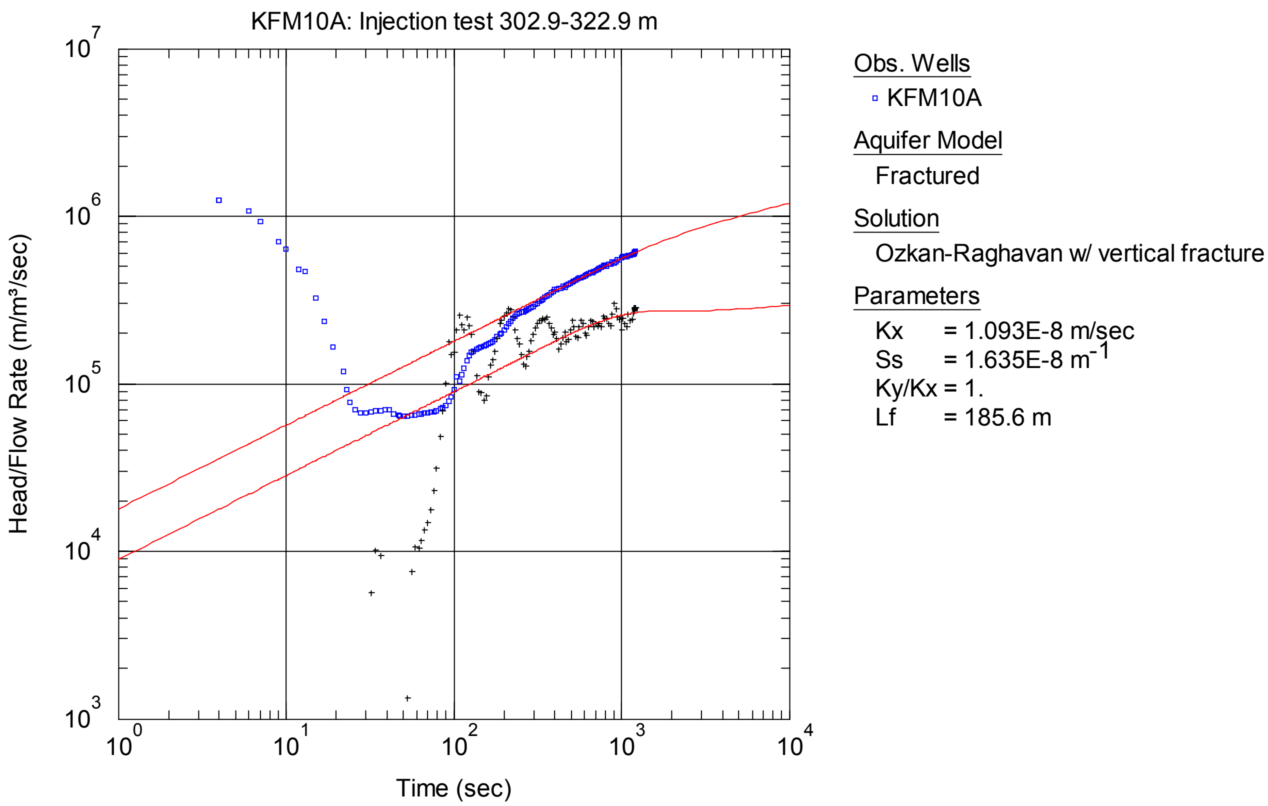


Figure A3-70. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 302.9-322.9 m in KFM10A.*

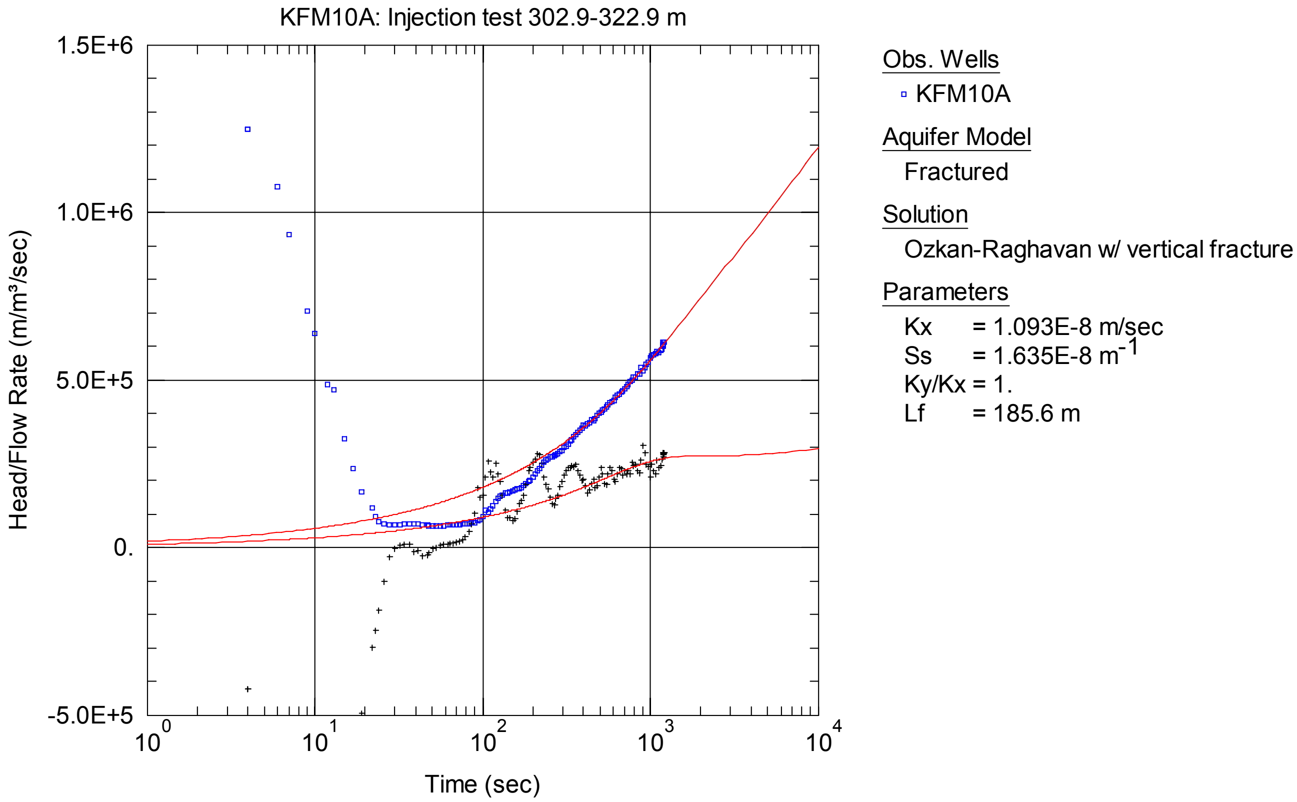


Figure A3-71. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 302.9-322.9 m in KFM10A.*

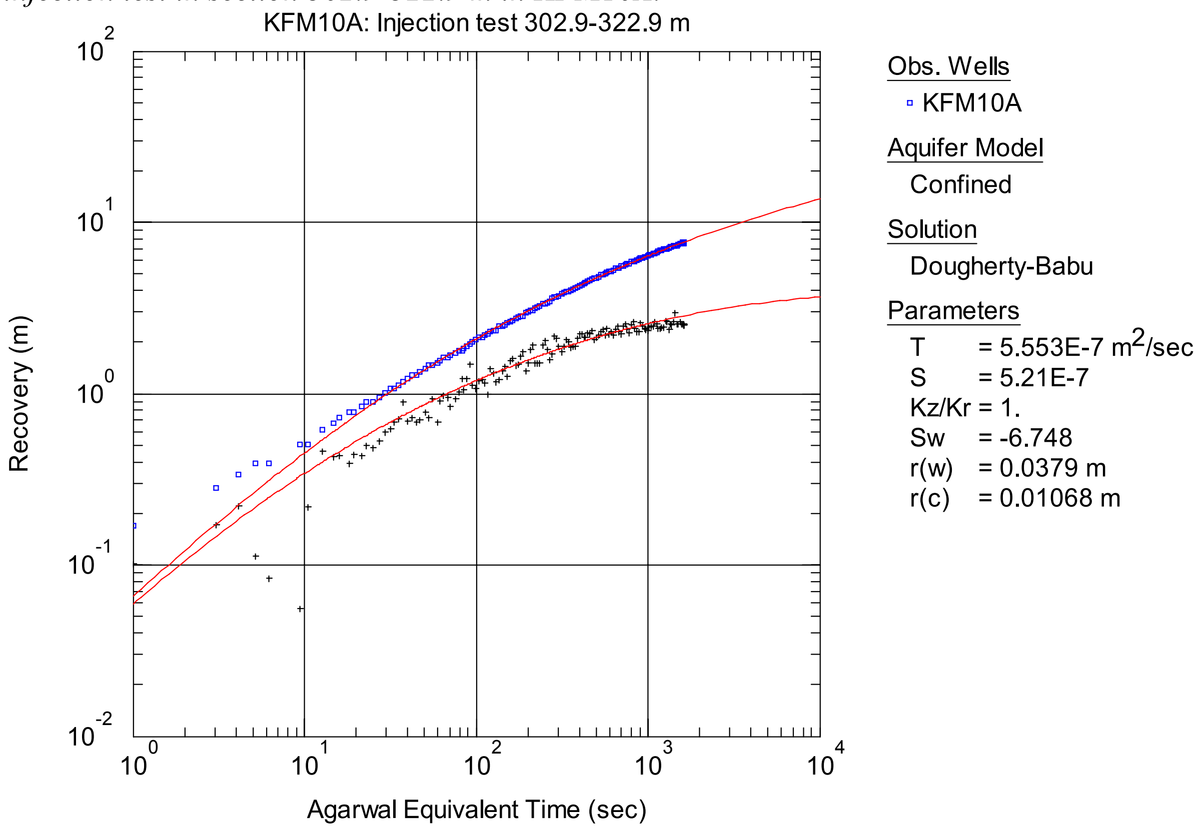


Figure A3-72. *Log-log plot of recovery (□) and derivative (+) versus time, showing fit to the Dougherty-Babu solution, from the injection test in section 302.9-322.9 m in borehole KFM10A.*

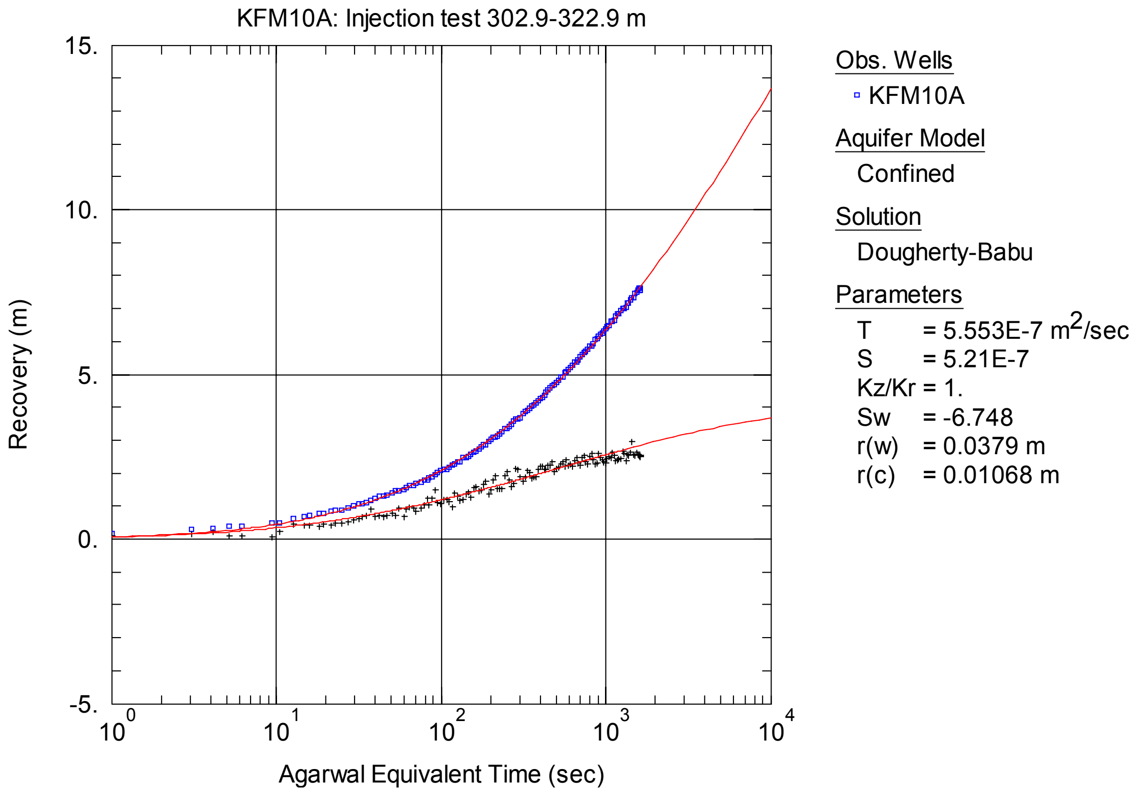


Figure A3-73. *Lin-log plot of recovery (□) and derivative (+) versus time, showing fit to the Dougherty-Babu solution, from the injection test in section 302.9-322.9 m in borehole KFM10A.*

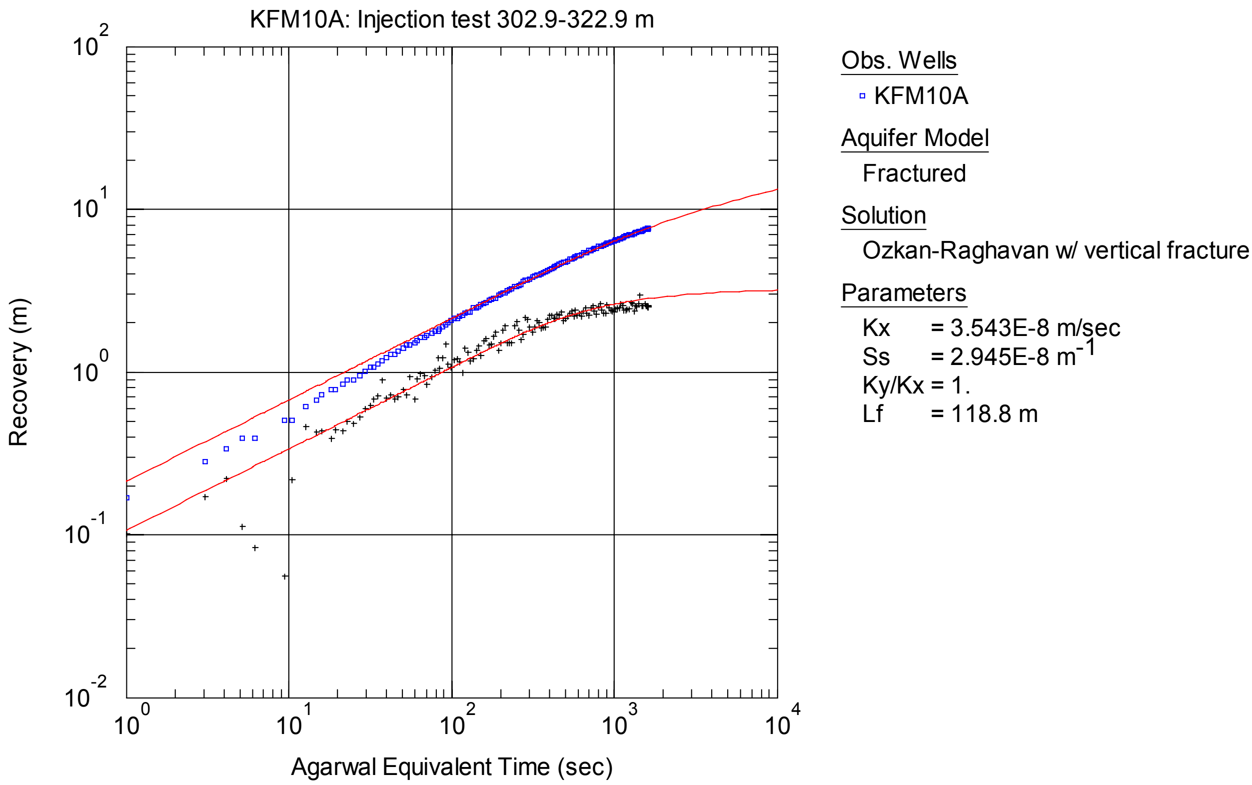


Figure A3-74. *Log-log plot of recovery (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 302.9-322.9 m in borehole KFM10A.*

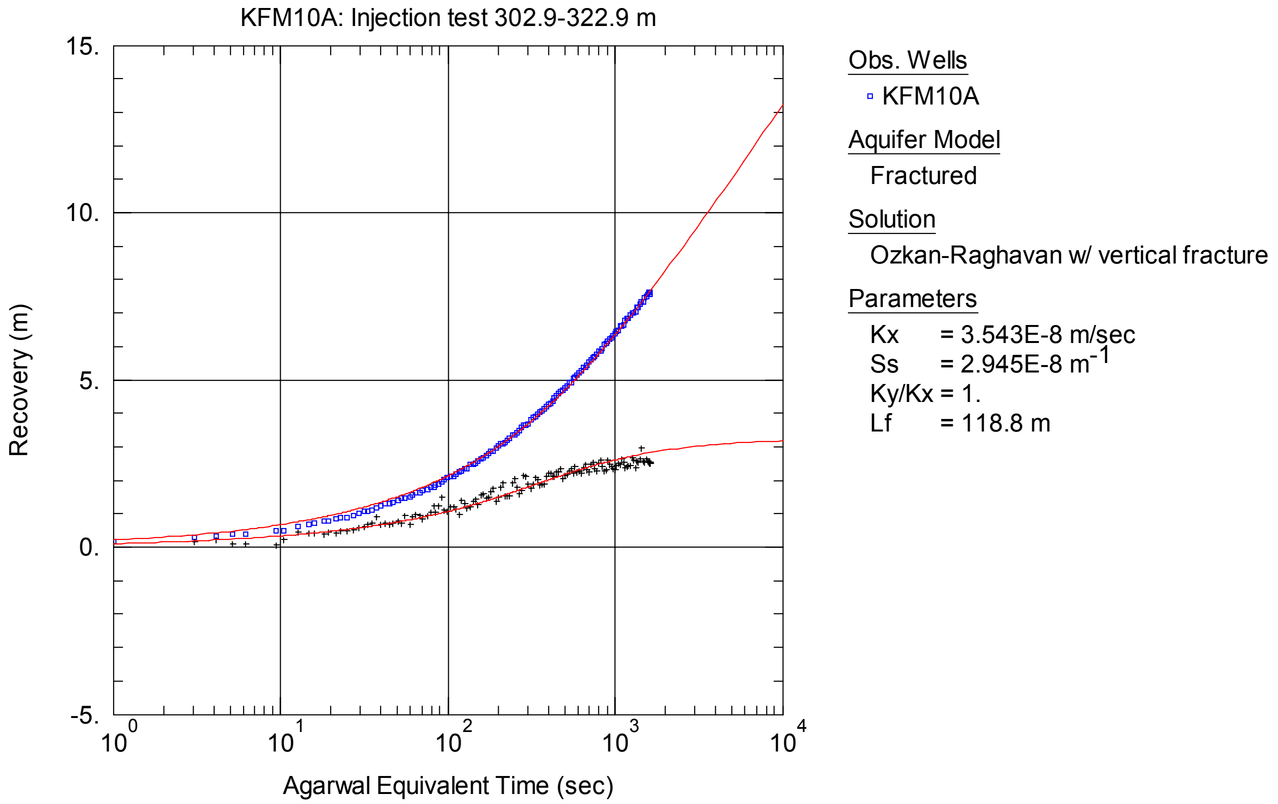


Figure A3-75. *Lin-log plot of recovery (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 302.9-322.9 m in borehole KFM10A.*

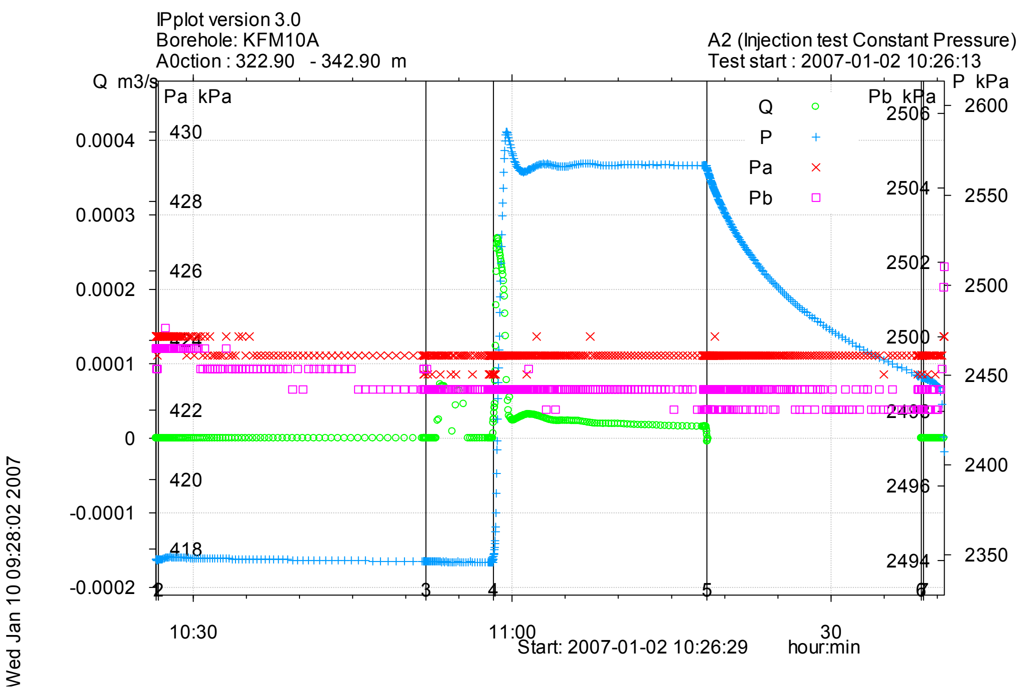


Figure A3-76. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 322.9-342.9 m in borehole KFM10A.*

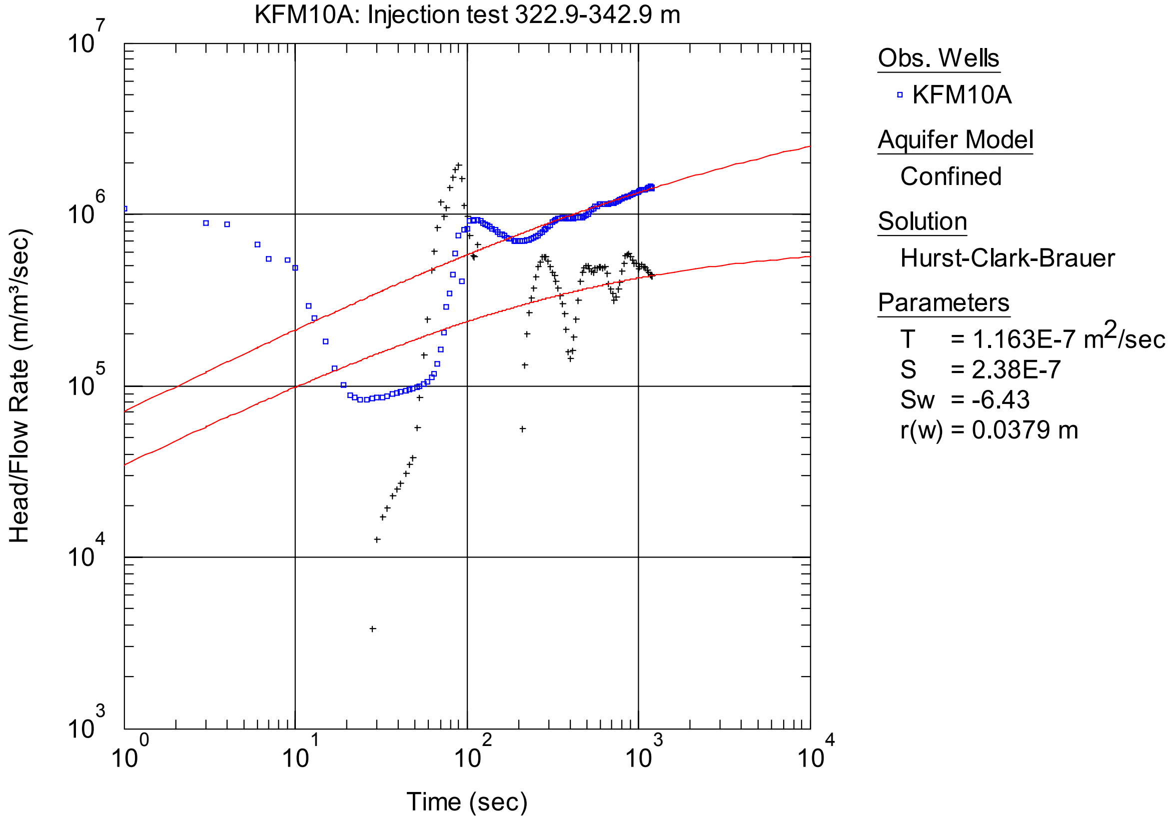


Figure A3-77. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 322.9-342.9 m in KFM10A.*

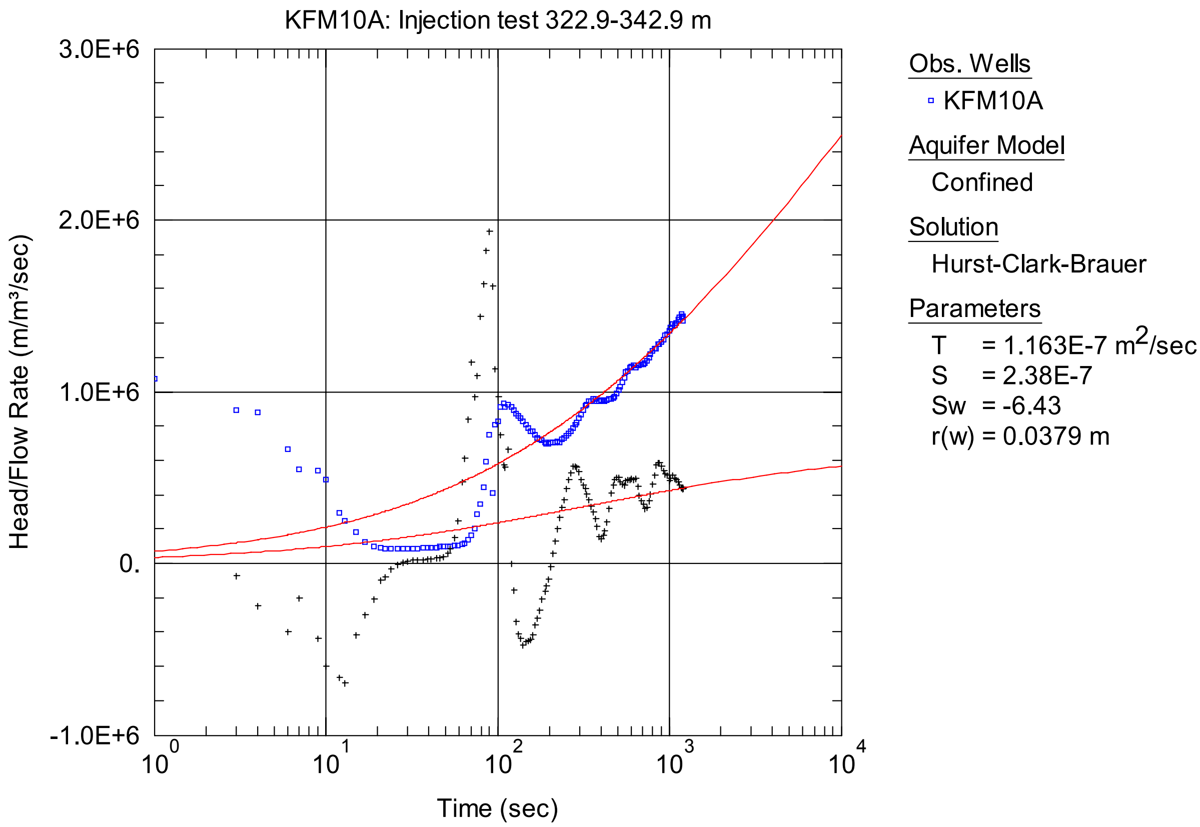


Figure A3-78. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 322.9-342.9 m in KFM10A.*

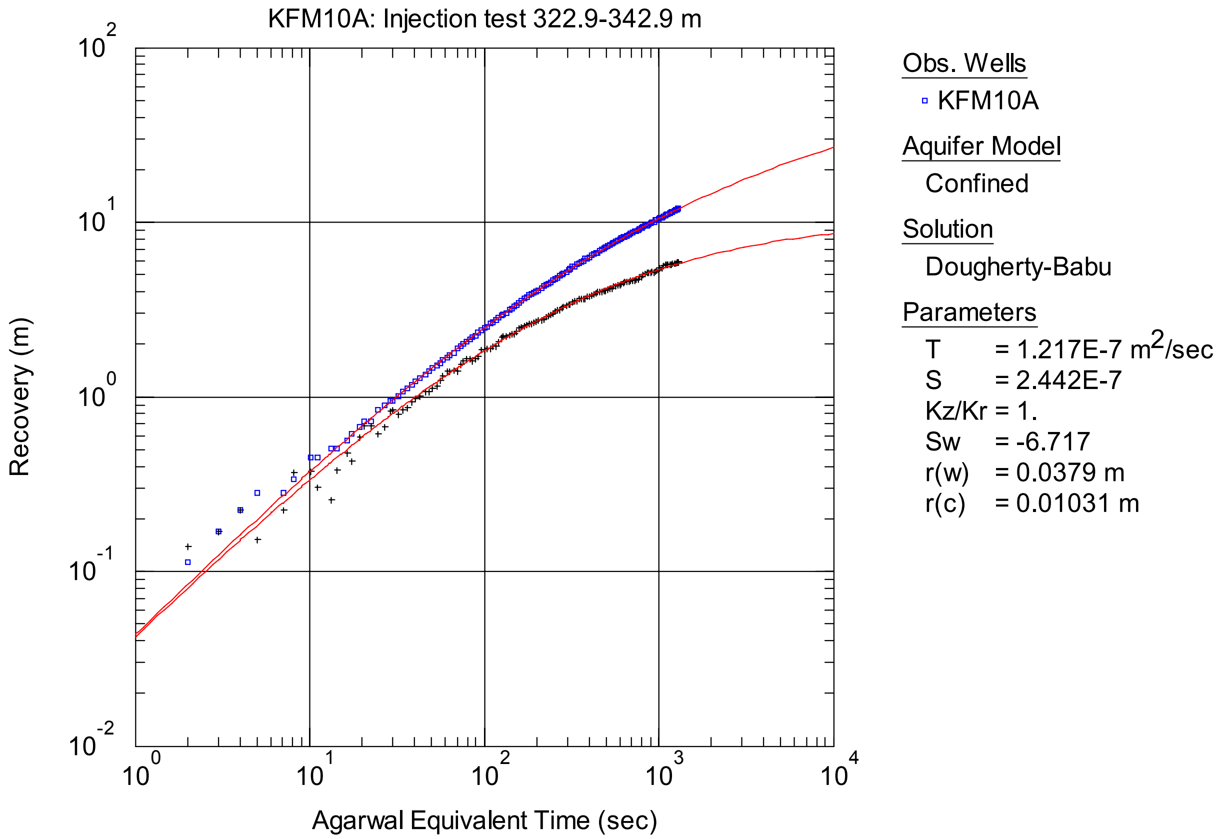


Figure A3-79. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 322.9-342.9 m in KFM10A.*

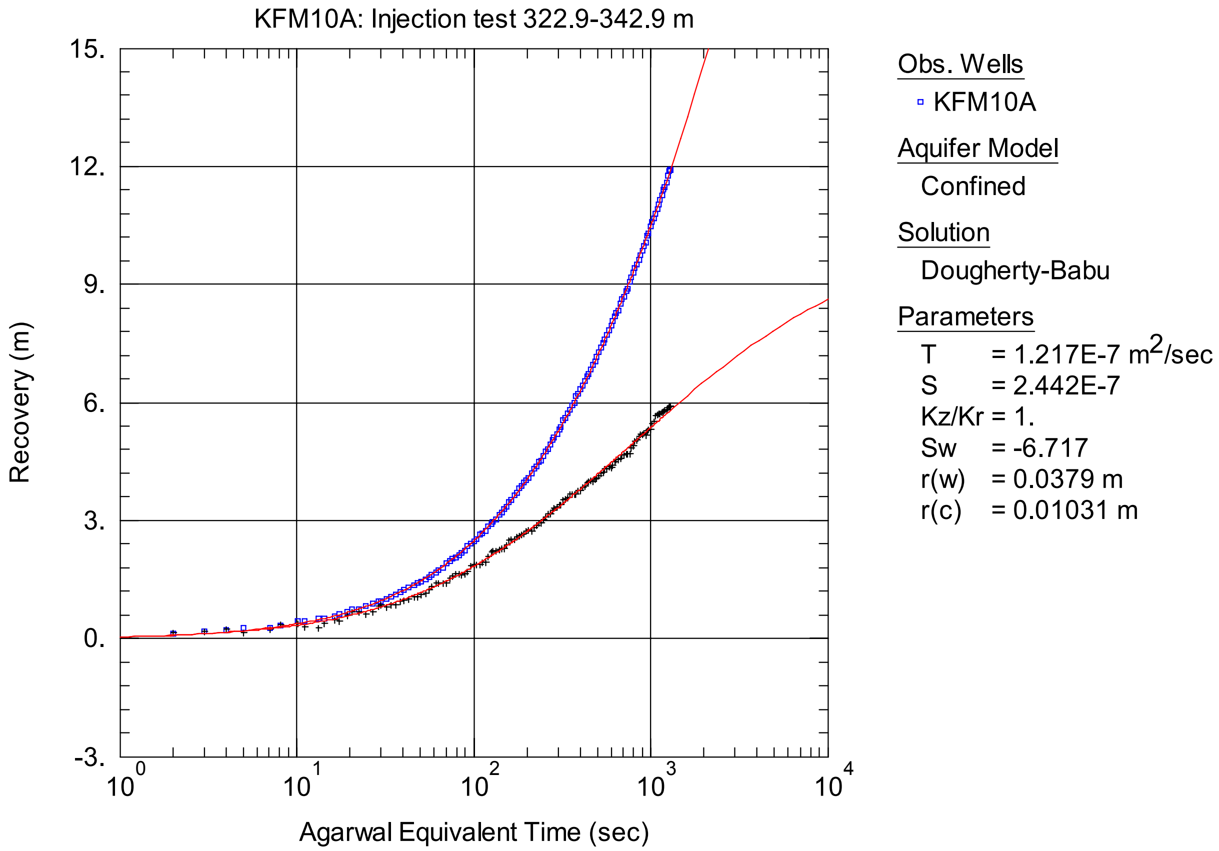


Figure A3-80. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 322.9-342.9 m in KFM10A.*

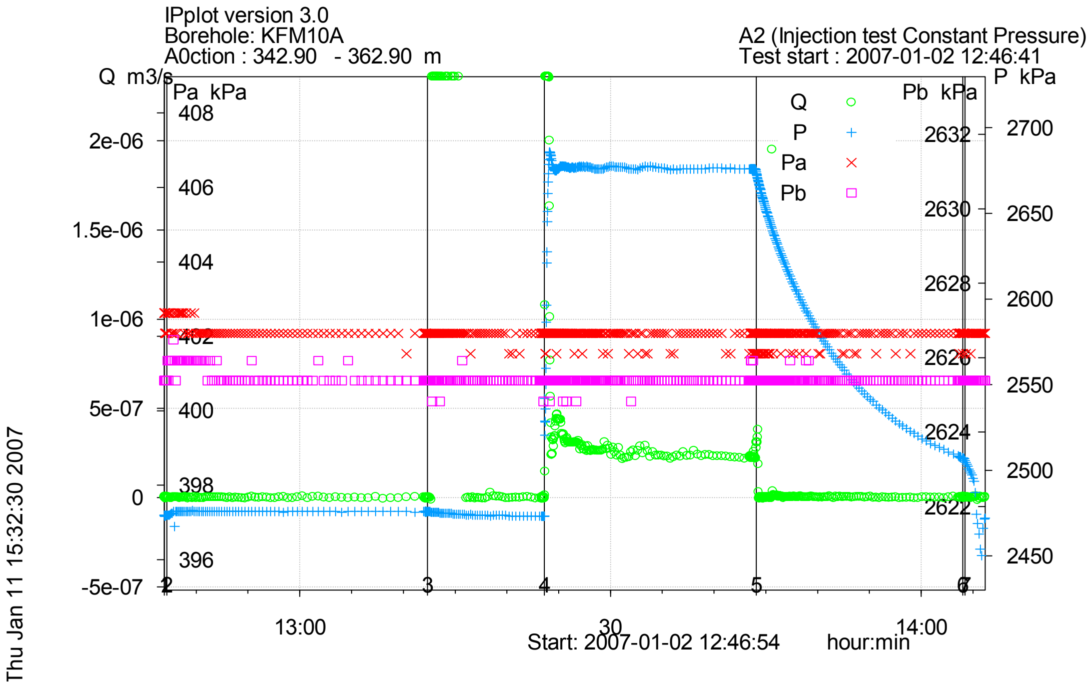


***Figure A3-81**. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 342.9-362.9 m in borehole KFM10A.*

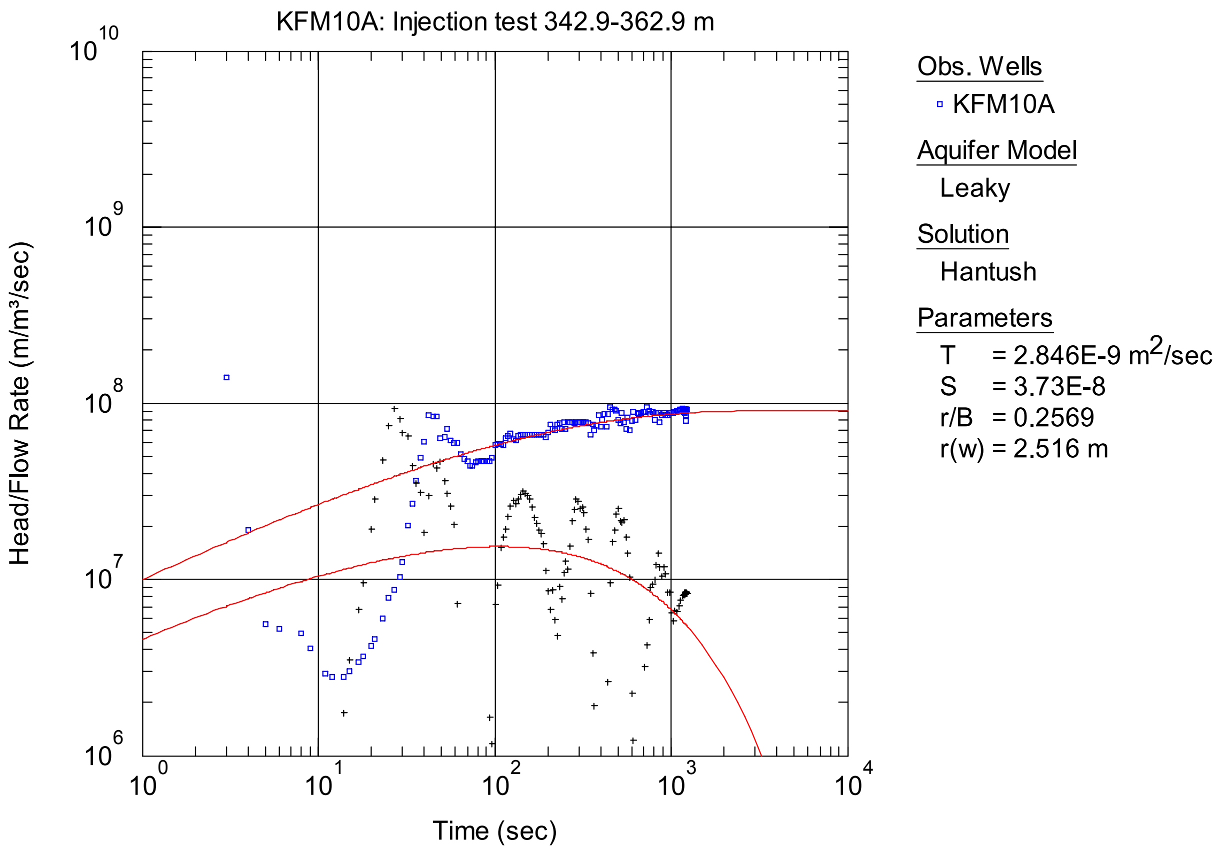


***Figure A3-82**. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 342.9-362.9 m in KFM10A.*

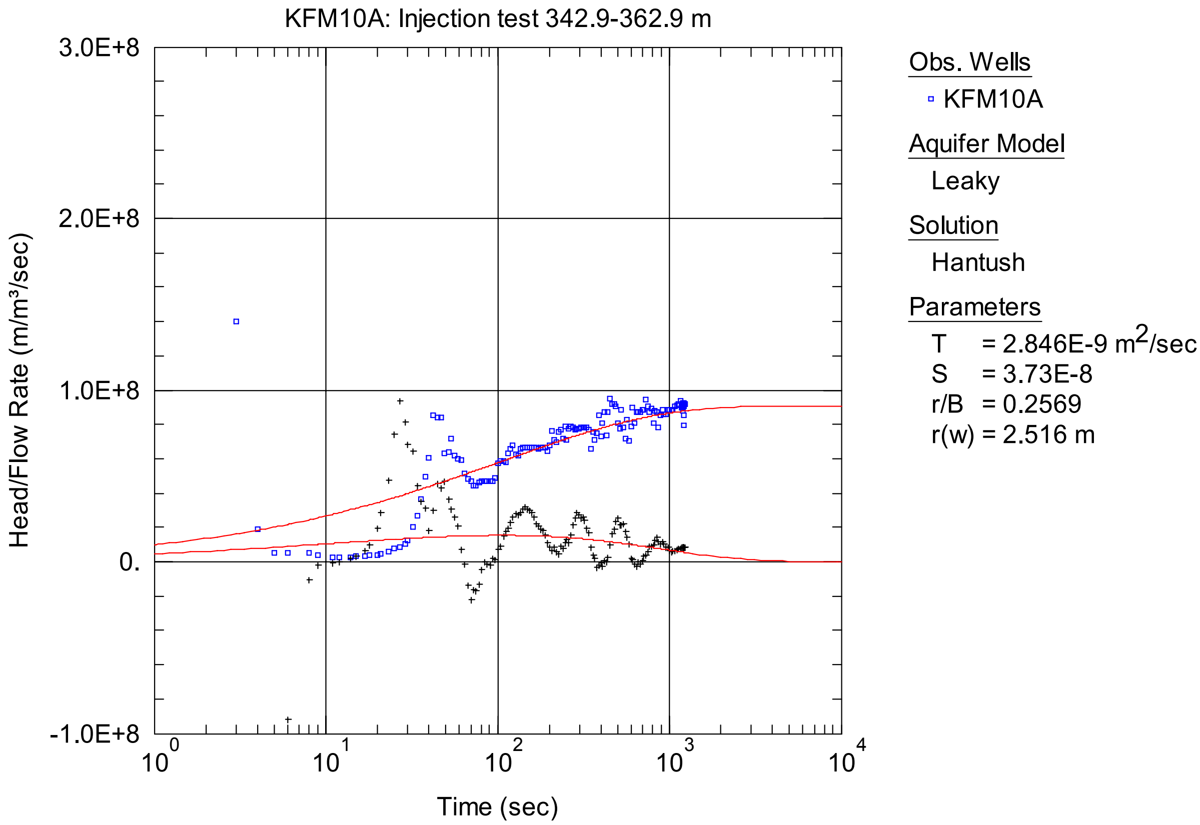


Figure A3-83. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 342.9-362.9 m in KFM10A.*

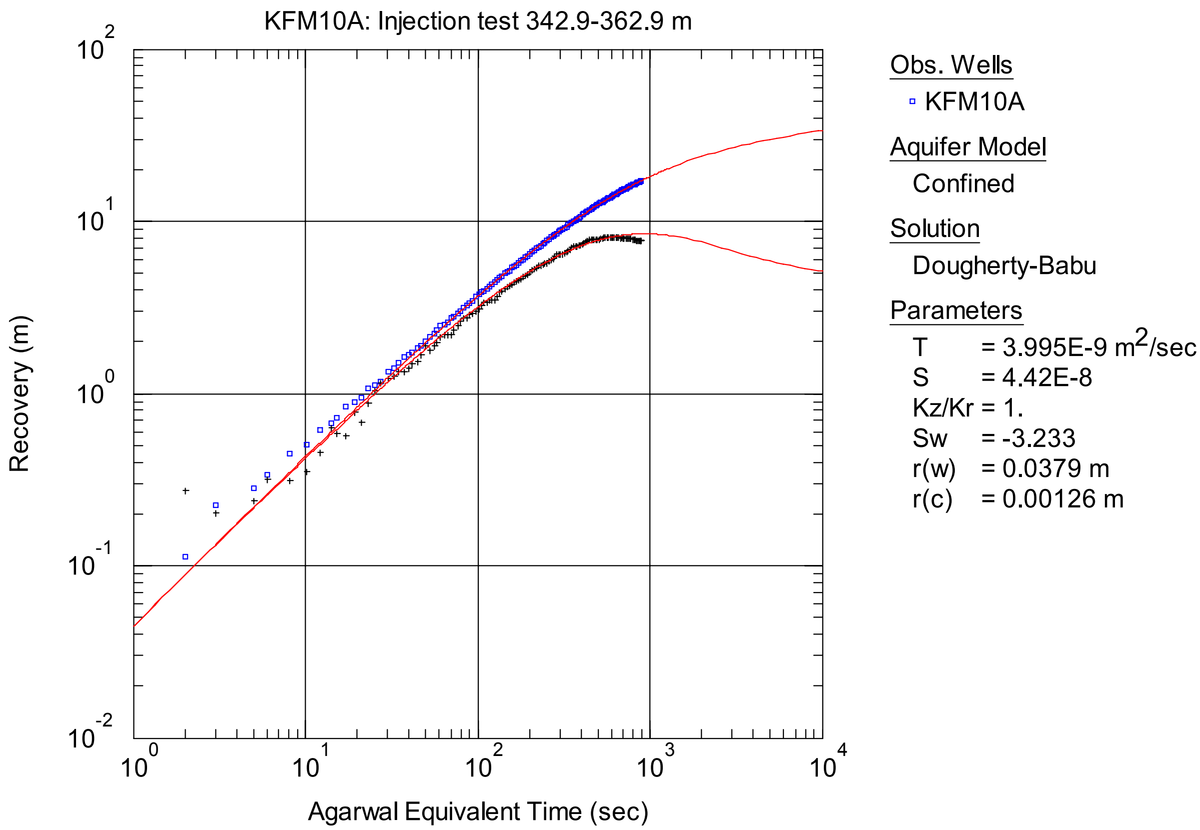


Figure A3-84. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 342.9-362.9 m in KFM10A.*

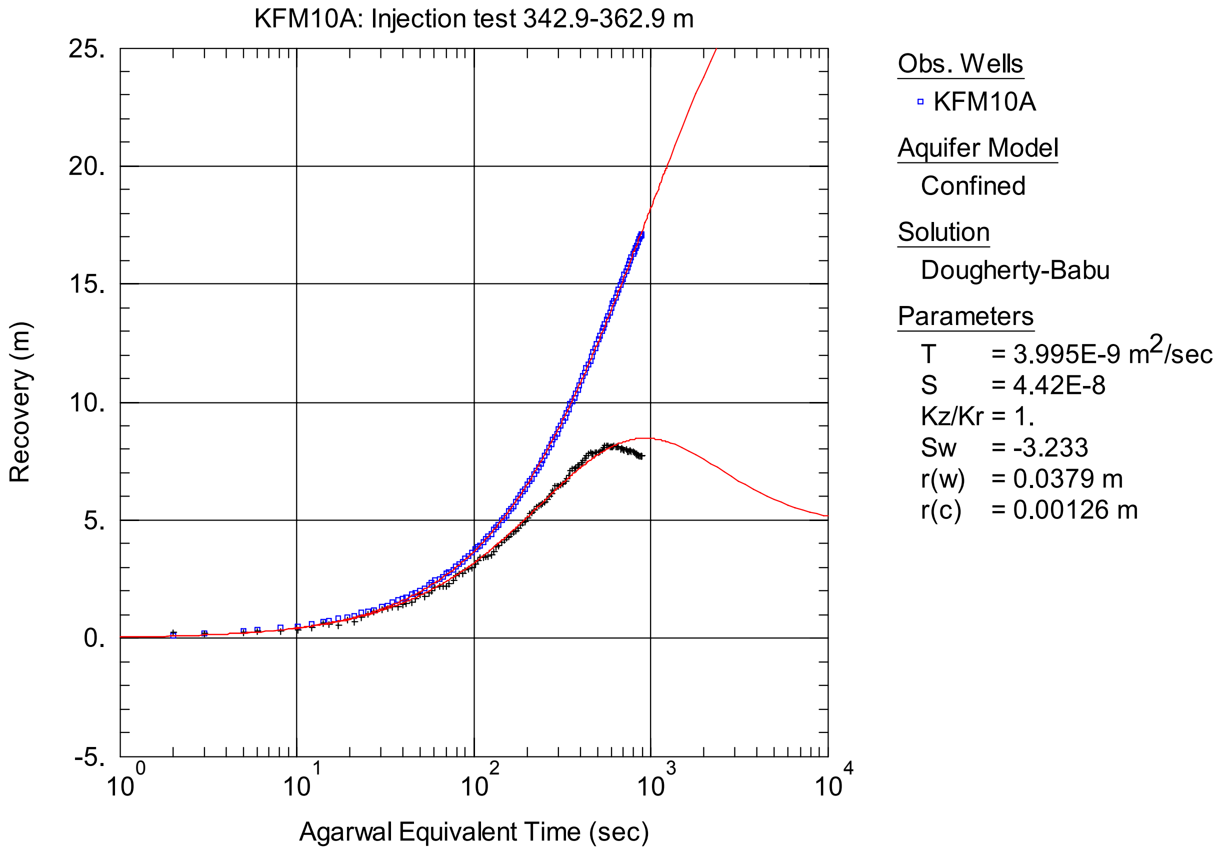


Figure A3-85. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 342.9-362.9 m in KFM10A.*

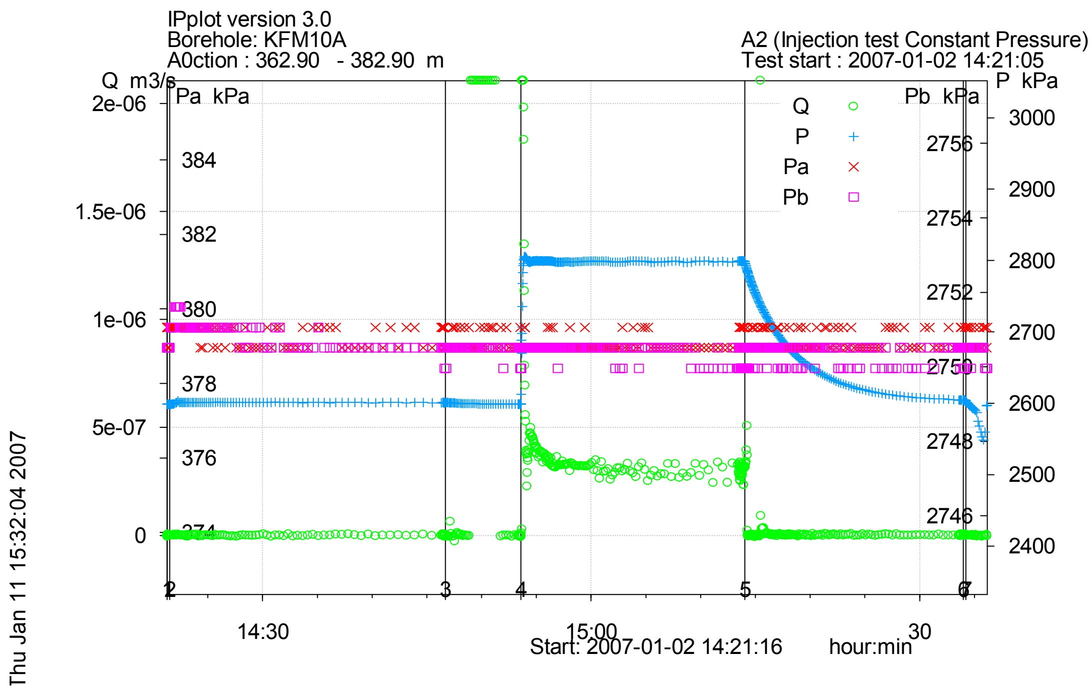


Figure A3-86. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 362.9-382.9 m in borehole KFM10A.*

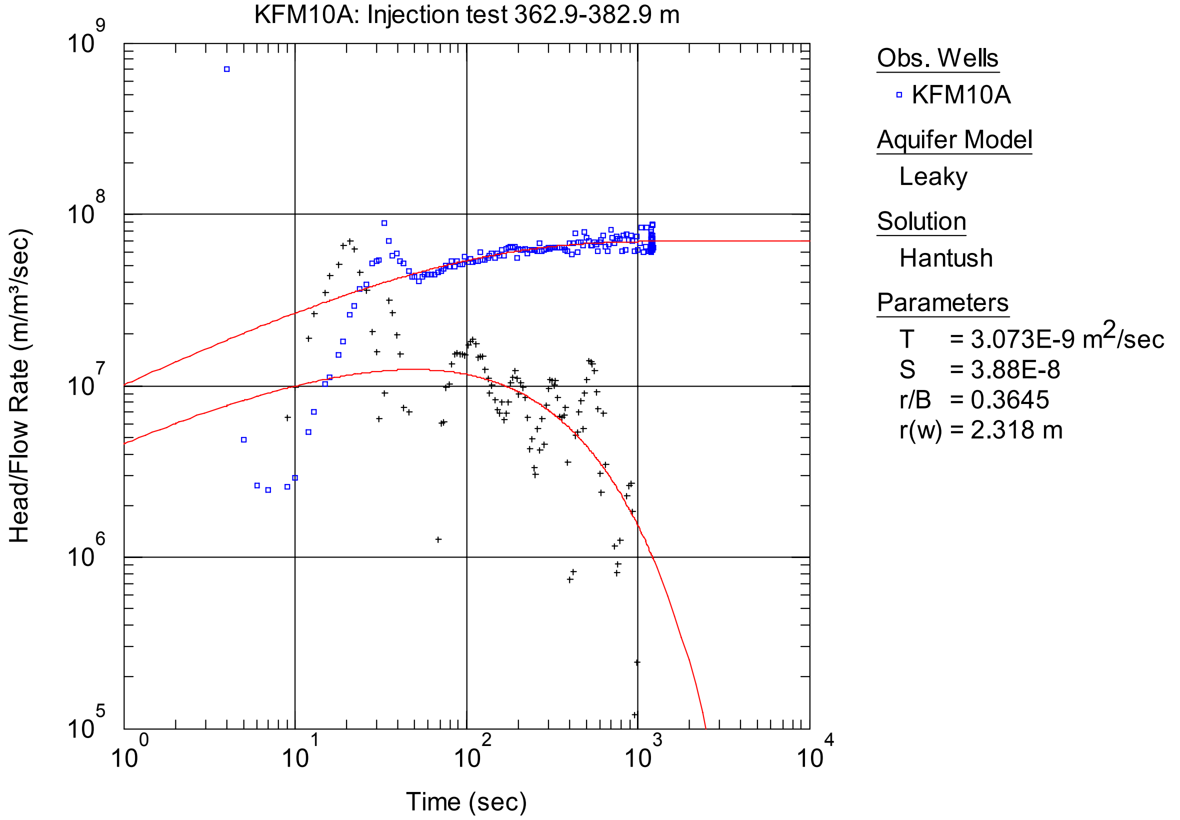


Figure A3-87. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 362.9-382.9 m in KFM10A.*

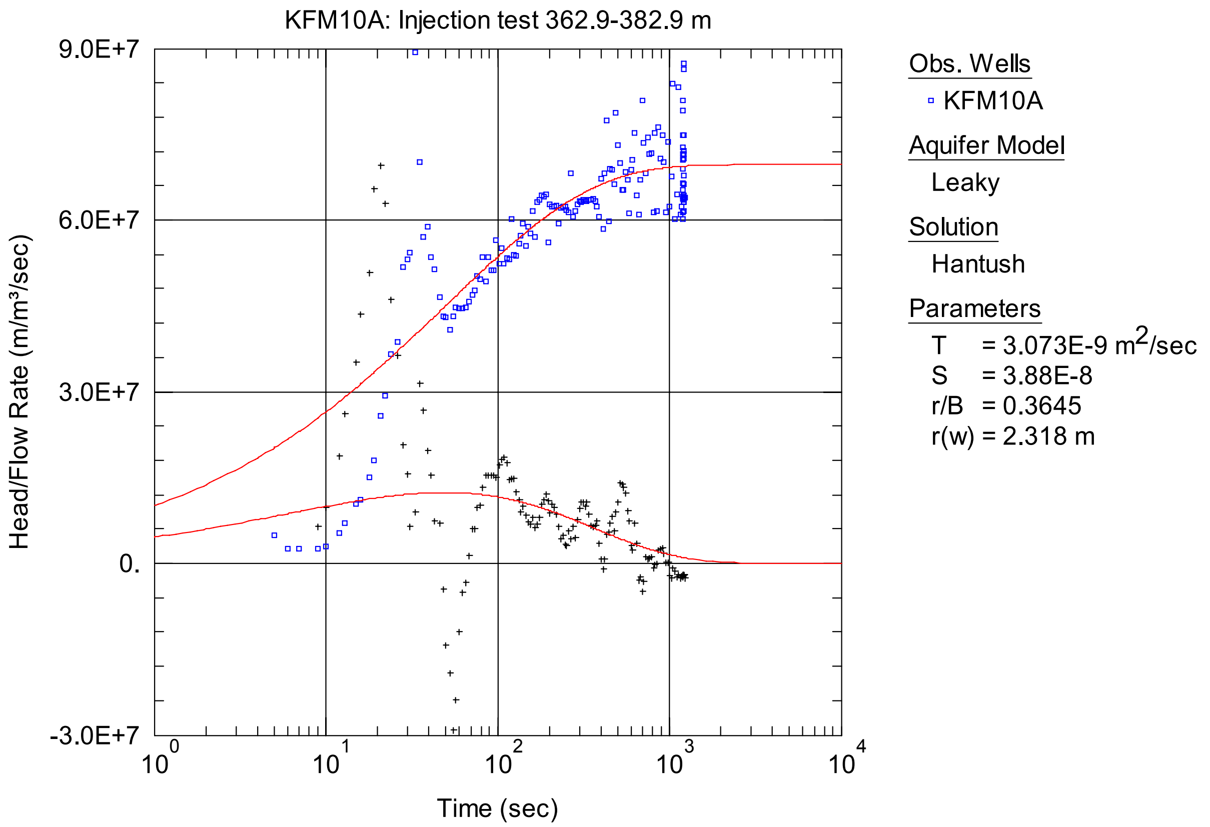


Figure A3-88. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 362.9-382.9 m in KFM10A.*

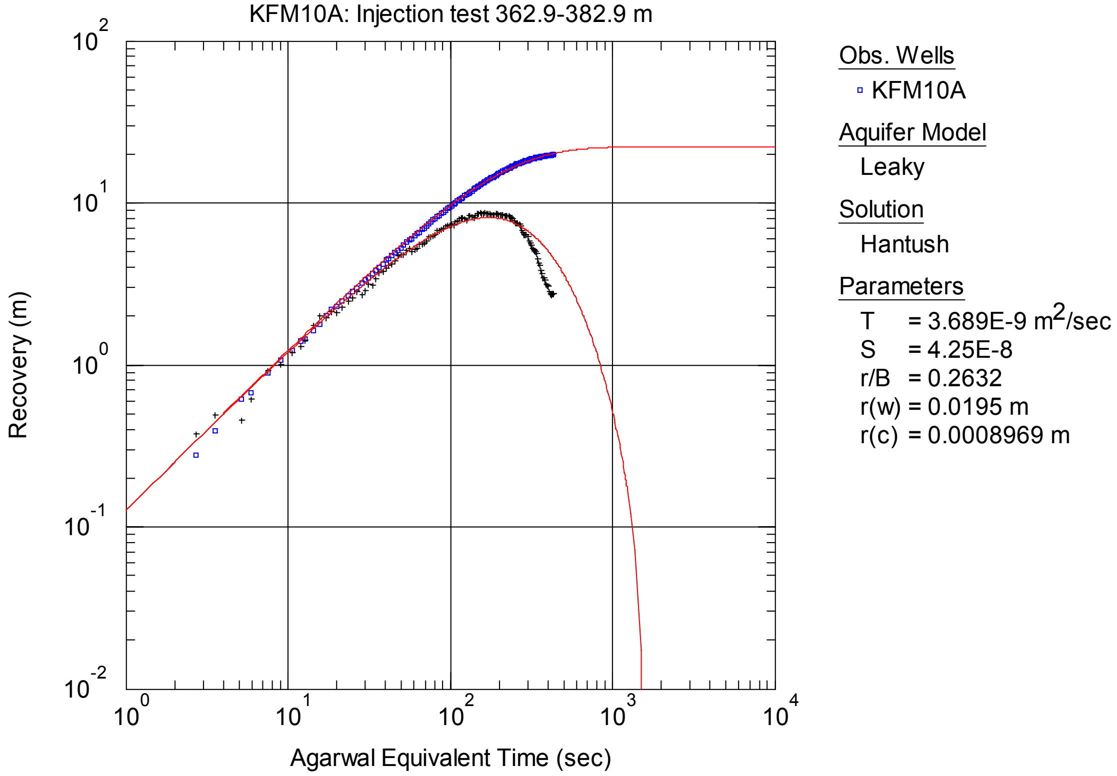


Figure A3-89. *Log-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 362.9-382.9 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

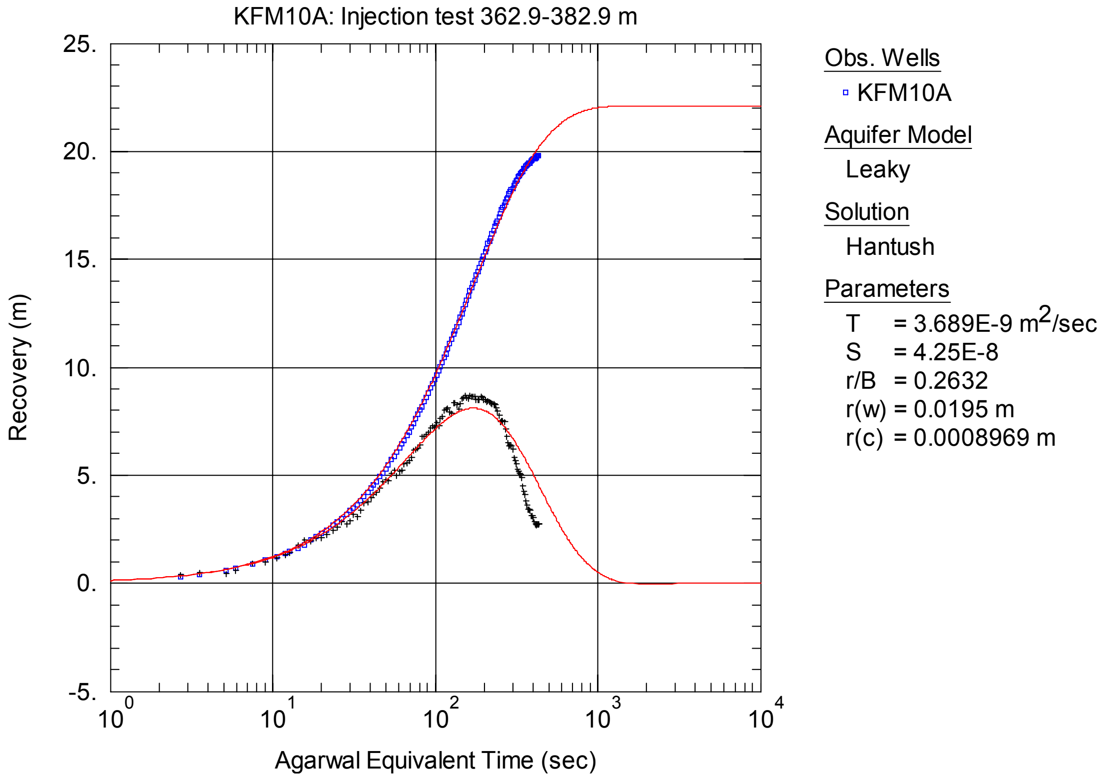


Figure A3-90. *Lin-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 362.9-382.9 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

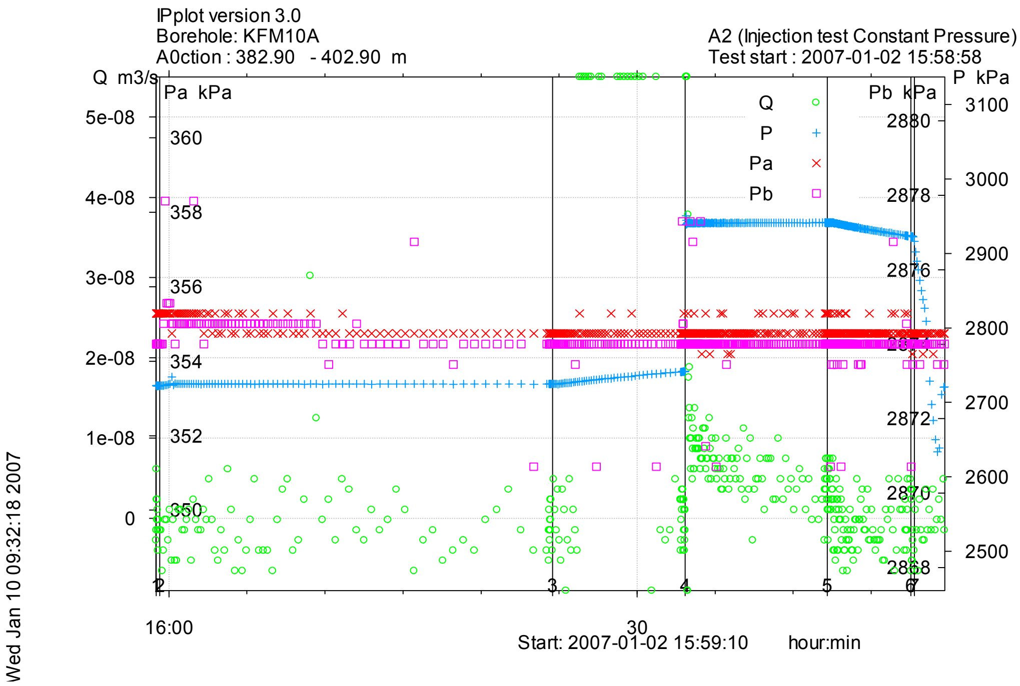


Figure A3-91. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 382.9-402.9 m in borehole KFM10A.*

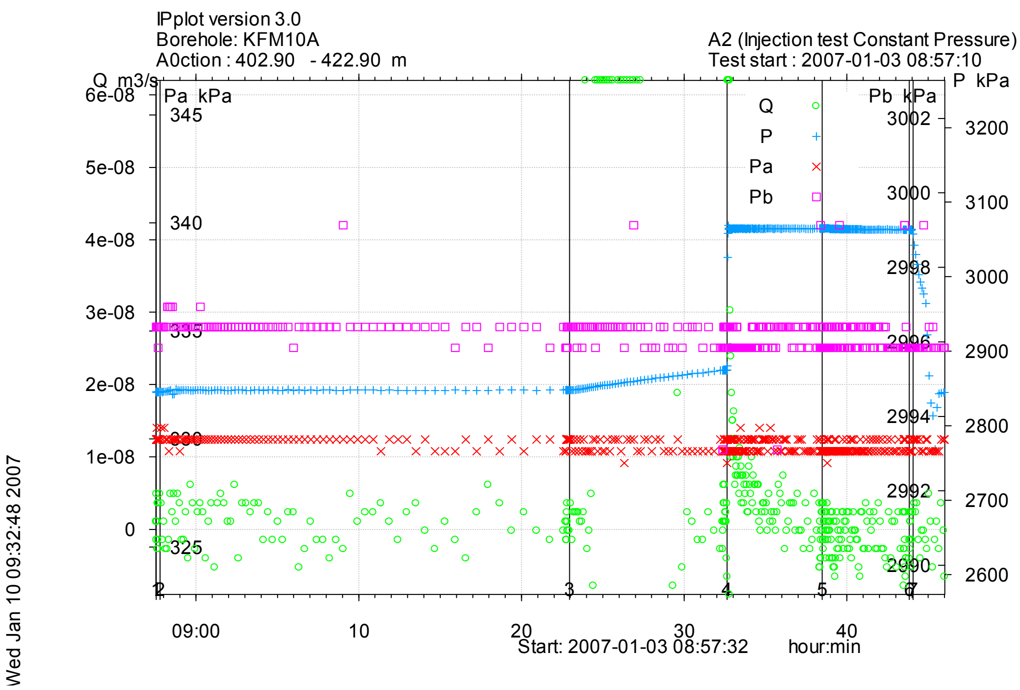


Figure A3-92. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 402.9-422.9 m in borehole KFM10A.*

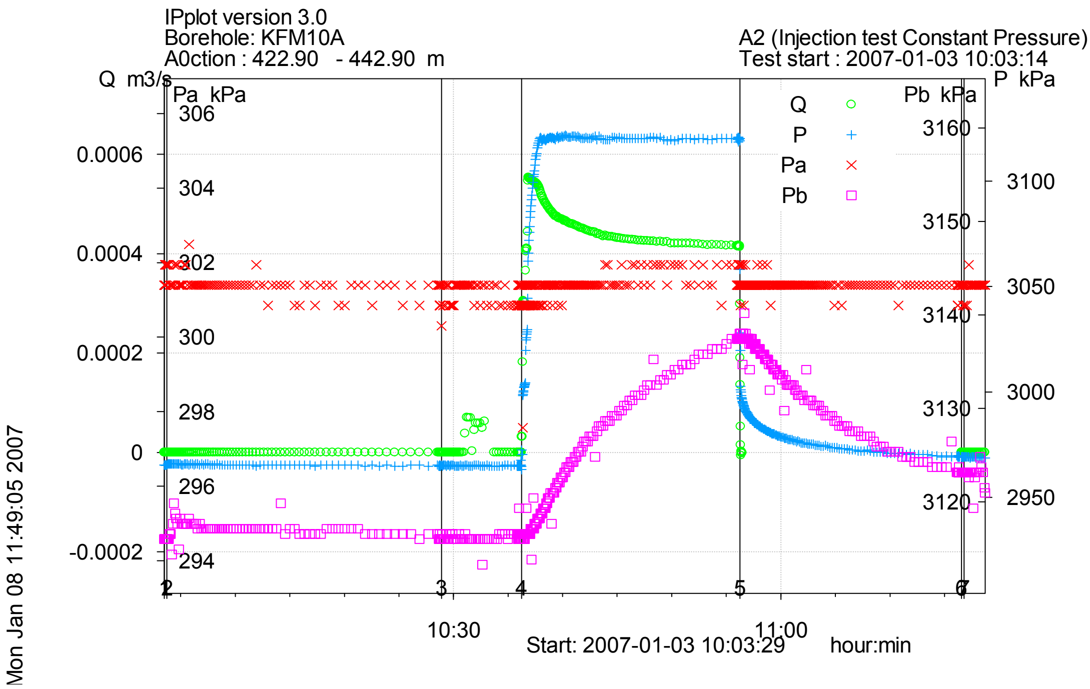


Figure A3-93. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 422.9-442.9 m in borehole KFM10A.*

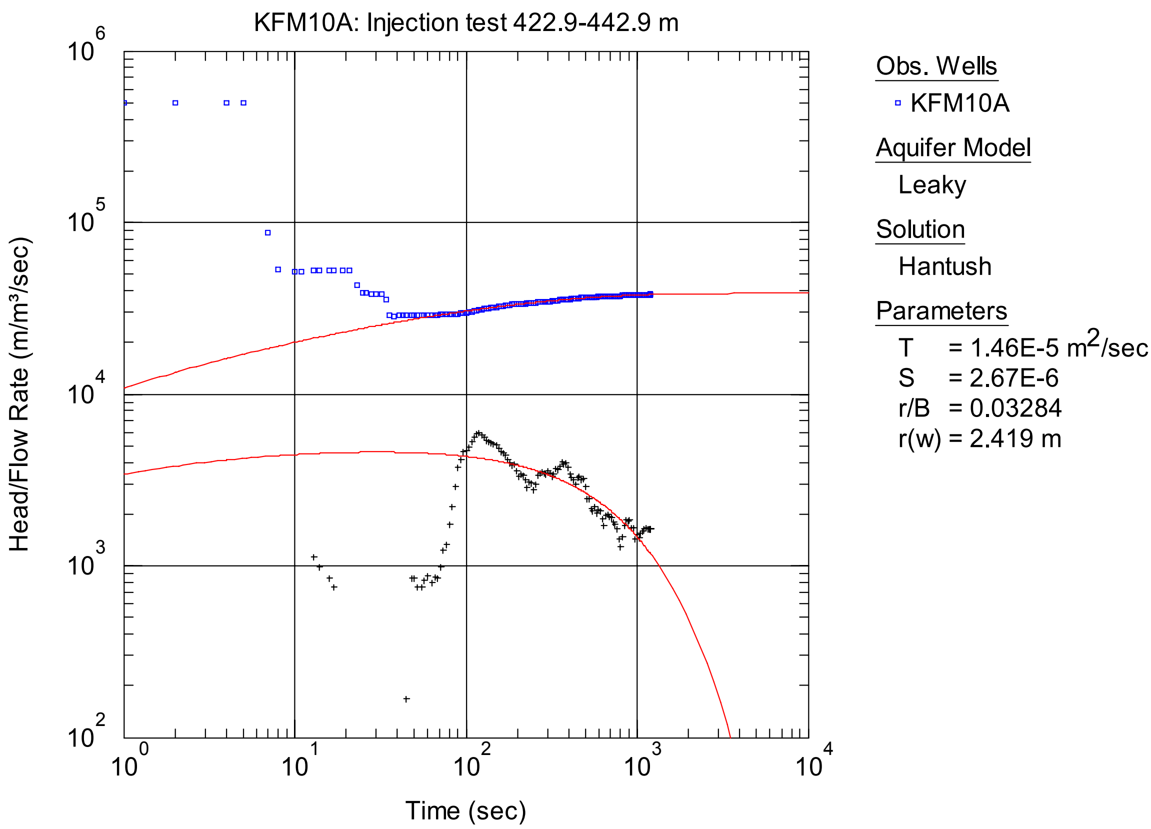


Figure A3-94. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 422.9-442.9 m in KFM10A.*

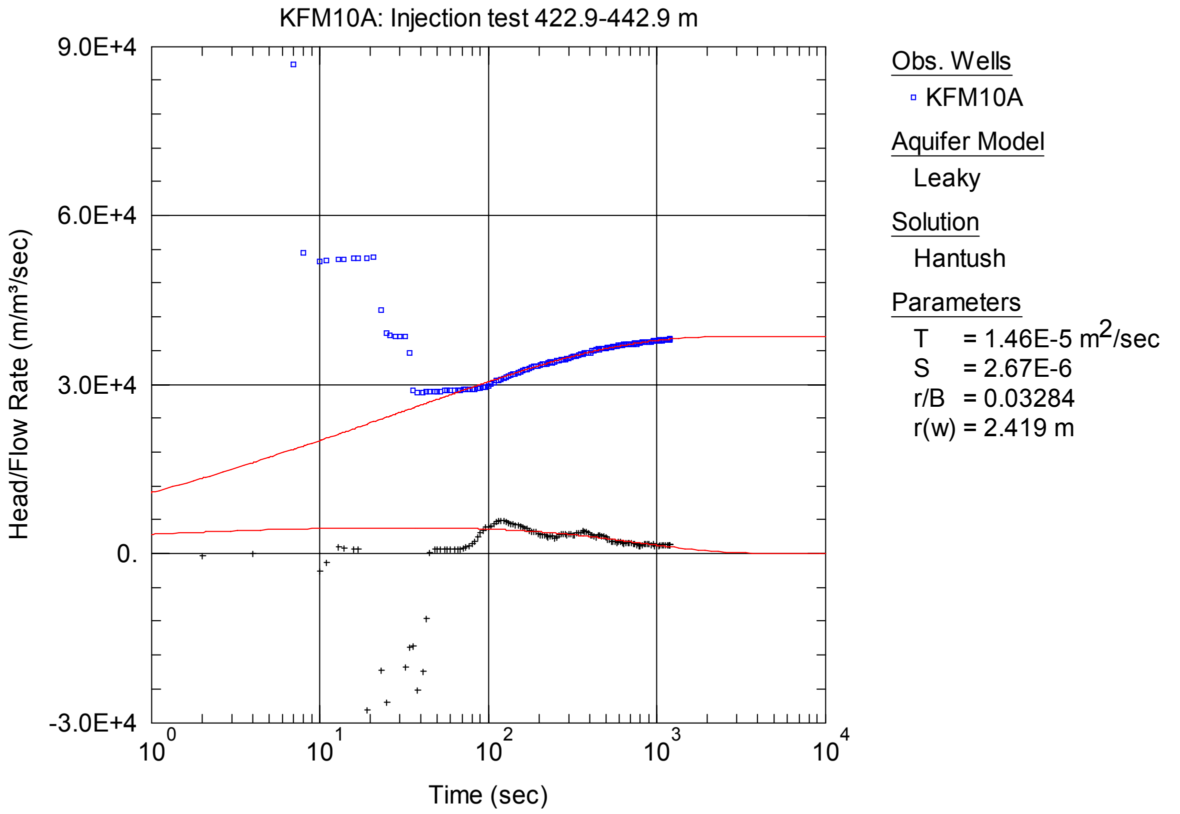


Figure A3-95*.* *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 422.9-442.9 m in KFM10A.*

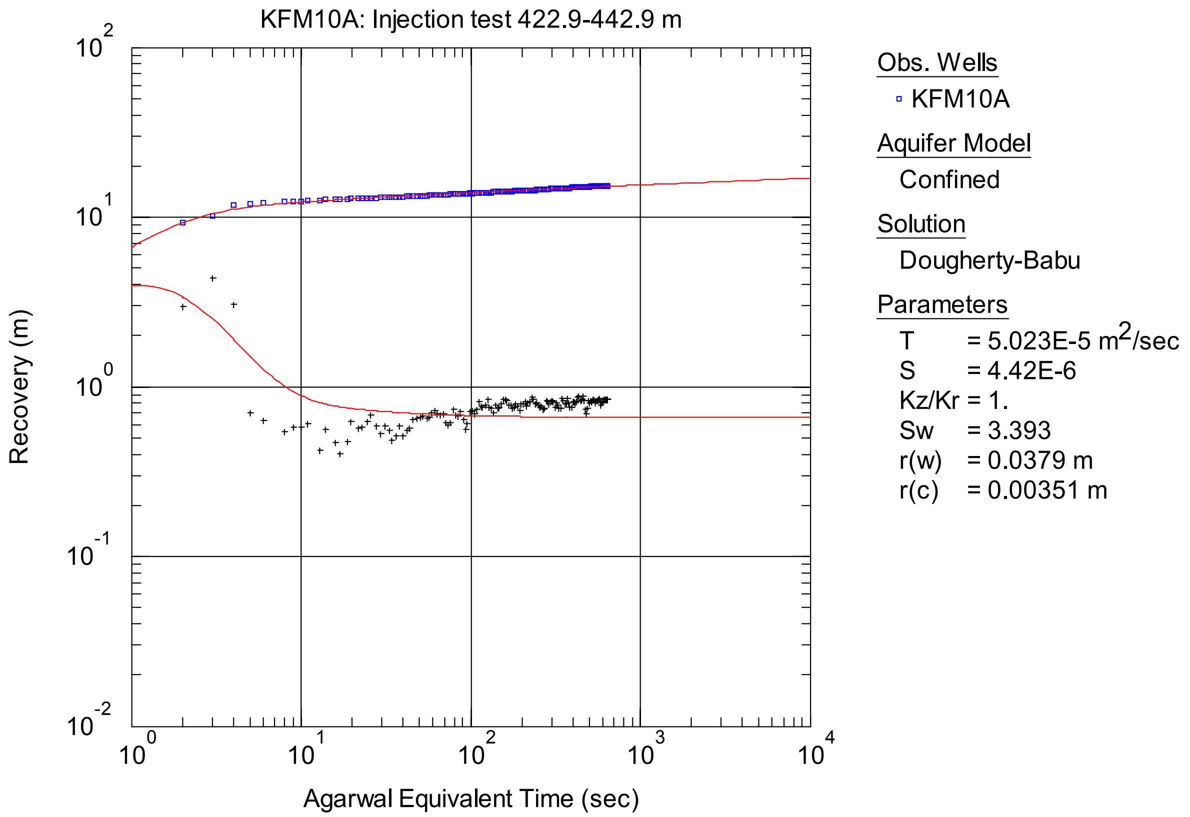


Figure A3-96*.* *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 422.9-442.9 m in KFM10A.*

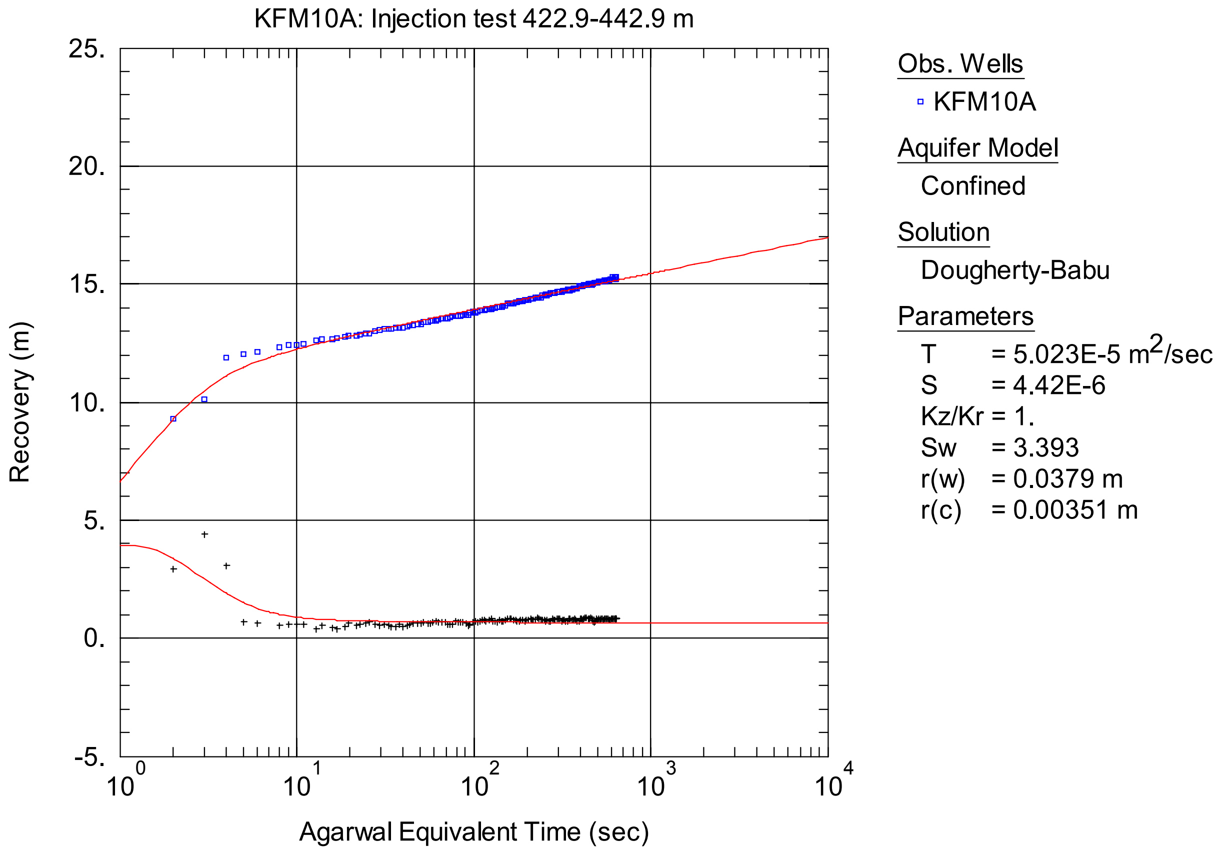


Figure A3-97. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 422.9-442.9 m in KFM10A.*

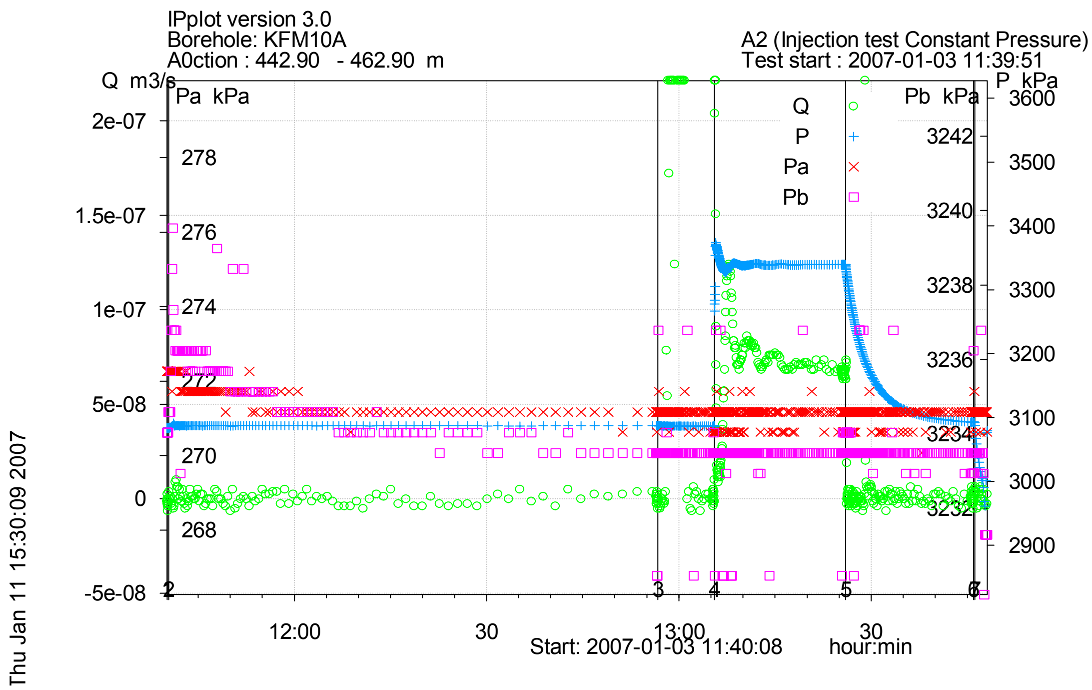


Figure A3-98. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 442.9-462.9 m in borehole KFM10A.*

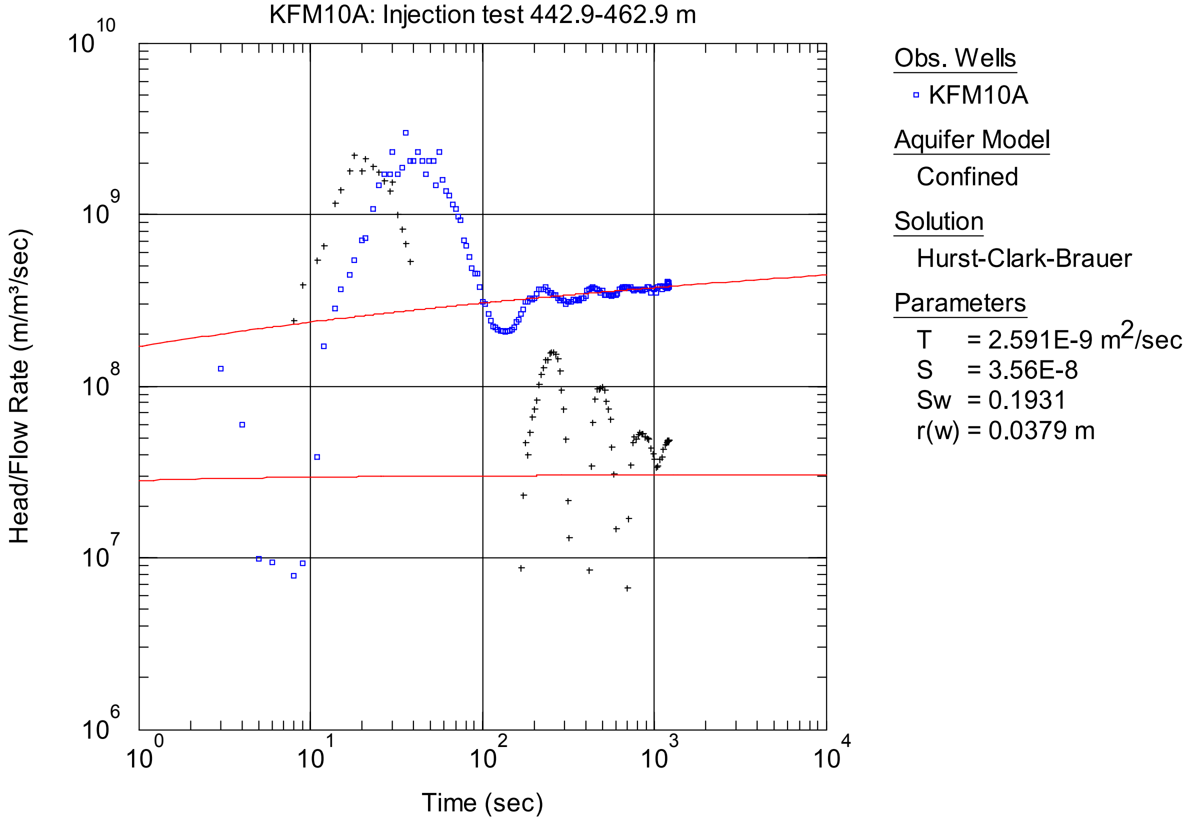


Figure A3-99. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 442.9-462.9 m in KFM10A.*

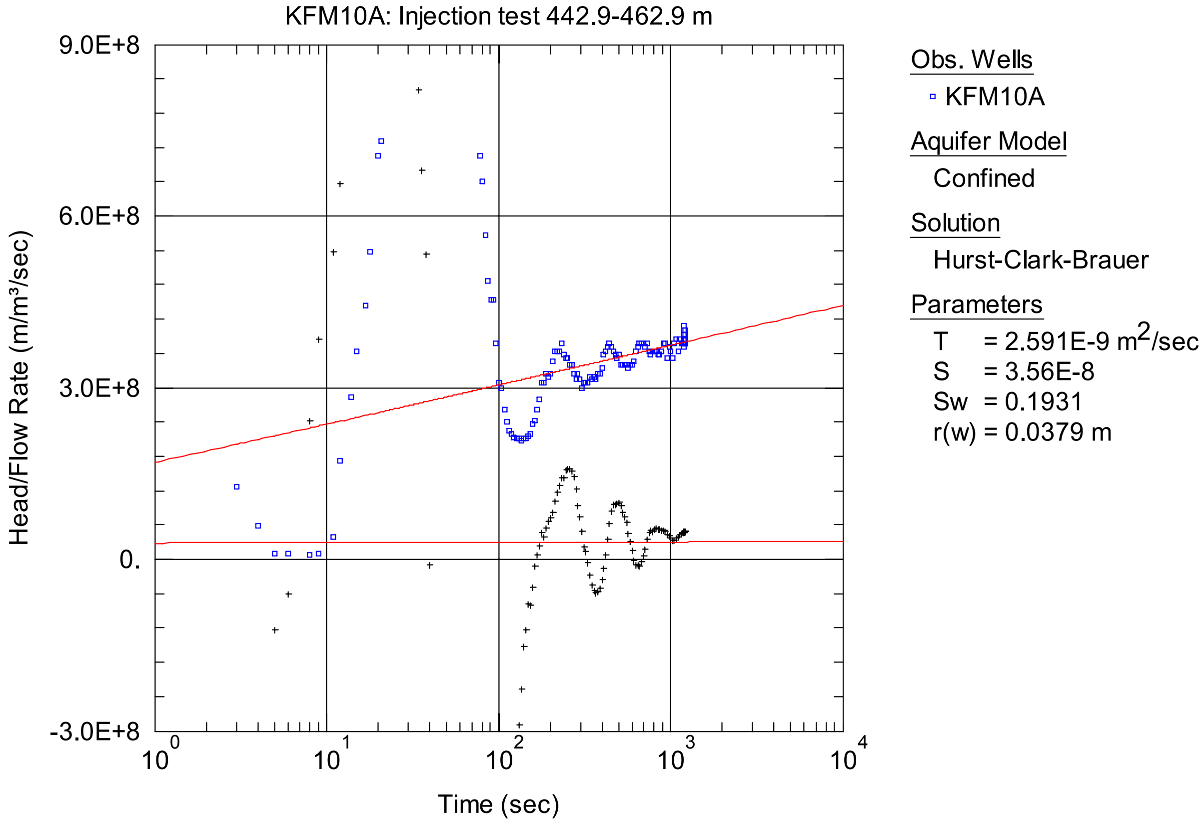


Figure A3-100. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 442.9-462.9 m in KFM10A.*

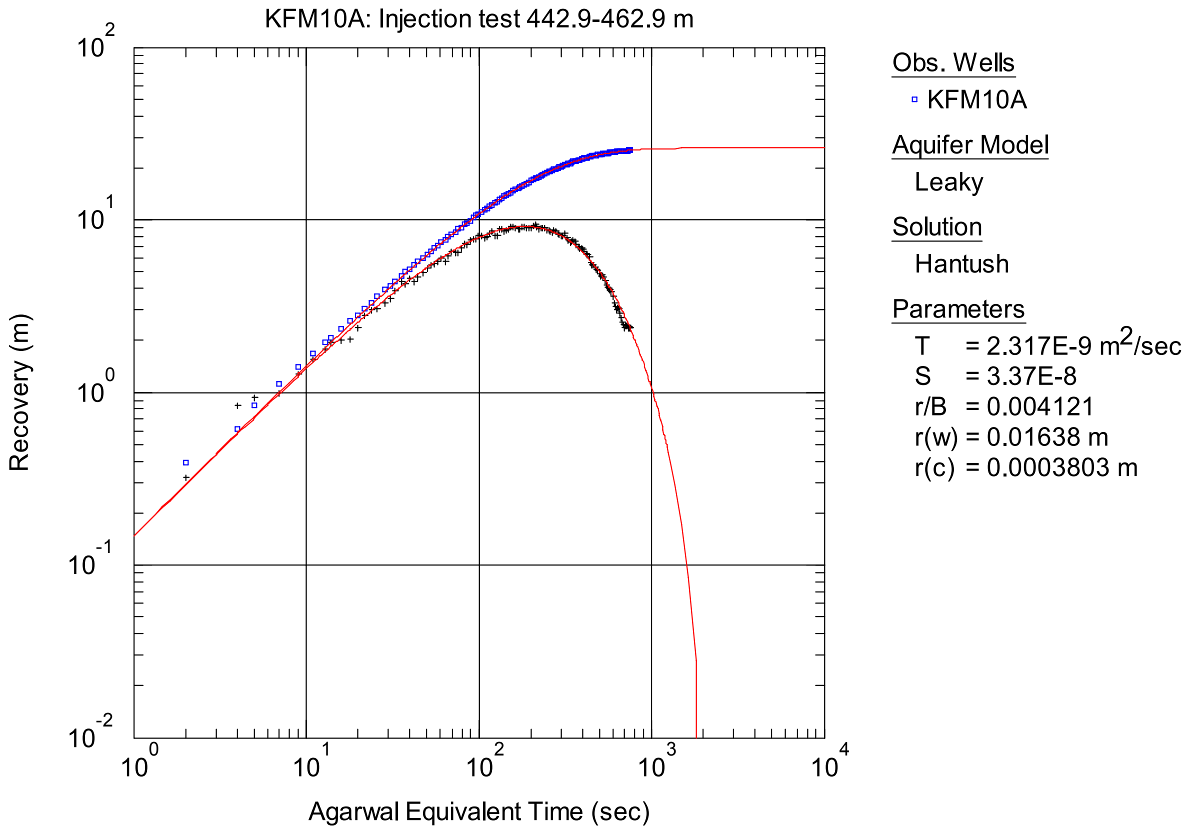


Figure A3-101. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 442.9-462.9 m in KFM10A.*

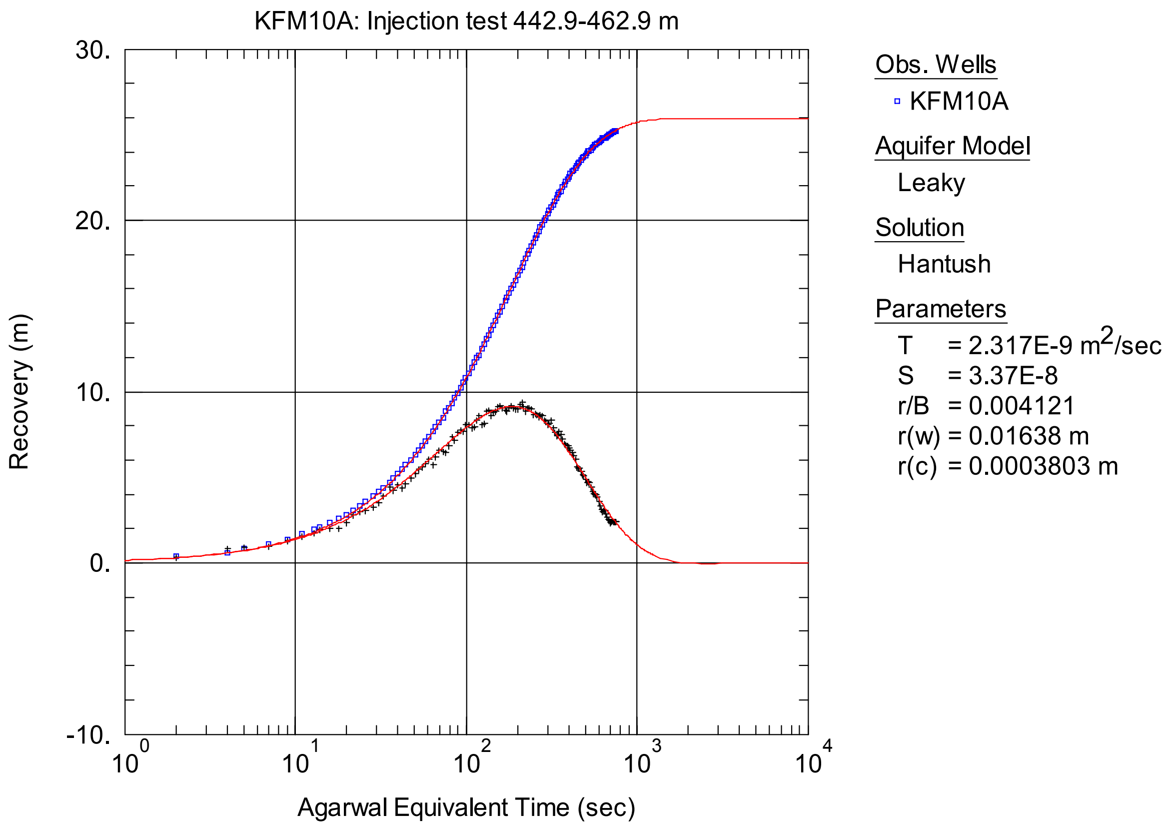


Figure A3-102. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 442.9-462.9 m in KFM10A.*

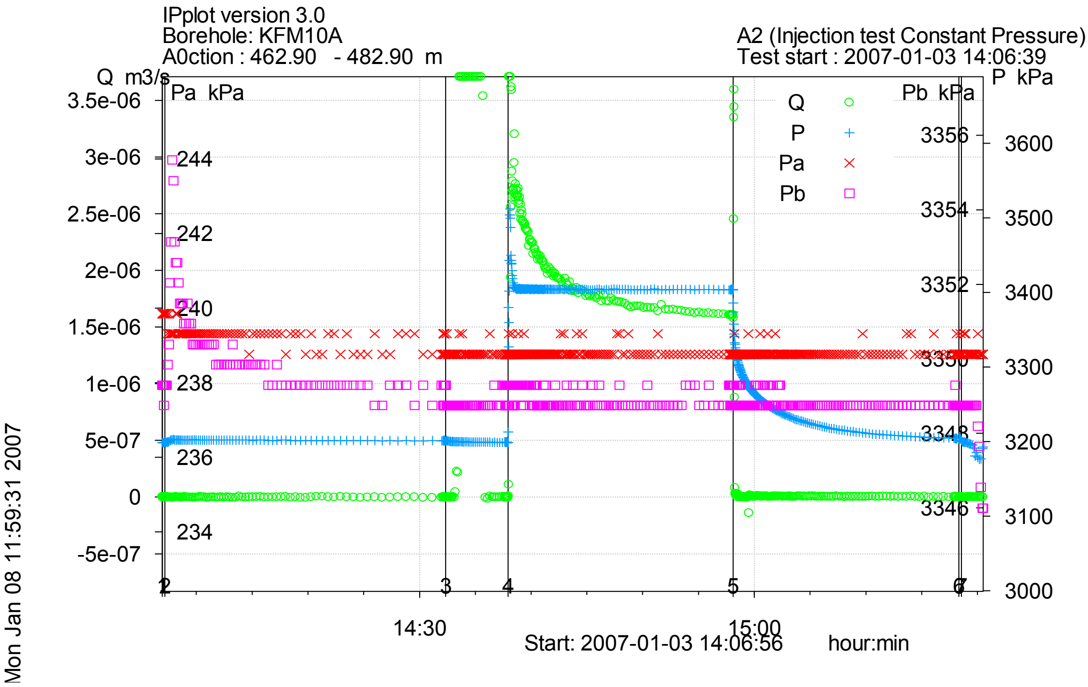


Figure A3-103. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 462.9-482.9 m in borehole KFM10A.*

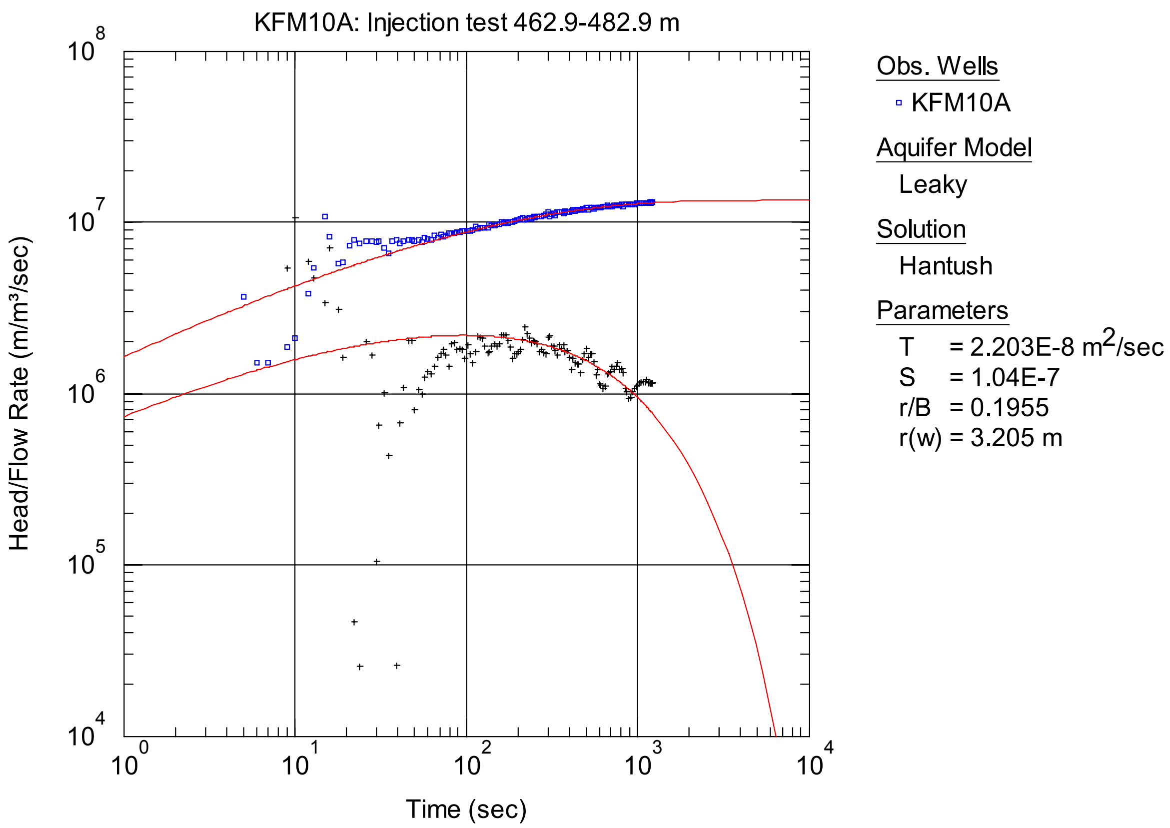


Figure A3-104. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 462.9-482.9 m in KFM10A.*

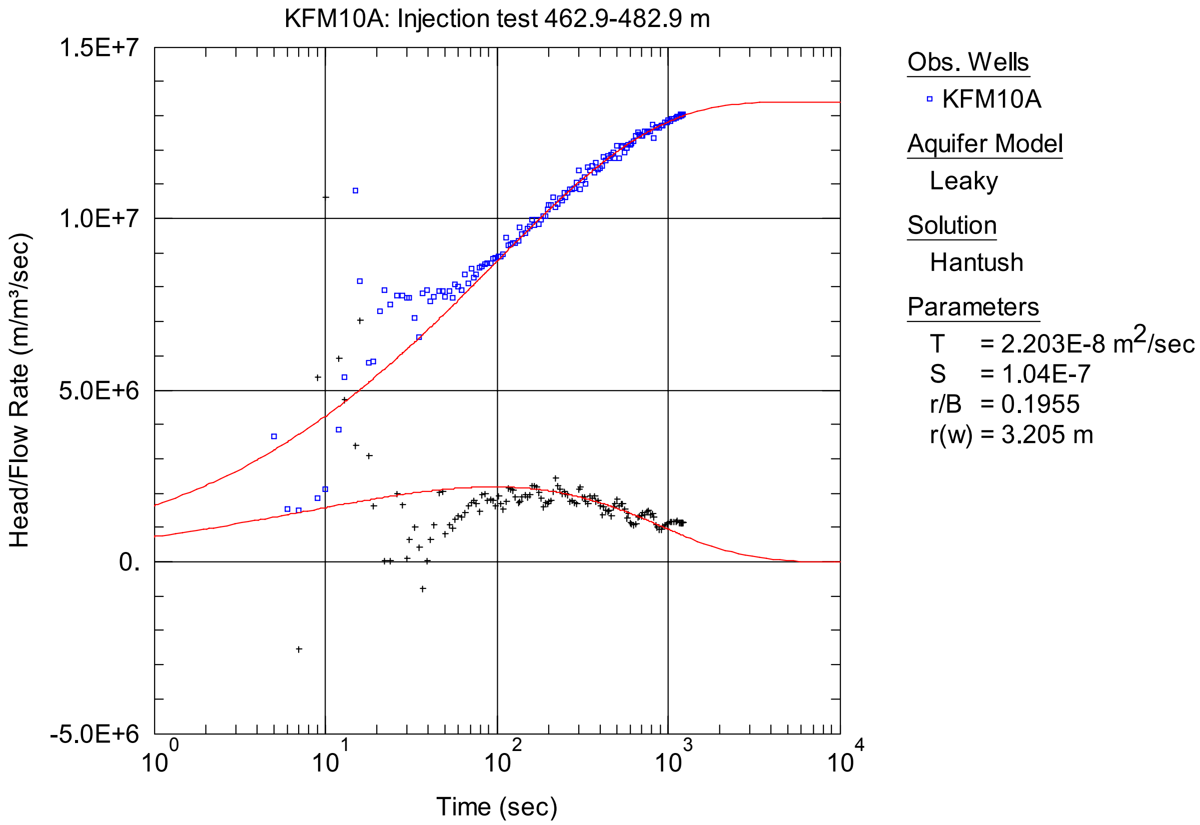


Figure A3-105. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 462.9-482.9 m in KFM10A.*

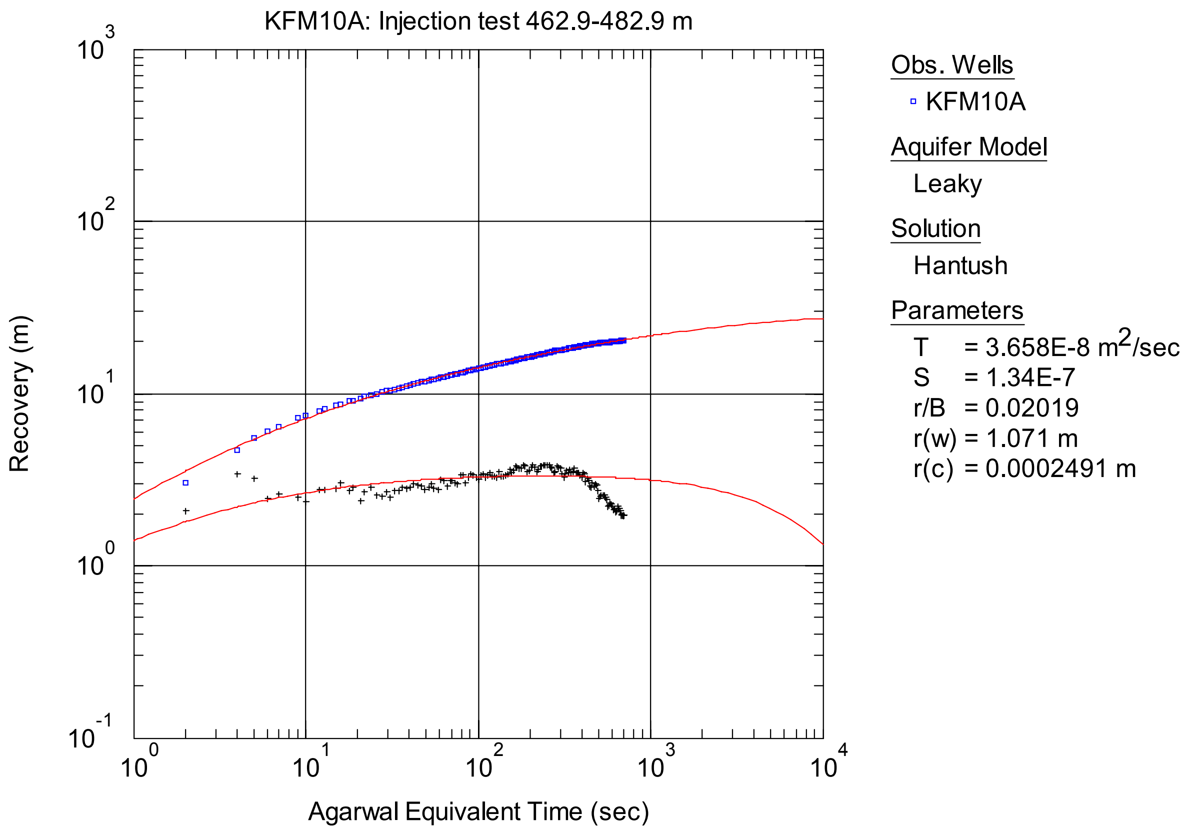


Figure A3-106. *Log-log plot of recovery (□) and derivative (+) versus time, showing fit to the Hantush solution, from the injection test in section 462.9-482.9 m in borehole KFM10A.*

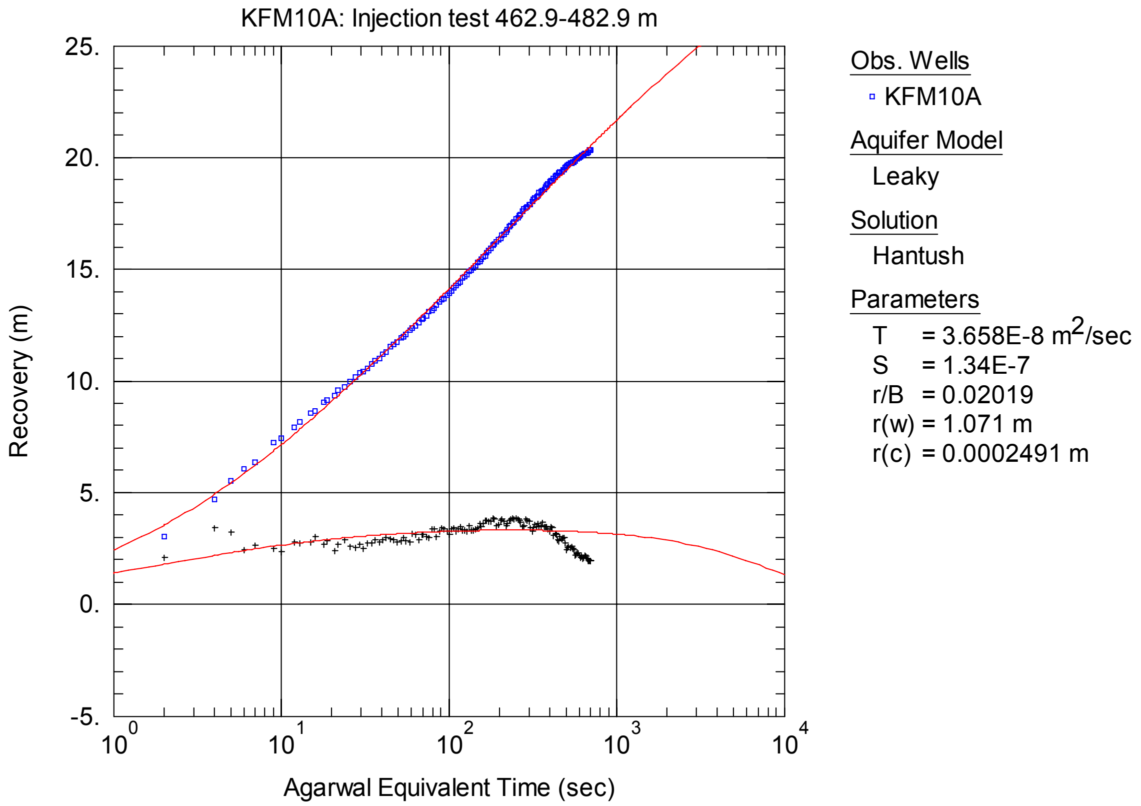


Figure A3-107. *Lin-log plot of recovery (□) and derivative (+) versus time, showing fit to the Hantush solution, from the injection test in section 462.9-482.9 m in borehole KFM10A.*

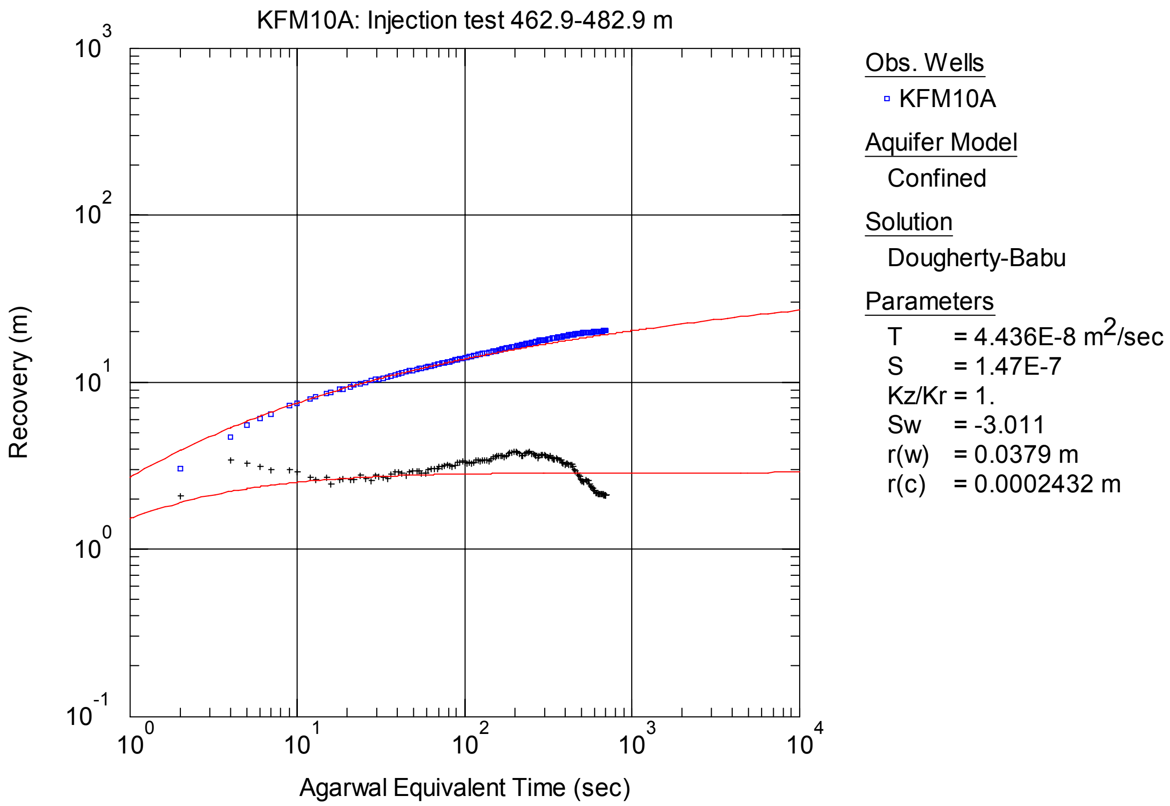


Figure A3-108. *Log-log plot of recovery (□) and derivative (+) versus time, showing fit to the Dougherty-Babu solution, from the injection test in section 462.9-482.9 m in borehole KFM10A.*

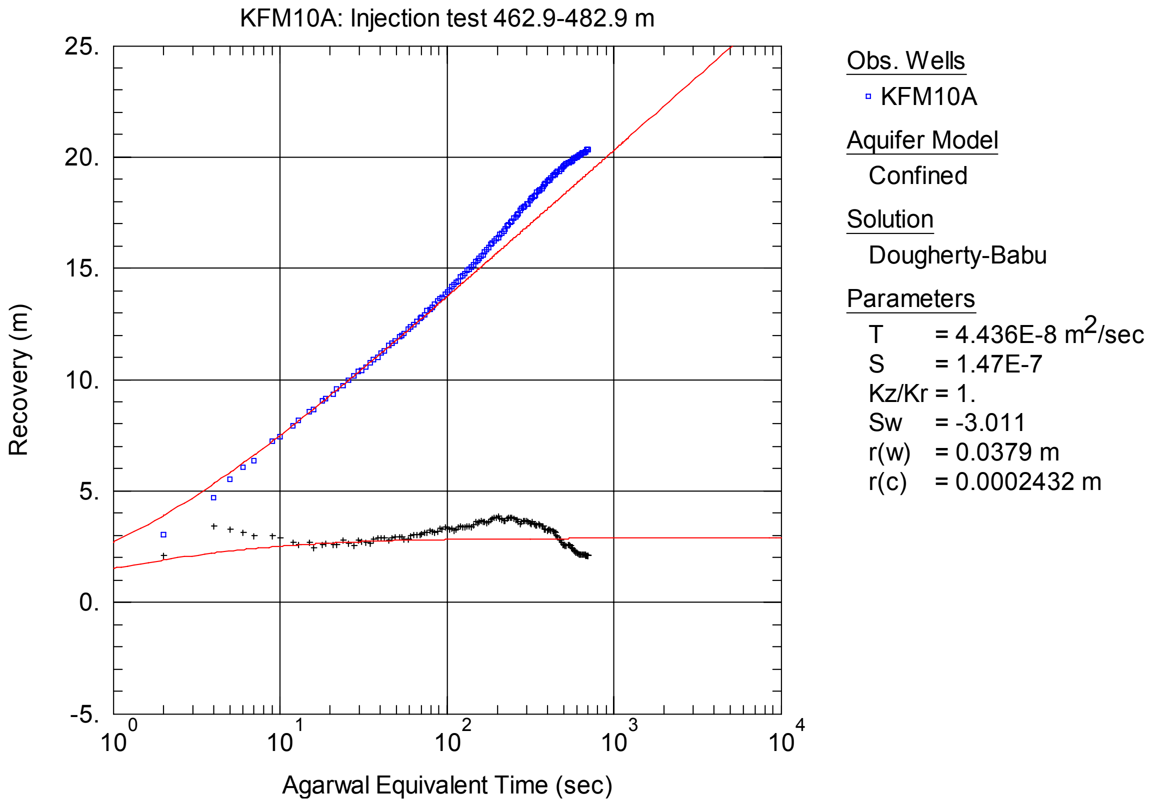


Figure A3-109. *Lin-log plot of recovery (□) and derivative (+) versus time, showing fit to the Dougherty-Babu solution, from the injection test in section 462.9-482.9 m in borehole KFM10A.*

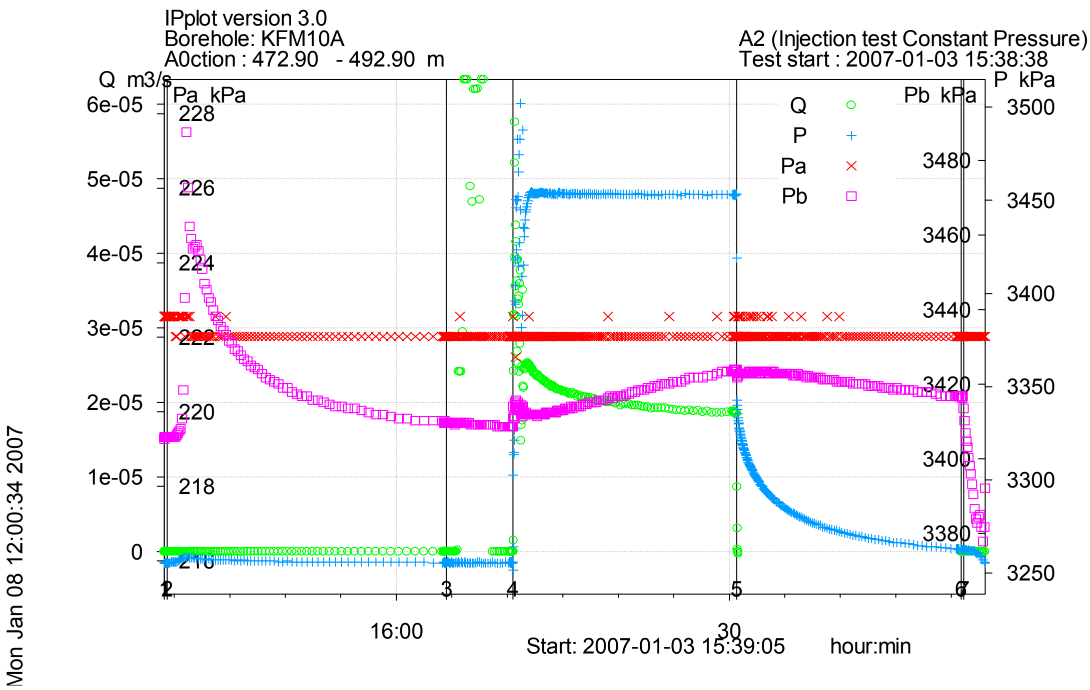


Figure A3-110. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 472.9-492.9 m in borehole KFM10A.*

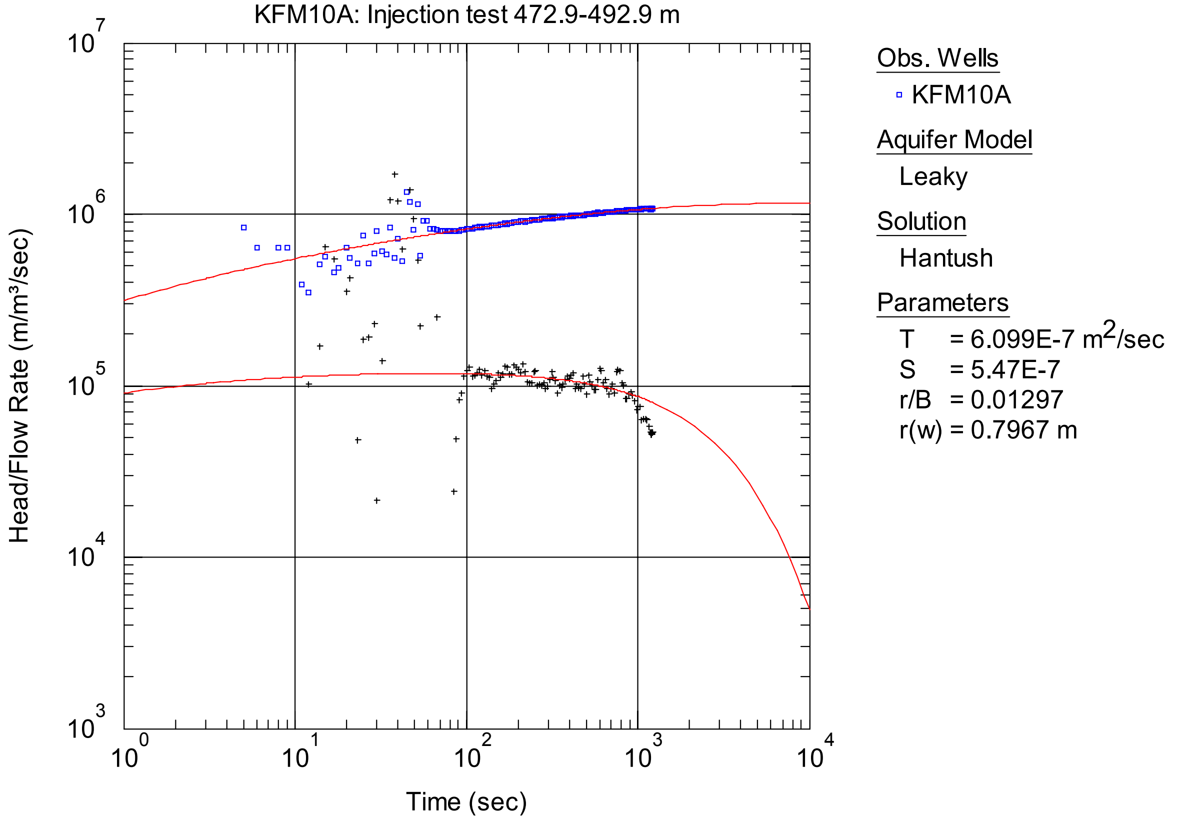


Figure A3-111. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 472.9-492.9 m in KFM10A.*

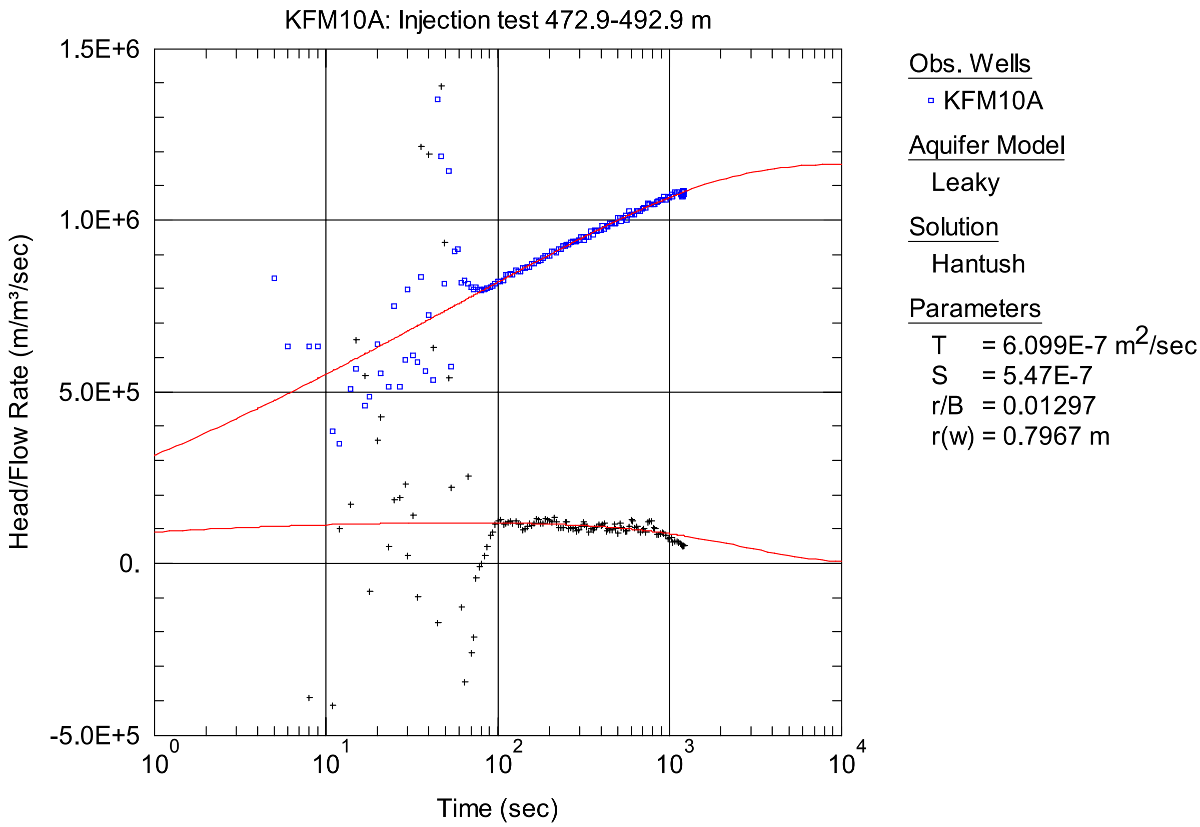


Figure A3-112. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 472.9-492.9 m in KFM10A.*

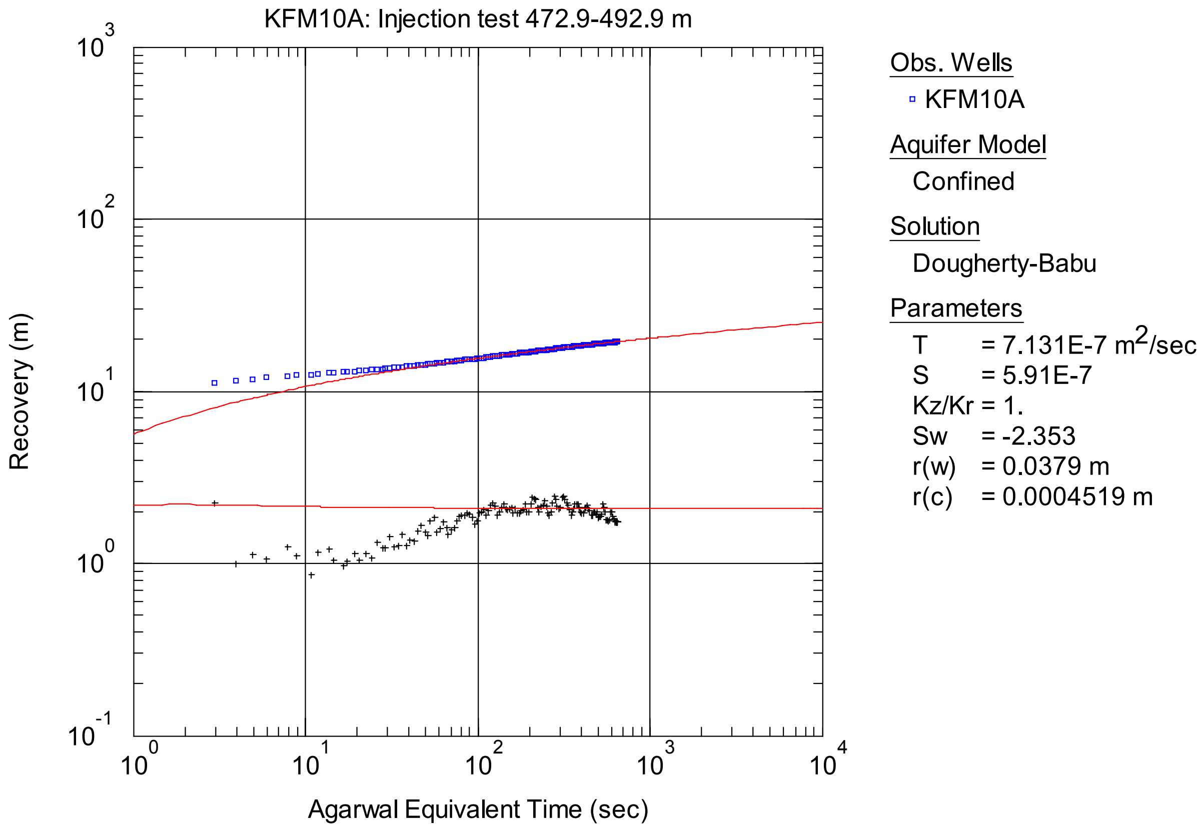


Figure A3-113. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 472.9-492.9 m in KFM10A.*

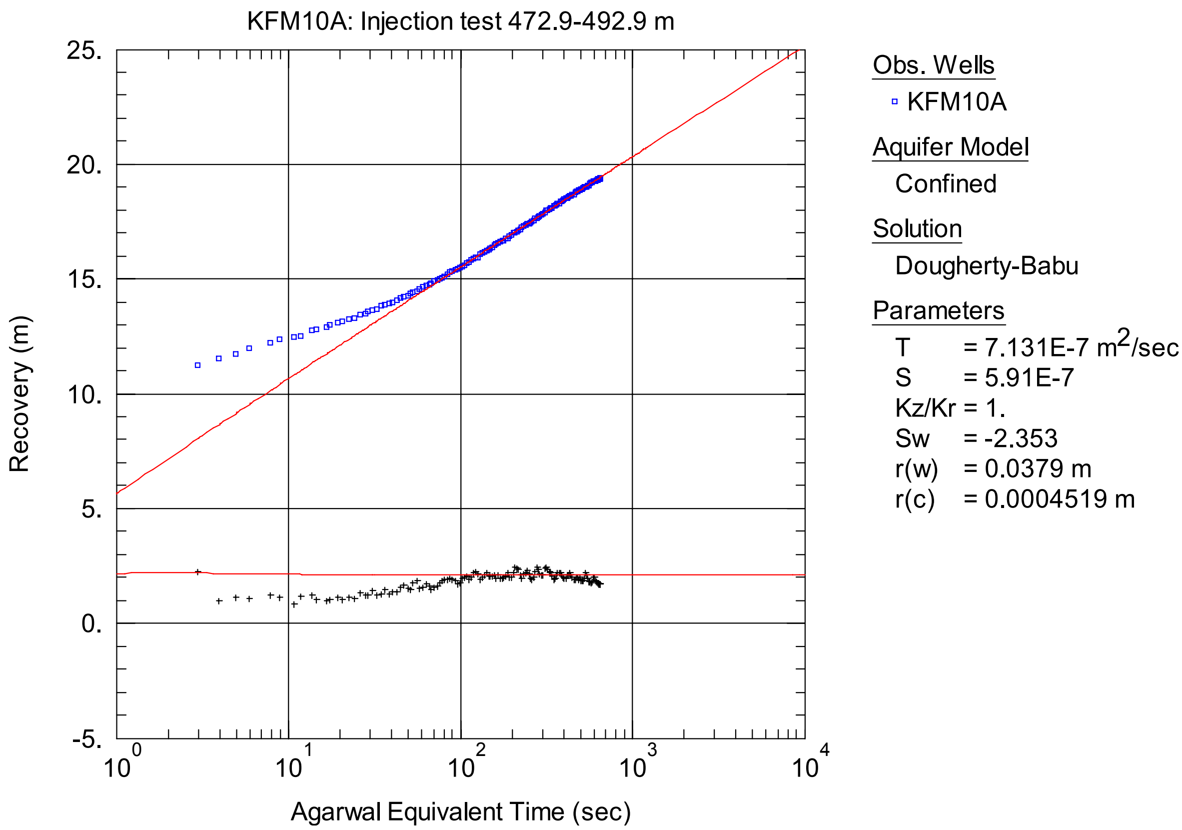


Figure A3-114. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 472.9-492.9 m in KFM10A.*

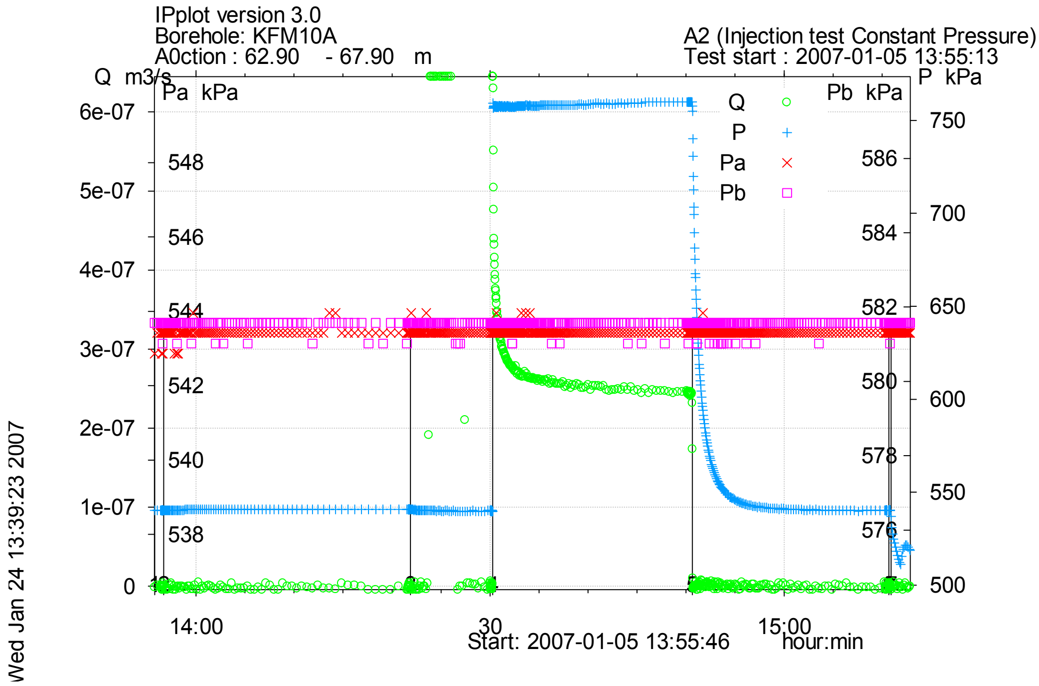


Figure A3-115. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 62.9-67.9 m in borehole KFM10A.*

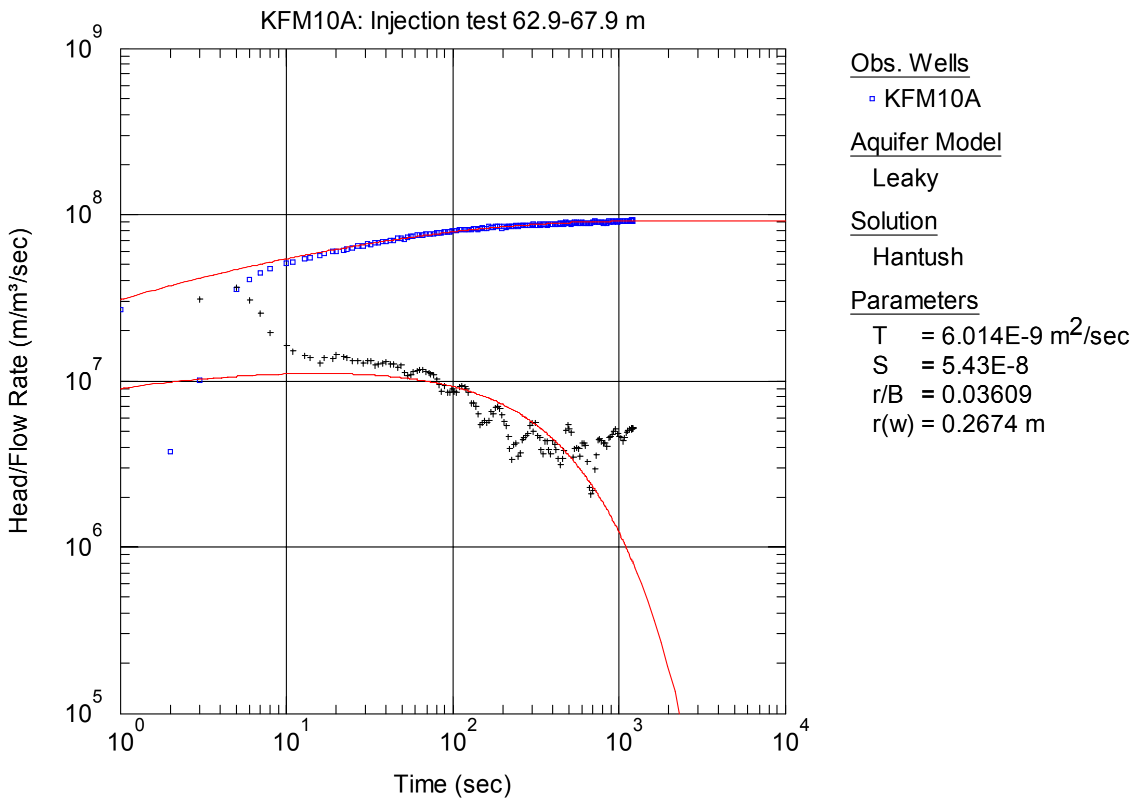


Figure A3-116. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 62.9-67.9 m in KFM10A.*

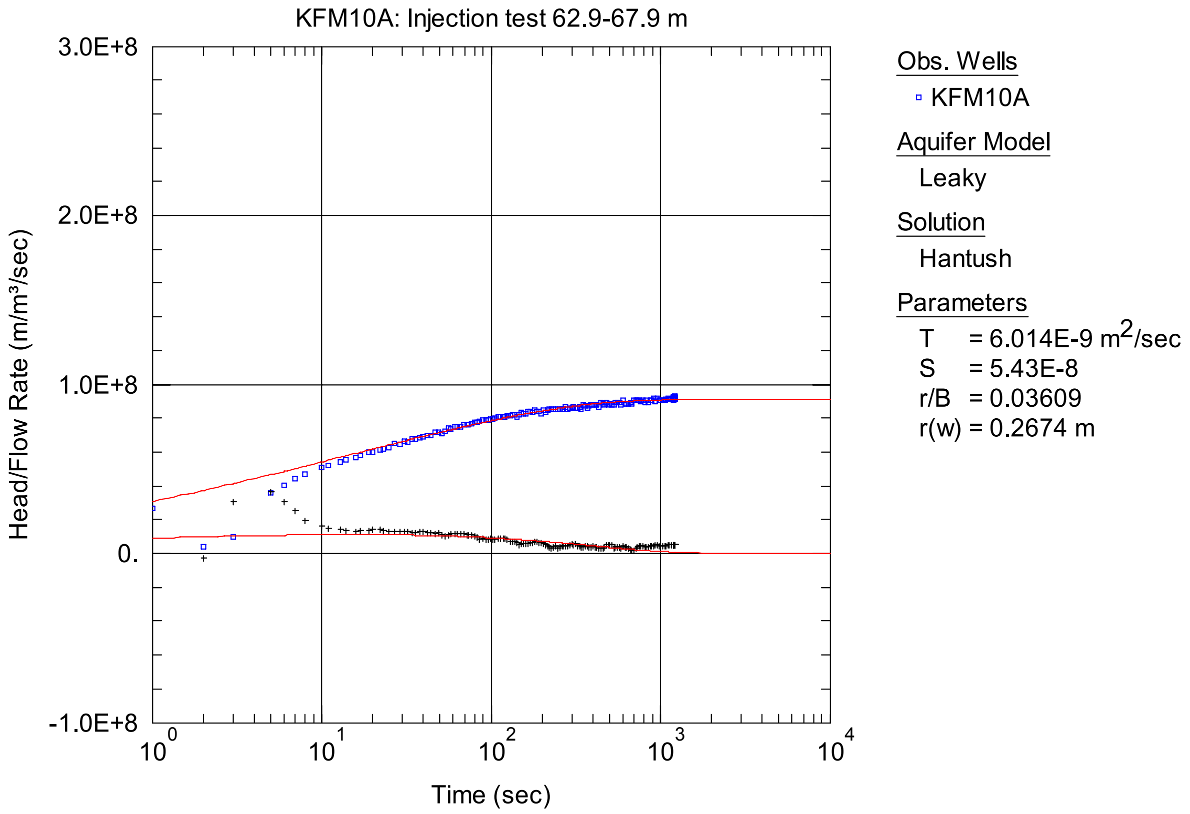


Figure A3-117. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 62.9-67.9 m in KFM10A.*

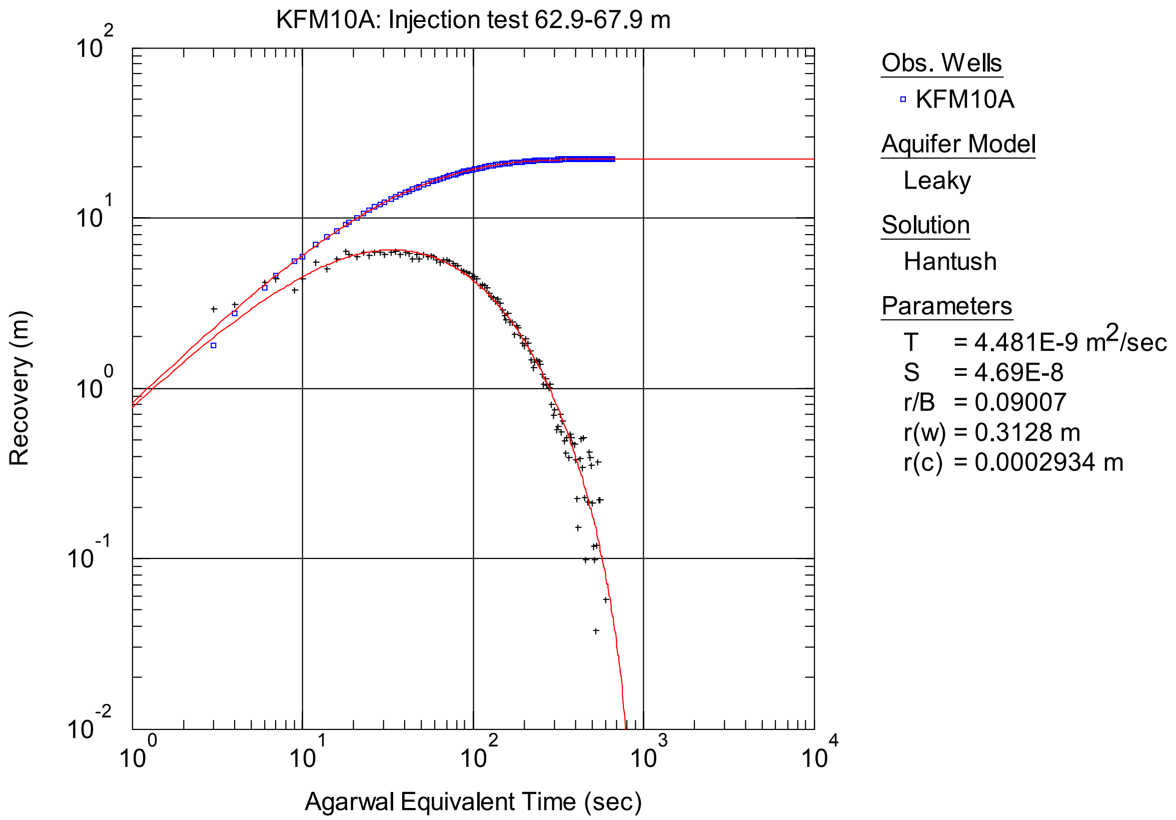


Figure A3-118. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 62.9-67.9 m in KFM10A.*

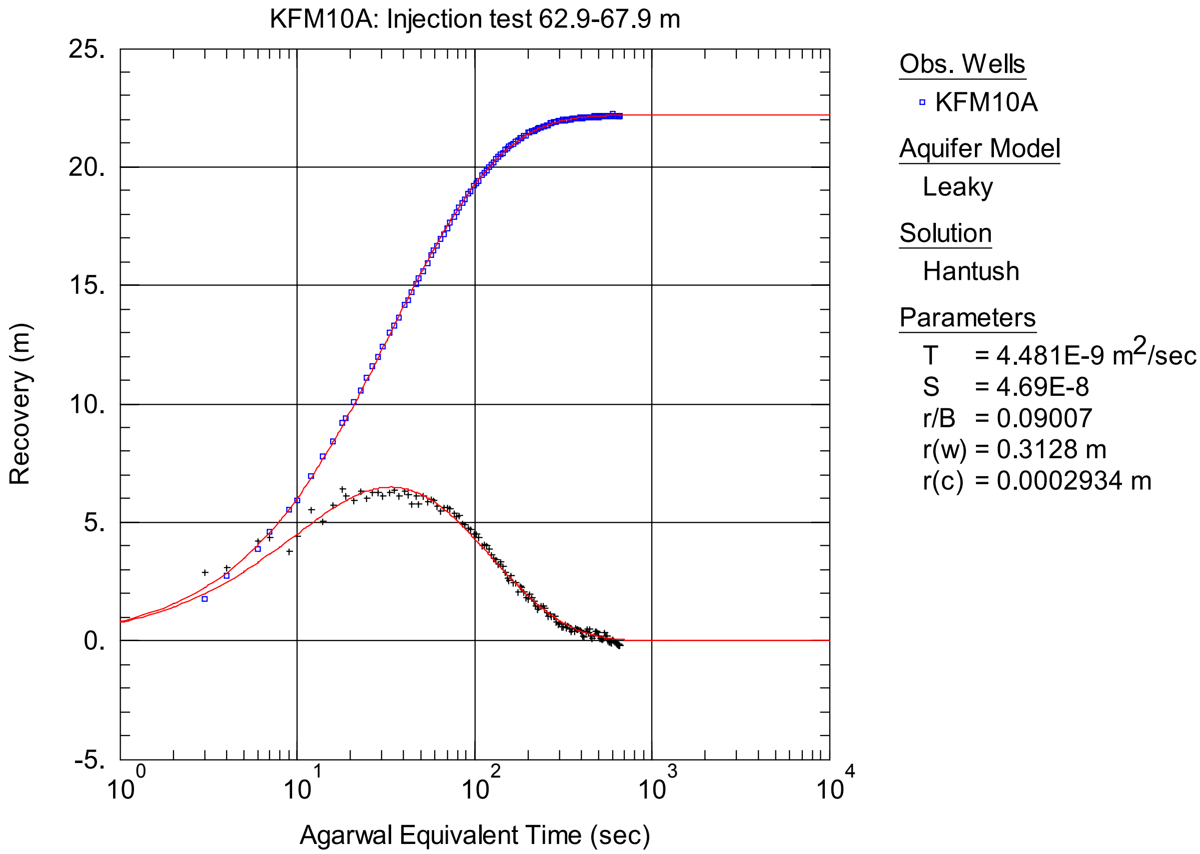


Figure A3-119. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 62.9-67.9 m in KFM10A.*

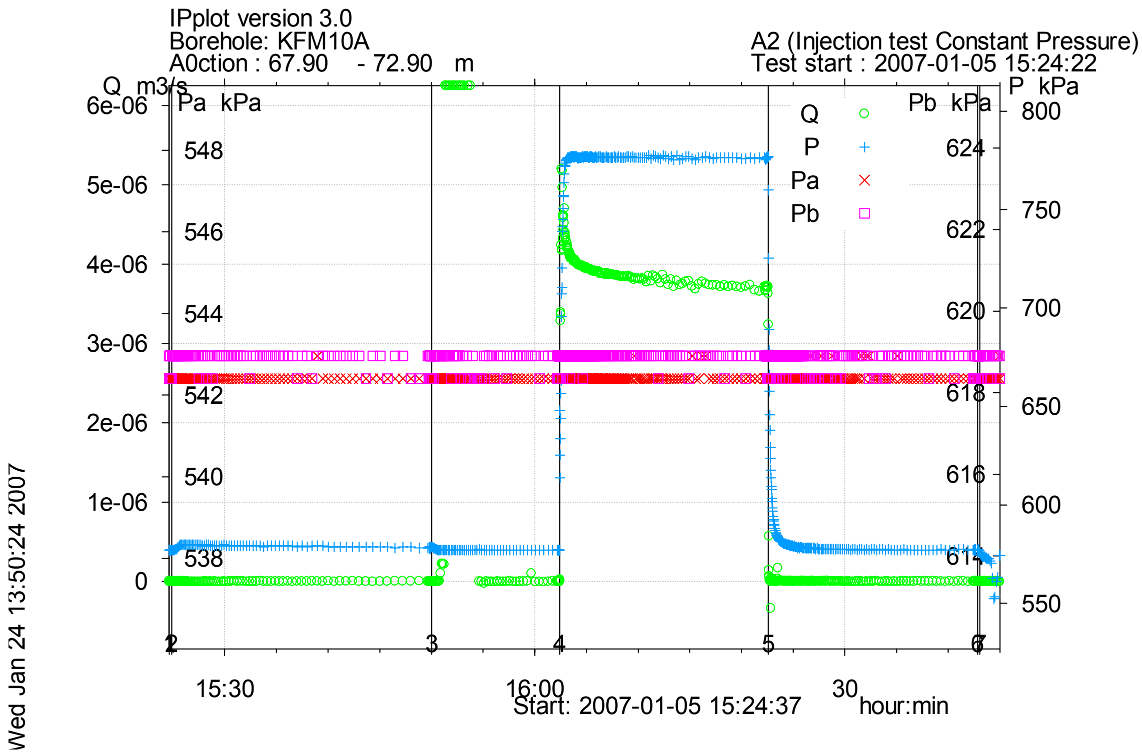


Figure A3-120. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 67.9-72.9 m in borehole KFM10A.*

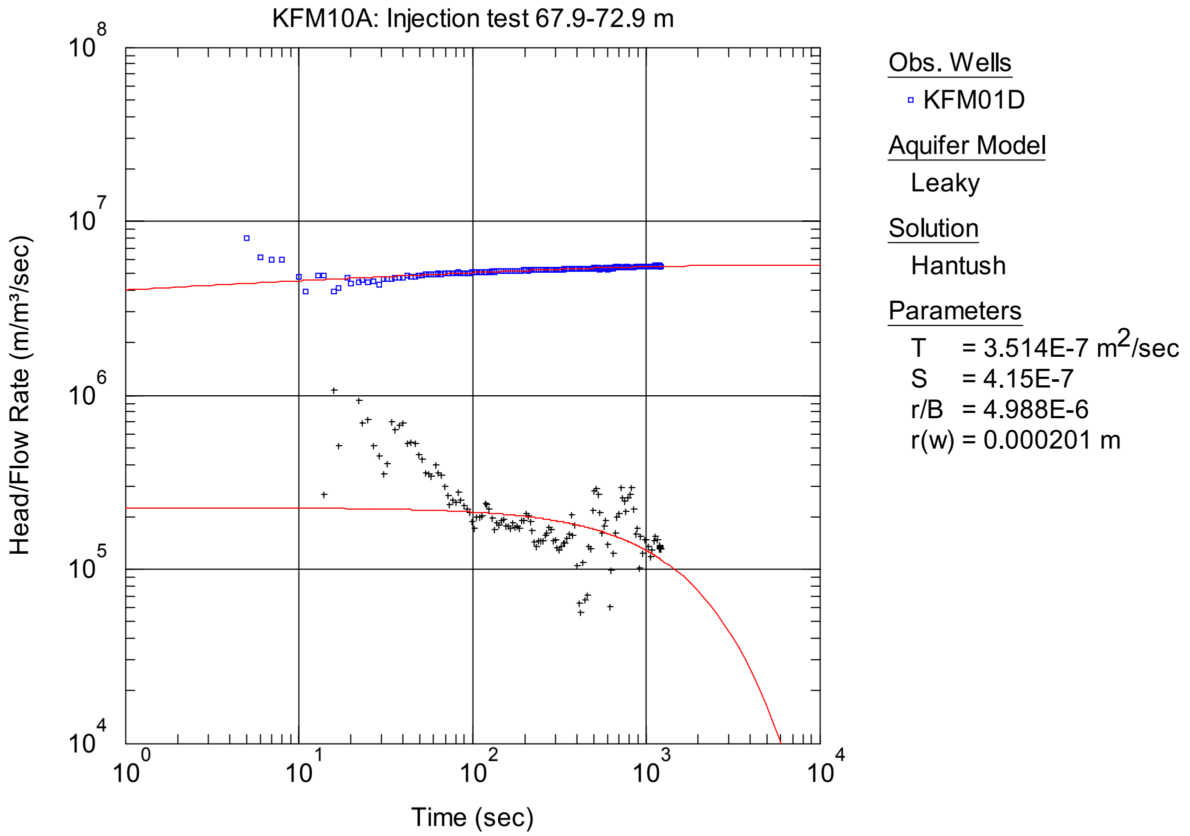


***Figure A3-121.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 67.9-72.9 m in KFM10A.*

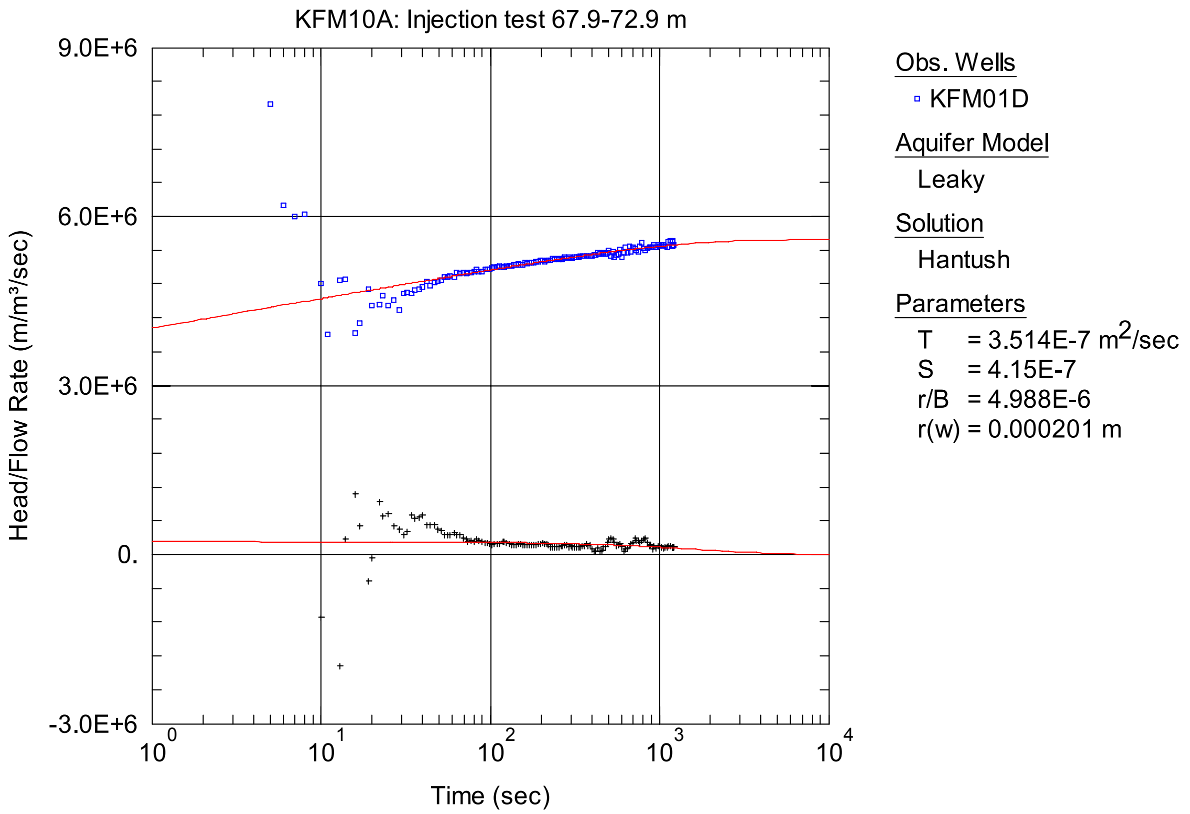


***Figure A3-122.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 67.9-72.9 m in KFM10A.*

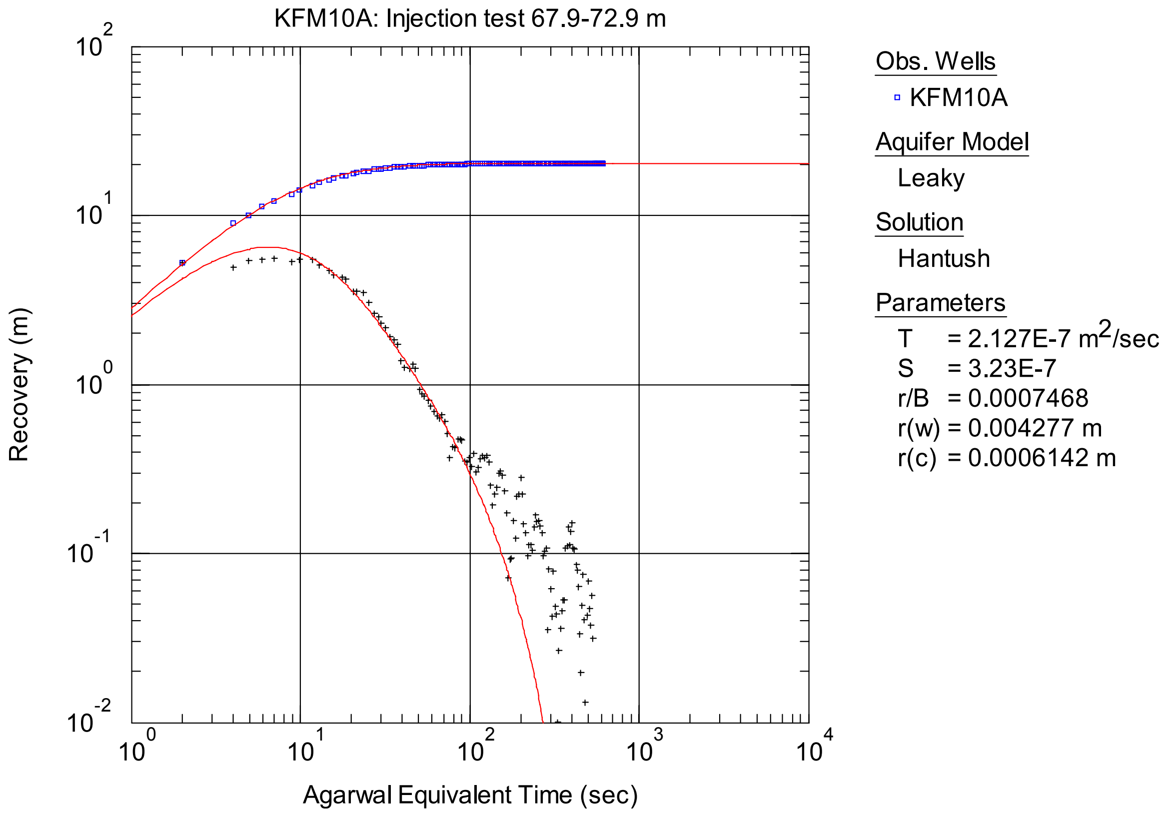


Figure A3-123. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 67.9-72.9 m in KFM10A.*

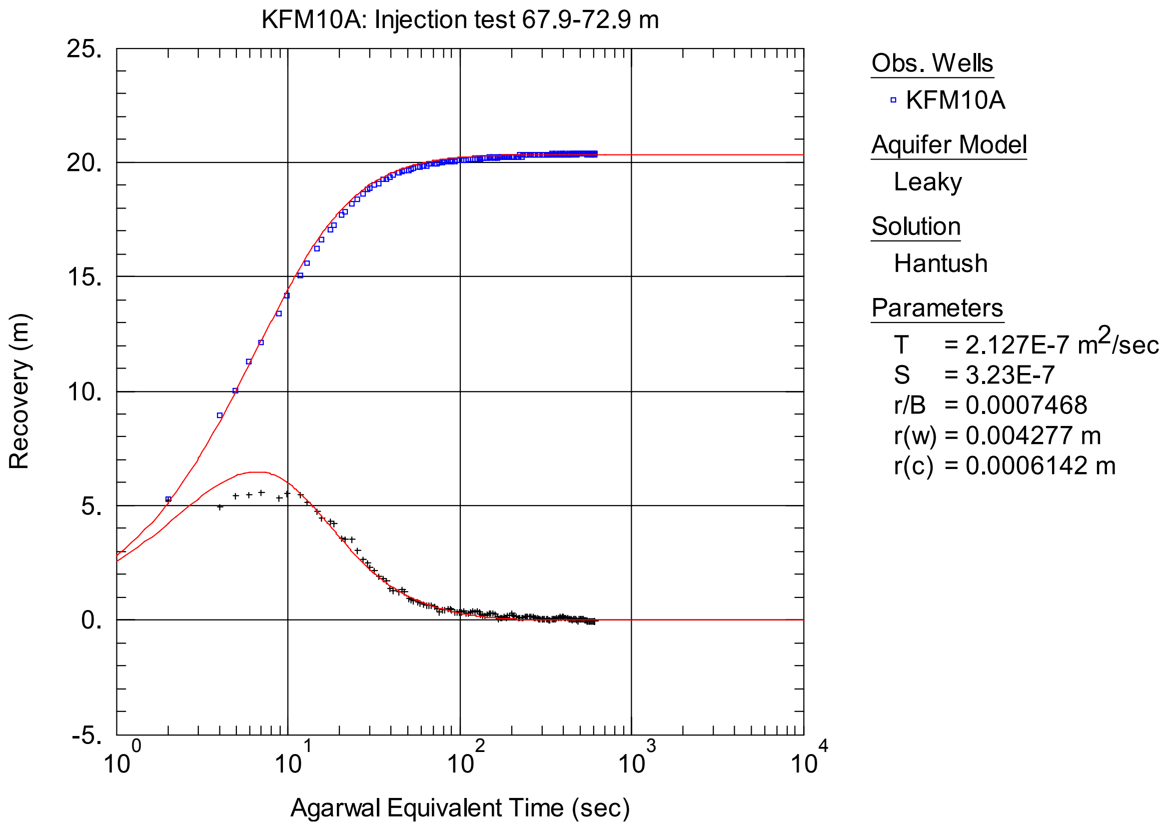


Figure A3-124. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 67.9-72.9 m in KFM10A.*

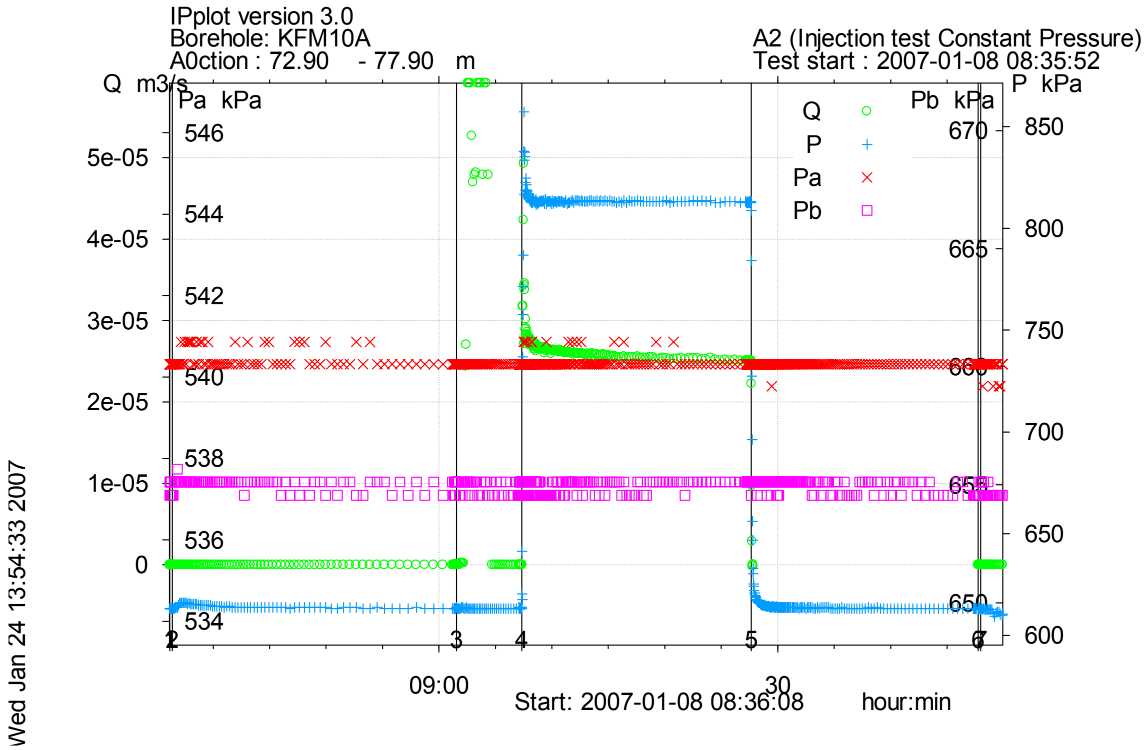


Figure A3-125. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 72.9-77.9 m in borehole KFM10A.*

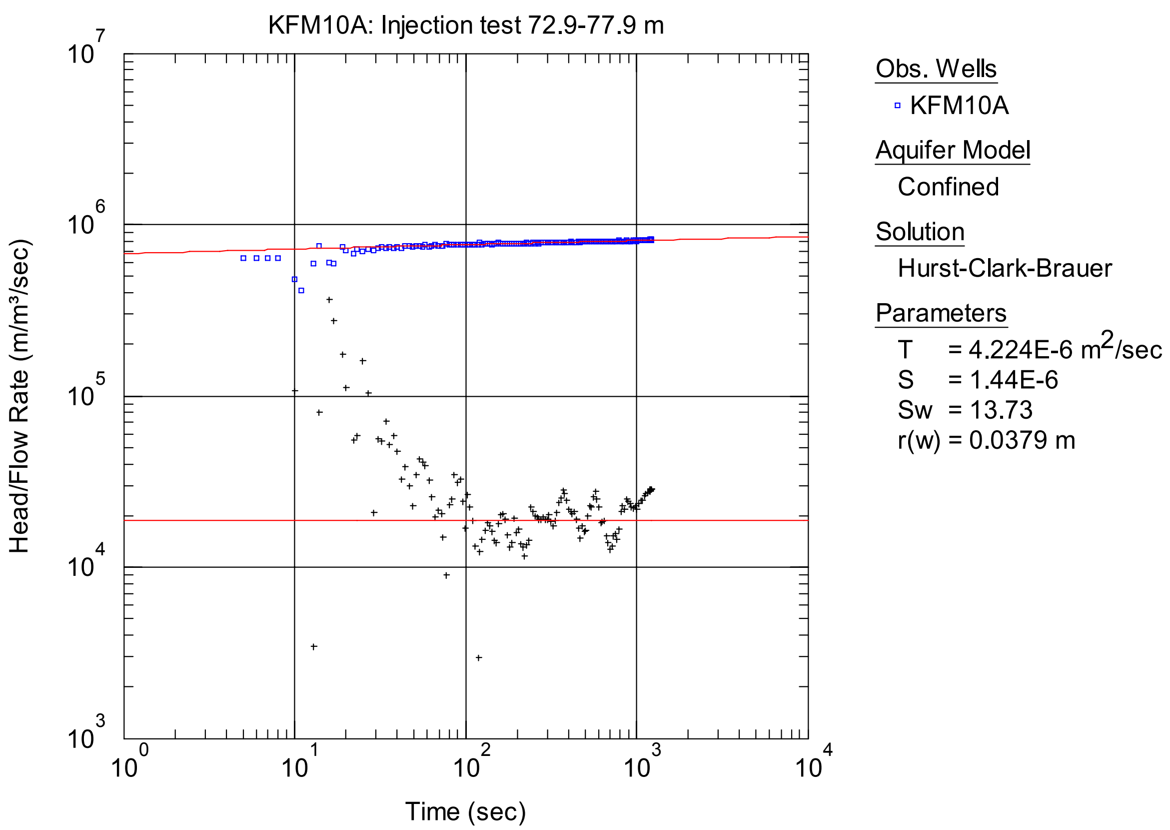


Figure A3-126. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 72.9-77.9 m in KFM10A.*

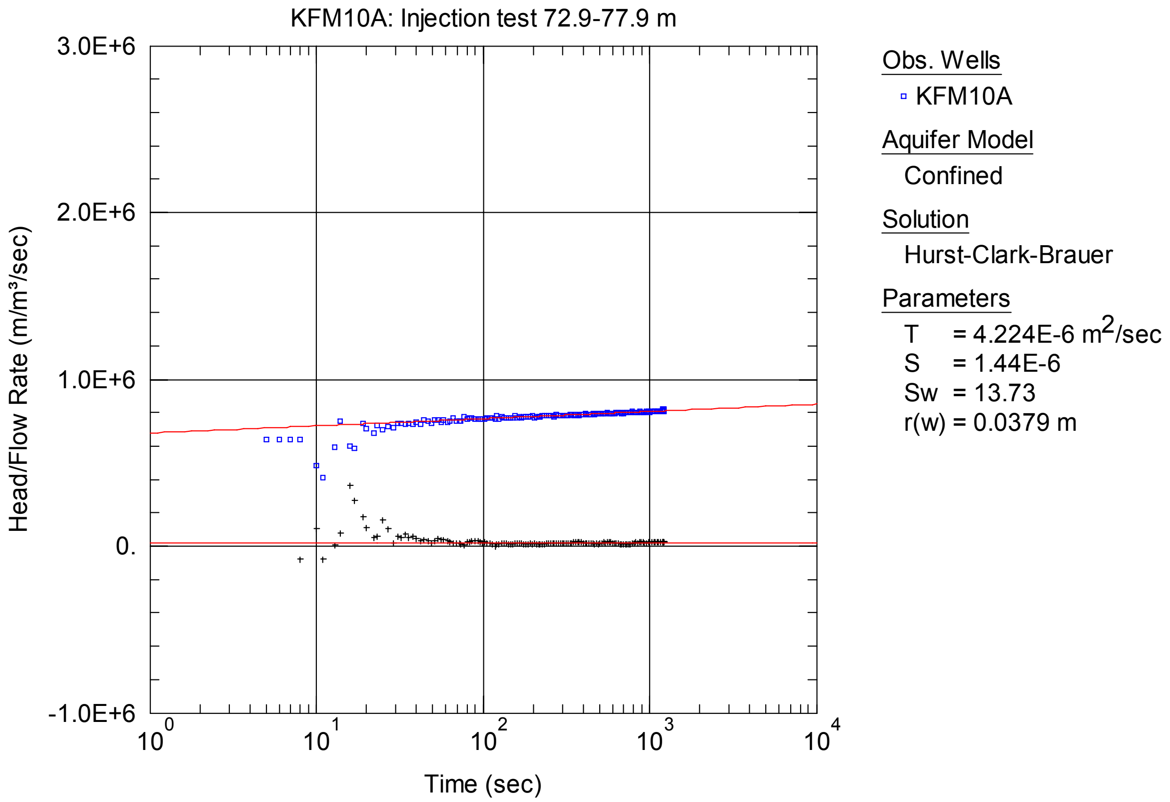


Figure A3-127. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 72.9-77.9 m in KFM10A.*

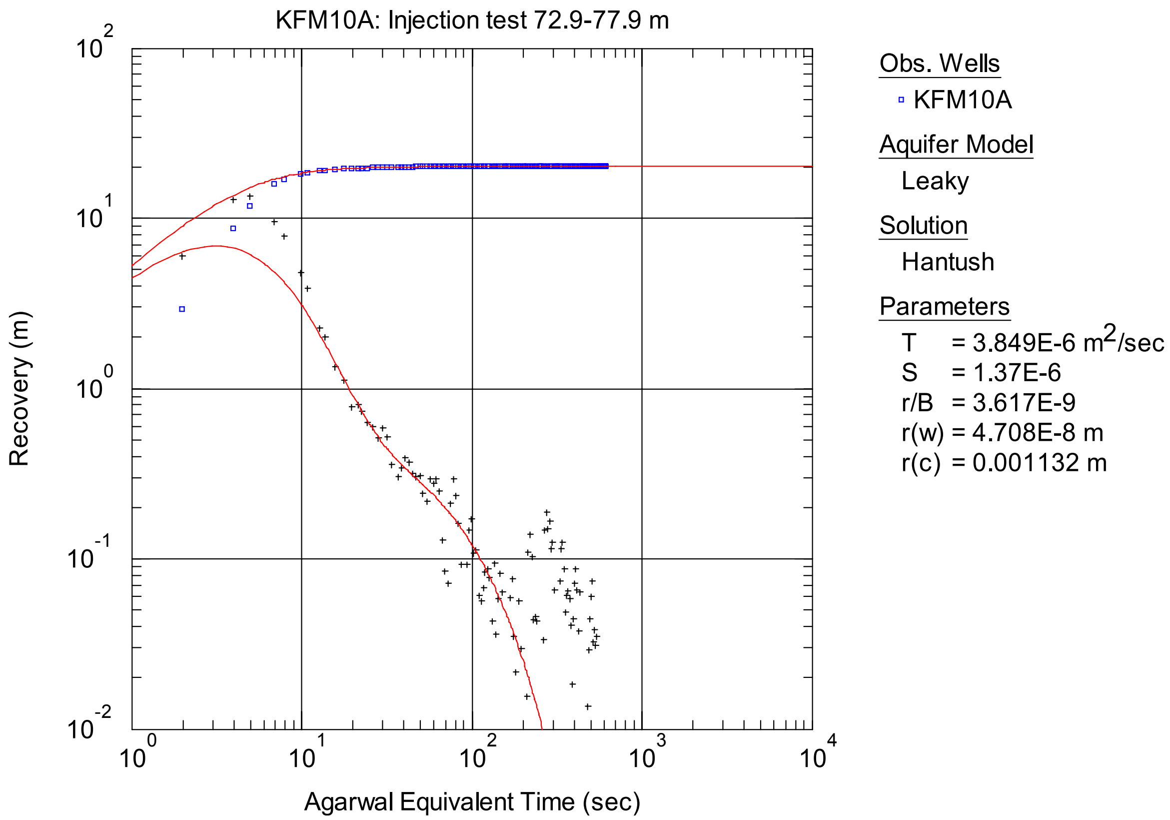


Figure A3-128. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 72.9-77.9 m in KFM10A.*

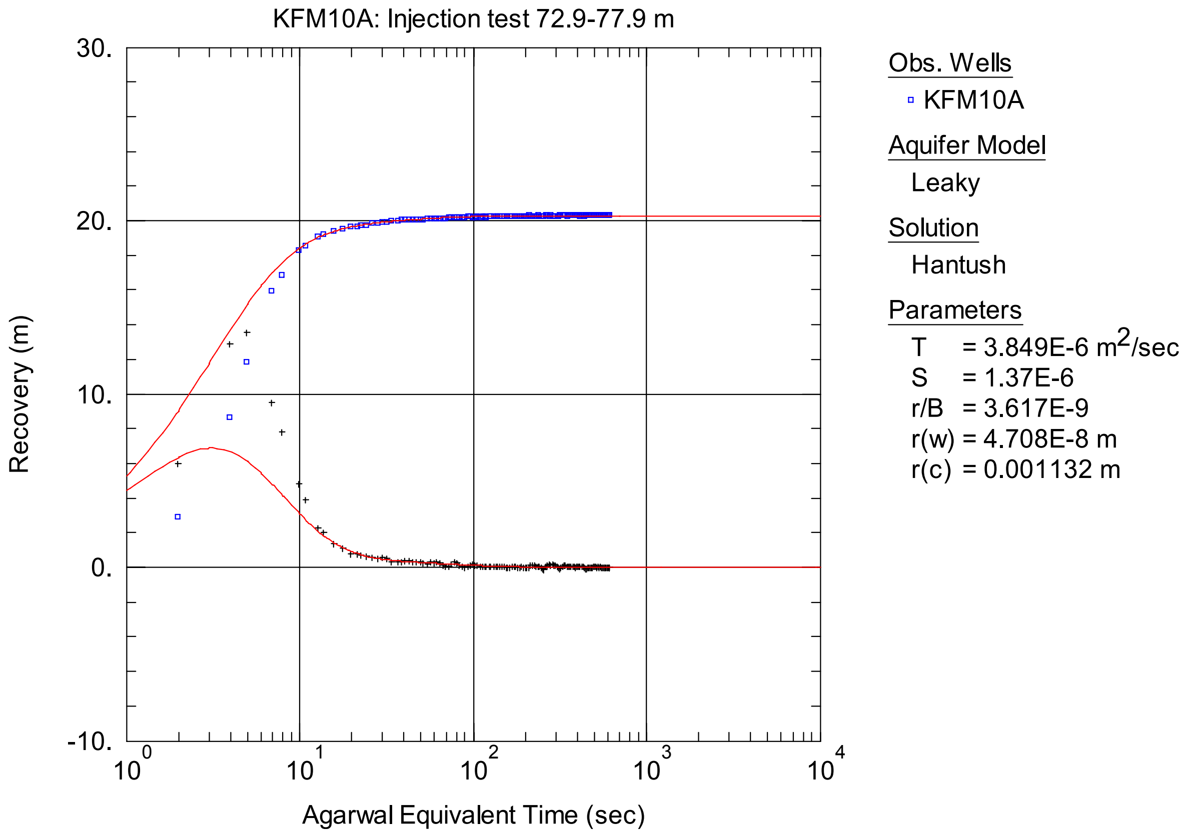


Figure A3-129. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 72.9-77.9 m in KFM10A.*

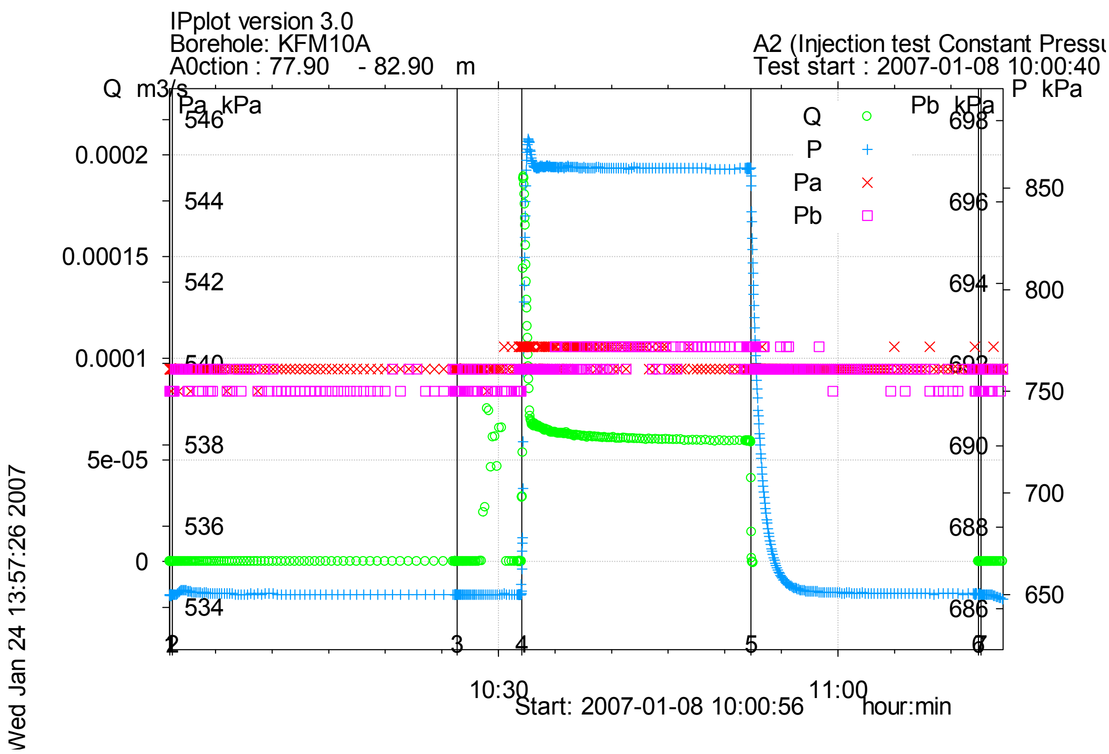


Figure A3-130. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 77.9-82.9 m in borehole KFM10A.*

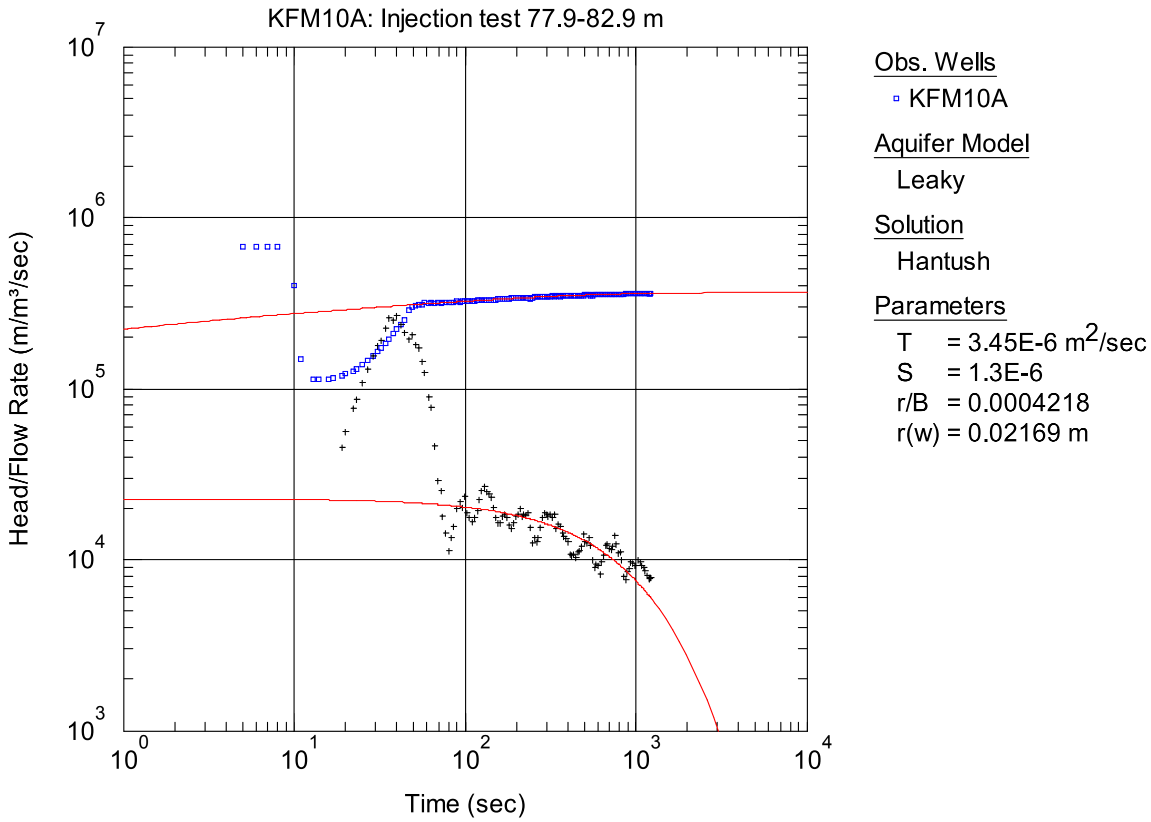


Figure A3-131. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 77.9-82.9 m in KFM10A.*

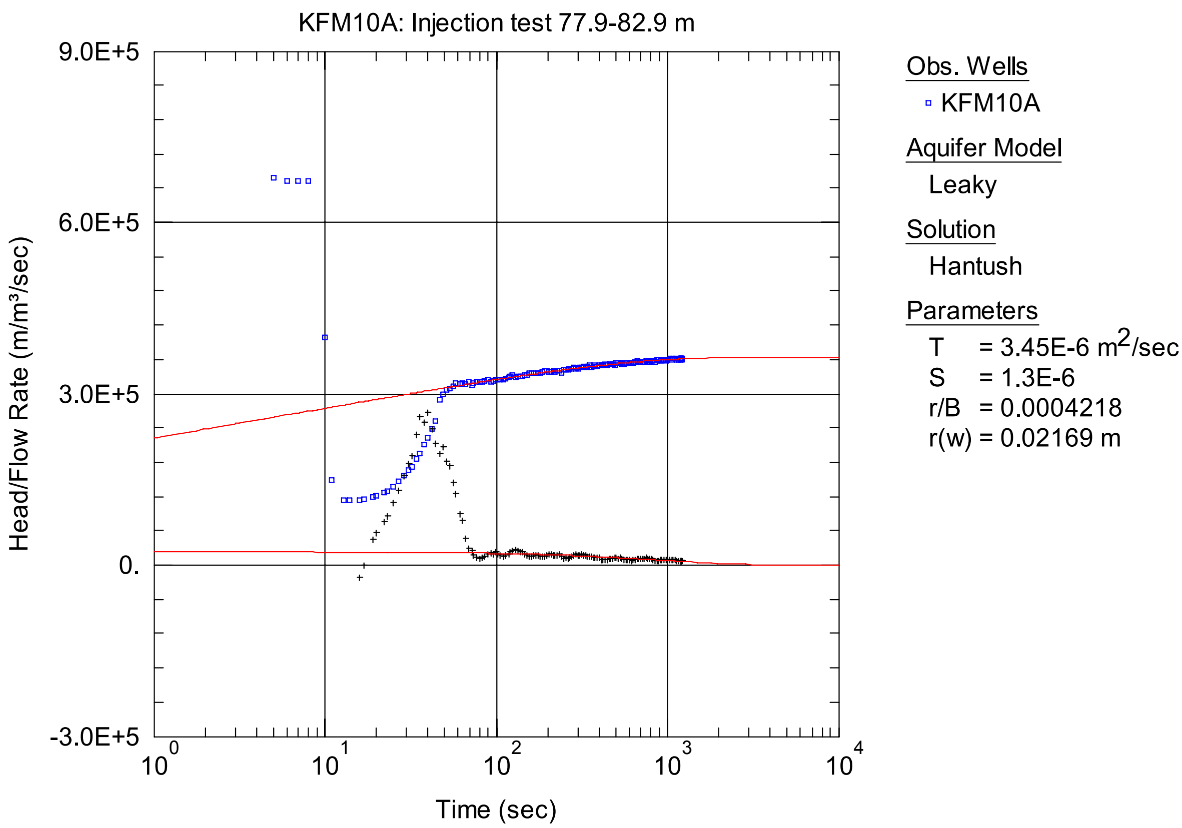


Figure A3-132. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 77.9-82.9 m in KFM10A.*

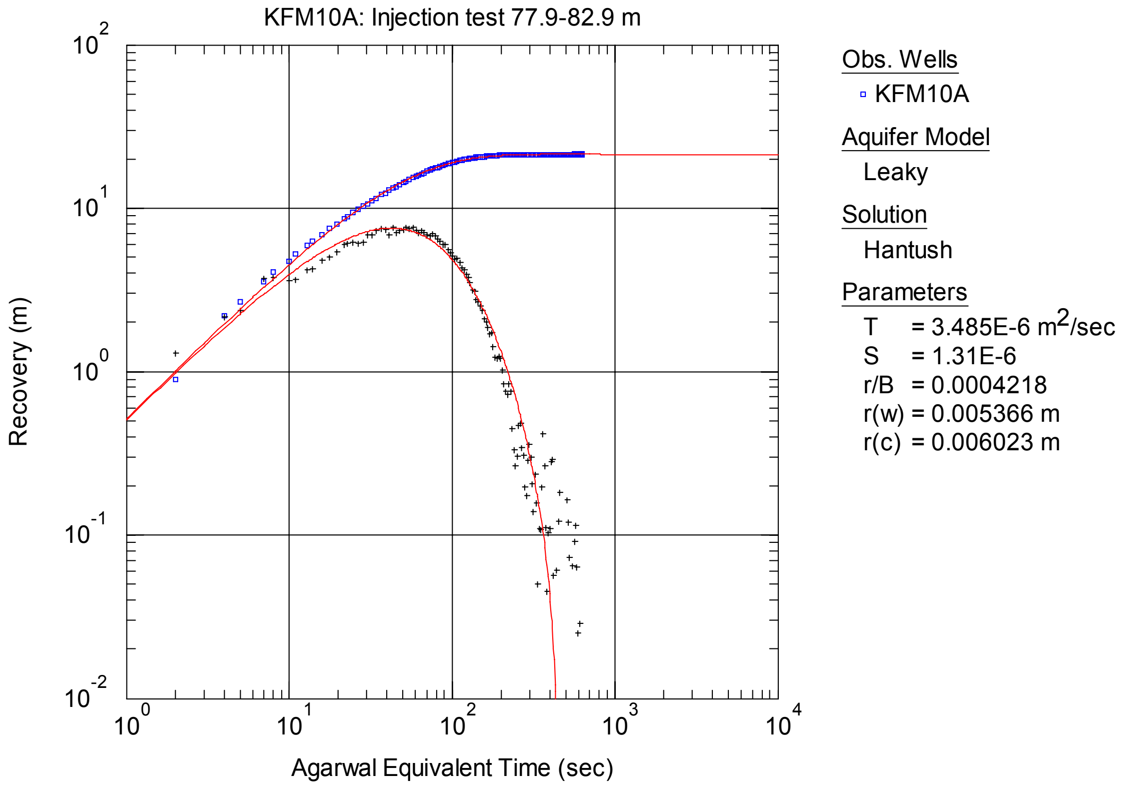


Figure A3-133. *Log-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 77.9-82.9 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous,evaluation.*

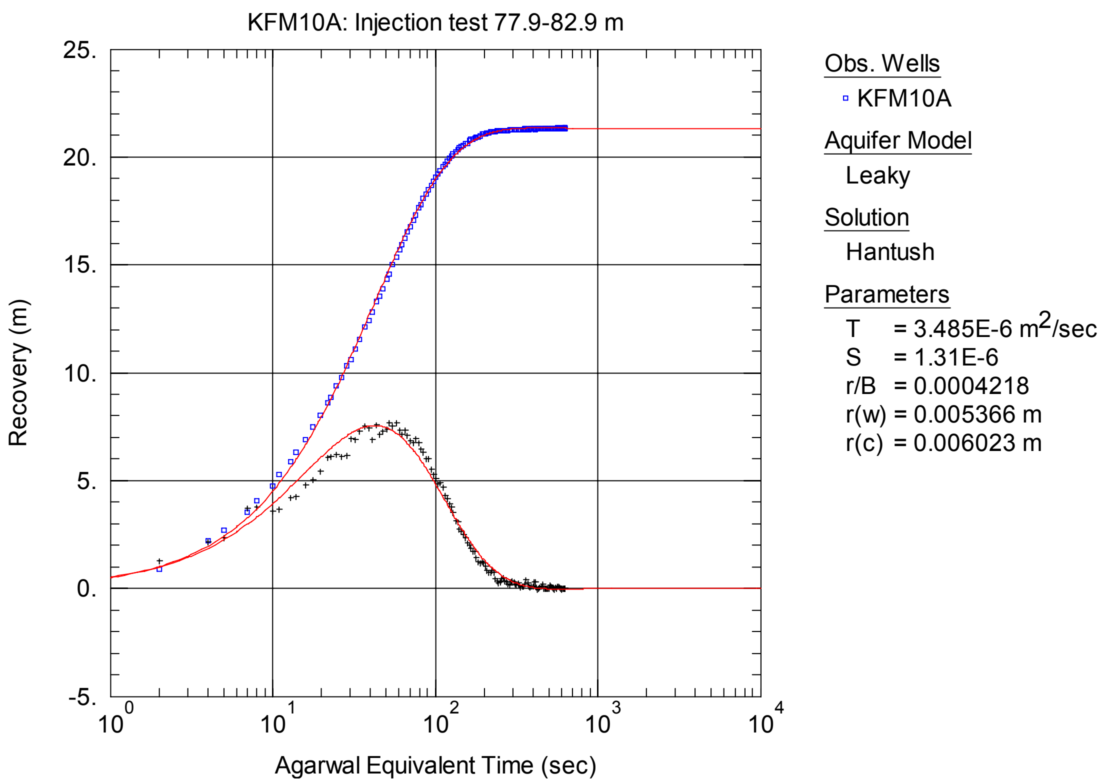


Figure A3-134. *Lin-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 77.9-82.9 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous,evaluation.*

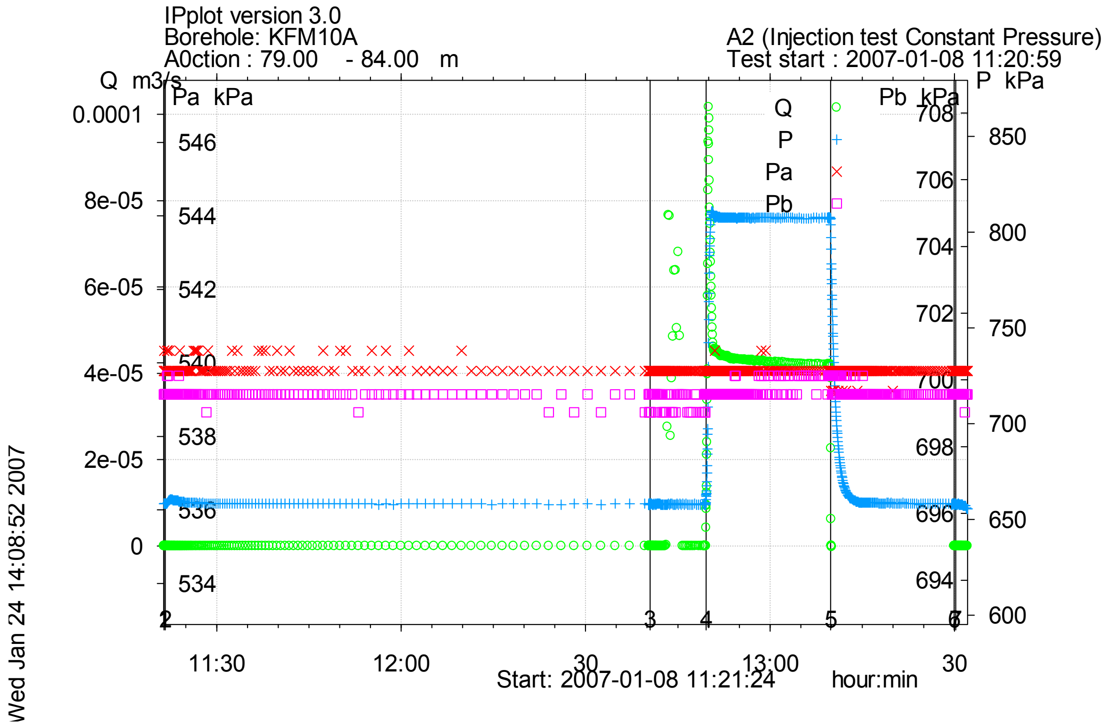


Figure A3-135. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 79.0-84.0 m in borehole KFM10A.

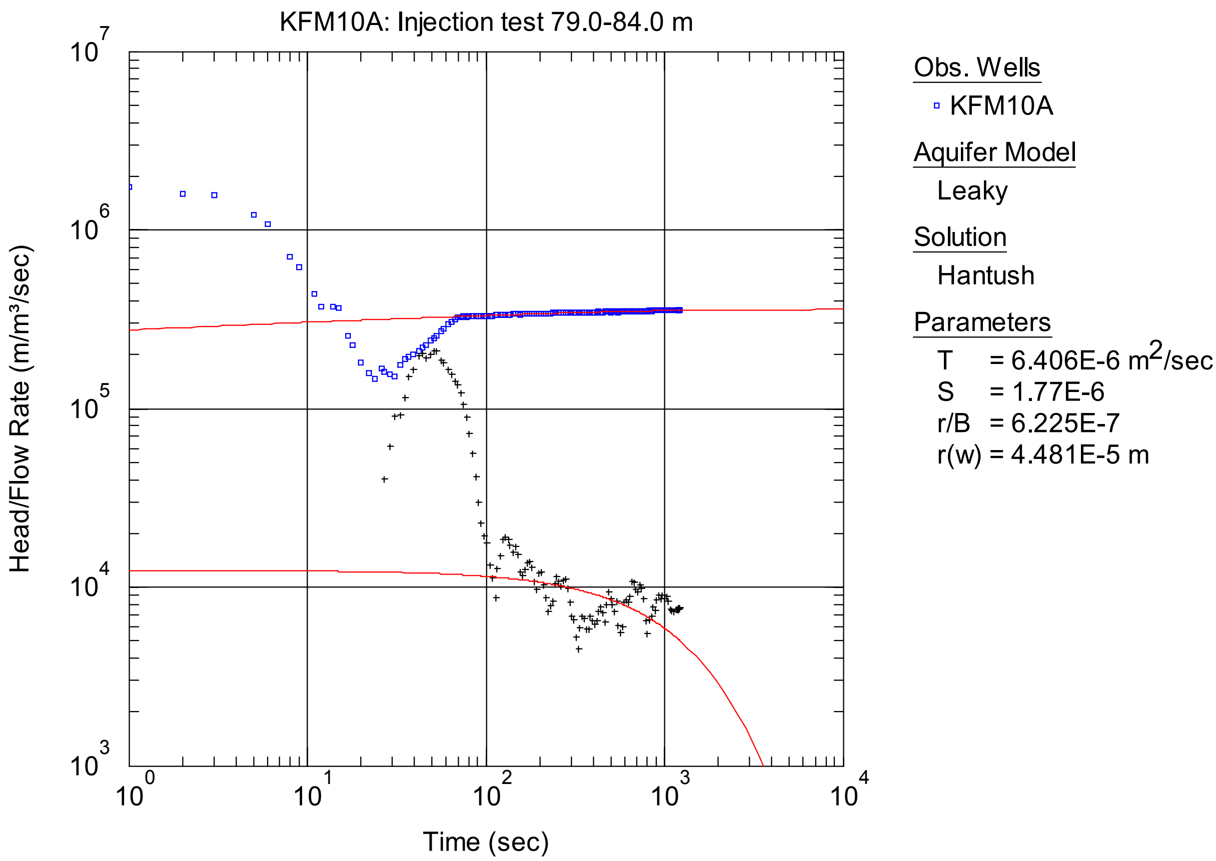


Figure A3-136. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 79.0-84.0 m in KFM10A.

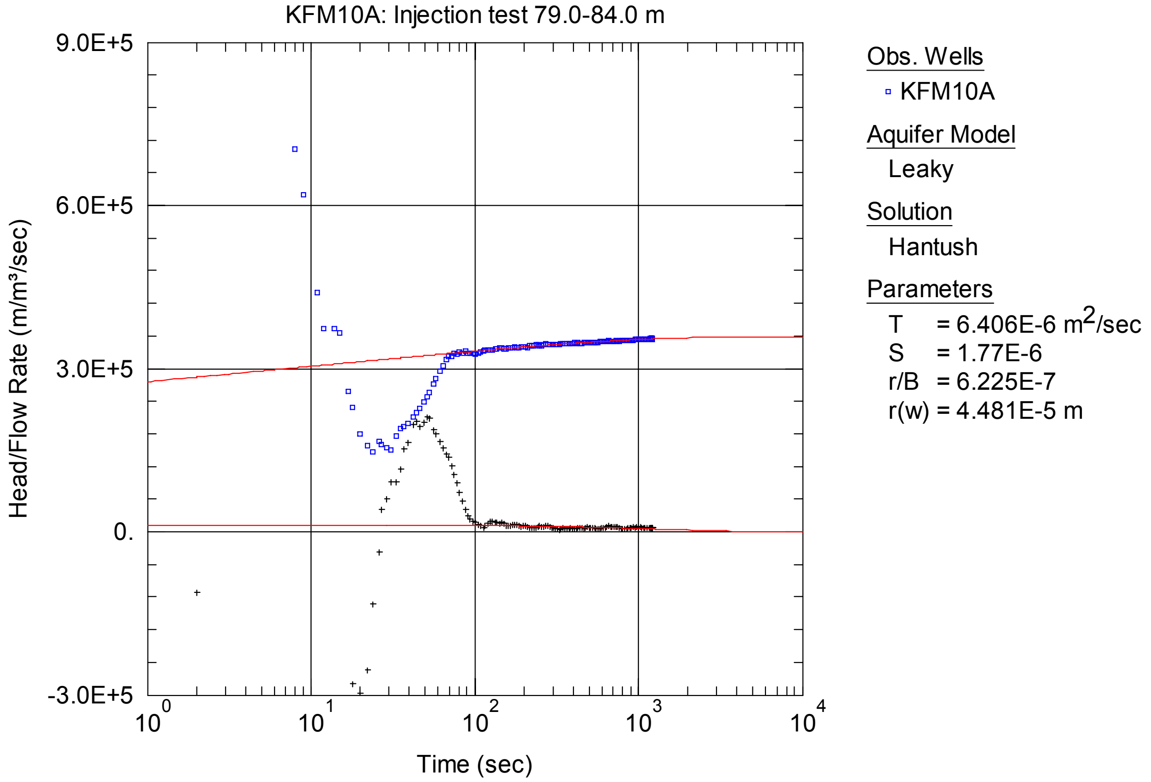


Figure A3-137. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 79.0-84.0 m in KFM10A.*

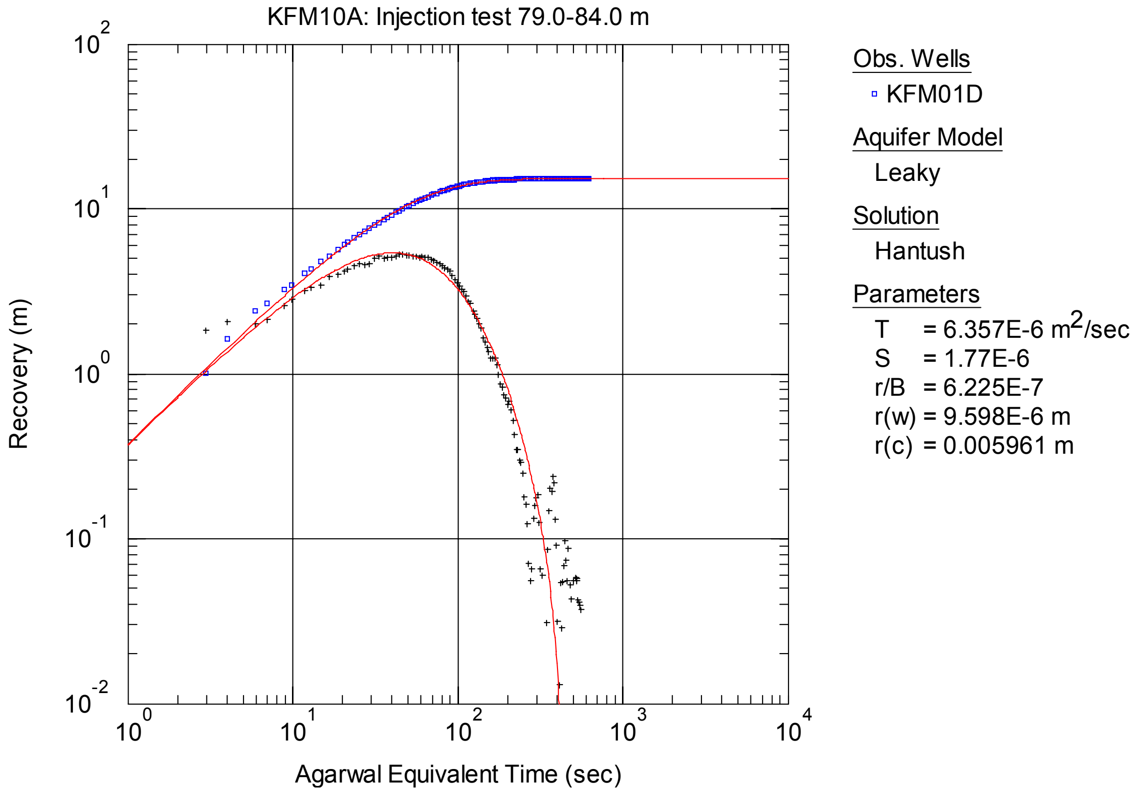


Figure A3-138. *Log-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 79.0-84.0 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

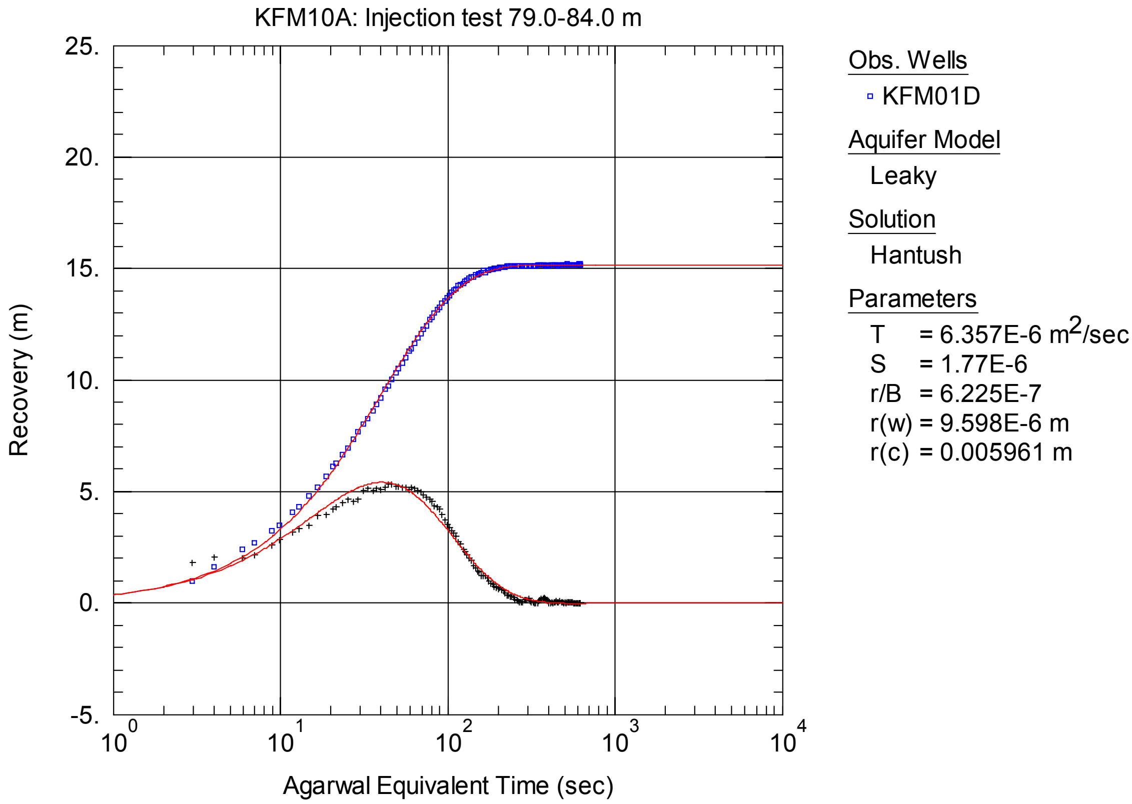


Figure A3-139. *Lin-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 79.0-84.0 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

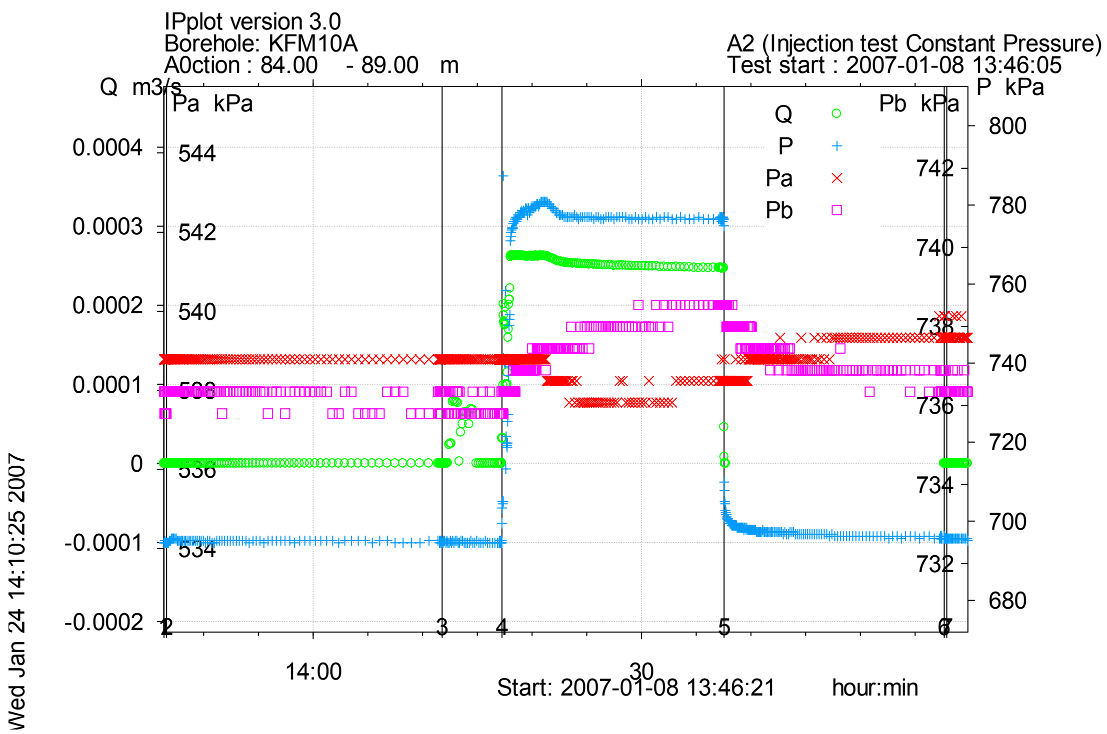


Figure A3-140. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 84.0-89.0 m in borehole KFM10A.*

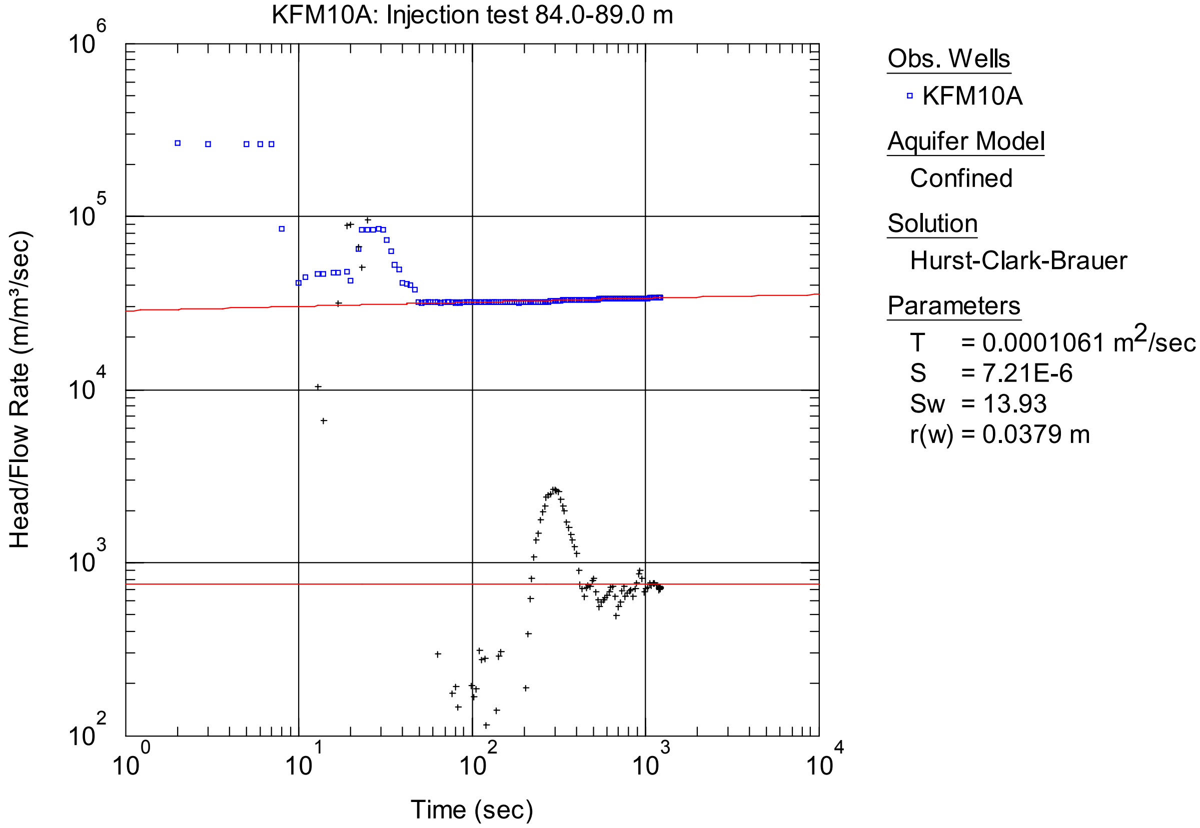


Figure A3-141. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 84.0-89.0 m in KFM10A.*

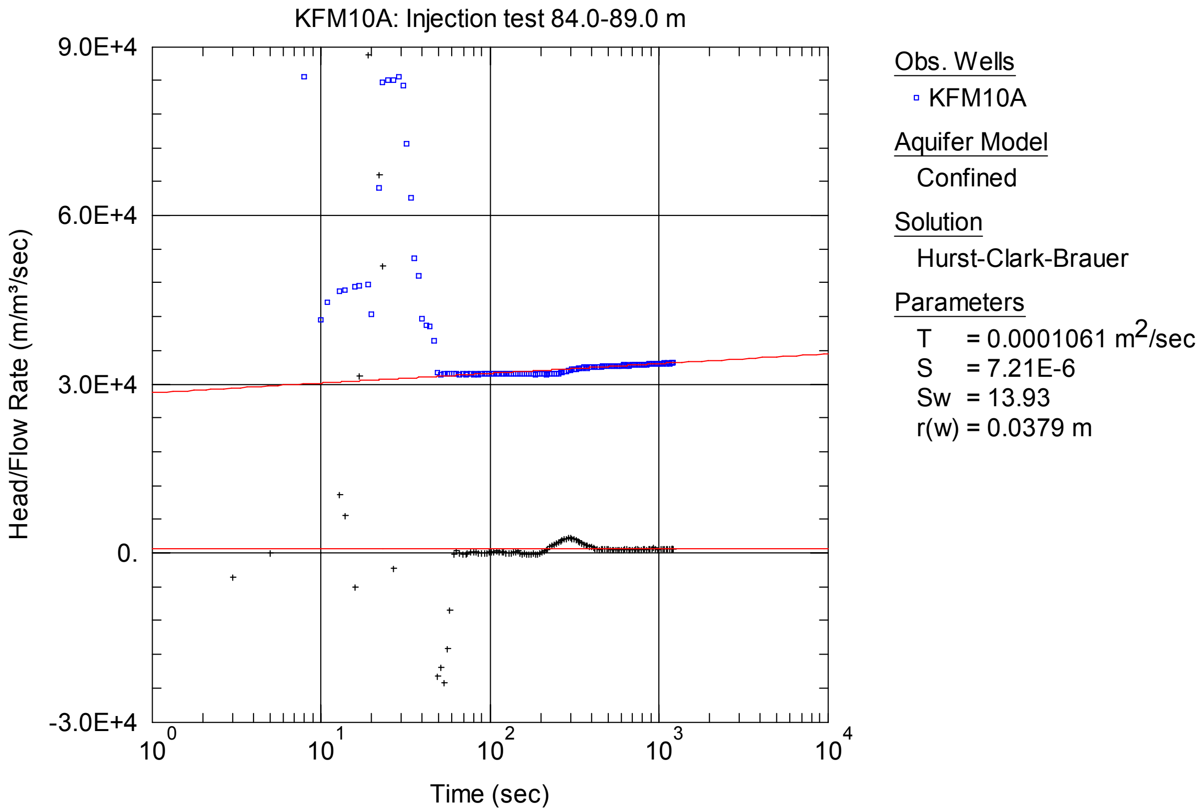


Figure A3-142. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 84.0-89.0 m in KFM10A.*

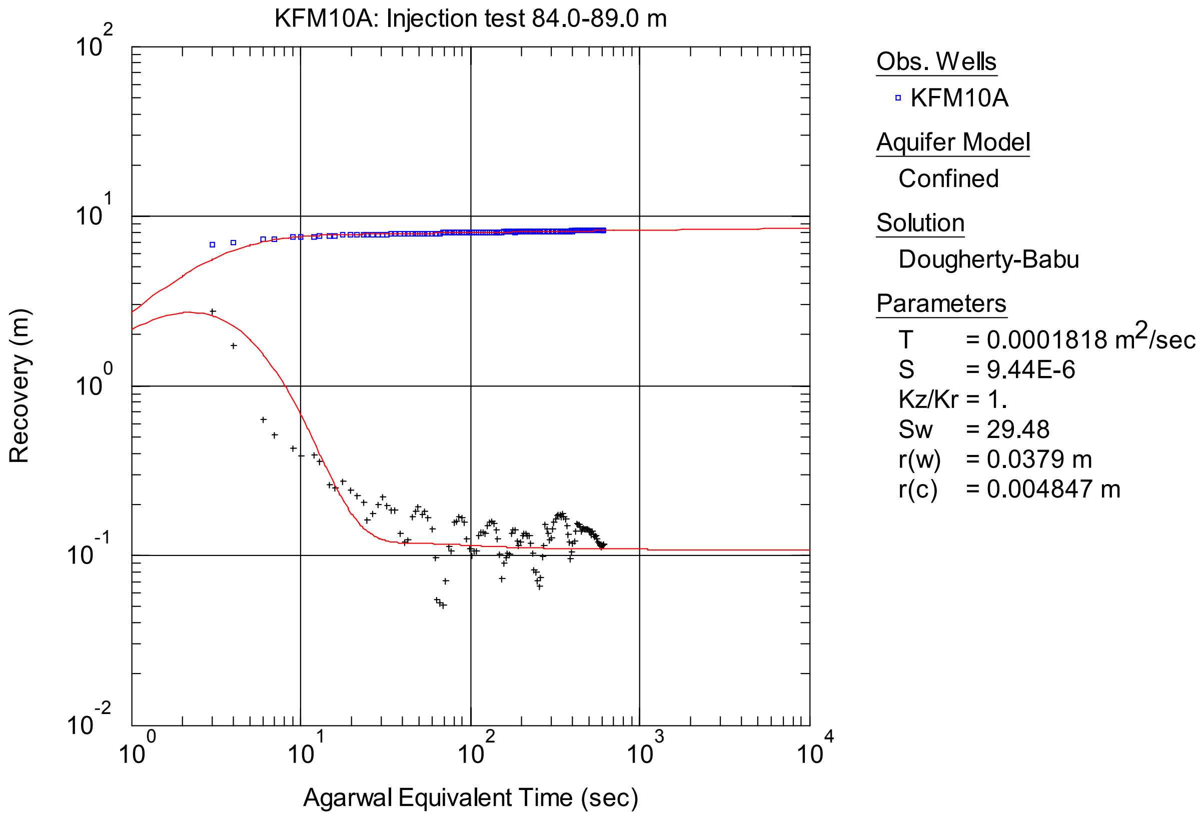


***Figure A3-143.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 84.0-89.0 m in KFM10A.*

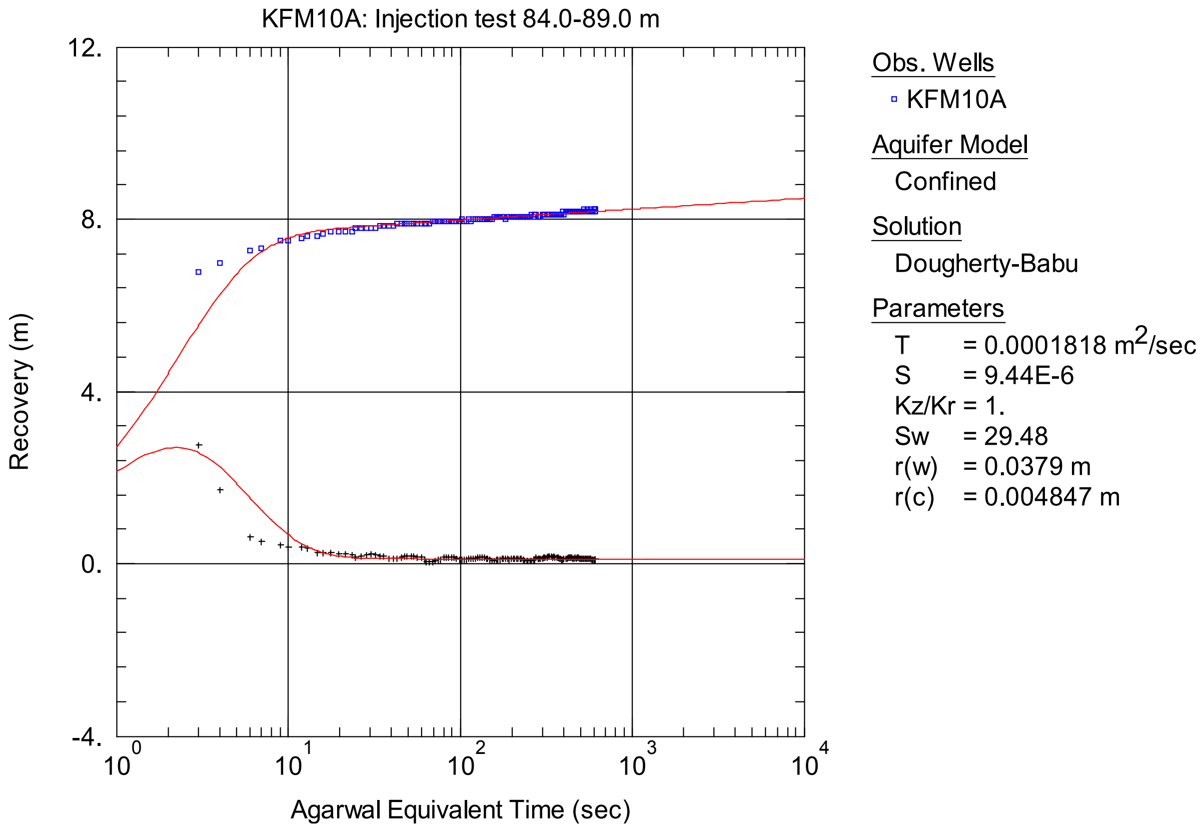


***Figure A3-144.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 84.0-89.0 m in KFM10A.*

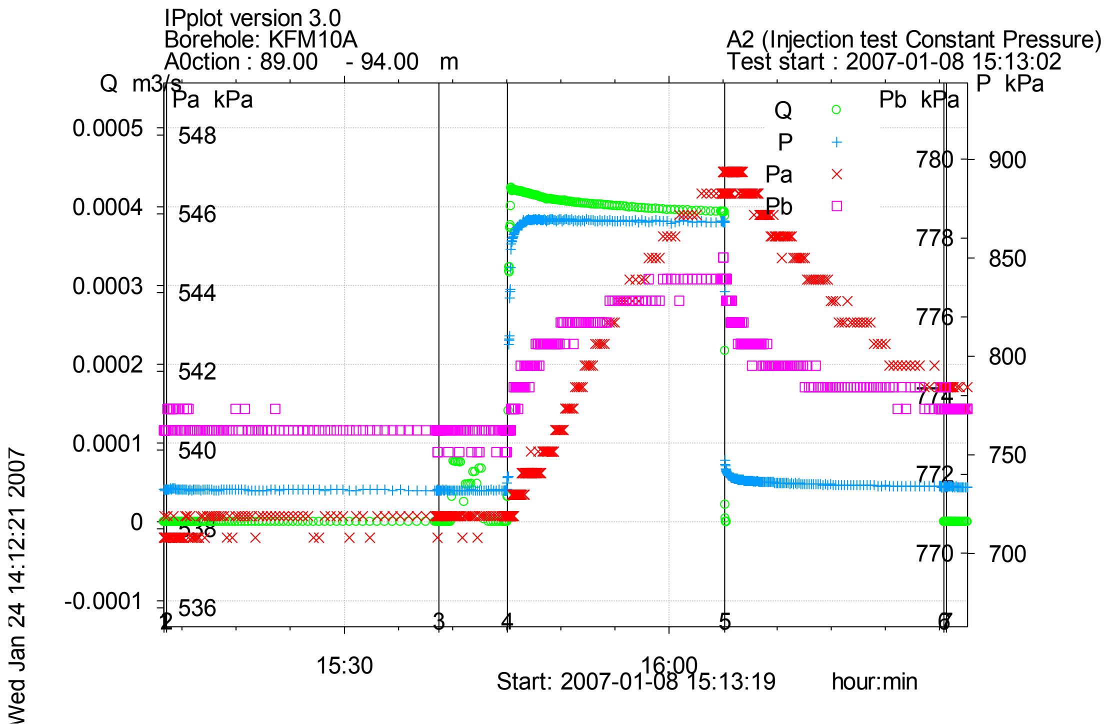


Figure A3-145. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 89.0-94.0 m in borehole KFM10A.*

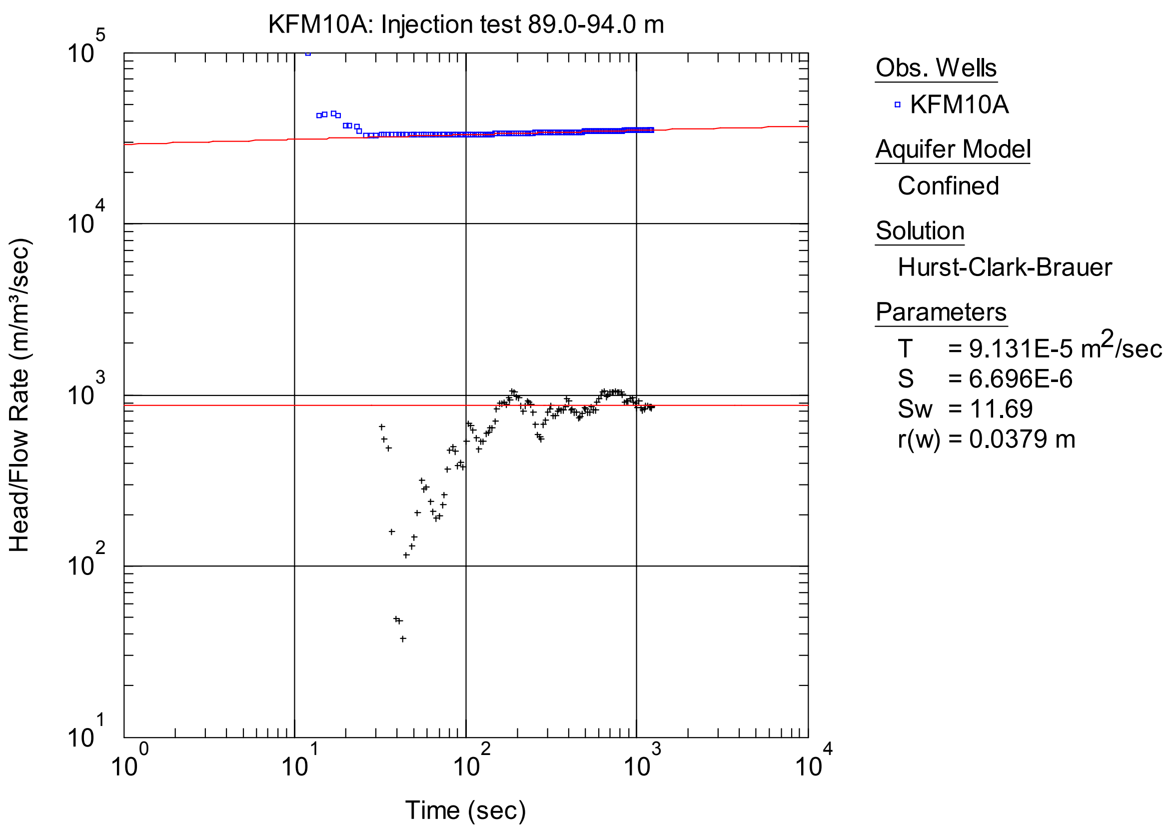


Figure A3-146. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 89.0-94.0 m in KFM10A.*

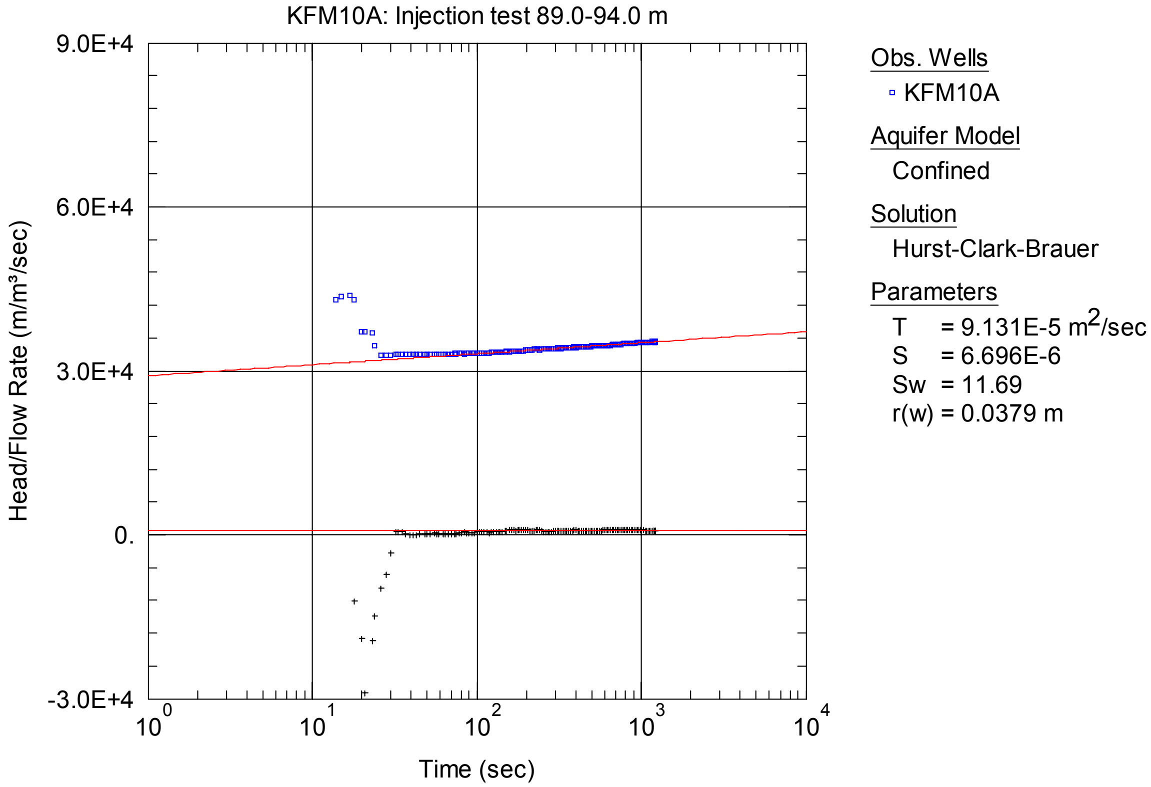


Figure A3-147. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 89.0-94.0 m in KFM10A.*

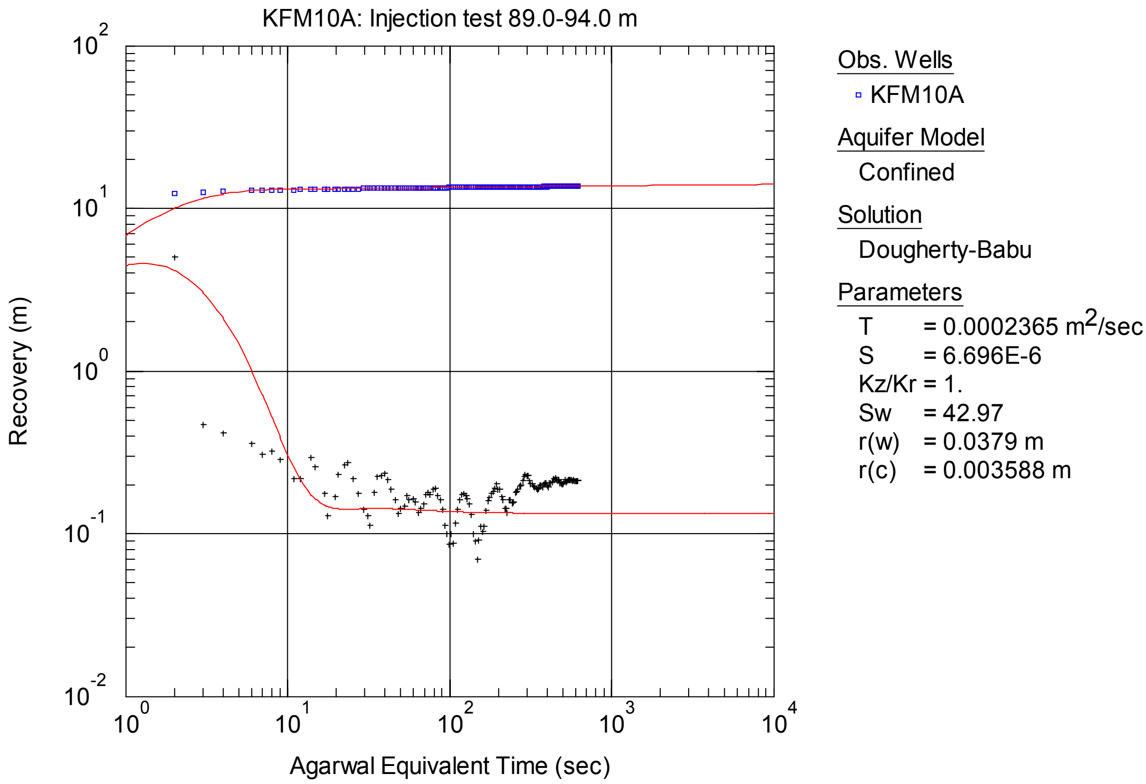


Figure A3-148. *Log-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 89.0-94.0 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

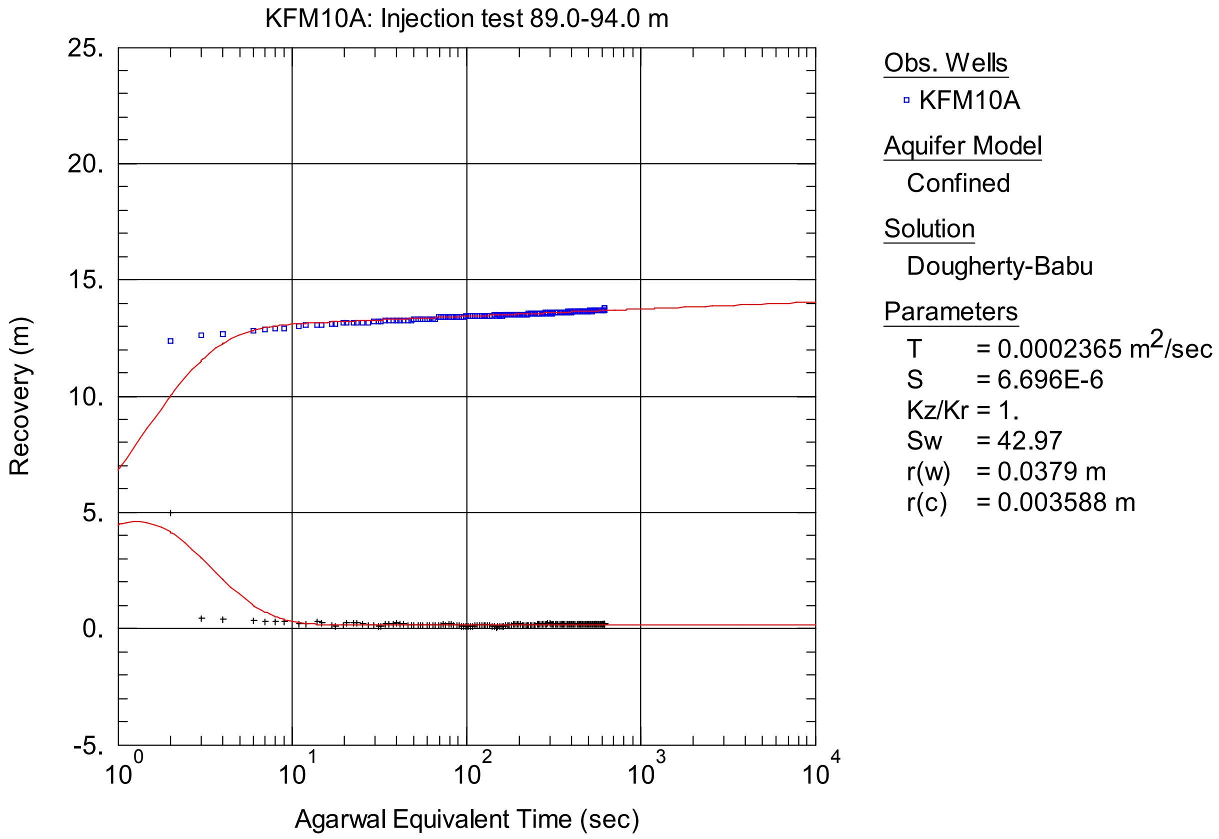


Figure A3-149. *Lin-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 89.0-94.0 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

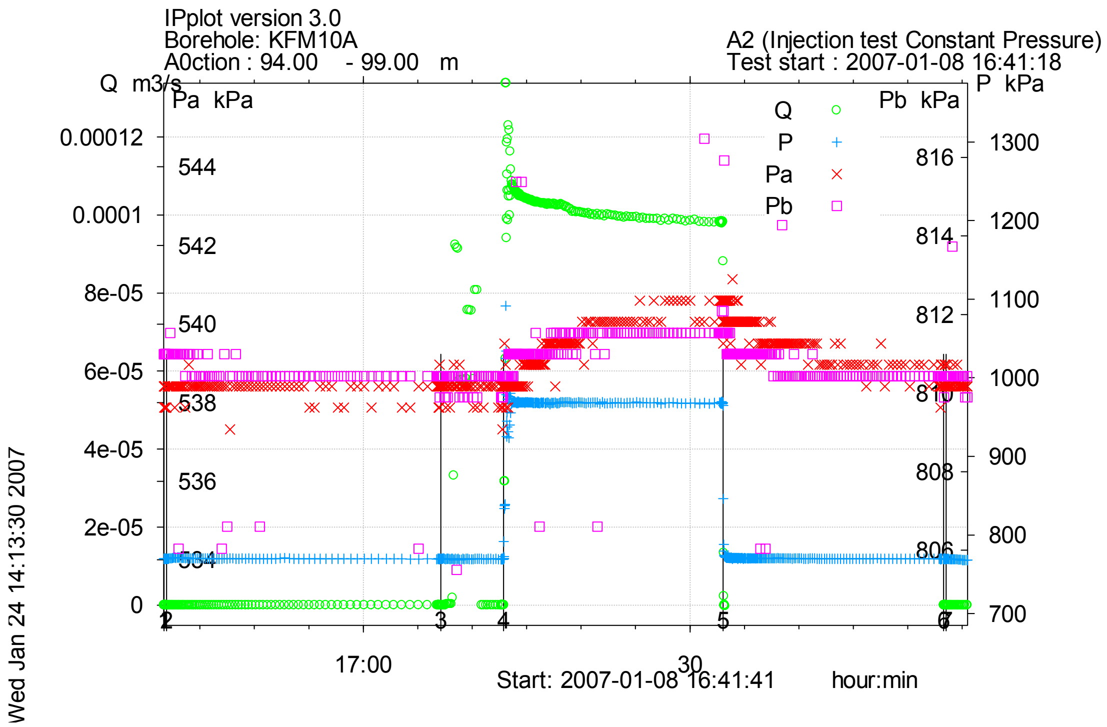


Figure A3-150. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 94.0-99.0 m in borehole KFM10A.*

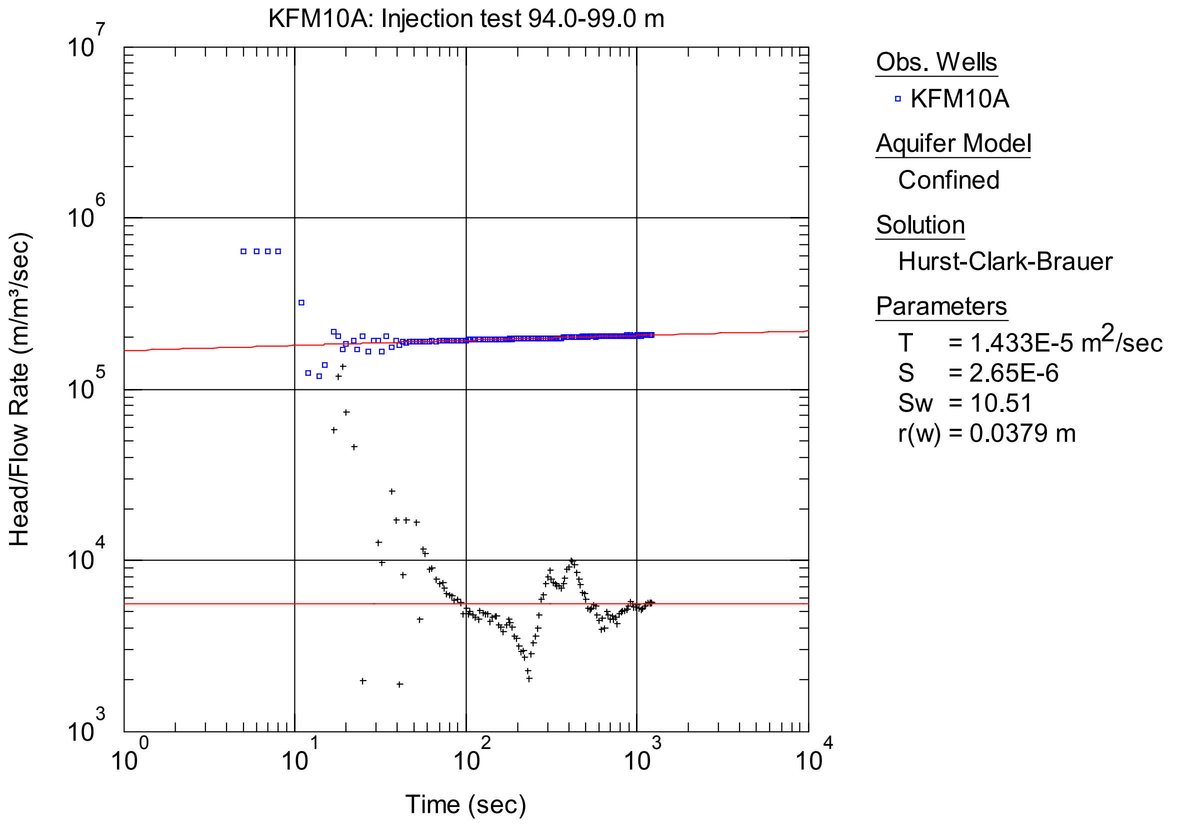


Figure A3-151. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 94.0-99.0 m in KFM10A.*

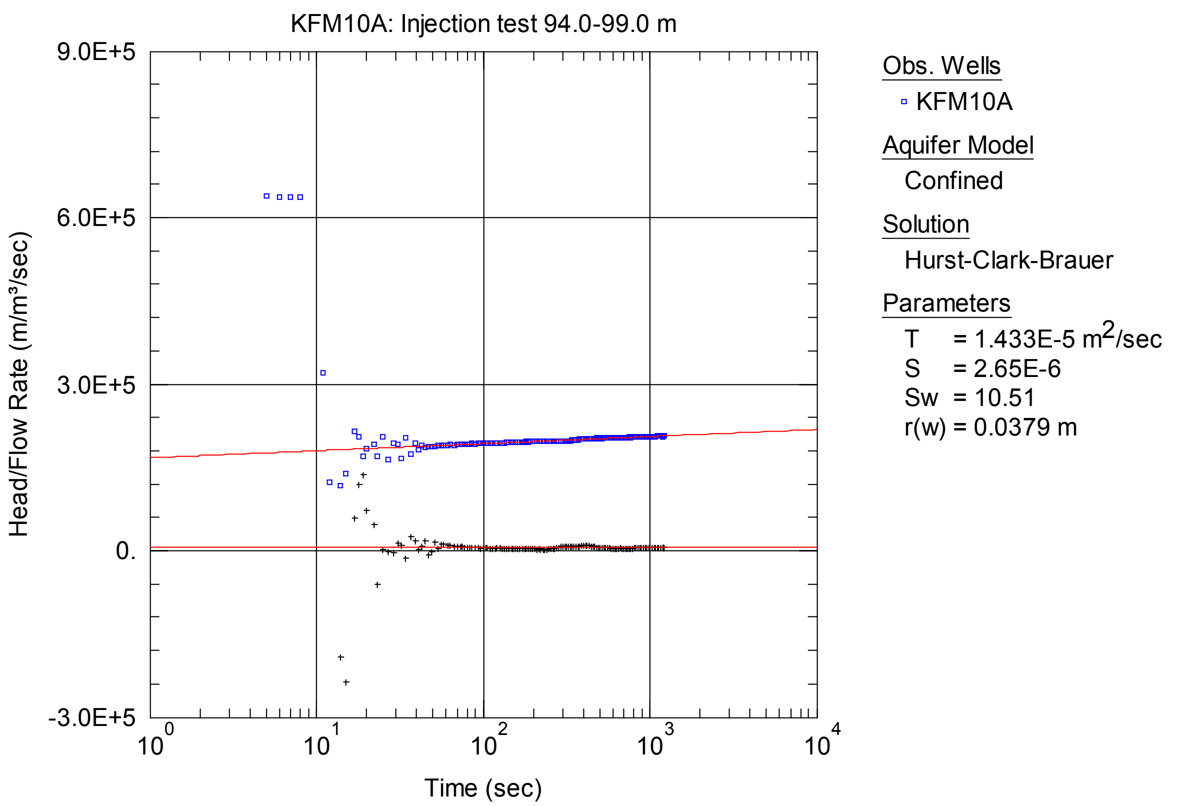


Figure A3-152. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 94.0-99.0 m in KFM10A.*

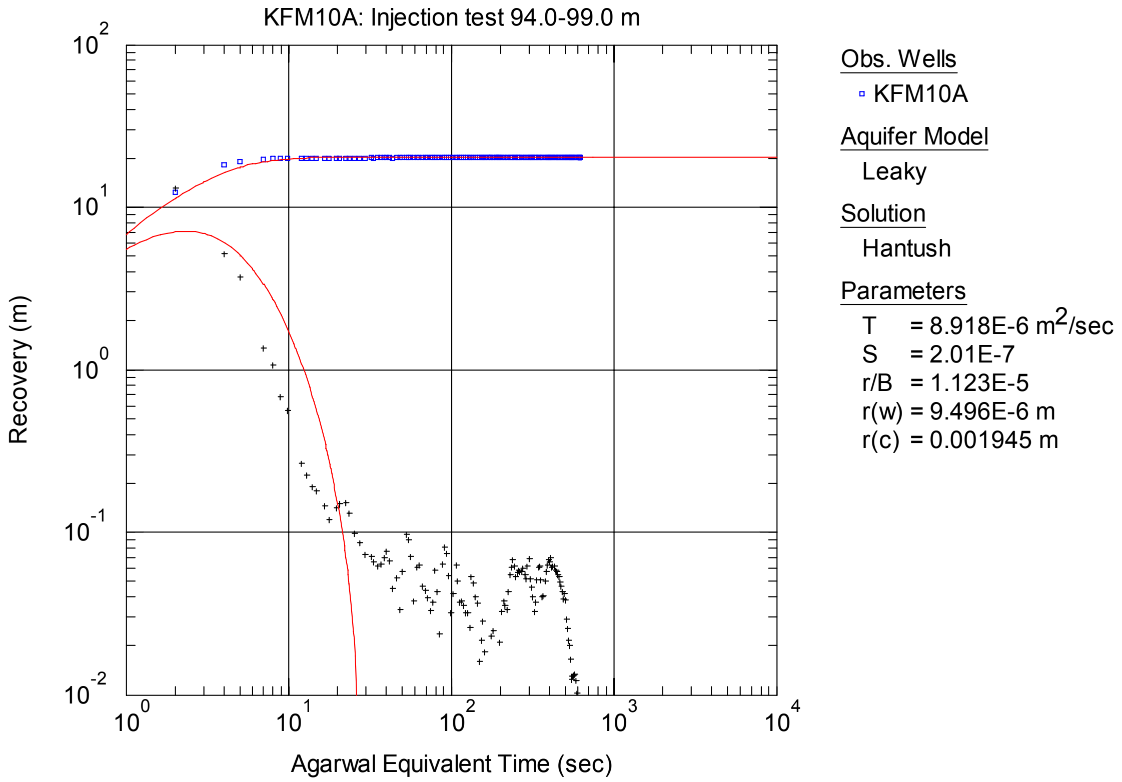


Figure A3-153. *Log-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 94.0-99.0 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

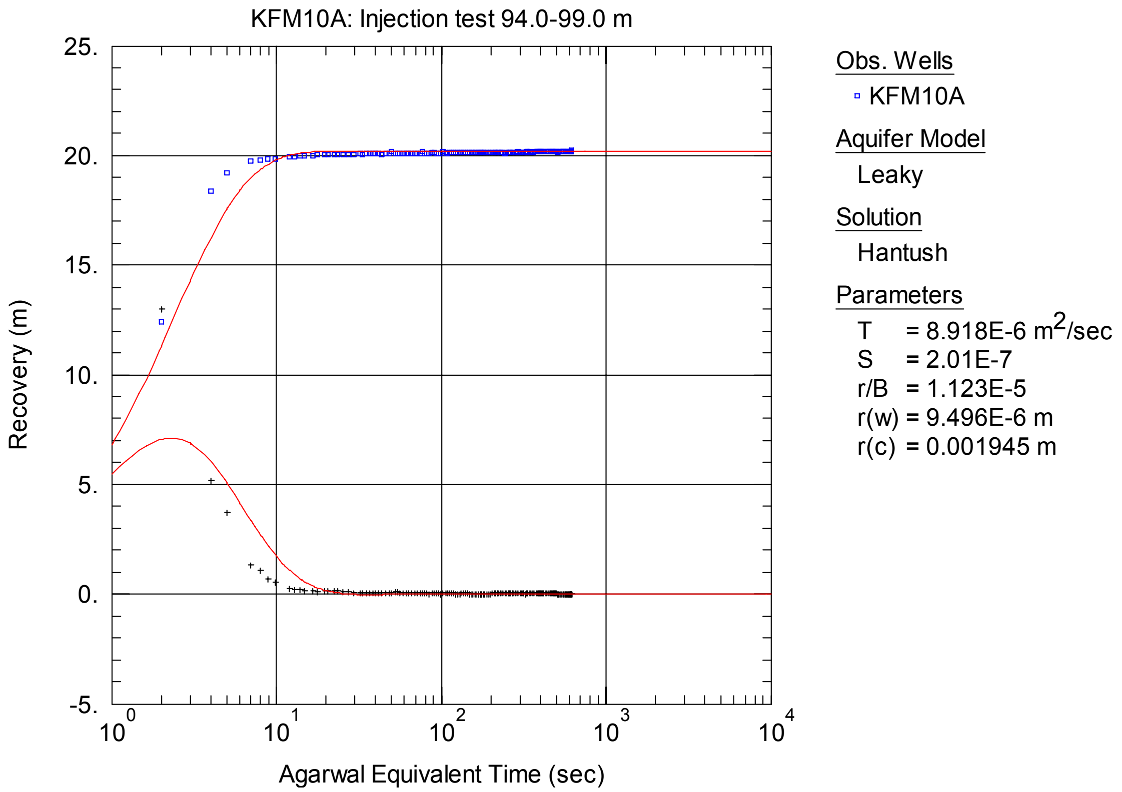


Figure A3-154. *Lin-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 94.0-99.0 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

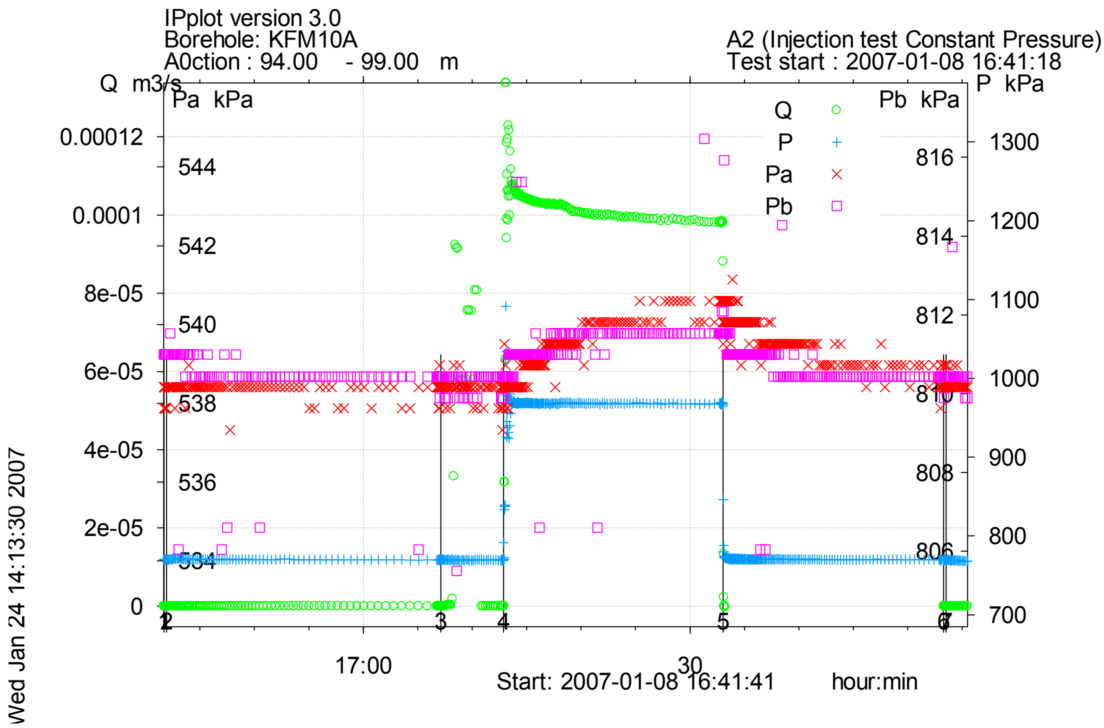


Figure A3-155. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 99.0-104.0 m in borehole KFM10A.*

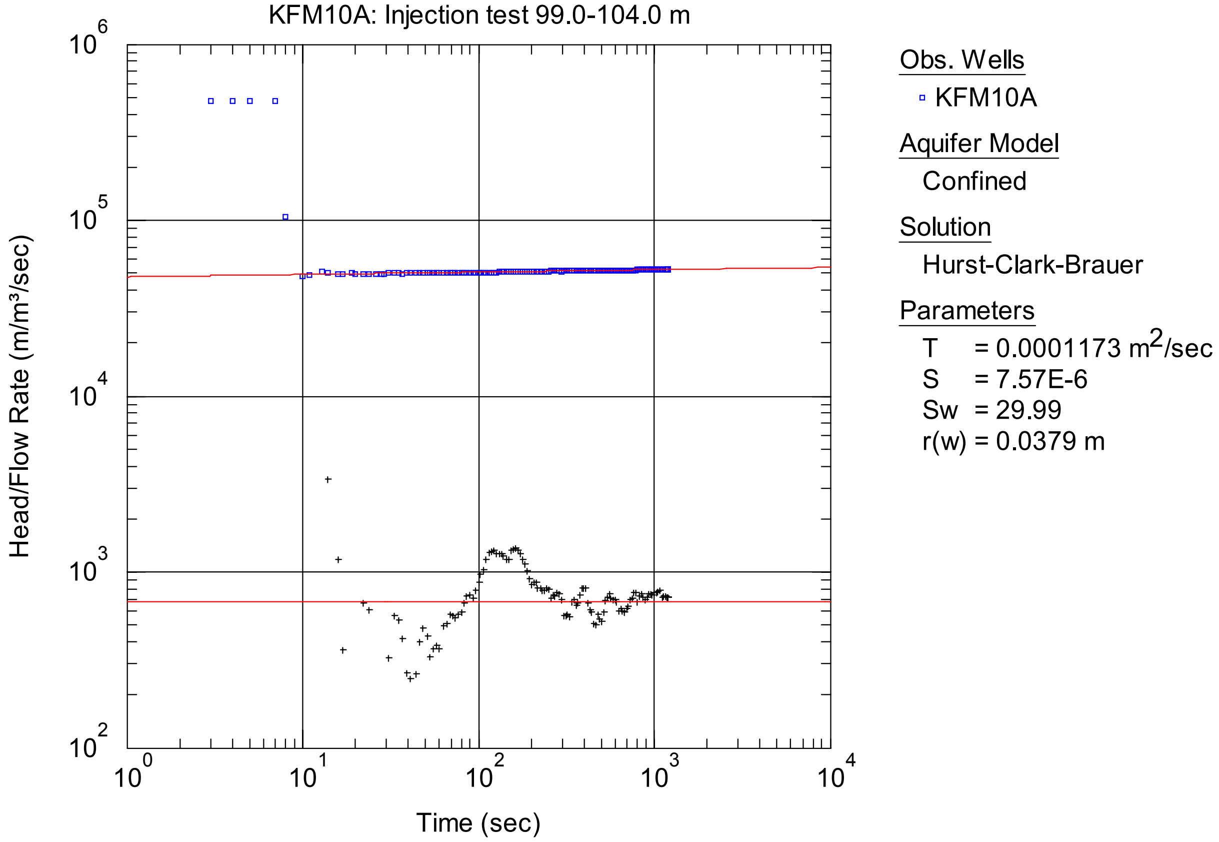


Figure A3-156. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 99.0-104.0 m in KFM10A.*

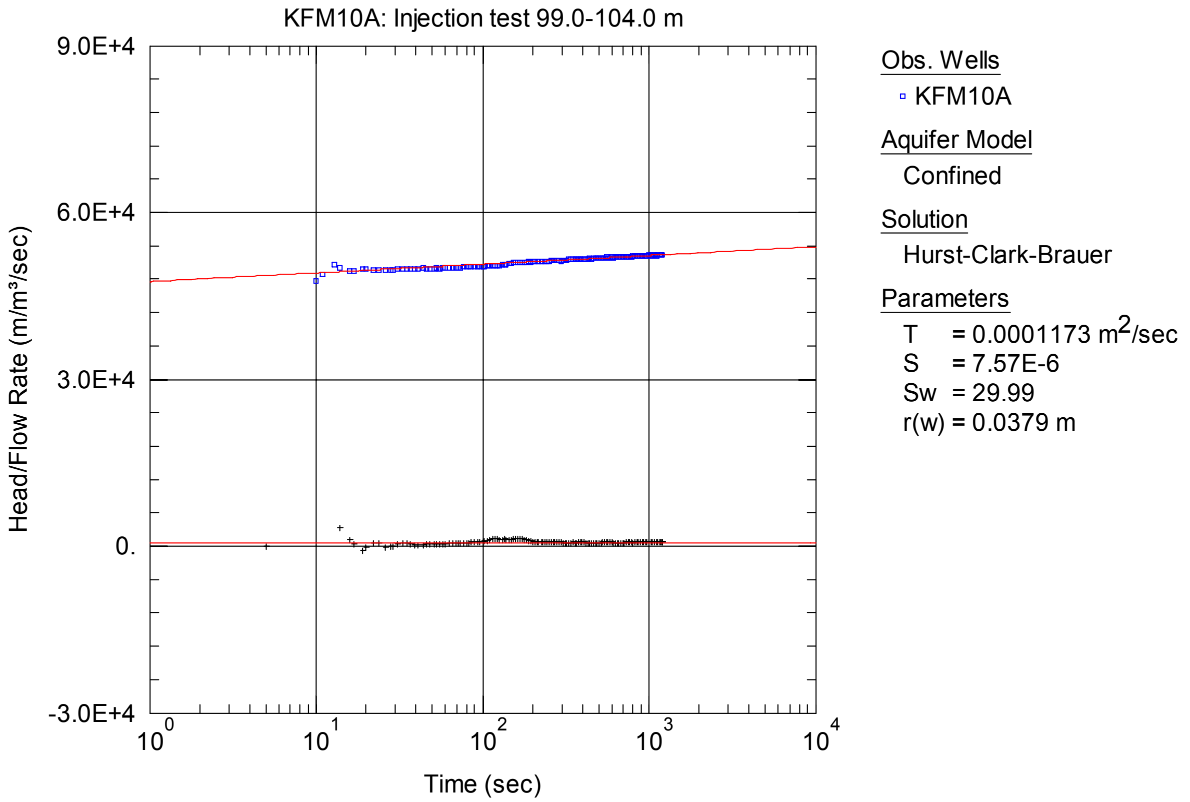


Figure A3-157. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 99.0-104.0 m in KFM10A.*

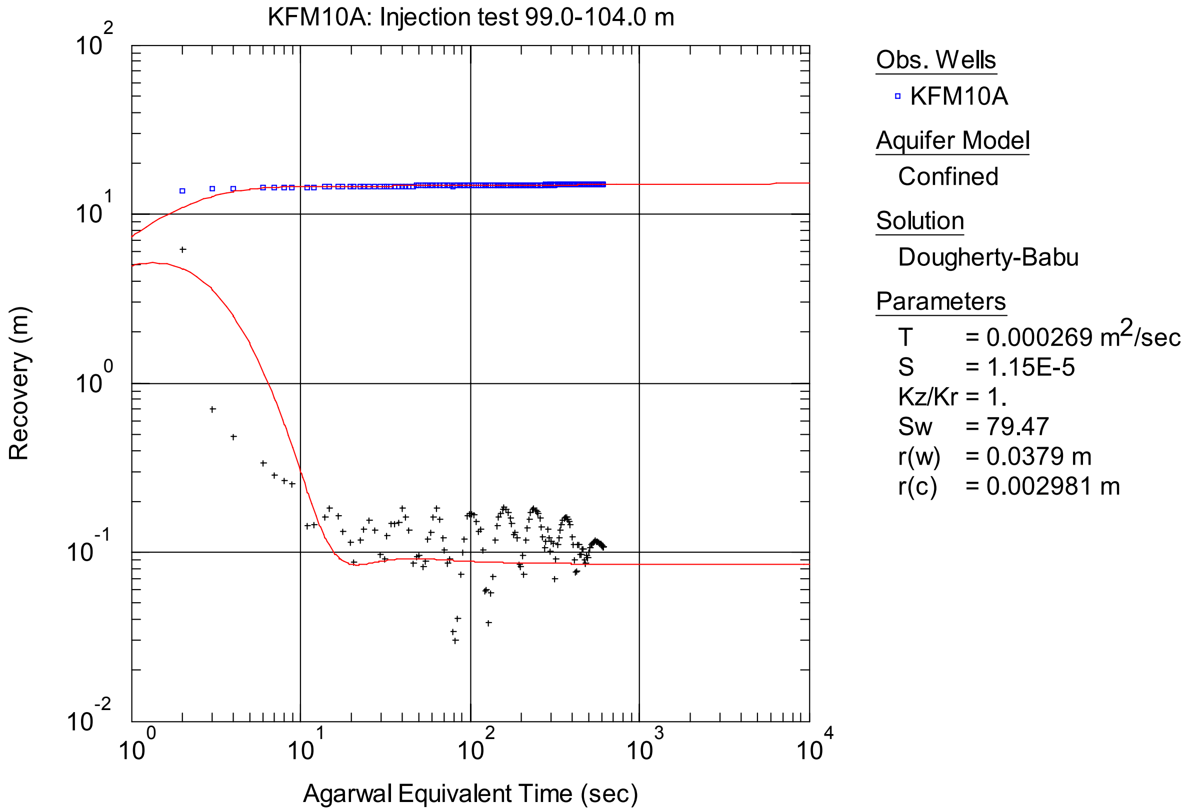


Figure A3-158. *Log-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 99.0-104.0 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

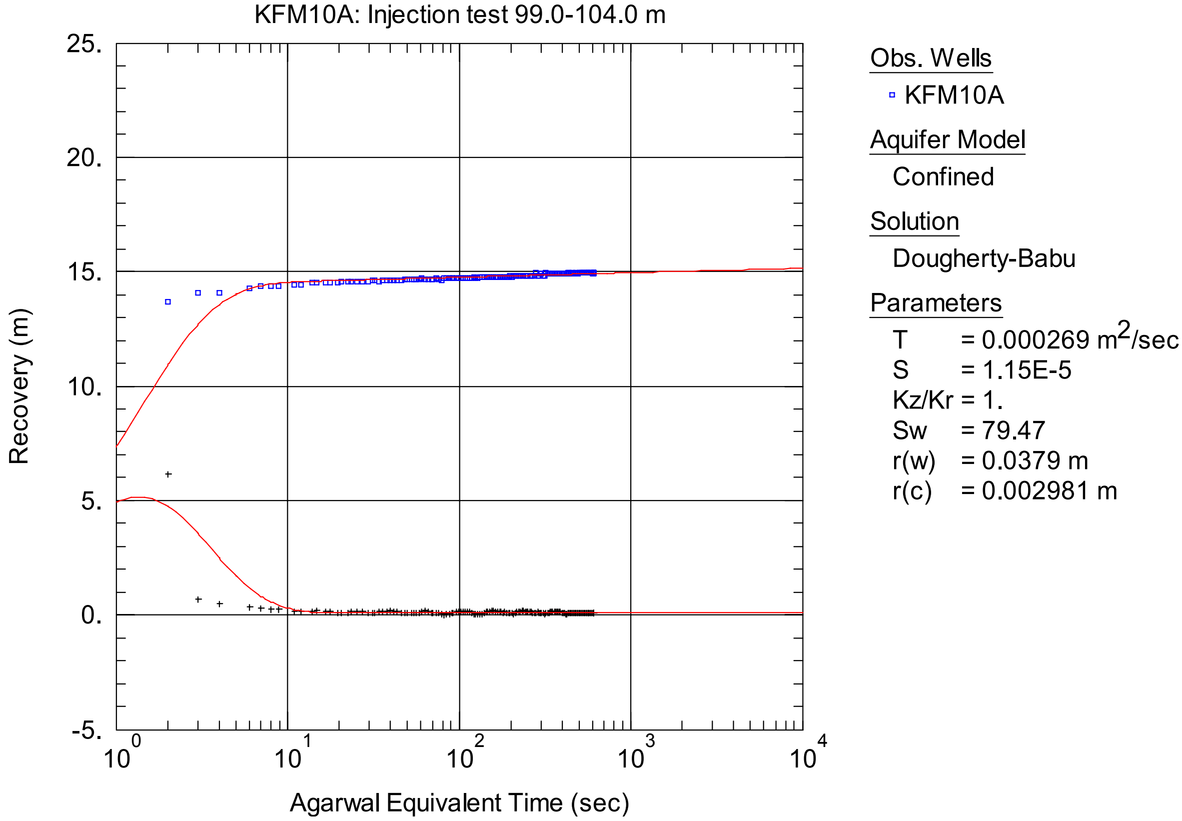


Figure A3-159. *Lin-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 94.0-99.0 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

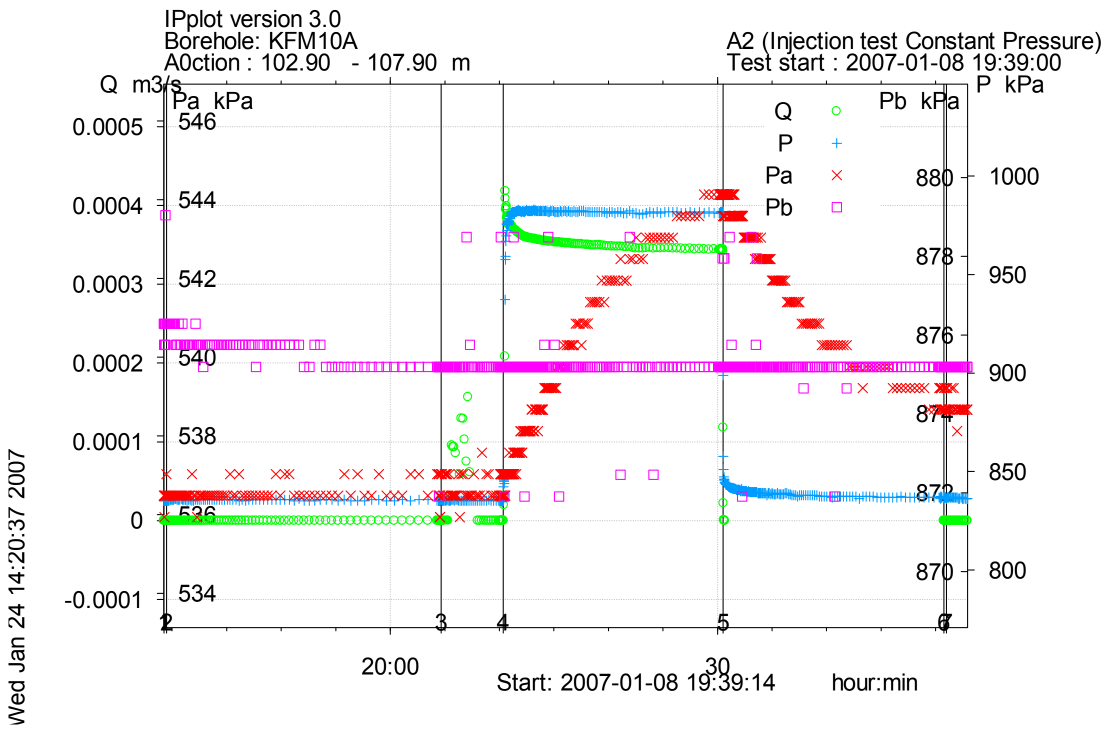


Figure A3-160. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 102.9-107.9 m in borehole KFM10A.*

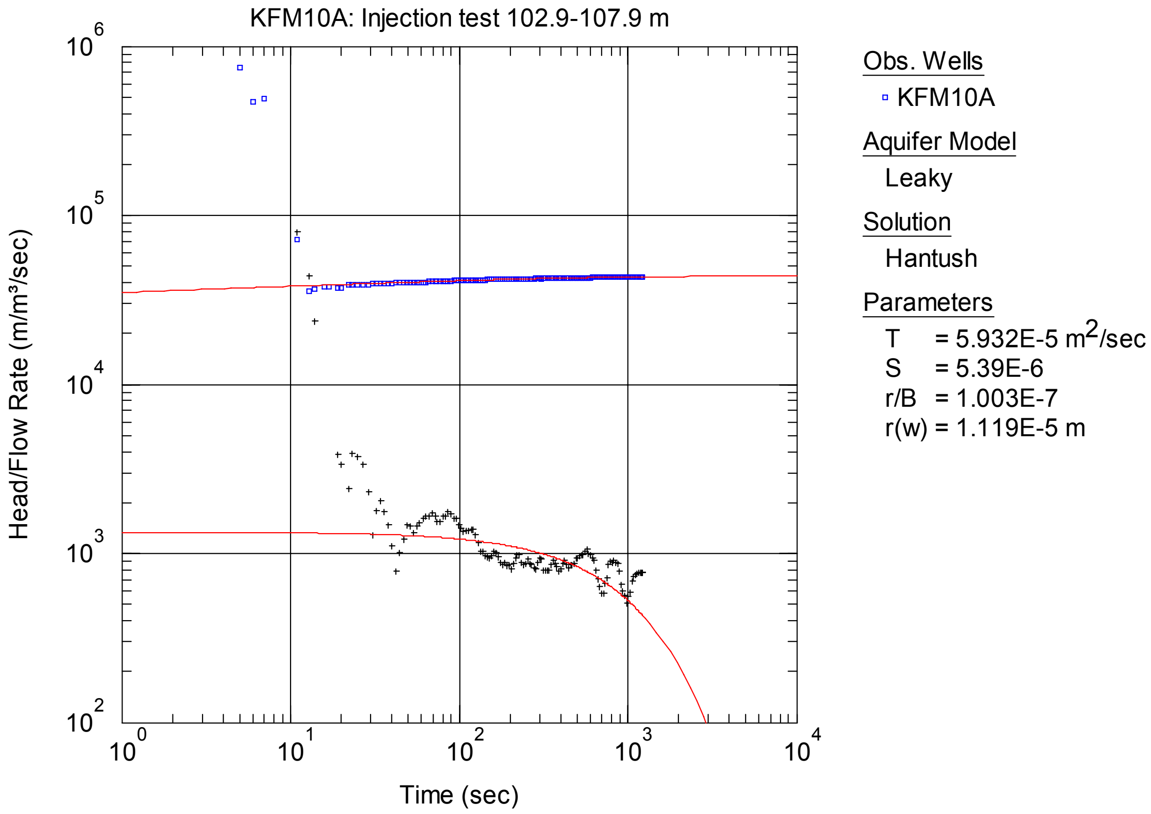


Figure A3-161*. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 102.9-107.9 m in KFM10A.*

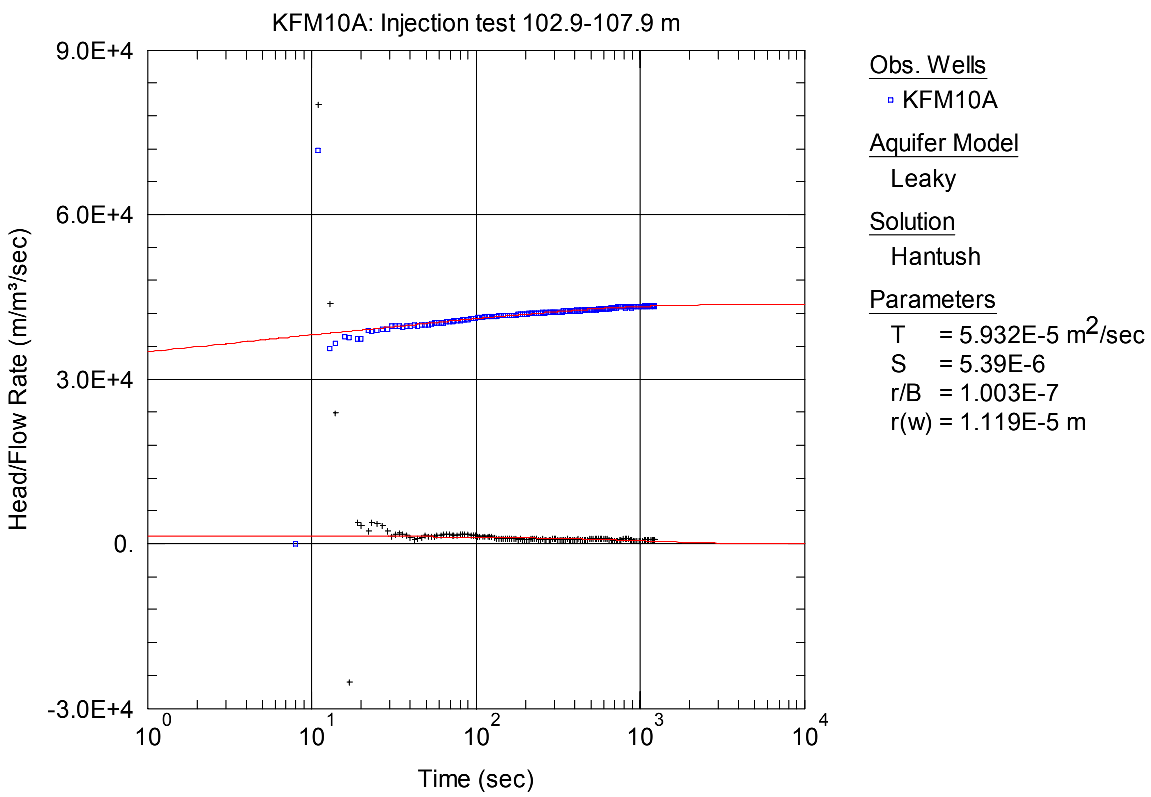


Figure A3-162. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 102.9-107.9 m in KFM10A.*

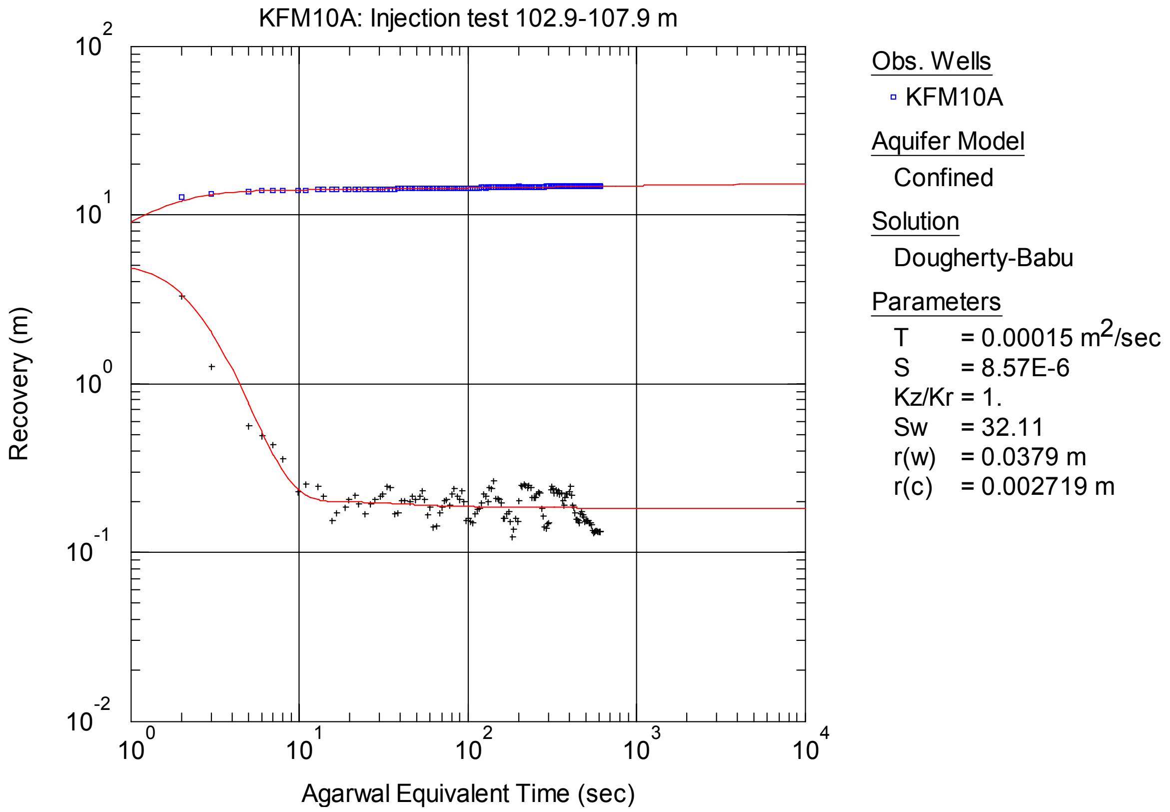


Figure A3-163. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 102.9-107.9 m in KFM10A.*

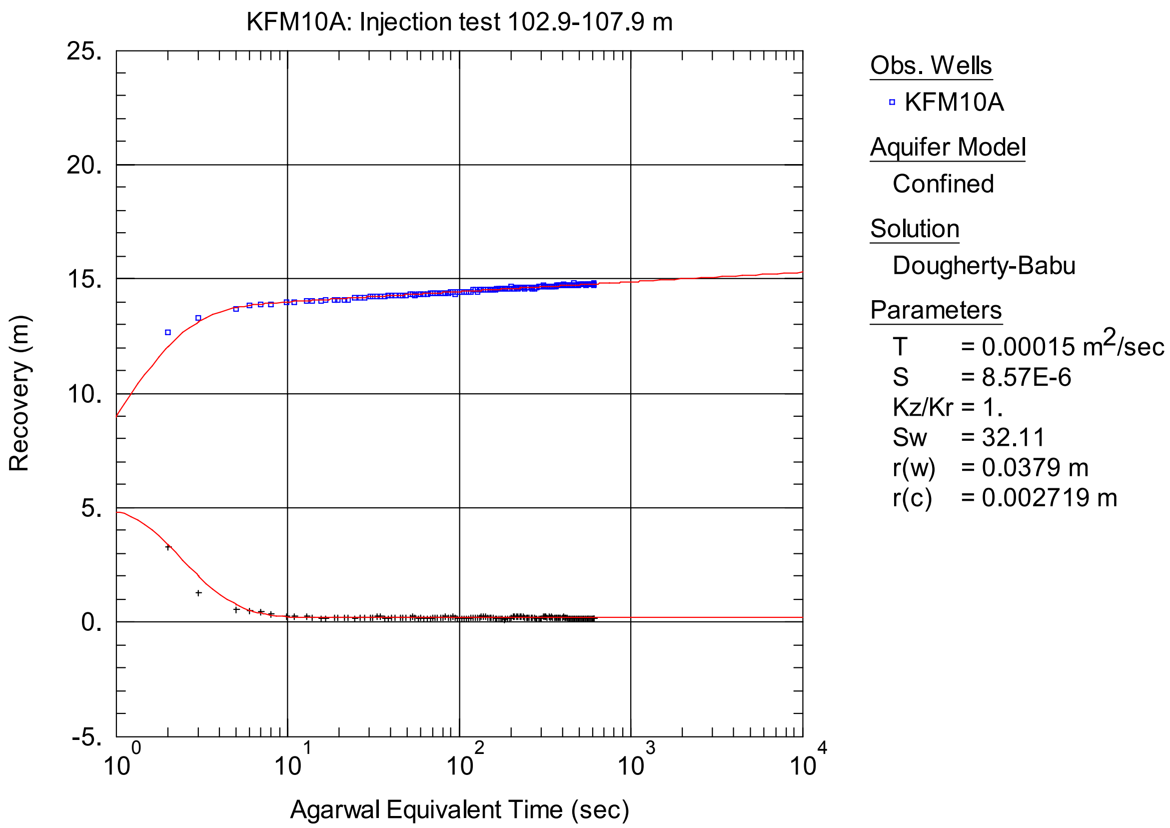


Figure A3-164. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 102.9-107.9 m in KFM10A.*

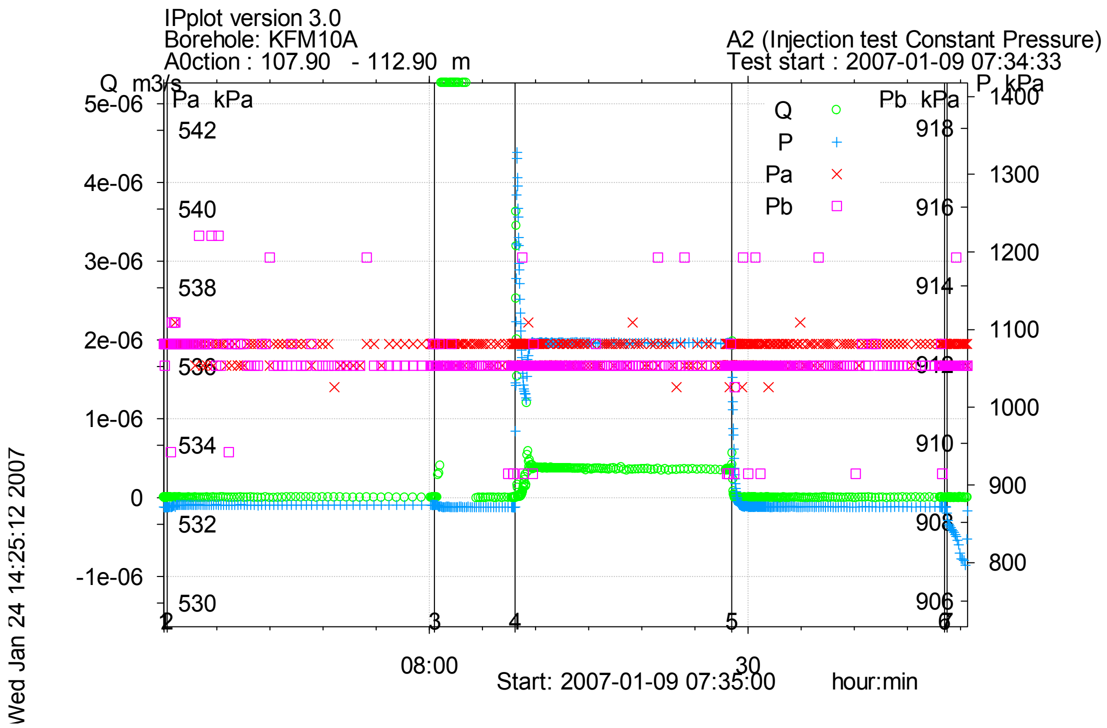


__Figure A3-165.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 107.9-112.9 m in borehole KFM10A.

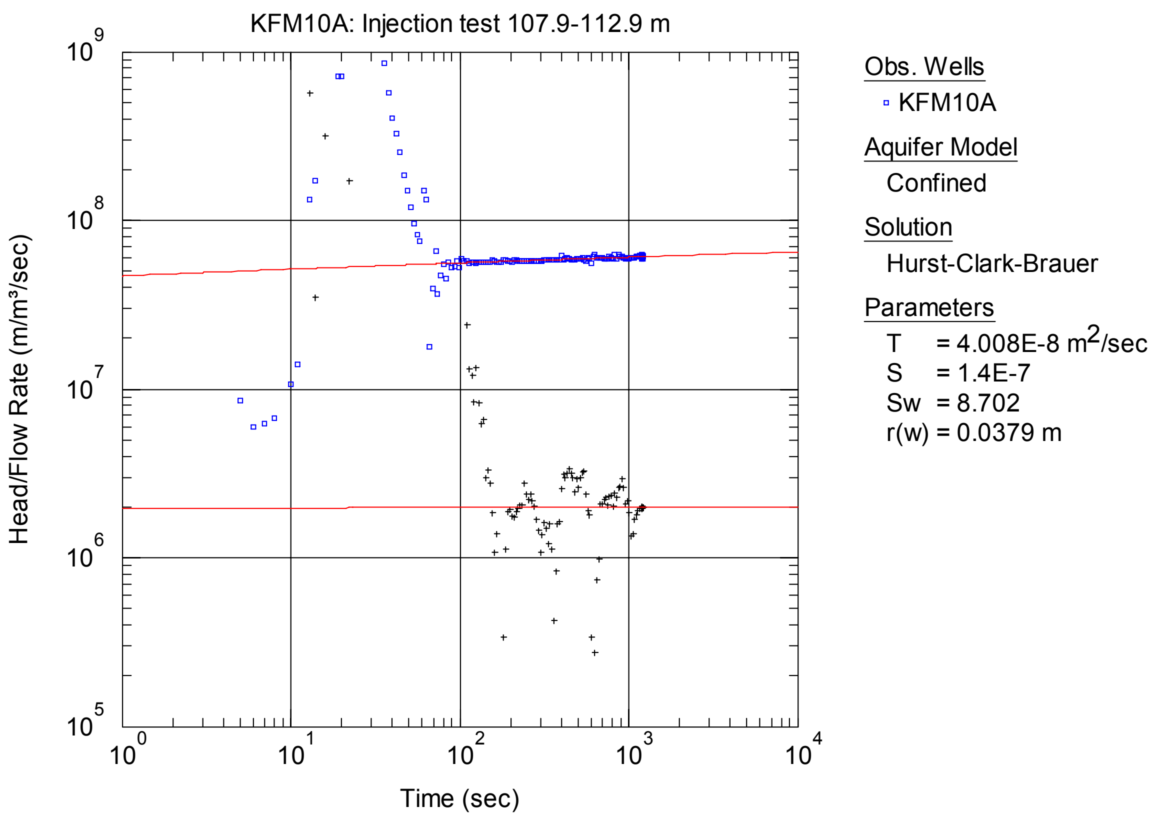


__Figure A3-166.__ Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 107.9-112.9 m in KFM10A.

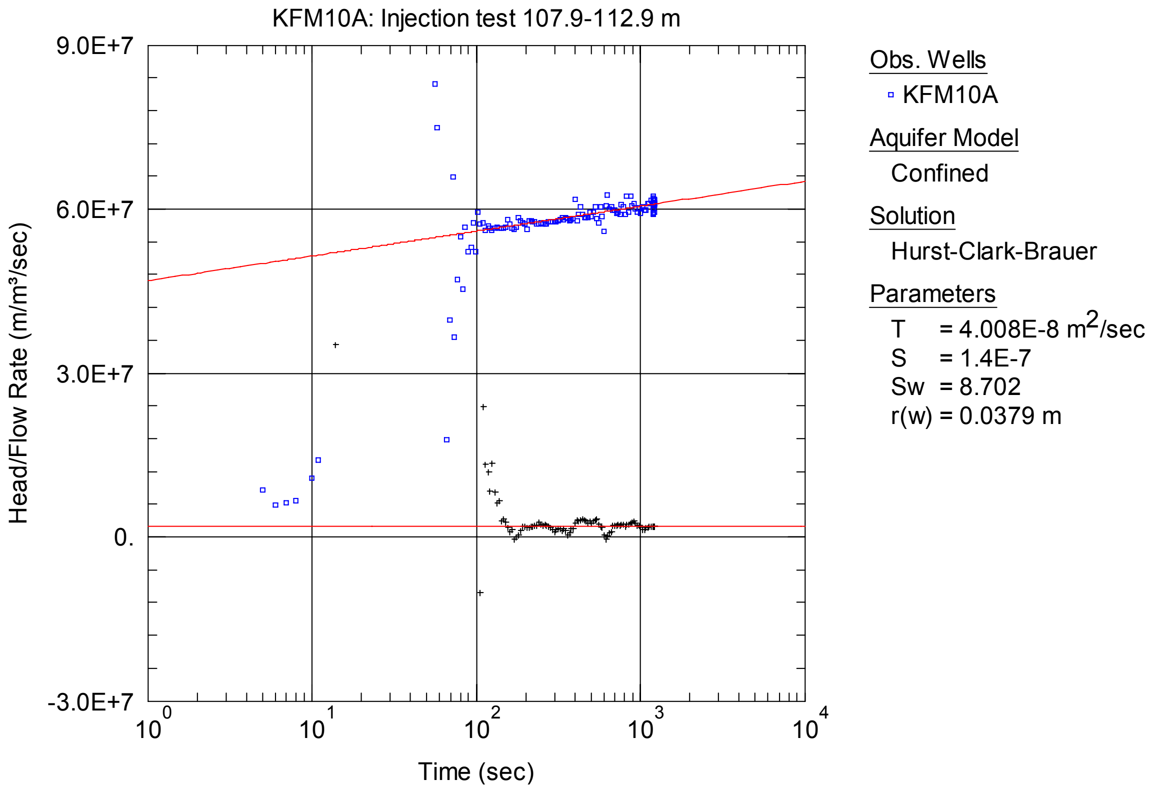


Figure A3-167. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 107.9-112.9 m in KFM10A.*

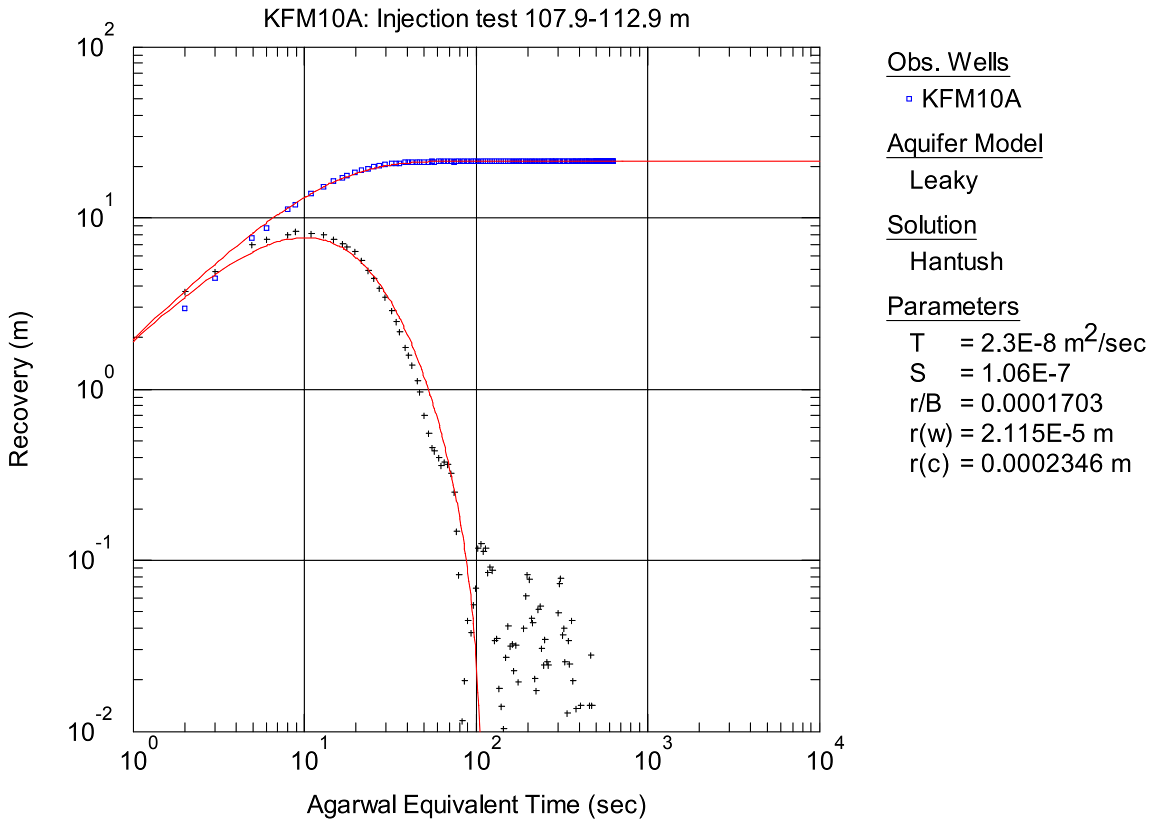


Figure A3-168. *Log-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 107.9-112.9 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

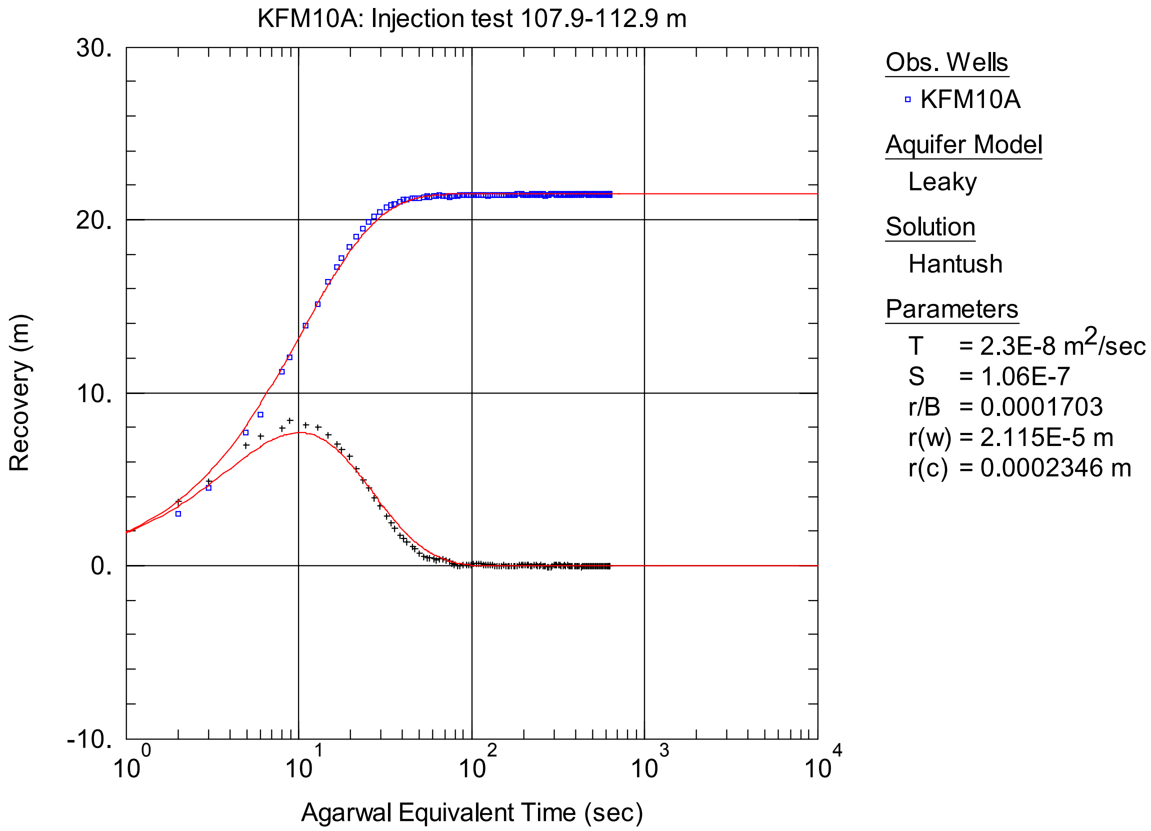


Figure A3-169. *Lin-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 107.9-112.9 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

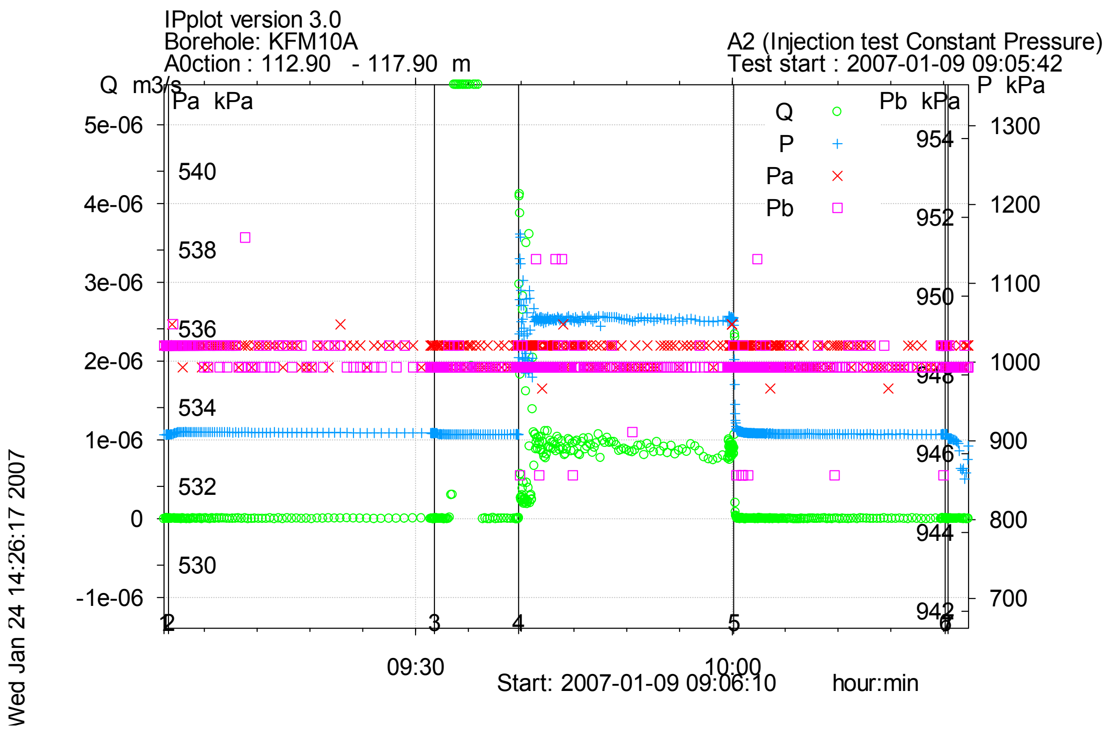


Figure A3-170. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 112.9-117.9 m in borehole KFM10A.*

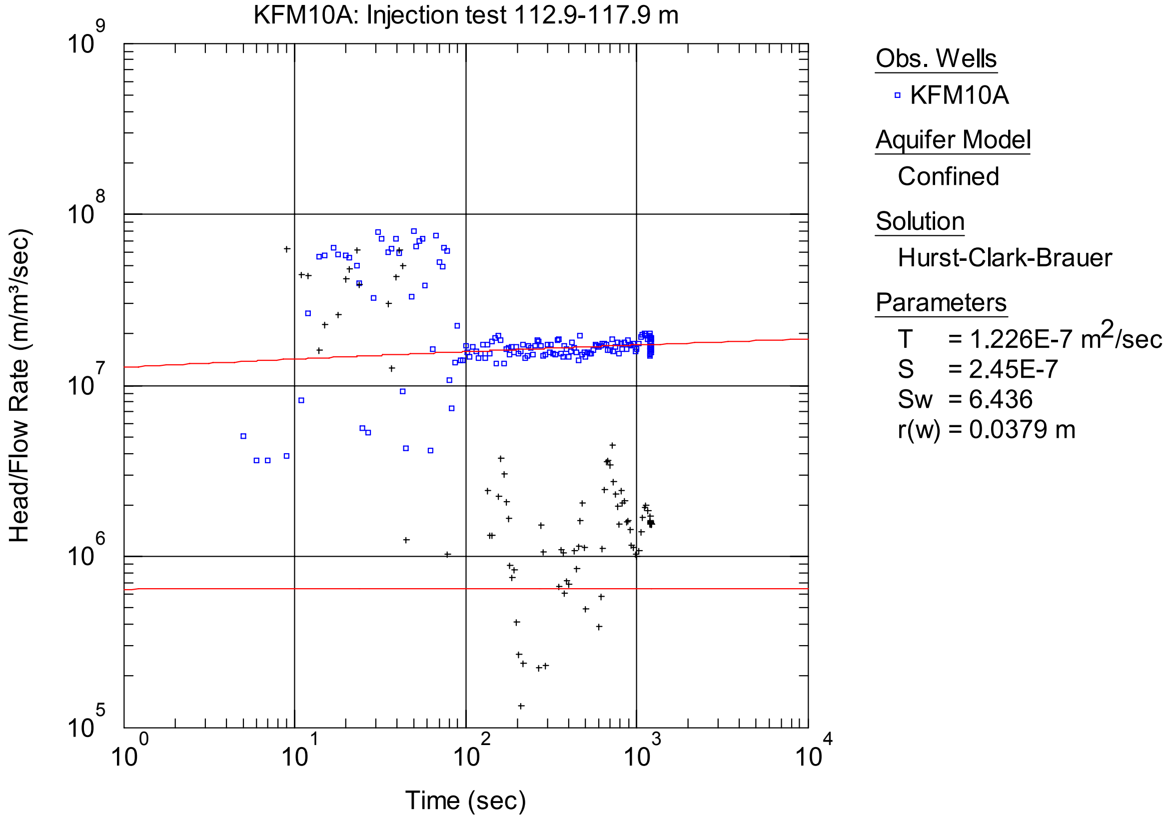


Figure A3-171. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 112.9-117.9 m in KFM10A.*

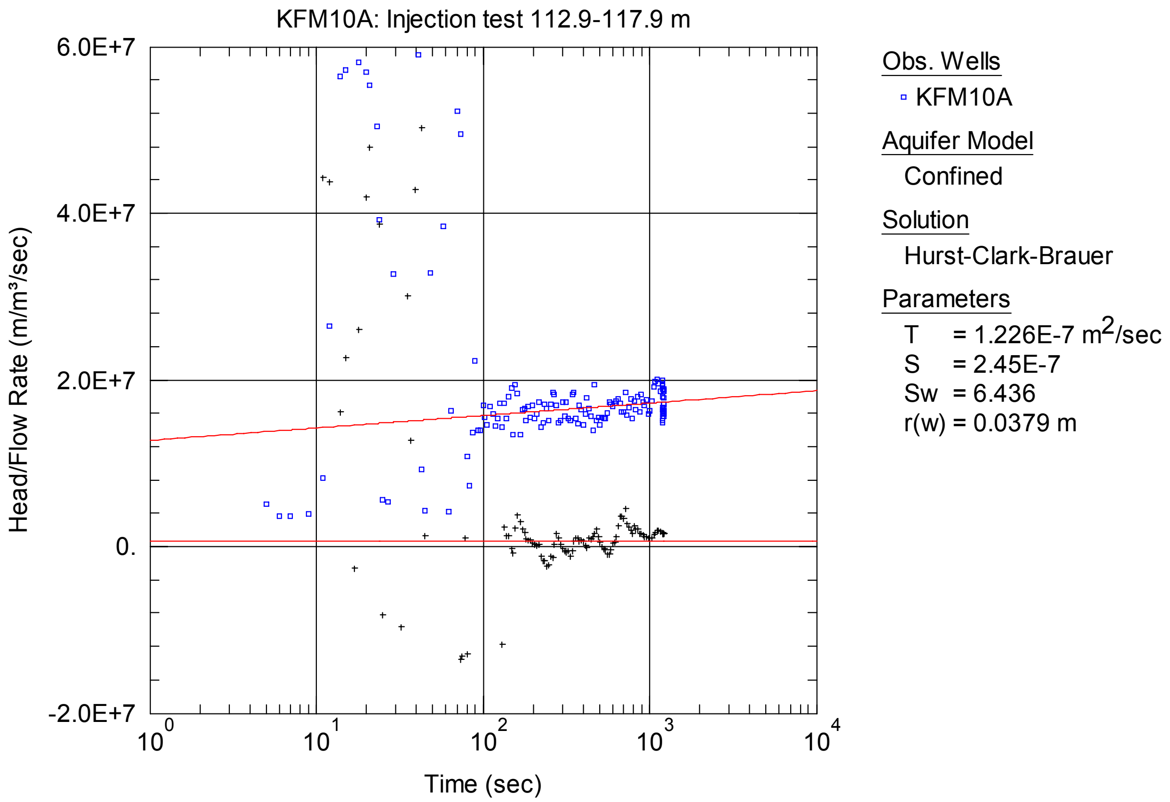


Figure A3-172. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 112.9-117.9 m in KFM10A.*

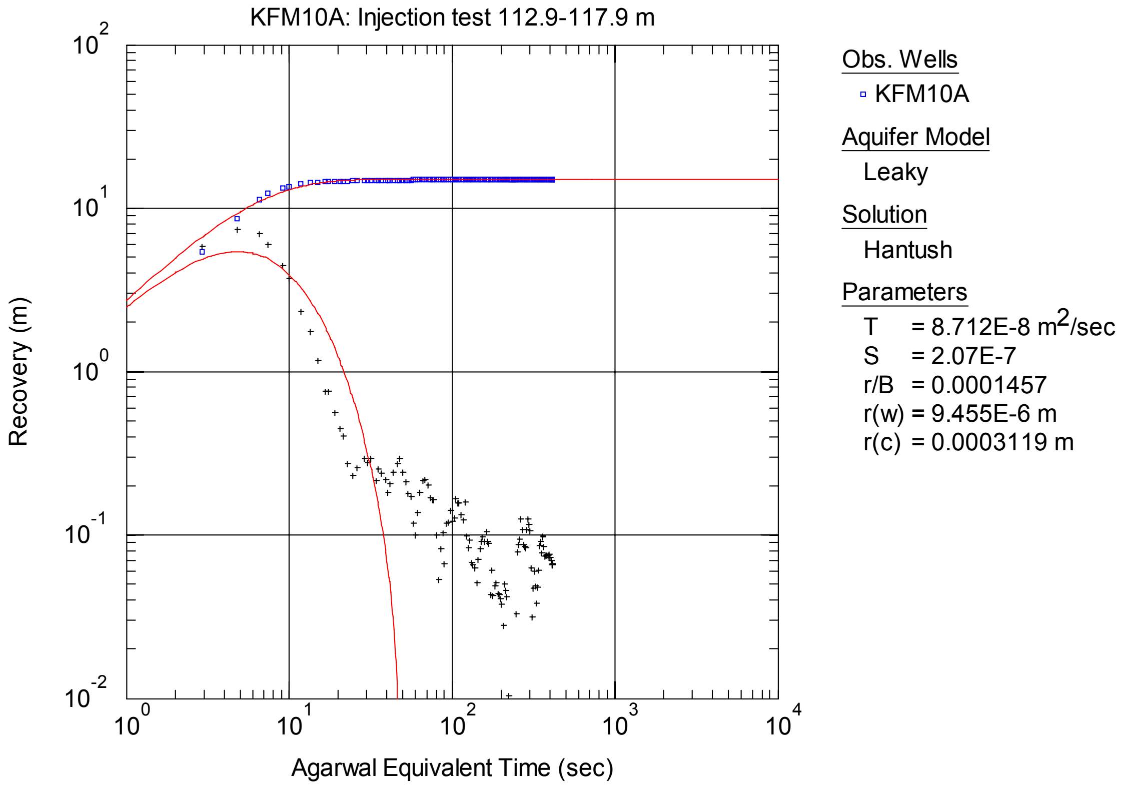


Figure A3-173. *Log-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 112.9-117.9 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

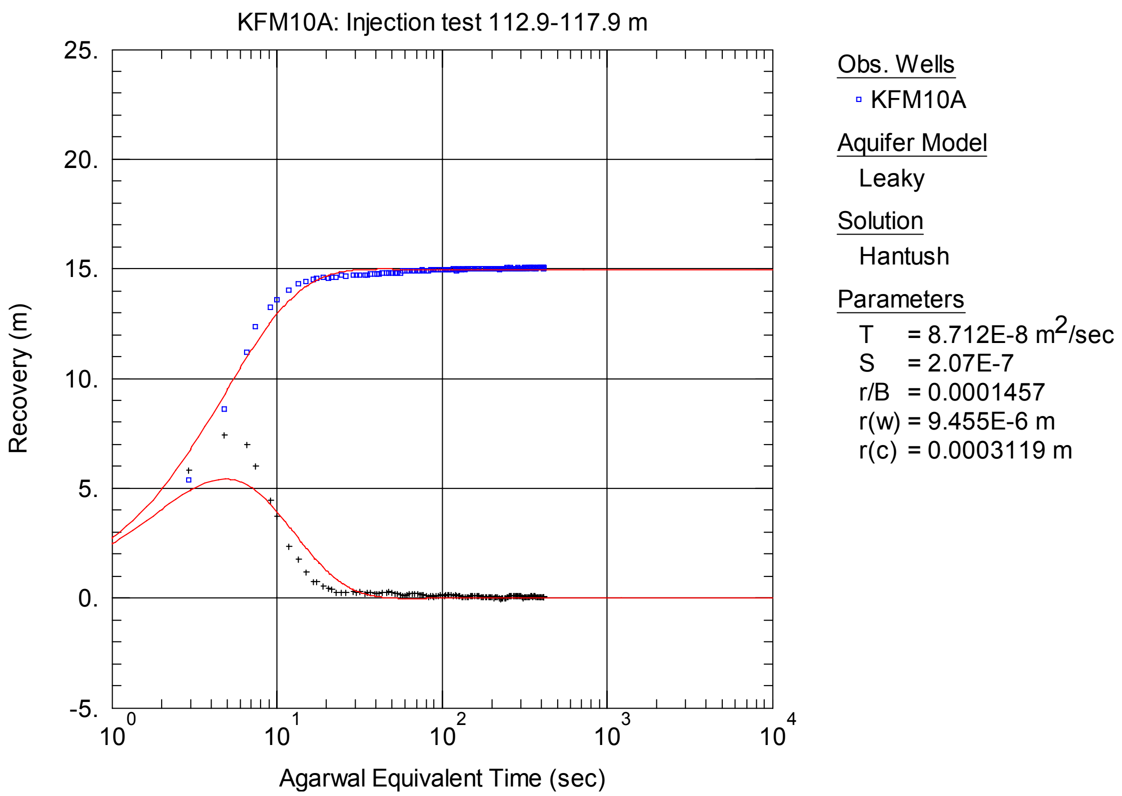


Figure A3-174. *Lin-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 112.9-117.9 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

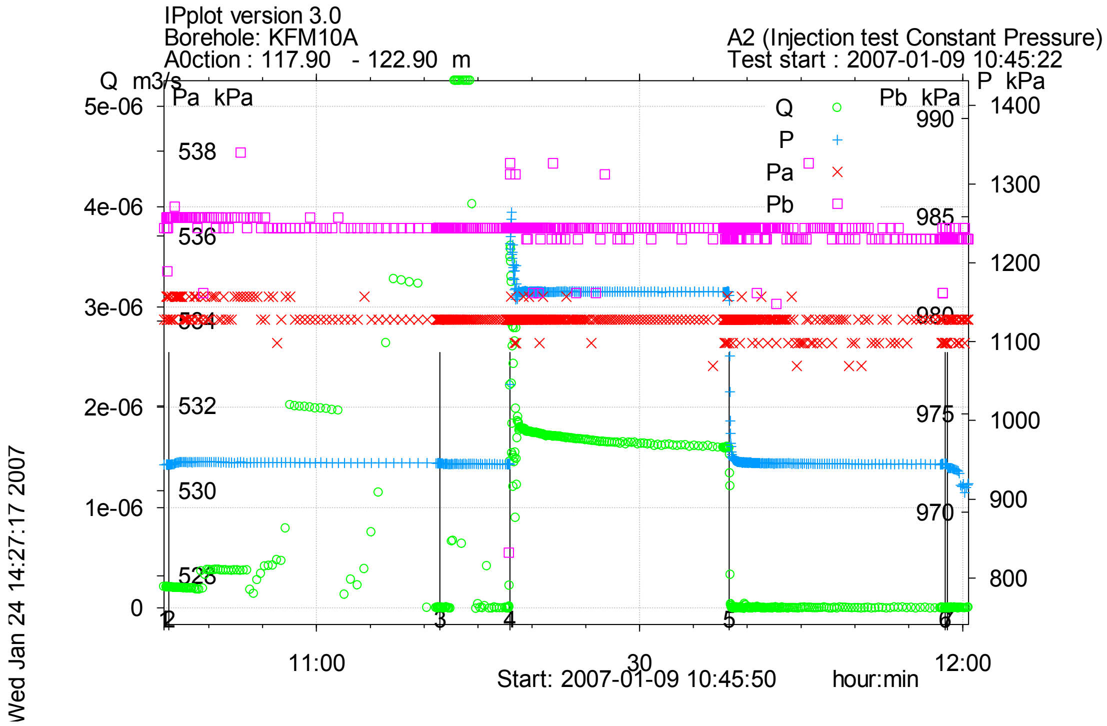


Figure A3-175. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 117.9-122.9 m in borehole KFM10A.

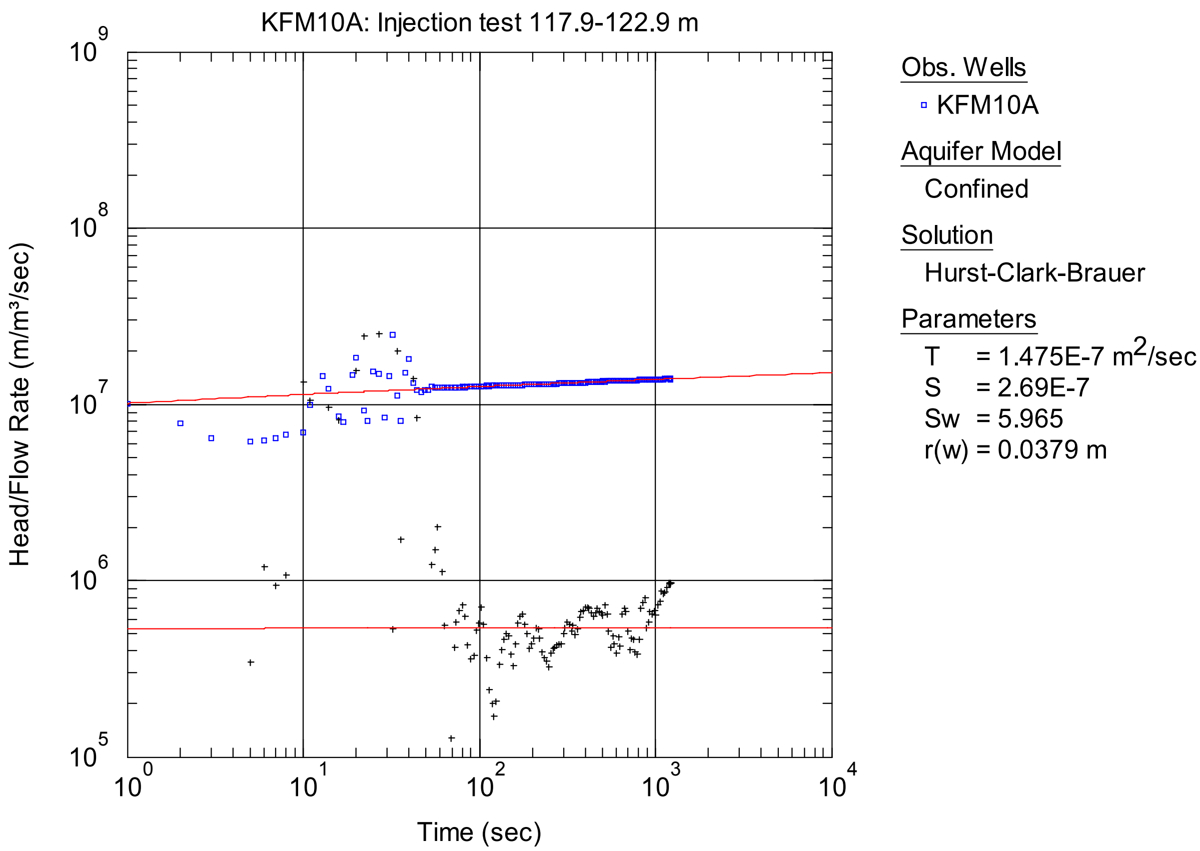


Figure A3-176. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 117.9-122.9 m in KFM10A.

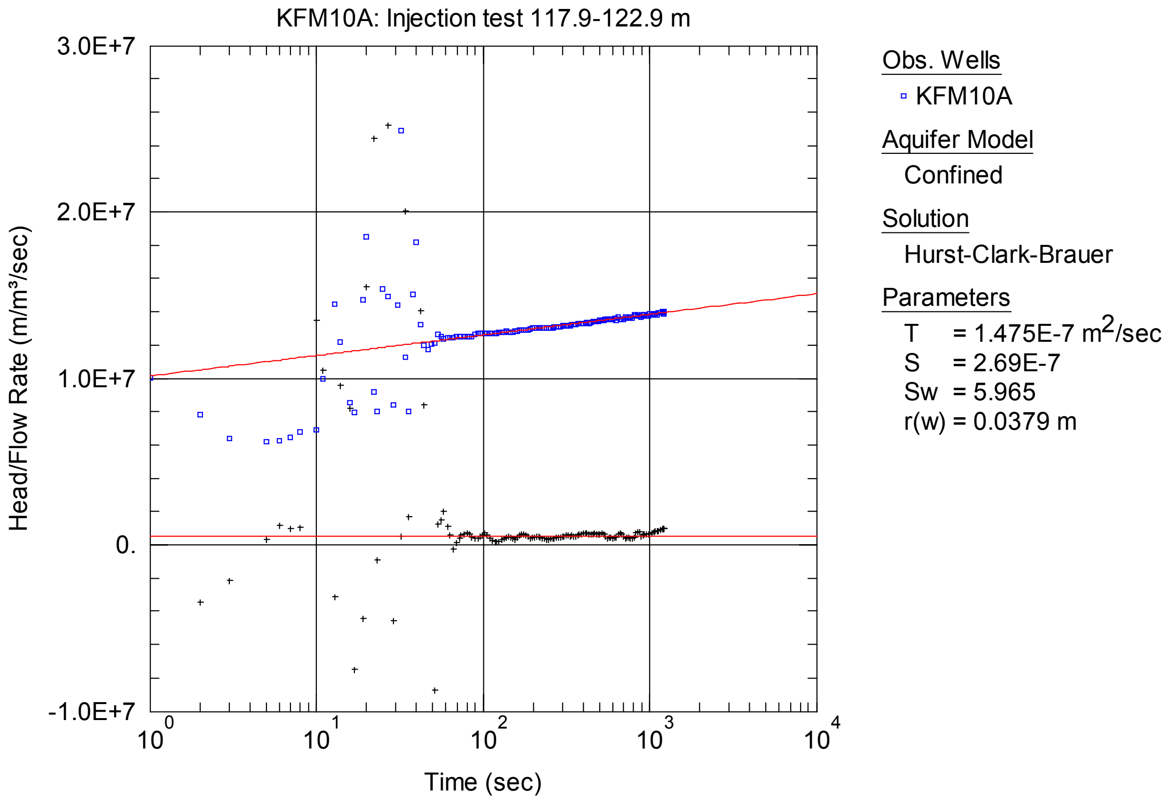


Figure A3-177. Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 117.9-122.9 m in KFM10A.

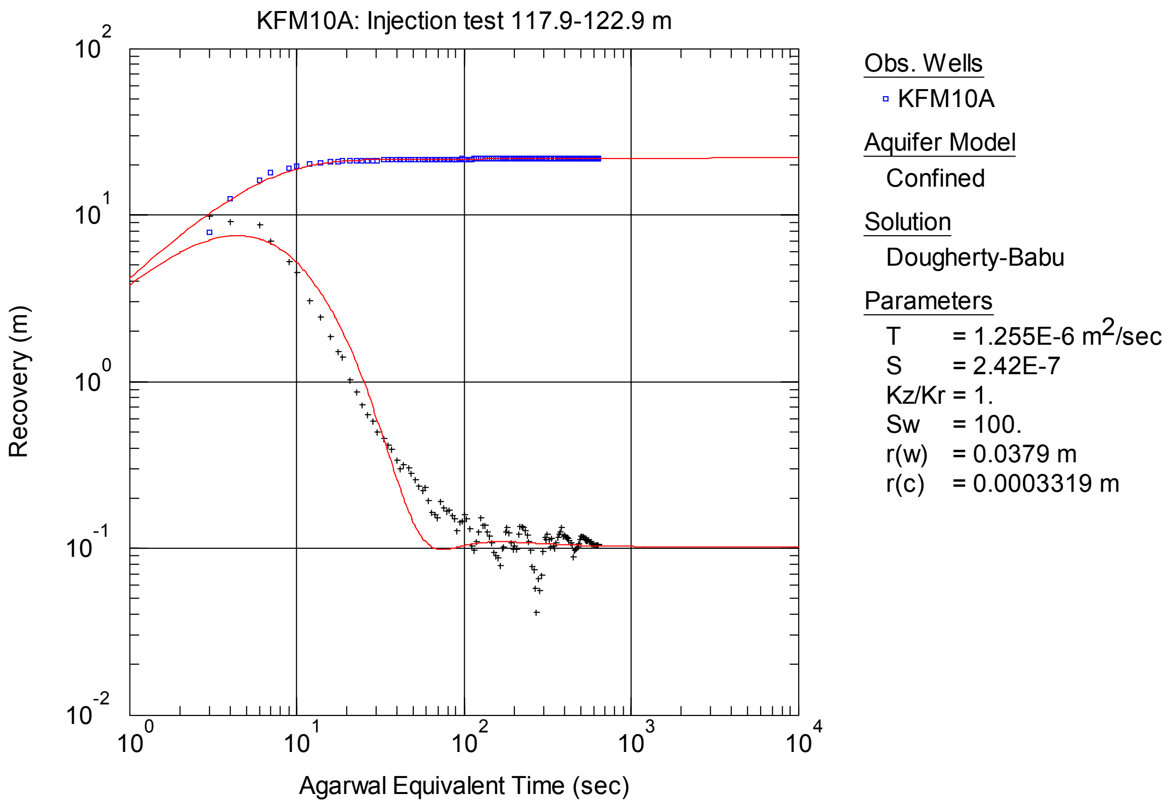


Figure A3-178. Log-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 117.9-122.9 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.

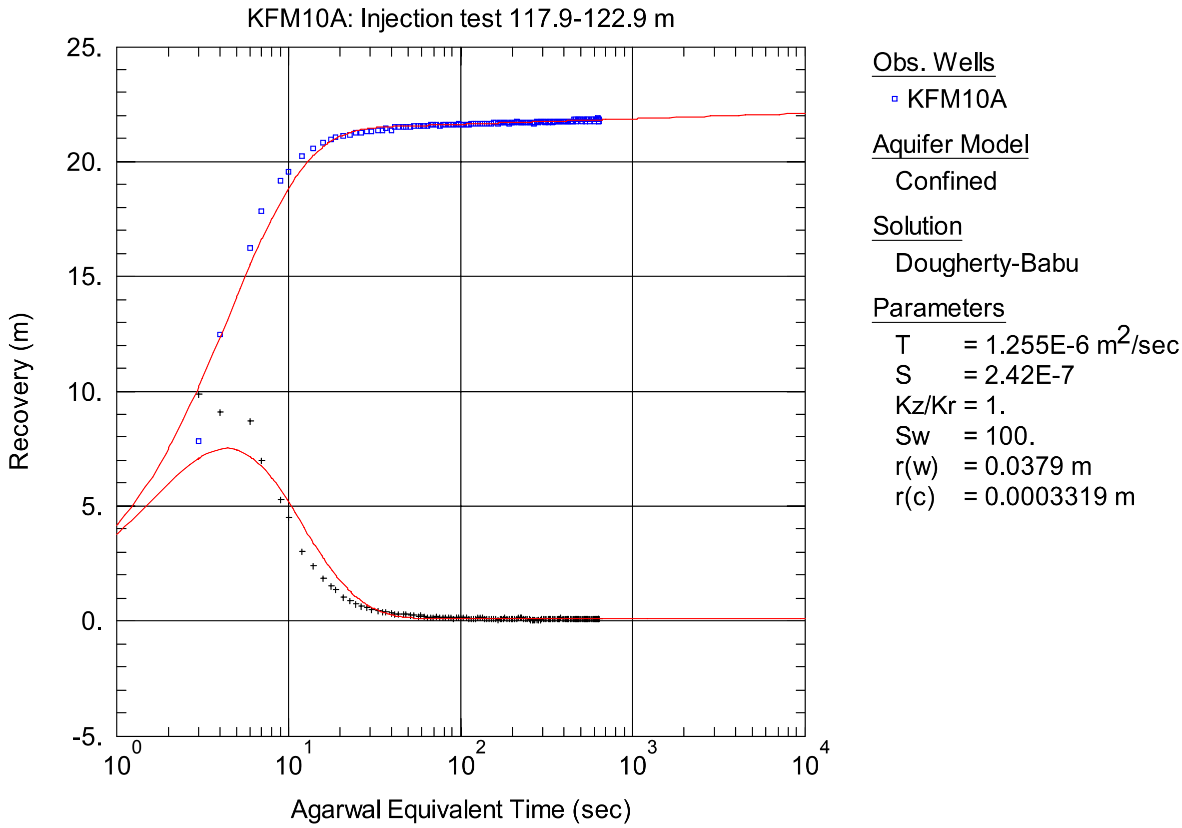


Figure A3-179. *Lin-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 117.9-122.9 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

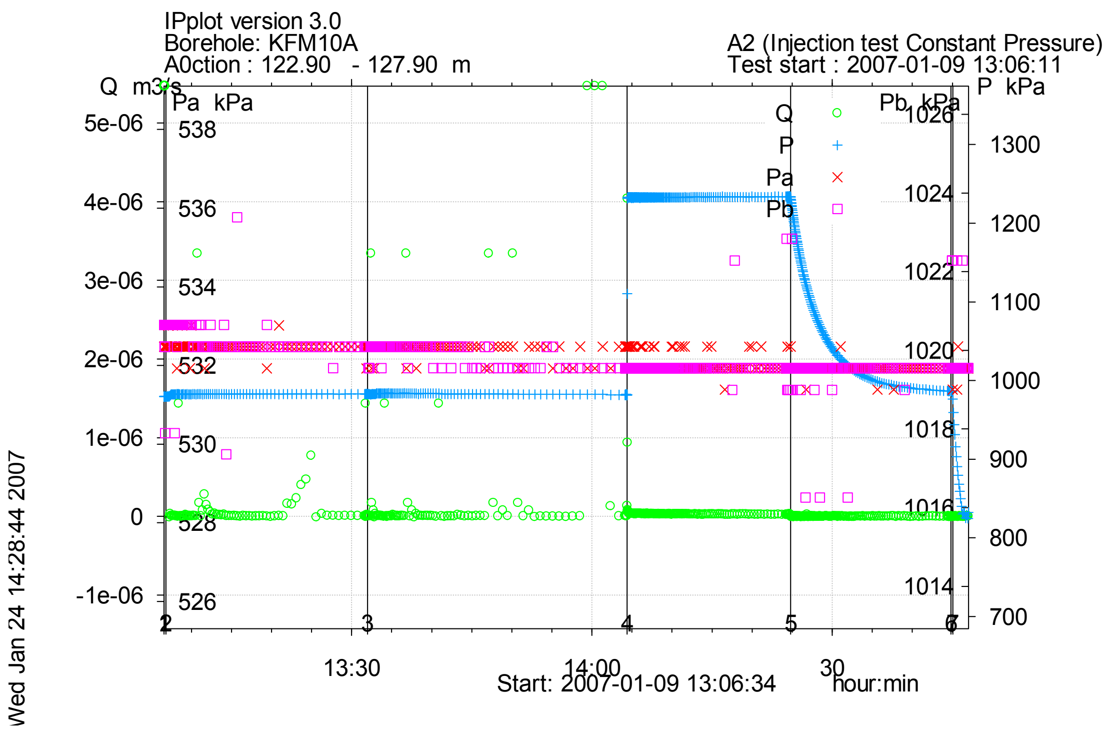


Figure A3-180. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 122.9-127.9 m in borehole KFM10A.*

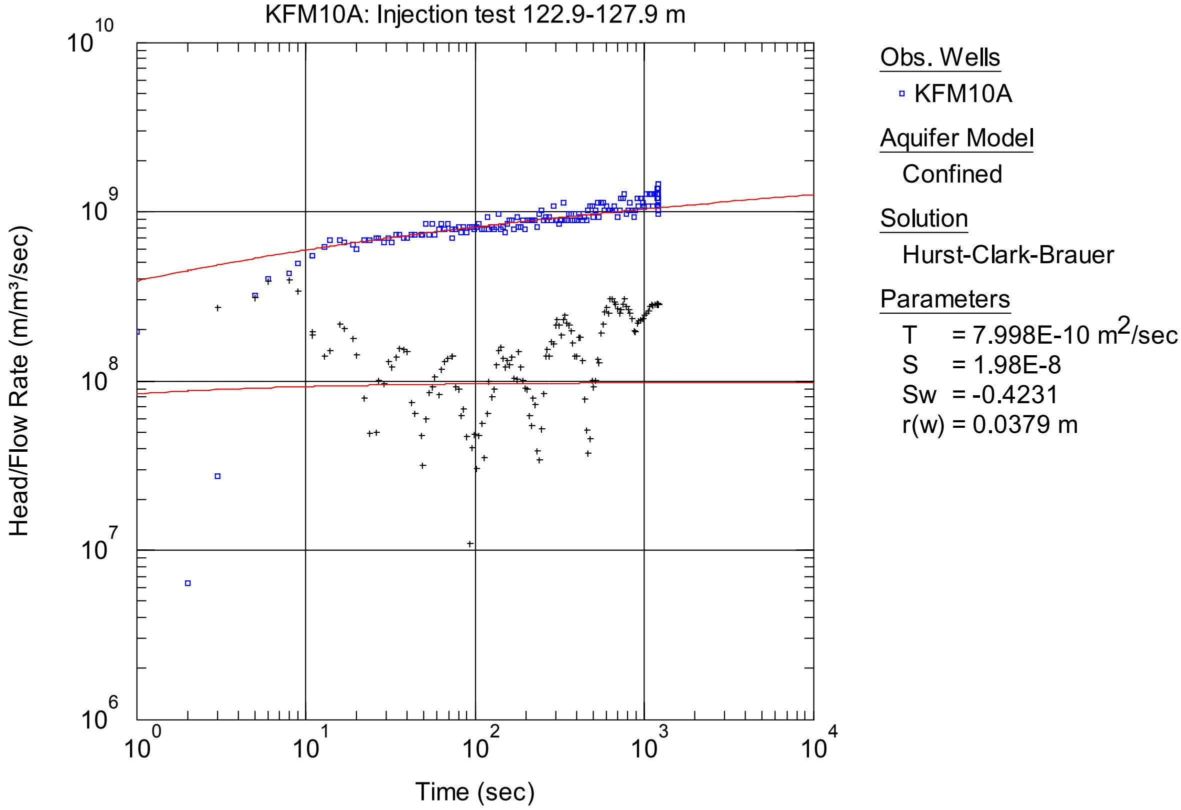


Figure A3-181. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 122.9-127.9 m in KFM10A.*

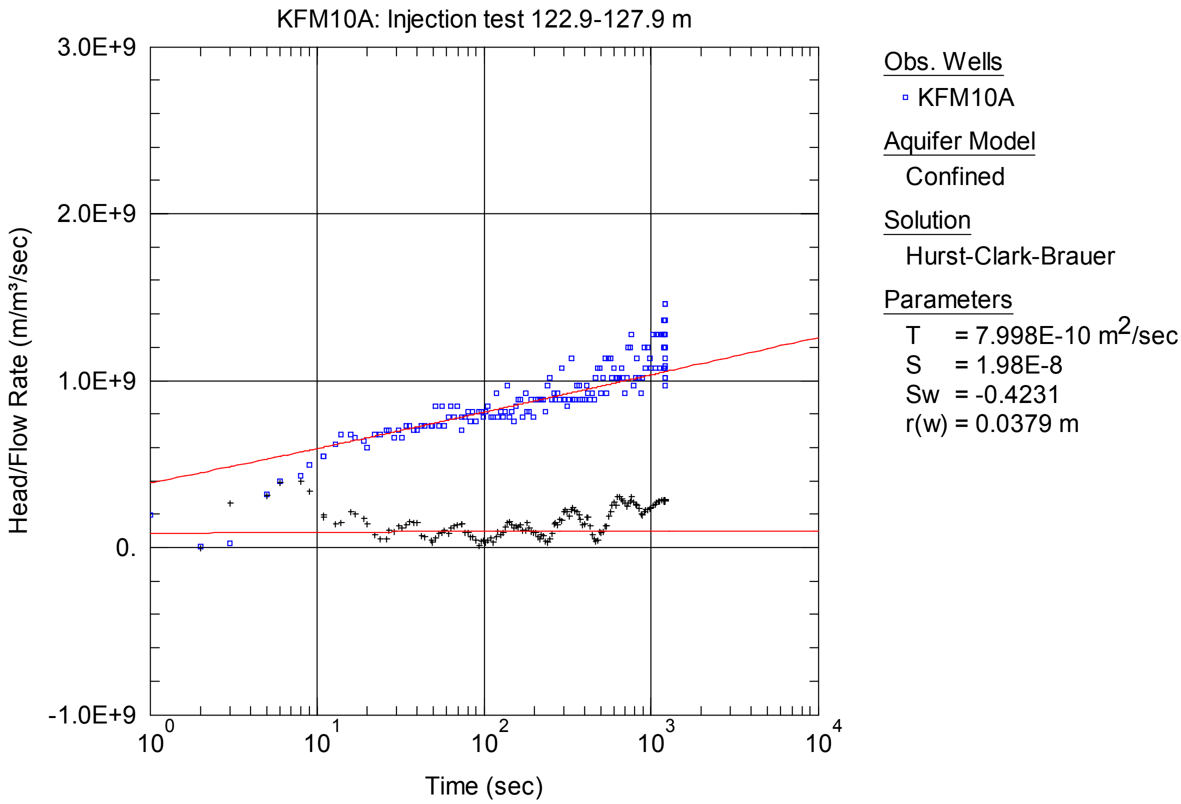


Figure A3-182. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 122.9-127.9 m in KFM10A.*

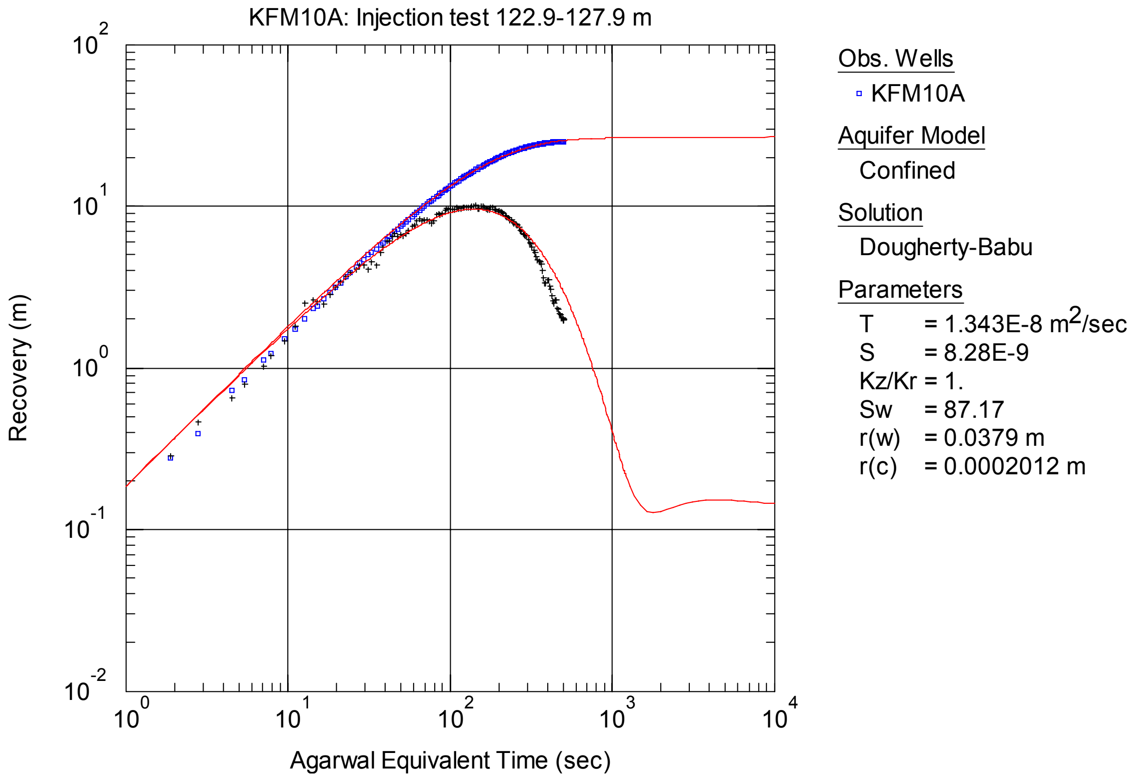


Figure A3-183. *Log-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 122.9-127.9 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

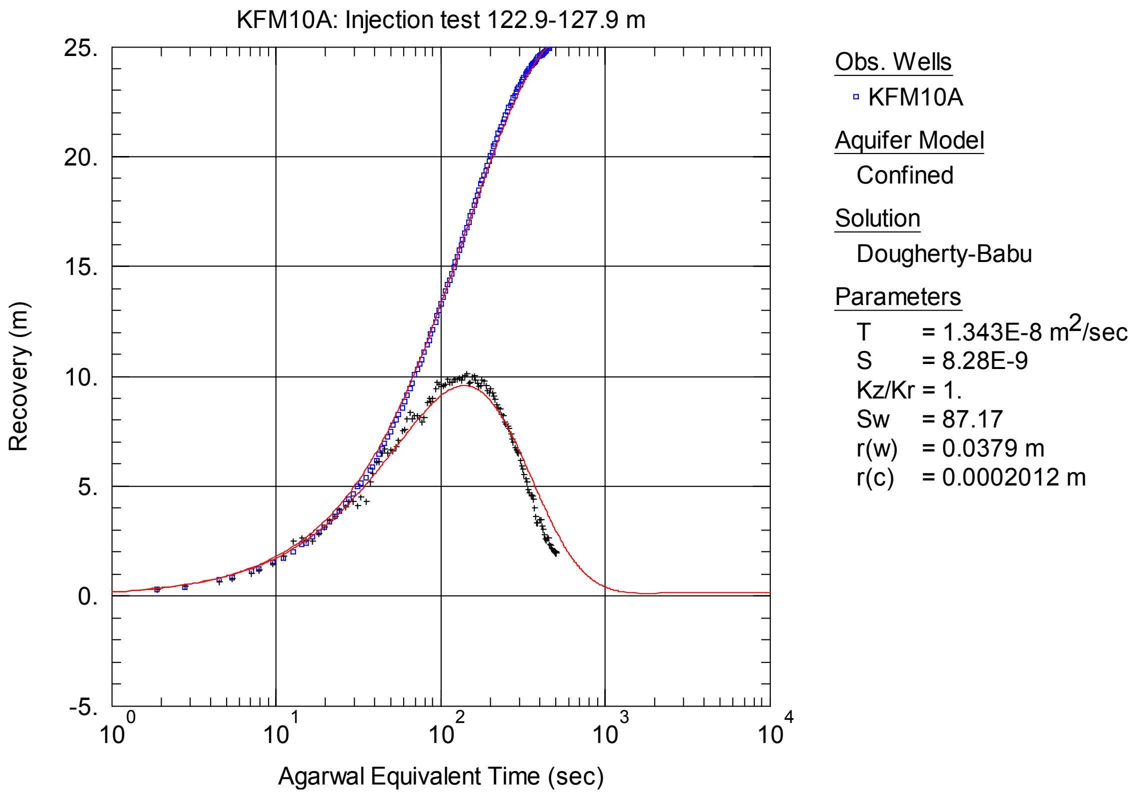


Figure A3-184. *Lin-log plot of recovery (□) and derivative (+) versus time, from the injection test in section 122.9-127.9 m in borehole KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

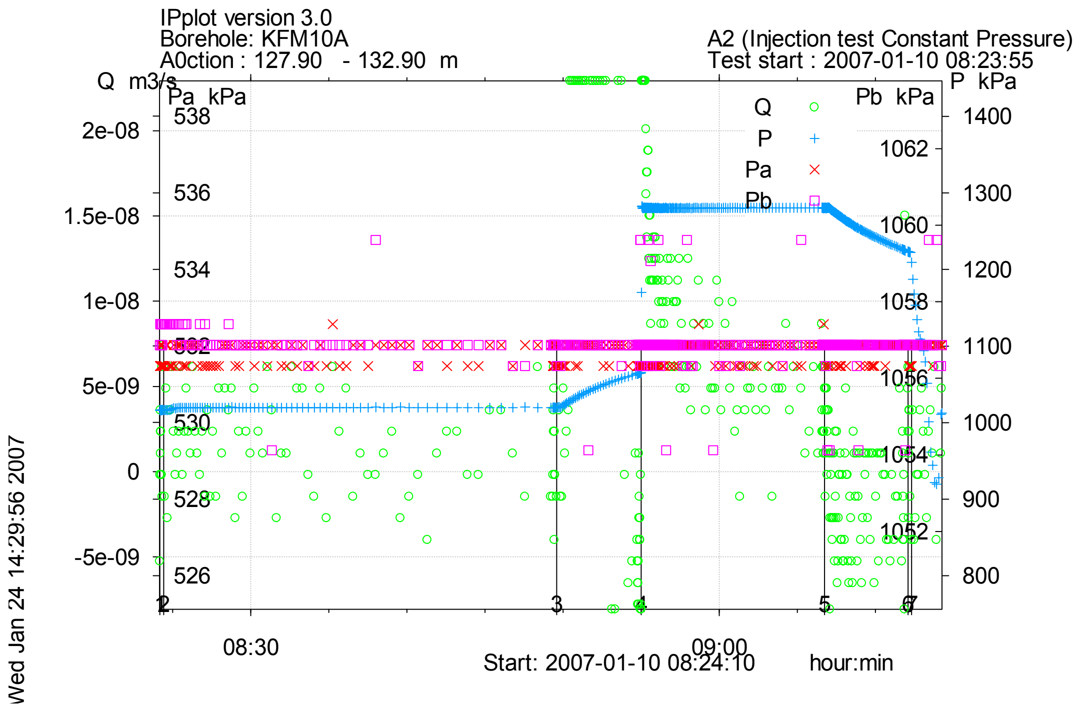


__Figure A3-185.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 127.9-132.9 m in borehole KFM10A.

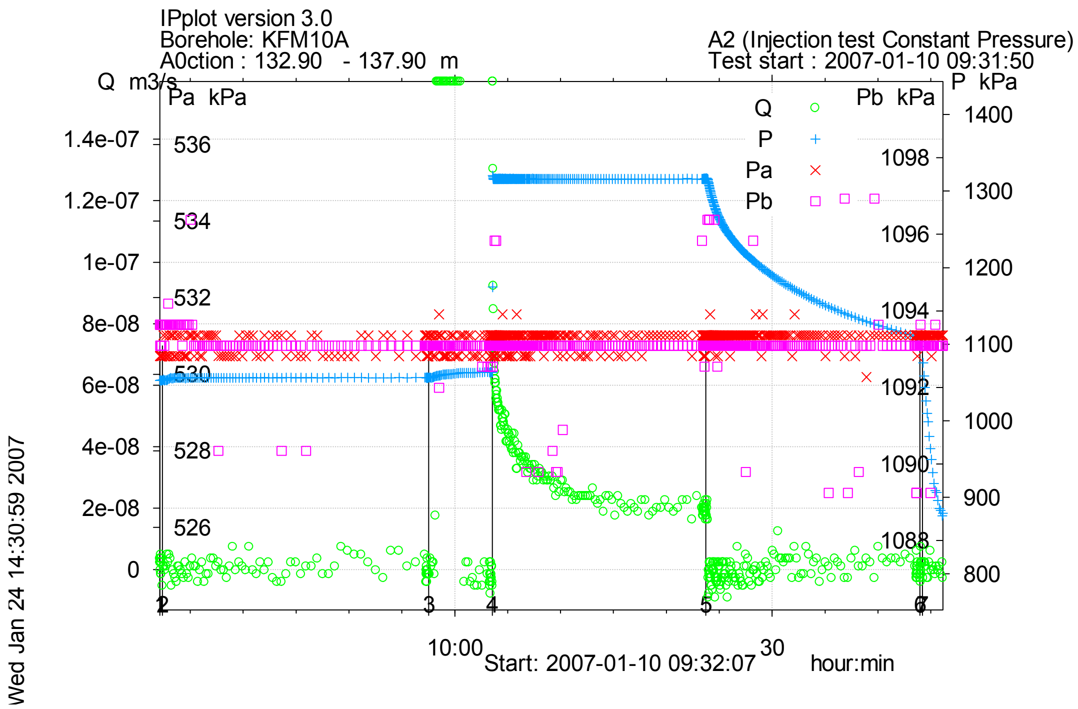


__Figure A3-186.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 132.9-137.9 m in borehole KFM10A.

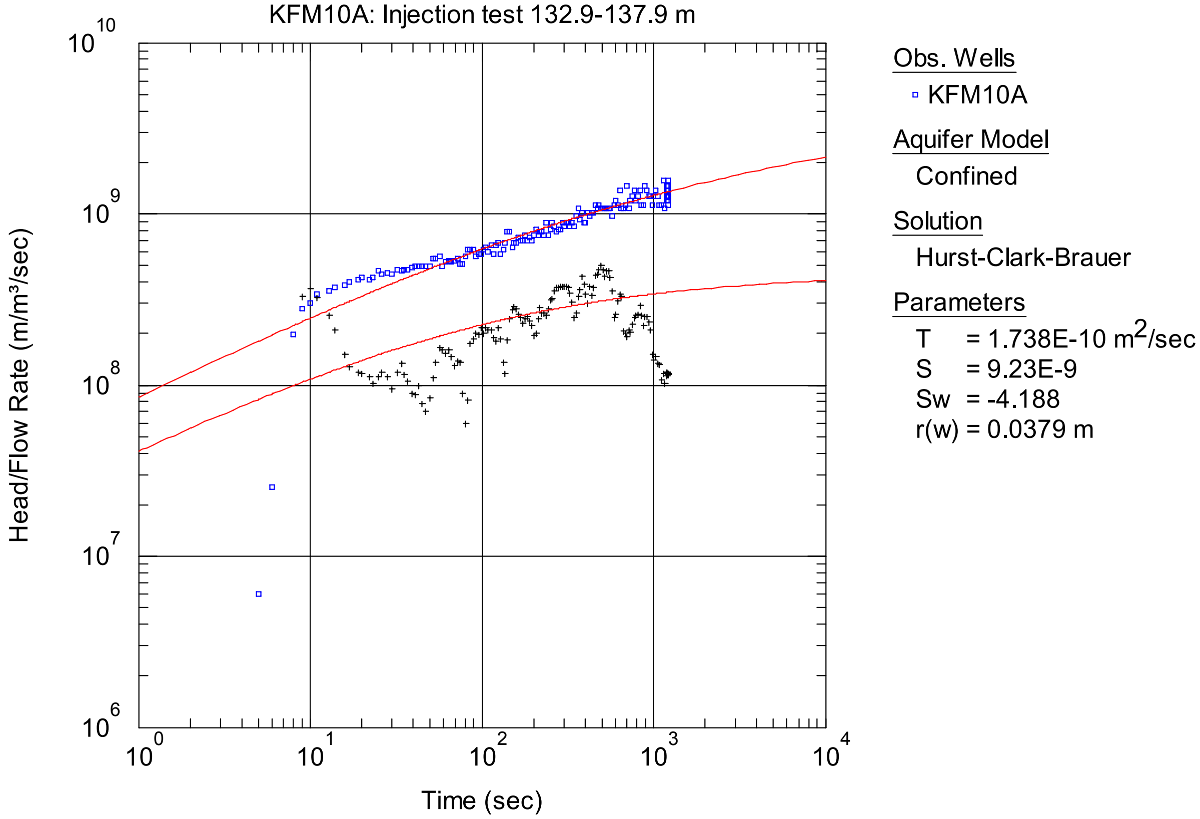


Figure A3-187. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 132.9-137.9 m in KFM10A.*

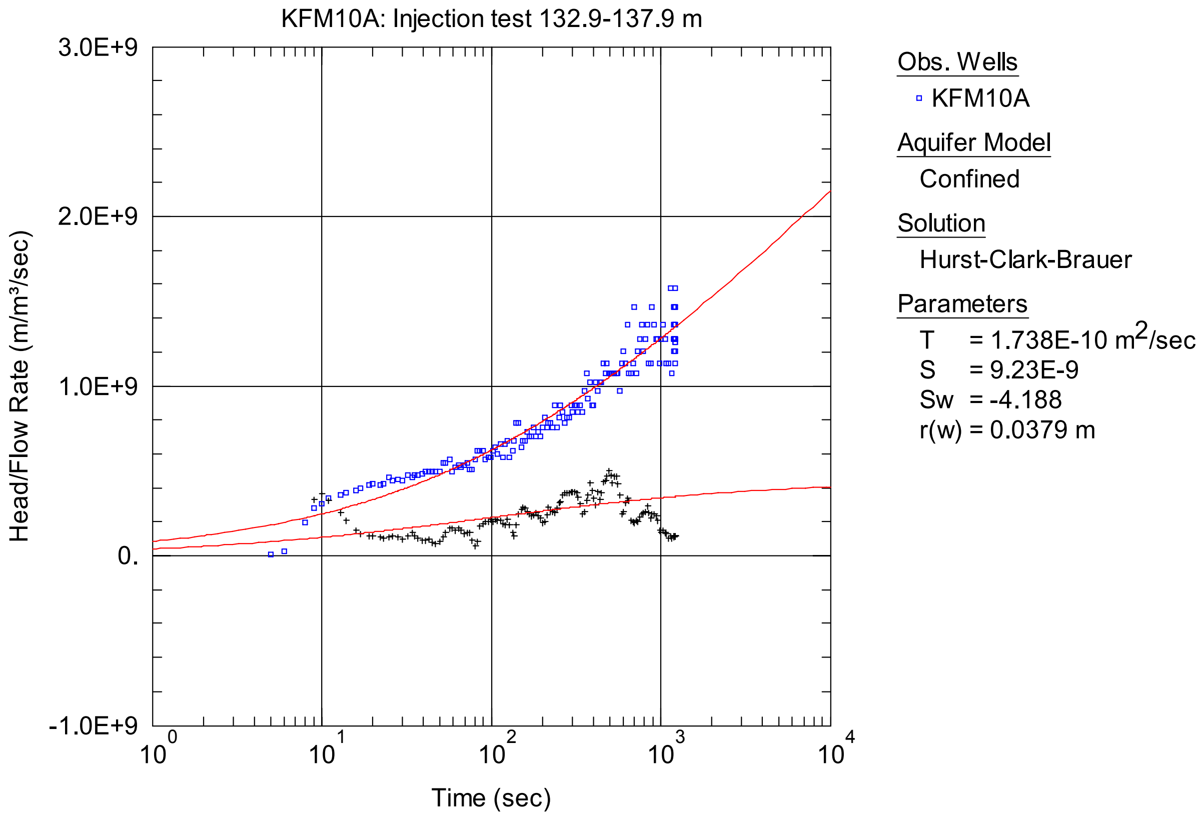


Figure A3-188. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 132.9-137.9 m in KFM10A.*

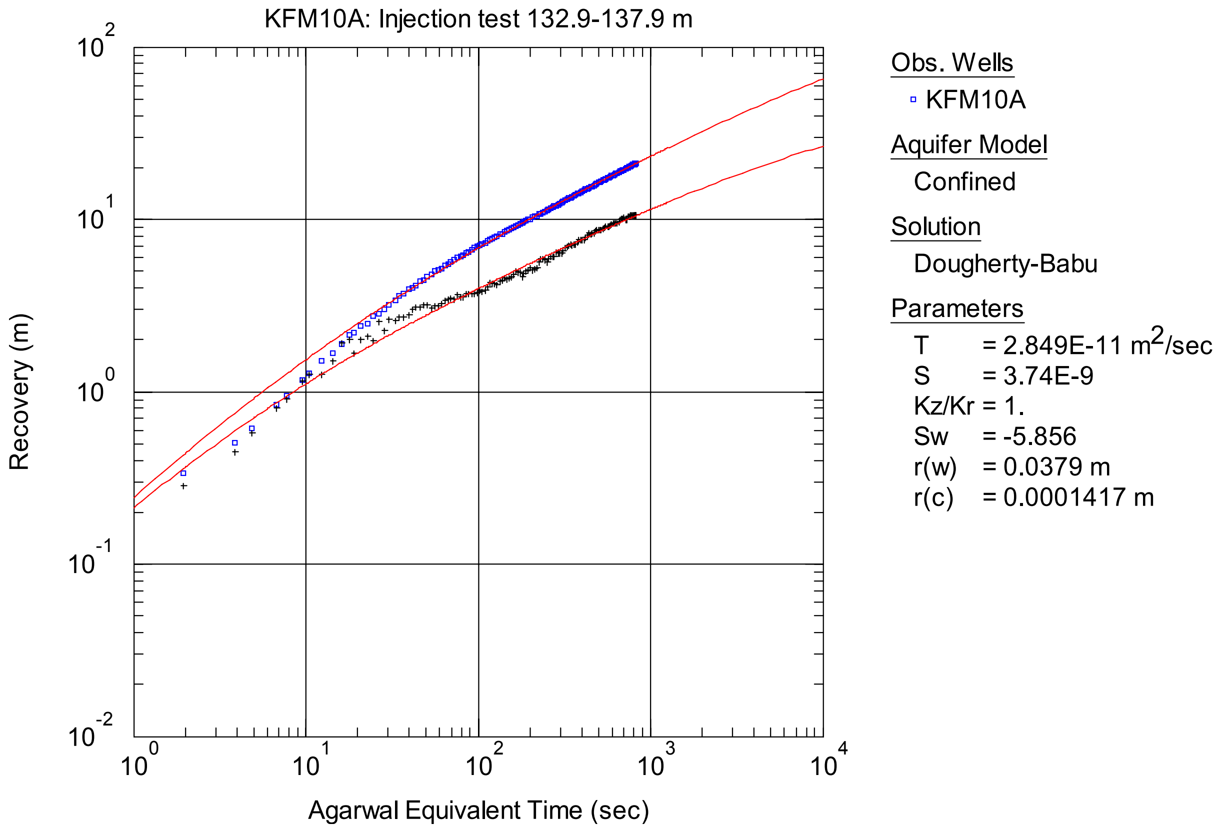


Figure A3-189. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 132.9-137.9 m in KFM10A.*

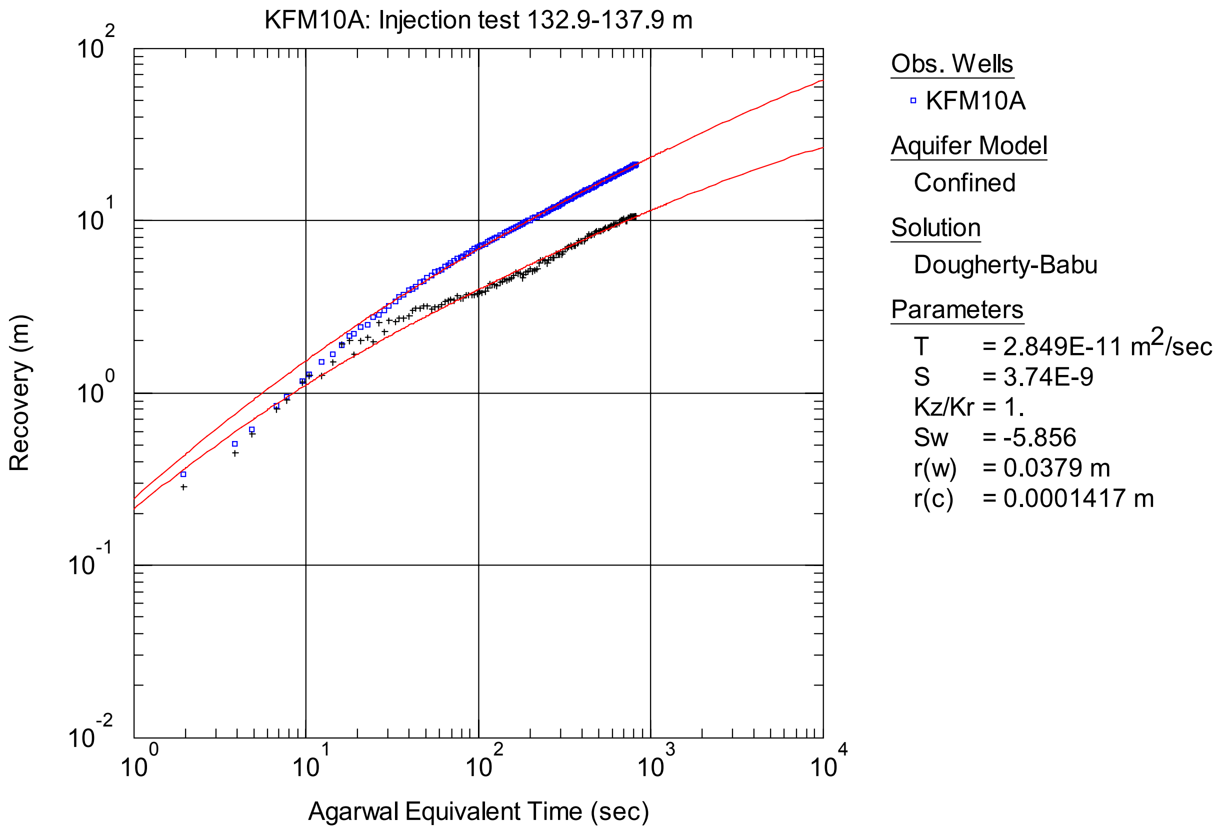


Figure A3-190. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 132.9-137.9 m in KFM10A.*

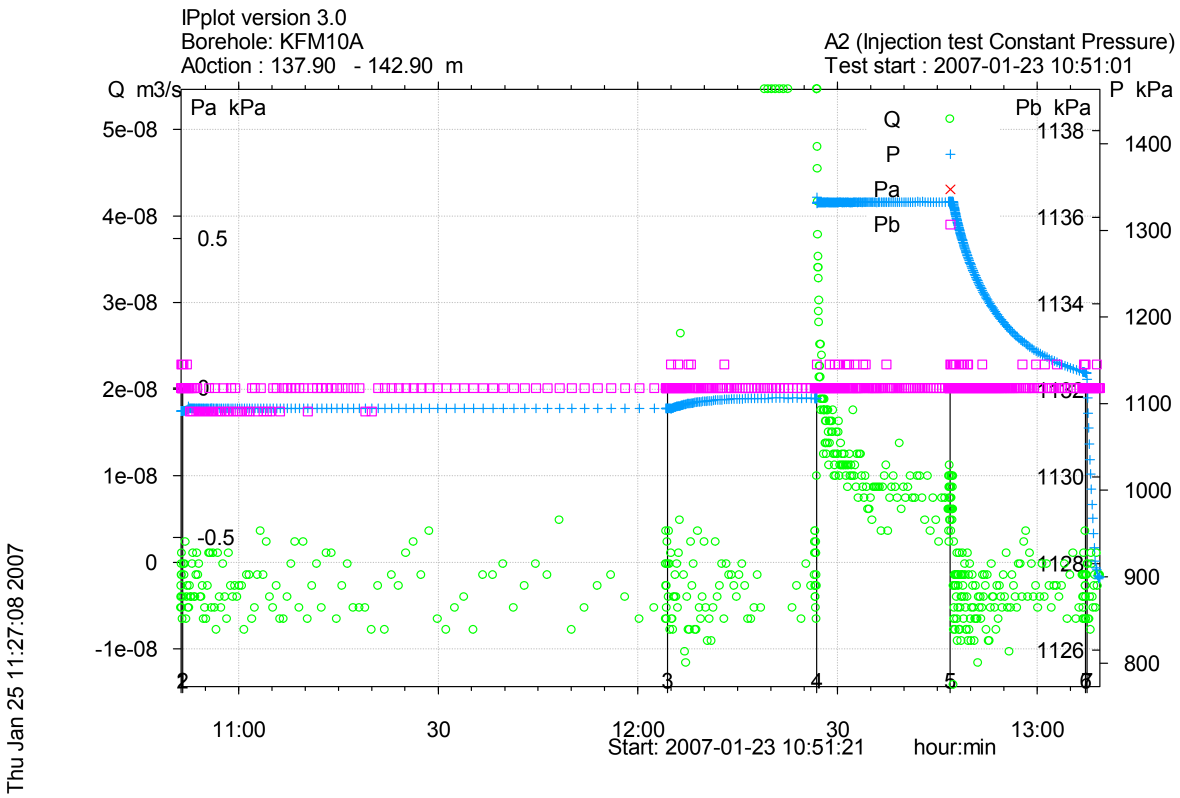


__Figure A3-191.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 137.9-142.9 m in borehole KFM10A.

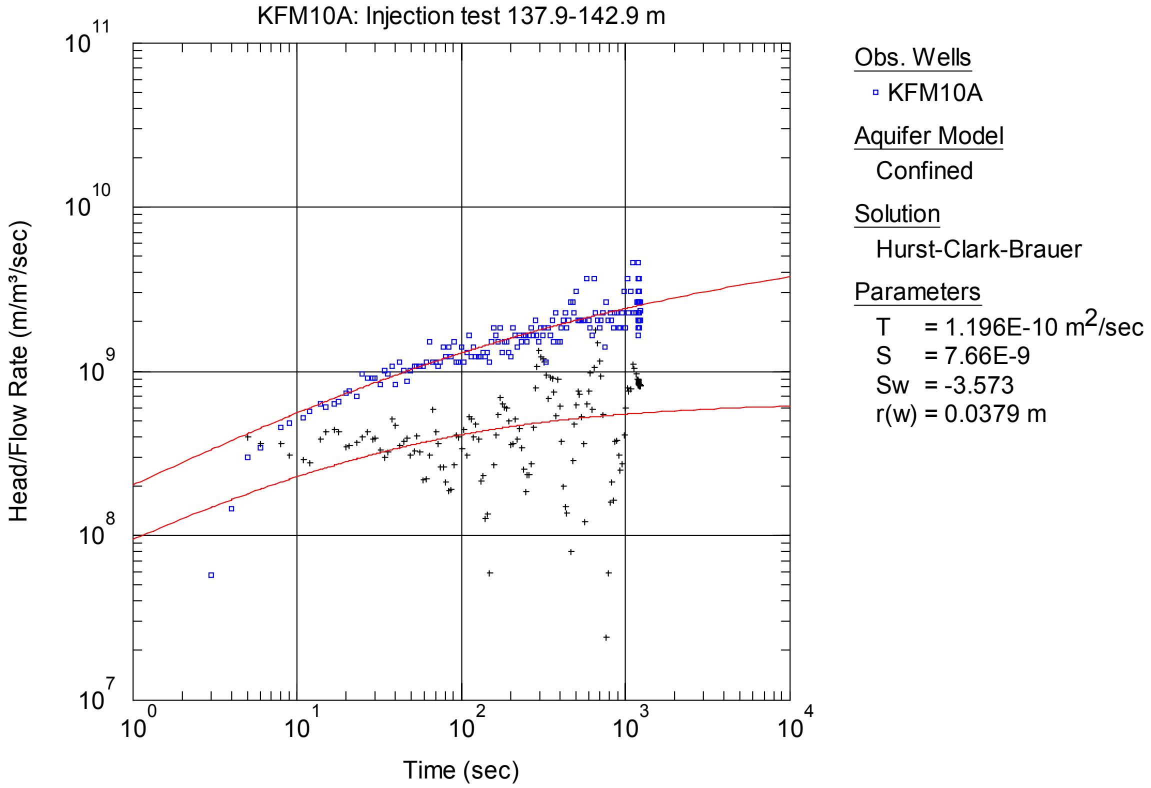


__Figure A3-192.__ Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 137.9-142.9 m in KFM10A.

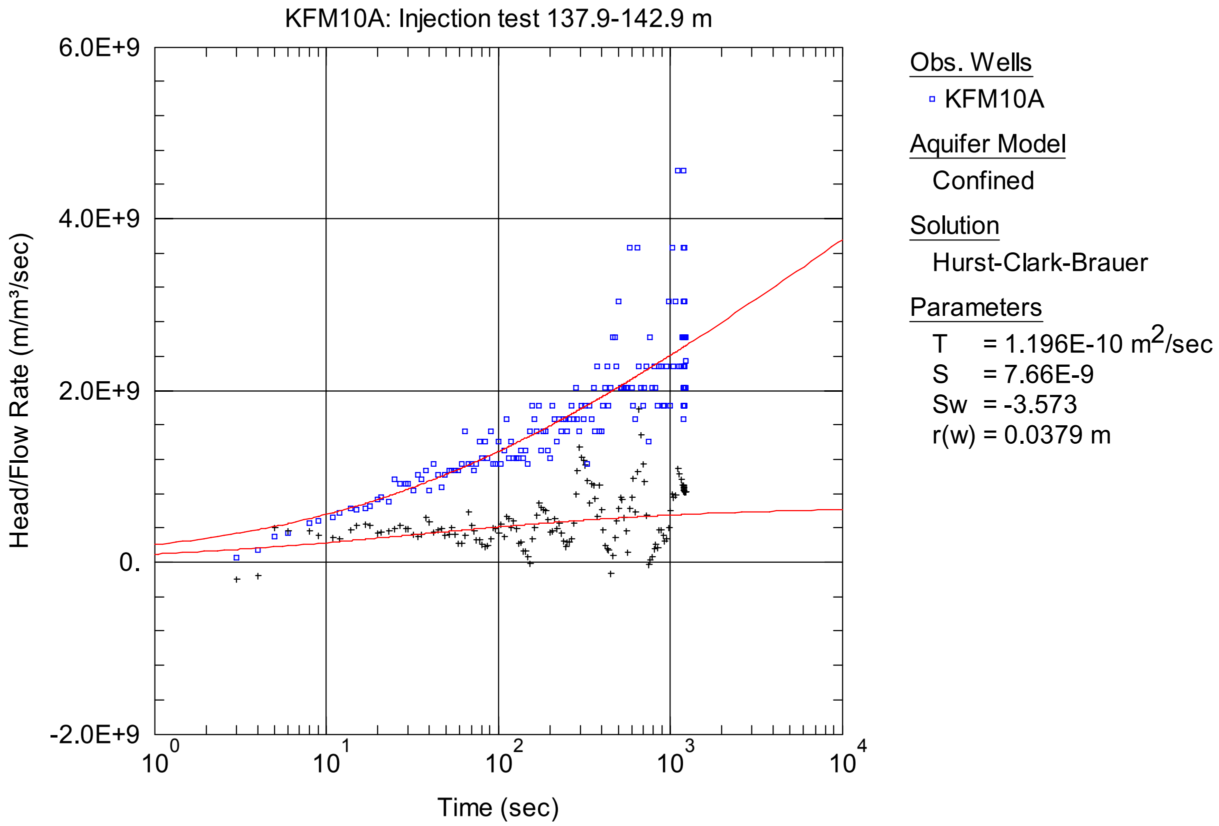


Figure A3-193. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 137.9-142.9 m in KFM10A.*

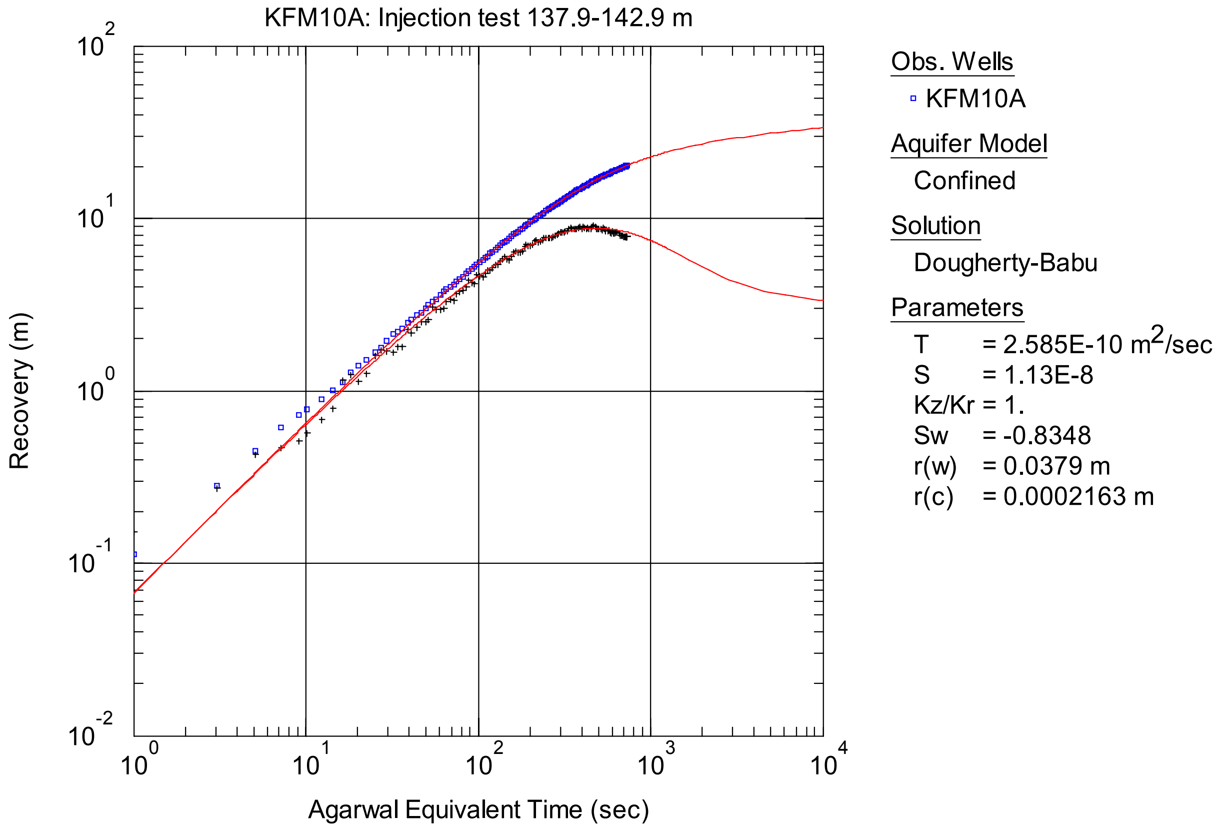


Figure A3-194. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 137.9-142.9 m in KFM10A.*

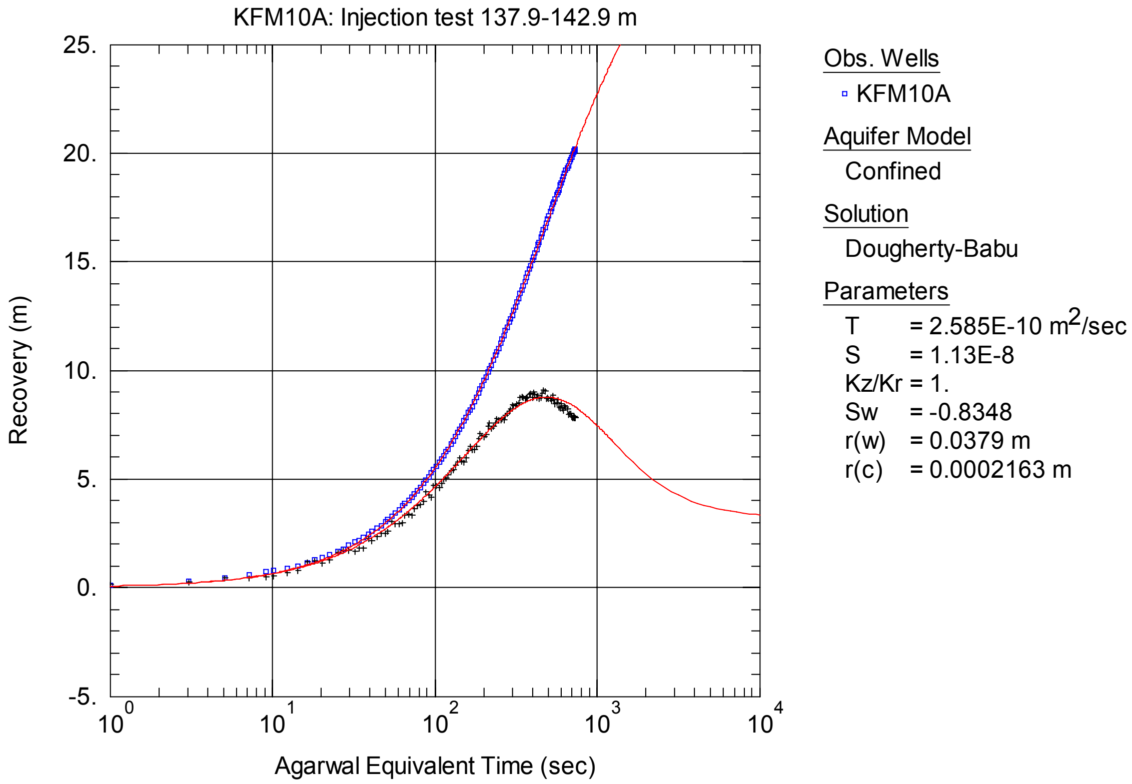


Figure A3-195. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 137.9-142.9 m in KFM10A.*

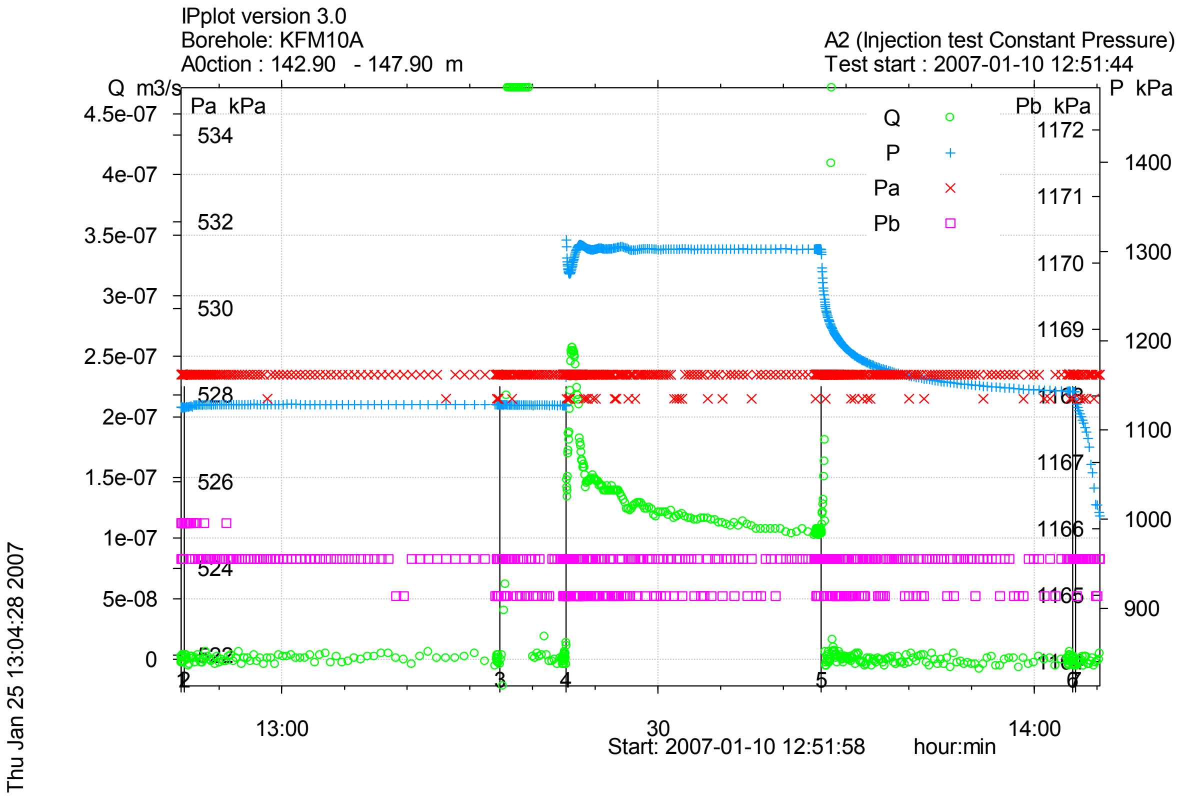


Figure A3-196. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 142.9-147.9 m in borehole KFM10A.*

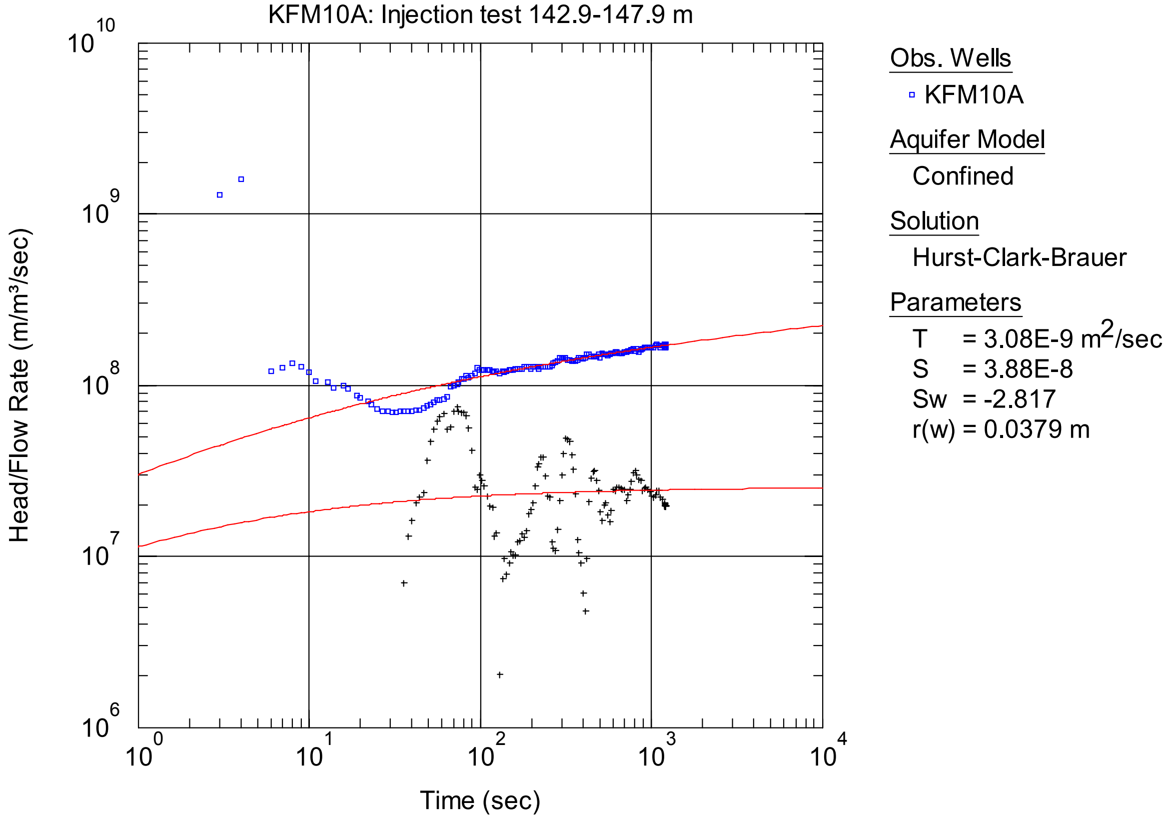


Figure A3-197. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 142.9-147.9 m in KFM10A.*

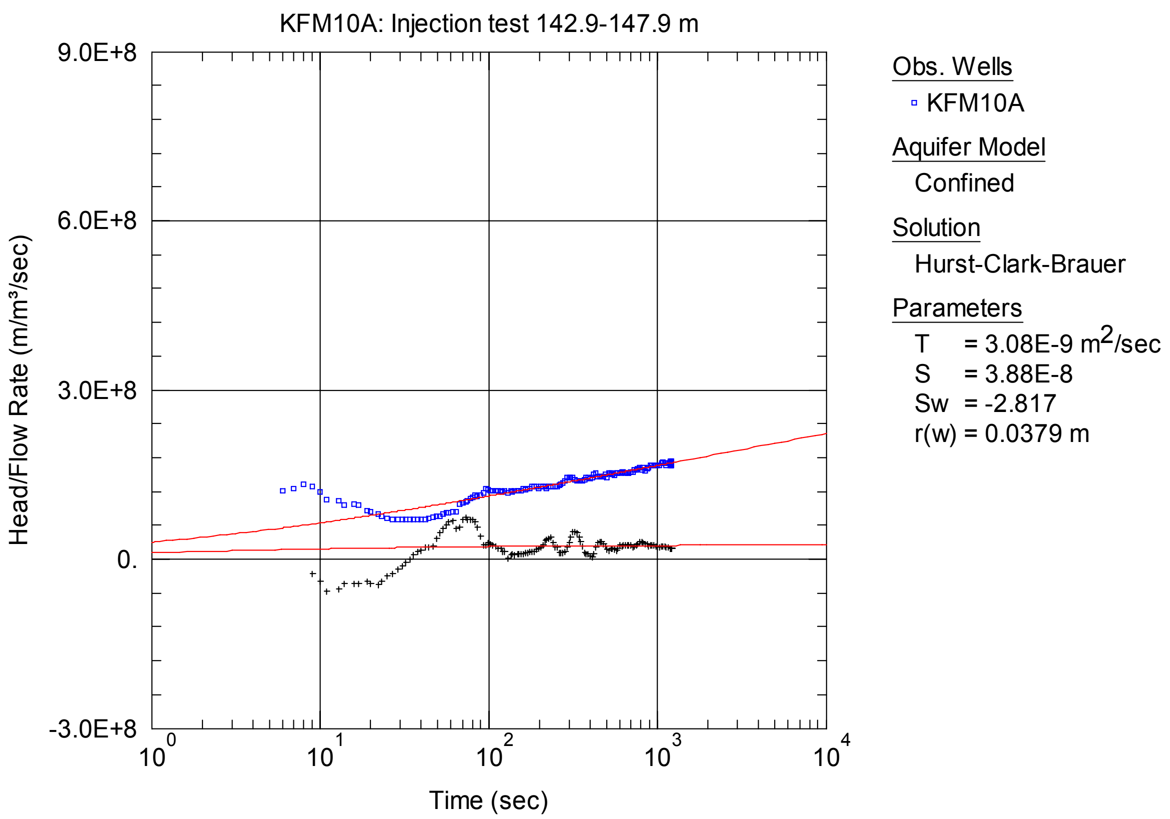


Figure A3-198. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 142.9-147.9 m in KFM10A.*

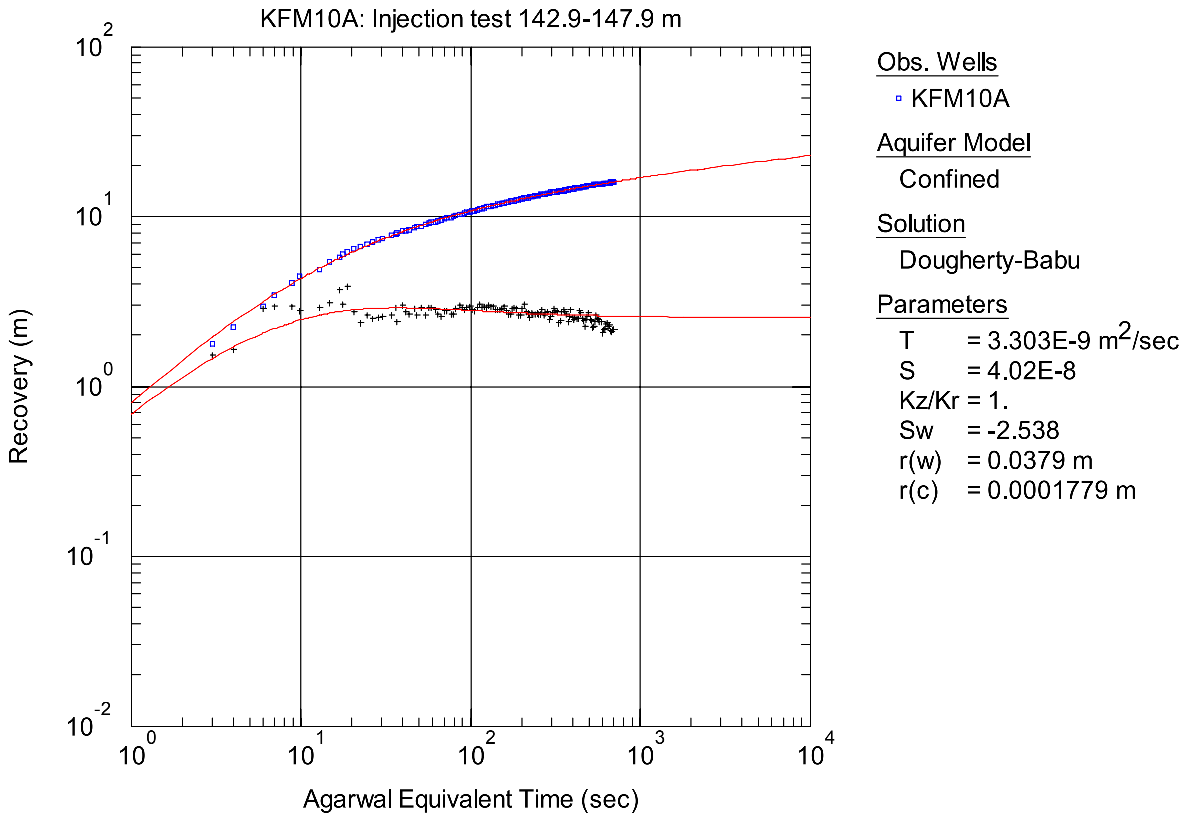


Figure A3-199. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 142.9-147.9 m in KFM10A.*

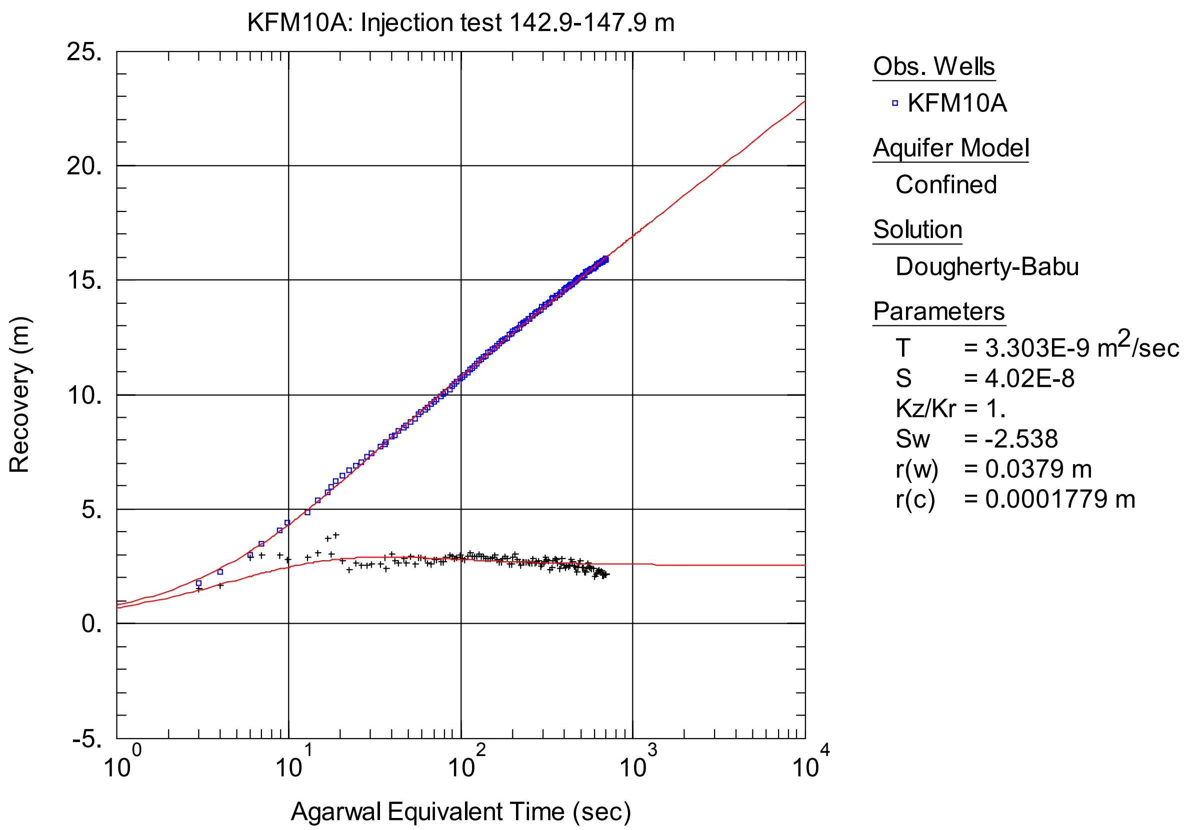


Figure A3-200. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 142.9-147.9 m in KFM10A.*

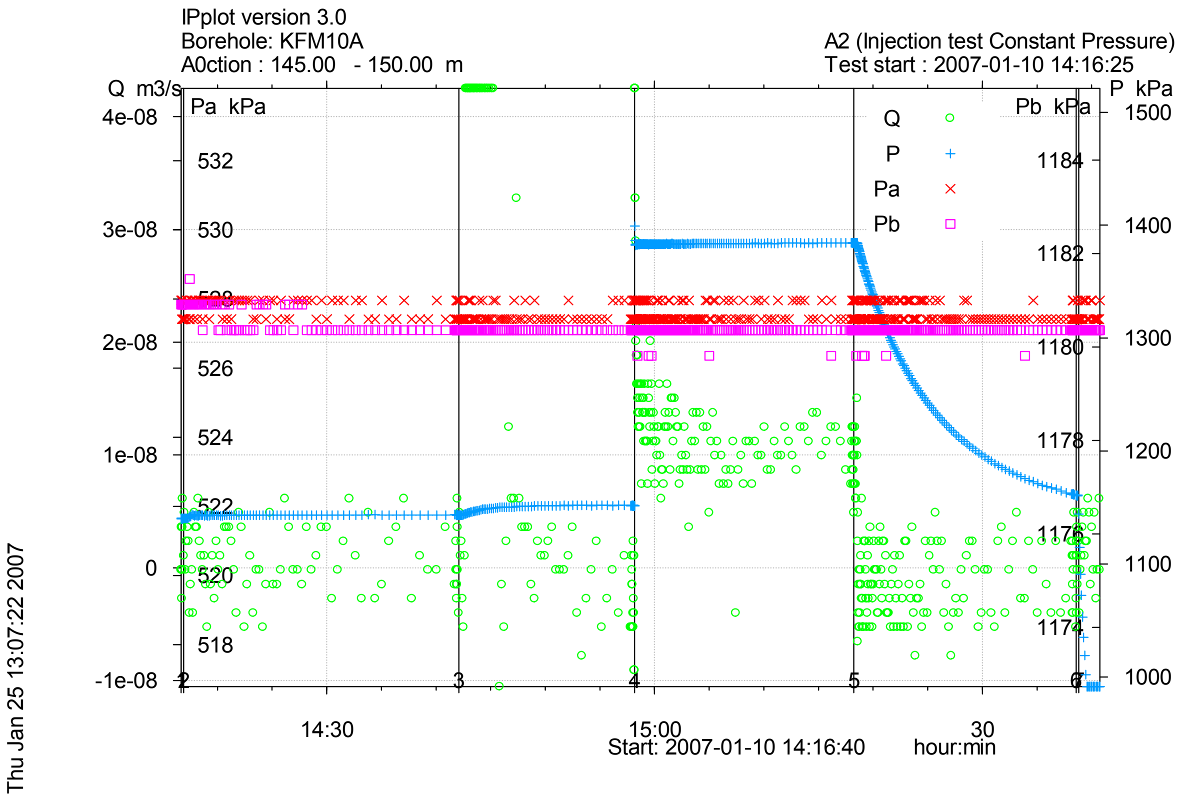


Figure A3-201. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 145.0-150.0 m in borehole KFM10A.*

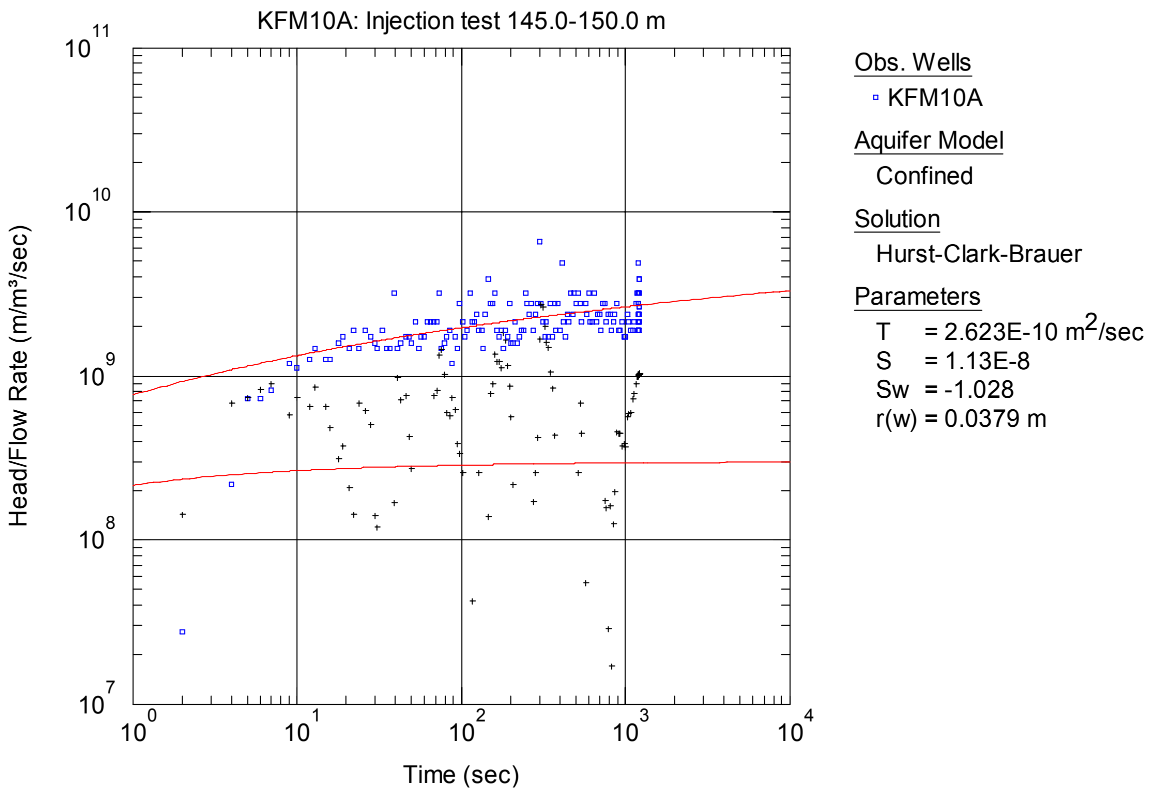


Figure A3-202. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 145.0-150.0 m in KFM10A.*

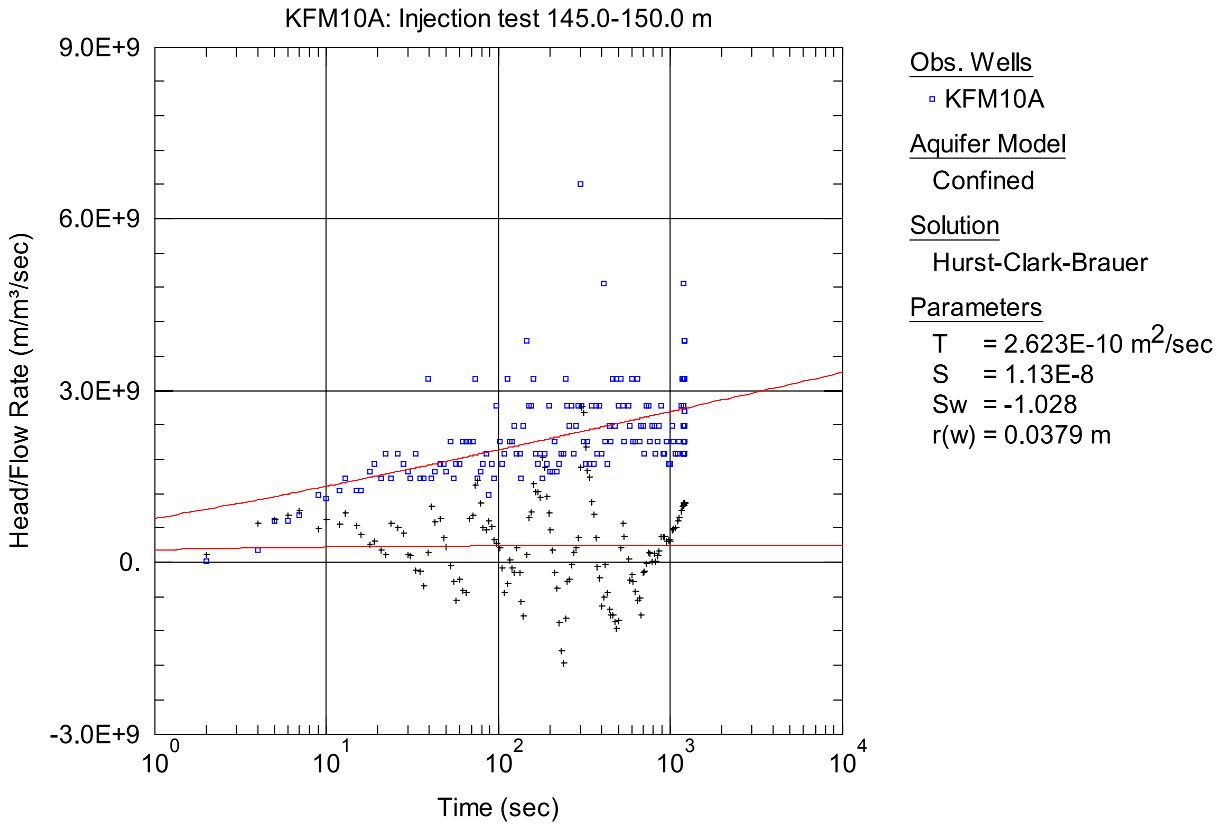


Figure A3-203. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 145.0-150.0 m in KFM10A.*

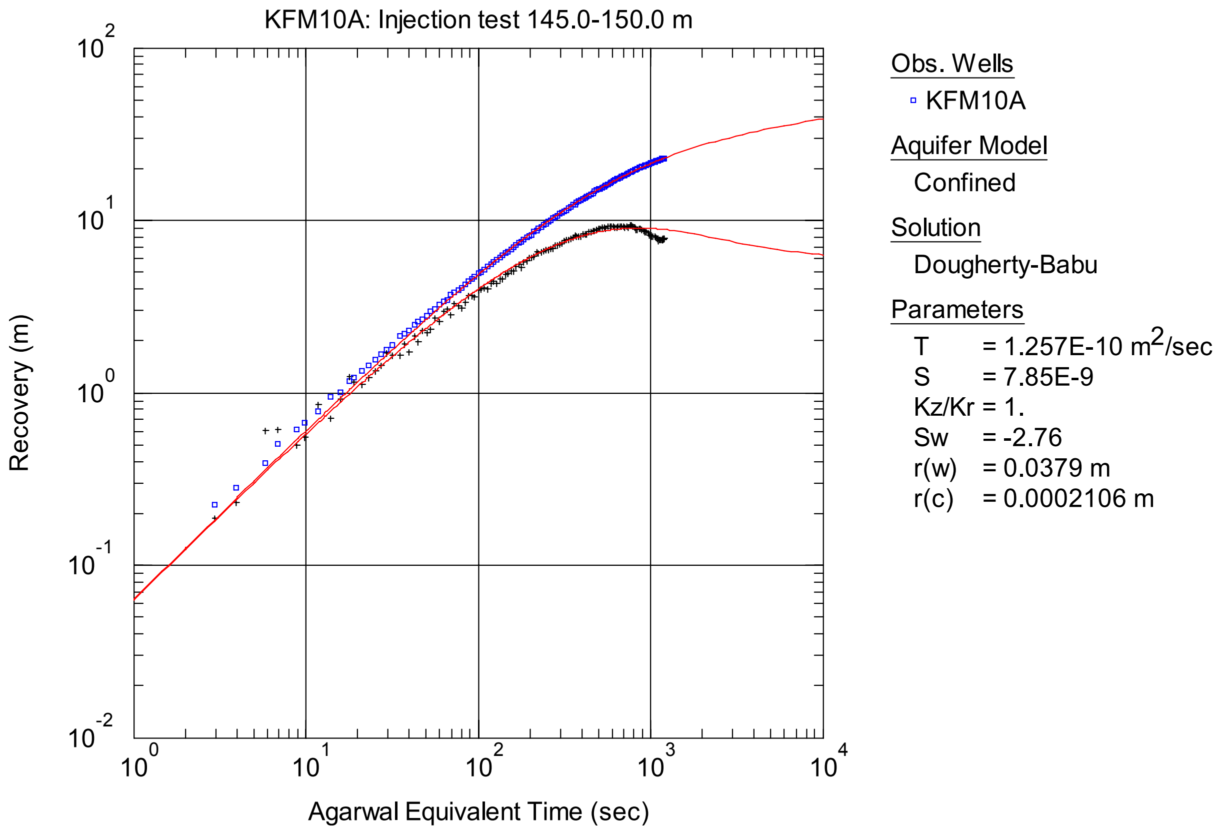


Figure A3-204. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 145.0-150.0 m in KFM10A.*

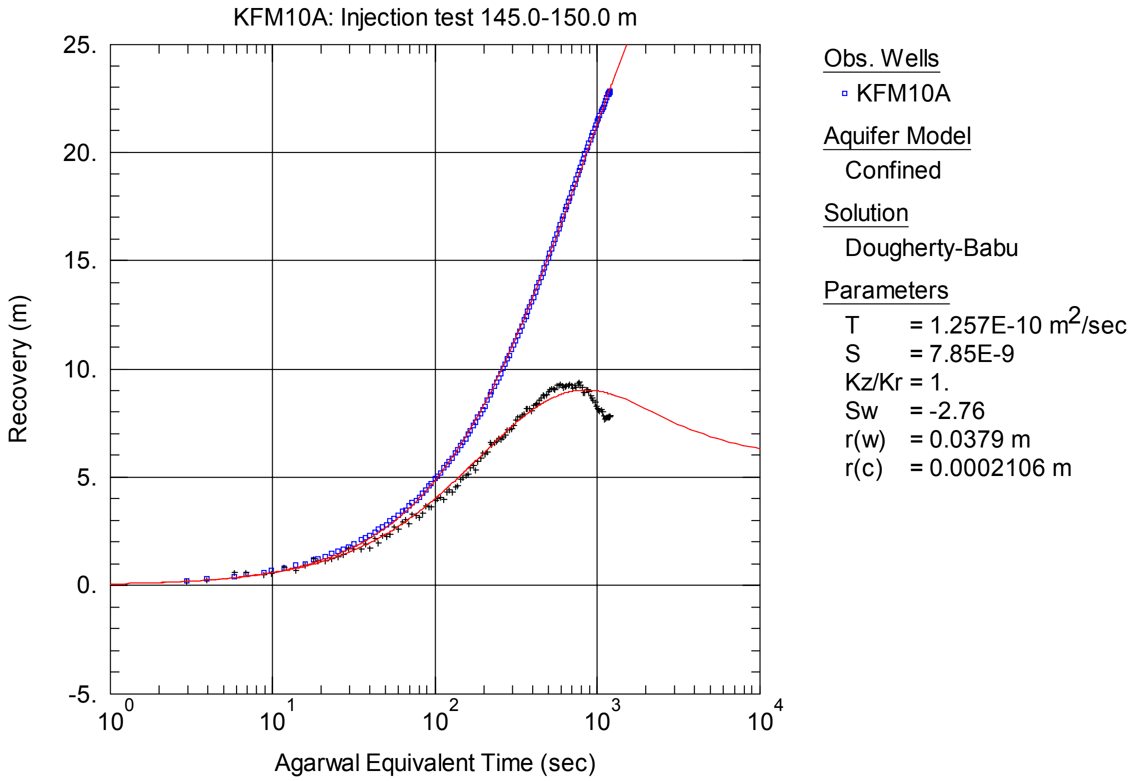


Figure A3-205. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 145.0-150.0 m in KFM10A.*

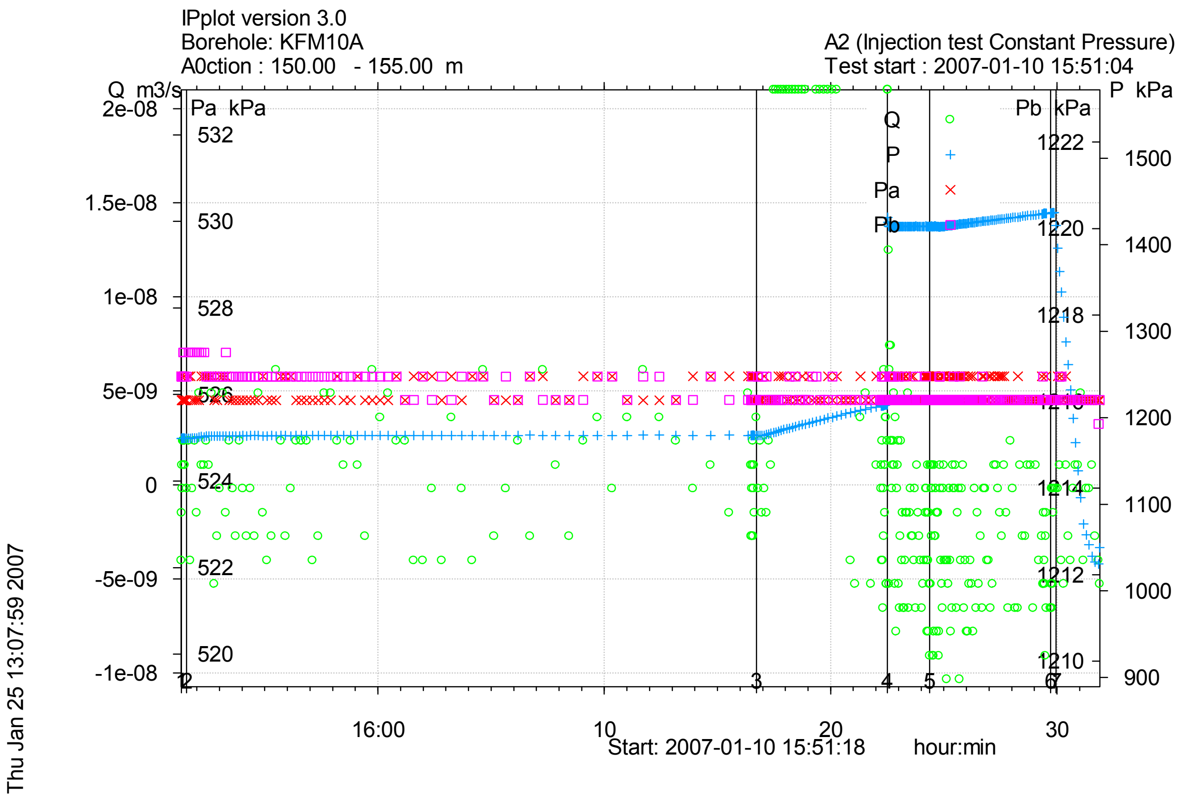


Figure A3-206. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 150.0-155.0 m in borehole KFM10A.*

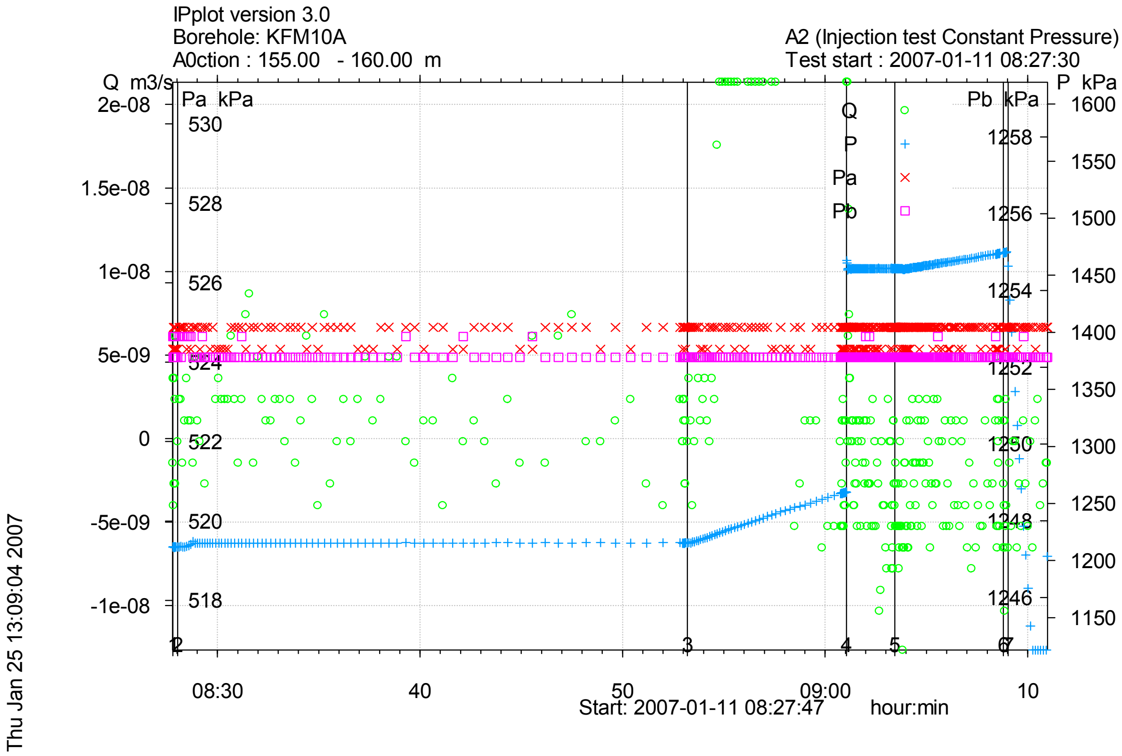


Figure A3-207. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 155.0-160.0 m in borehole KFM10A.*

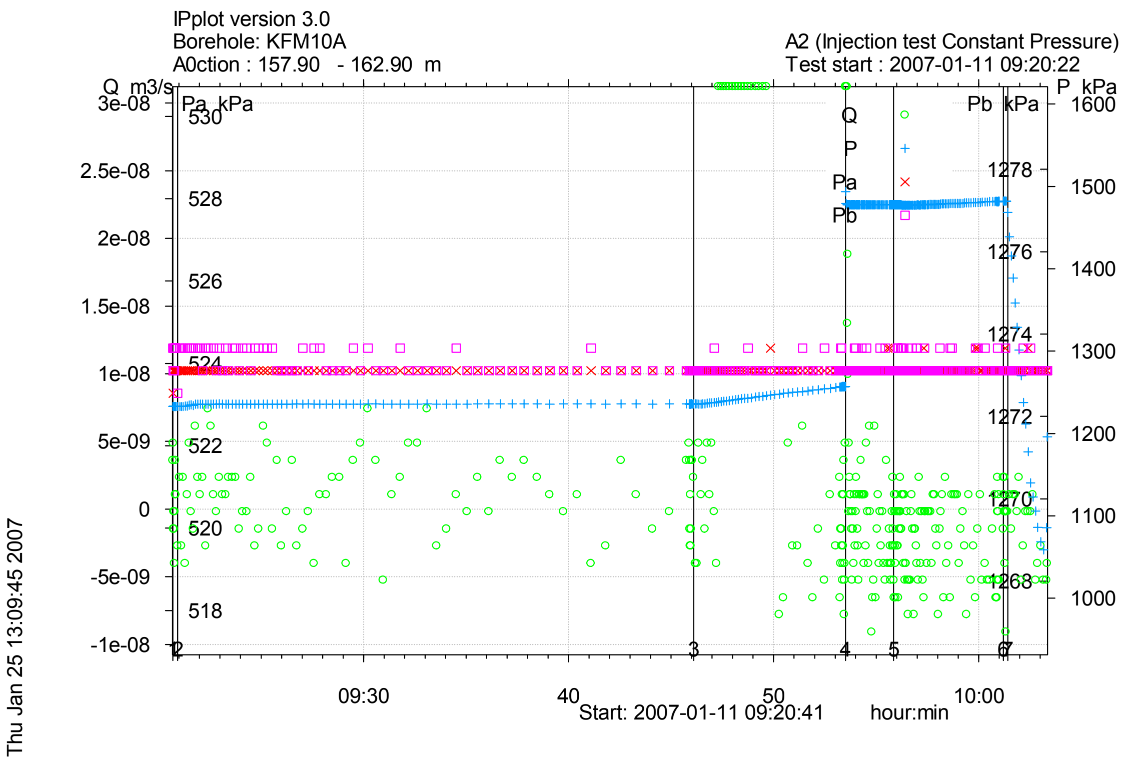


Figure A3-208. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 157.9-162.9 m in borehole KFM10A.*

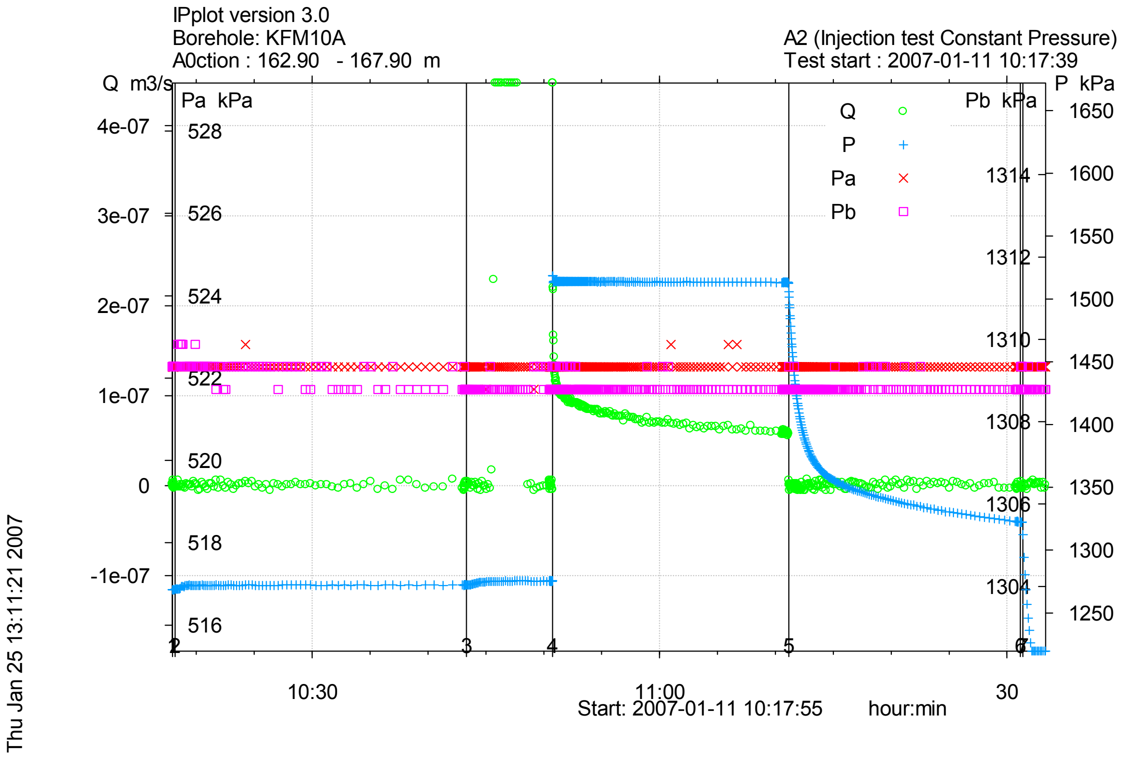


Figure A3-209. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 162.9-167.9 m in borehole KFM10A.*

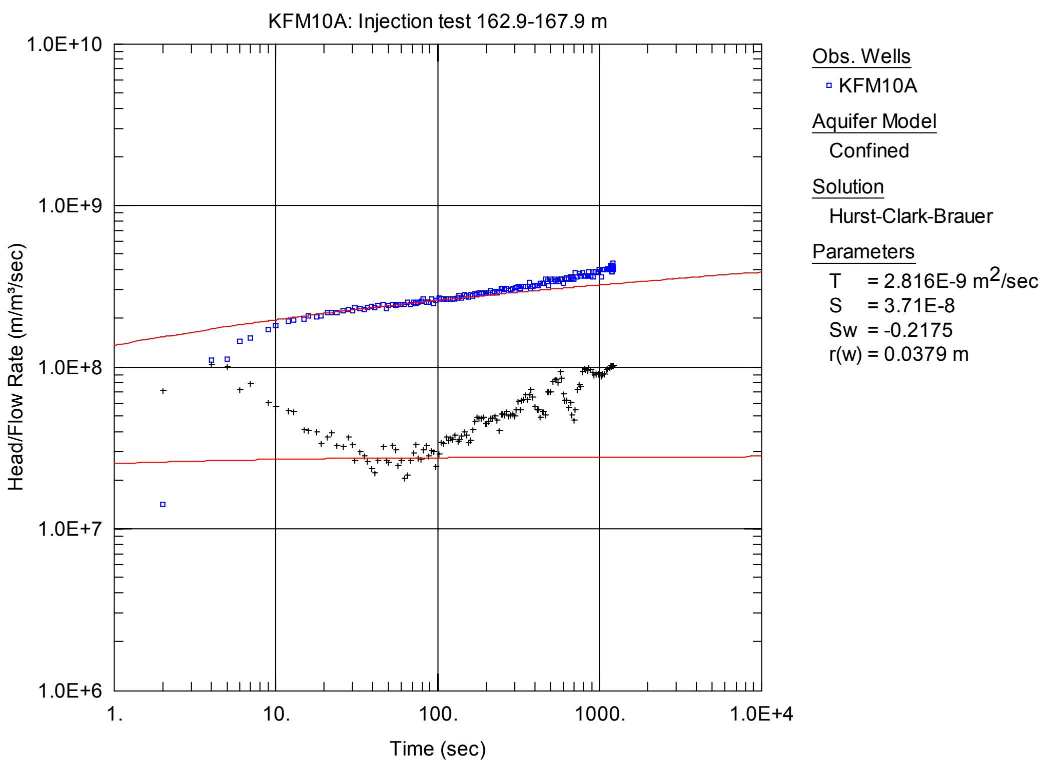


Figure A3-210. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the *injection test in section 162.9-167.9 m in KFM10A.*

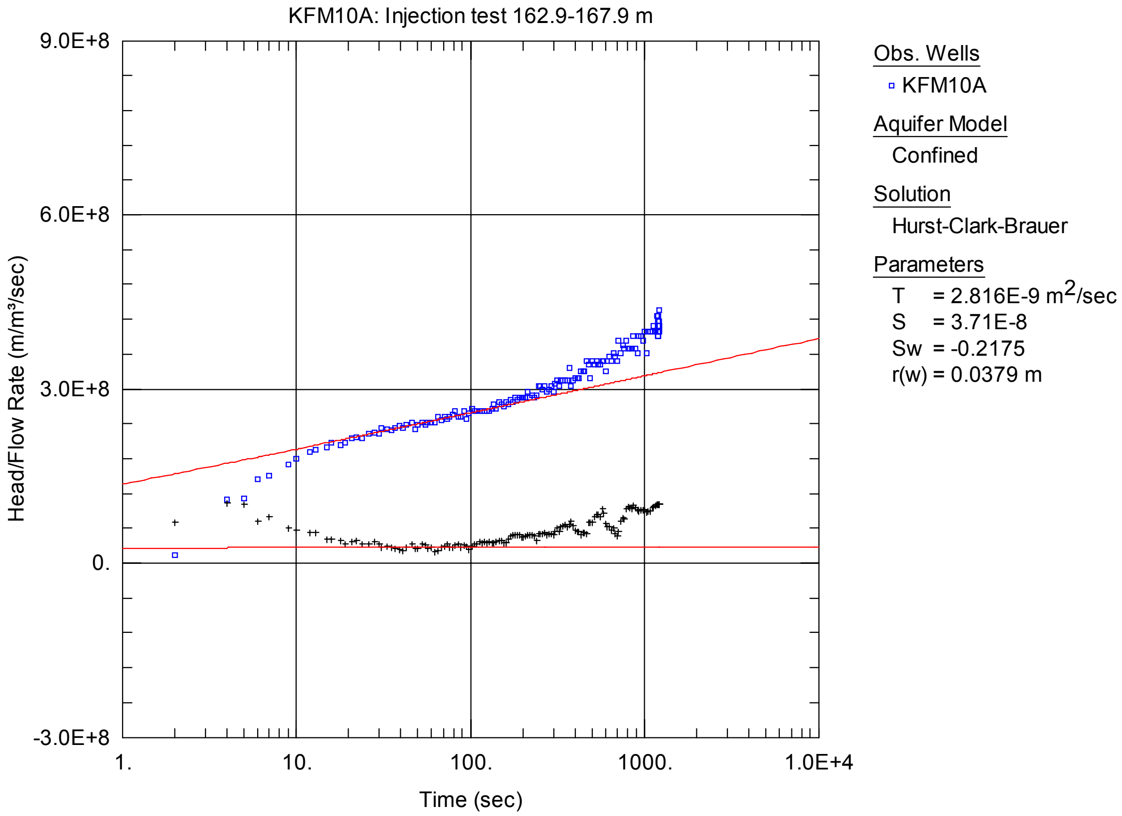


Figure A3-211. Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the *injection test in section 162.9-167.9 m in KFM10A.*

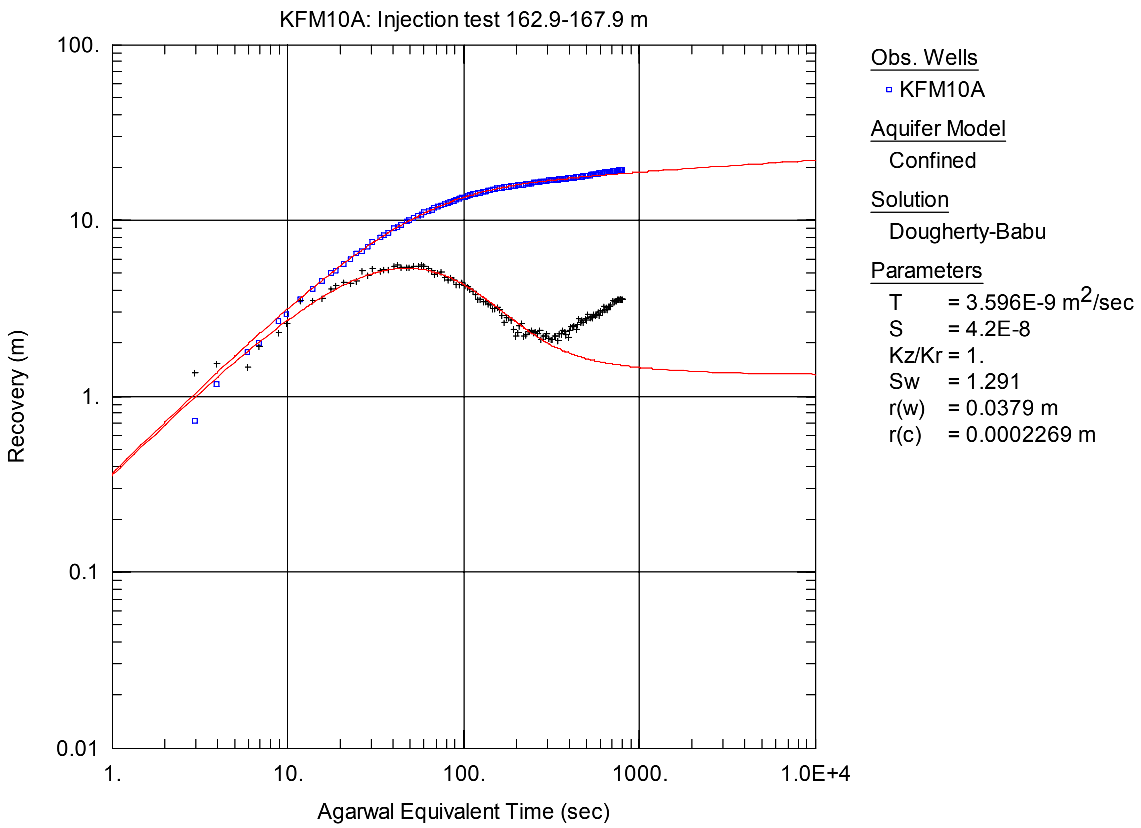


Figure A3-212. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 162.9-167.9 m in KFM10A.*

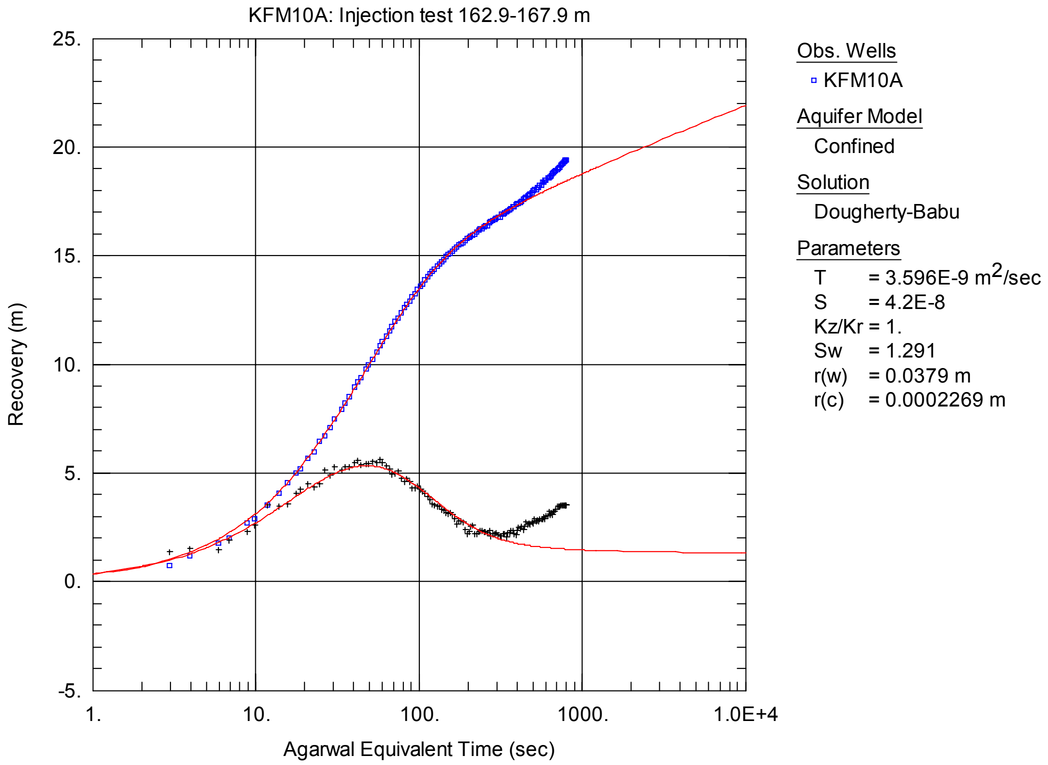


Figure A3-213. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 162.9-167.9 m in KFM10A.*

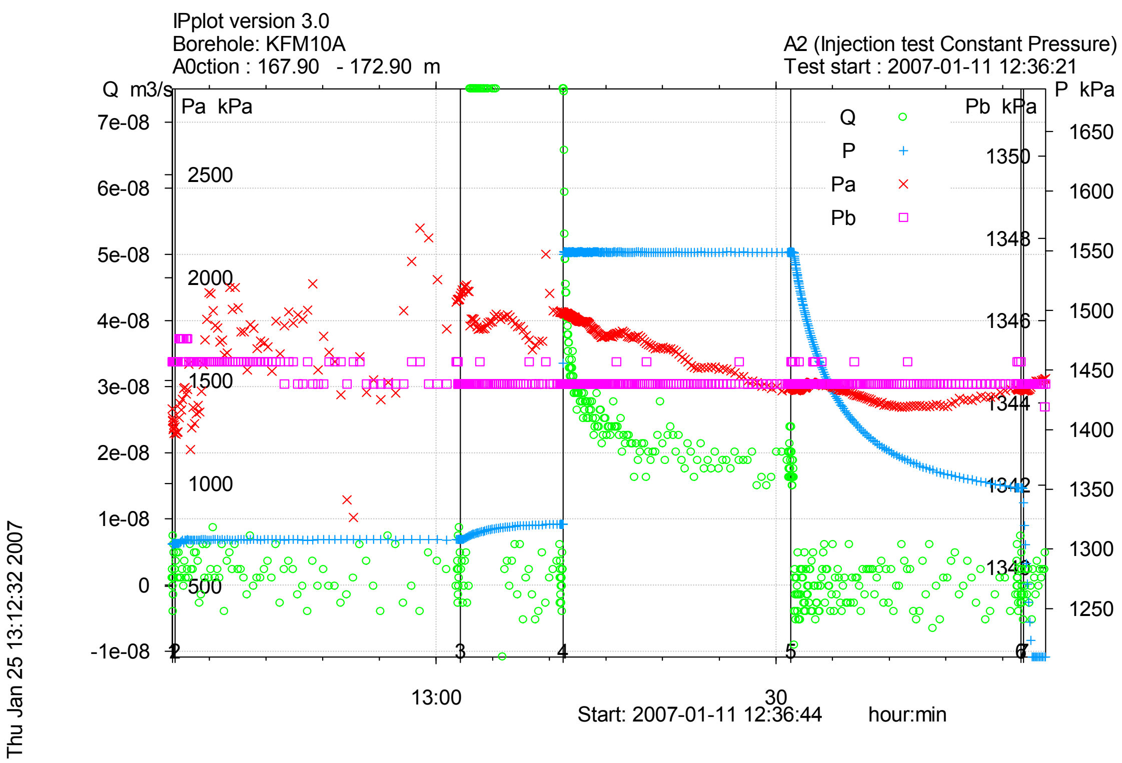


Figure A3-214. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 167.9-172.9 m in borehole KFM10A.*

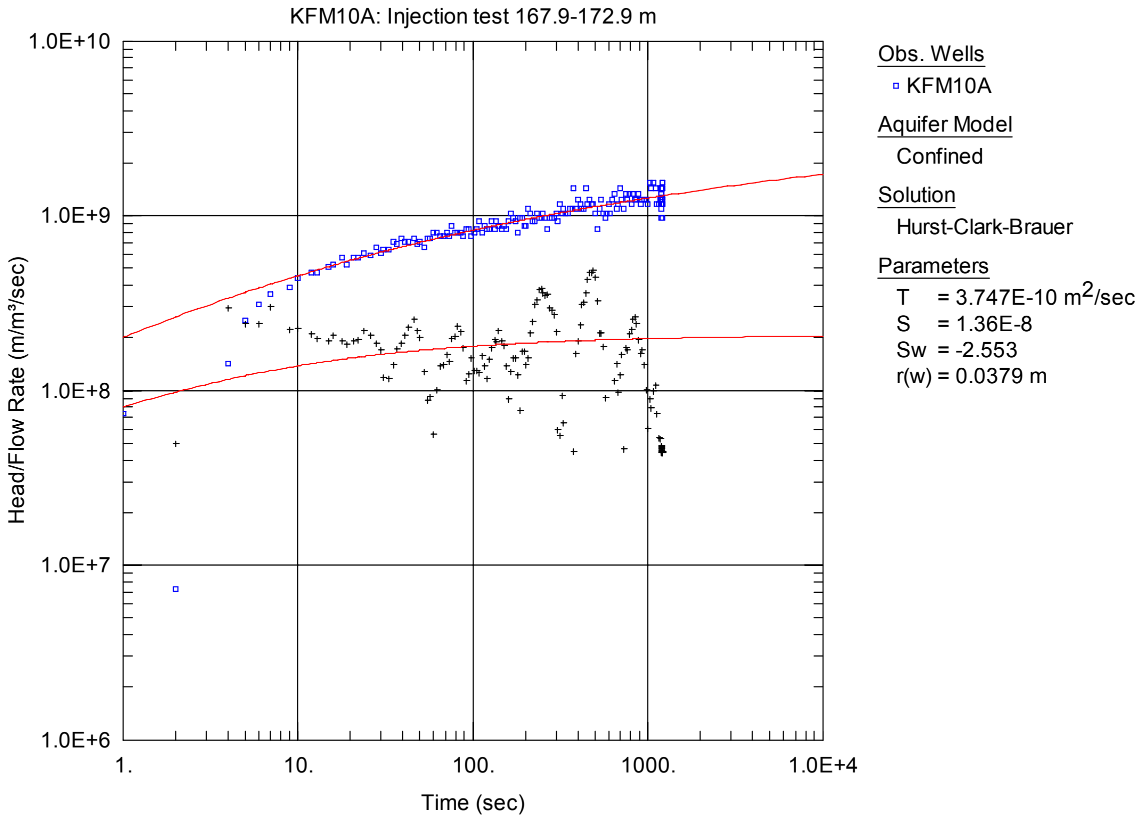


Figure A3-215. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the *injection test in section 167.9-172.9 m in KFM10A.*

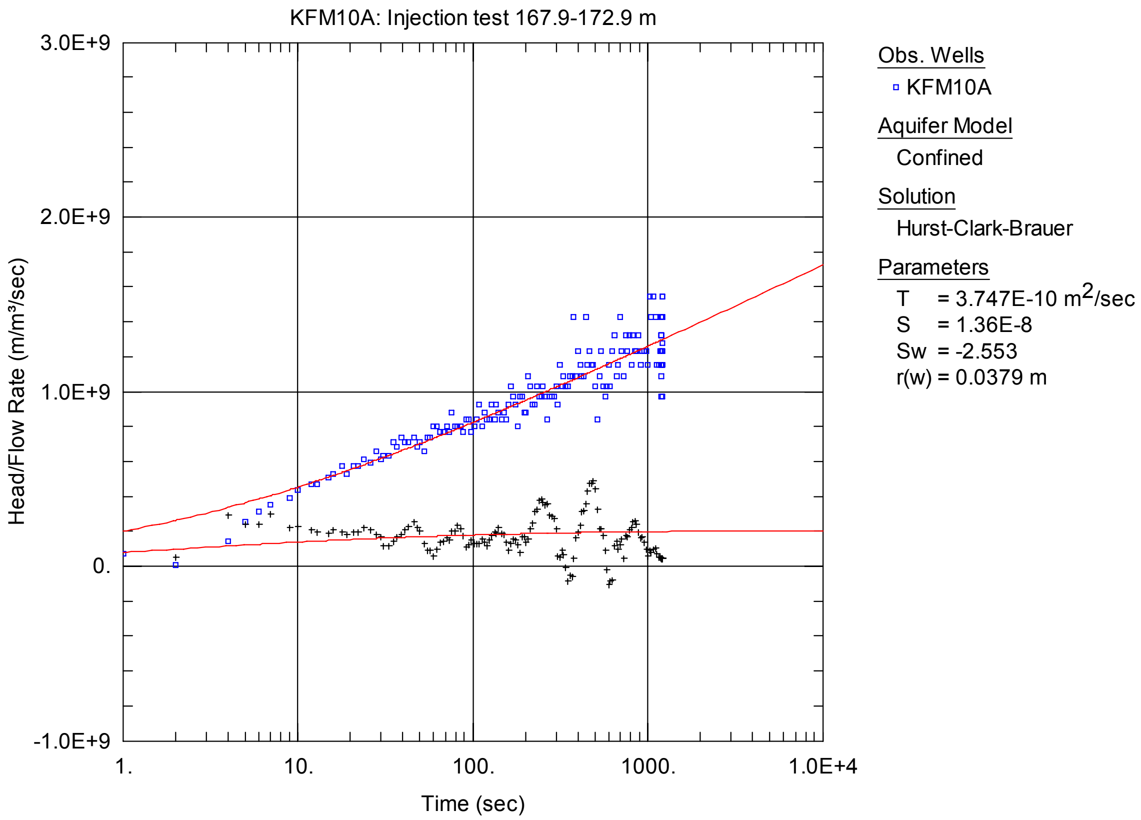


Figure A3-216. Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the *injection test in section 167.9-172.9 m in KFM10A.*

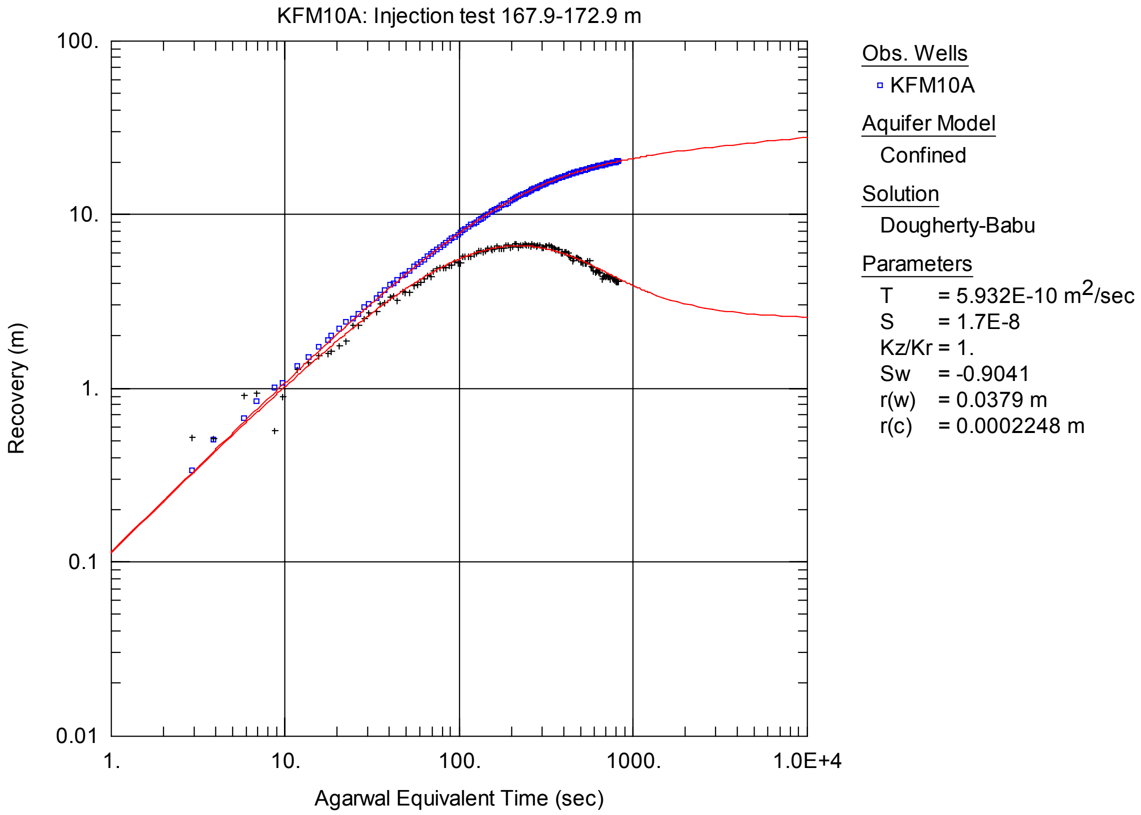


Figure A3-217. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 167.9-172.9 m in KFM10A.*

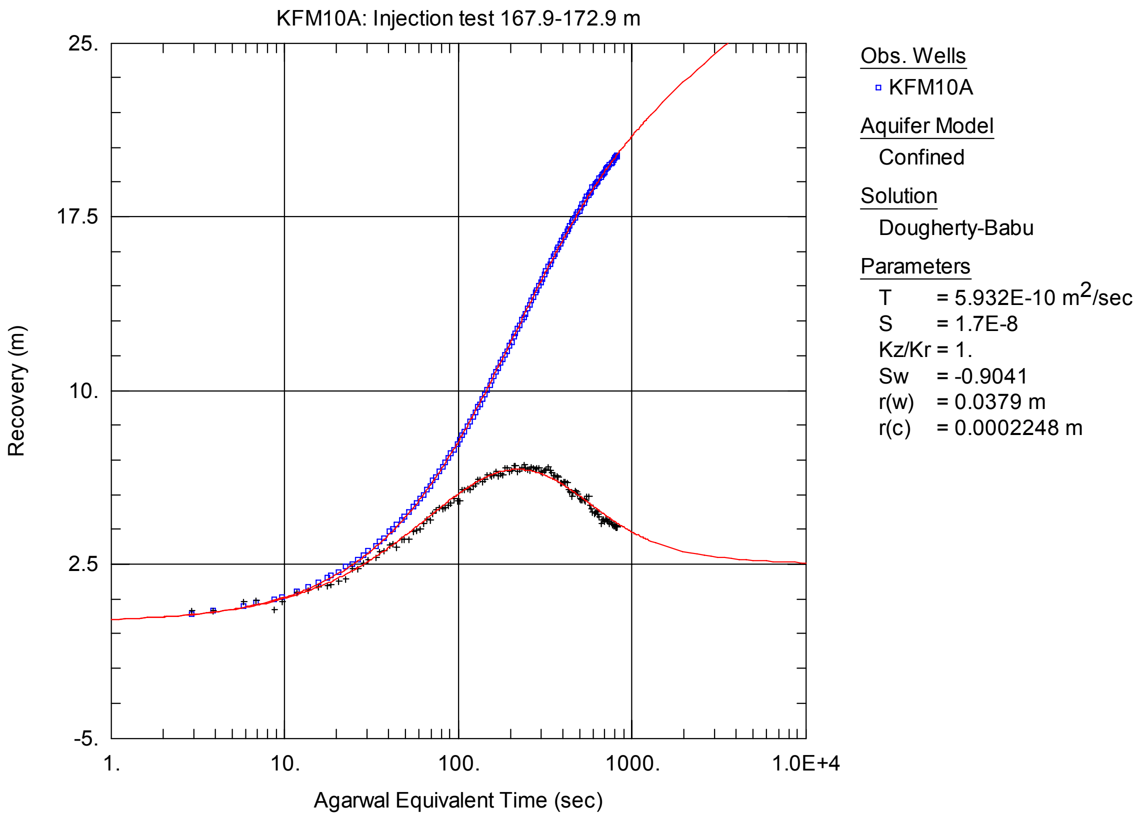


Figure A3-218. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 167.9-172.9 m in KFM10A.*

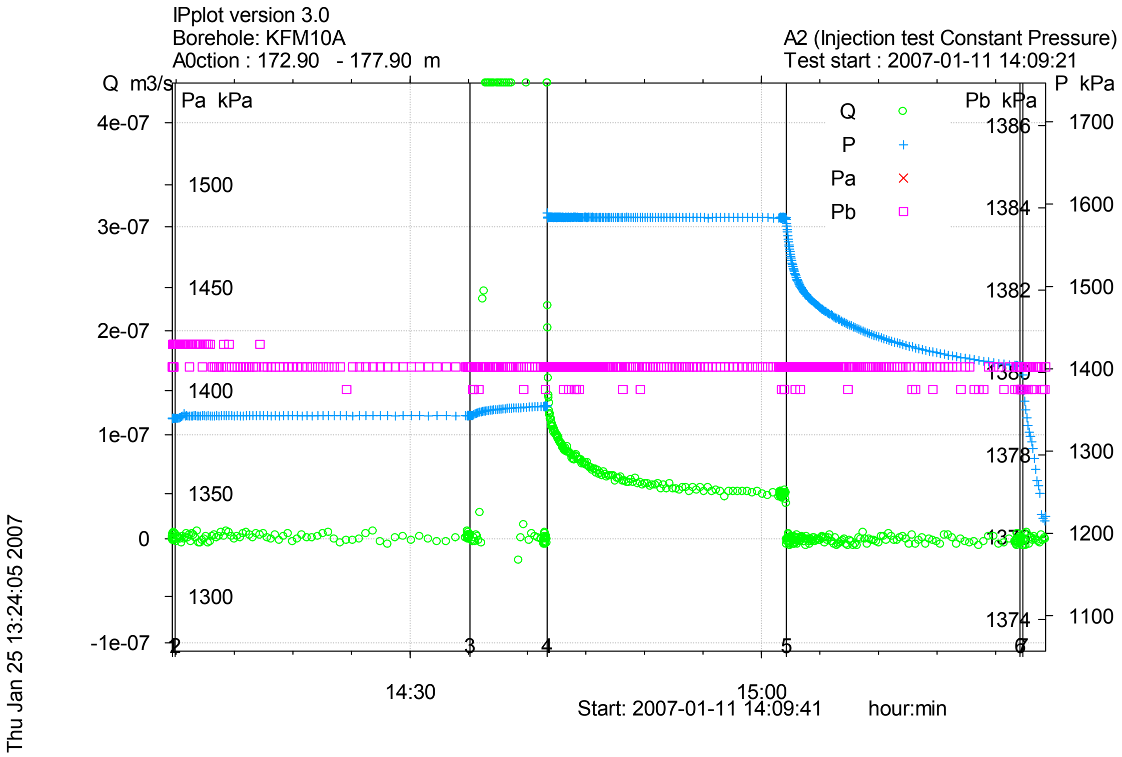


Figure A3-219. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 172.9-177.9 m in borehole KFM10A.*

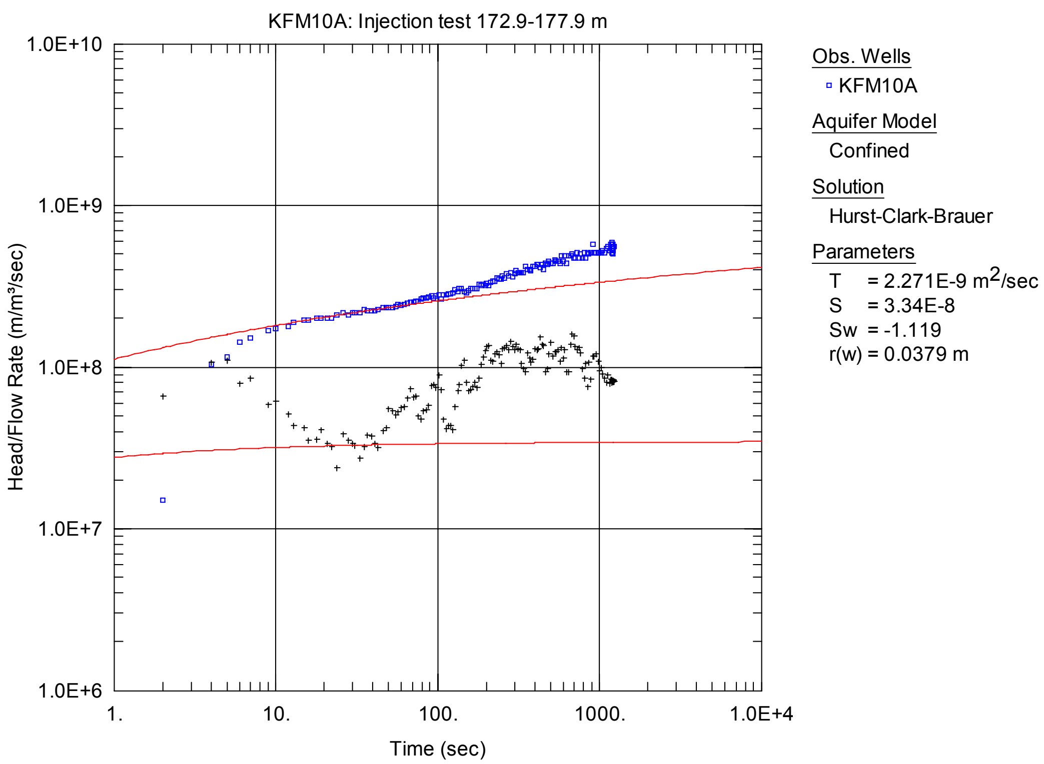


Figure A3-220. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the *injection test in section 172.9-177.9 m in KFM10A.*

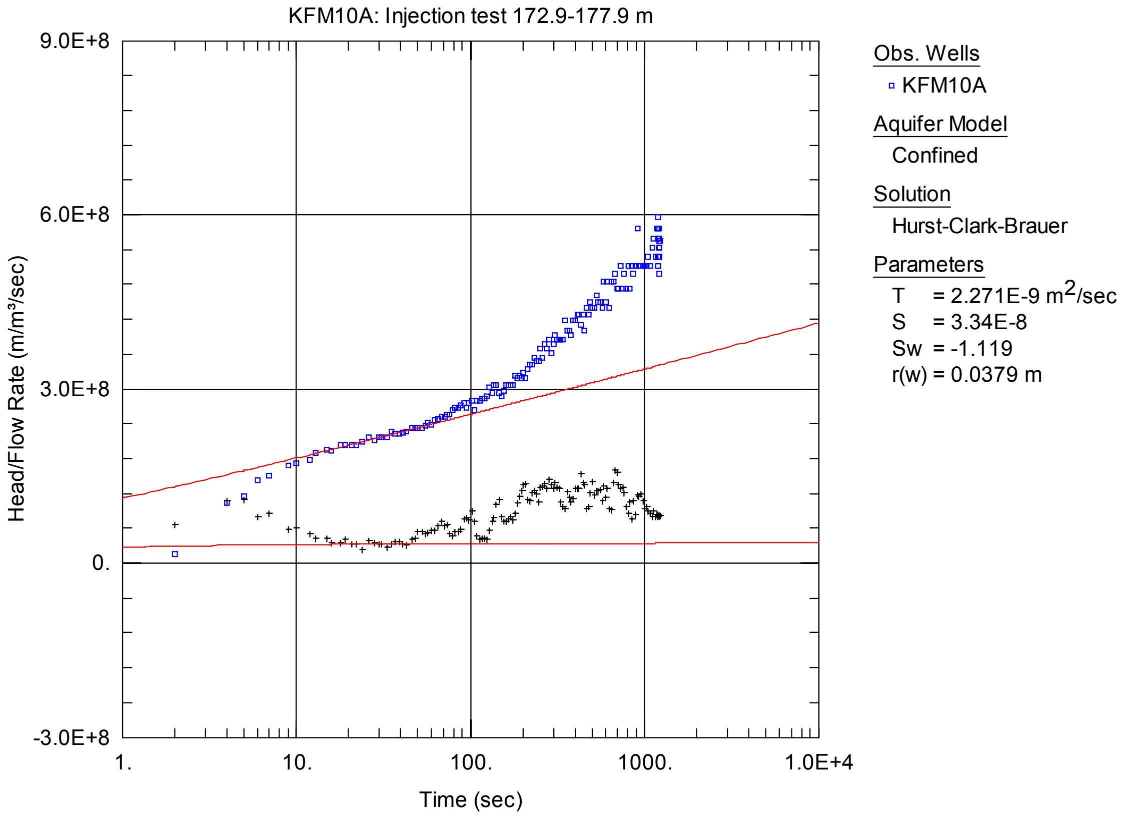


Figure A3-221. Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the *injection test in section 172.9-177.9 m in KFM10A.*

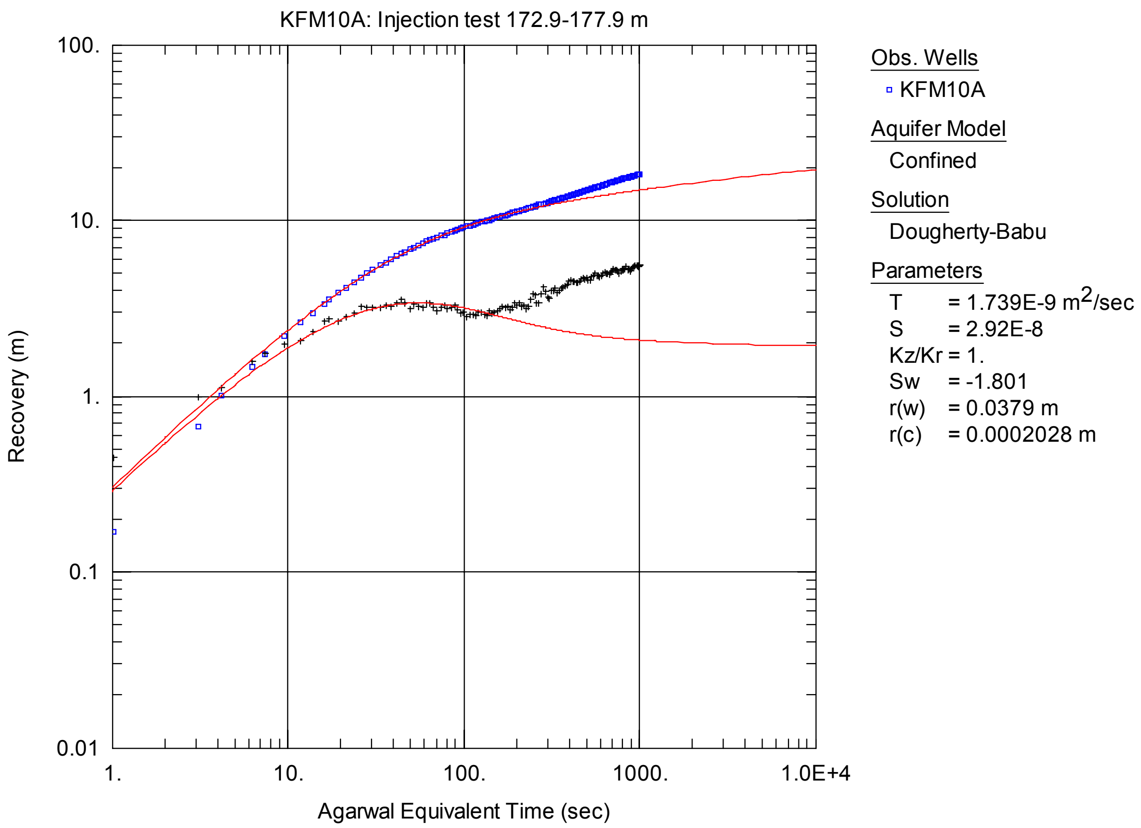


Figure A3-222. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 172.9-177.9 m in KFM10A.*

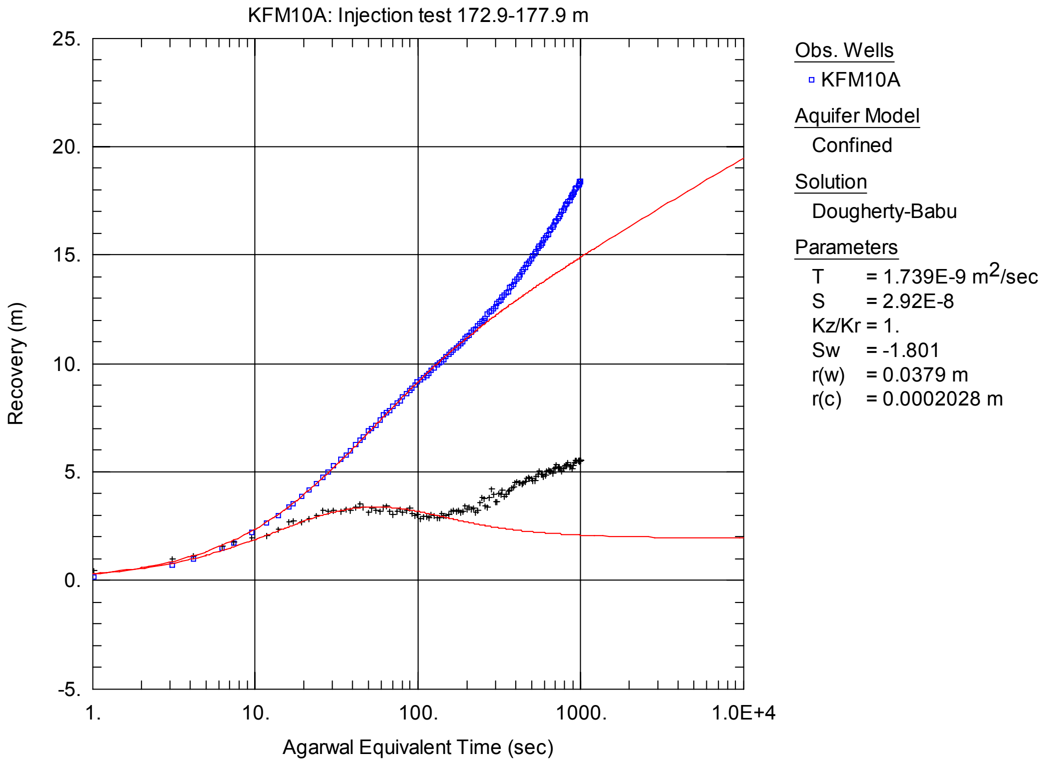


Figure A3-223. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 172.9-177.9 m in KFM10A.*

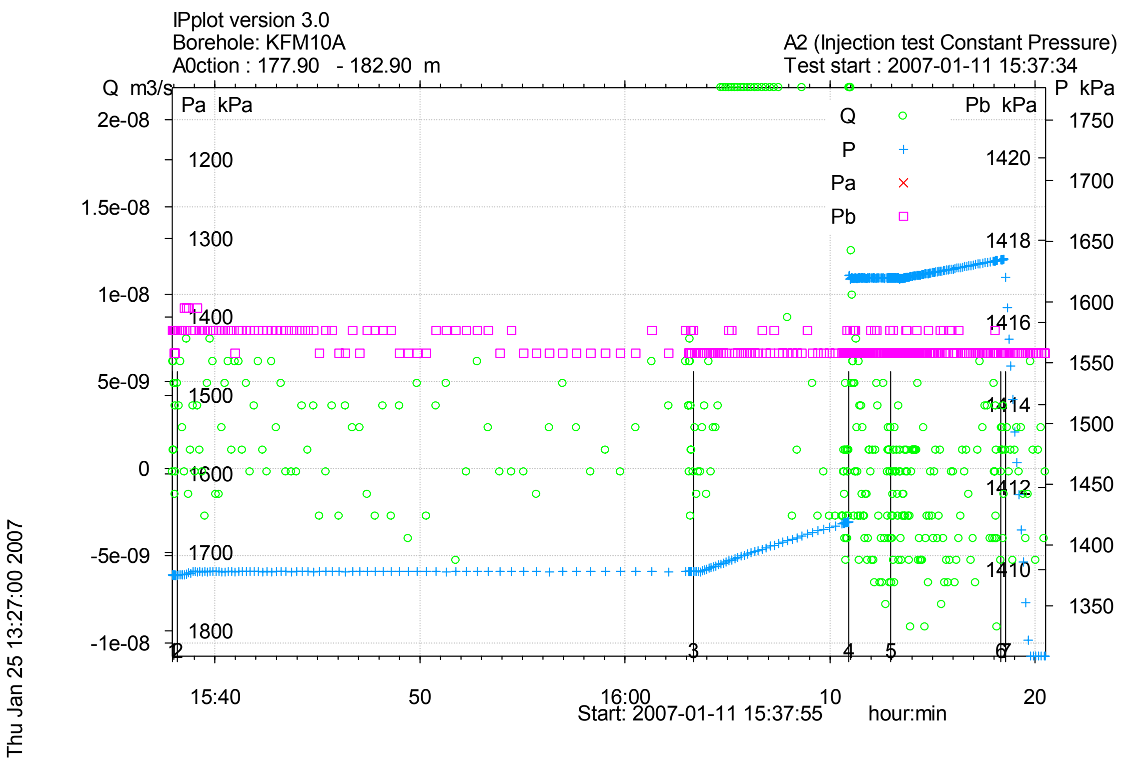


Figure A3-224. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 177.9-182.9 m in borehole KFM10A.*

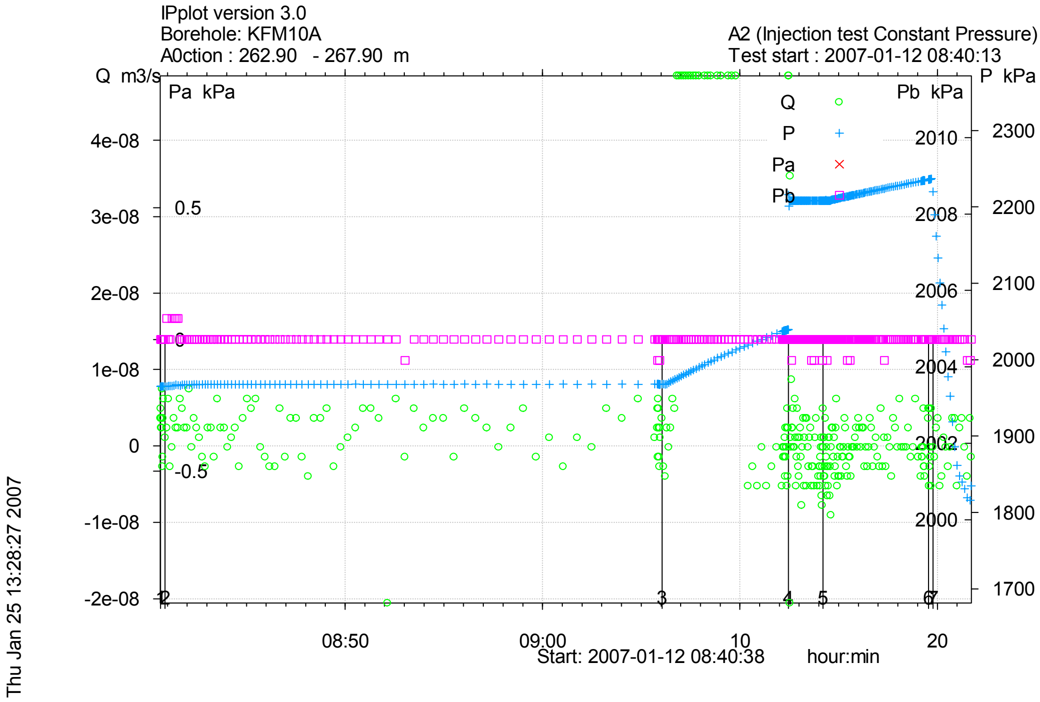


Figure A3-225. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 262.9-267.9 m in borehole KFM10A.*

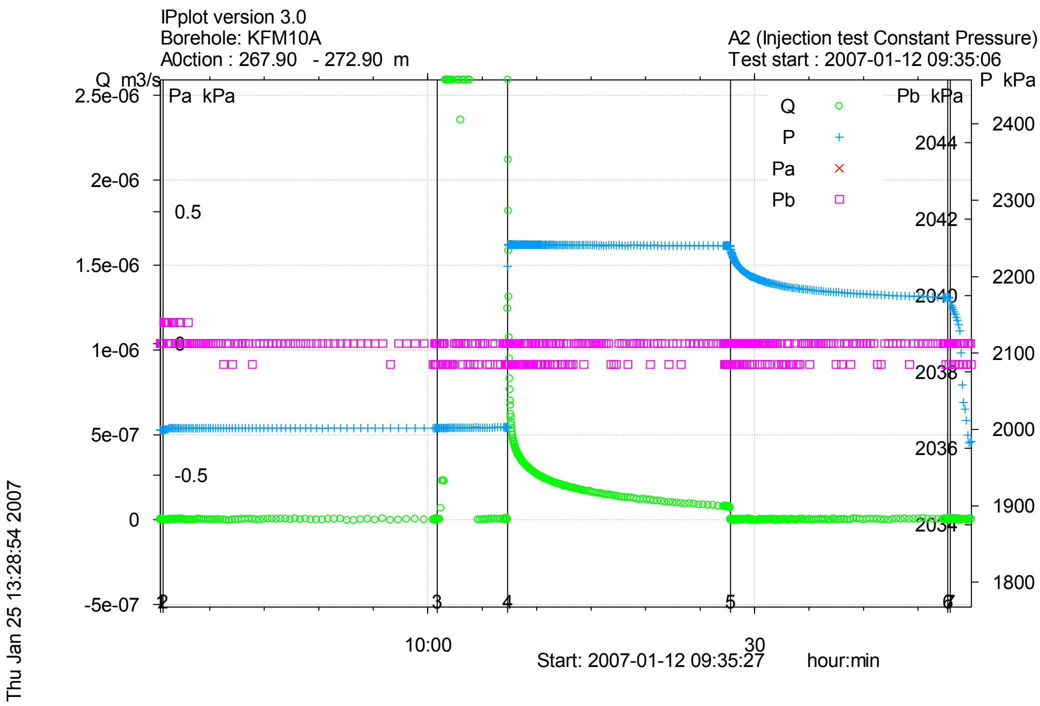


Figure A3-226. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 267.9-272.9 m in borehole KFM10A.*

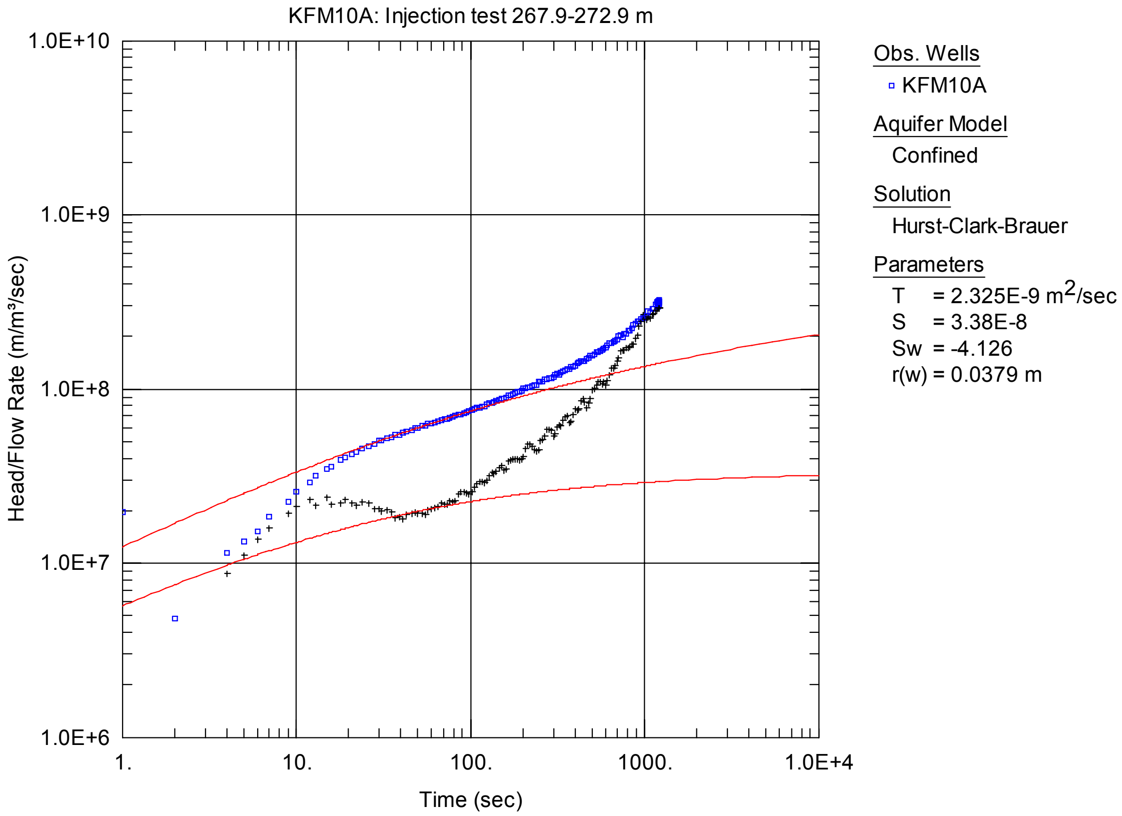


Figure A3-227. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the *injection test in section 267.9-272.9 m in KFM10A.*

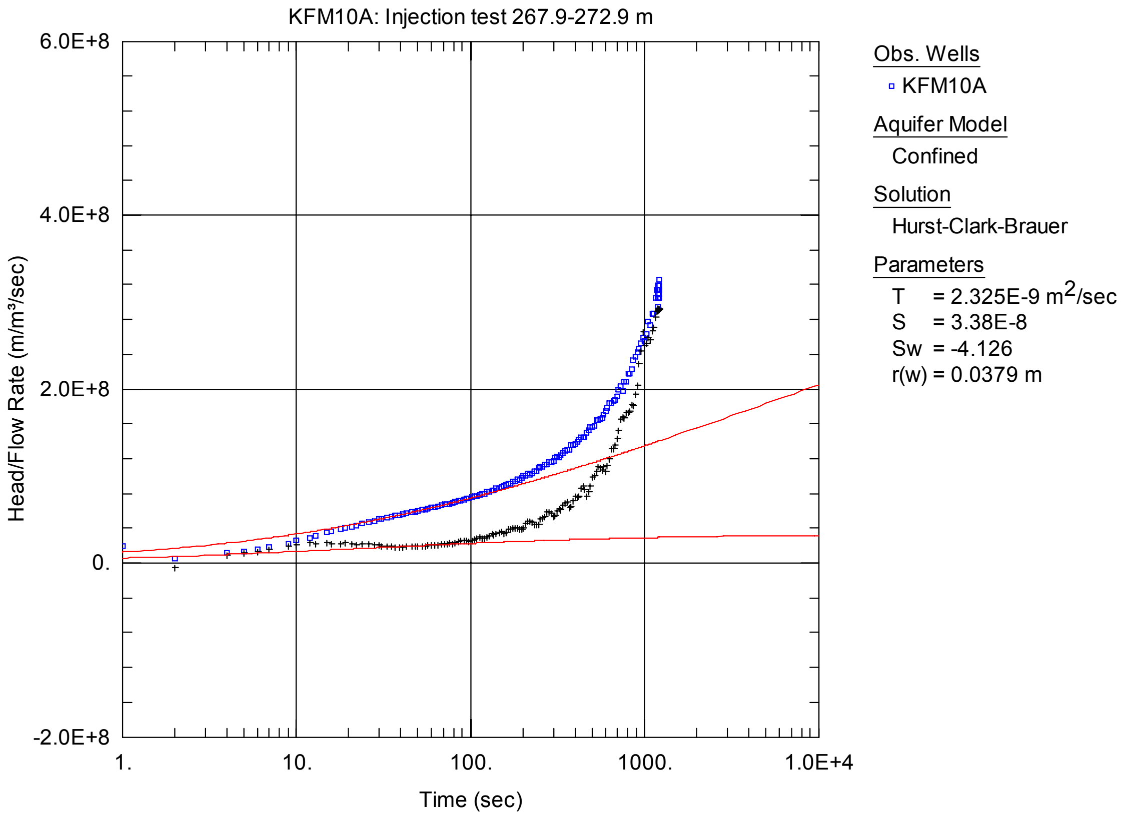


Figure A3-228. Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the *injection test in section 267.9-272.9 m in KFM10A.*

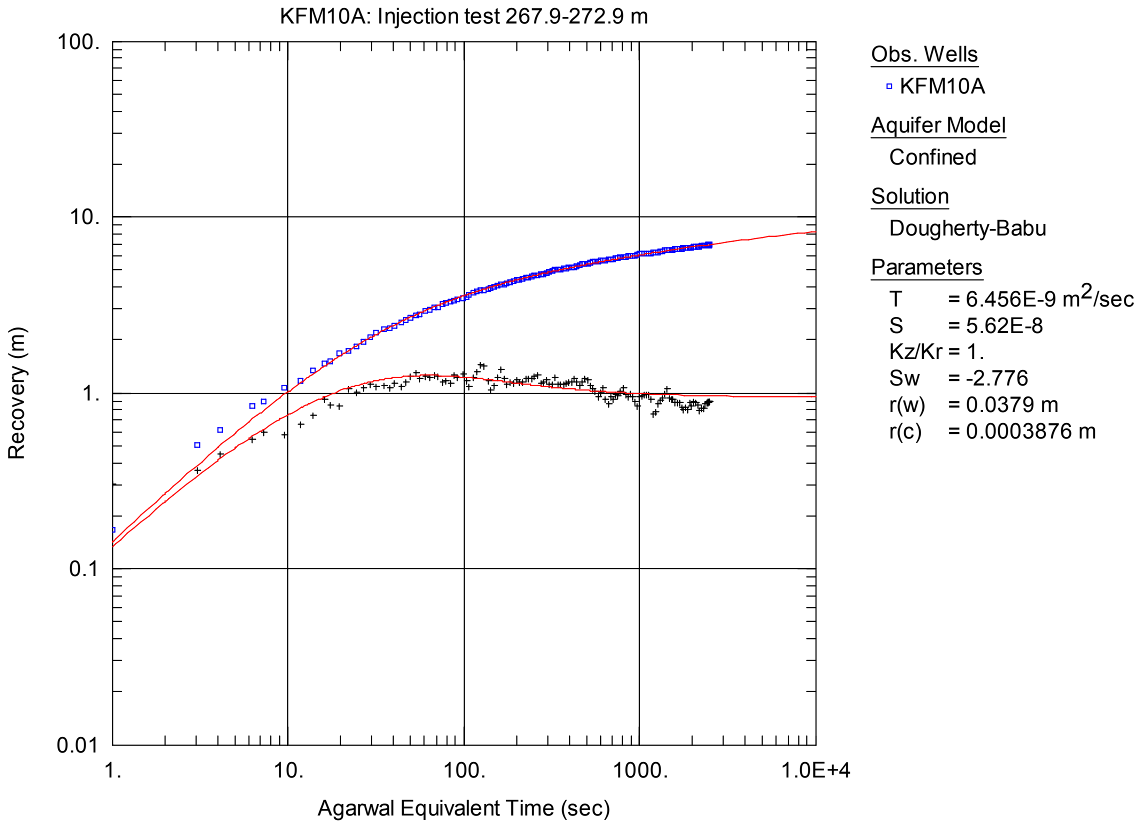


***Figure A3-229.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 267.9-272.9 m in KFM10A.*

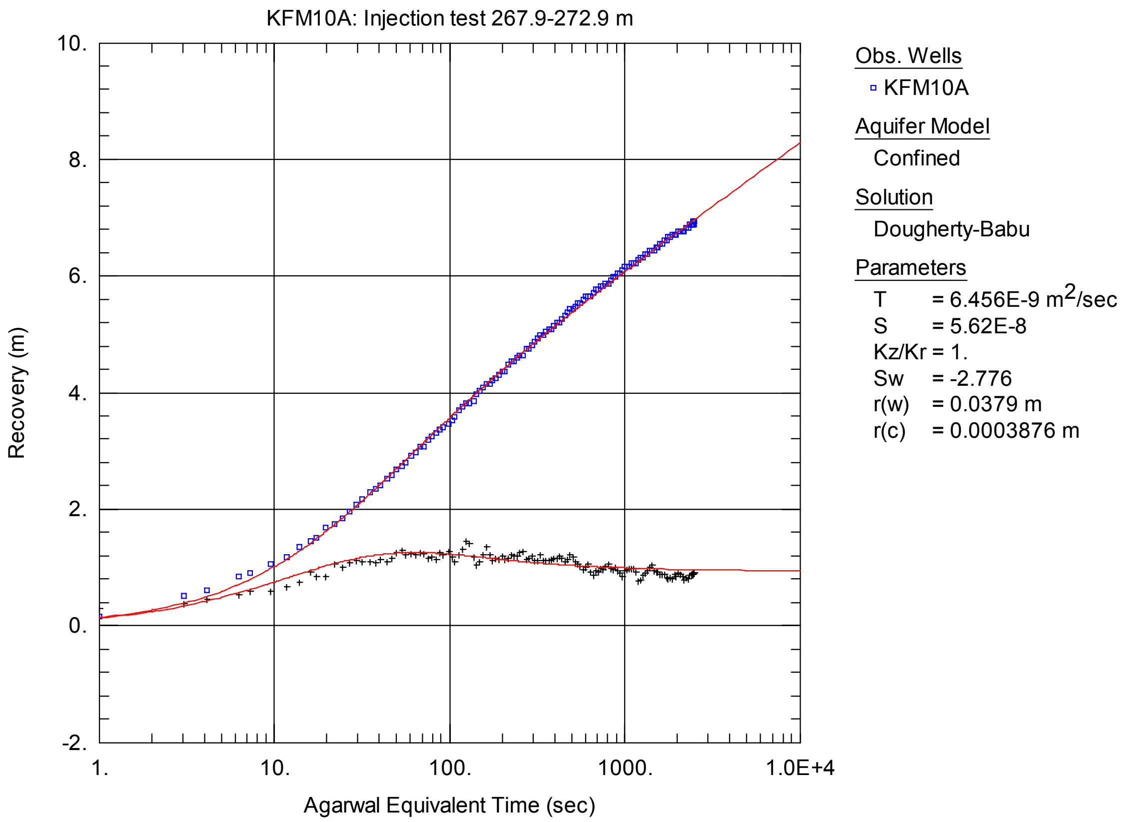


***Figure A3-230.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 267.9-272.9 m in KFM10A.*

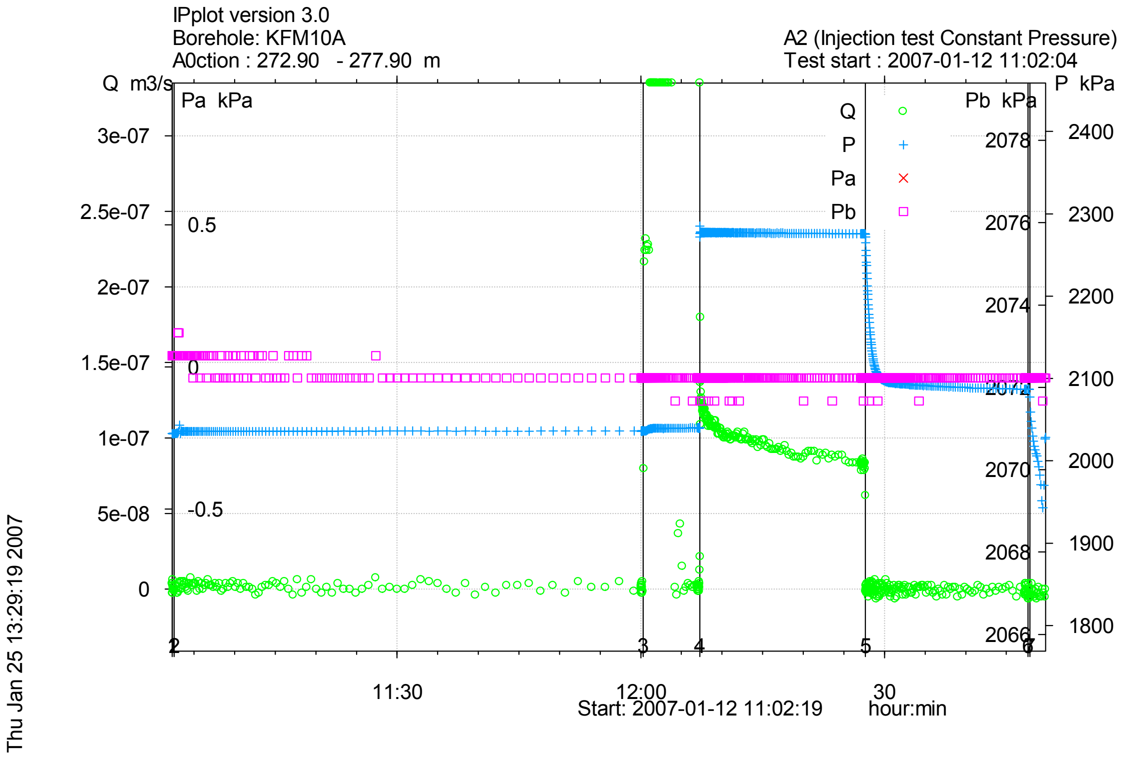


Figure A3-231. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 272.9-277.9 m in borehole KFM10A.*

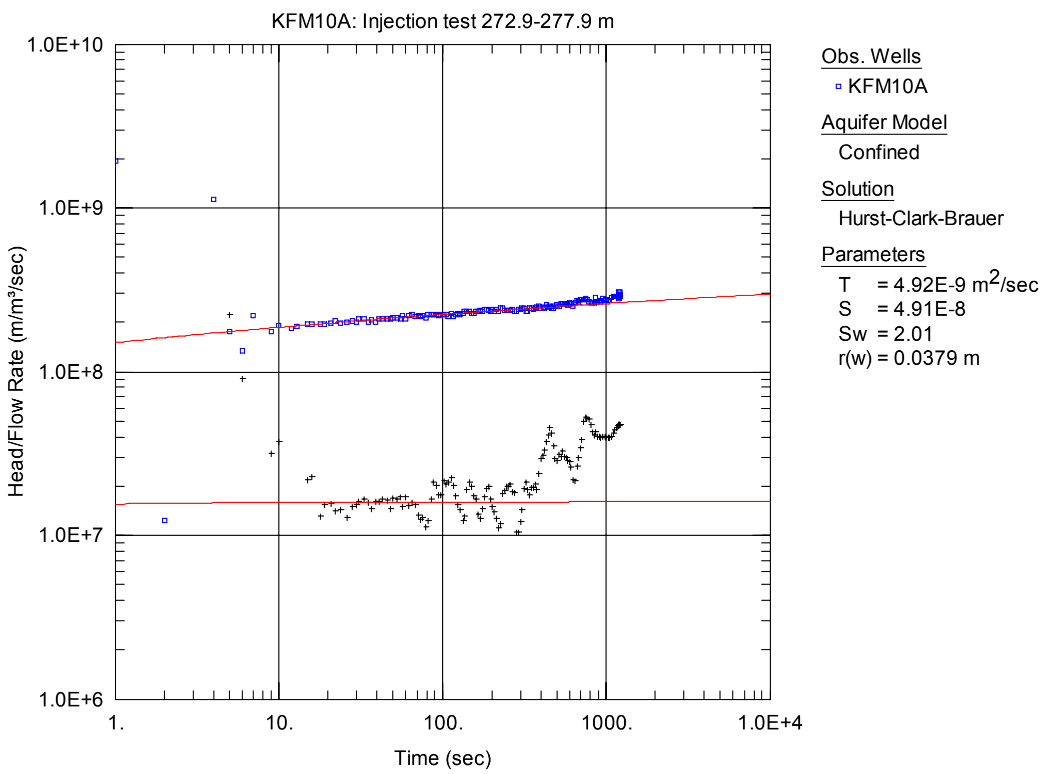


Figure A3-232. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the *injection test in section 272.9-277.9 m in KFM10A.*

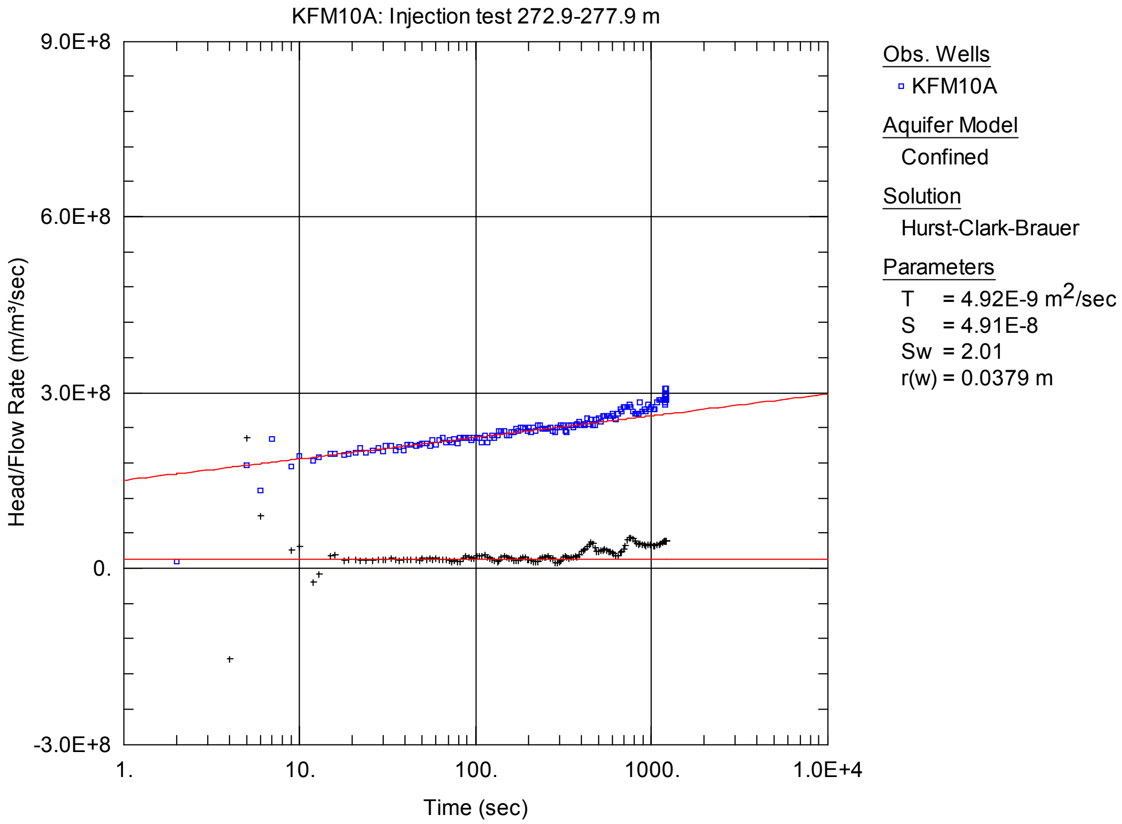


Figure A3-233. Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the *injection test in section 272.9-277.9 m in KFM10A.*

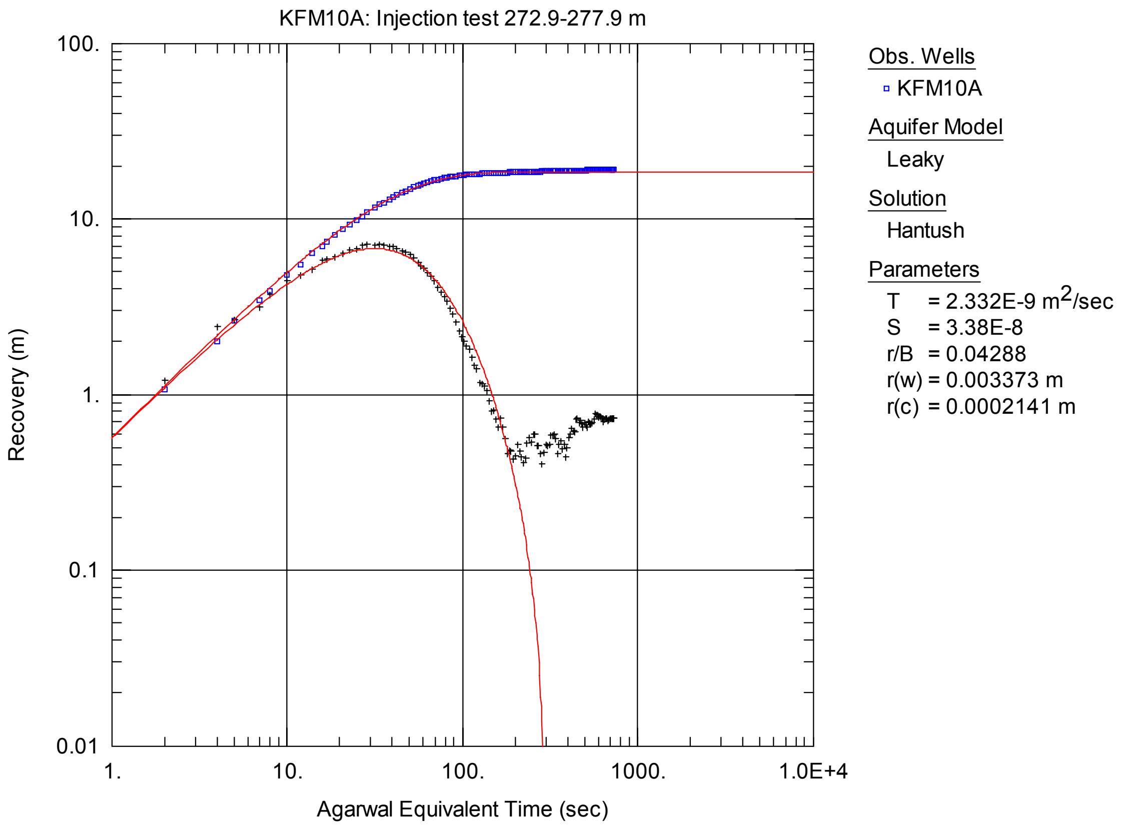


Figure A3-234. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 272.9-277.9 m in KFM10A.*

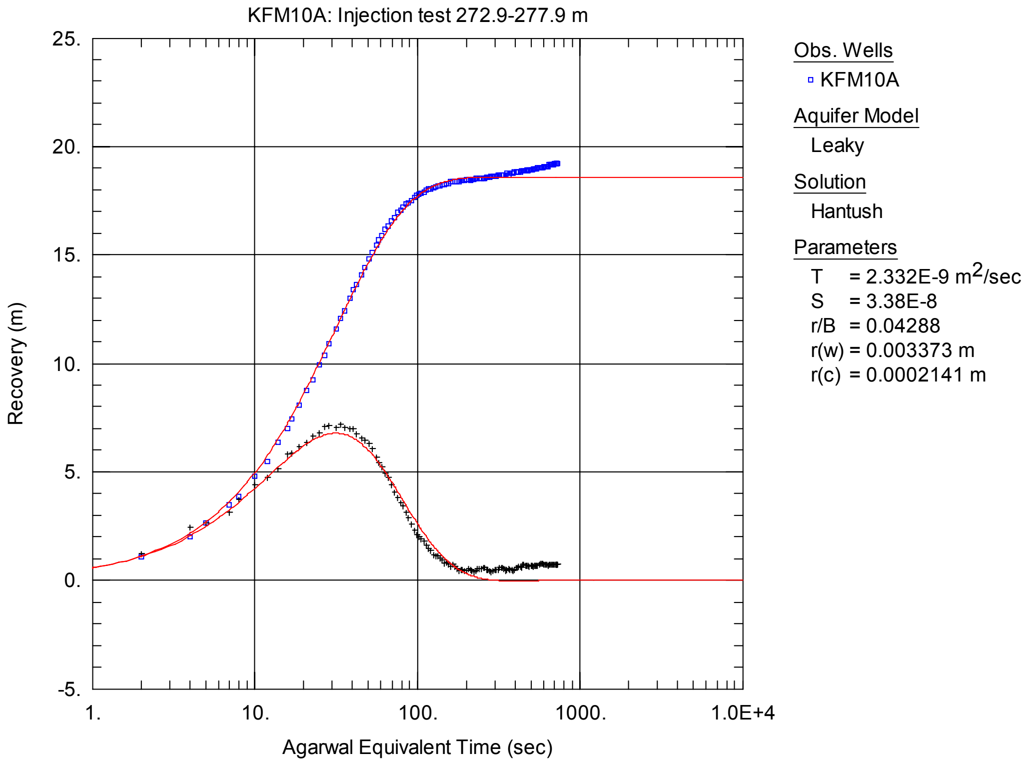


Figure A3-235. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 272.9-277.9 m in KFM10A.*

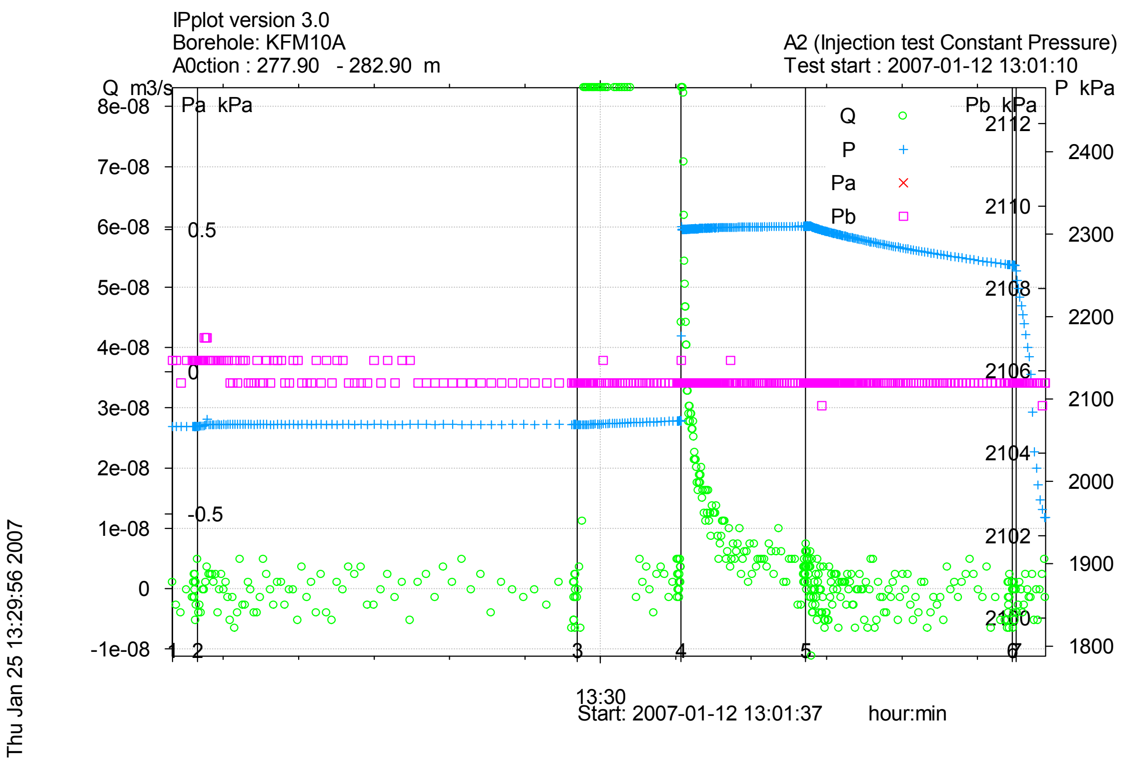


Figure A3-236. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 277.9-282.9 m in borehole KFM10A.*

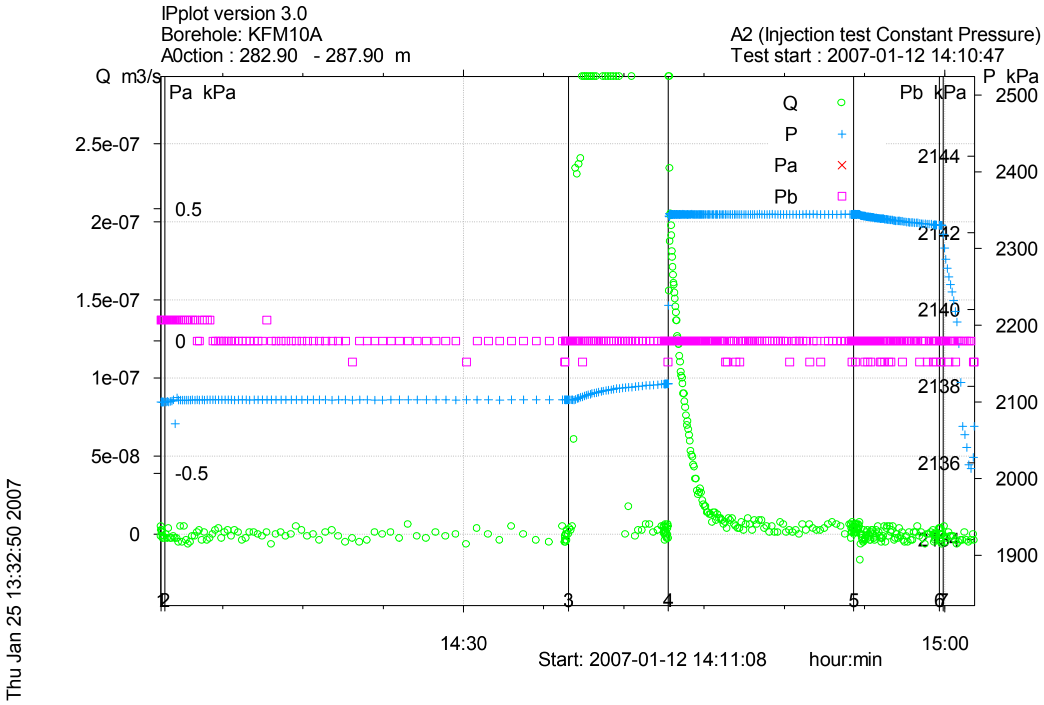


Figure A3-237. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 282.9-287.9 m in borehole KFM10A.

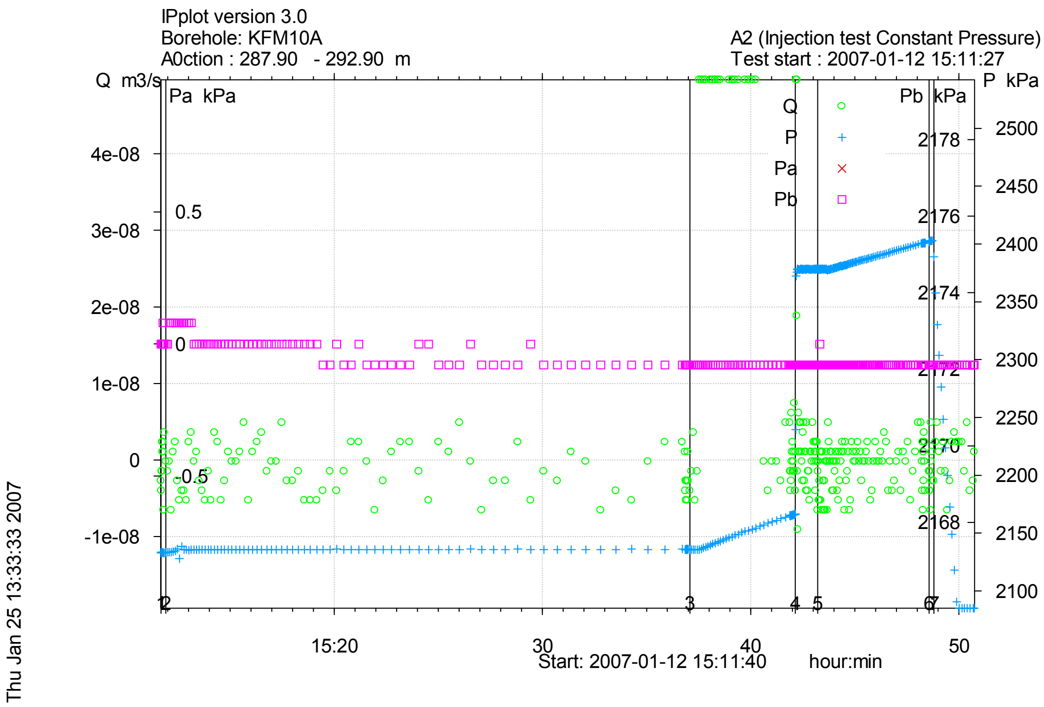


Figure A3-238. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 287.9-292.9 m in borehole KFM10A.

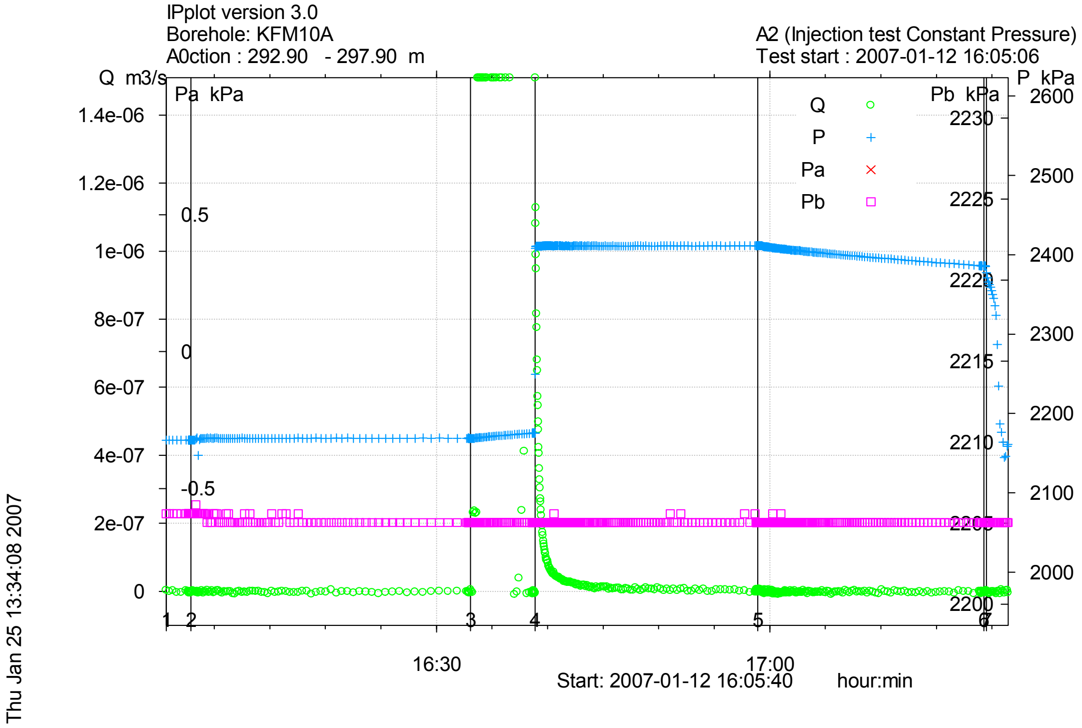


Figure A3-239. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 292.9-297.9 m in borehole KFM10A.

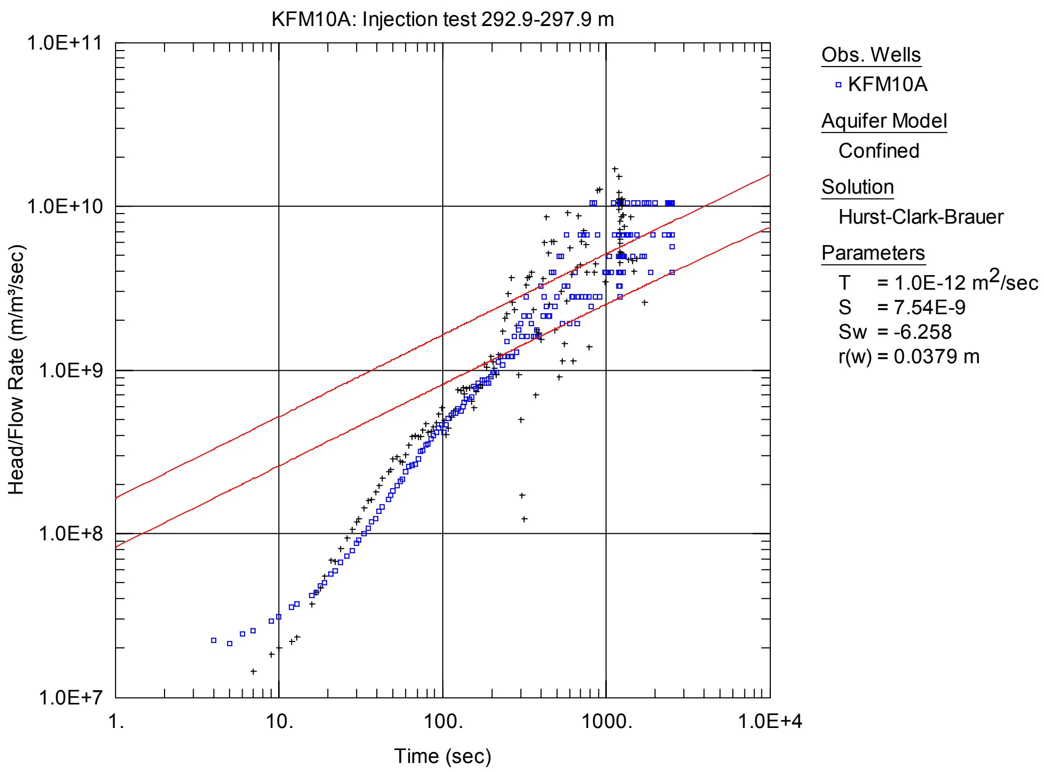


Figure A3-240. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 292.9-297.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.

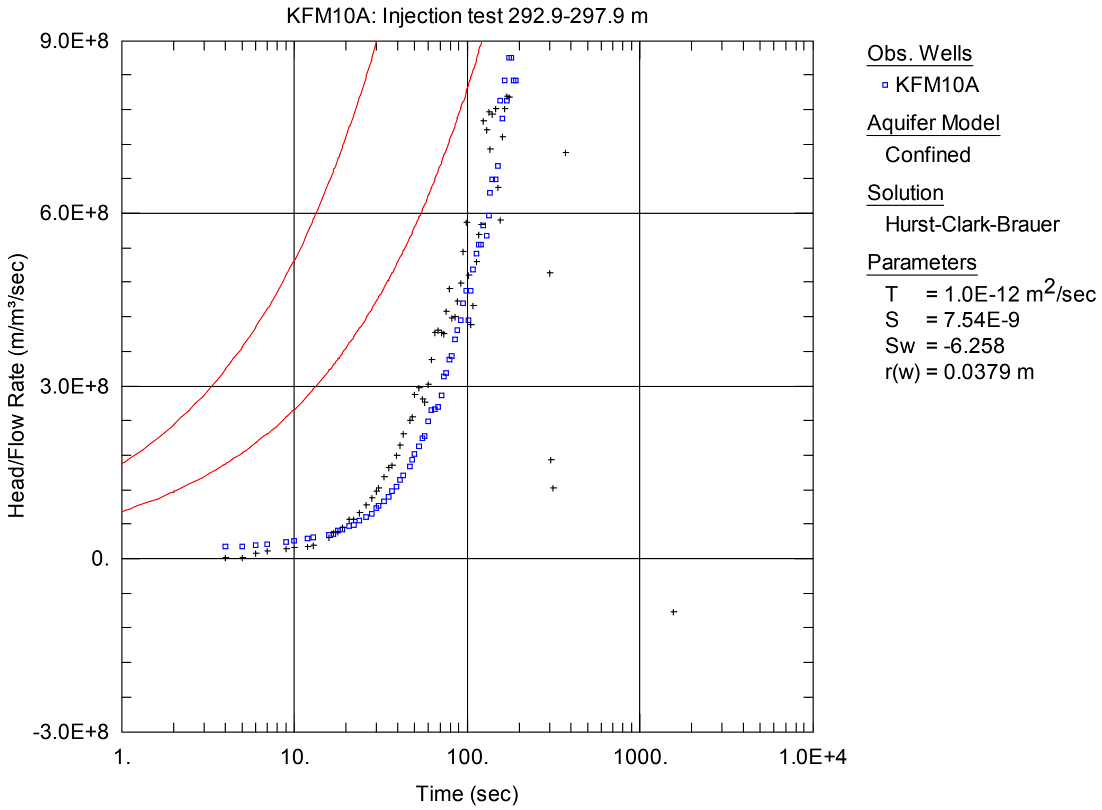


***Figure A3-241.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 292.9-297.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

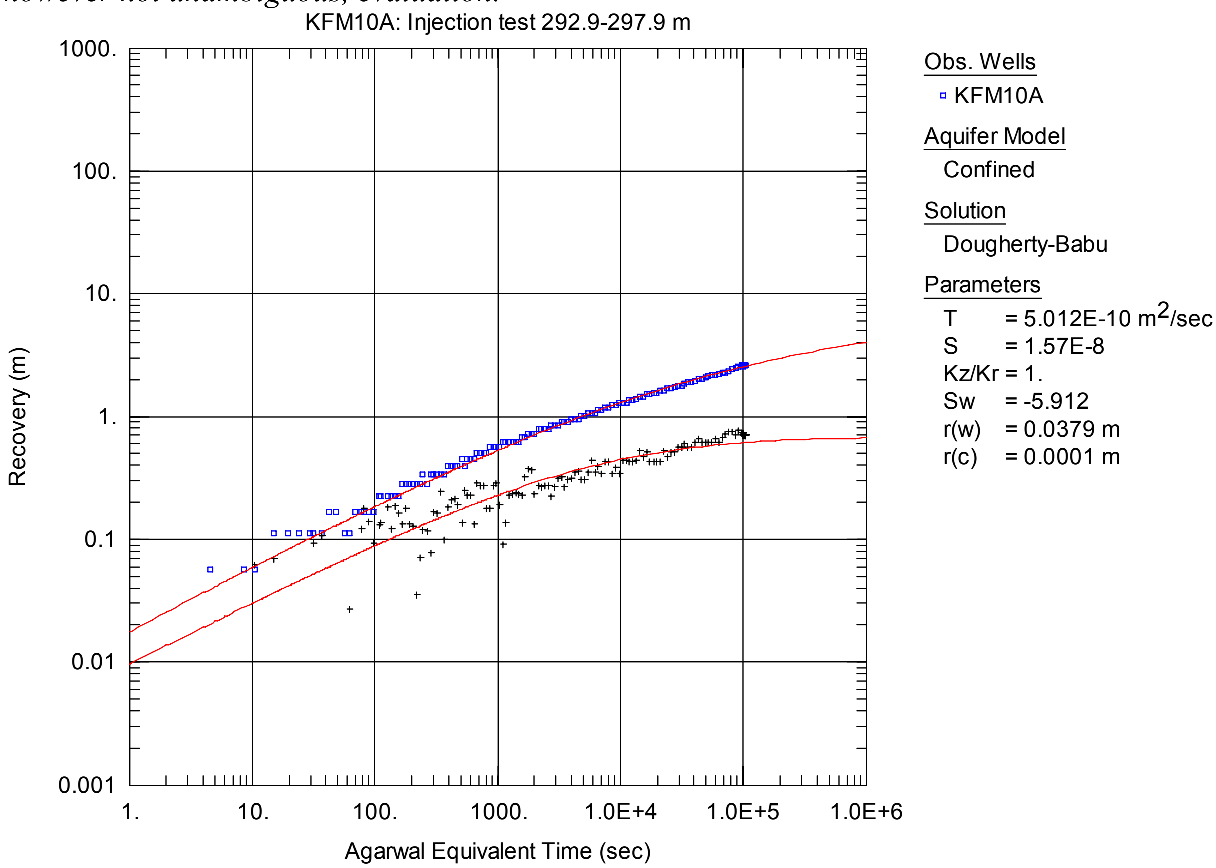


***Figure A3-242.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 292.9-297.9 m in KFM10A.*

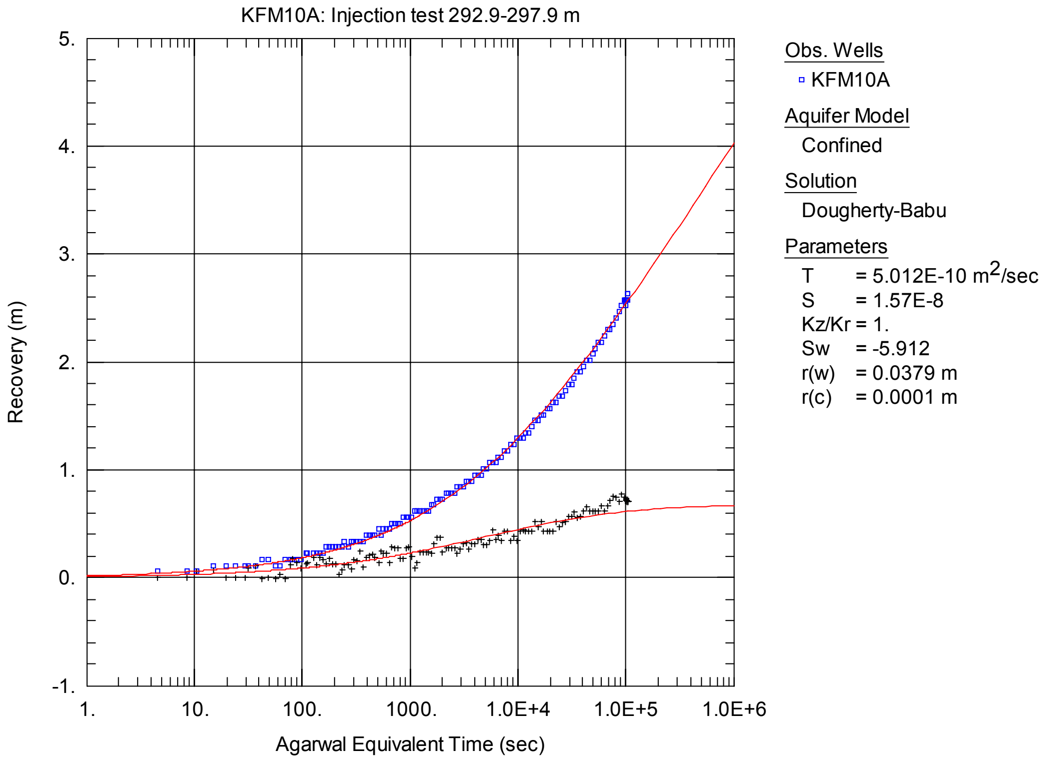


***Figure A3-243.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 292.9-297.9 m in KFM10A.*

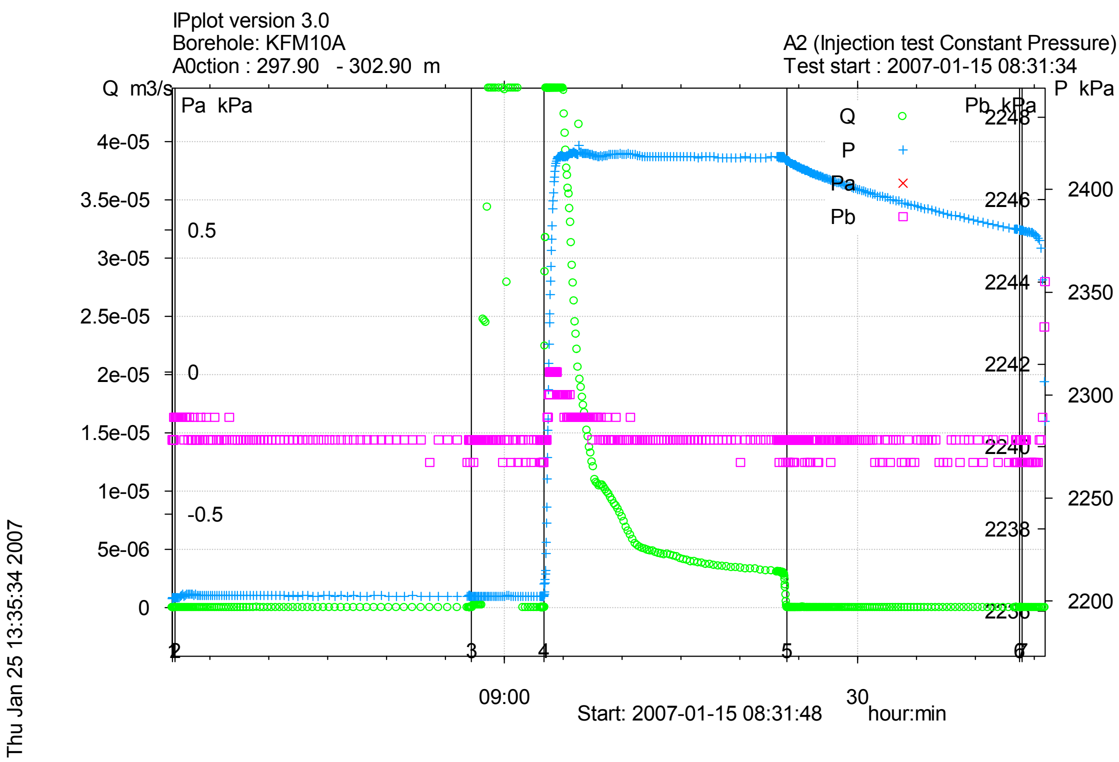


***Figure A3-244.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 297.9-302.9 m in borehole KFM10A.*

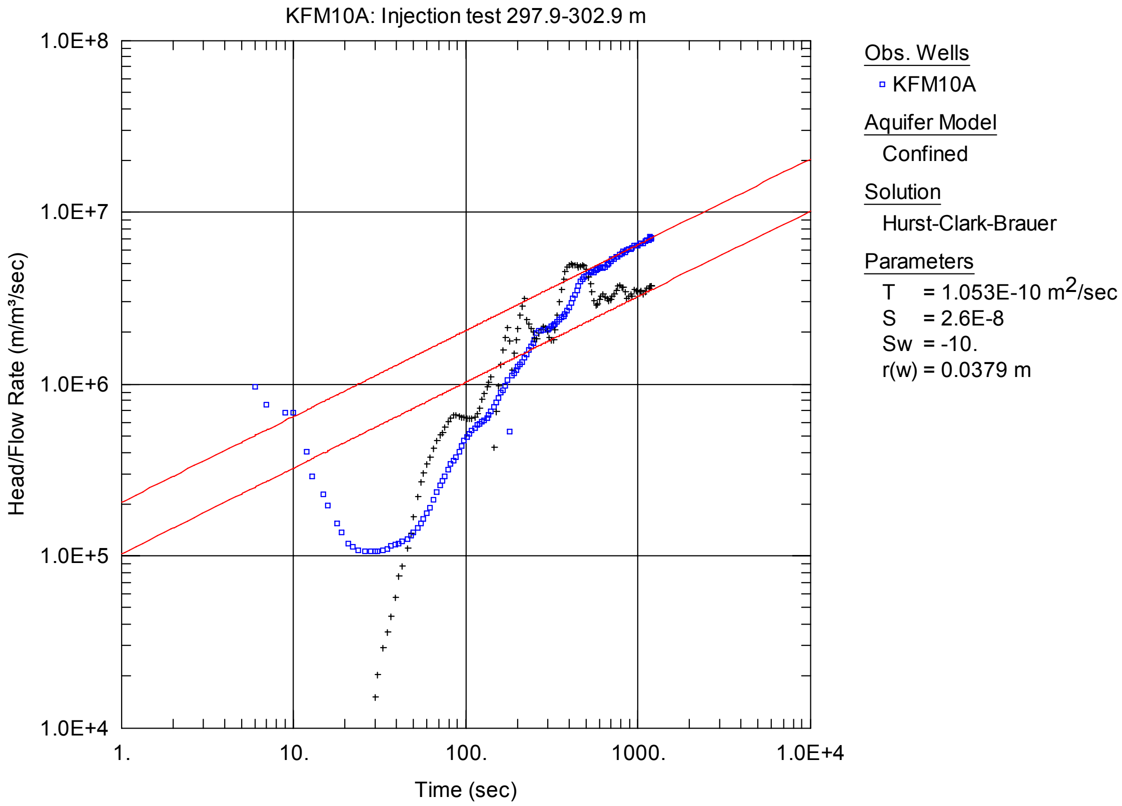


Figure A3-245. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 297.9-302.9 m in KFM10A. The type curve fit is only to show that an assumption of PRF is not valid.*

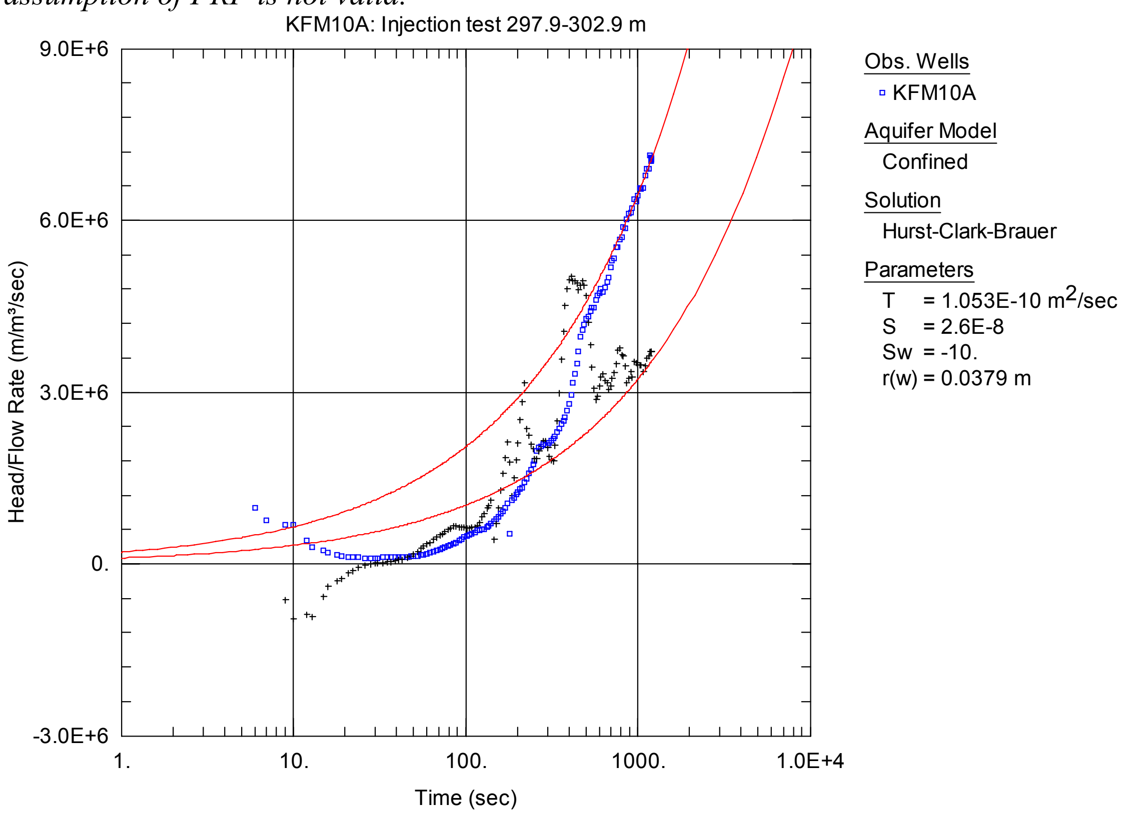


Figure A3-246. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 297.9-302.9 m in KFM10A. The type curve fit is only to show that an assumption of PRF is not valid.*

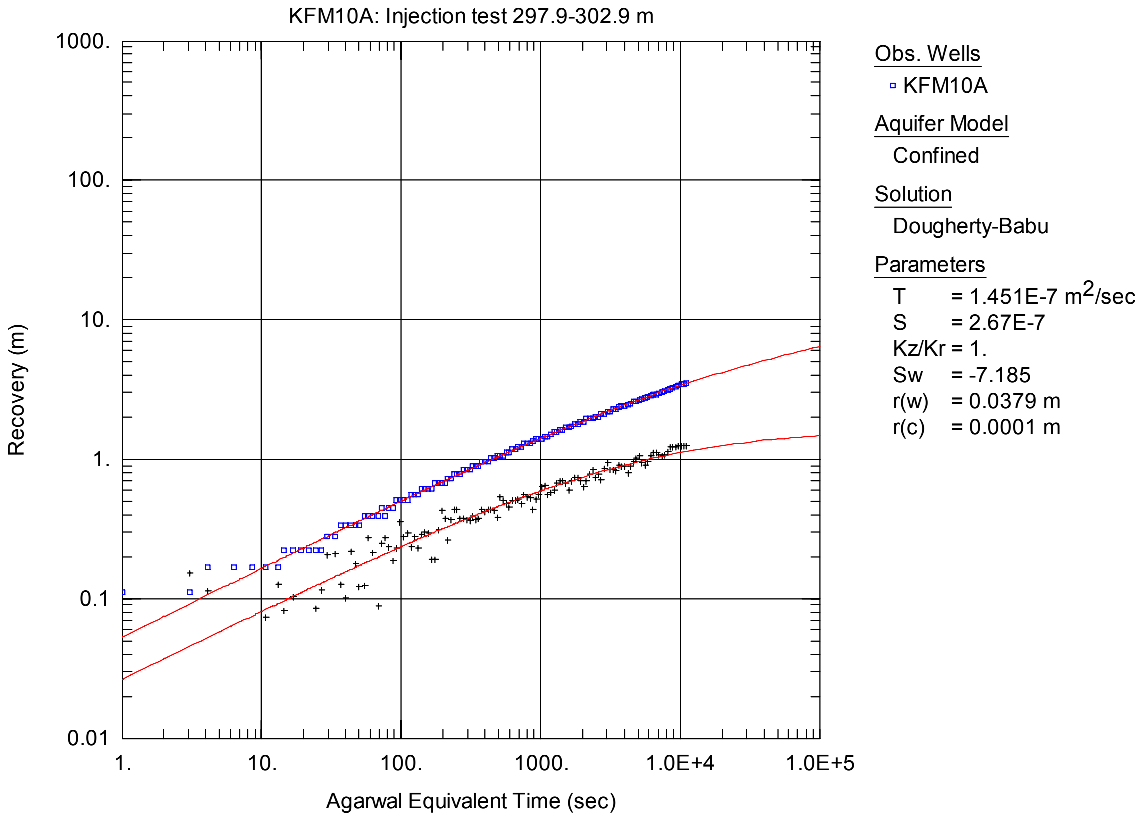


***Figure A3-247.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 297.9-302.9 m in KFM10A.*

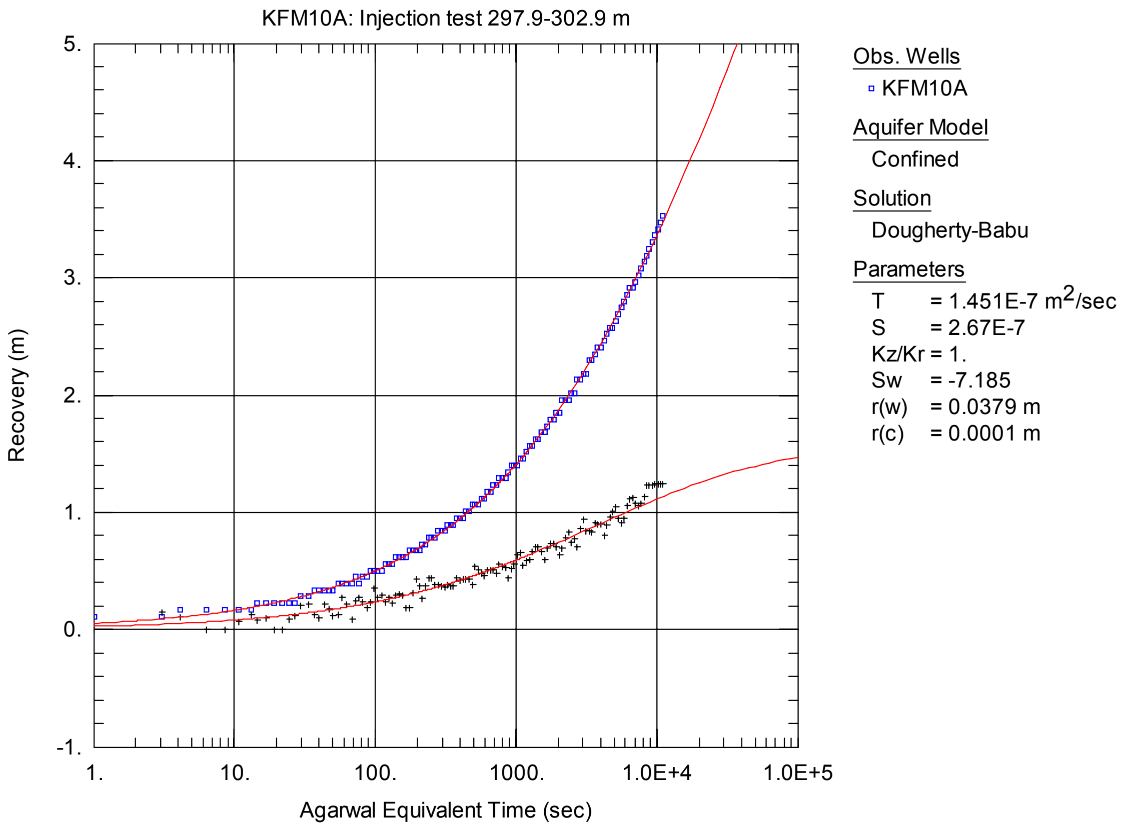


***Figure A3-248.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 297.9-302.9 m in KFM10A.*

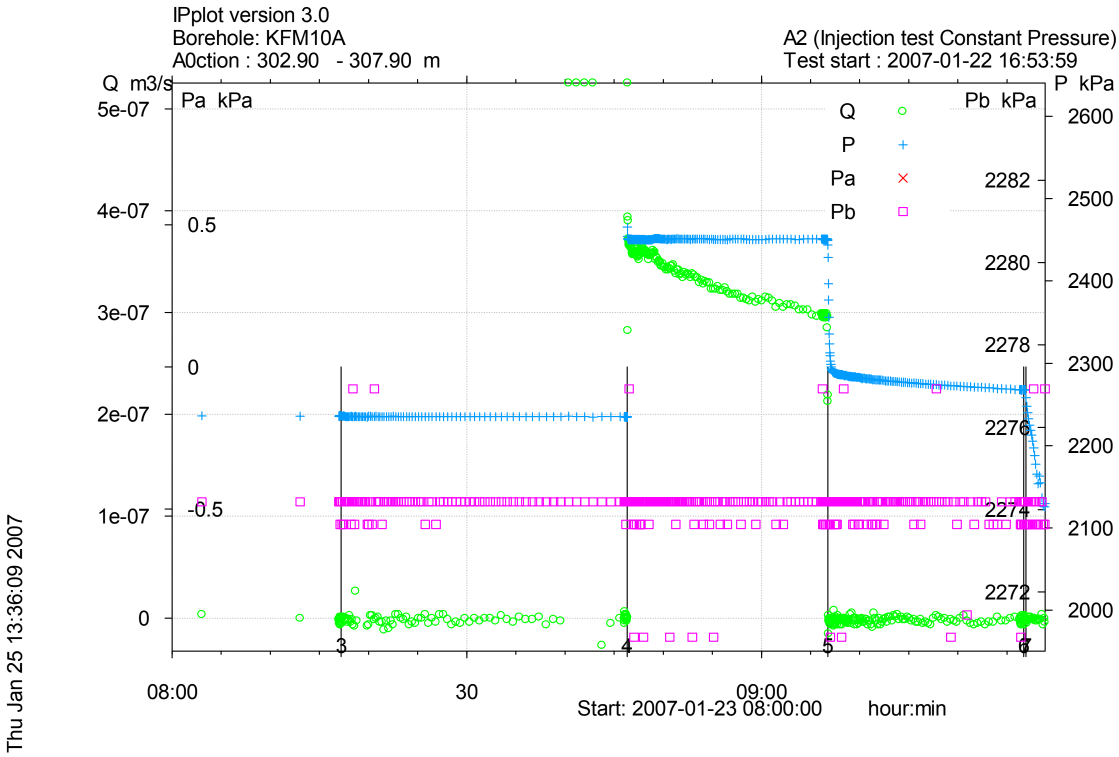


Figure A3-249. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 302.9-307.9 m in borehole KFM10A.

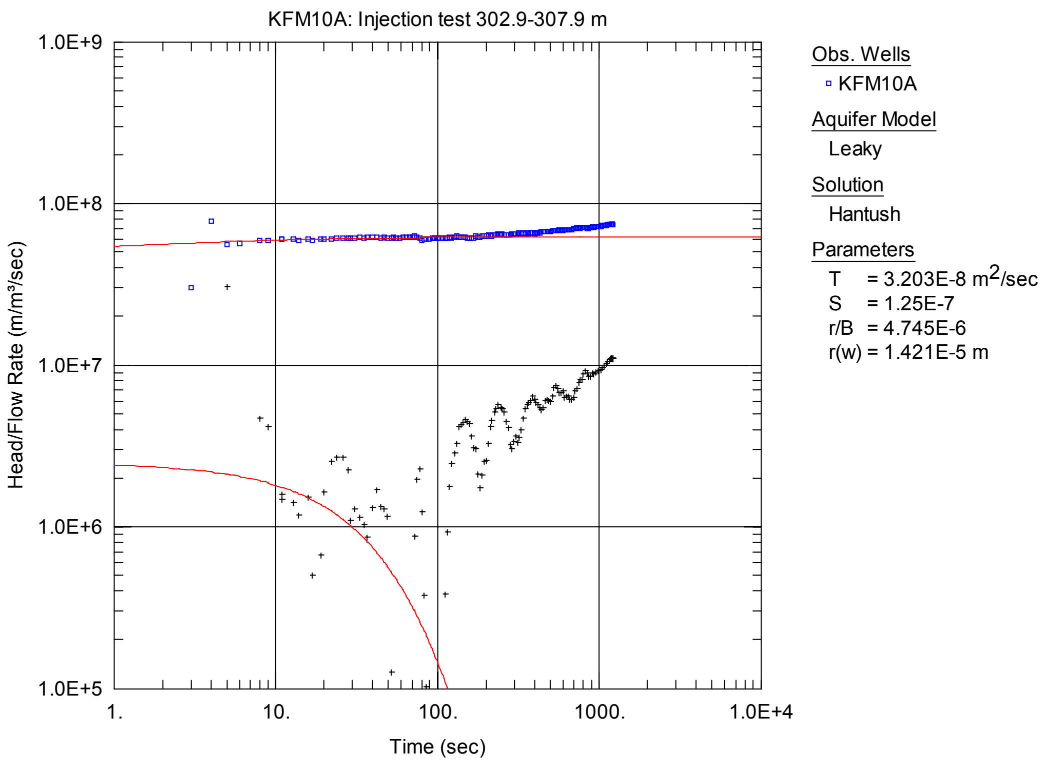


Figure A3-250. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 302.9-307.9 m in KFM10A.

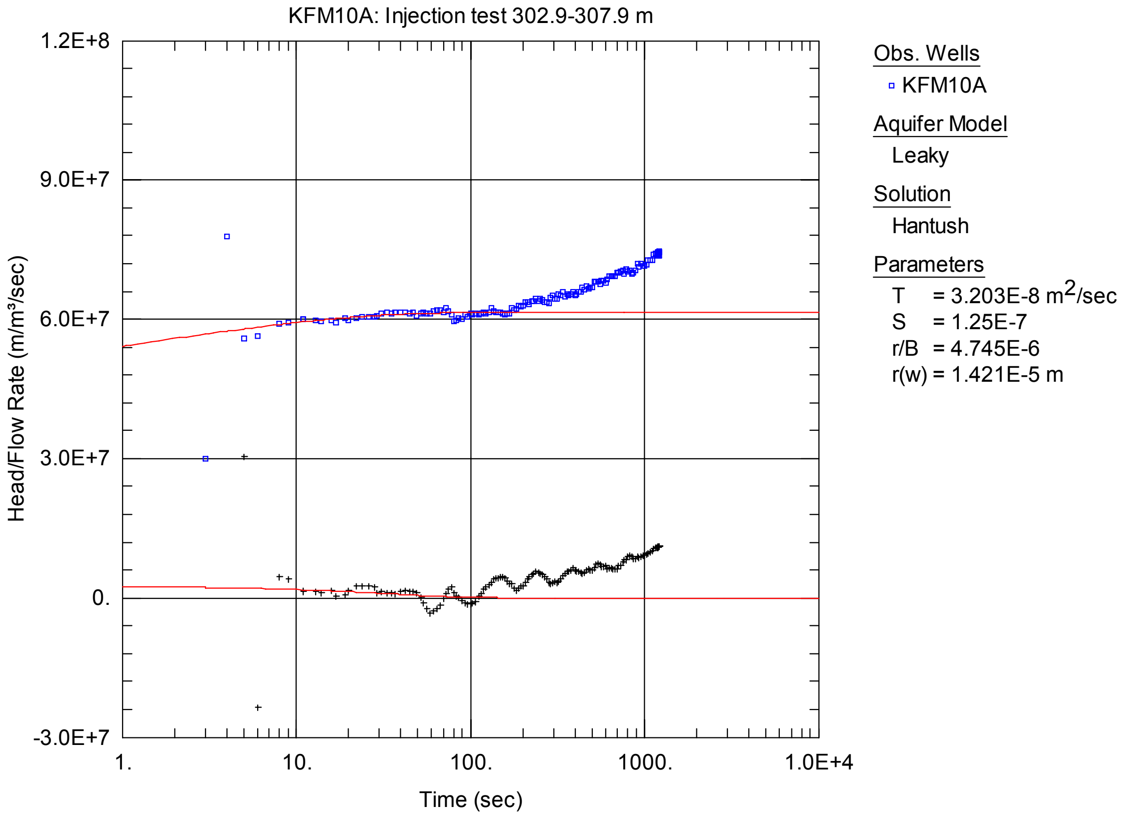


Figure A3-251. Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 302.9-307.9 m in KFM10A.

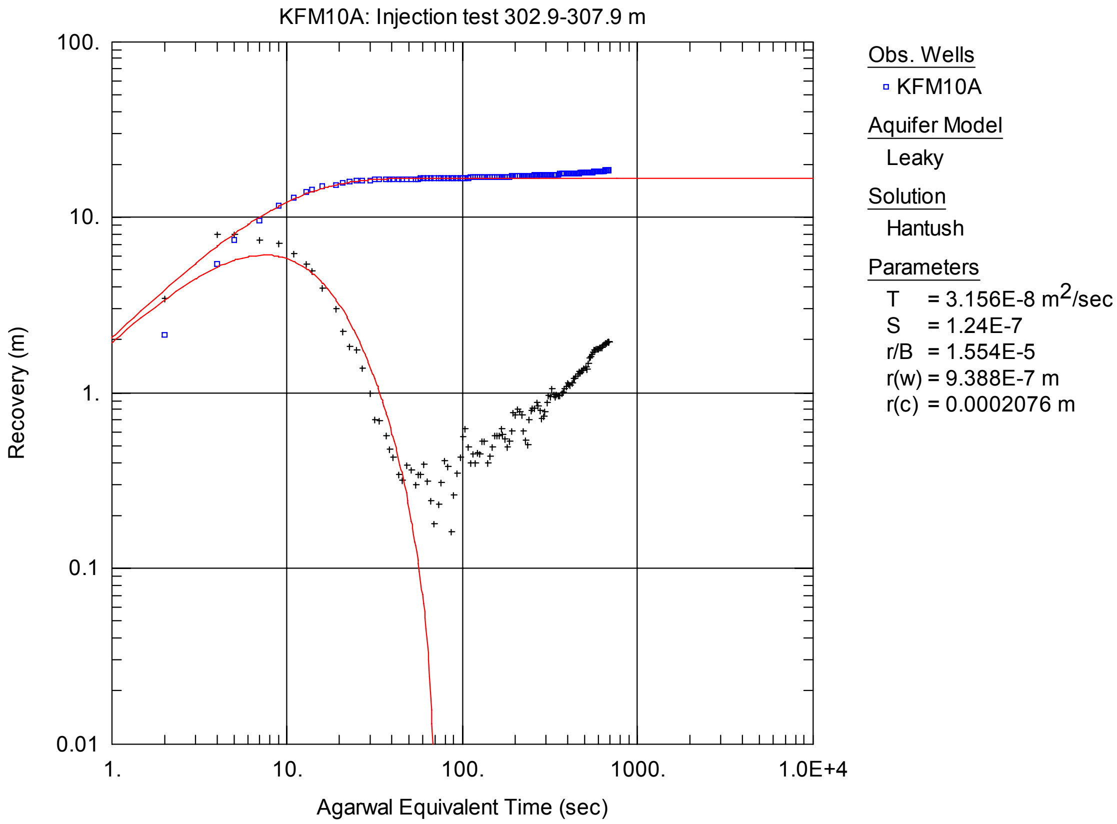


Figure A3-252. Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 302.9-307.9 m in KFM10A.

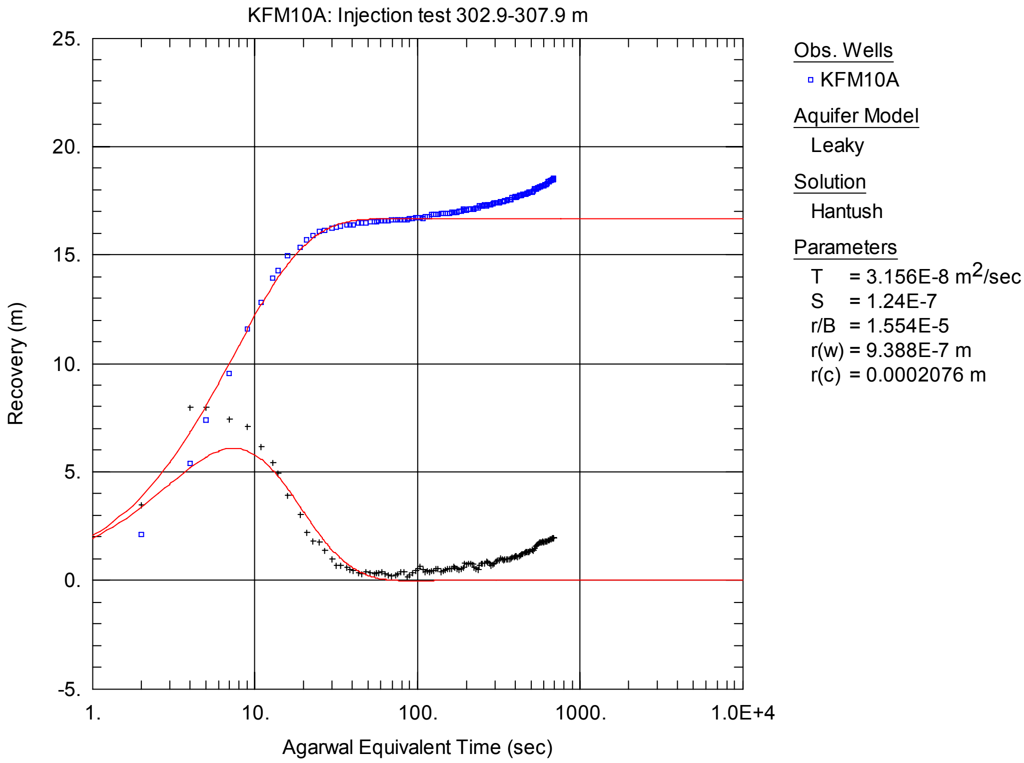


Figure A3-253. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 302.9-307.9 m in KFM10A.*

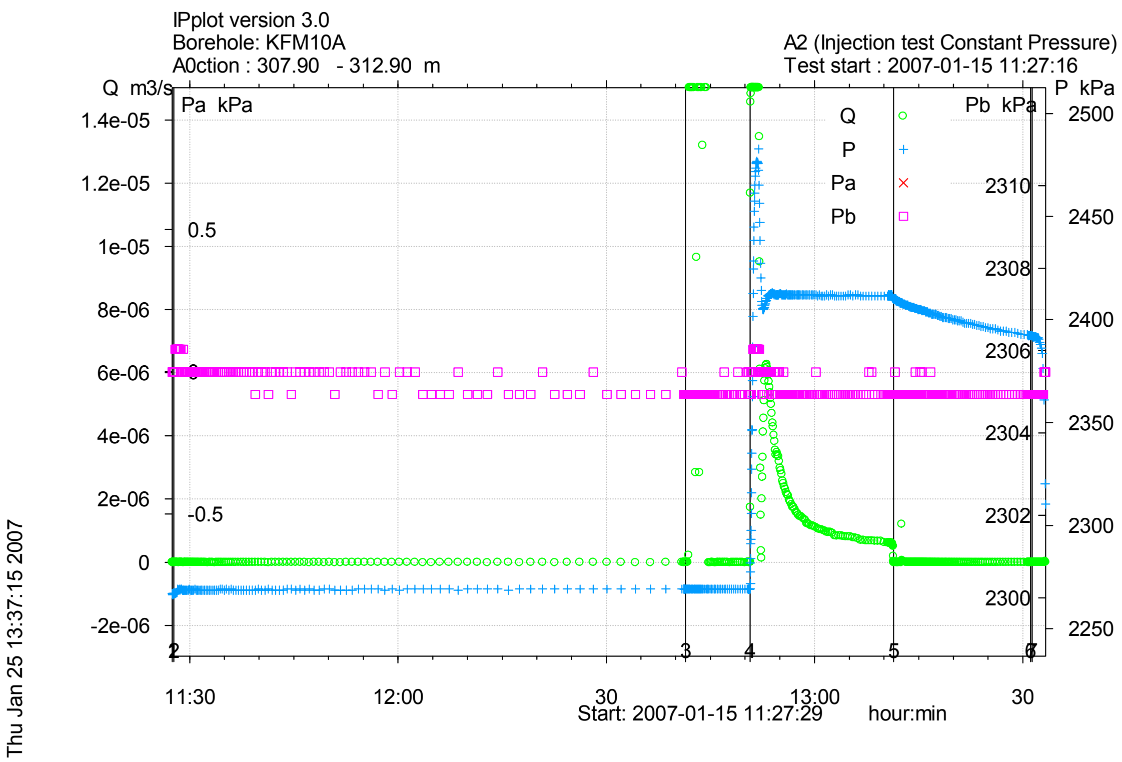


Figure A3-254. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 307.9-312.9 m in borehole KFM10A.*

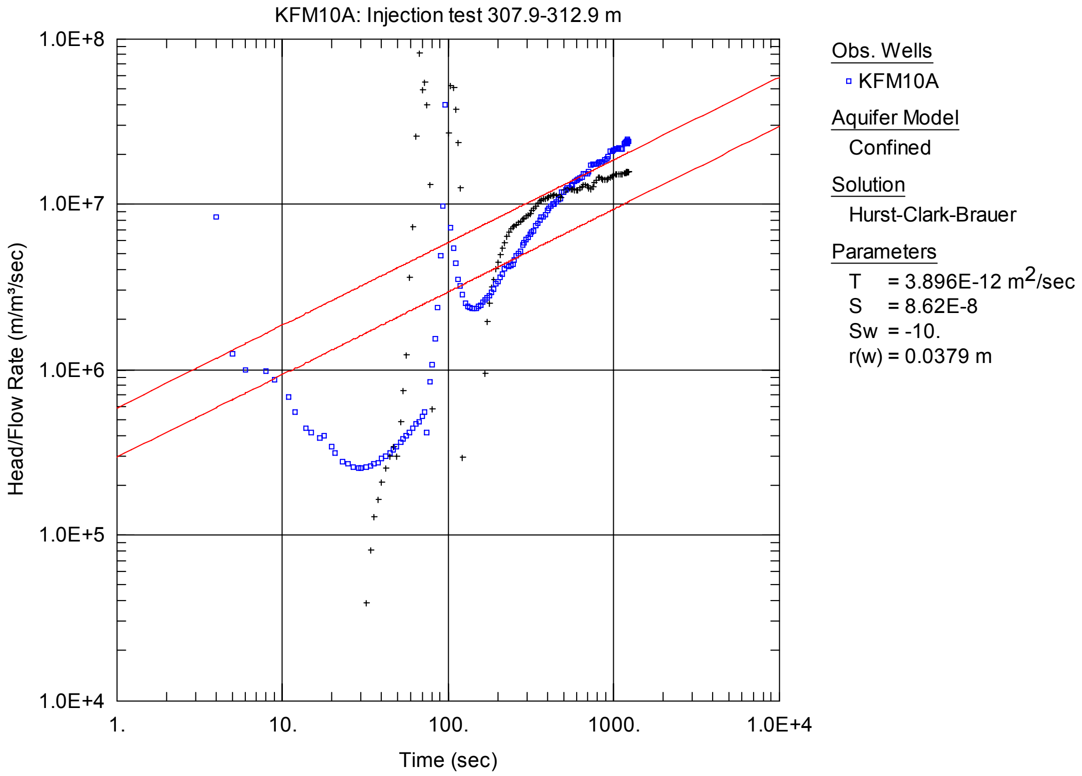


Figure A3-255. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 307.9-312.9 m in KFM10A. The type curve fit is only to show that an assumption of PRF is not valid.*

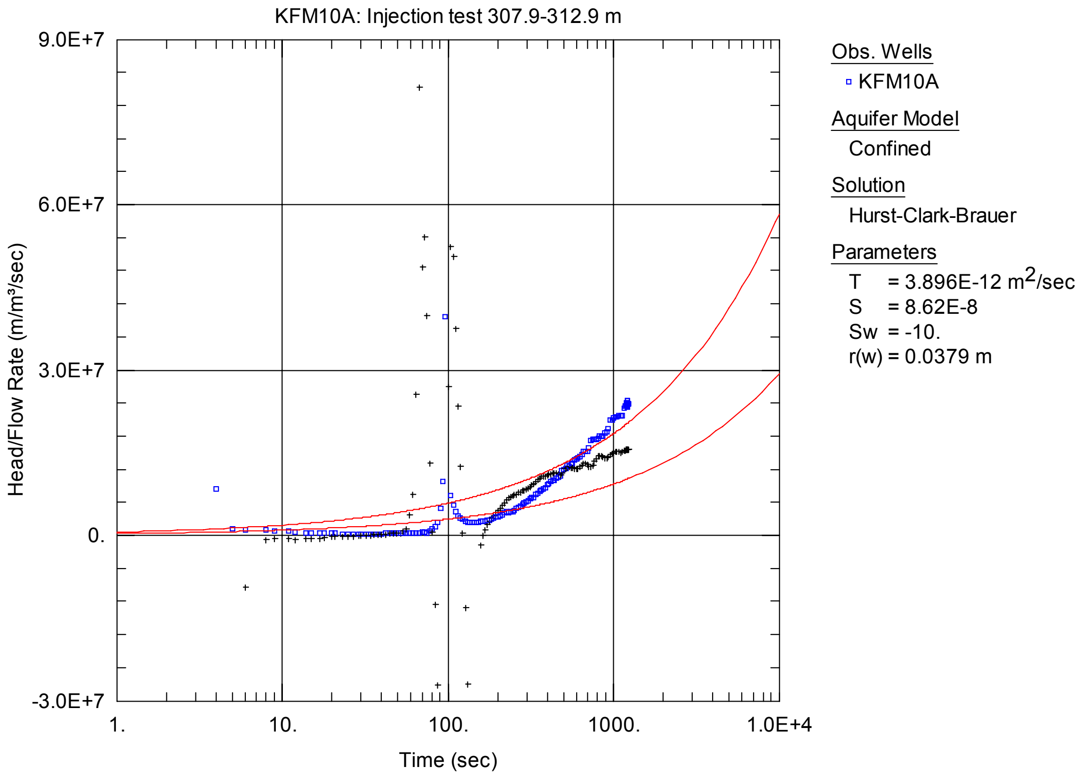


Figure A3-256. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 307.9-312.9 m in KFM10A. The type curve fit is only to show that an assumption of PRF is not valid.*

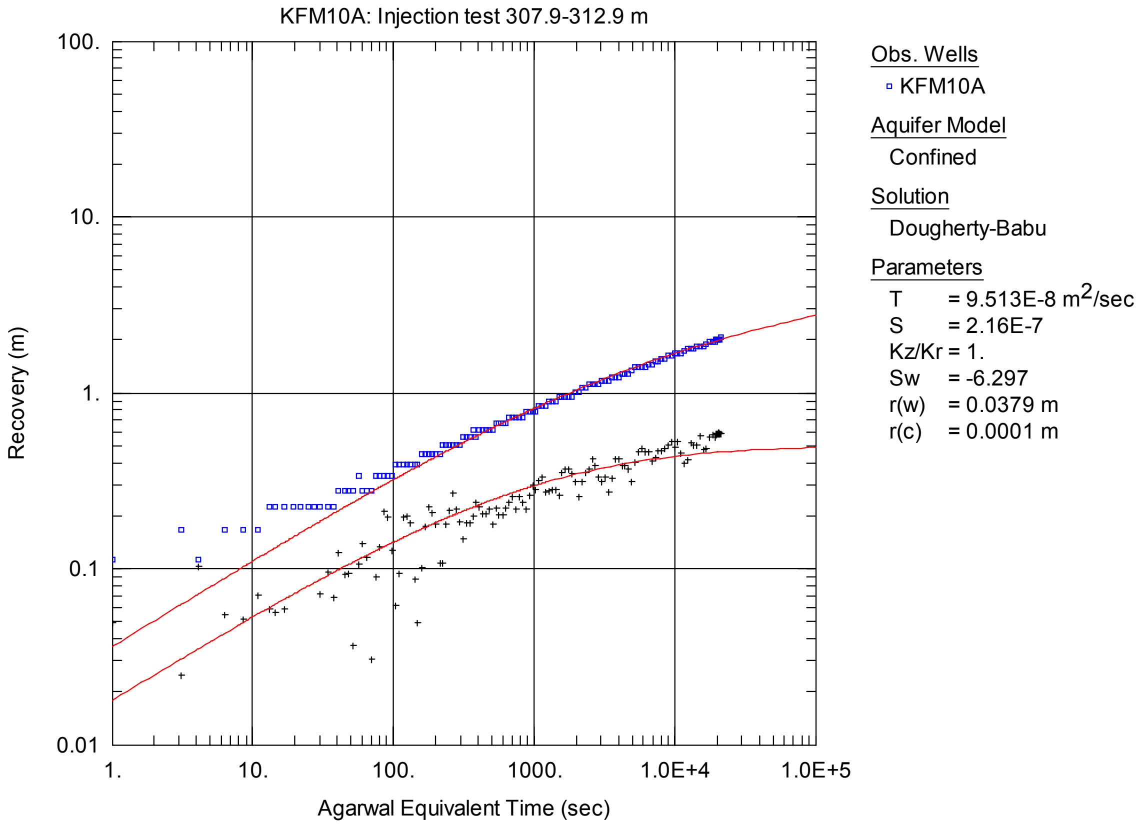


***Figure A3-257.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 307.9-312.9 m in KFM10A.*

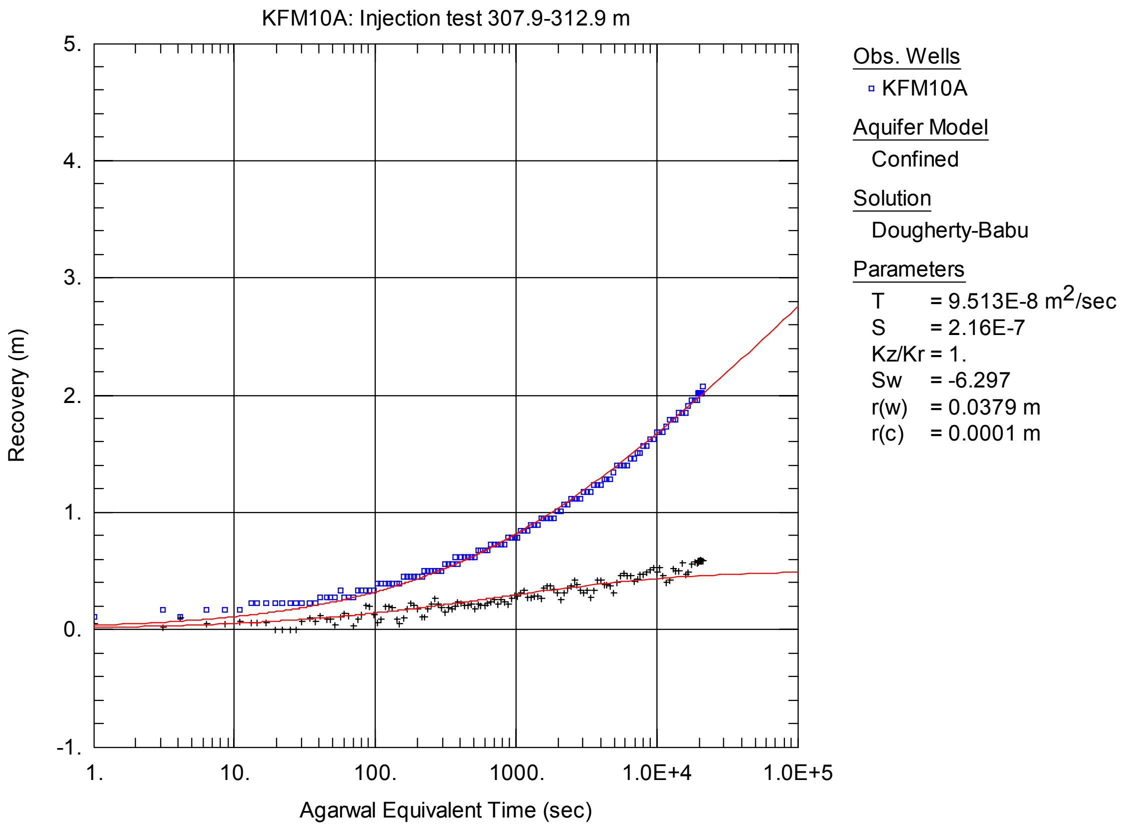


***Figure A3-258.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 307.9-312.9 m in KFM10A.*

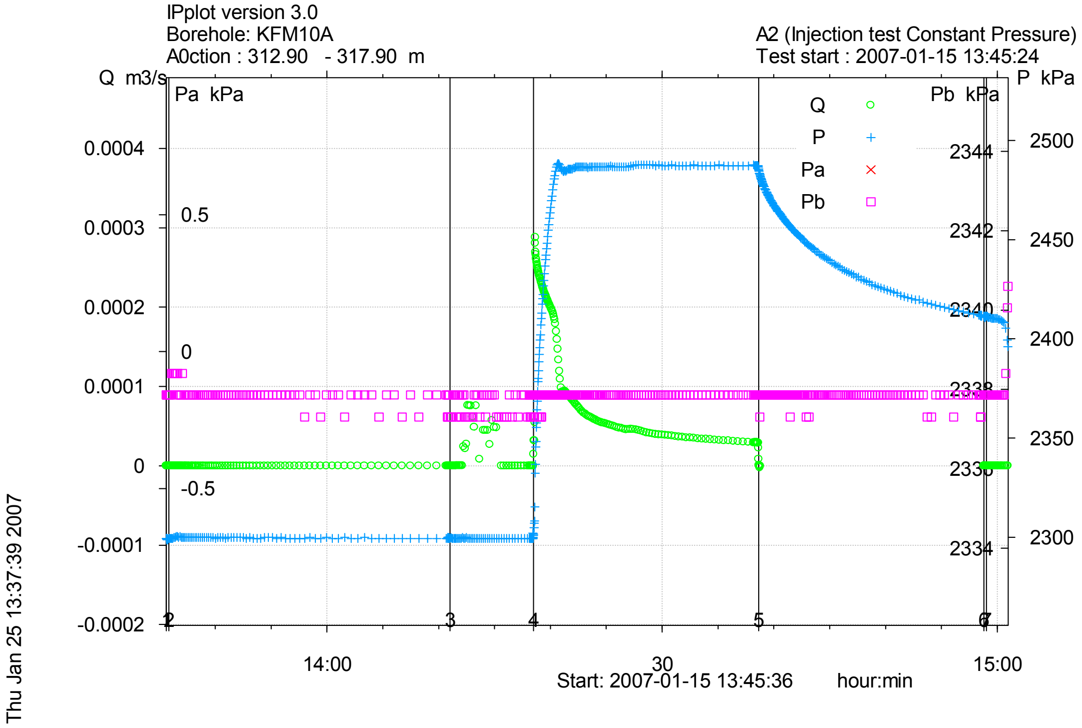


***Figure A3-259.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 312.9-317.9 m in borehole KFM10A.*

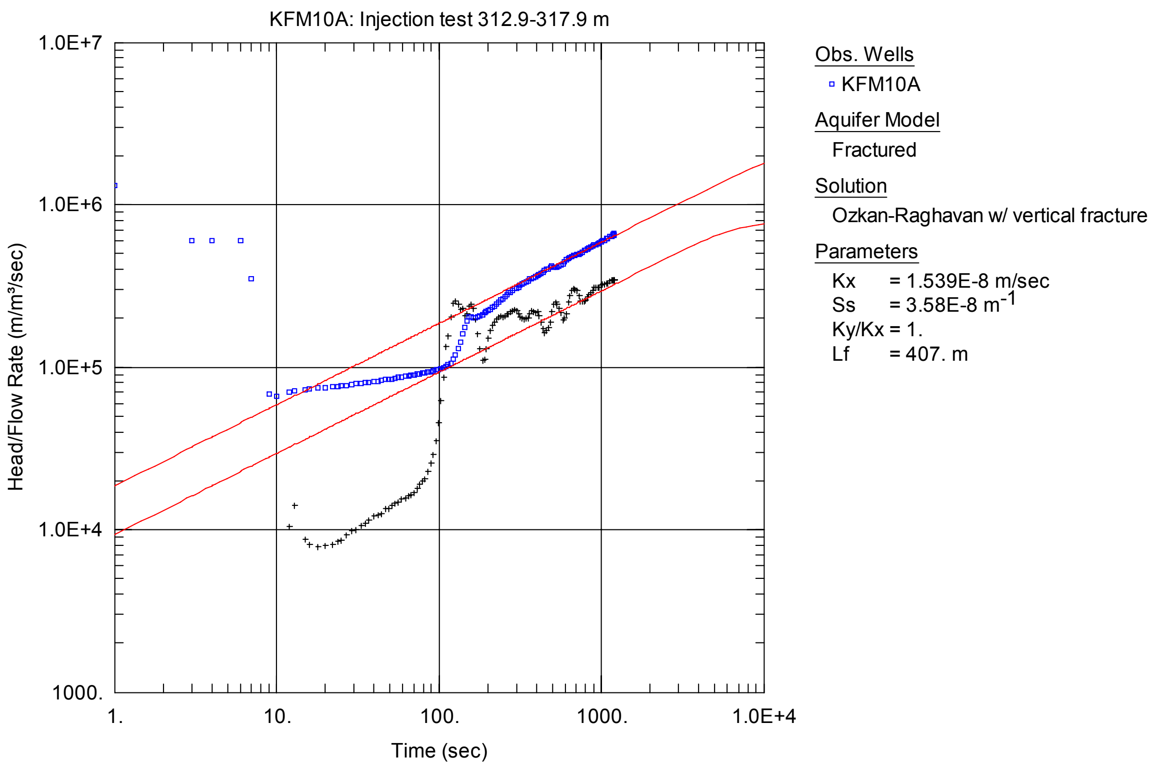


***Figure A3-260.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 312.9-317.9 m in KFM10A. The type curve fit is only to show that an assumption of PLF is not valid.*

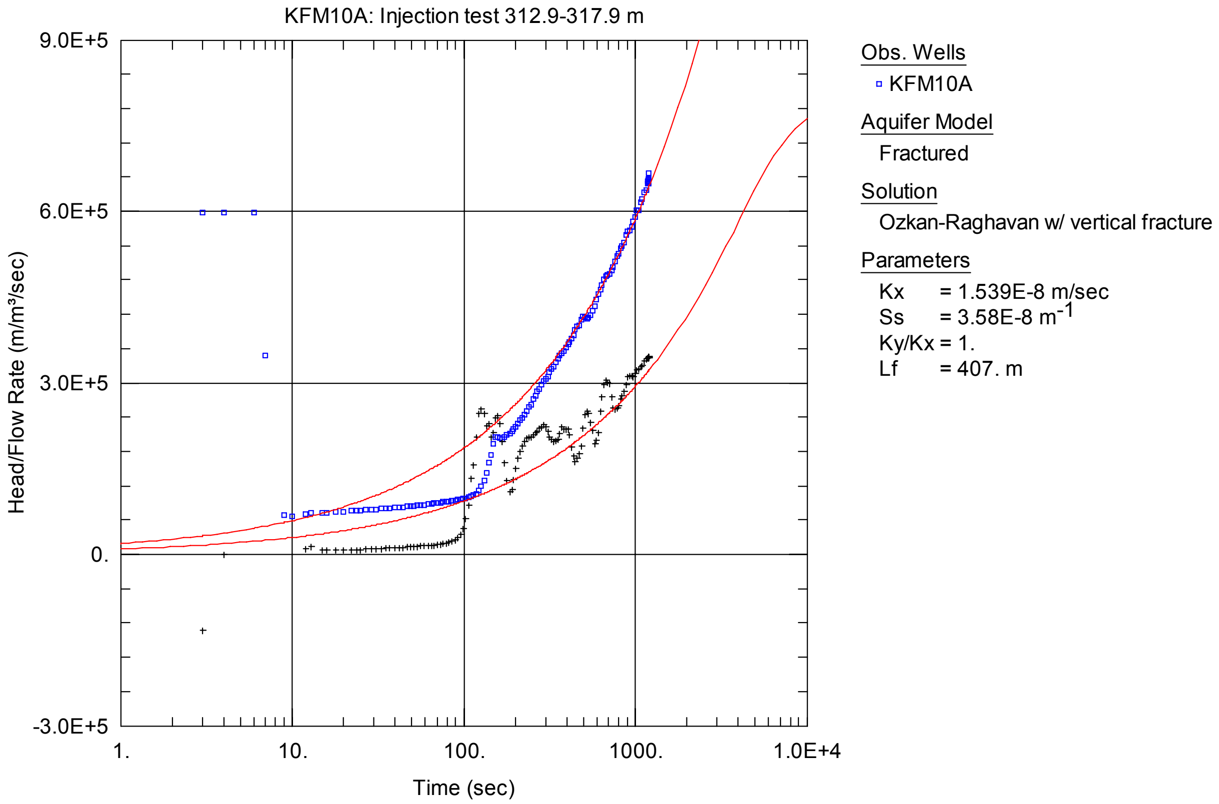


Figure A3-261. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 312.9-317.9 m in KFM10A. The type curve fit is only to show that an assumption of PLF is not valid.*

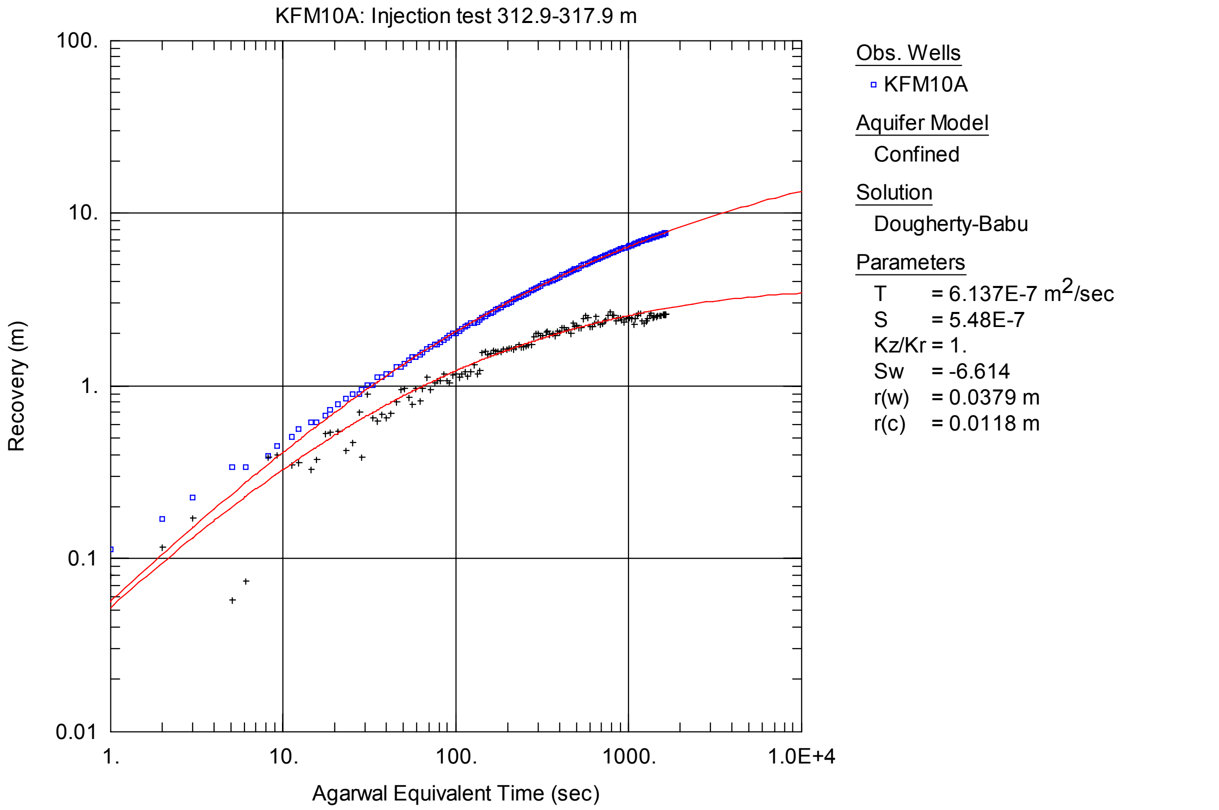


Figure A3-262. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 312.9-317.9 m in KFM10A.*

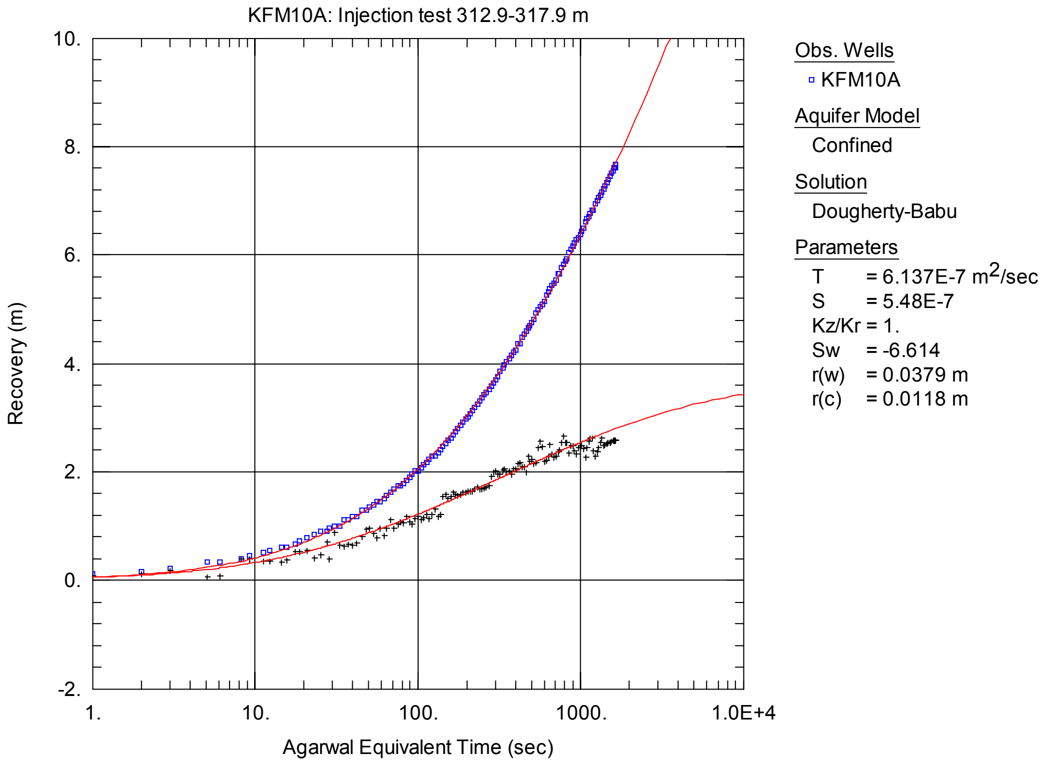


Figure A3-263. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 312.9-317.9 m in KFM10A.*

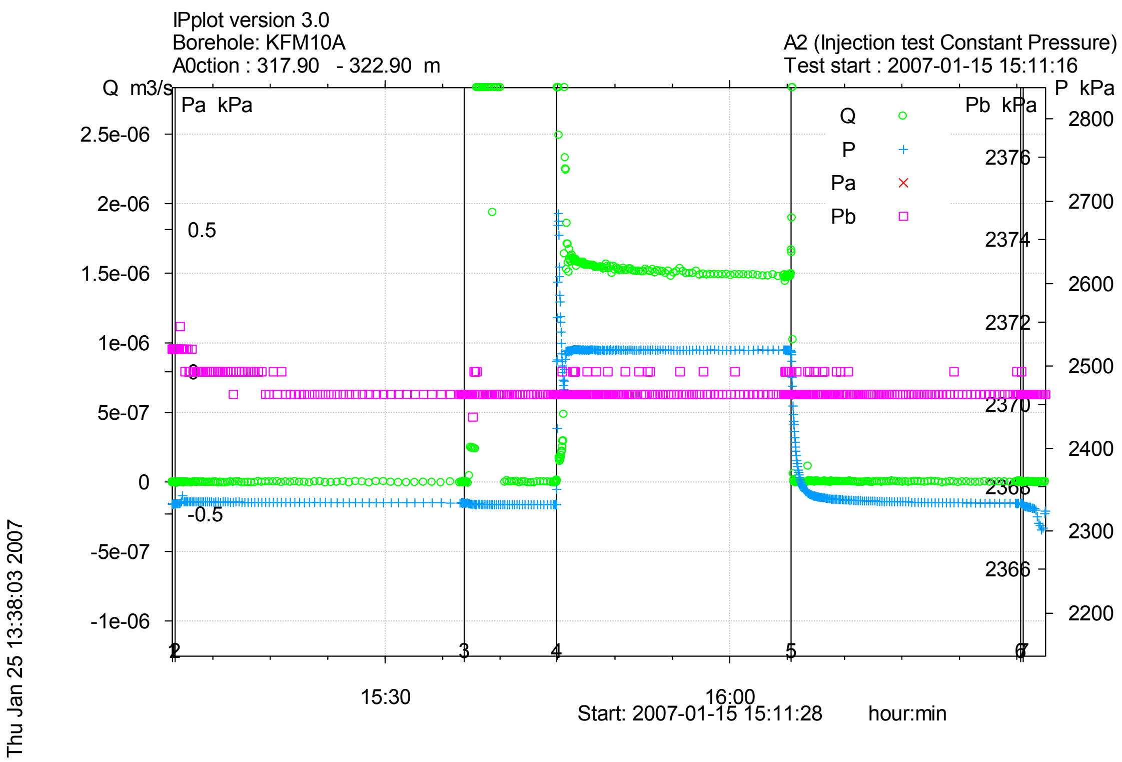


Figure A3-264. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 317.9-322.9 m in borehole KFM10A.*

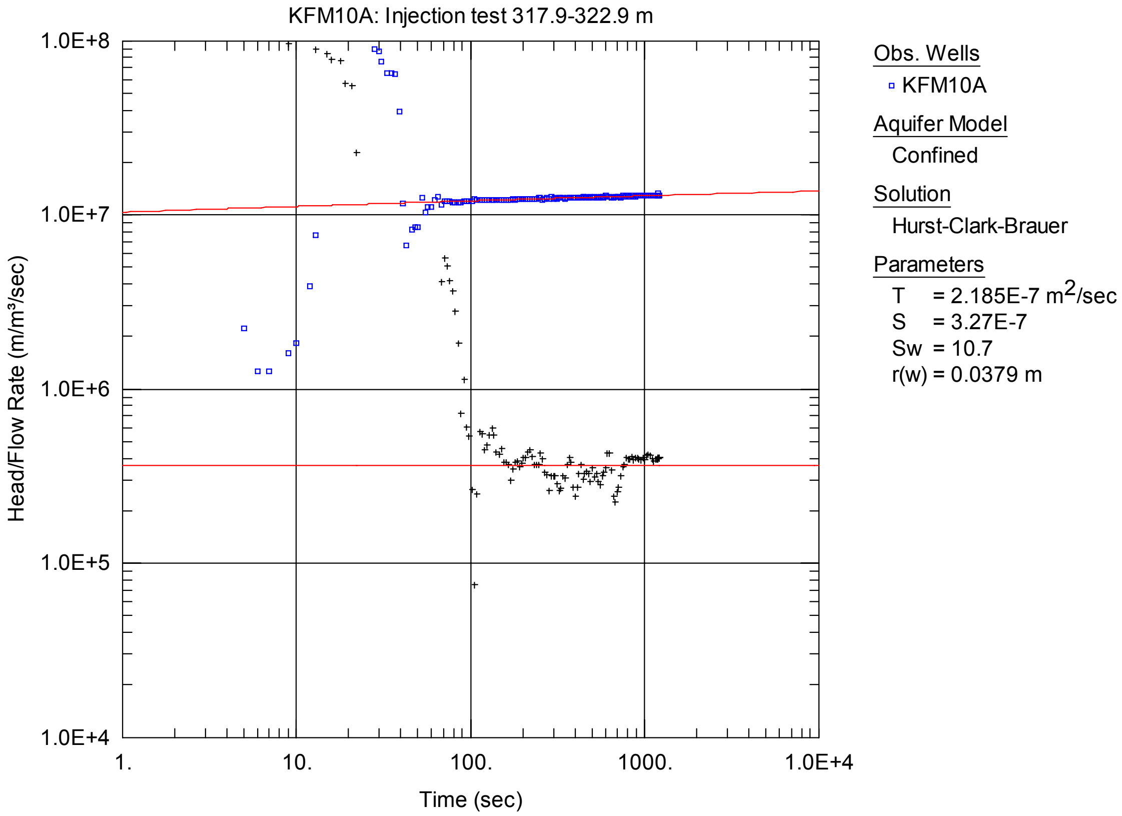


***Figure A3-265.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 317.9-322.9 m in KFM10A.*

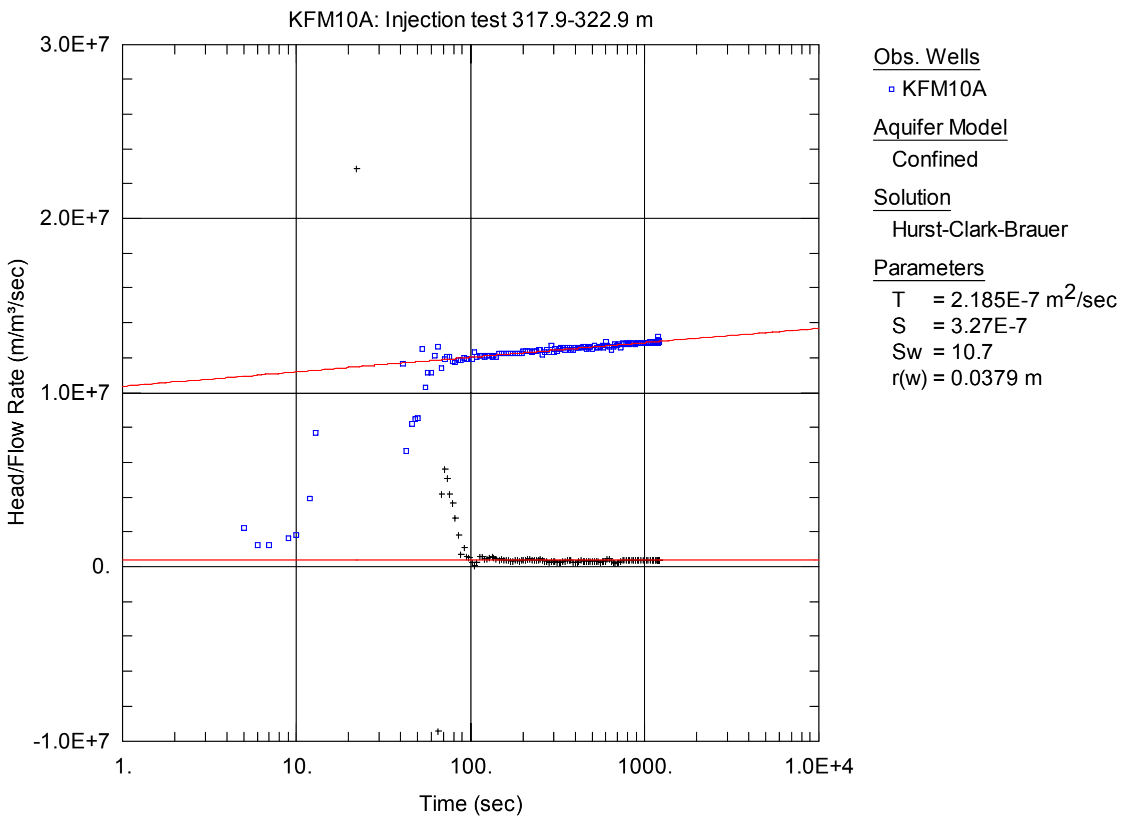


***Figure A3-266.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 317.9-322.9 m in KFM10A.*

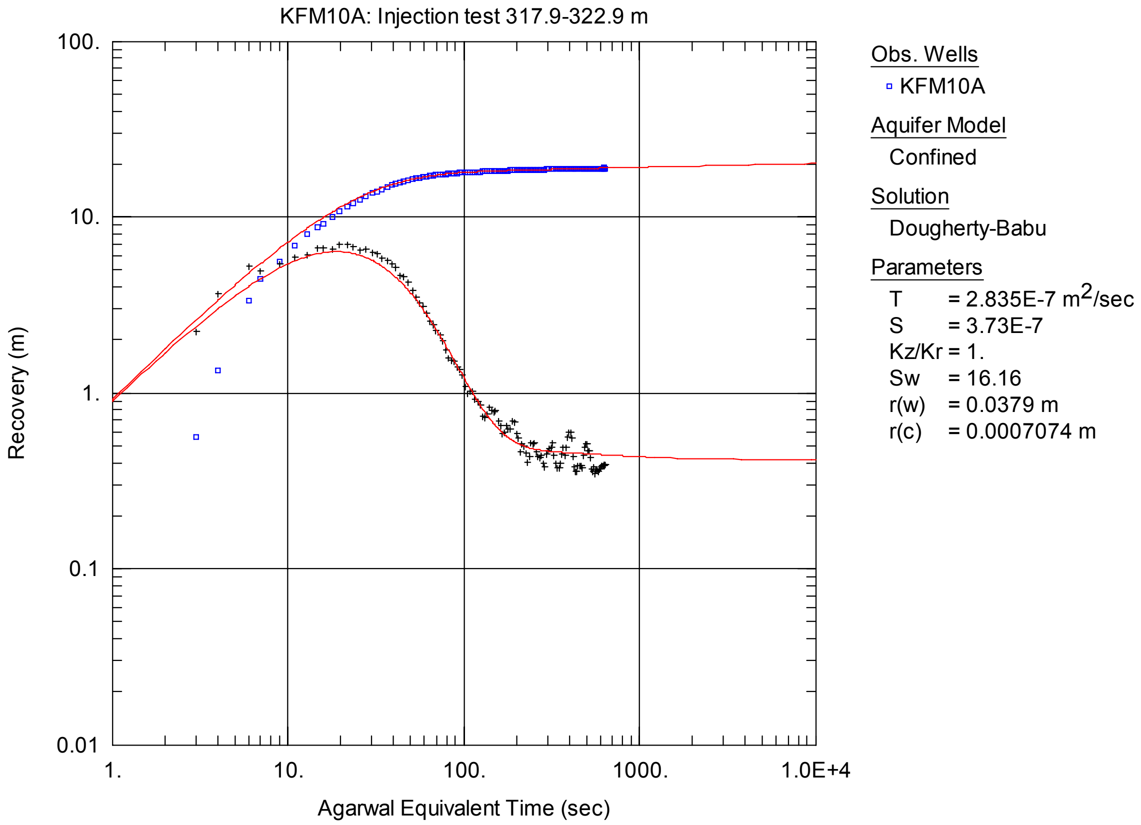


***Figure A3-267**. Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 317.9-322.9 m in KFM10A.*

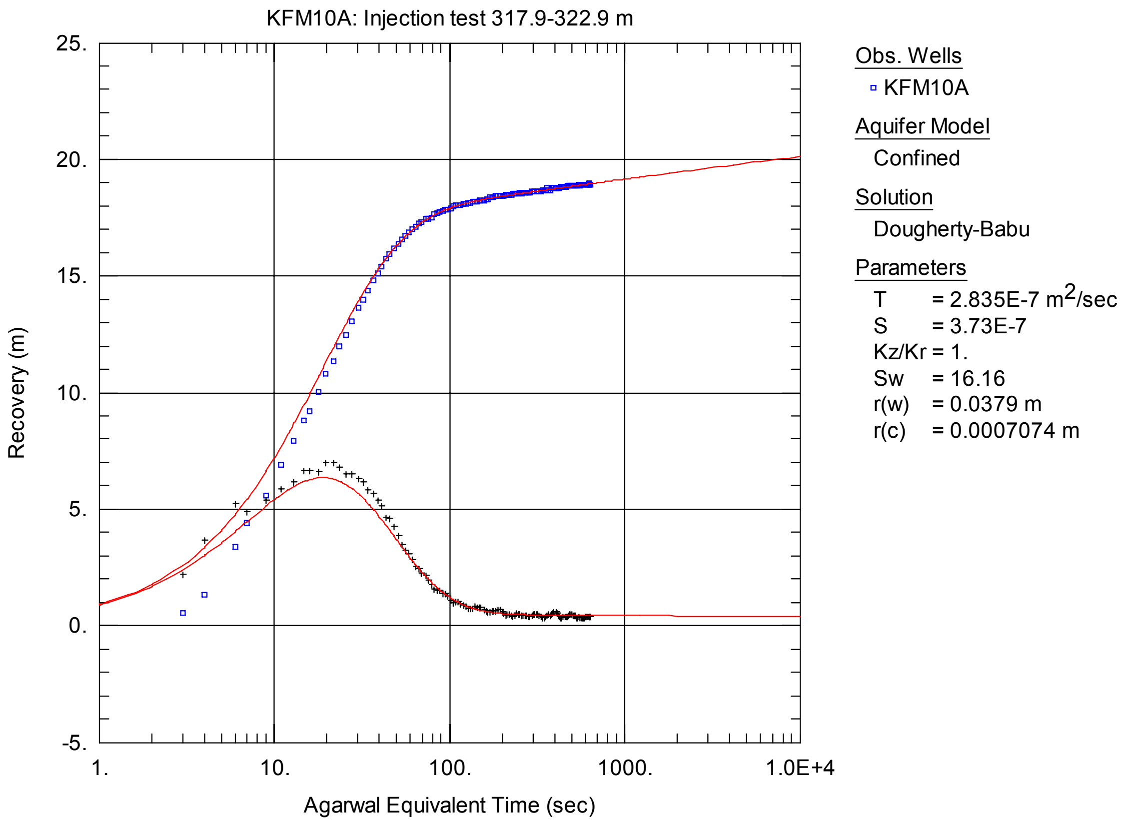


***Figure A3-268**. Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 317.9-322.9 m in KFM10A.*

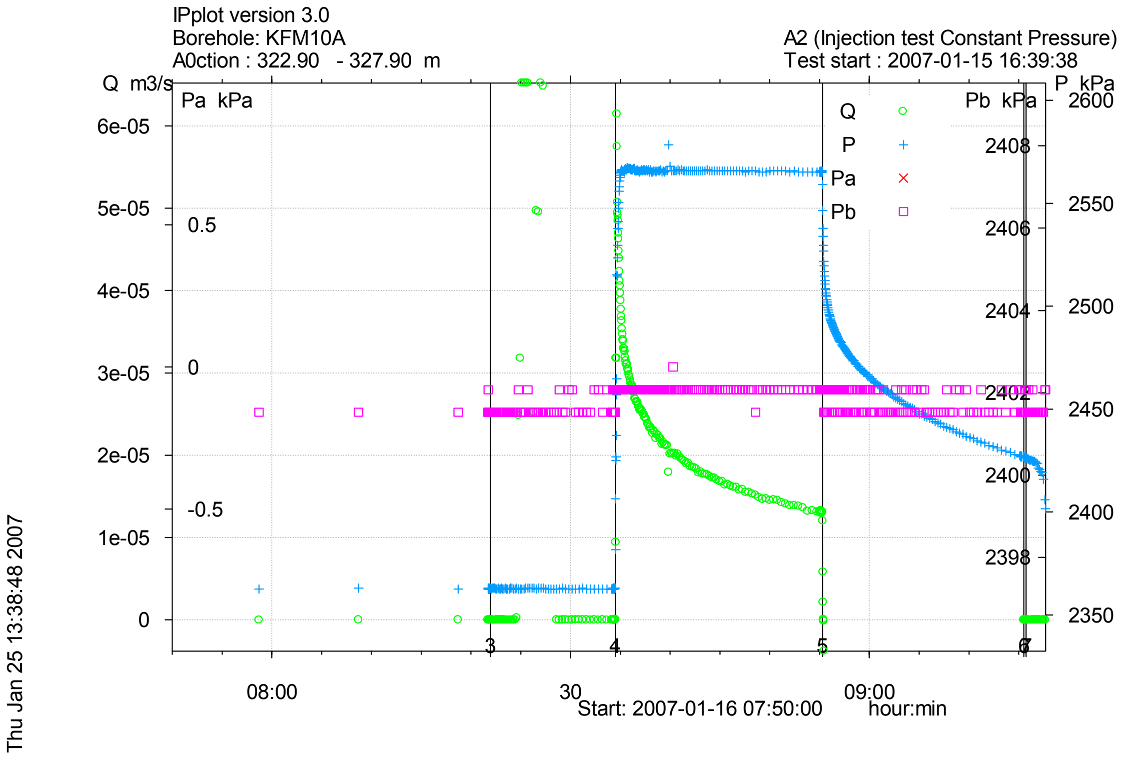


Figure A3-269. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 322.9-327.9 m in borehole KFM10A.

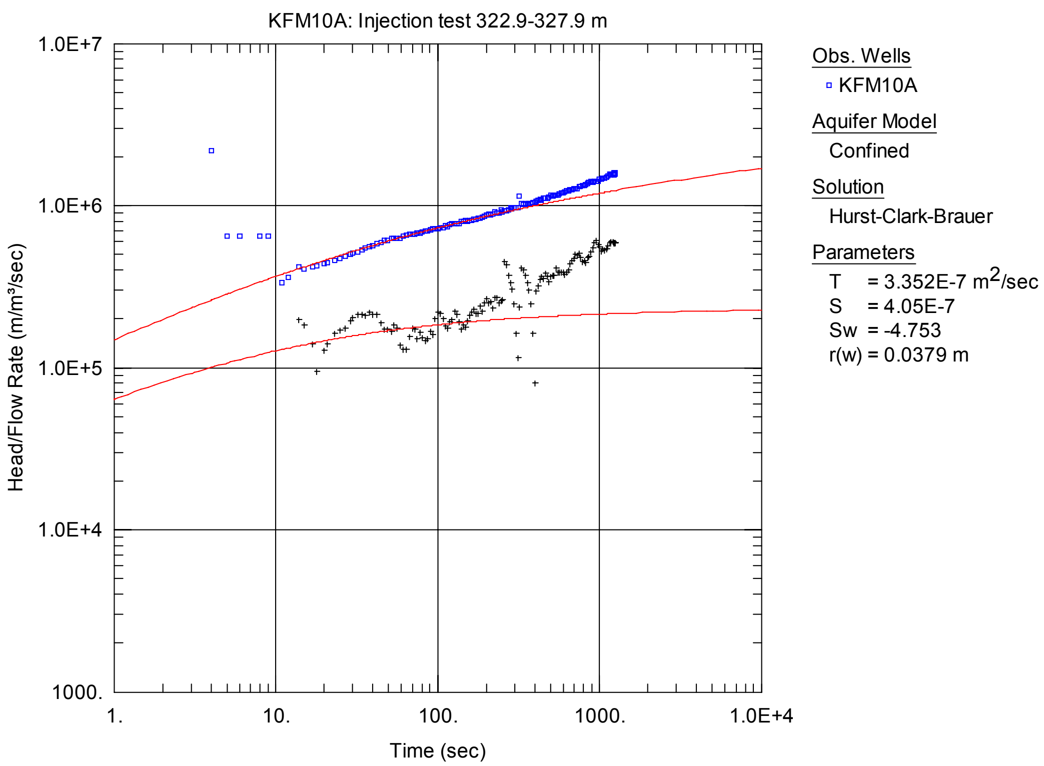


Figure A3-270. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 322.9-327.9 m in KFM10A.

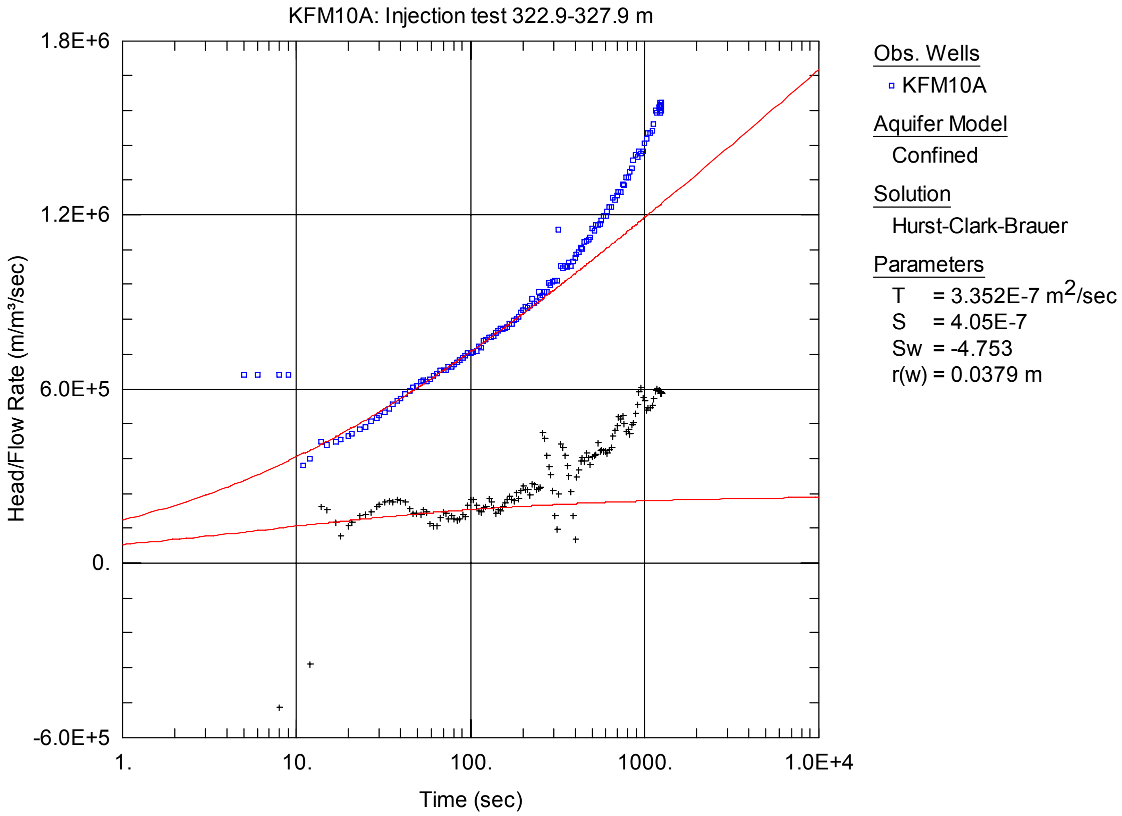


Figure A3-271. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 322.9-327.9 m in KFM10A.*

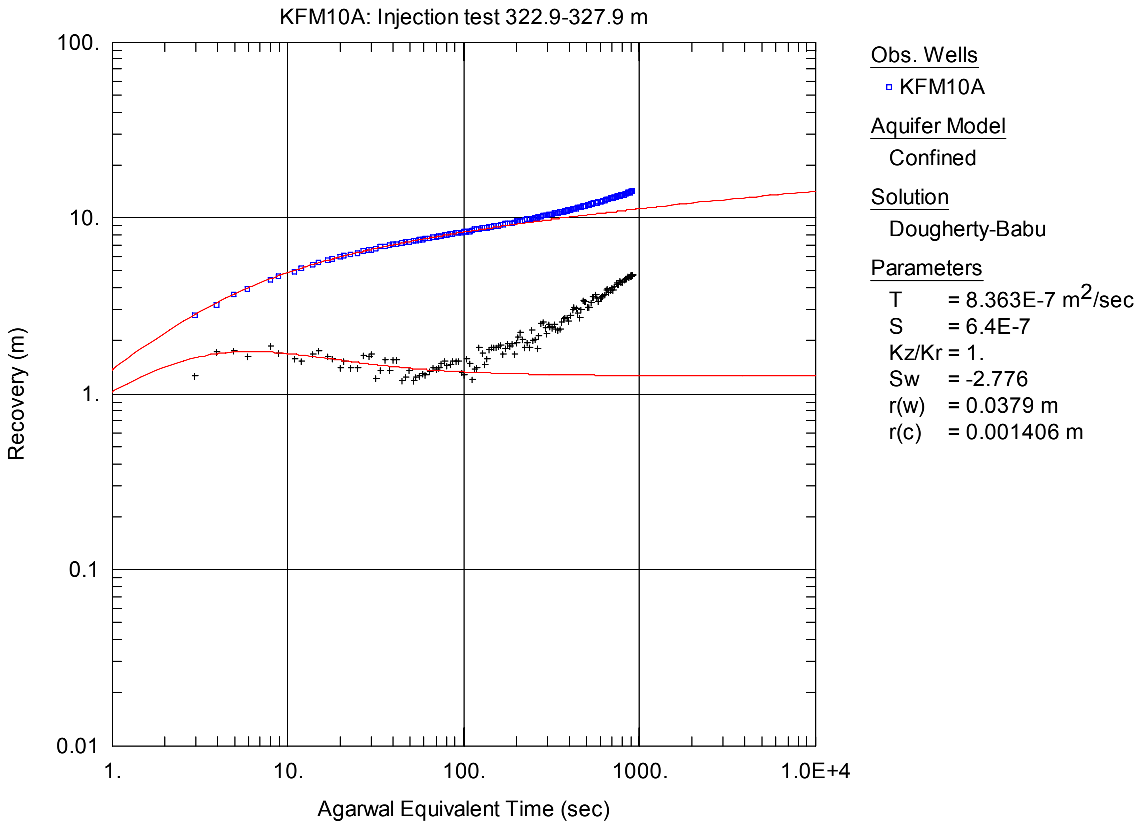


Figure A3-272. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 322.9-327.9 m in KFM10A.*

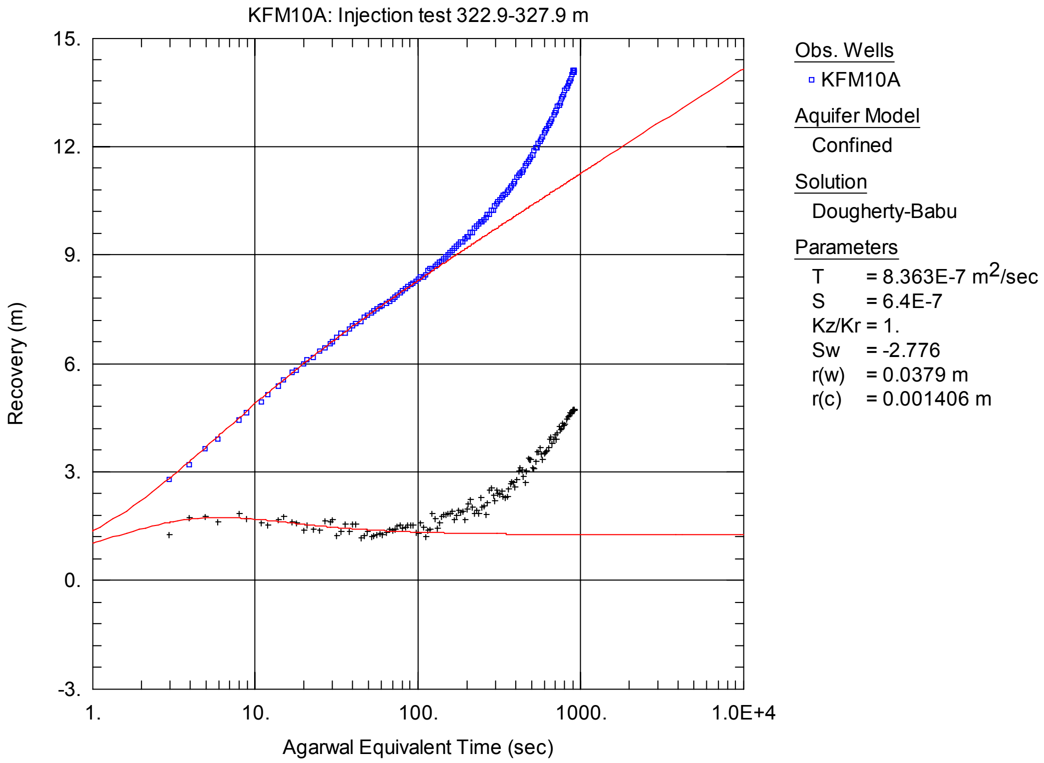


Figure A3-273. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 322.9-327.9 m in KFM10A.*

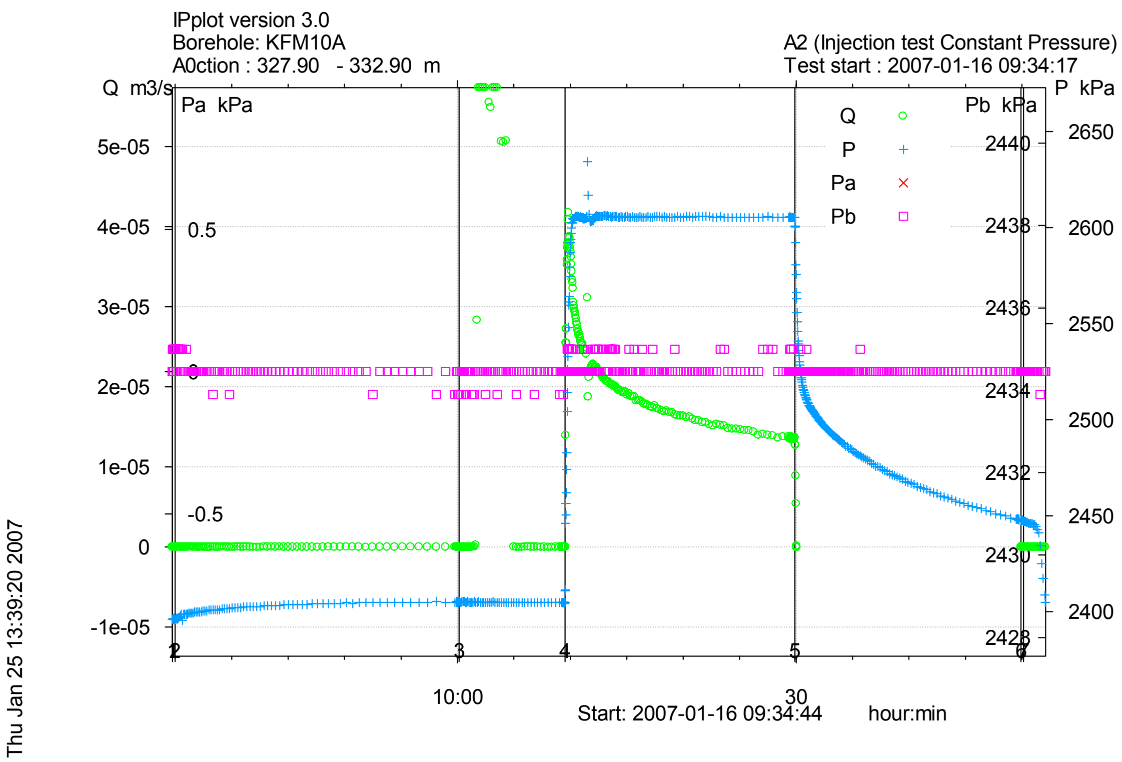


Figure A3-274. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 327.9-332.9 m in borehole KFM10A.*

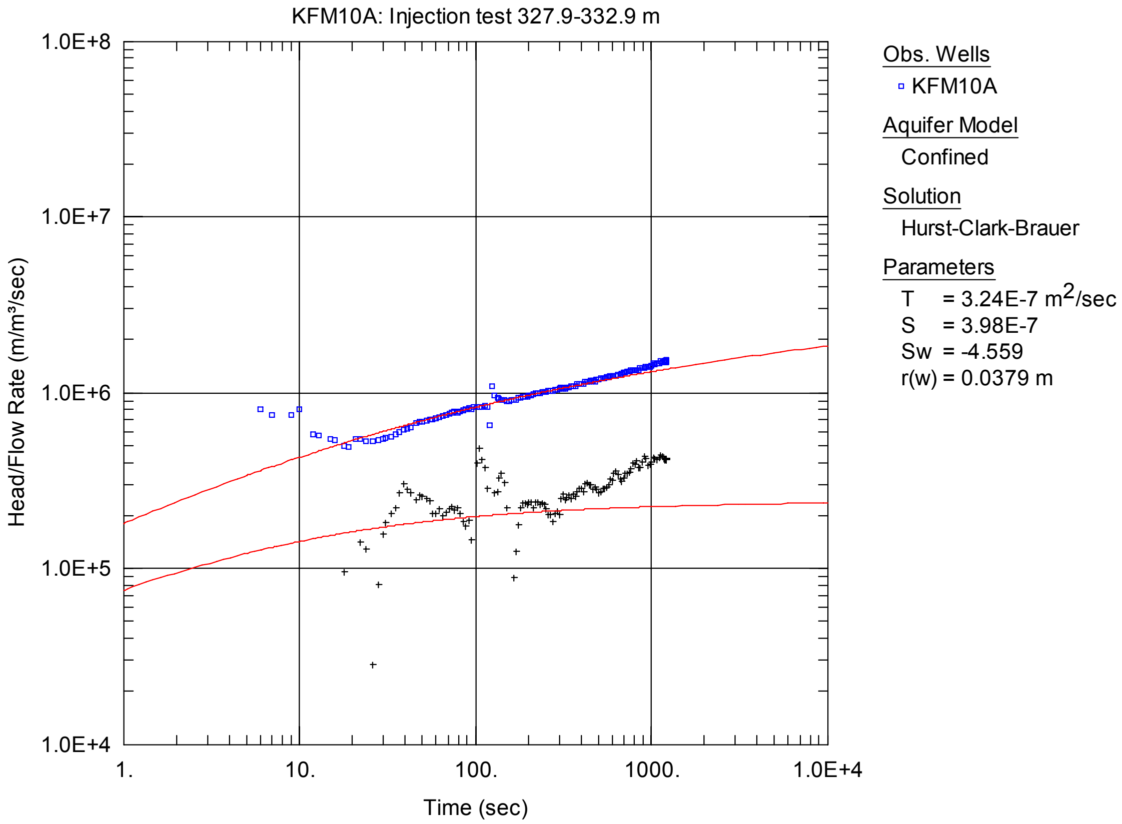


Figure A3-275. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 327.9-332.9 m in KFM10A.

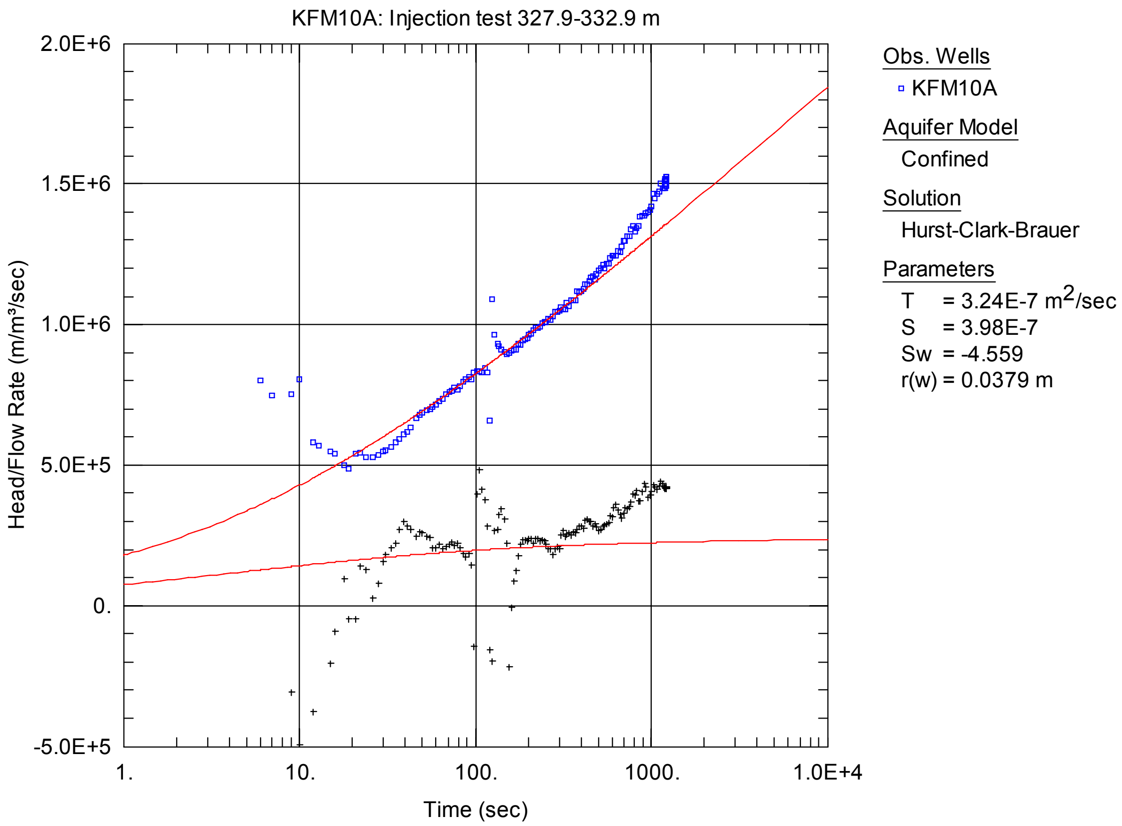


Figure A3-276. Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 327.9-332.9 m in KFM10A.

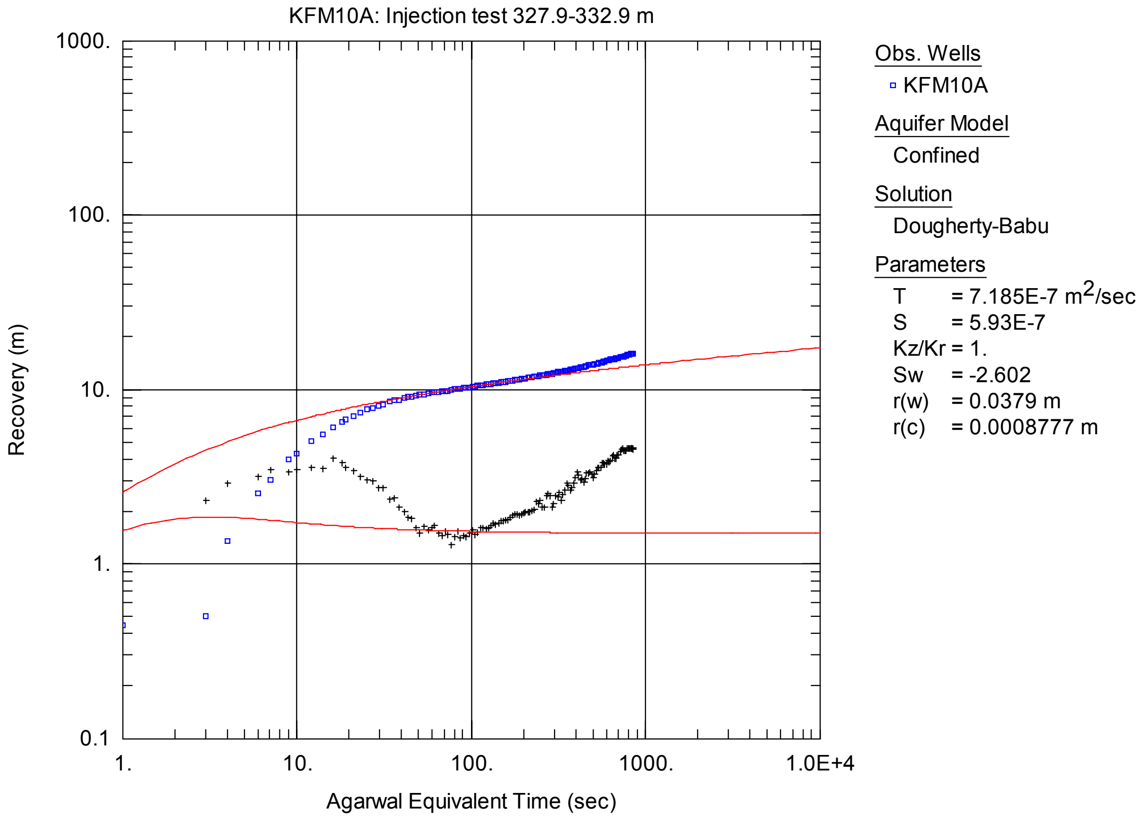


Figure A3-277. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 327.9-332.9 m in KFM10A.*

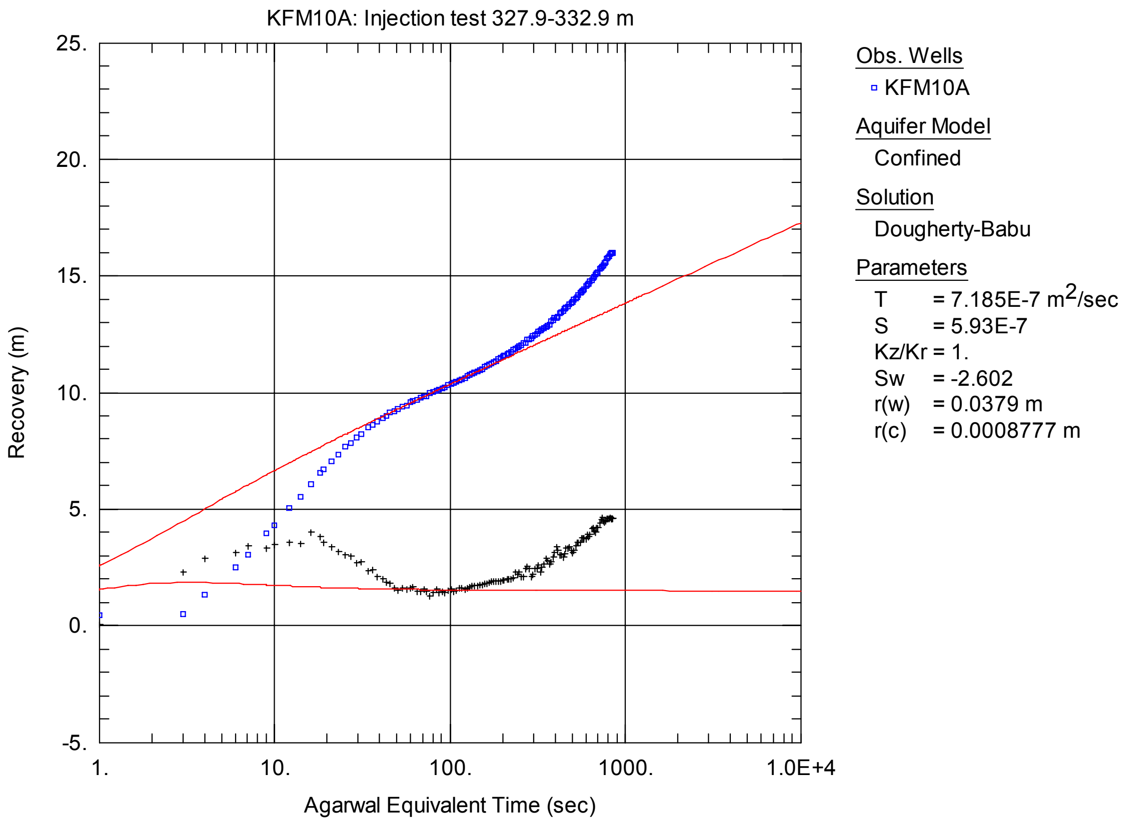


Figure A3-278. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 327.9-332.9 m in KFM10A.*

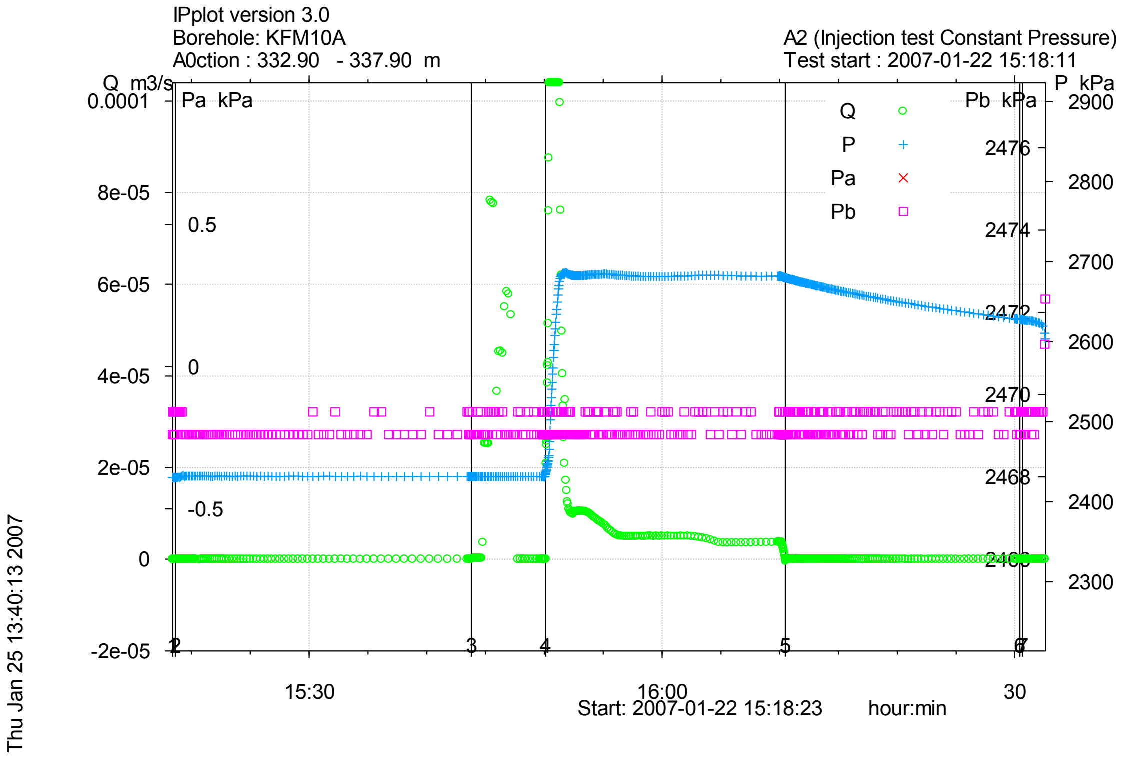


Figure A3-279. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 332.9-337.9 m in borehole KFM10A.

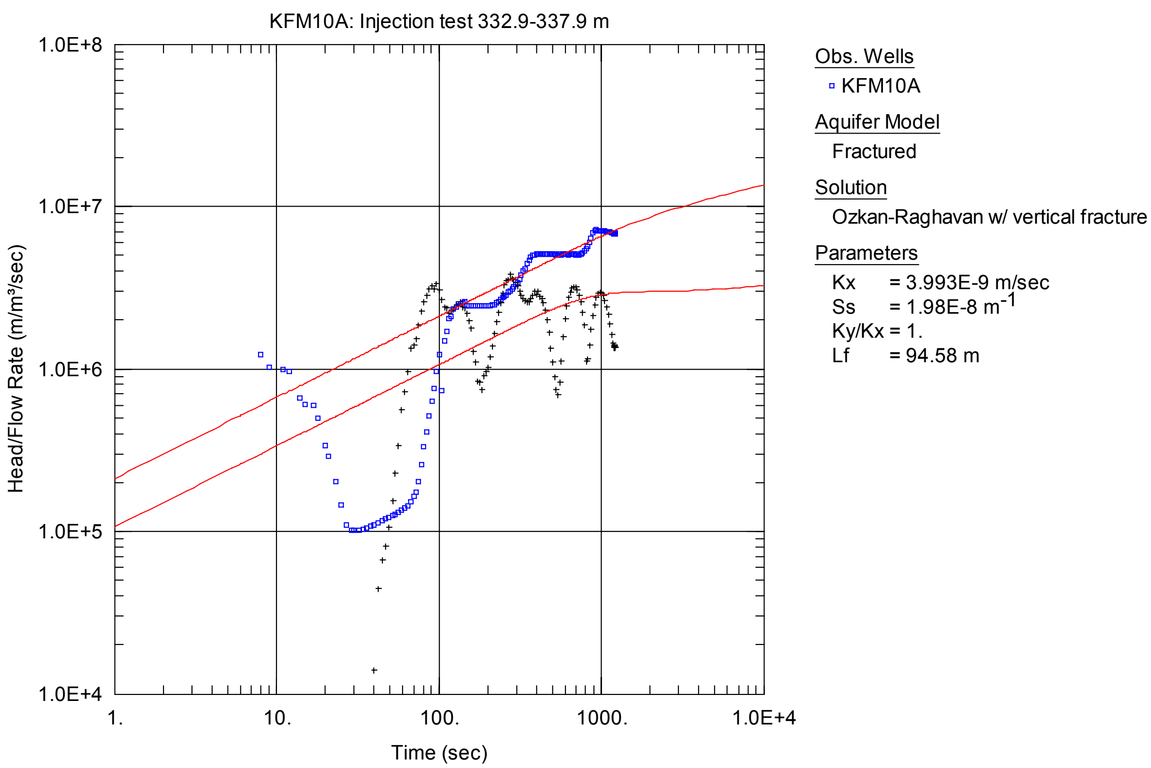


Figure A3-280. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 332.9-337.9 m in KFM10A.

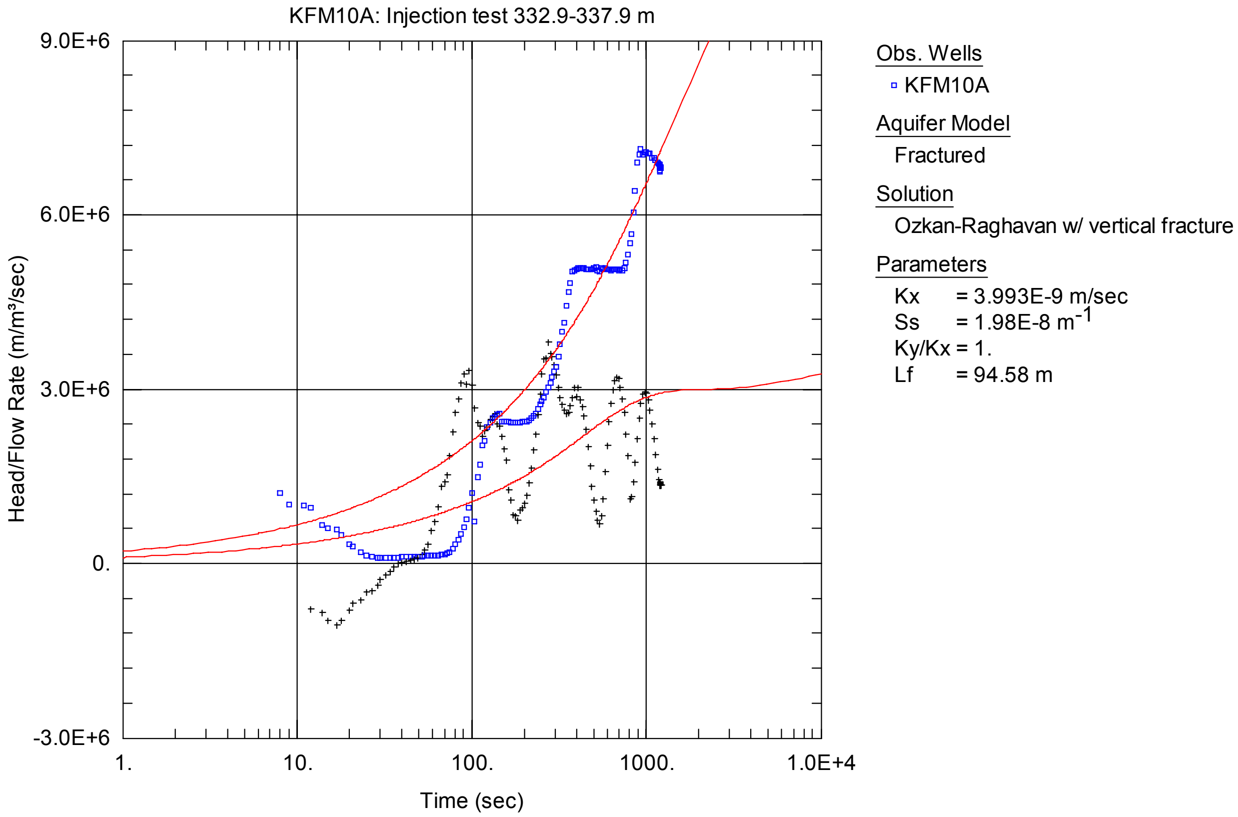


***Figure A3-281.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 332.9-337.9 m in KFM10A.*

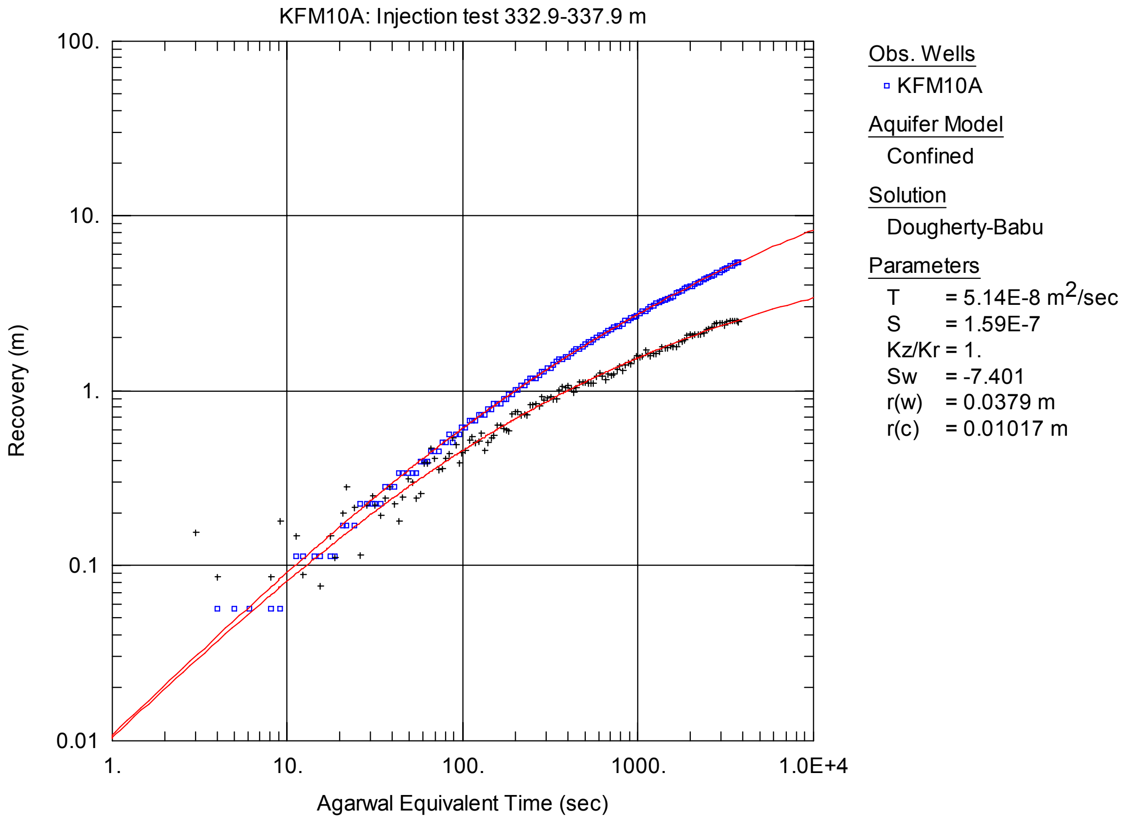


***Figure A3-282.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 332.9-337.9 m in KFM10A.*

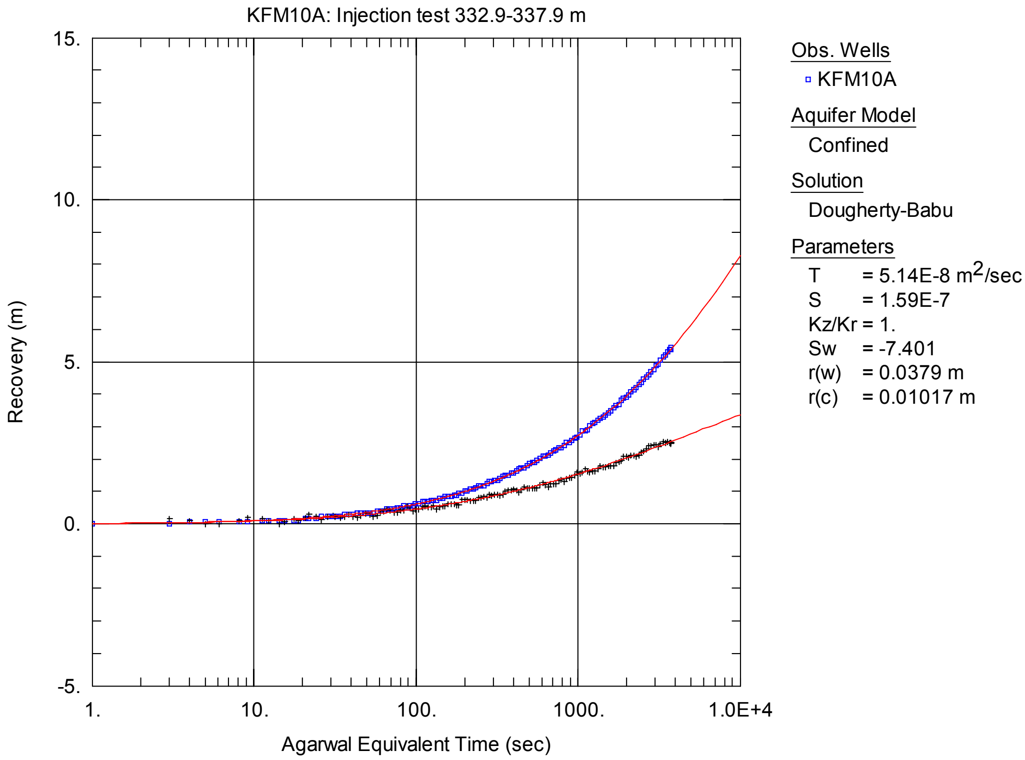


Figure A3-283. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 332.9-337.9 m in KFM10A.*

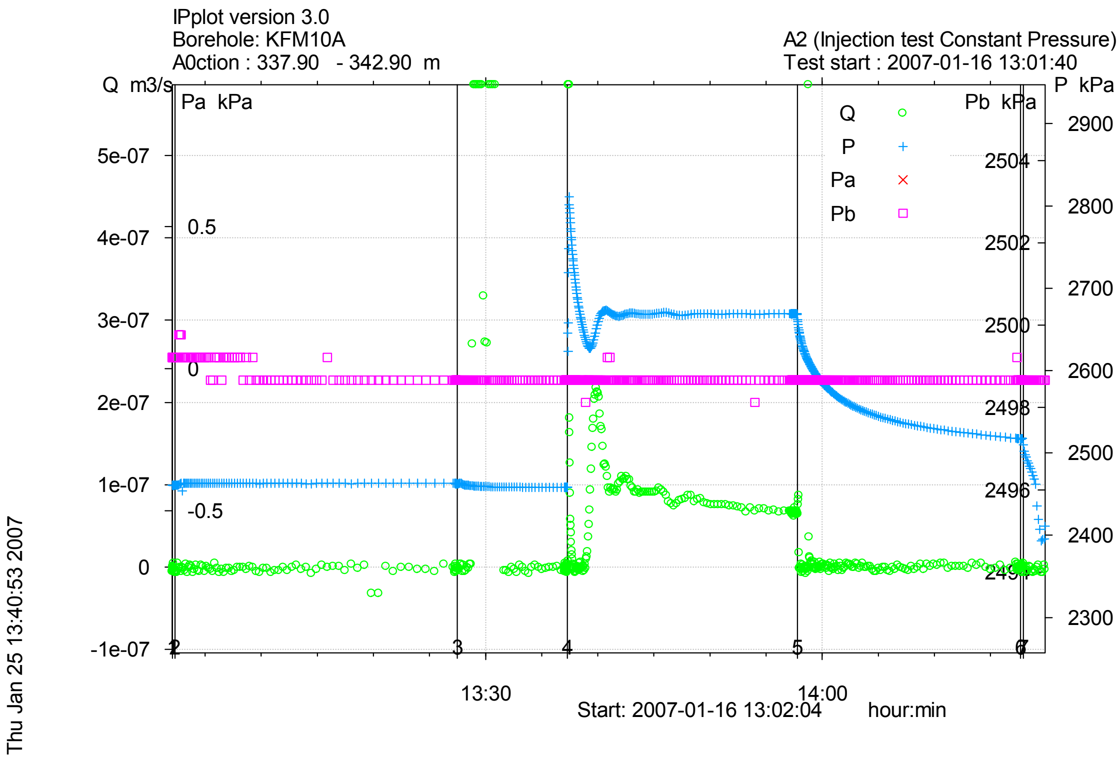


Figure A3-284. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 337.9-342.9 m in borehole KFM10A.*

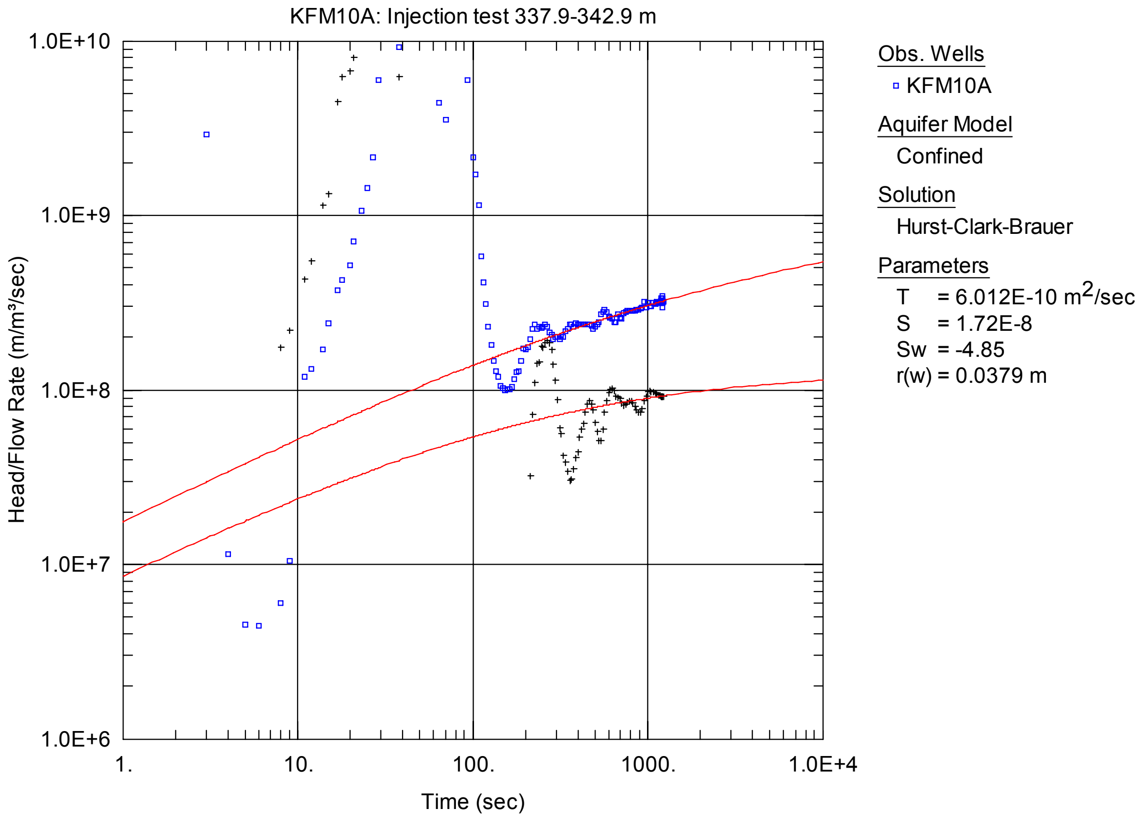


***Figure A3-285.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 337.9-342.9 m in KFM10A.*

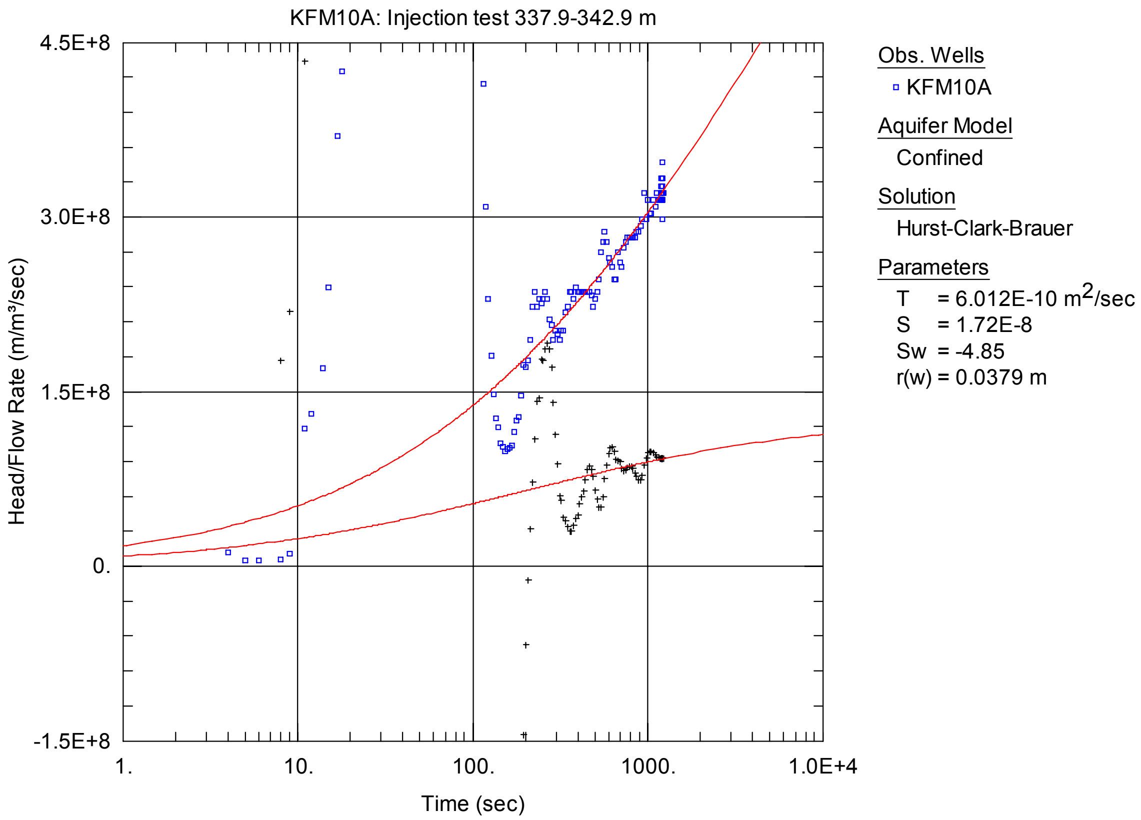


***Figure A3-286.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 337.9-342.9 m in KFM10A.*

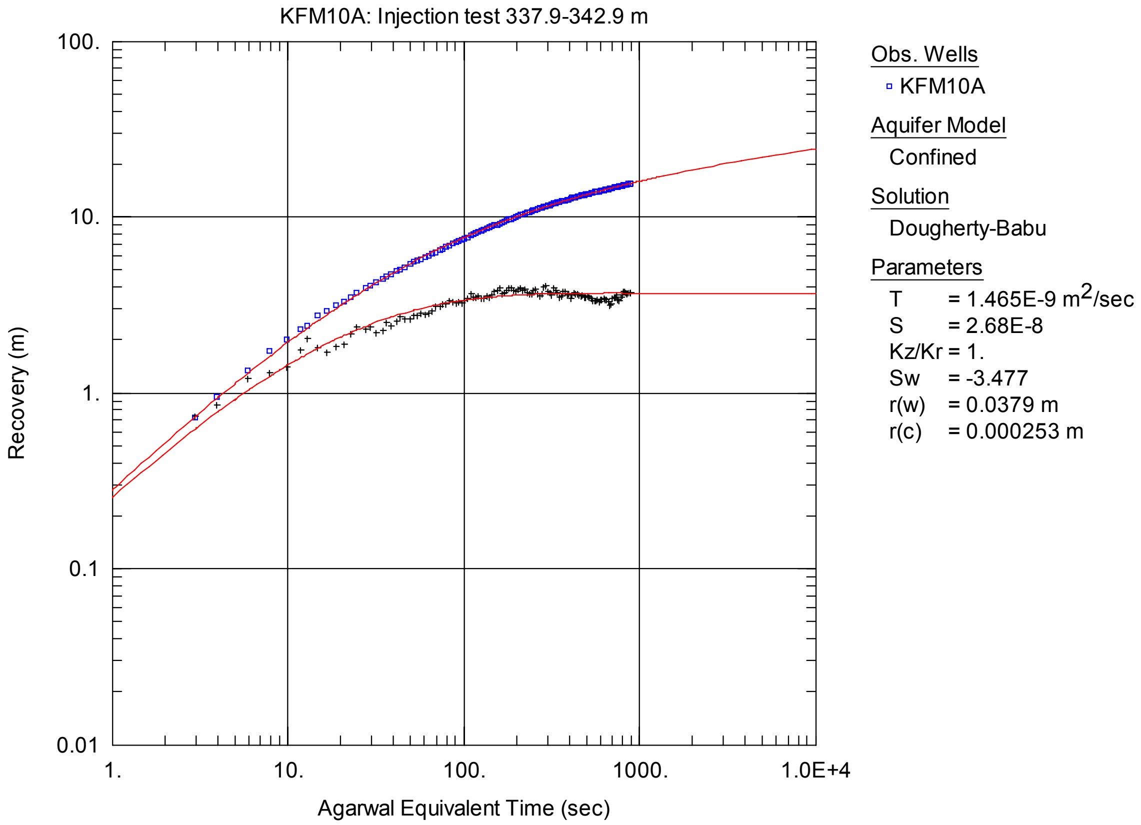


Figure A3-287. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 337.9-342.9 m in KFM10A.*

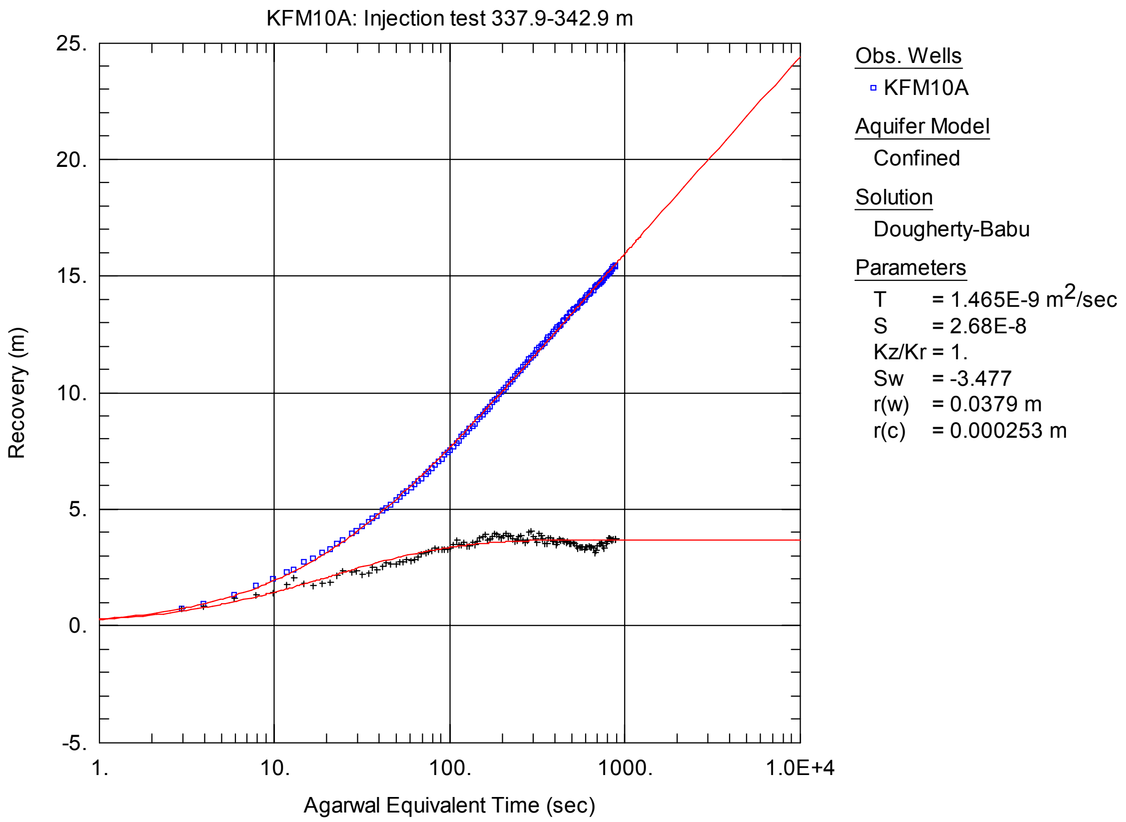


Figure A3-288. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 337.9-342.9 m in KFM10A.*

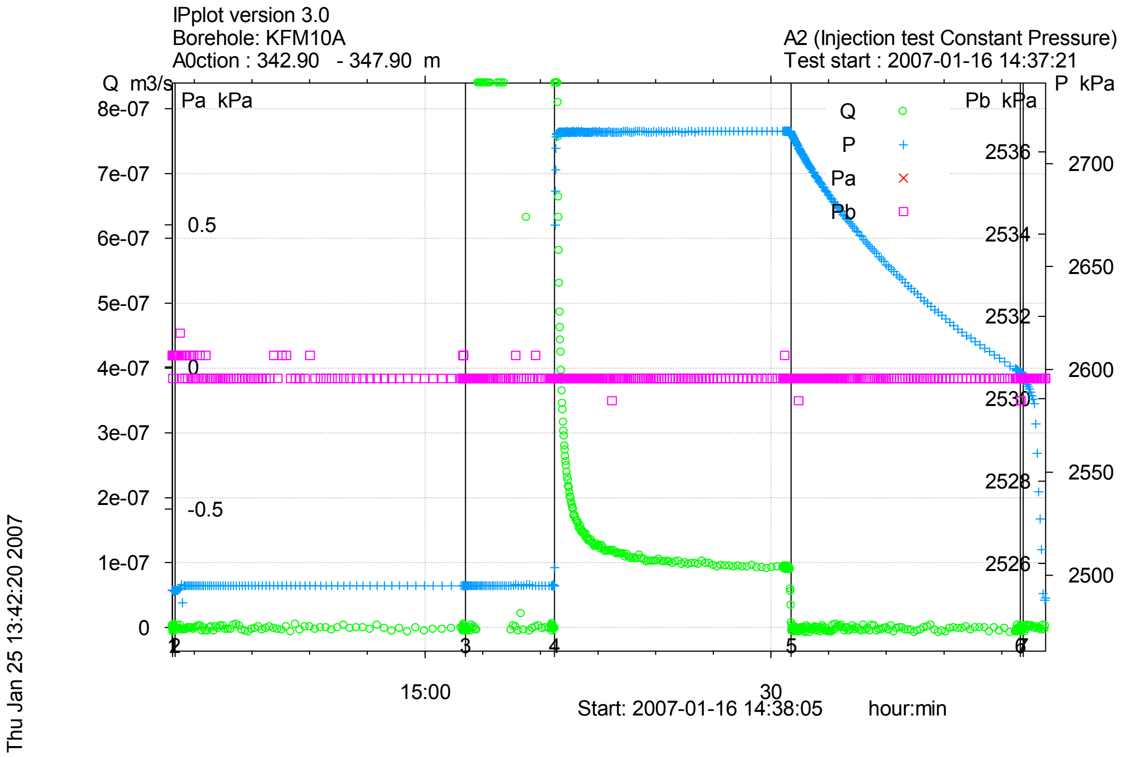


Figure A3-289. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 342.9-347.9 m in borehole KFM10A.*

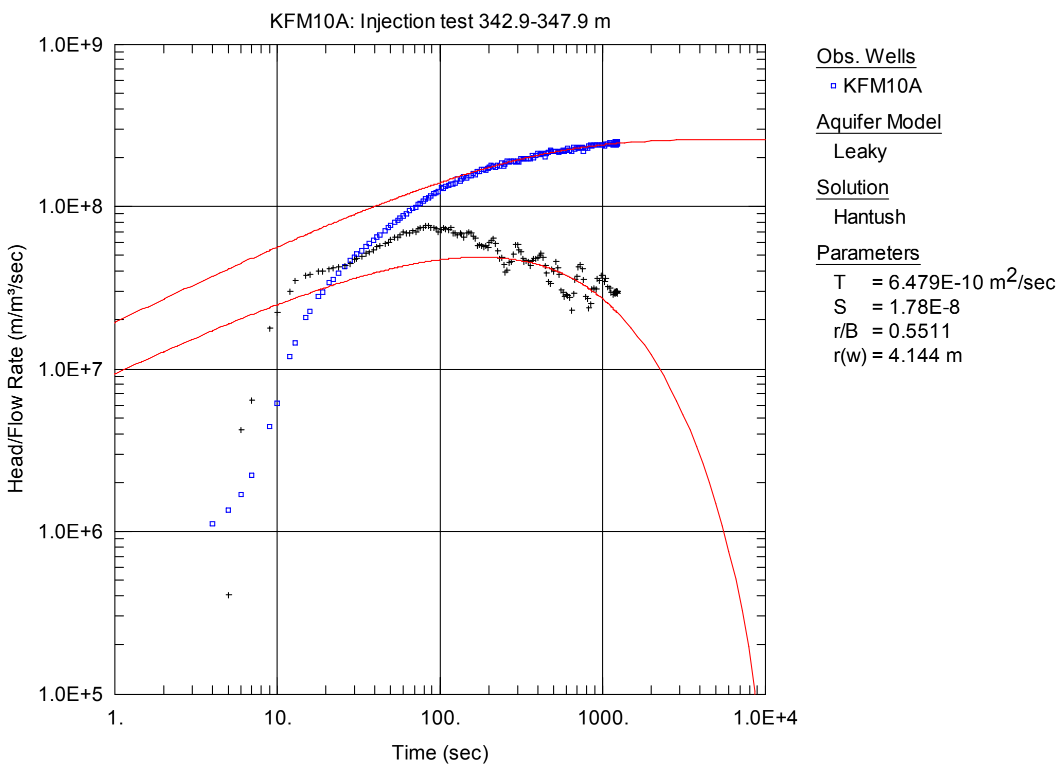


Figure A3-290. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 342.9-347.9 m in KFM10A.*

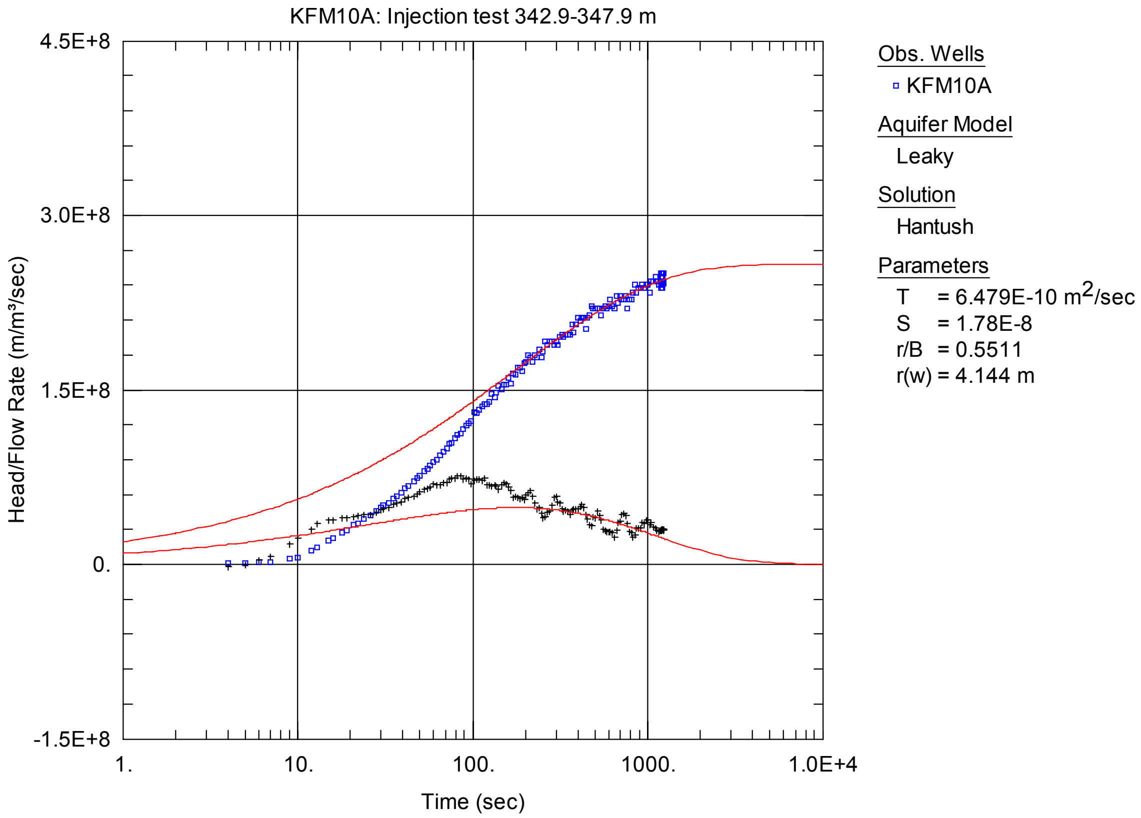


Figure A3-291. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 342.9-347.9 m in KFM10A.*

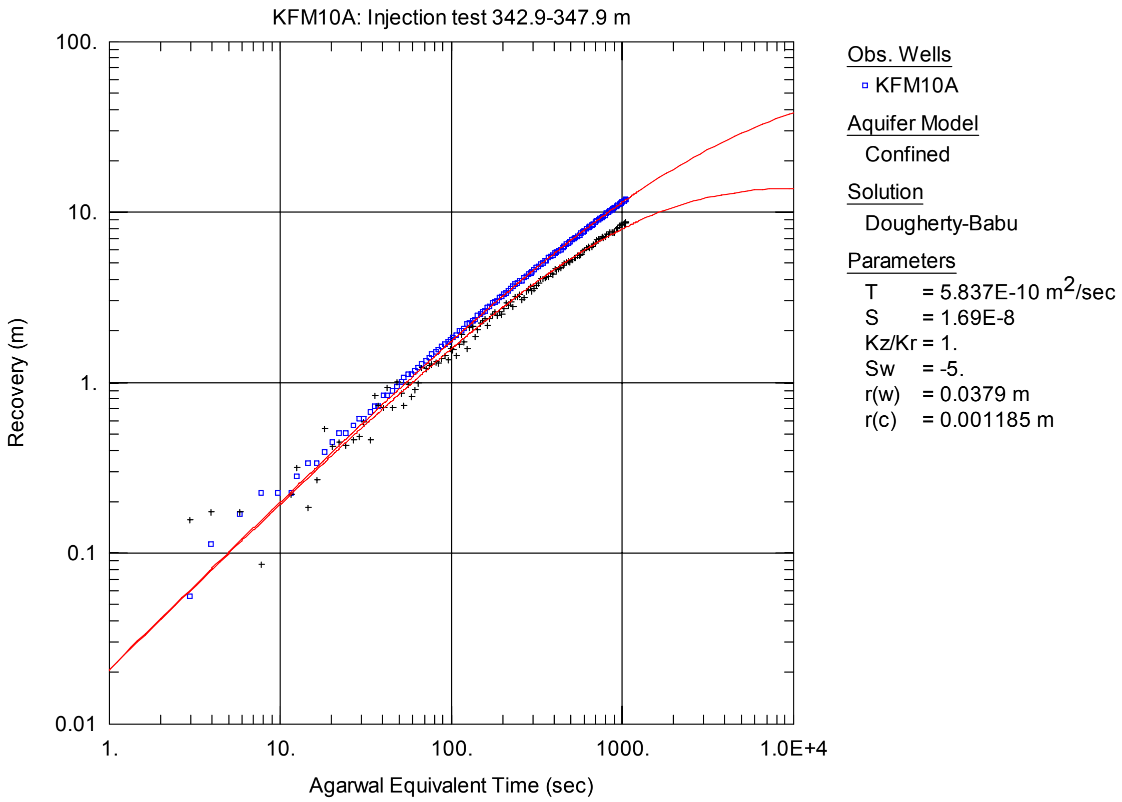


Figure A3-292. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 342.9-347.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

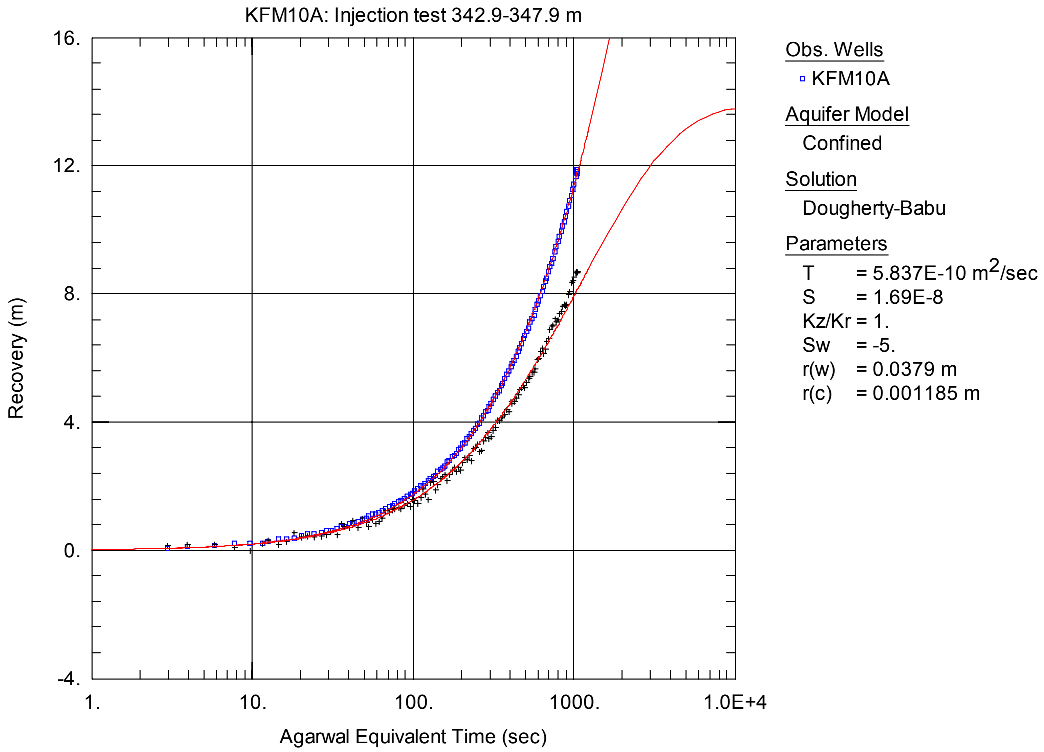


Figure A3-293. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 342.9-347.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

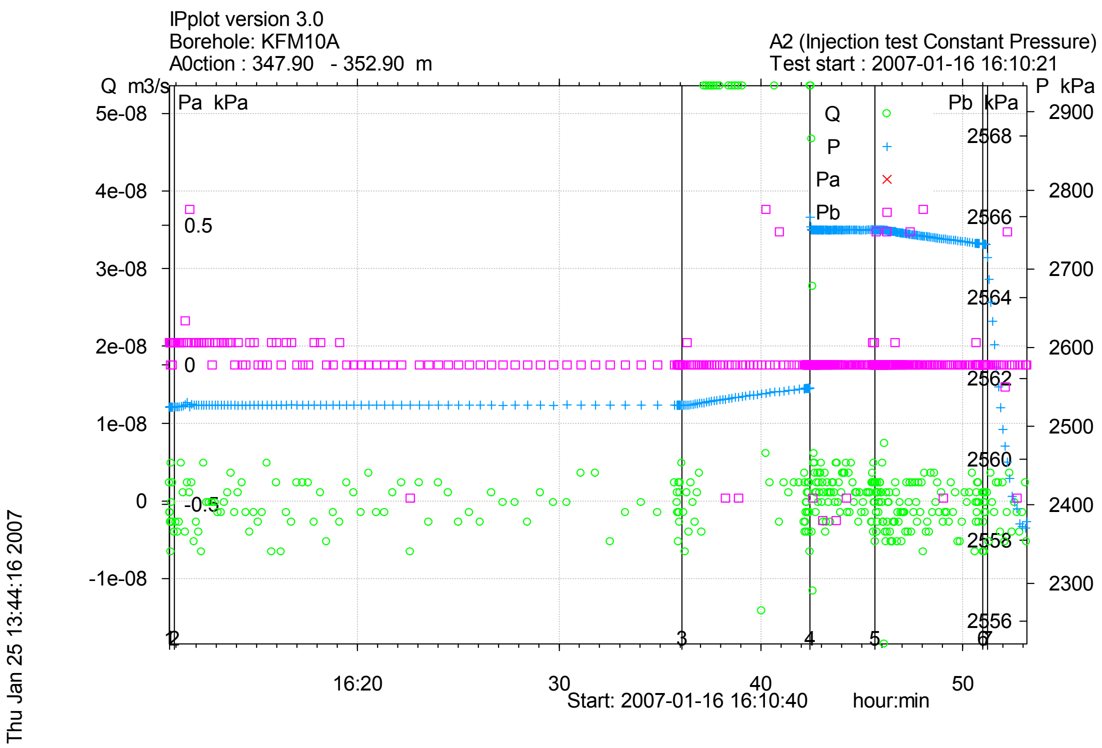


Figure A3-294. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 347.9-352.9 m in borehole KFM10A.*

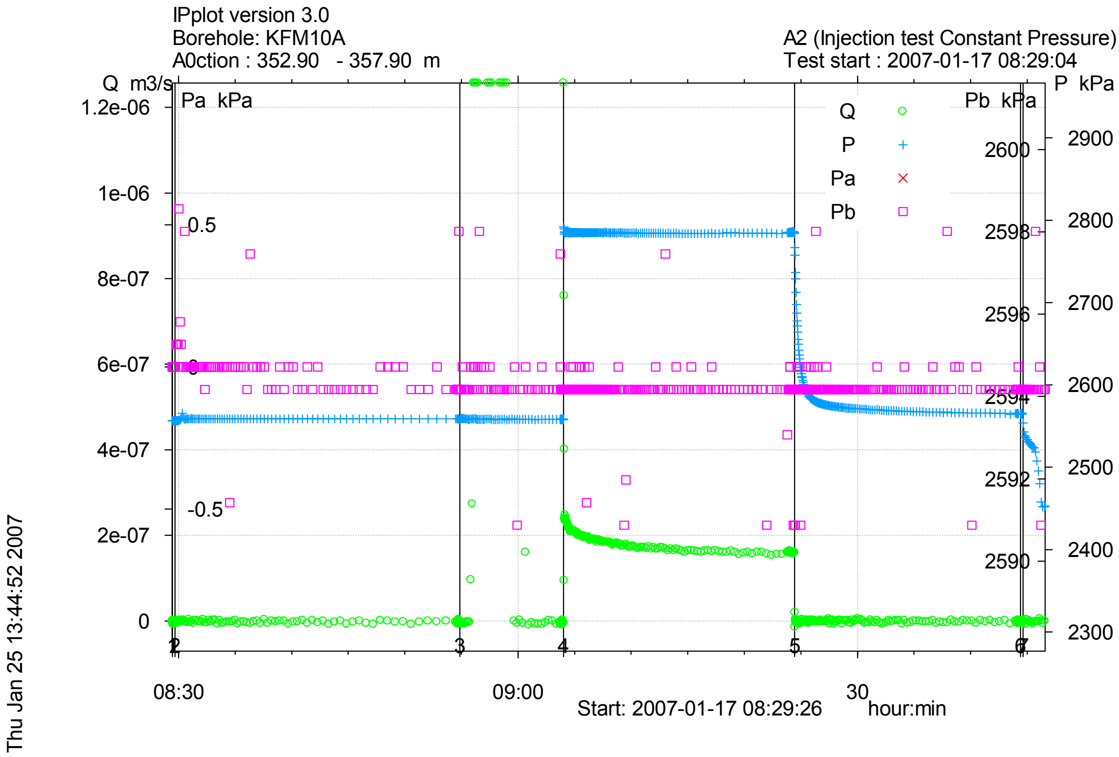


Figure A3-295. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 352.9-357.9 m in borehole KFM10A.*

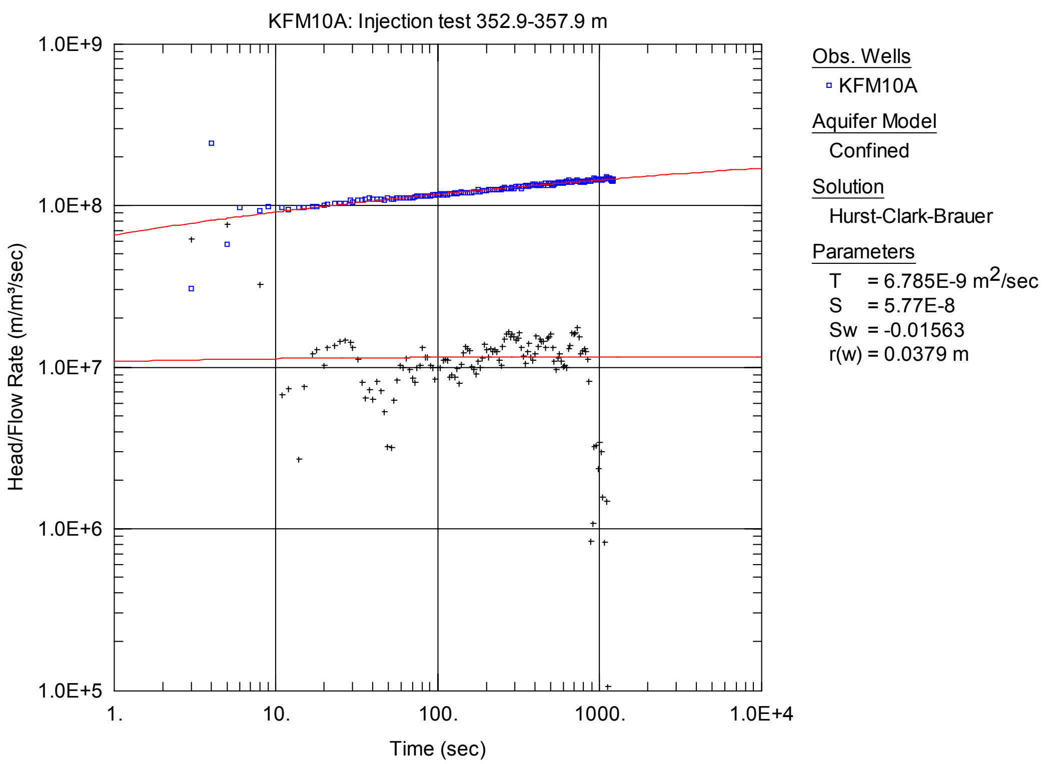


Figure A3-296. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 352.9-357.9 m in KFM10A.*

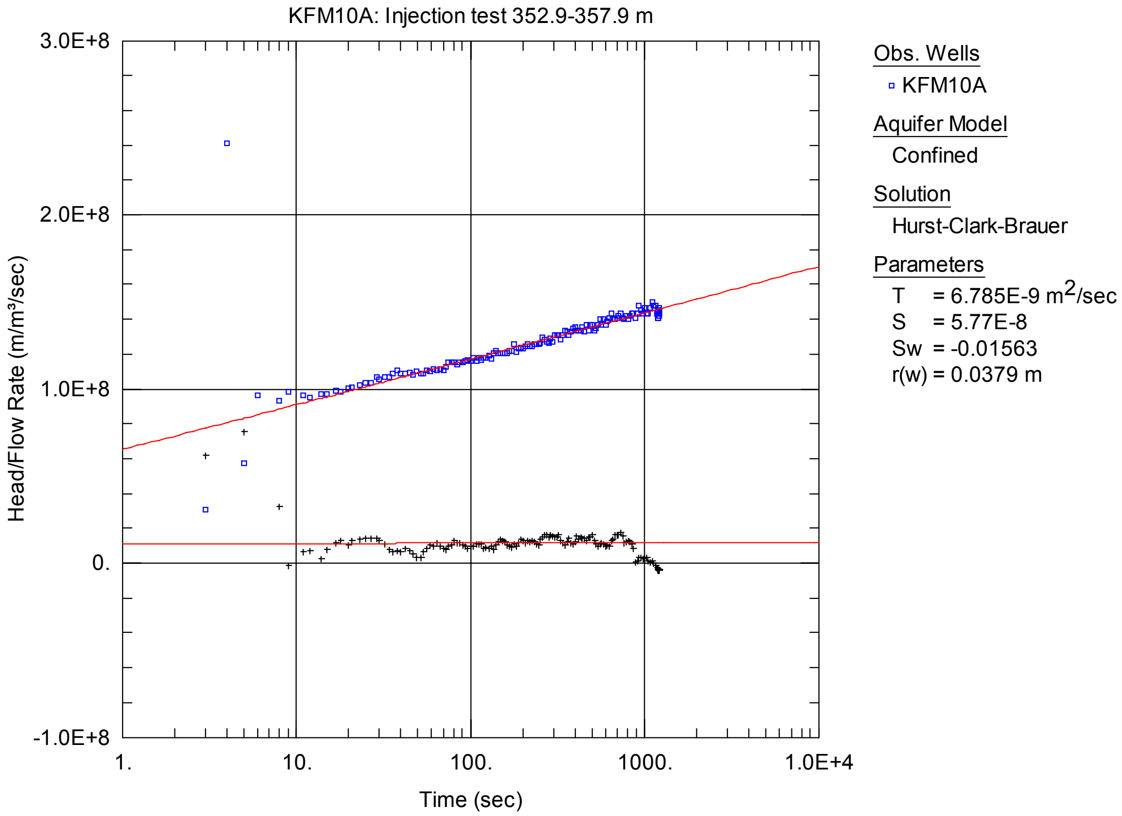


Figure A3-297. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 352.9-357.9 m in KFM10A.*

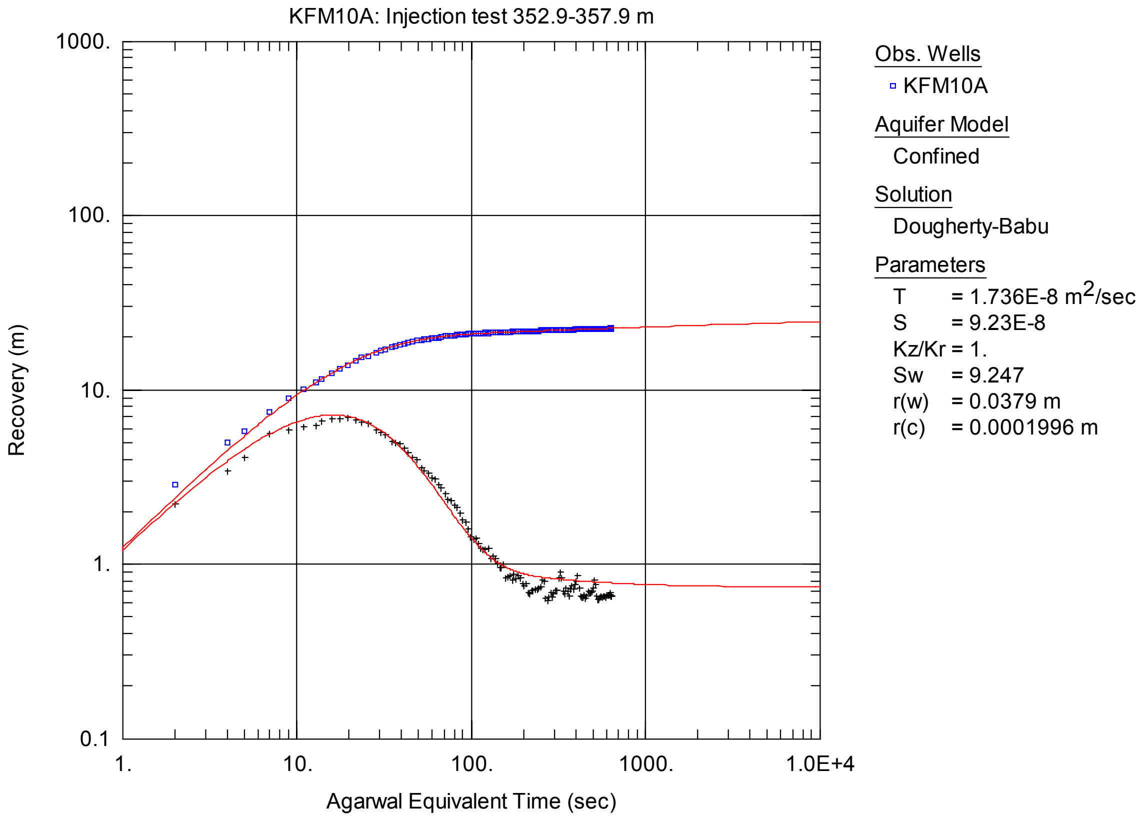


Figure A3-298. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 352.9-357.9 m in KFM10A.*

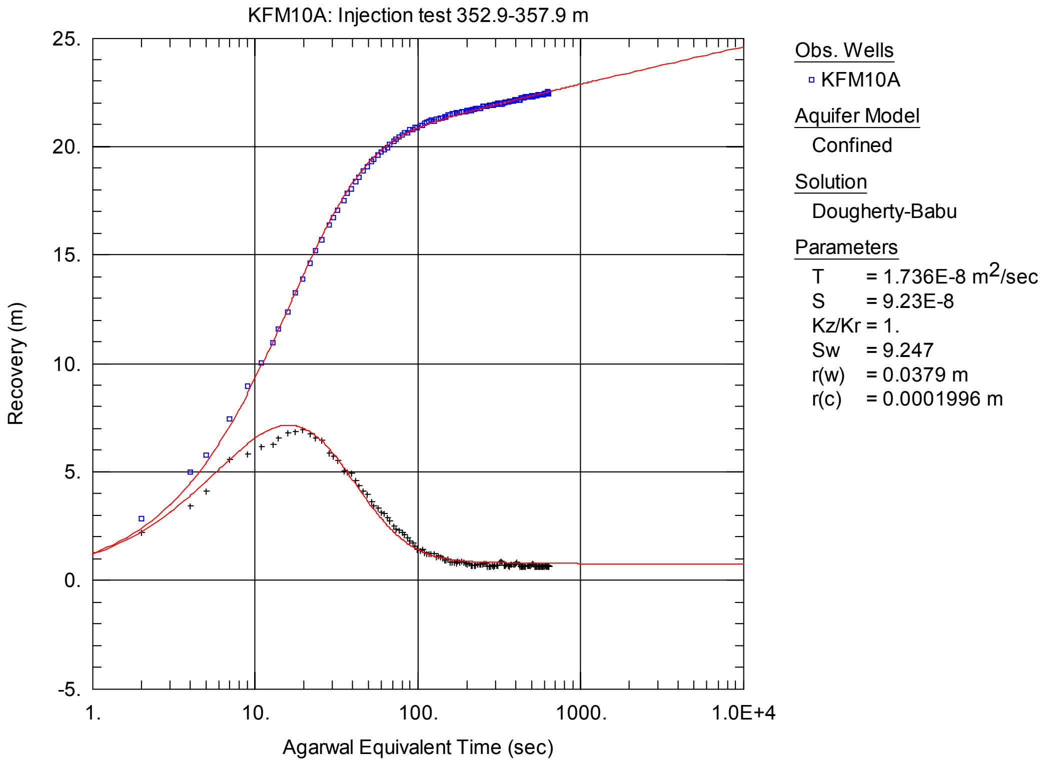


Figure A3-299. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 352.9-357.9 m in KFM10A.*

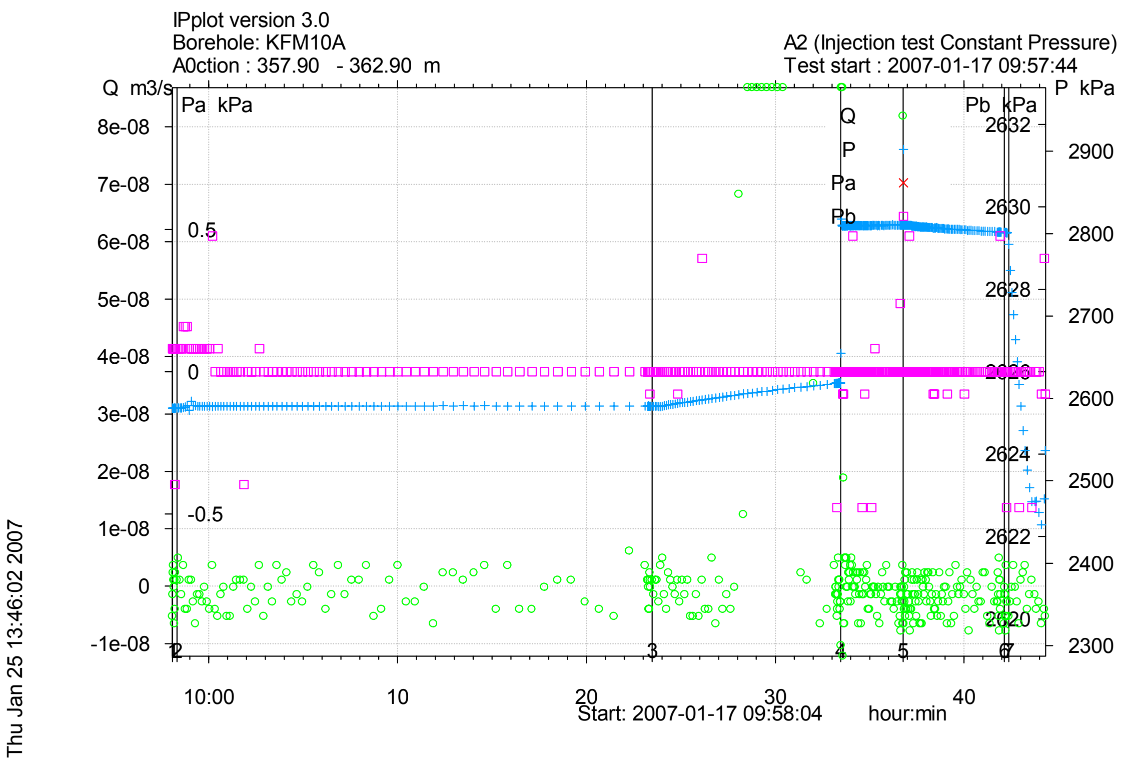


Figure A3-300. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 357.9-362.9 m in borehole KFM10A.*

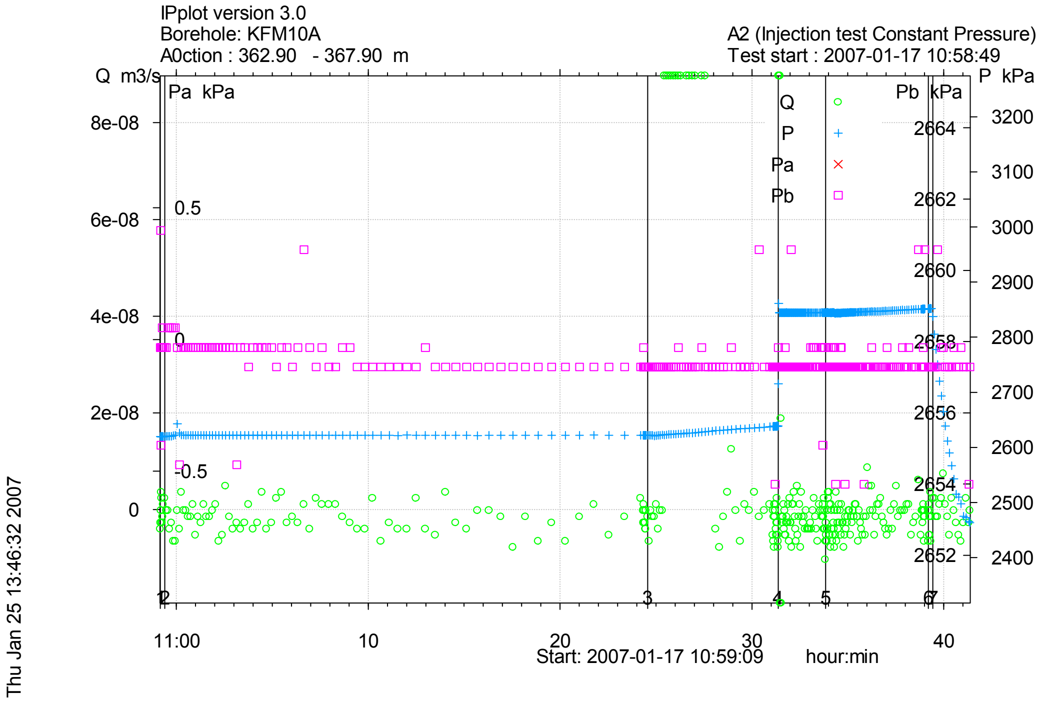


***Figure A3-301.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 362.9-367.9 m in borehole KFM10A.*

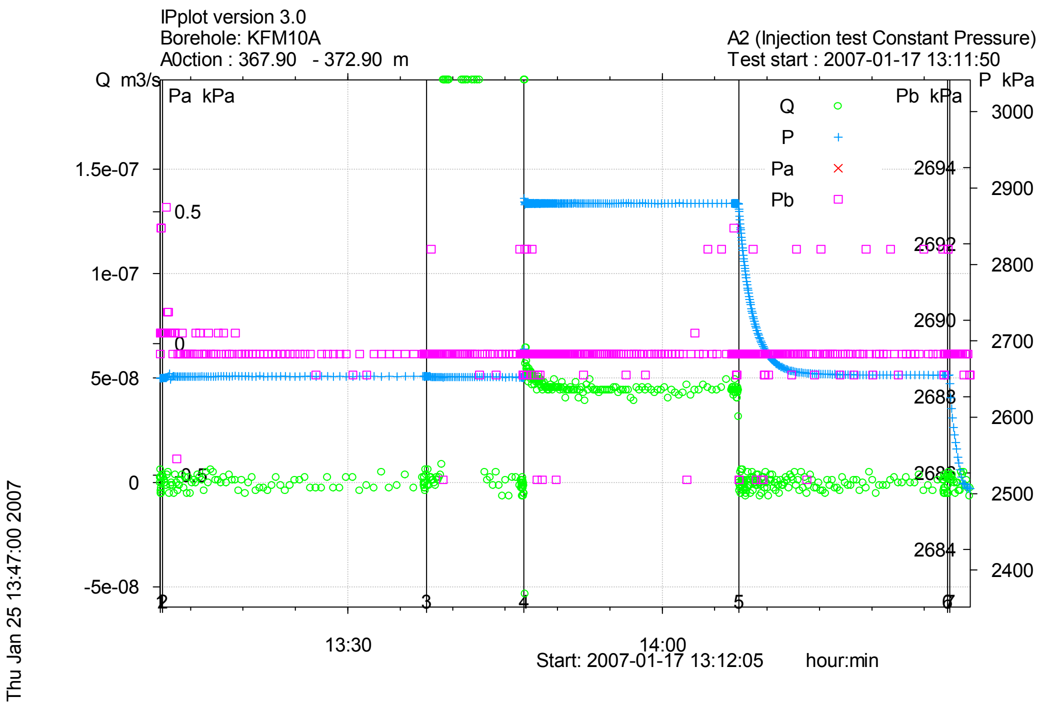


***Figure A3-302.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 367.9-372.9 m in borehole KFM10A.*

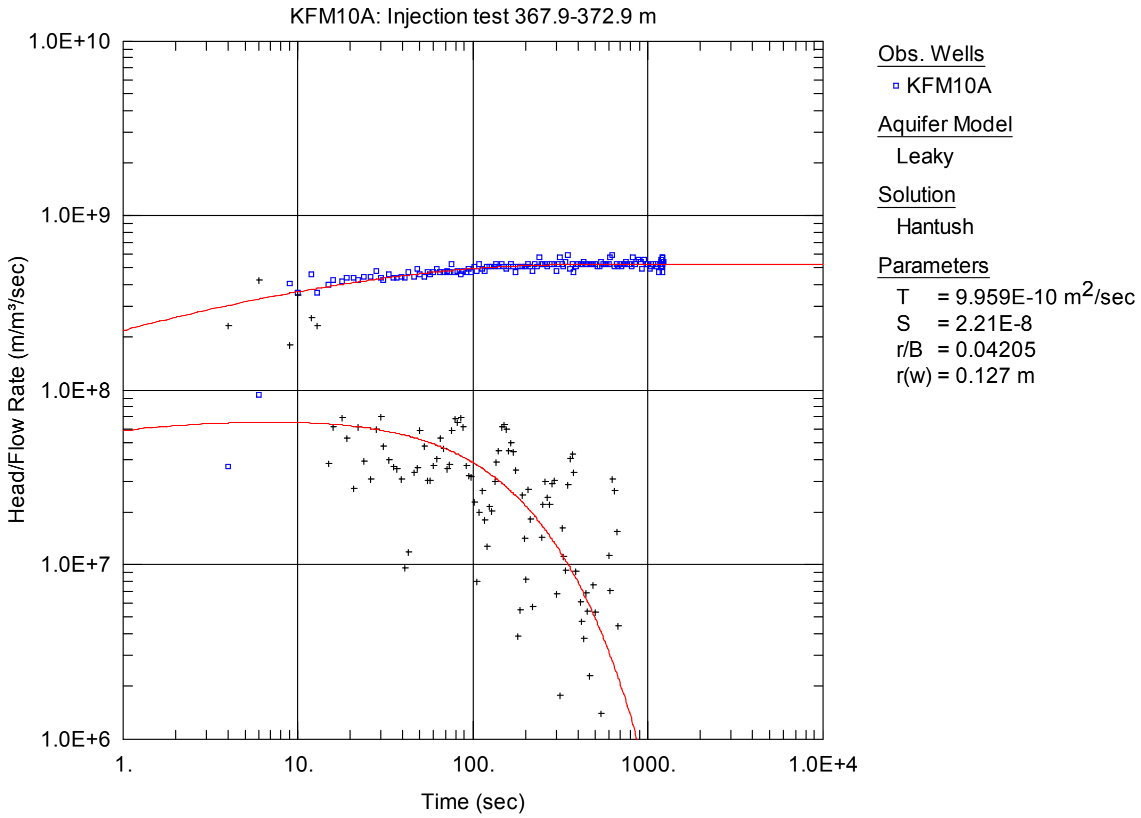


Figure A3-303. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 367.9-372.9 m in KFM10A.*

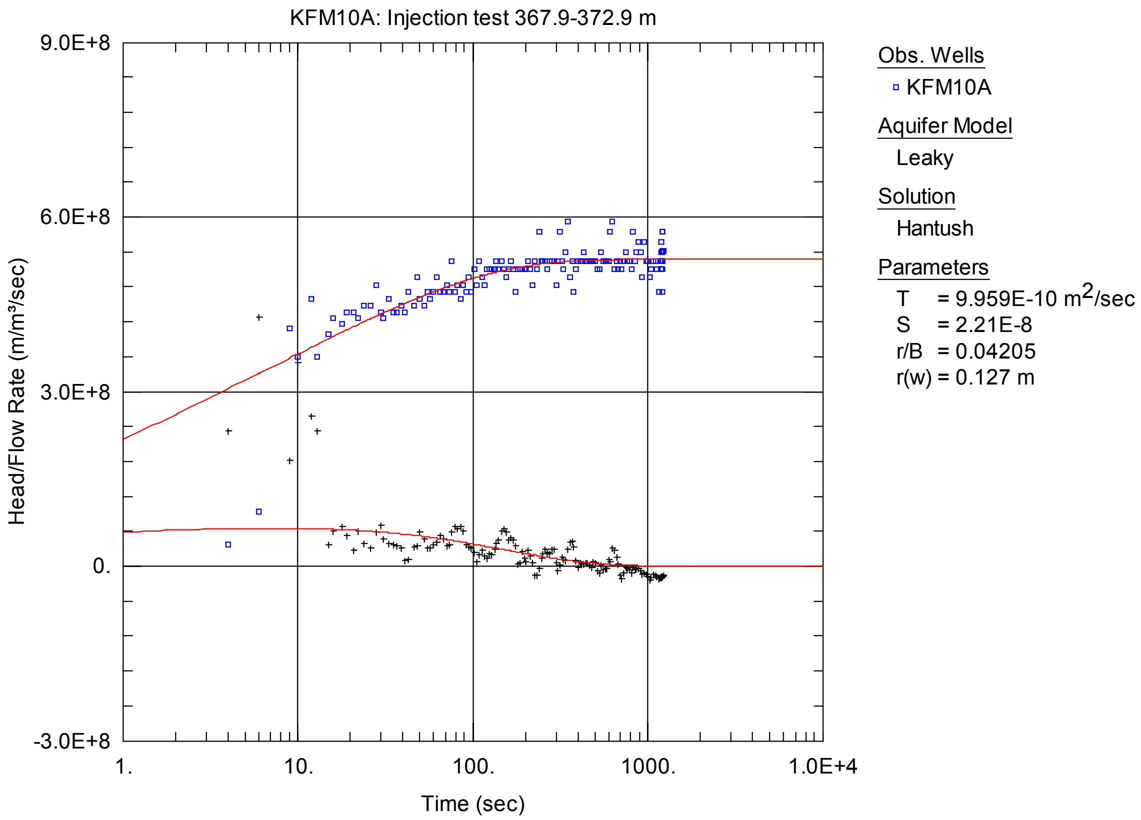


Figure A3-304. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 367.9-372.9 m in KFM10A.*

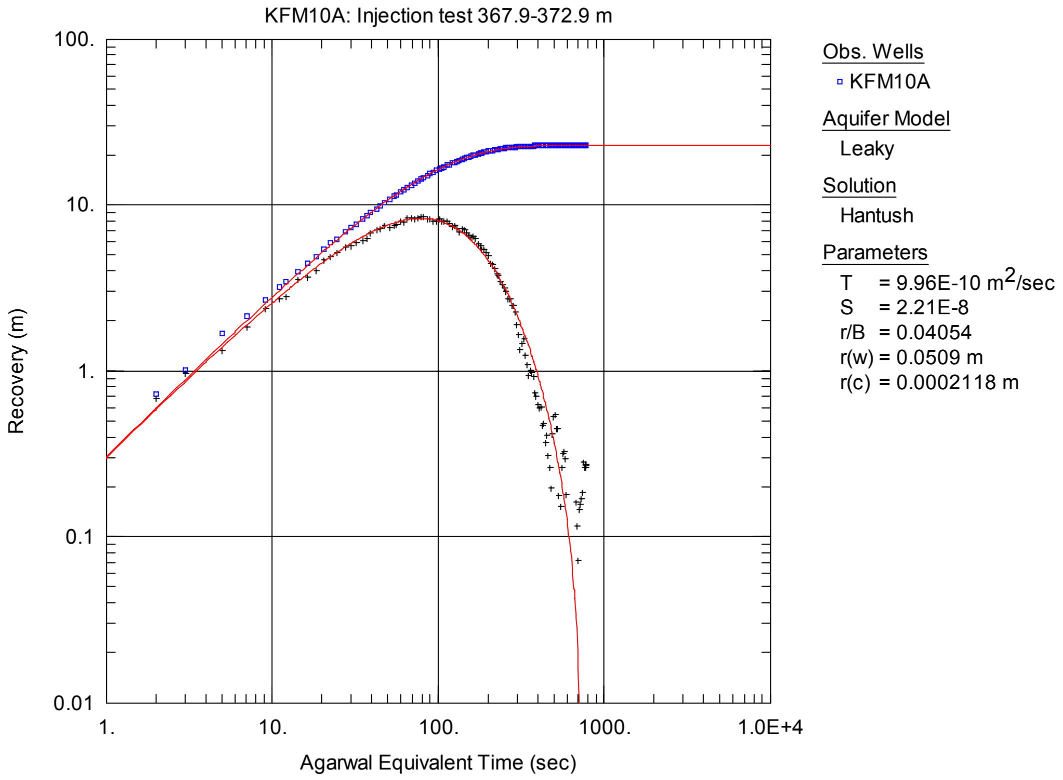


Figure A3-305. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 367.9-372.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

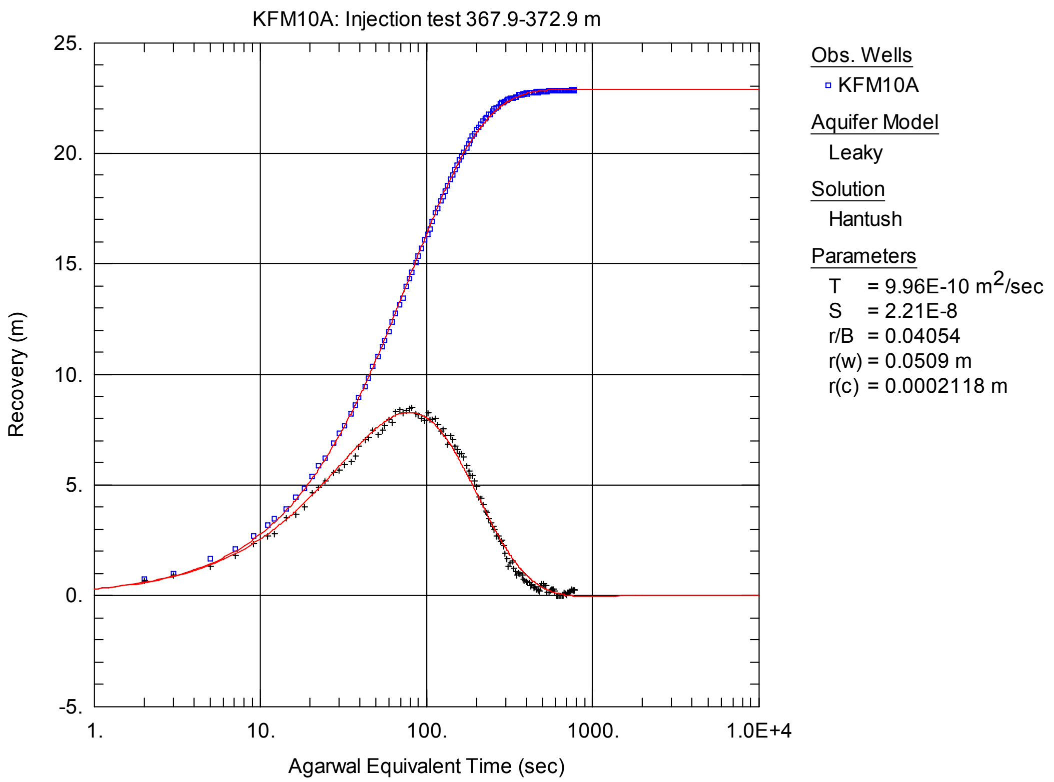


Figure A3-306. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 367.9-372.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

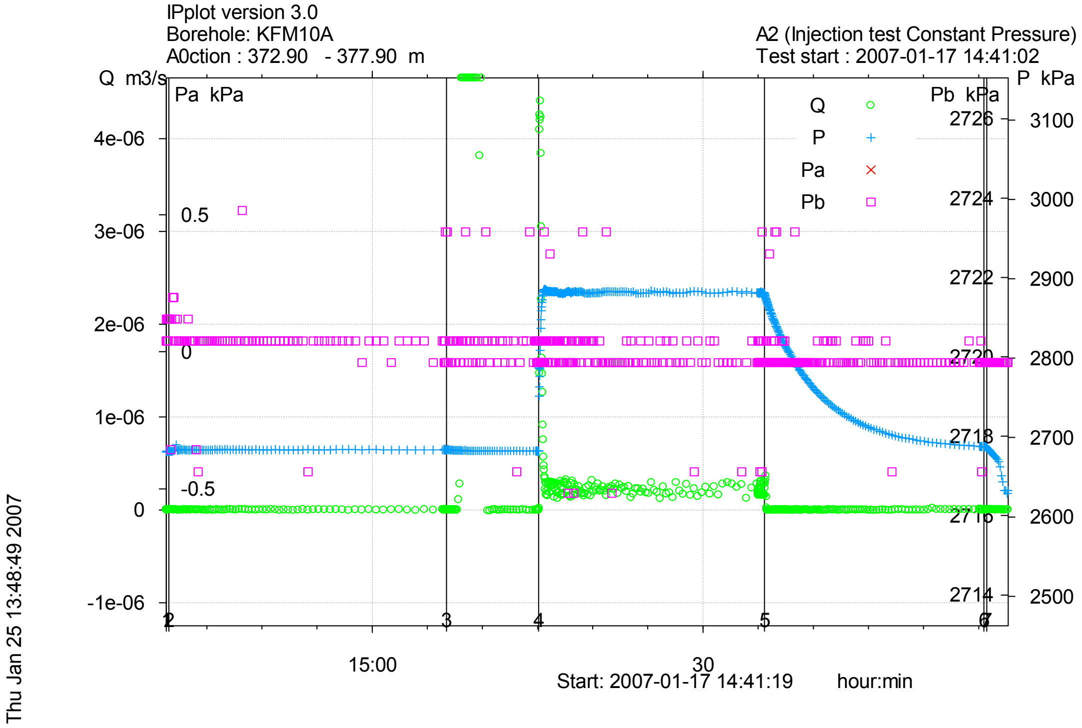


Figure A3-307. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 372.9-377.9 m in borehole KFM10A.*

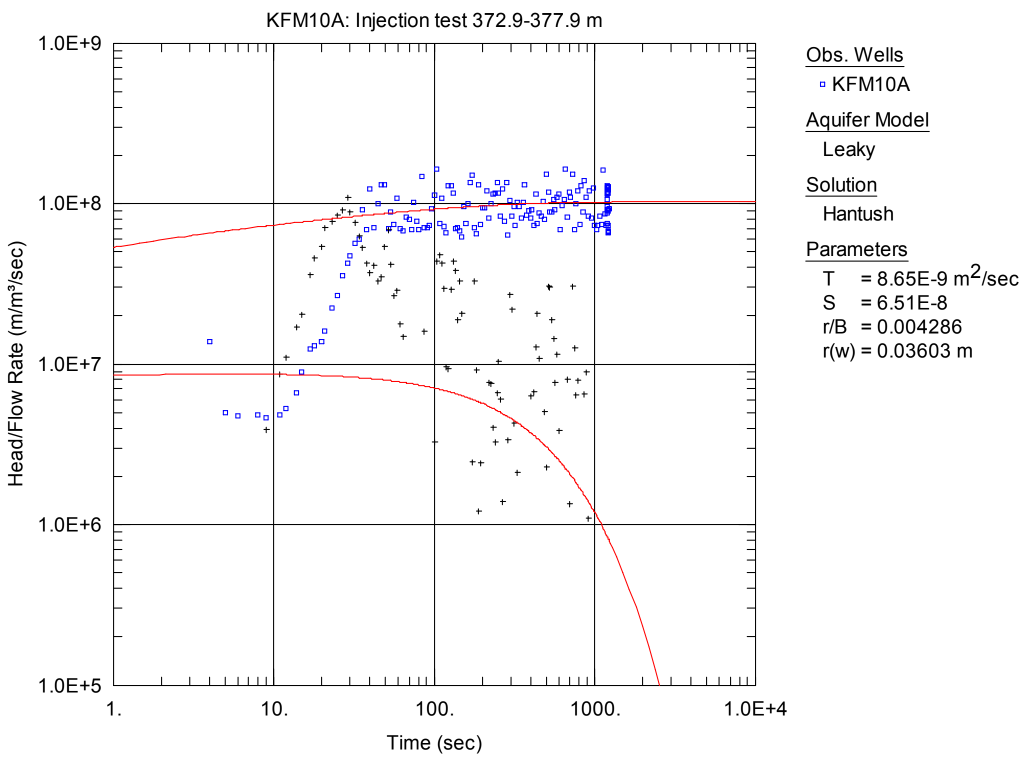


Figure A3-308. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 372.9-377.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

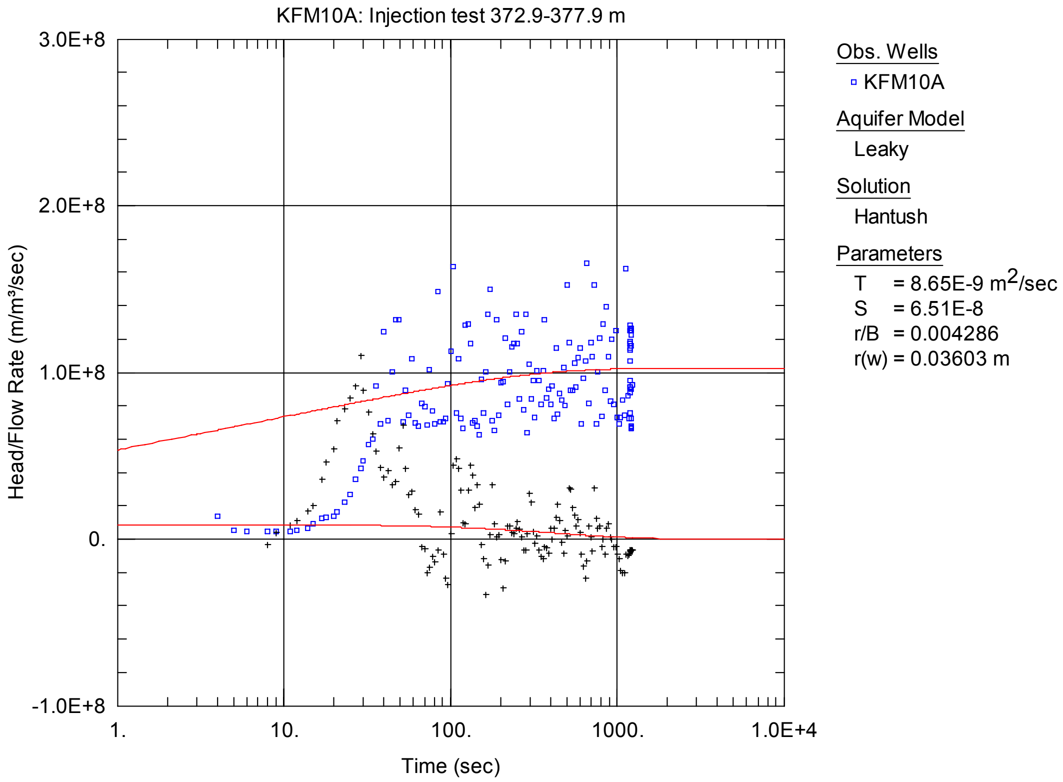


Figure A3-309. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 372.9-377.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

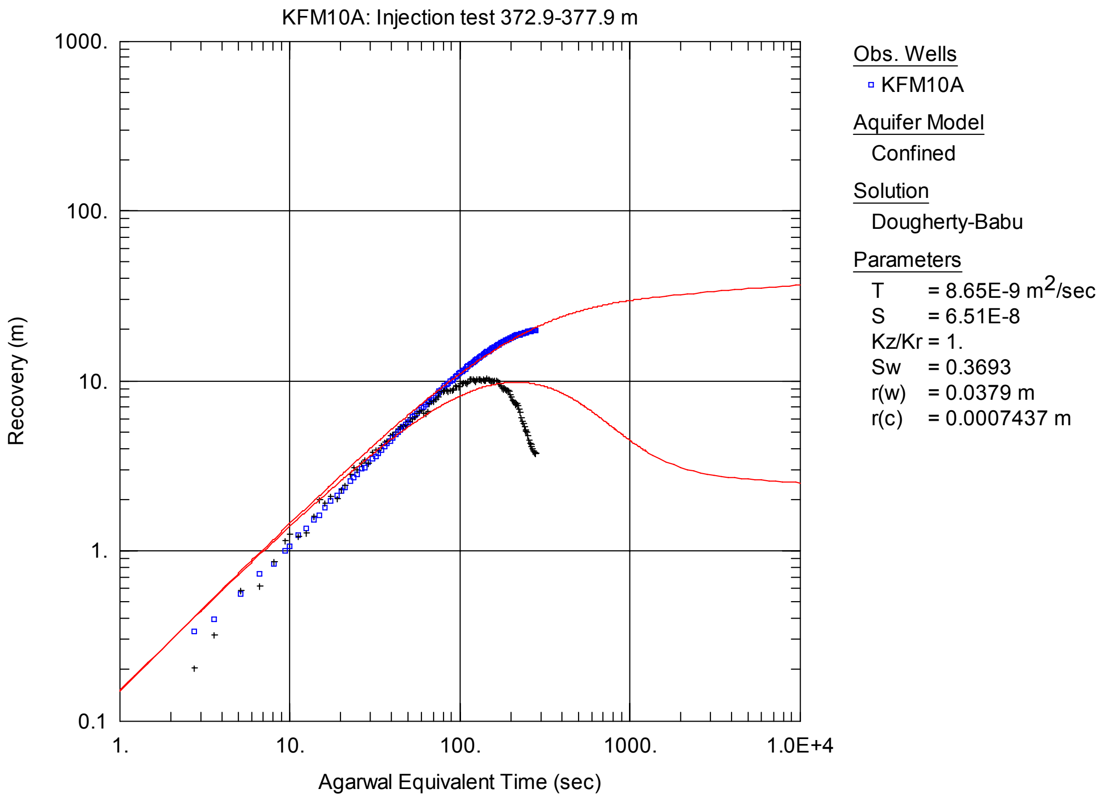


Figure A3-310. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 372.9-377.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

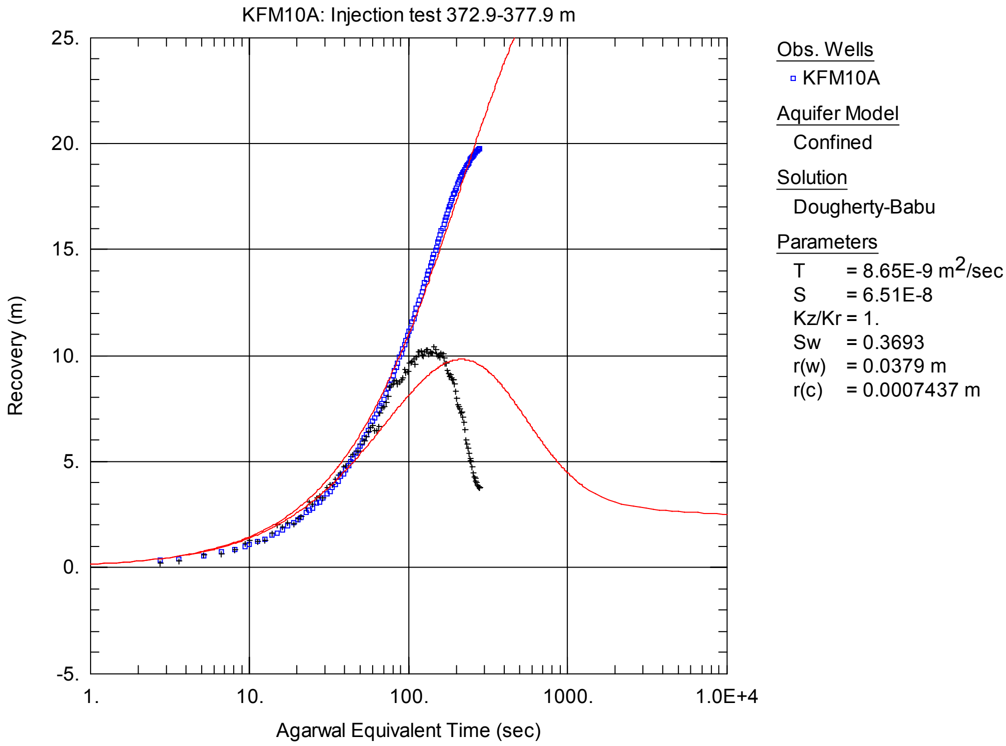


Figure A3-311. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 372.9-377.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

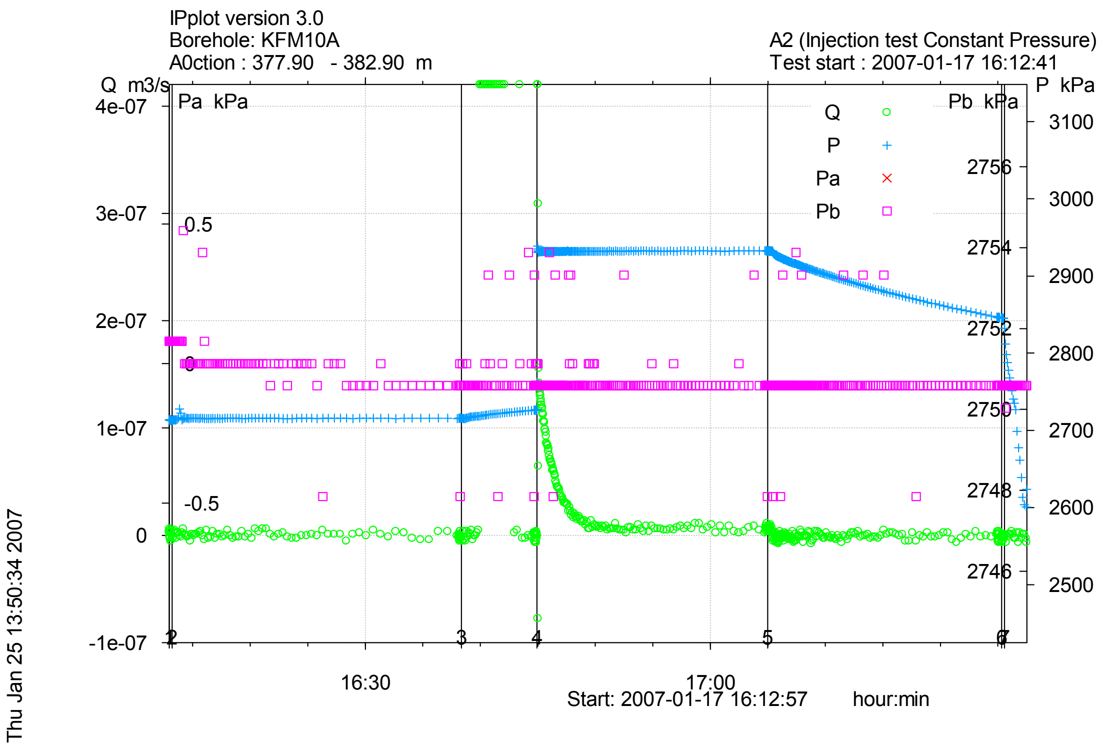


Figure A3-312. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 377.9-382.9 m in borehole KFM10A.*

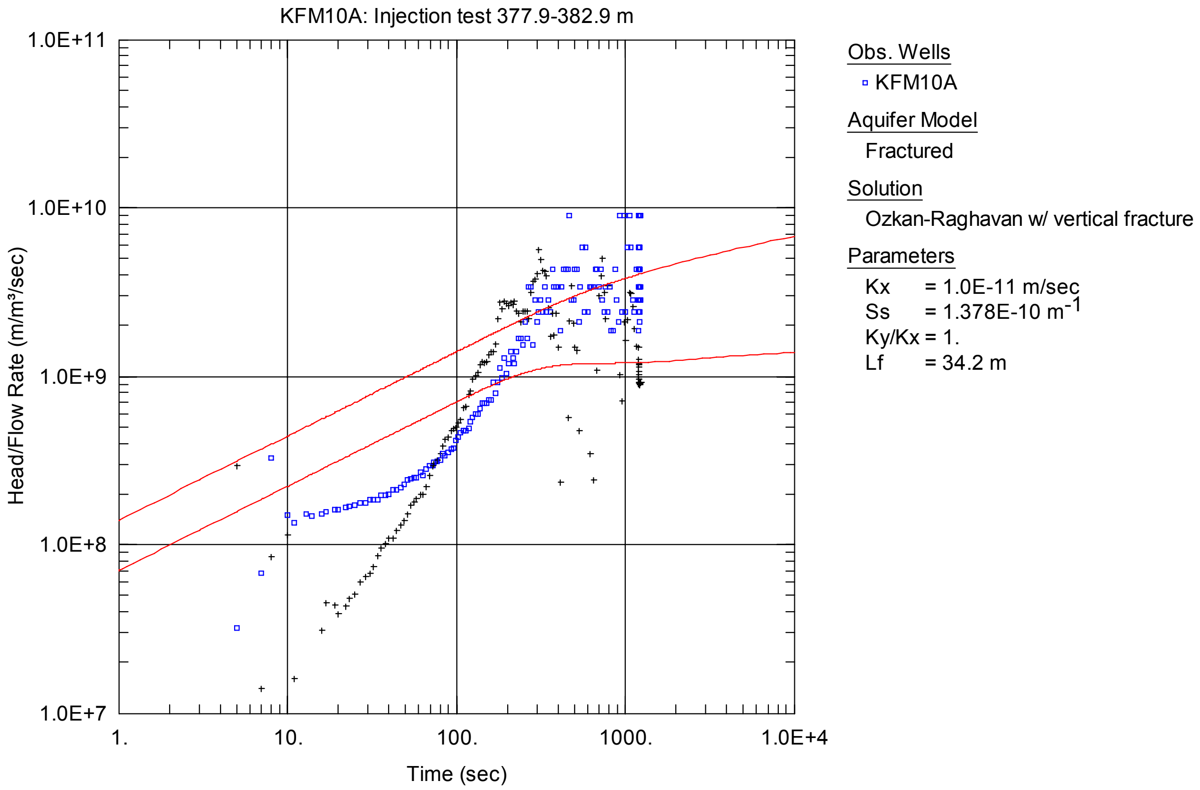


Figure A3-313. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 377.9-382.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

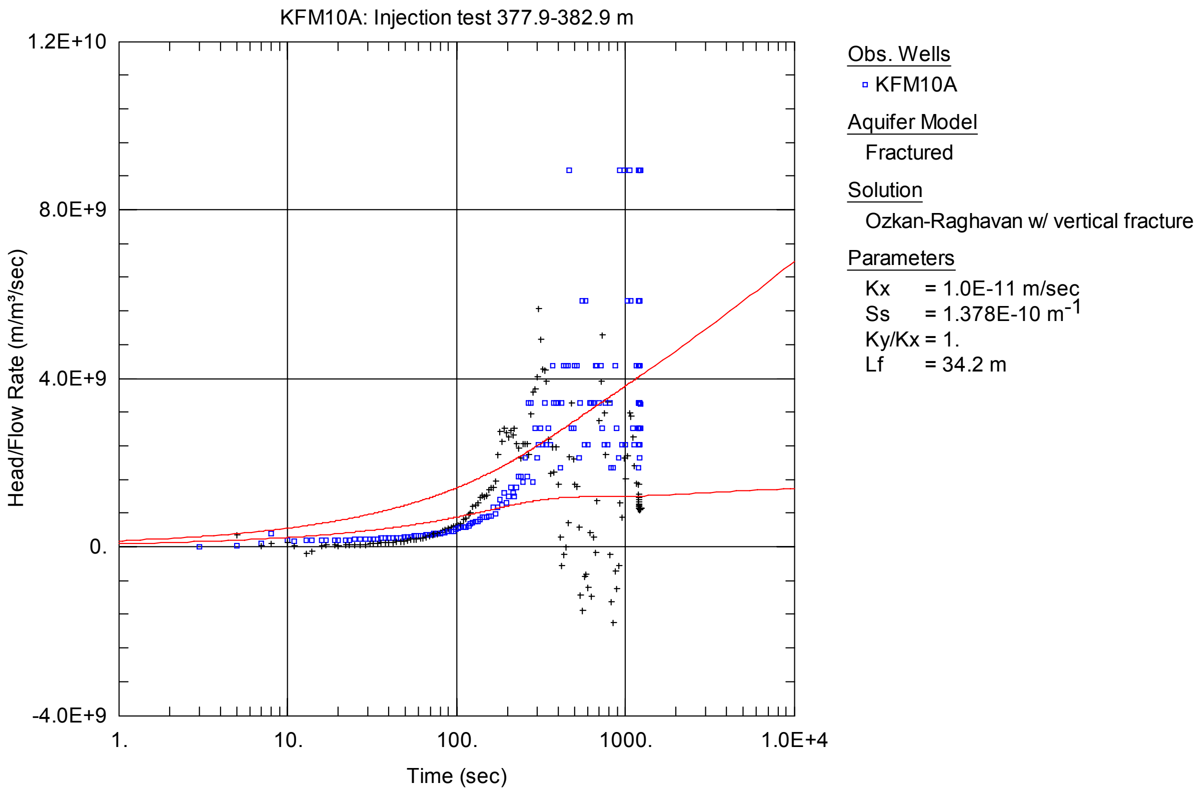


Figure A3-314. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 377.9-382.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

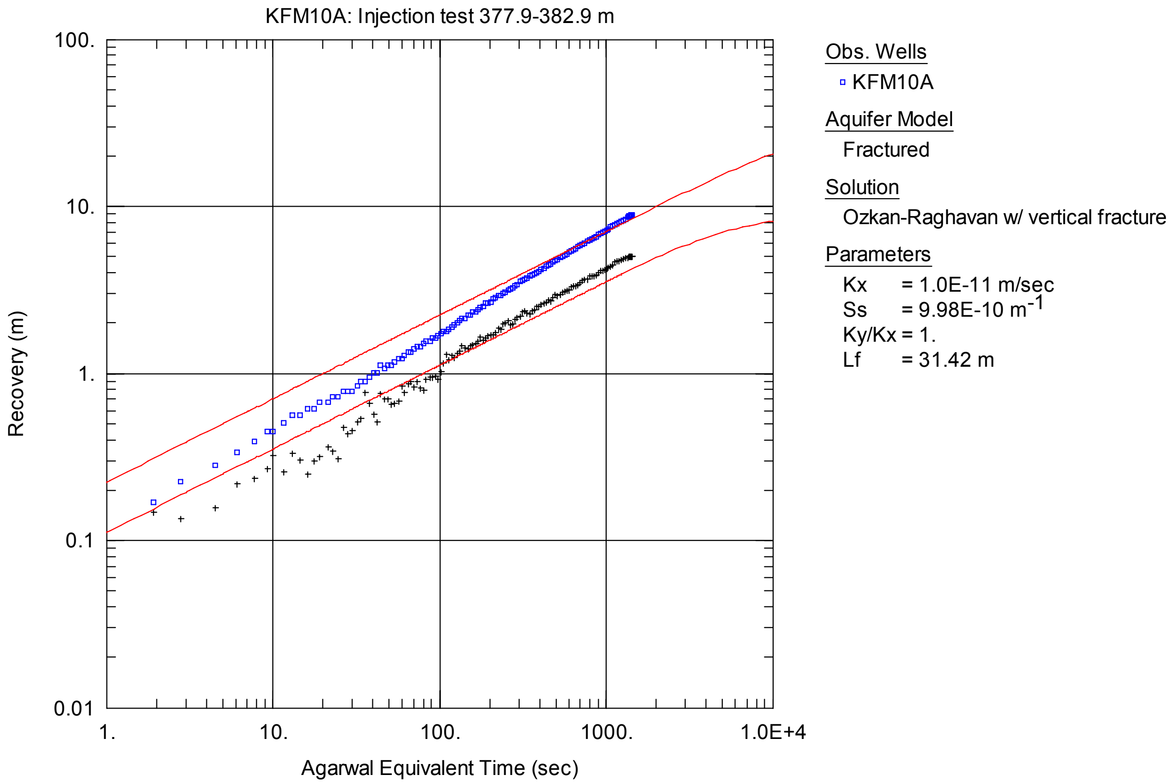


Figure A3-315. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 377.9-382.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

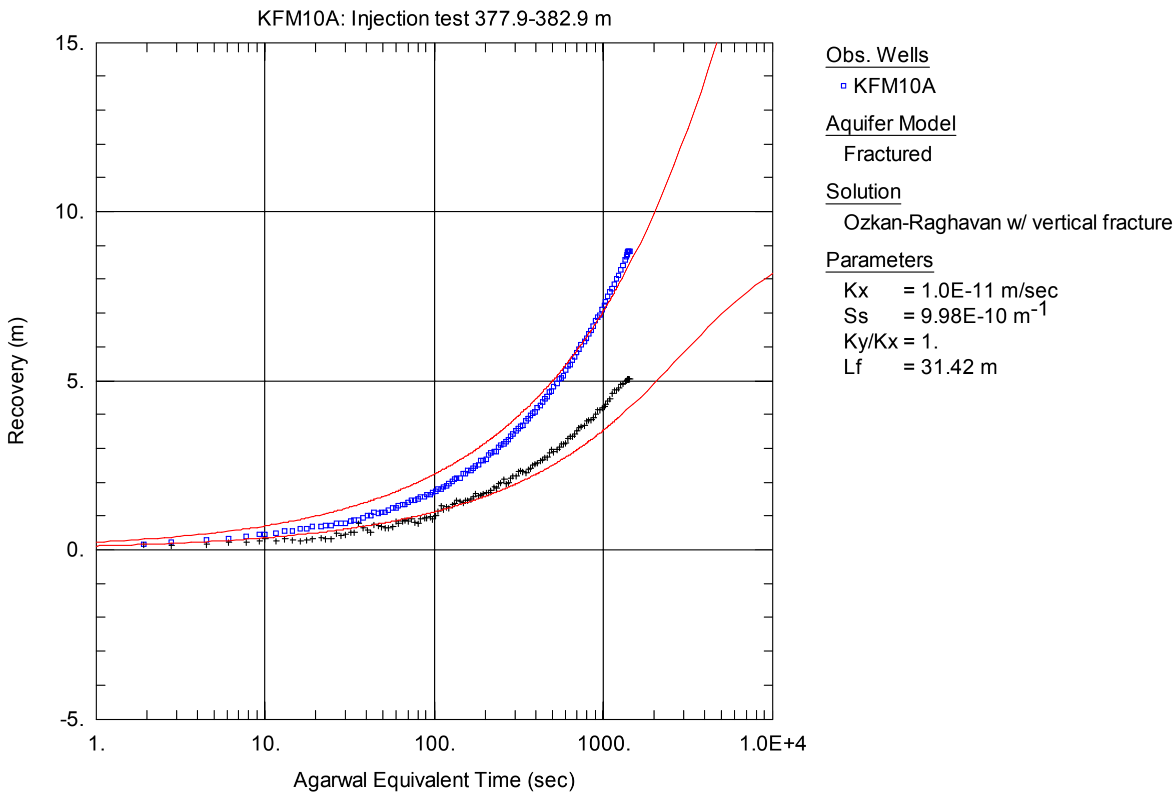


Figure A3-316. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 377.9-382.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

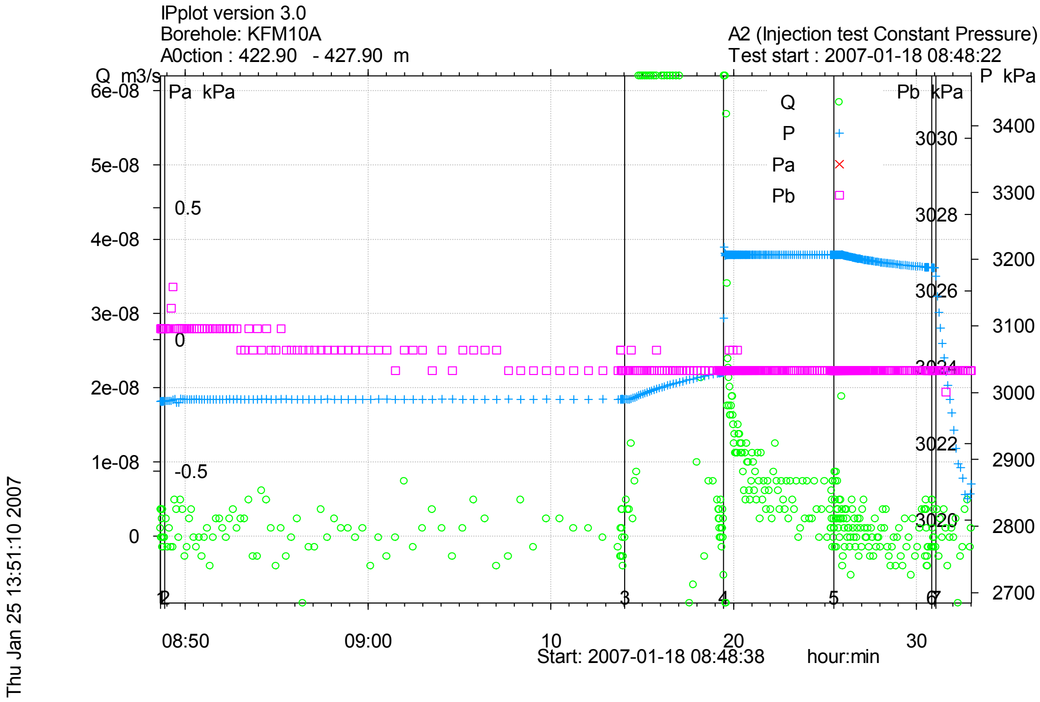


Figure A3-317. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 422.9-427.9 m in borehole KFM10A.*

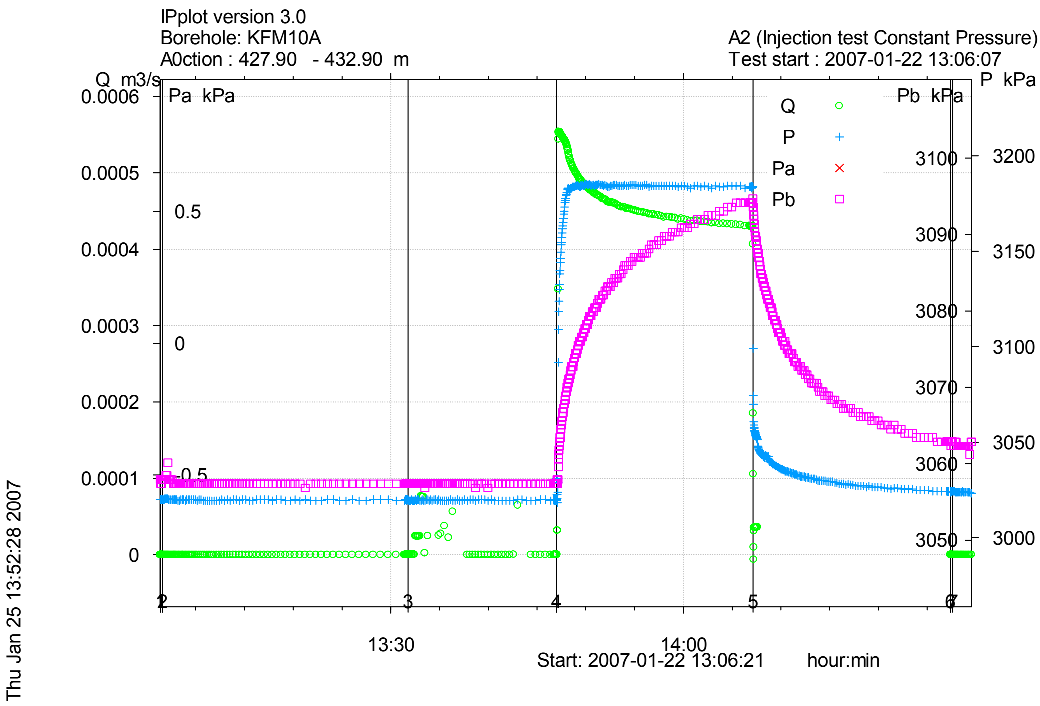


Figure A3-318. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 427.9-432.9 m in borehole KFM10A.*

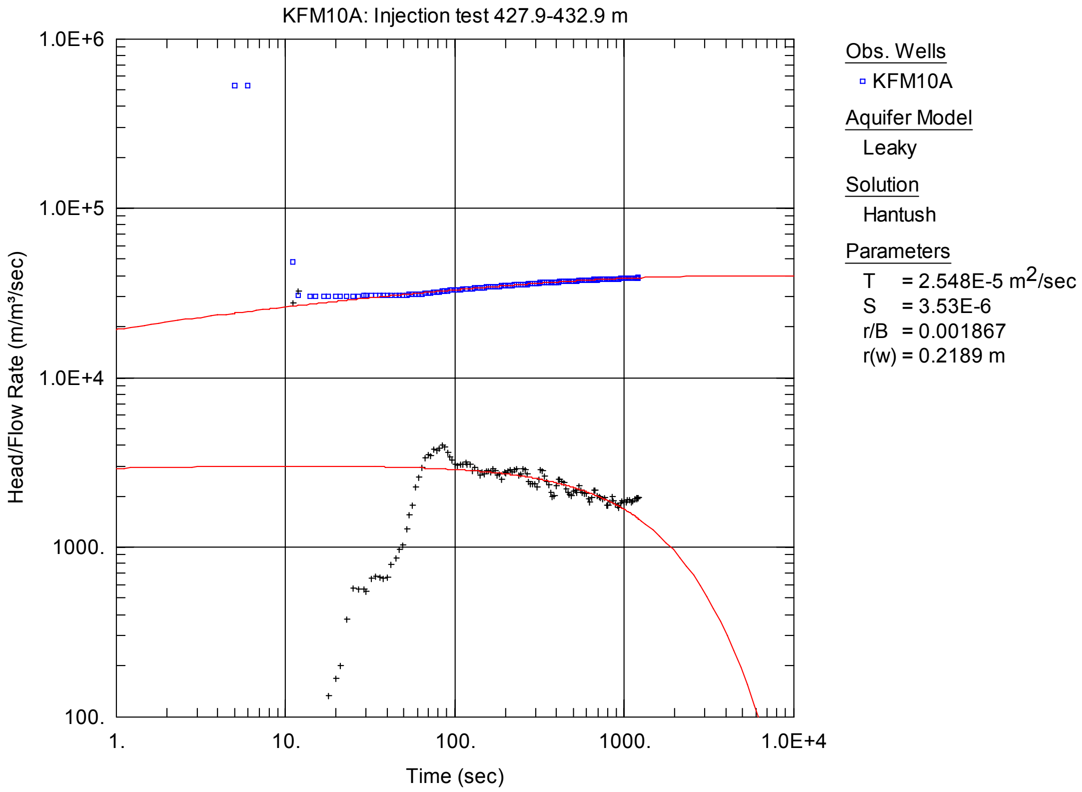


Figure A3-319. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 427.9-432.9 m in KFM10A.*

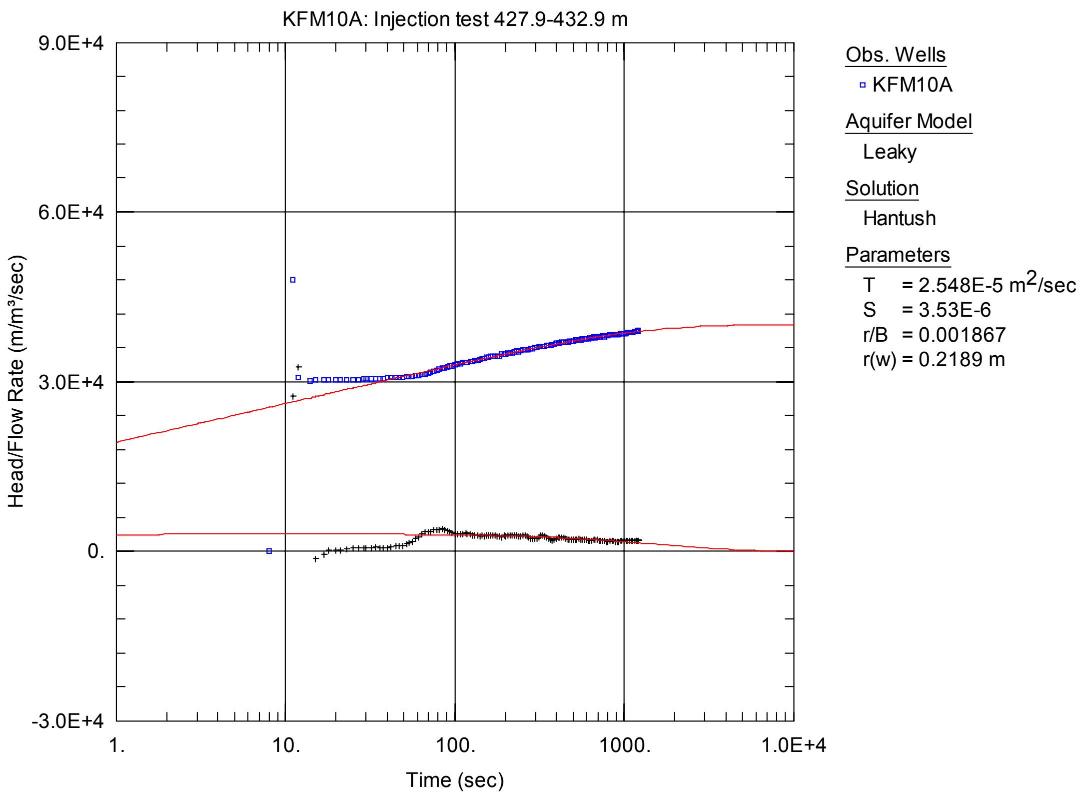


Figure A3-320. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 427.9-432.9 m in KFM10A.*

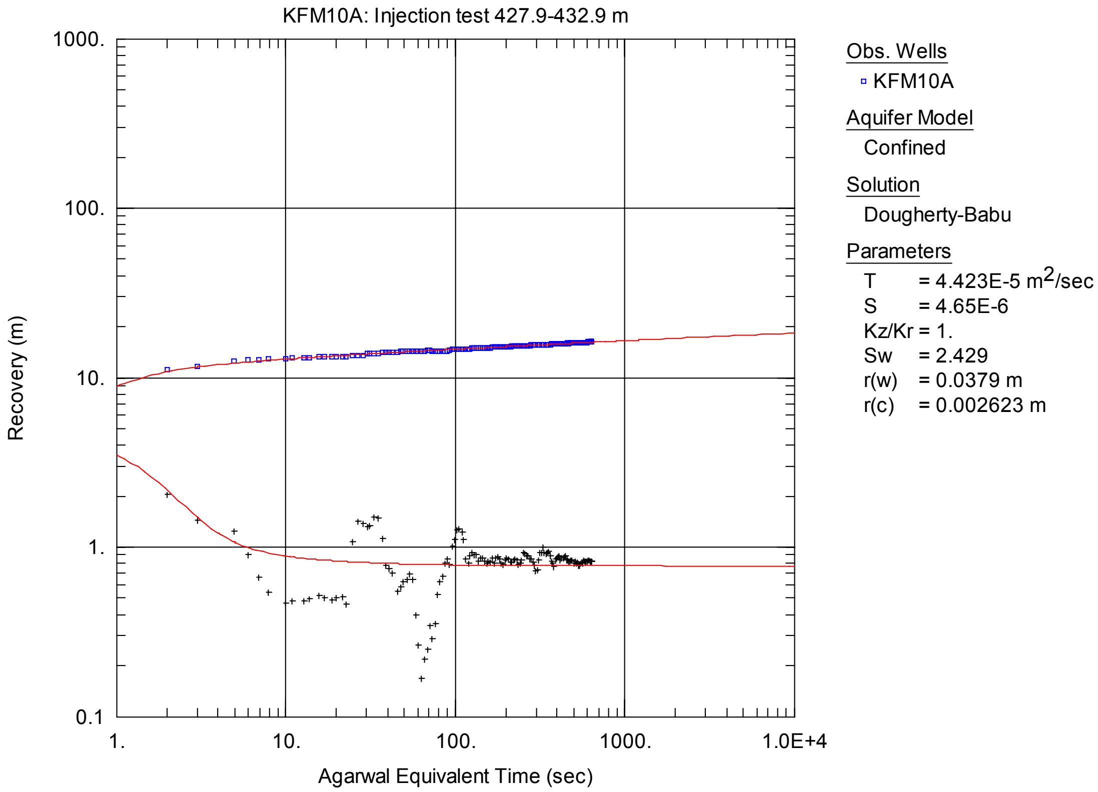


Figure A3-321. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 427.9-432.9 m in KFM10A.*

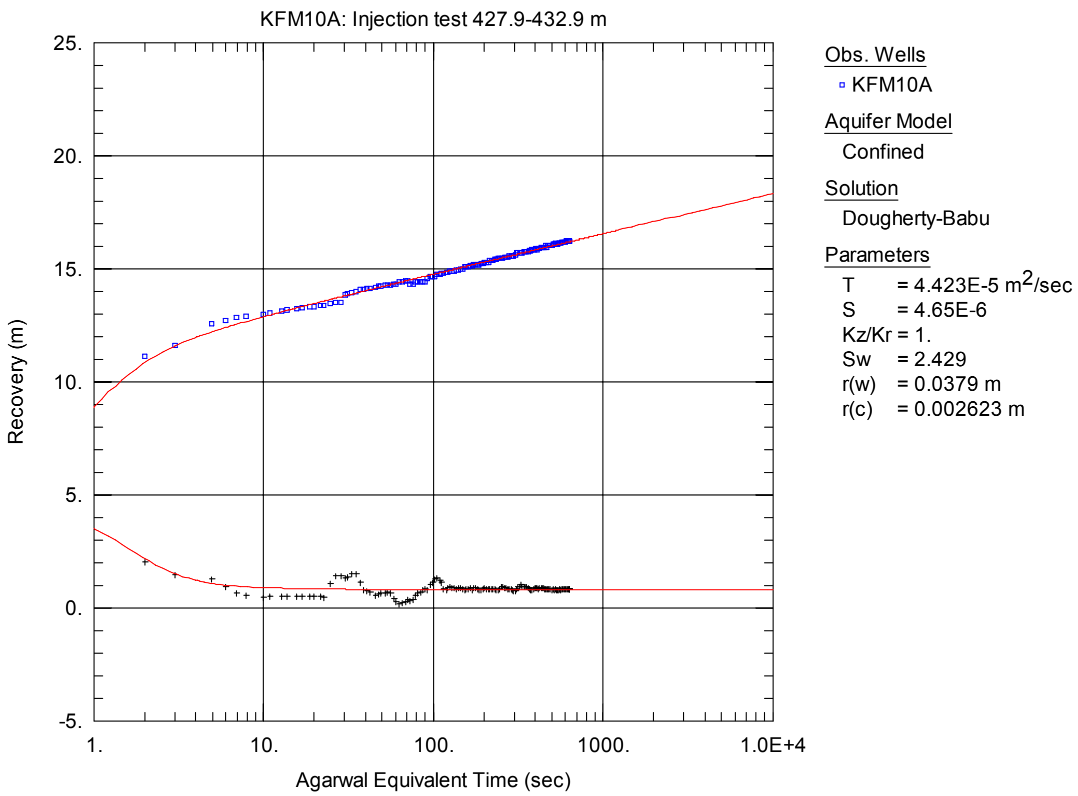


Figure A3-322. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 427.9-432.9 m in KFM10A.*

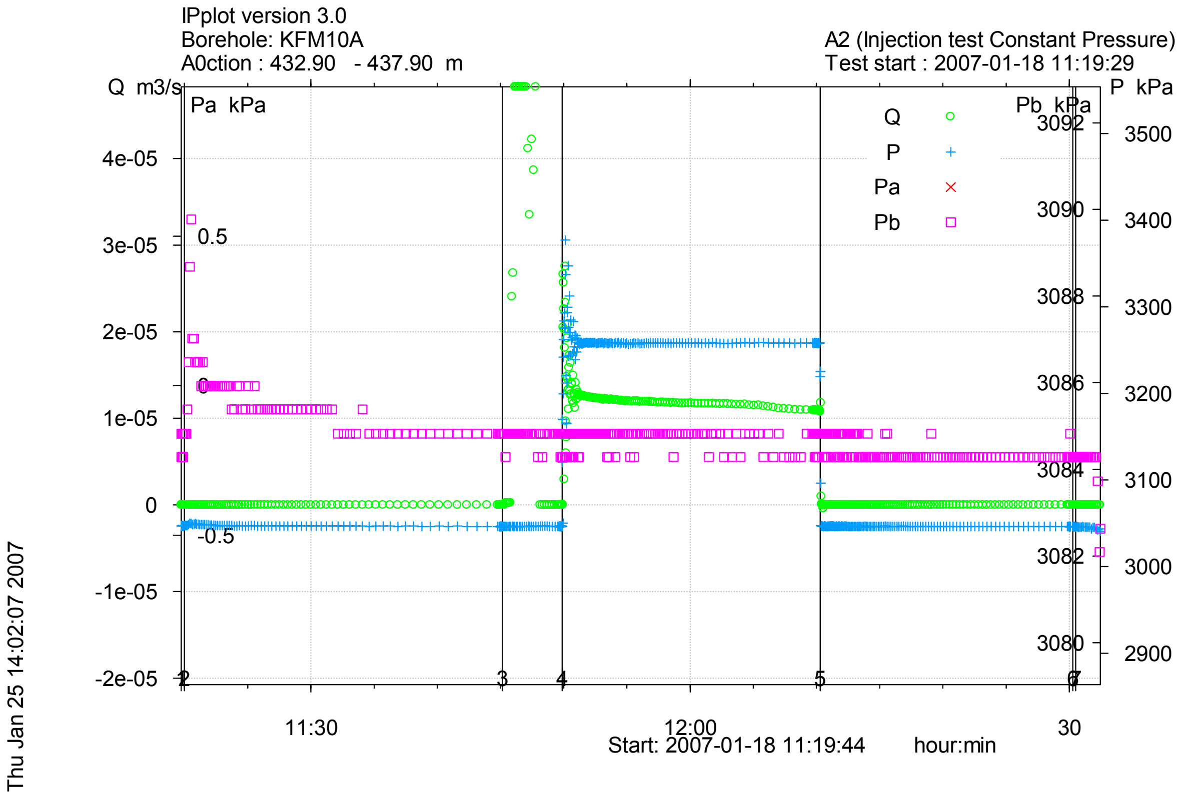


***Figure A3-323.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 432.9-437.9 m in borehole KFM10A.*

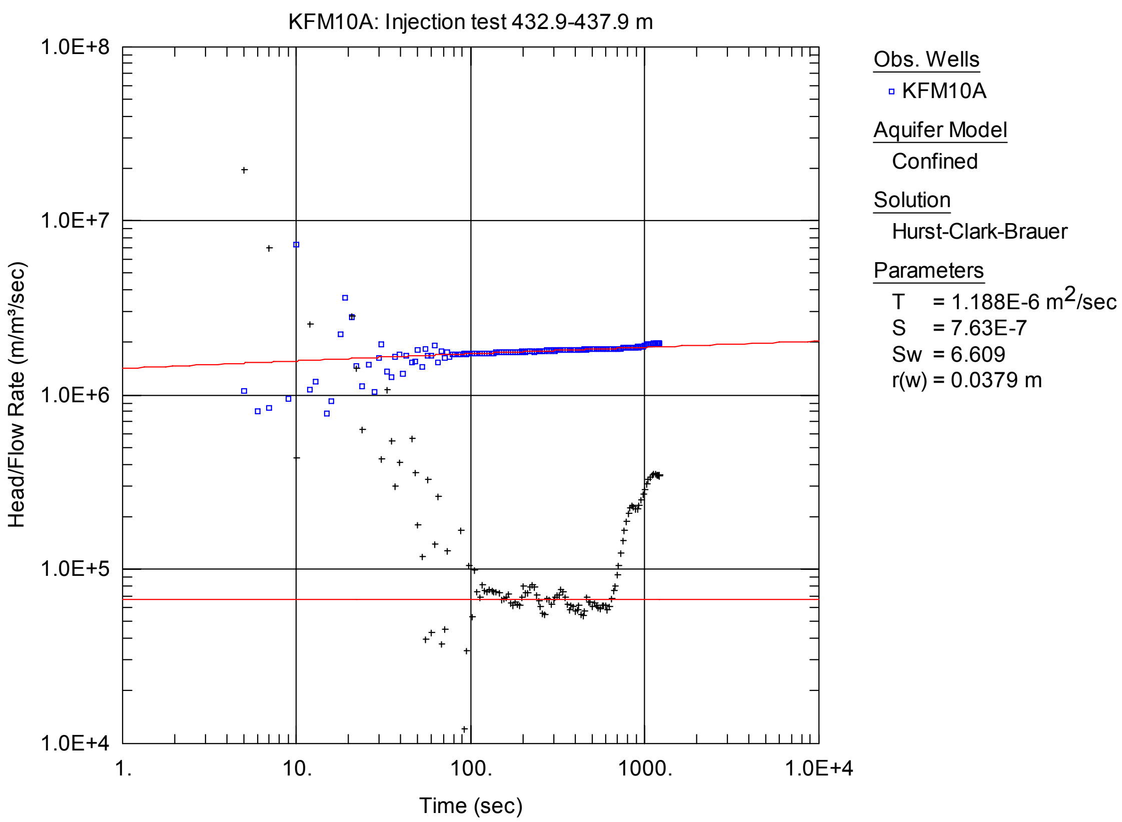


Figure A3-324. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 432.9-437.9 m in KFM10A.

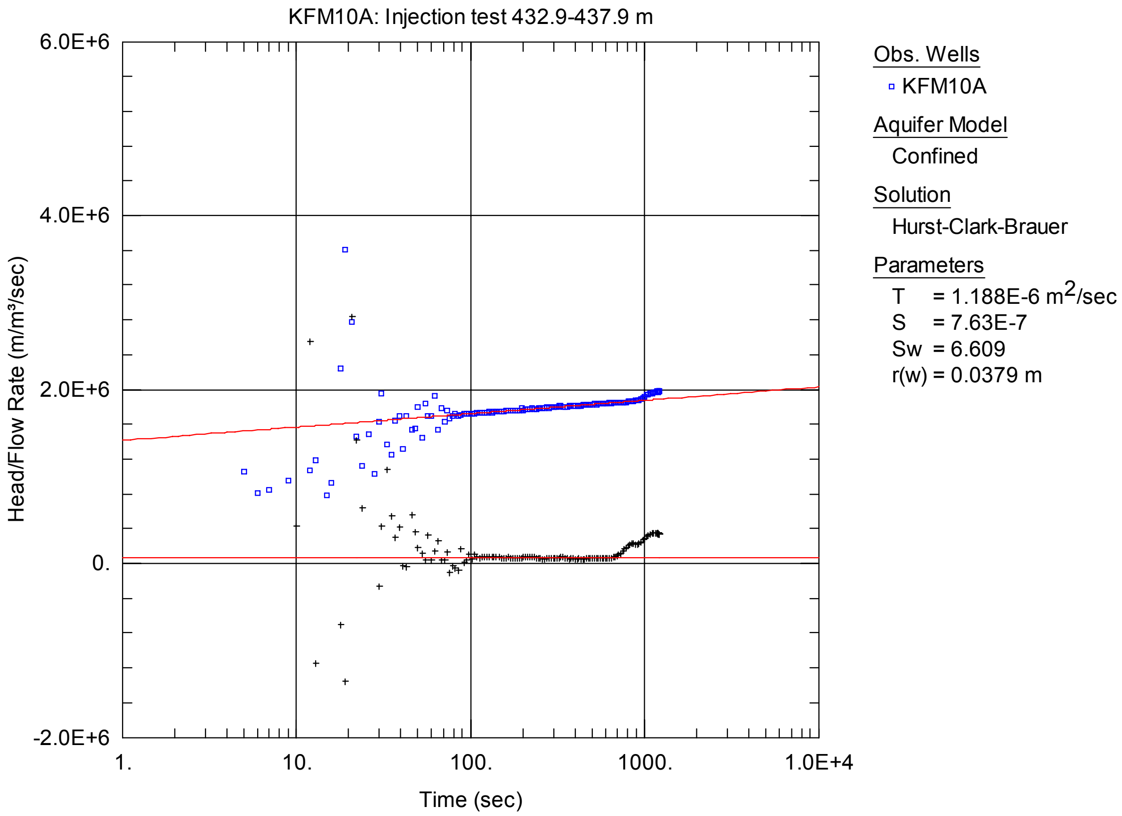


Figure A3-325. Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 432.9-437.9 m in KFM10A.

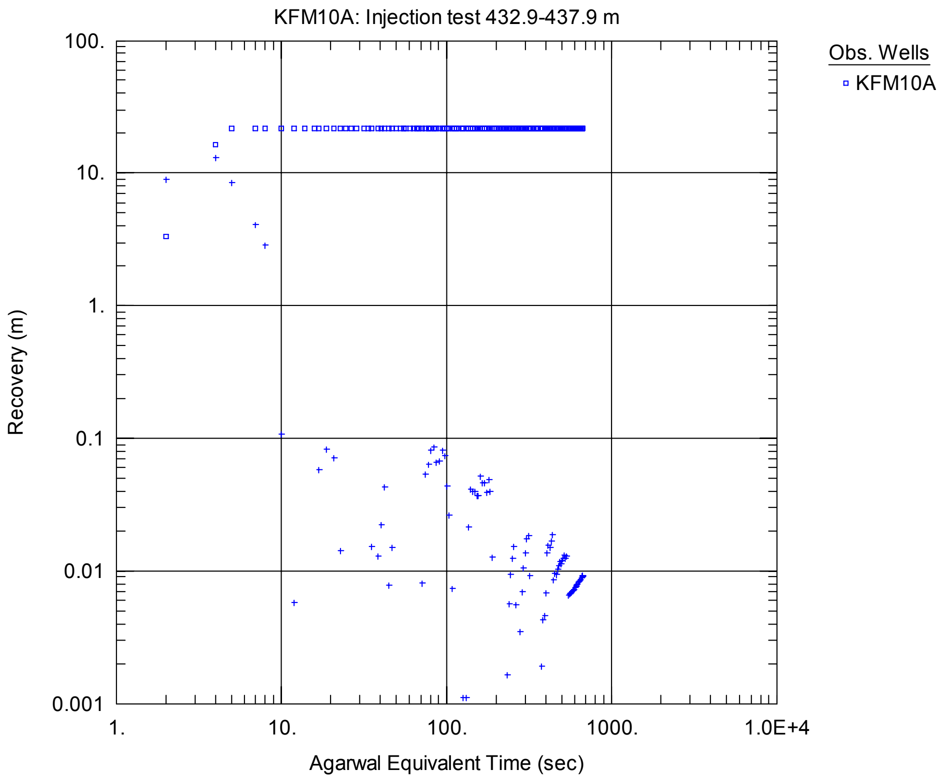


Figure A3-326. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 432.9-437.9 m in KFM10A. No type curve fit is shown since no unambiguous transient evaluation is possible.*

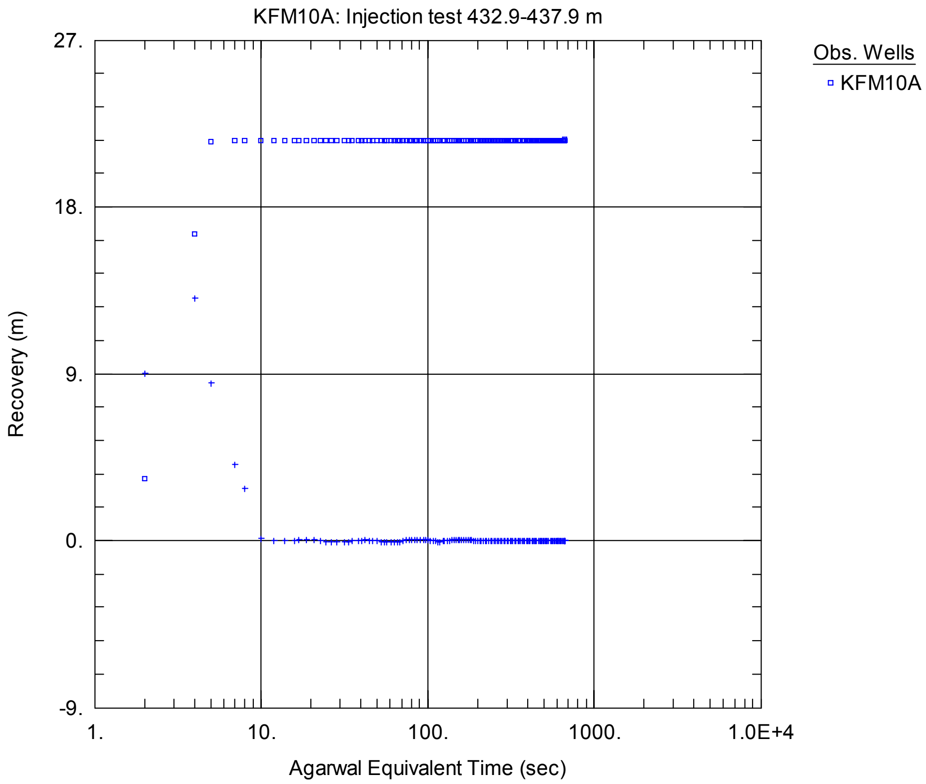


Figure A3-327. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 432.9-437.9 m in KFM10A. No type curve fit is shown since no unambiguous transient evaluation is possible.*

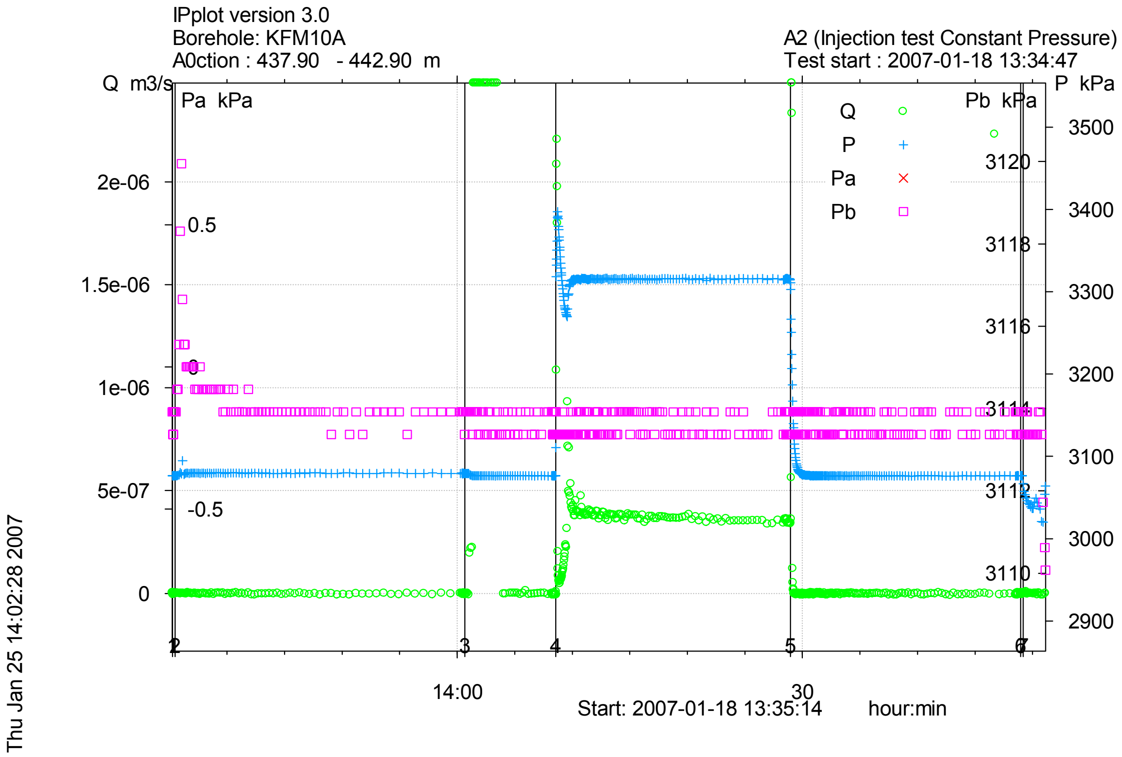


Figure A3-328. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 437.9-442.9 m in borehole KFM10A.*

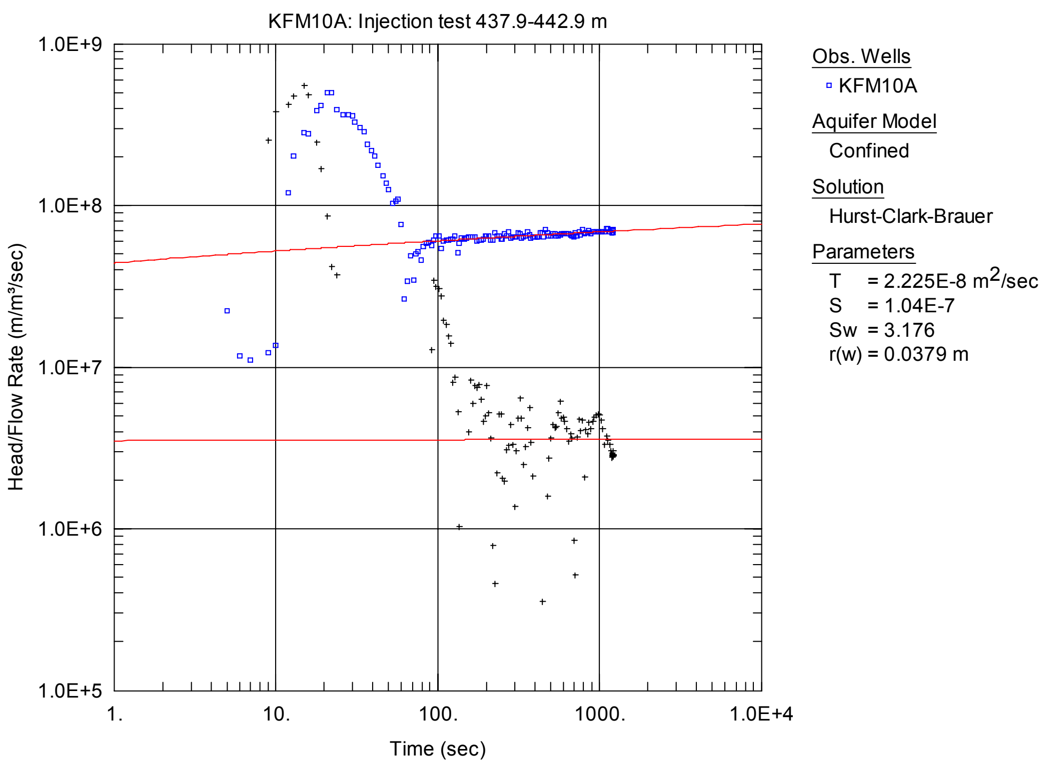


Figure A3-329. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 437.9-442.9 m in KFM10A.*

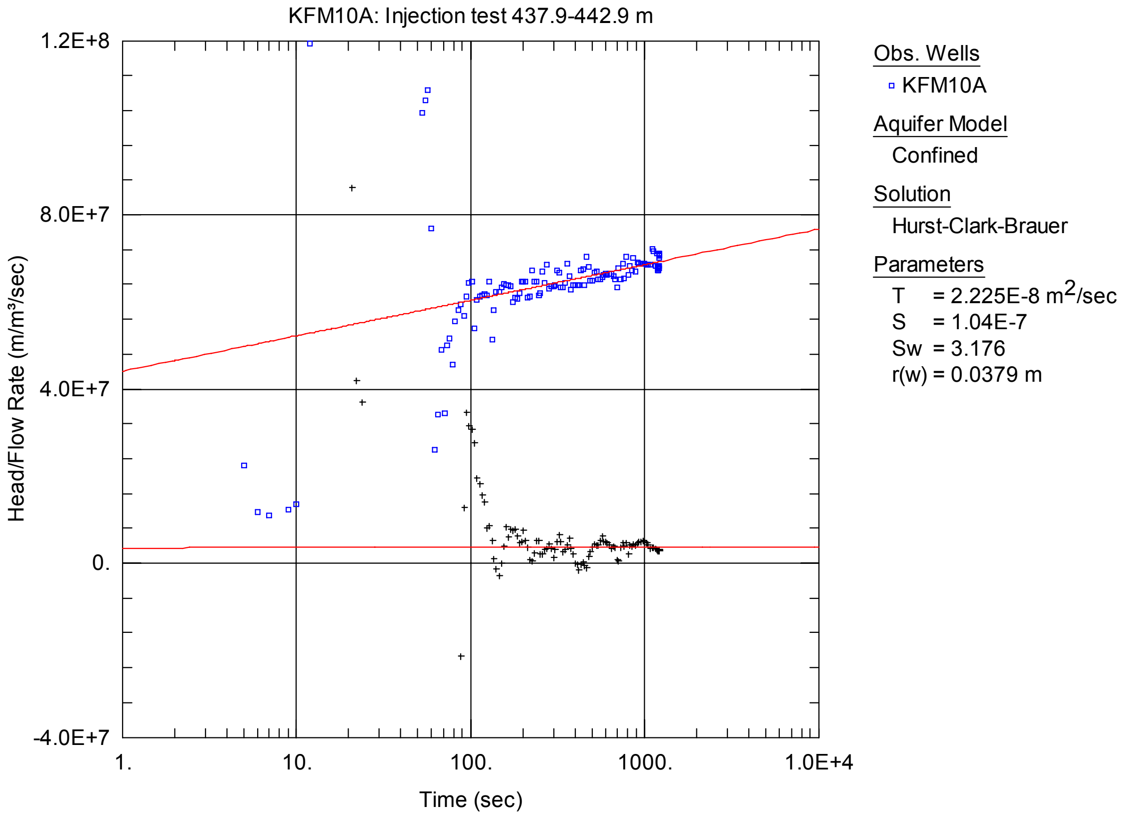


Figure A3-330. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 437.9-442.9 m in KFM10A.*

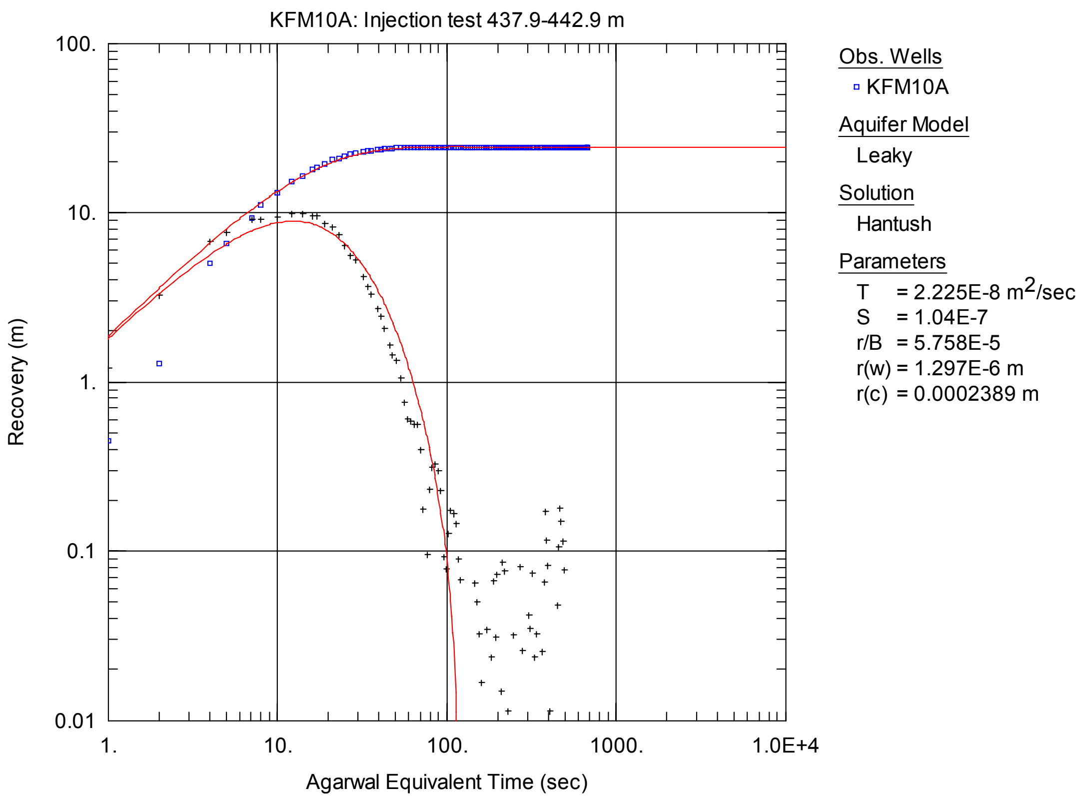


Figure A3-331. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 437.9-442.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

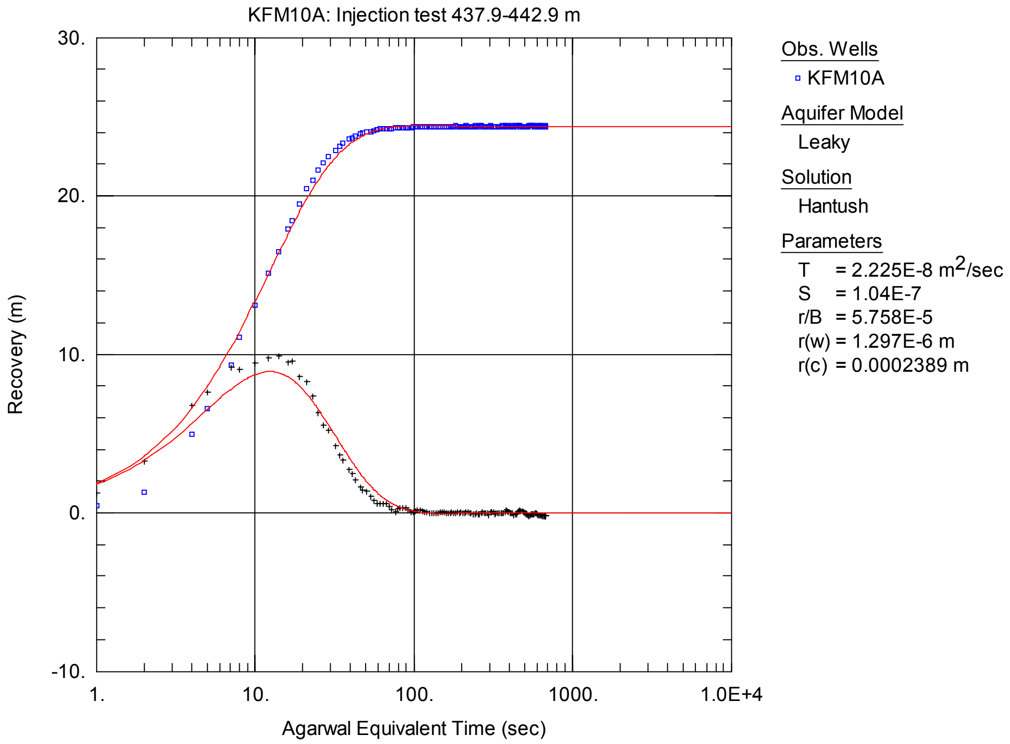


Figure A3-332. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 437.9-442.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

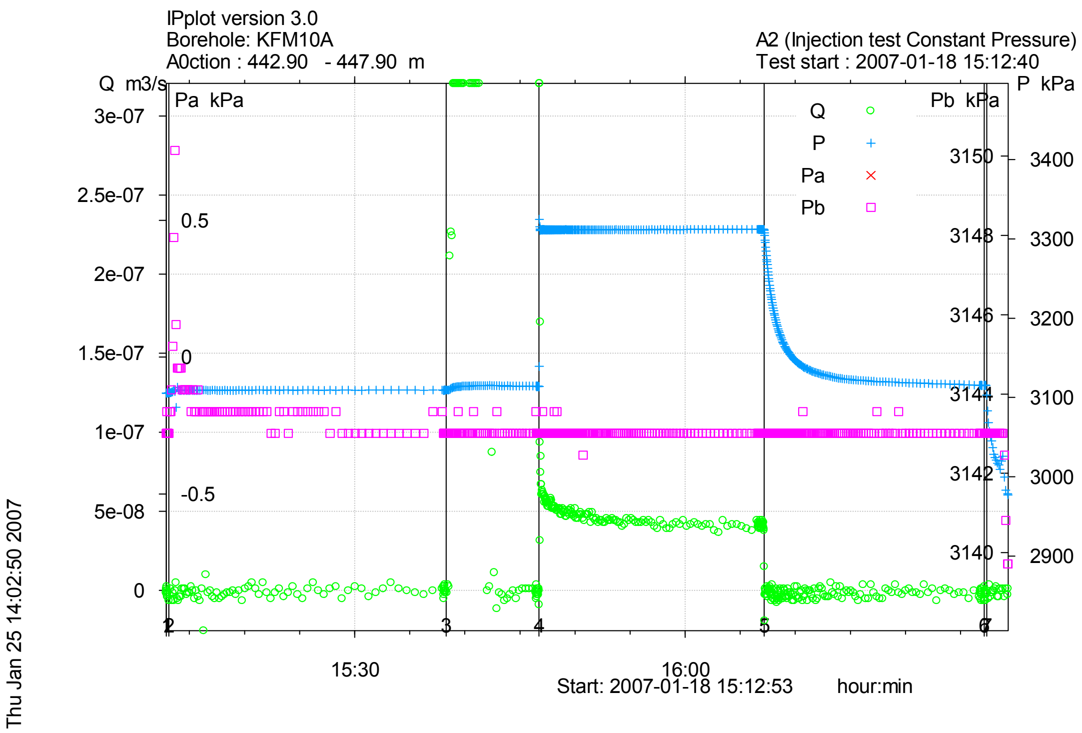


Figure A3-333. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 442.9-447.9 m in borehole KFM10A.*

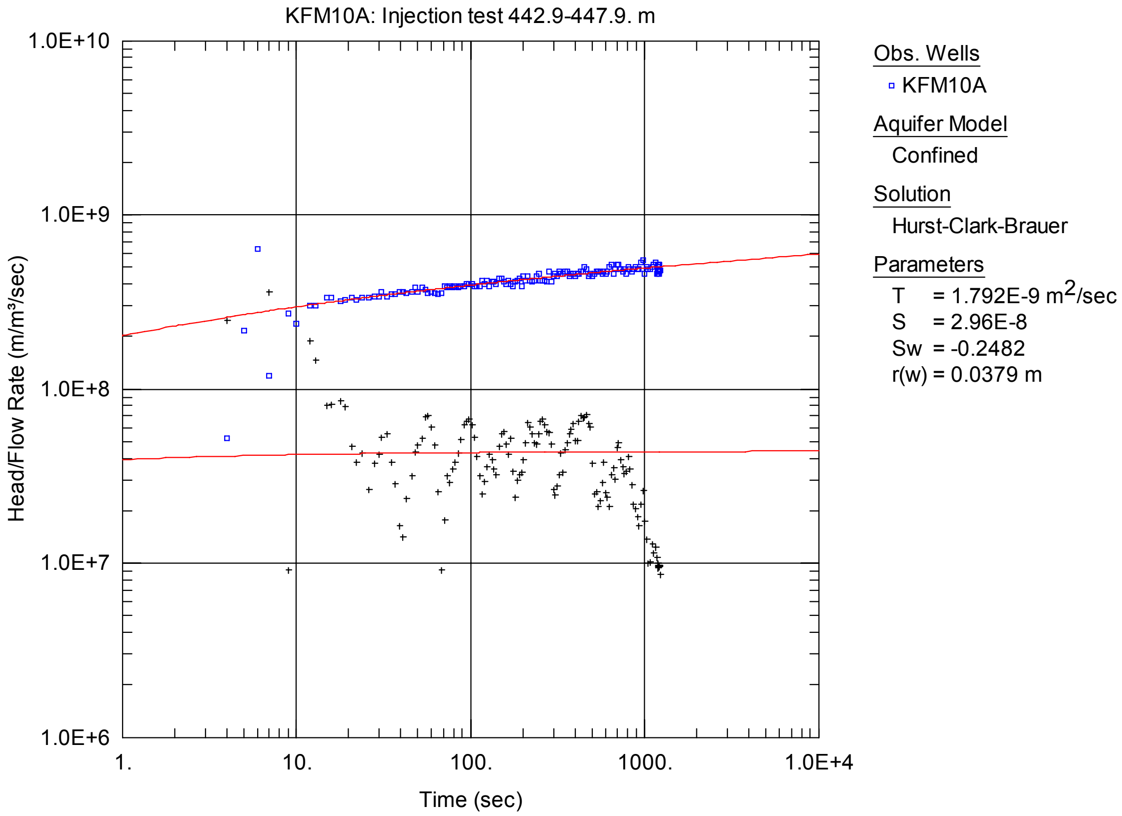


Figure A3-334. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 442.9-447.9 m in KFM10A.*

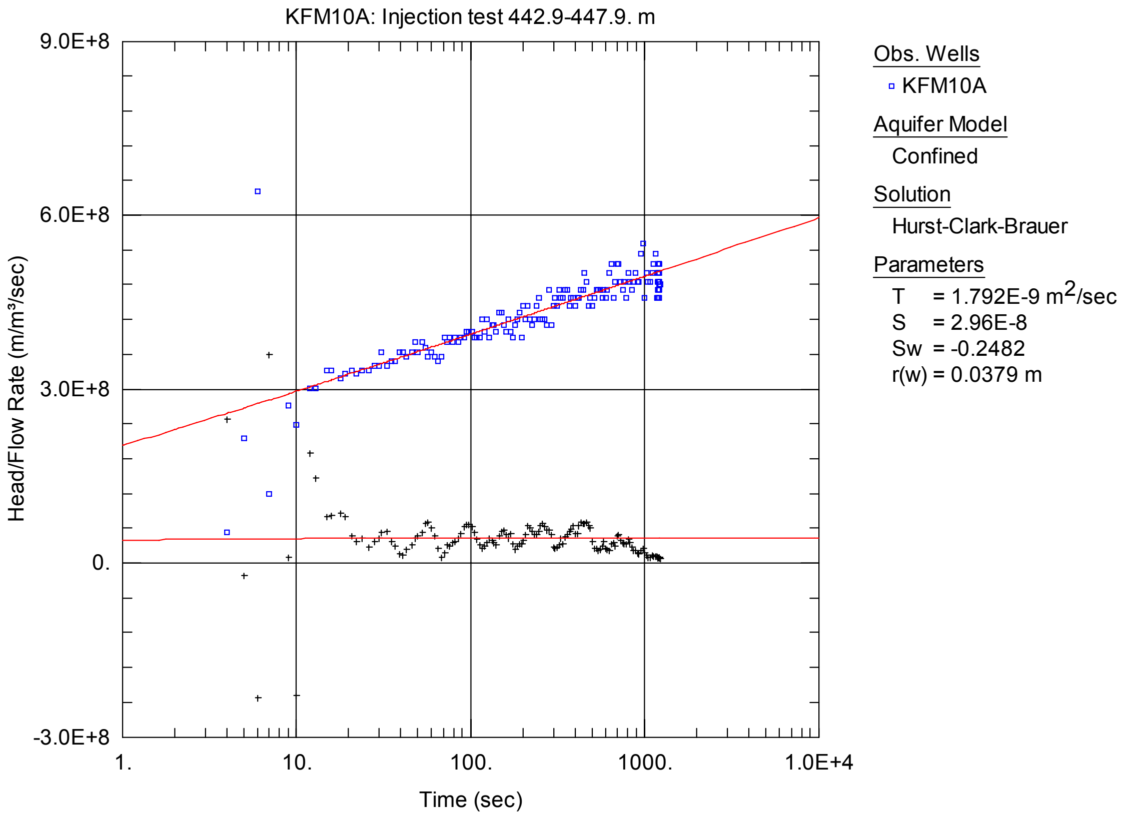


Figure A3-335. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 442.9-447.9 m in KFM10A.*

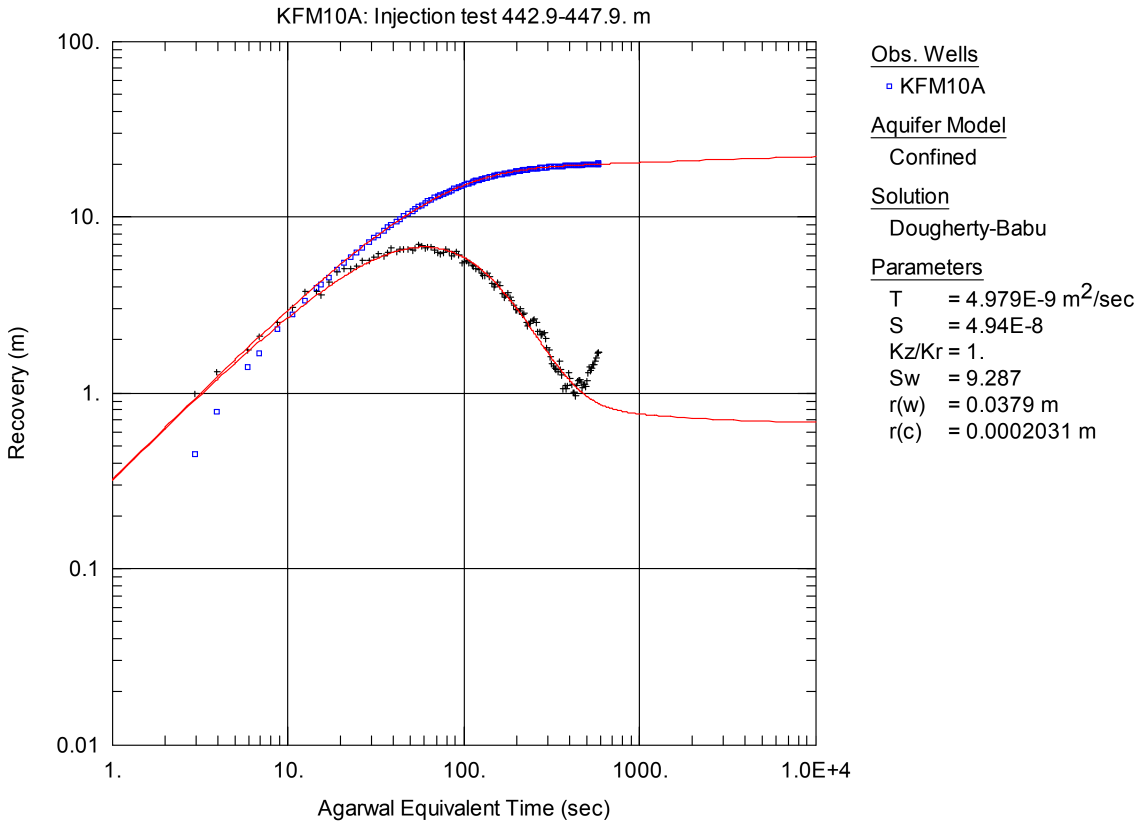


Figure A3-336. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 442.9-447.9 m in KFM10A.*

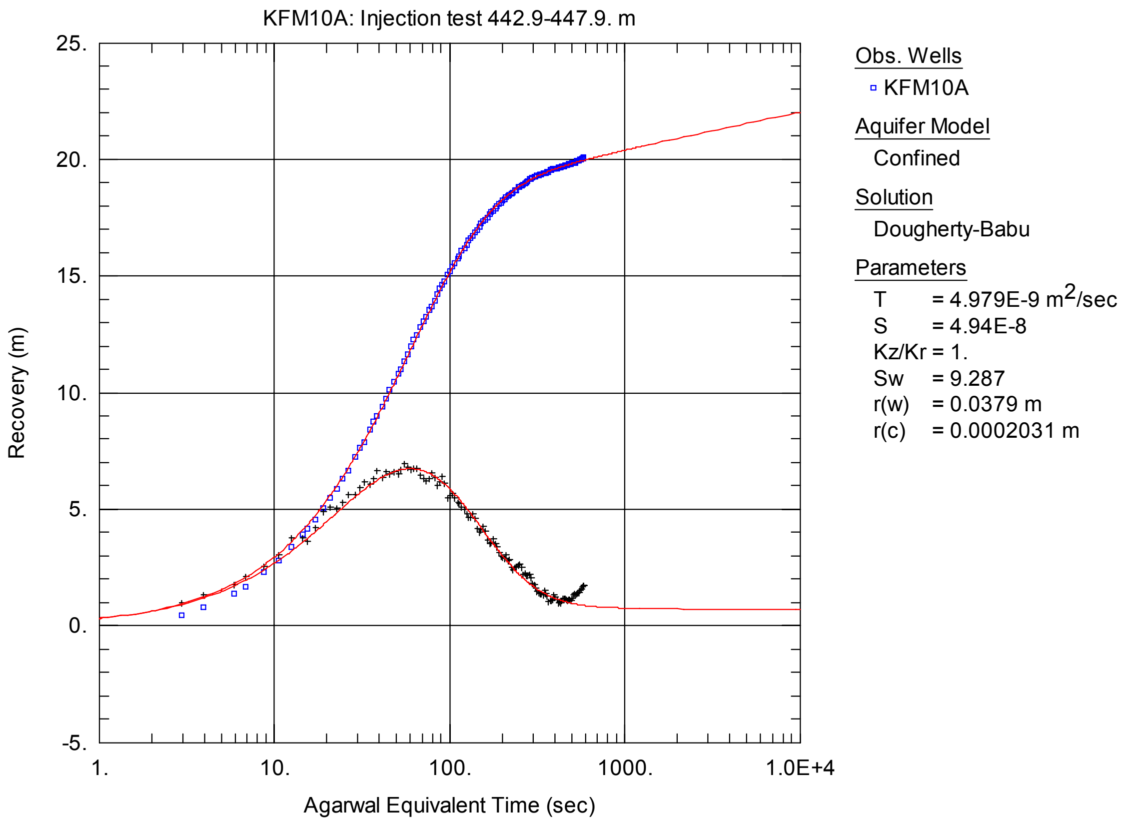


Figure A3-337. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 442.9-447.9 m in KFM10A.*

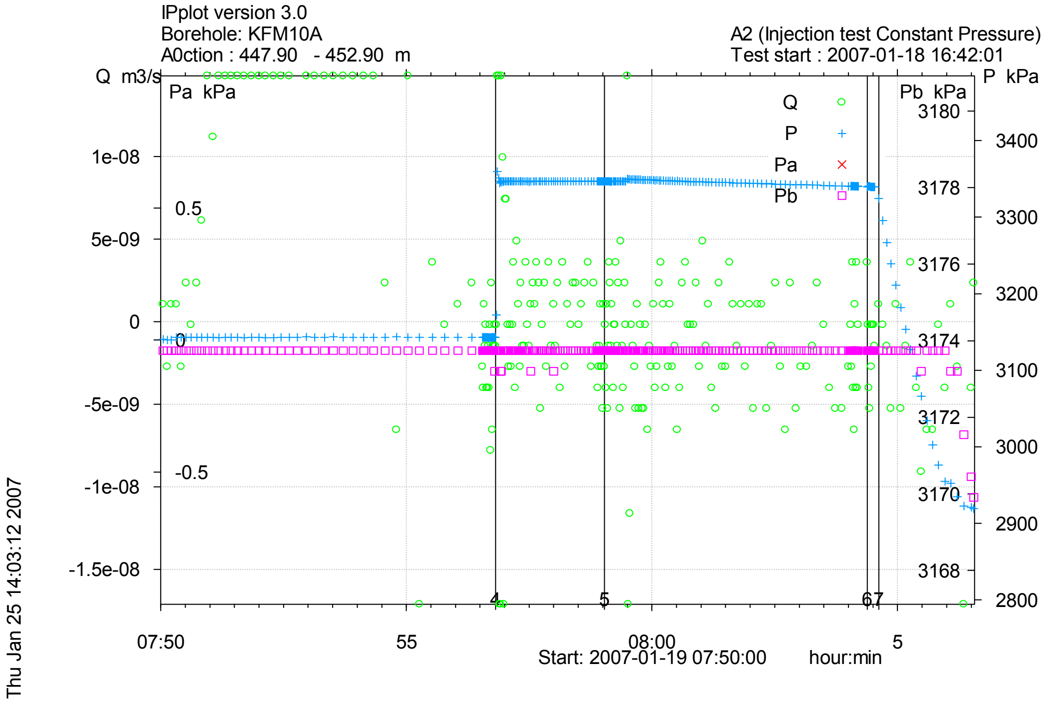


Figure A3-338. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 447.9-452.9 m in borehole KFM10A.

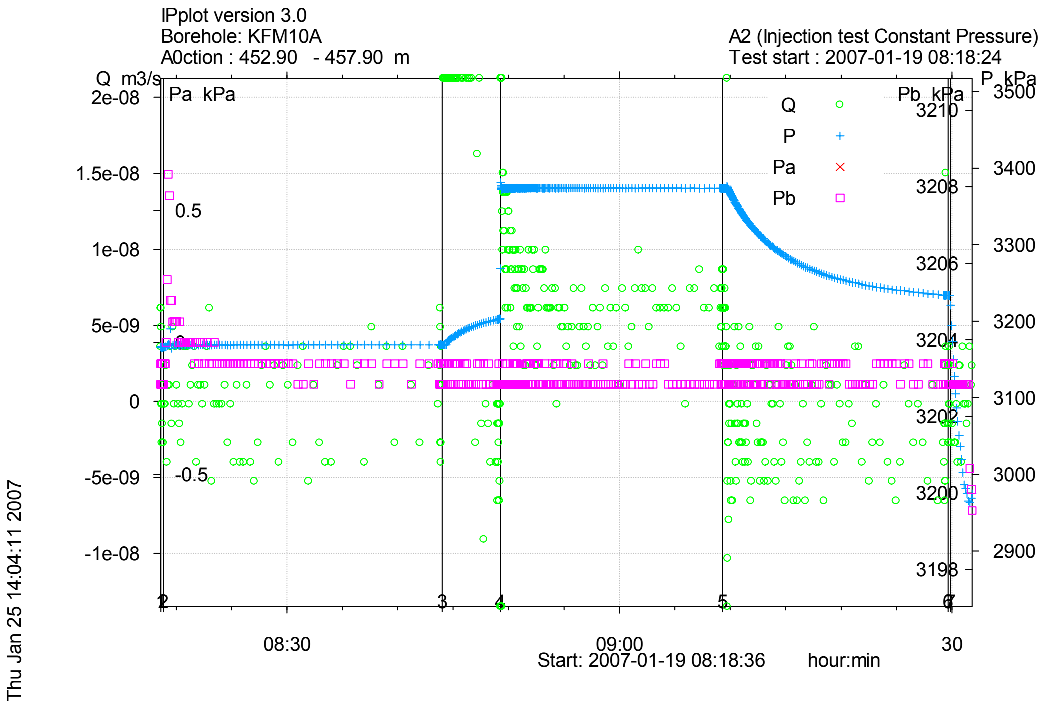


Figure A3-339. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 452.9-457.9 m in borehole KFM10A.

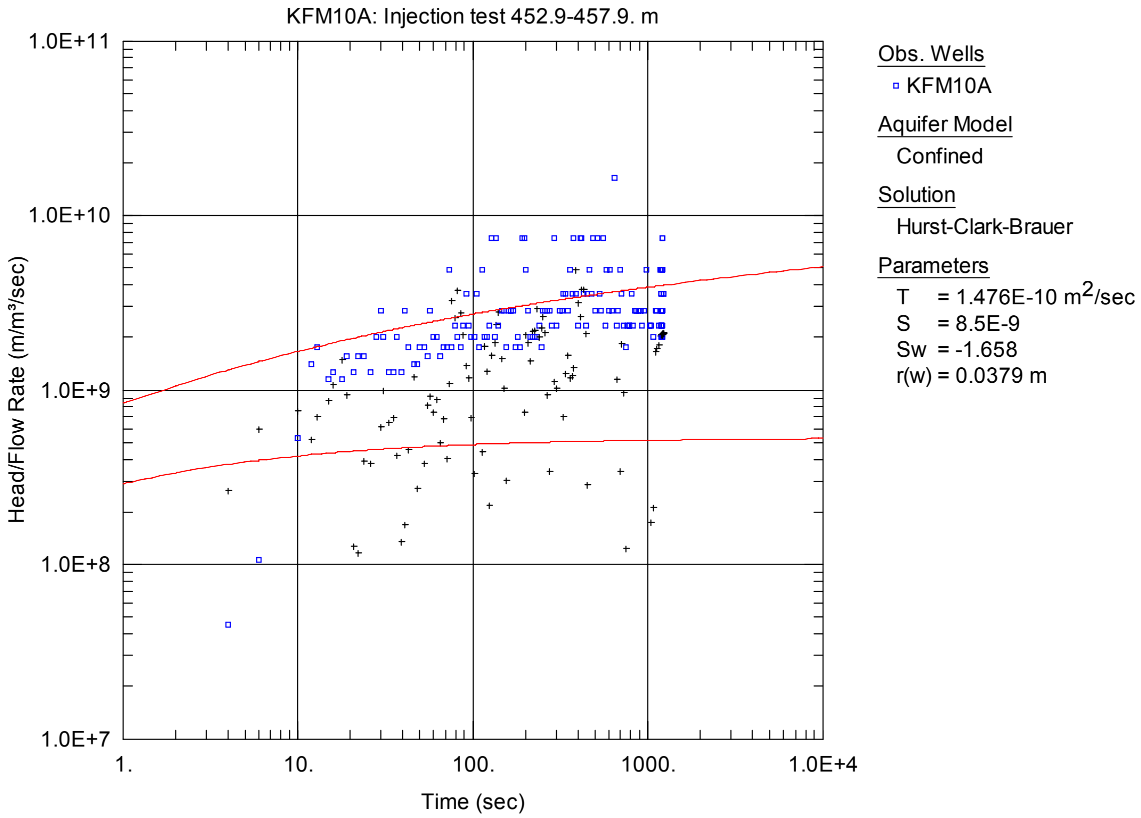


Figure A3-340. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 452.9-457.9 m in KFM10A.*

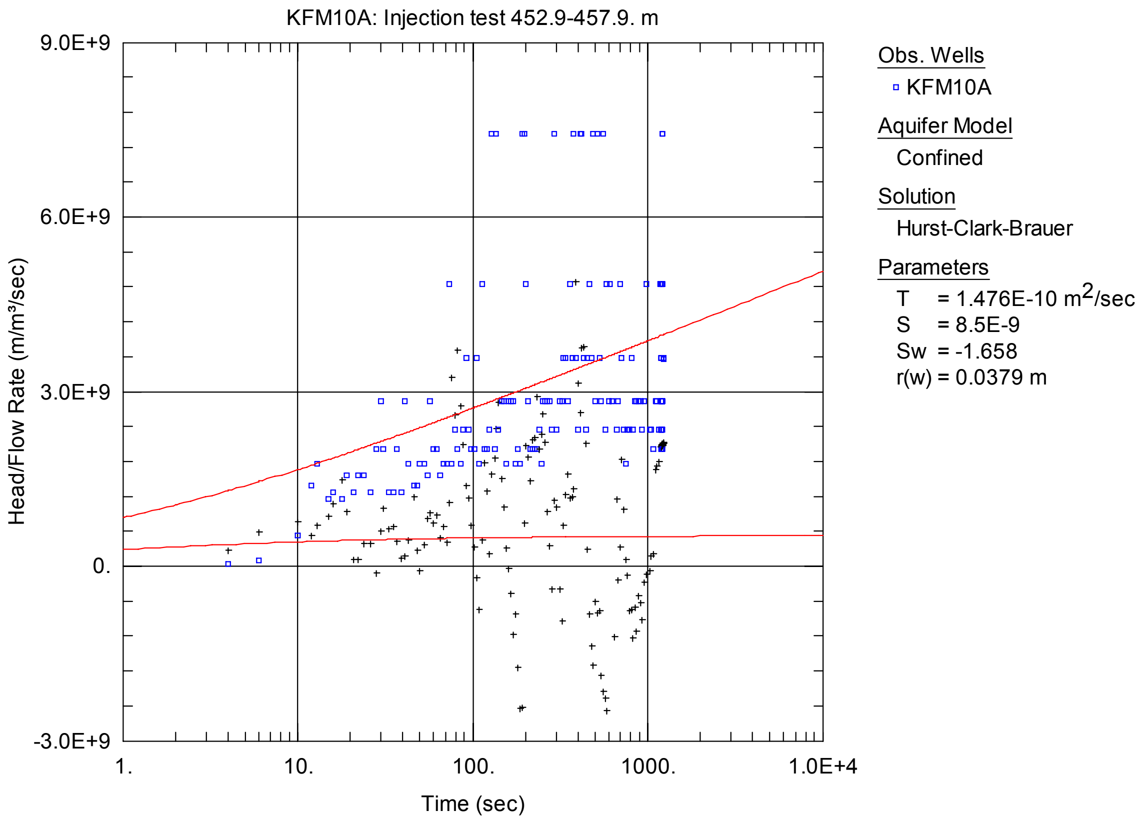


Figure A3-341. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 452.9-457.9 m in KFM10A.*

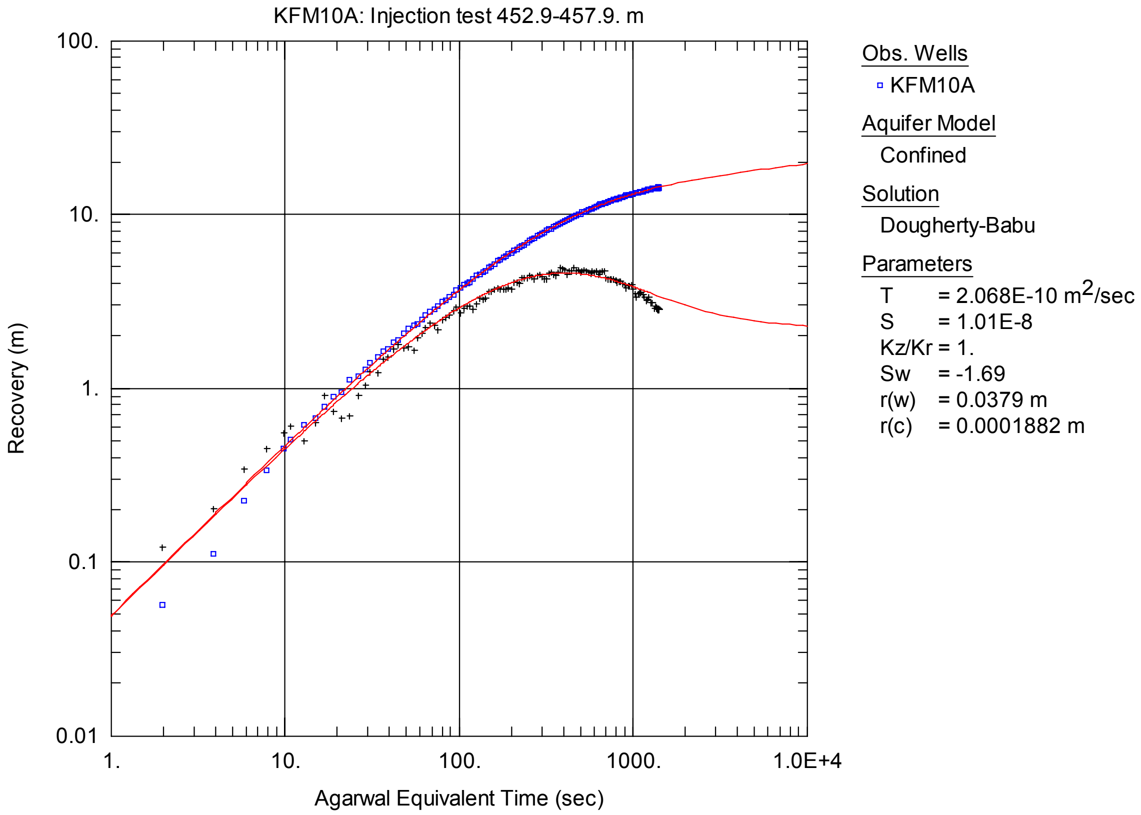


Figure A3-342. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 452.9-457.9 m in KFM10A.*

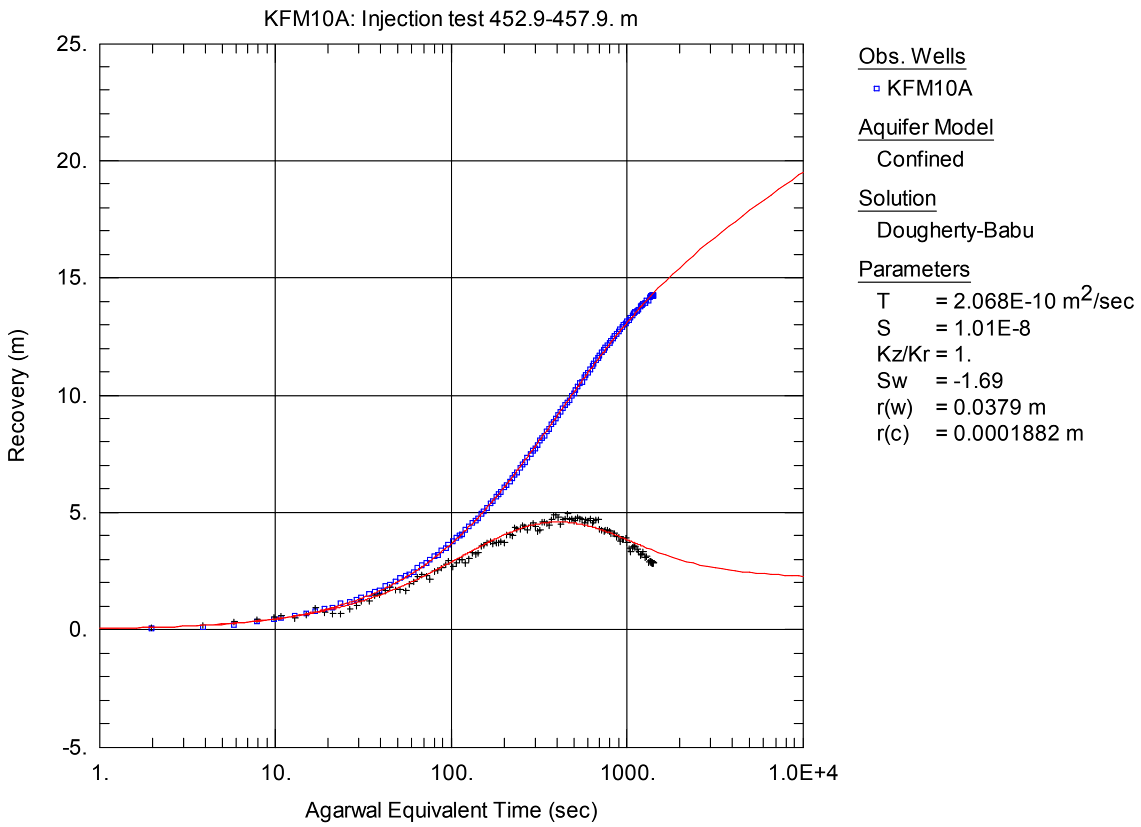


Figure A3-343. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 452.9-457.9 m in KFM10A.*

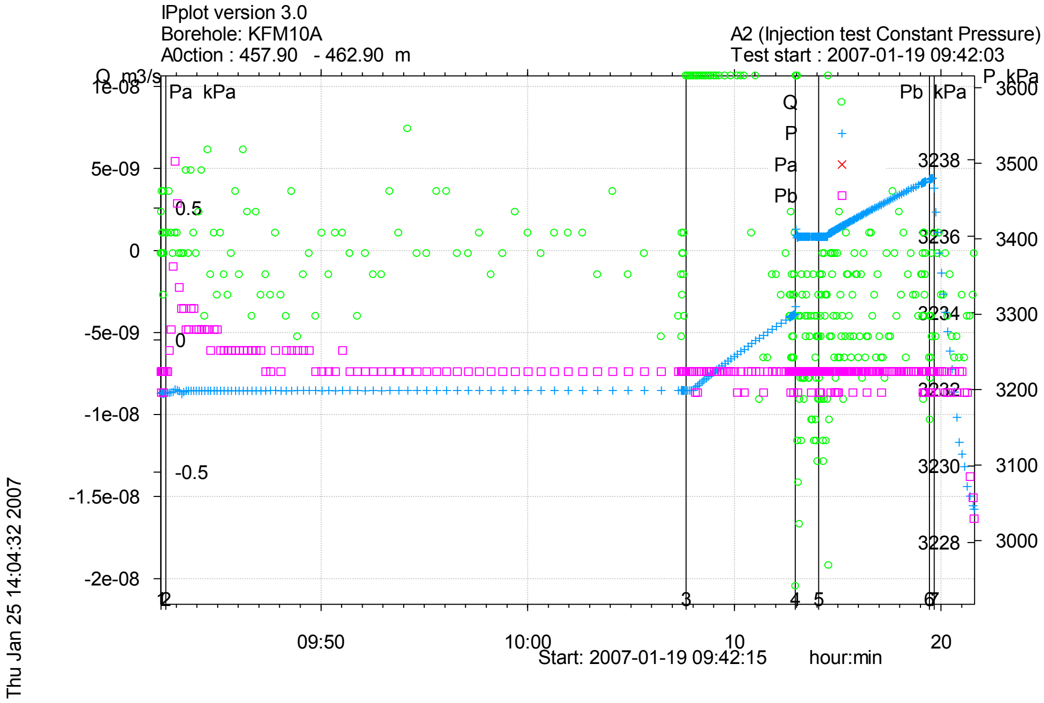


Figure A3-344. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 457.9-462.9 m in borehole KFM10A.

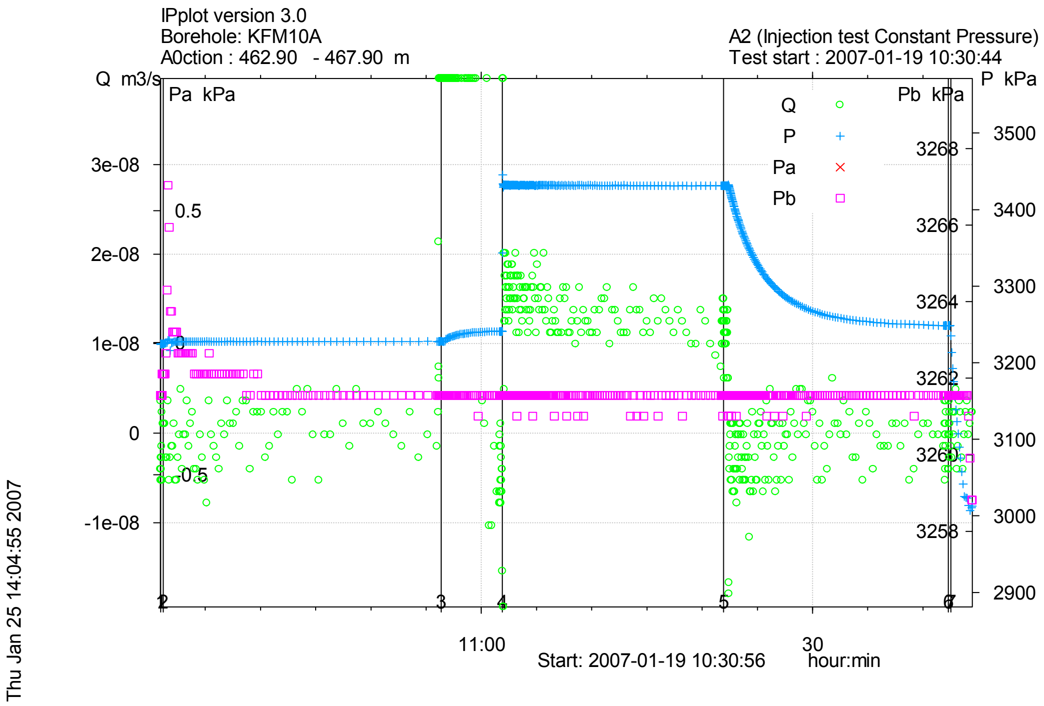


Figure A3-345. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 462.9-467.9 m in borehole KFM10A.

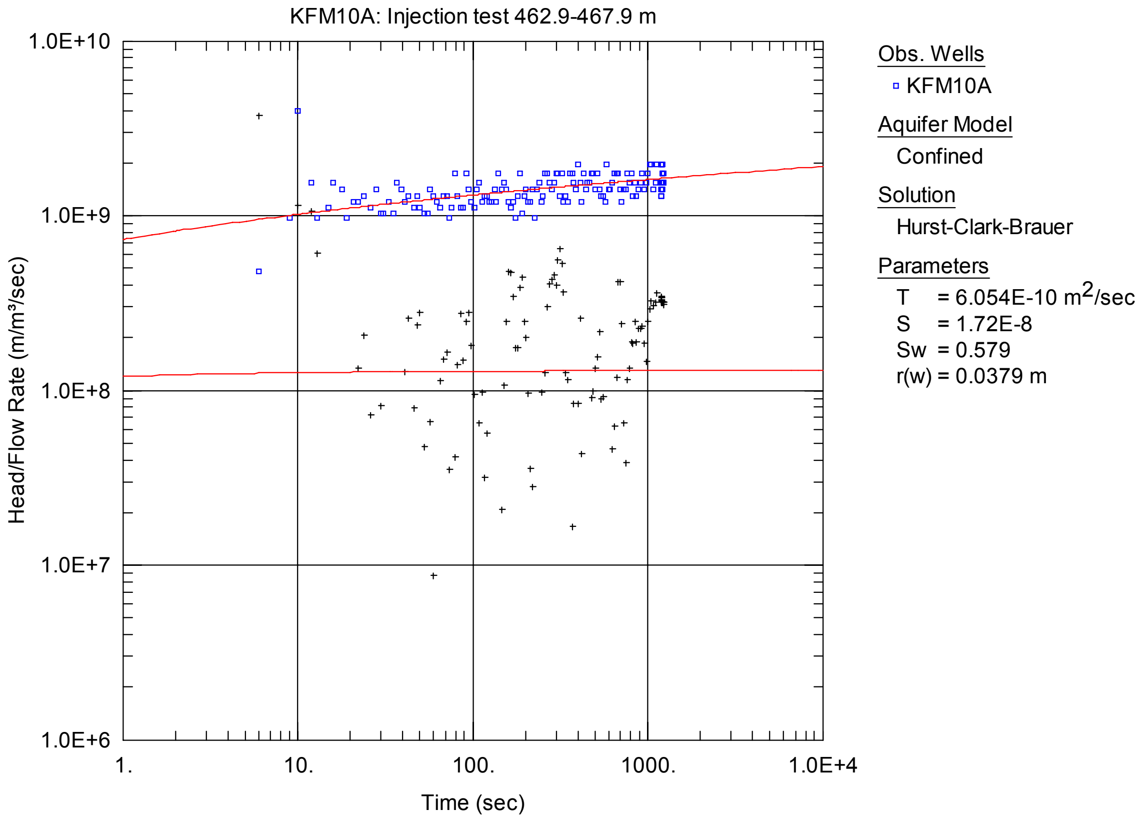


Figure A3-346. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 462.9-467.9 m in KFM10A.*

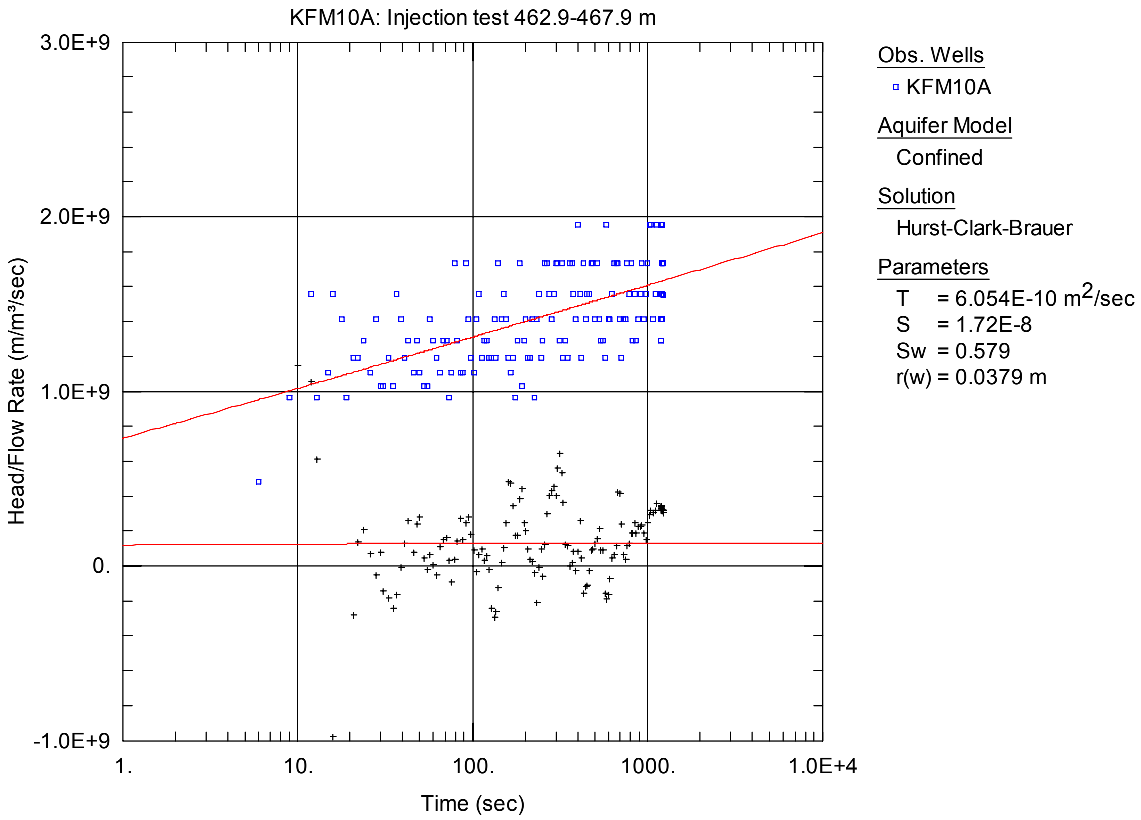


Figure A3-347. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 462.9-467.9 m in KFM10A.*

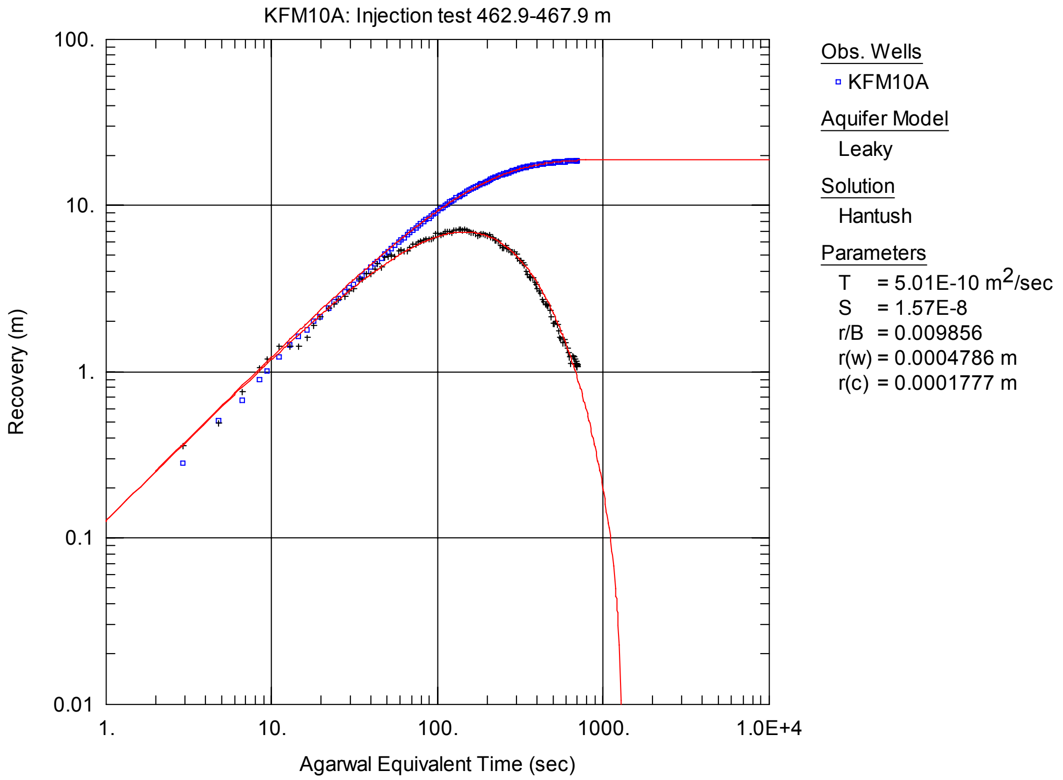


Figure A3-348. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 462.9-467.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

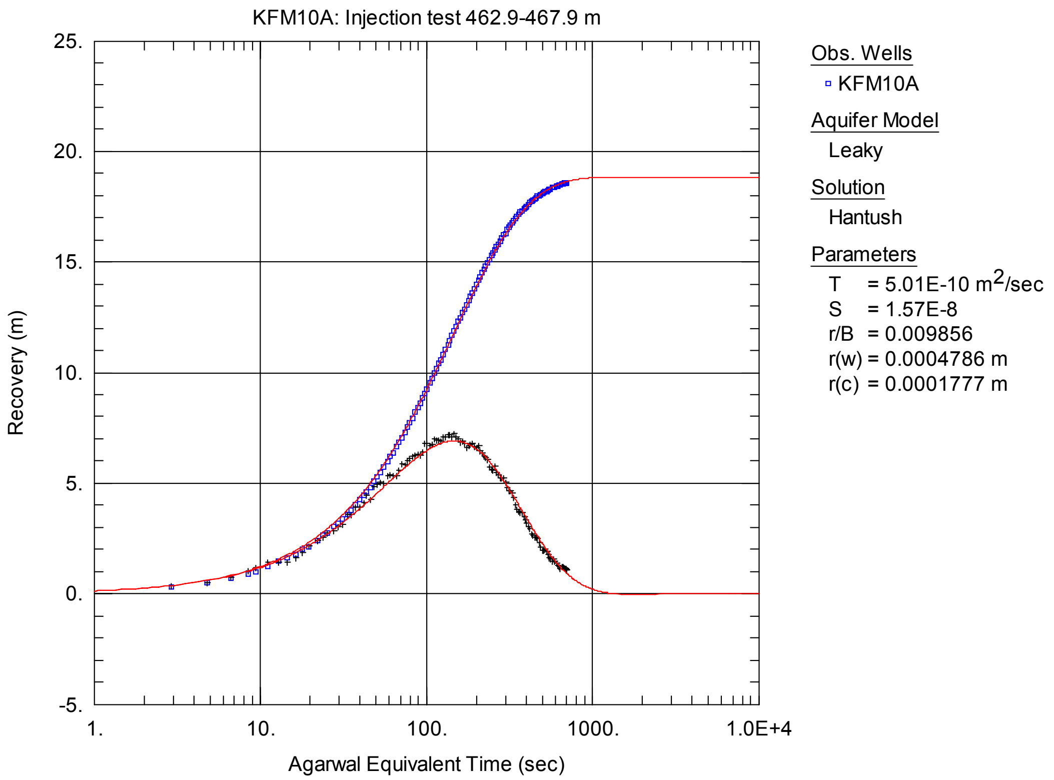


Figure A3-349. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 462.9-467.9 m in KFM10A. The type curve fit is showing a possible, however not unambiguous, evaluation.*

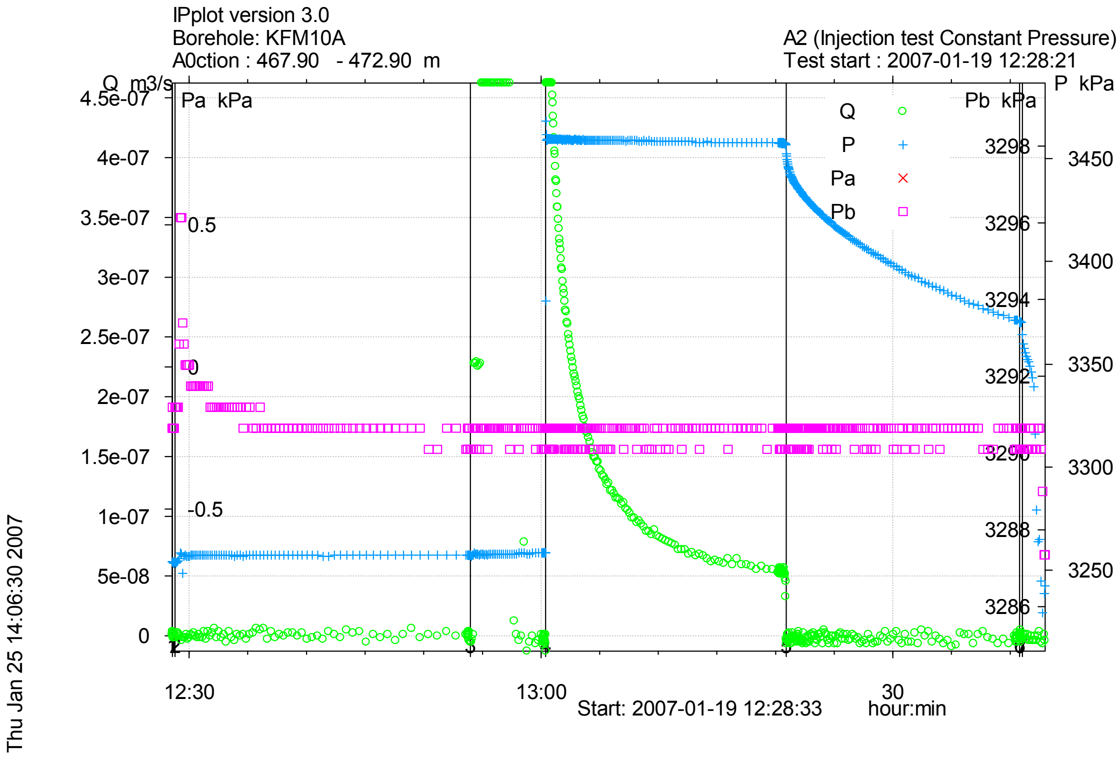


***Figure A3-350.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 467.9-472.9 m in borehole KFM10A.*

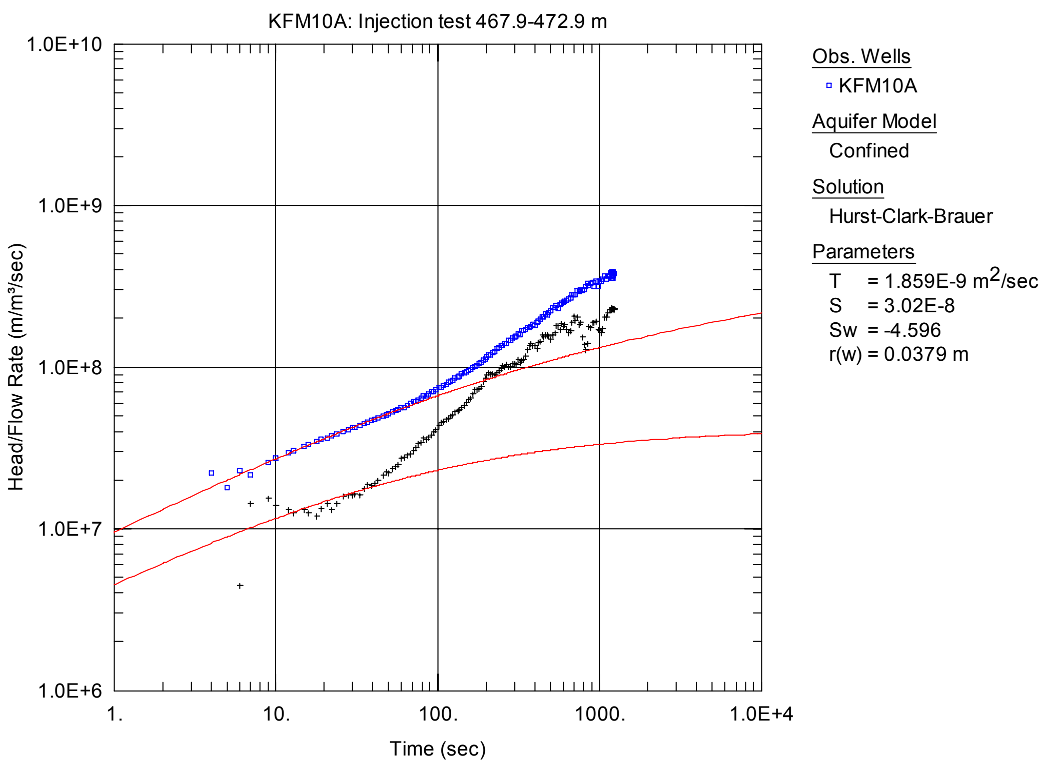


***Figure A3-351.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 467.9-472.9 m in KFM10A.*

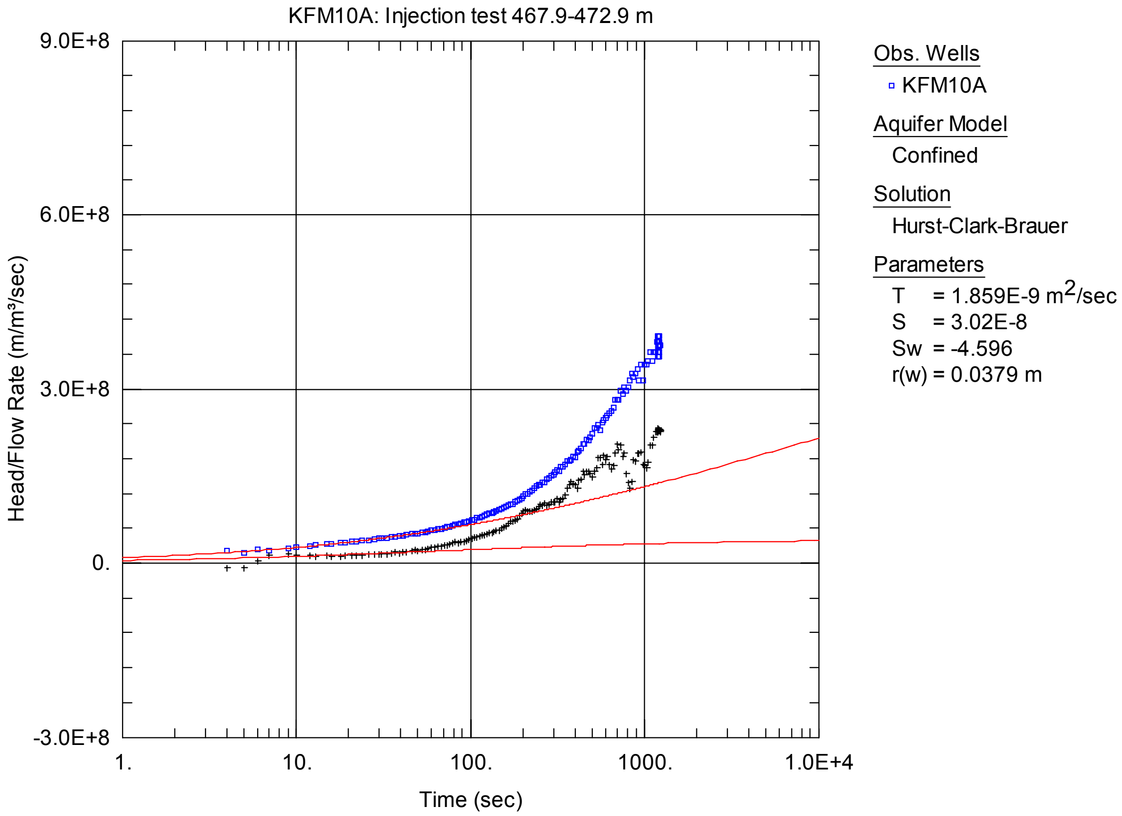


Figure A3-352. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 467.9-472.9 m in KFM10A.*

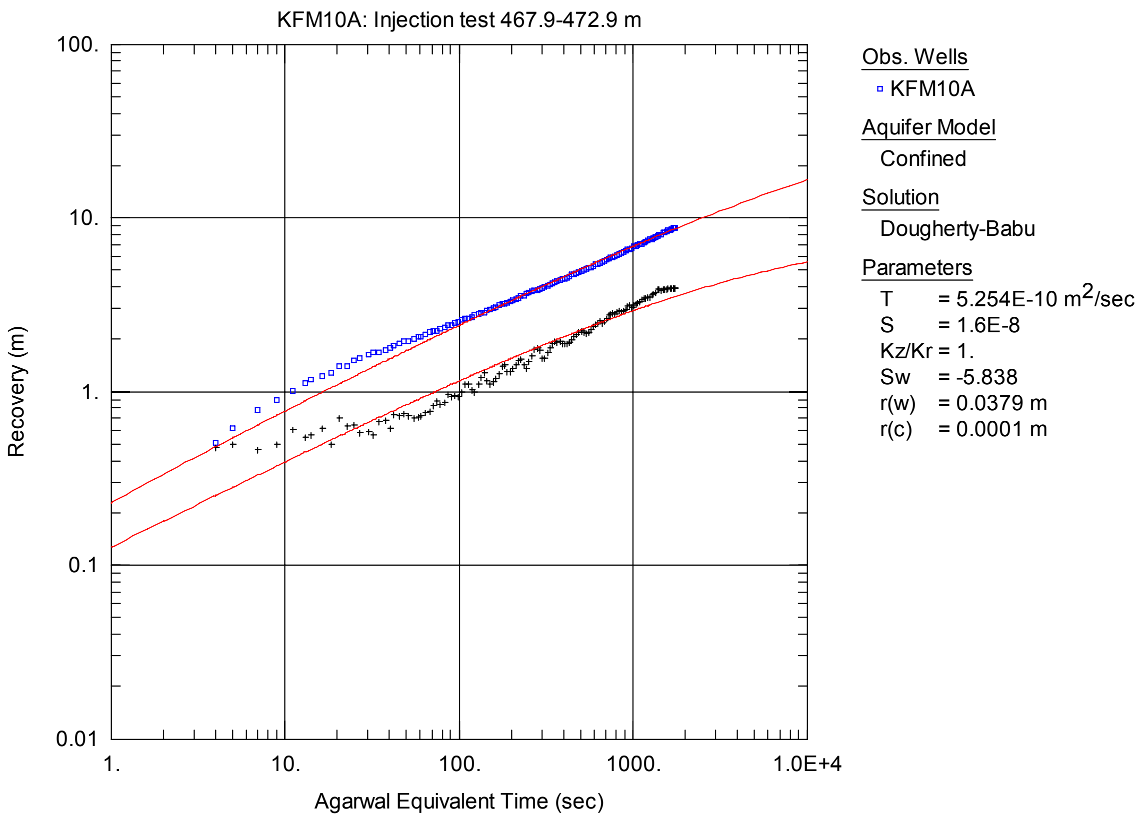


Figure A3-353. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 467.9-472.9 m in KFM10A.*

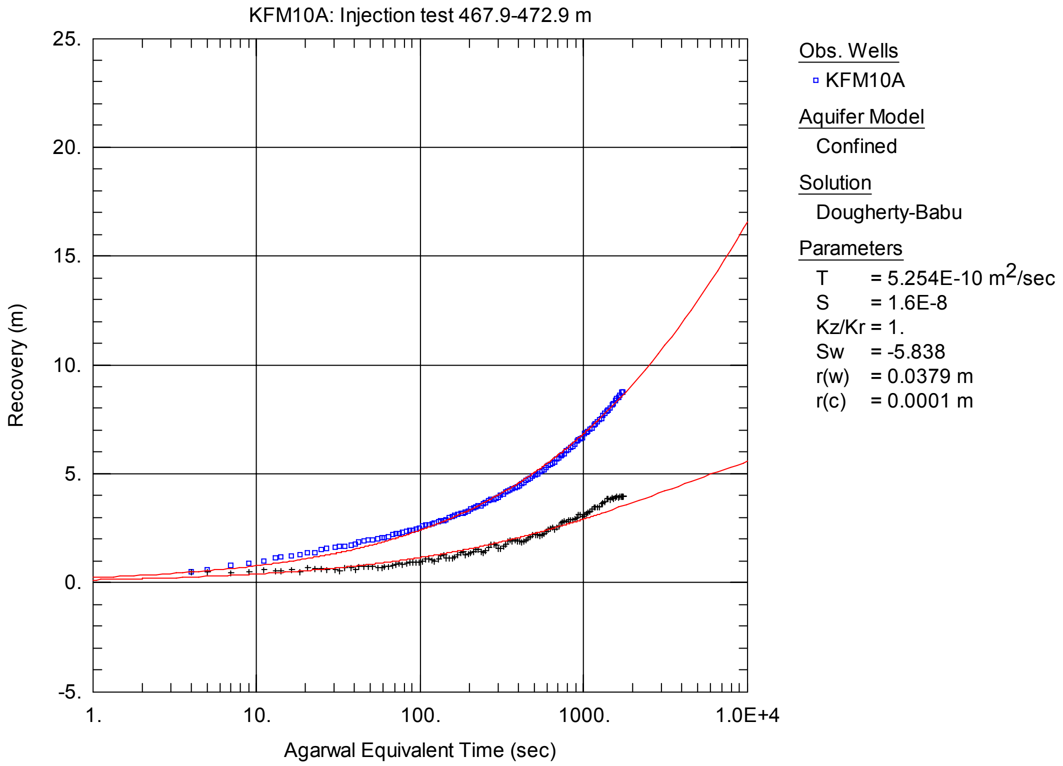


Figure A3-354. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 467.9-472.9 m in KFM10A.*

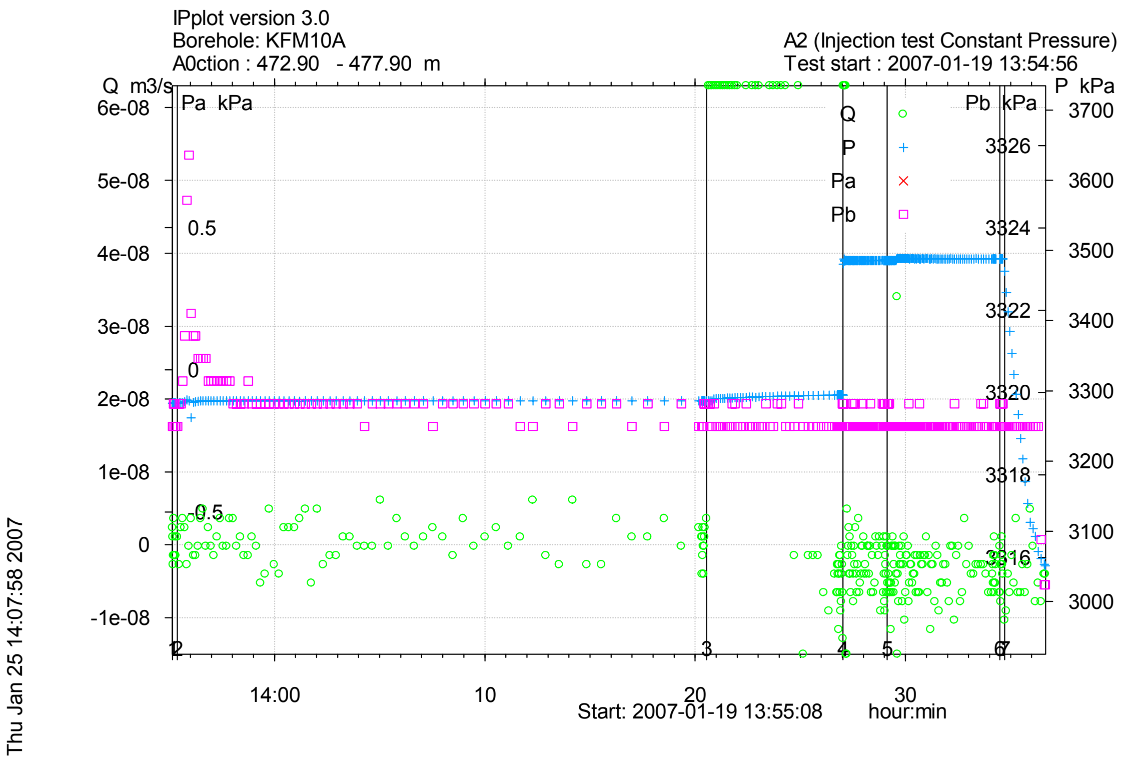


Figure A3-355. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 472.9-477.9 m in borehole KFM10A.*

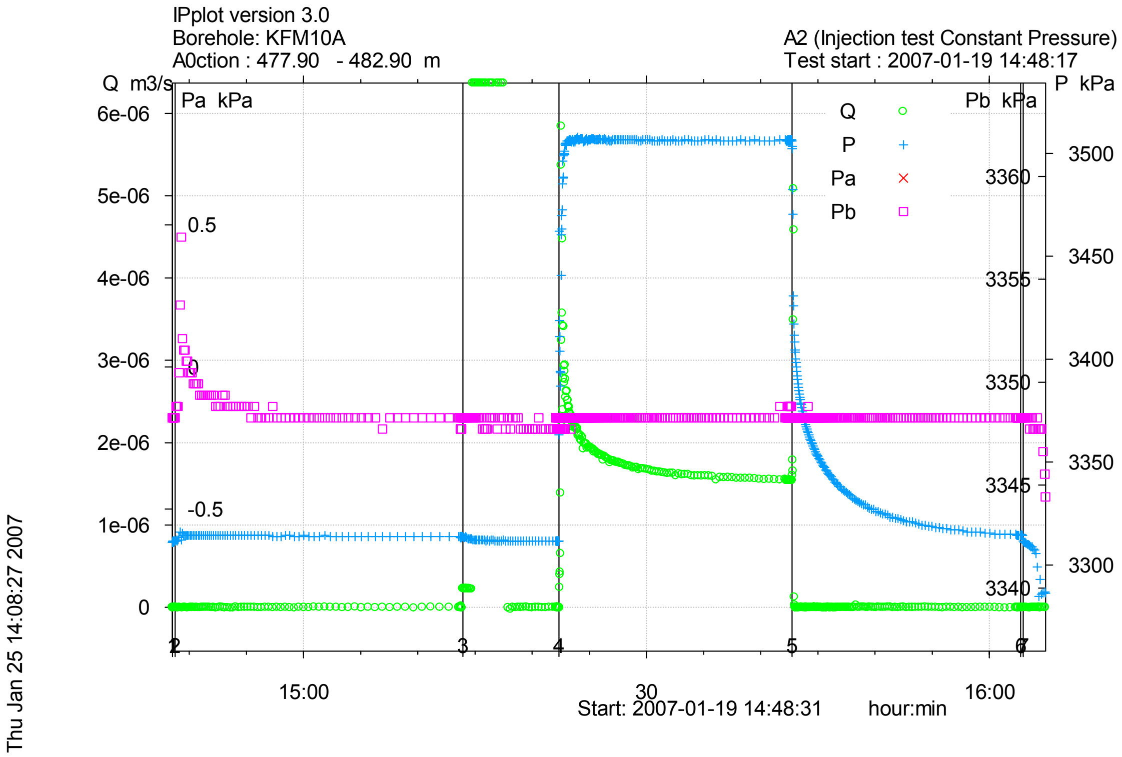


Figure A3-356. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 477.9-482.9 m in borehole KFM10A.

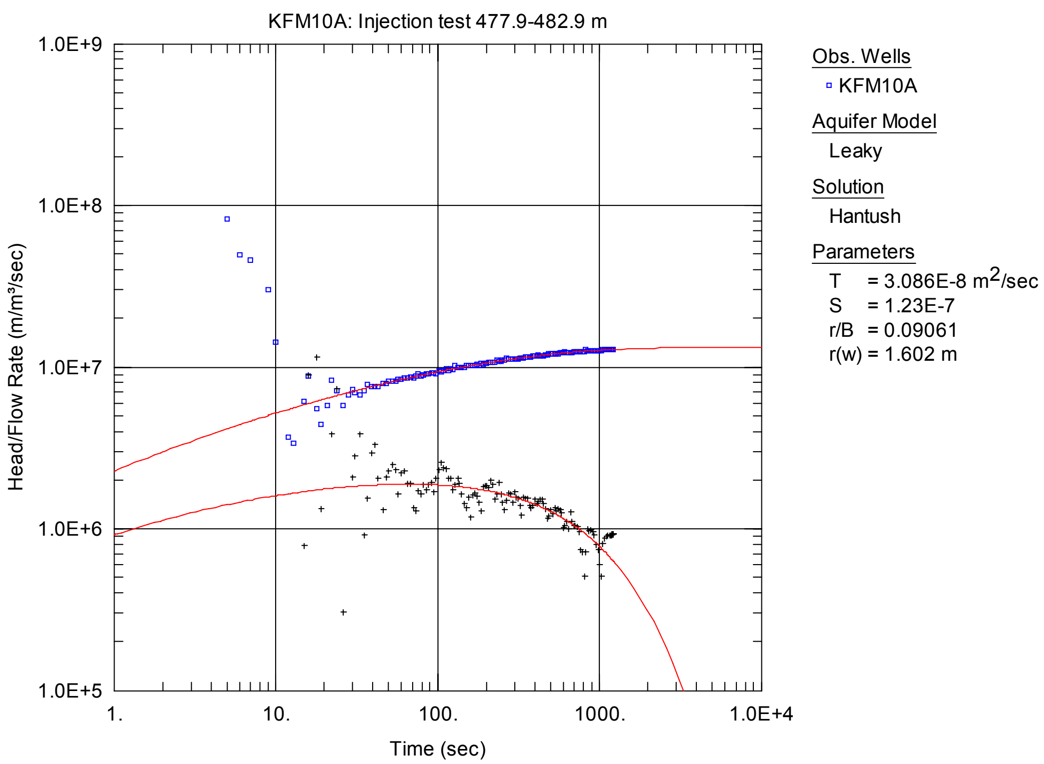


Figure A3-357. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 477.9-482.9 m in KFM10A.

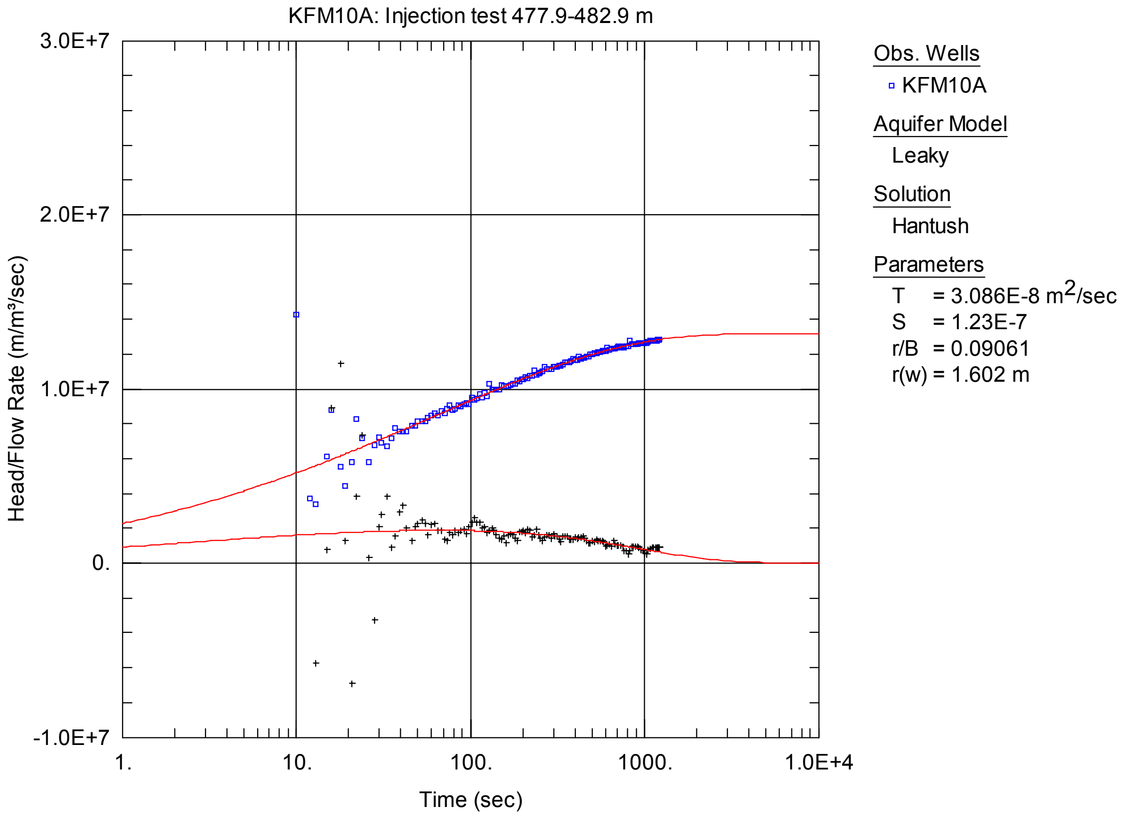


***Figure A3-358.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 477.9-482.9 m in KFM10A.*

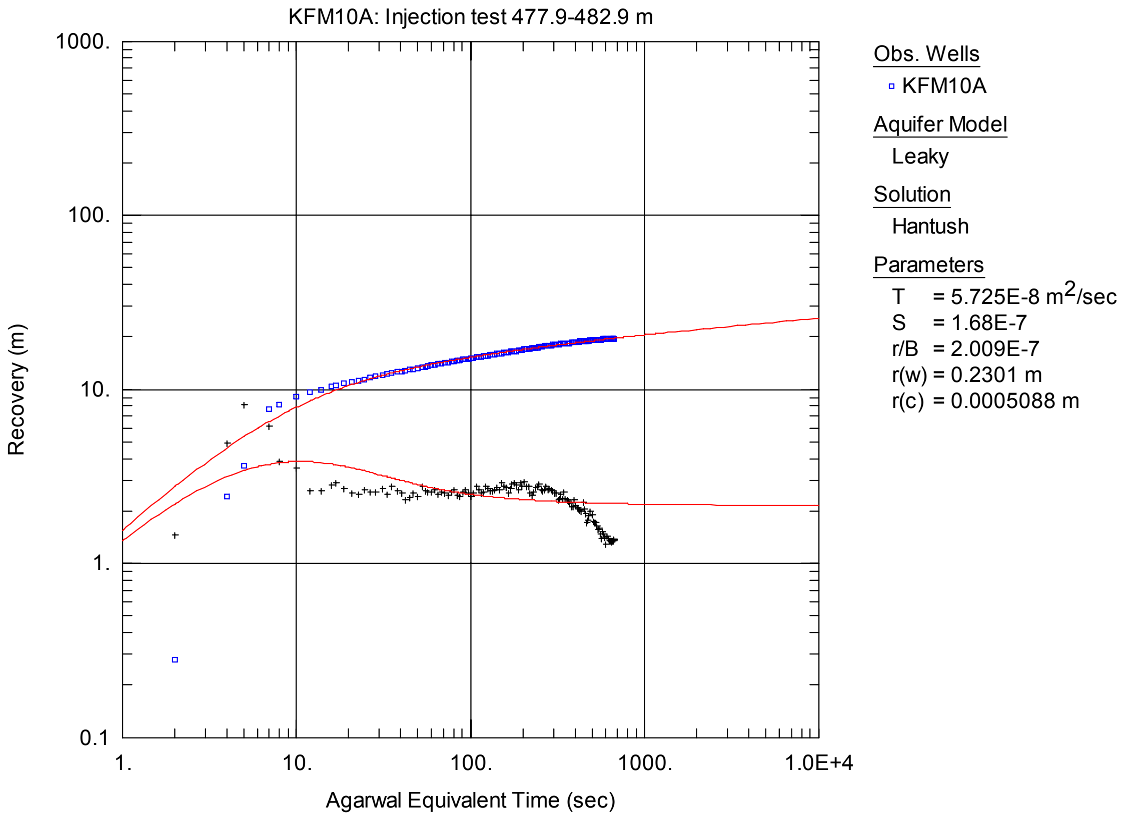


***Figure A3-359.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 477.9-482.9 m in KFM10A.*

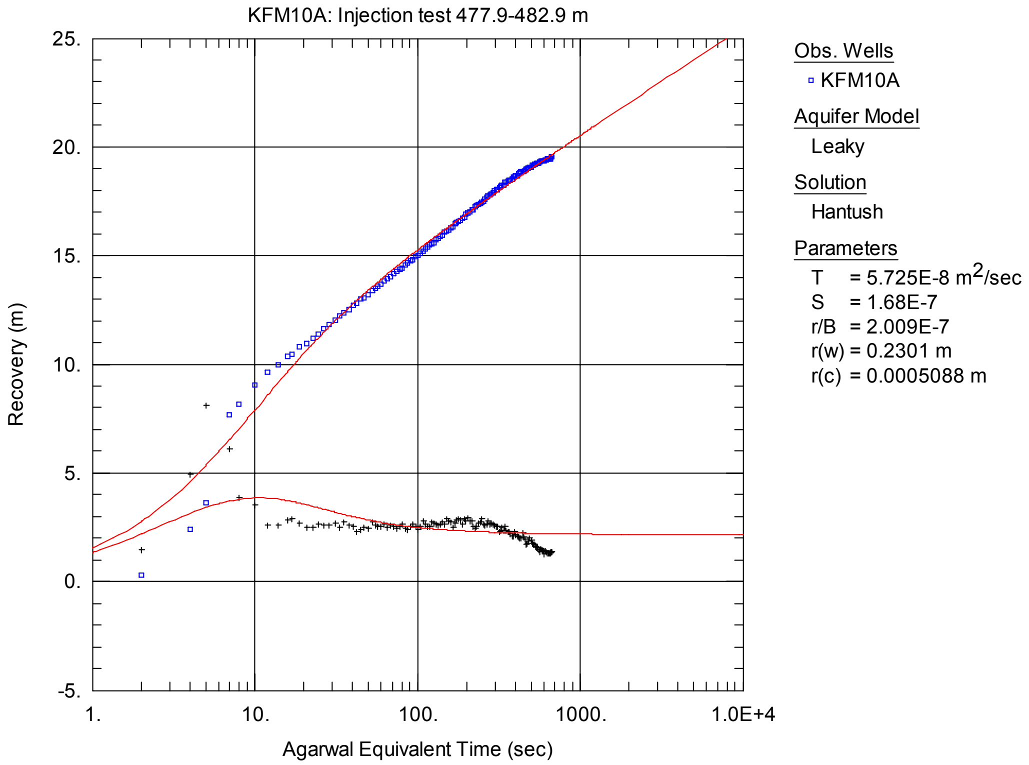


Figure A3-360. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 477.9-482.9 m in KFM10A.*

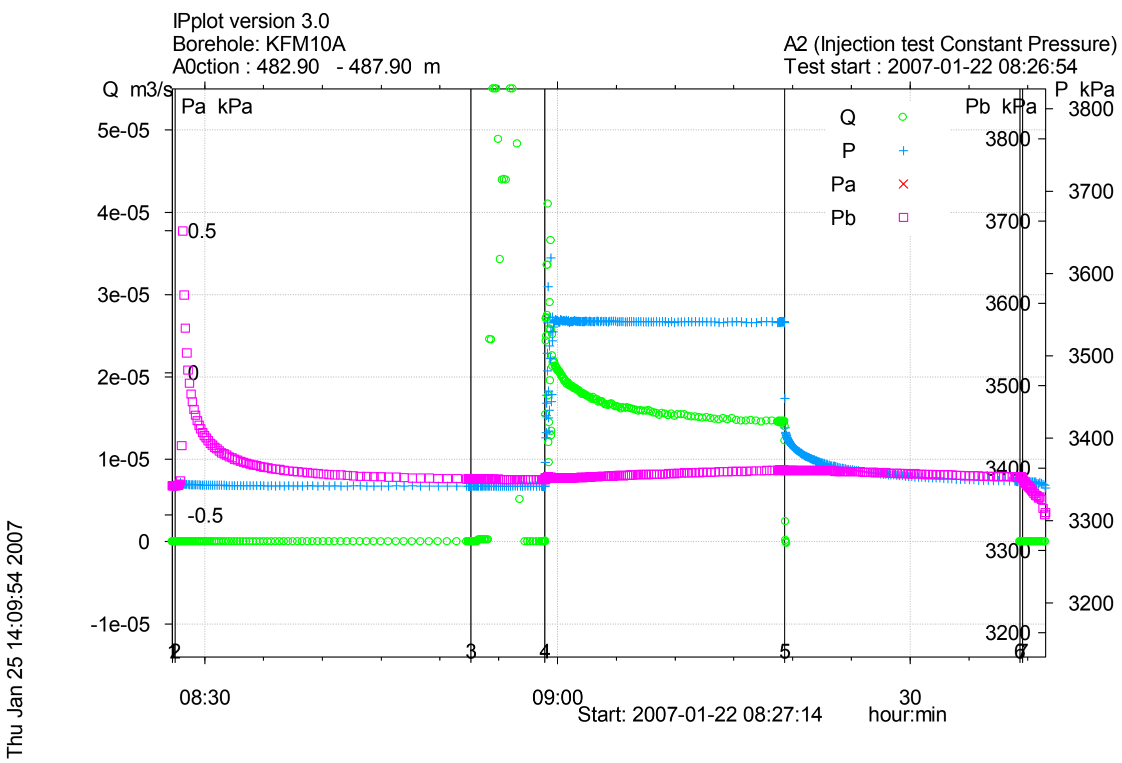


Figure A3-361. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 482.9-487.9 m in borehole KFM10A.*

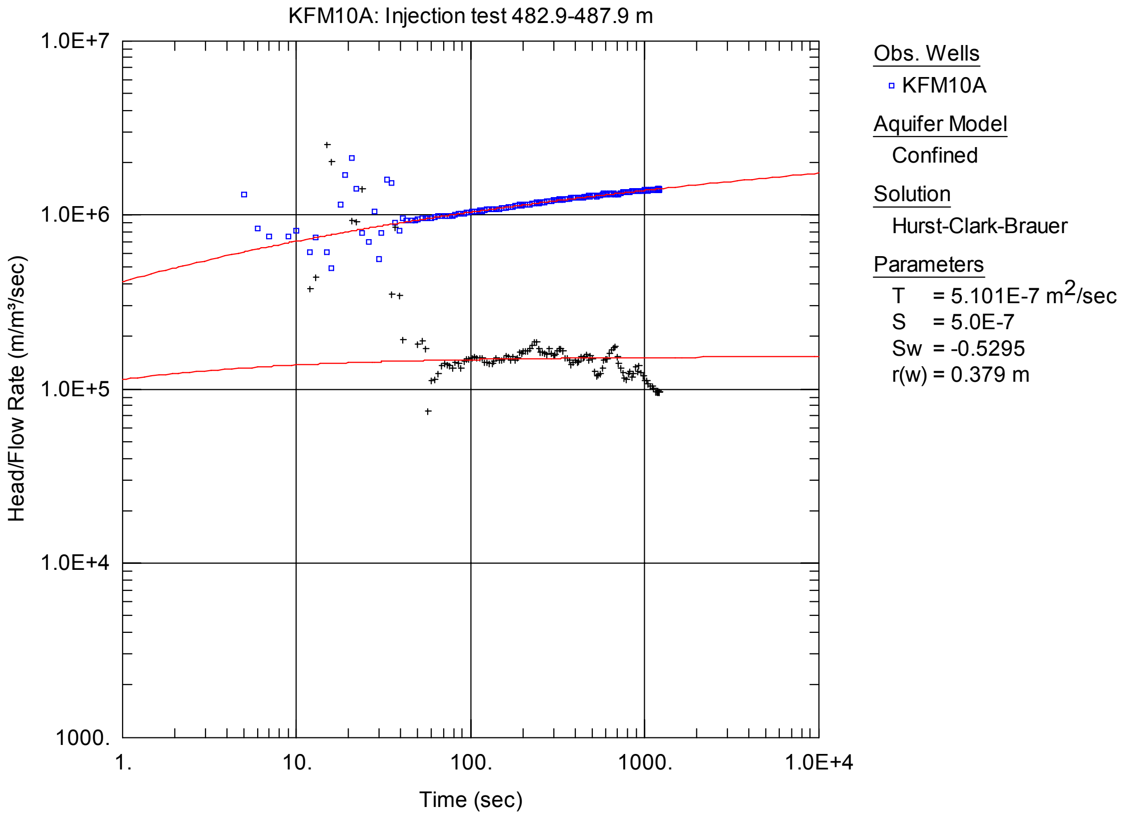


Figure A3-362. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 482.9-487.9 m in KFM10A.*

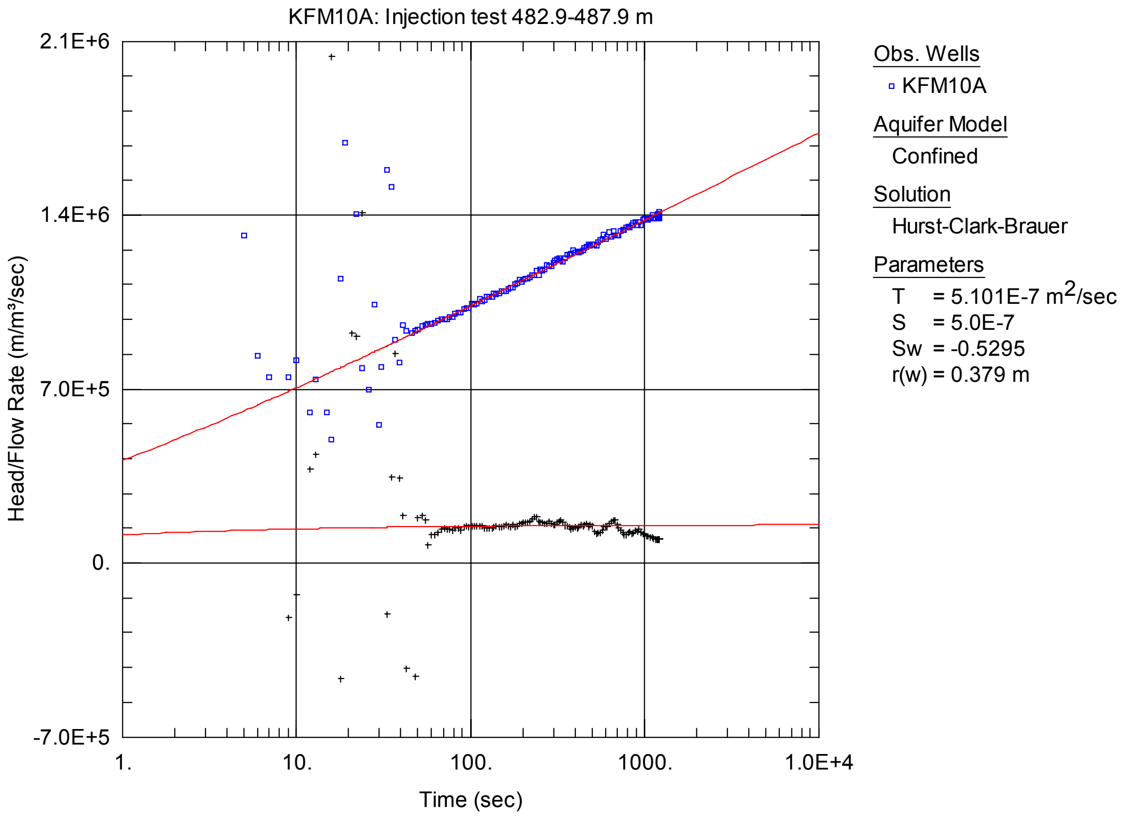


Figure A3-363. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 482.9-487.9 m in KFM10A.*

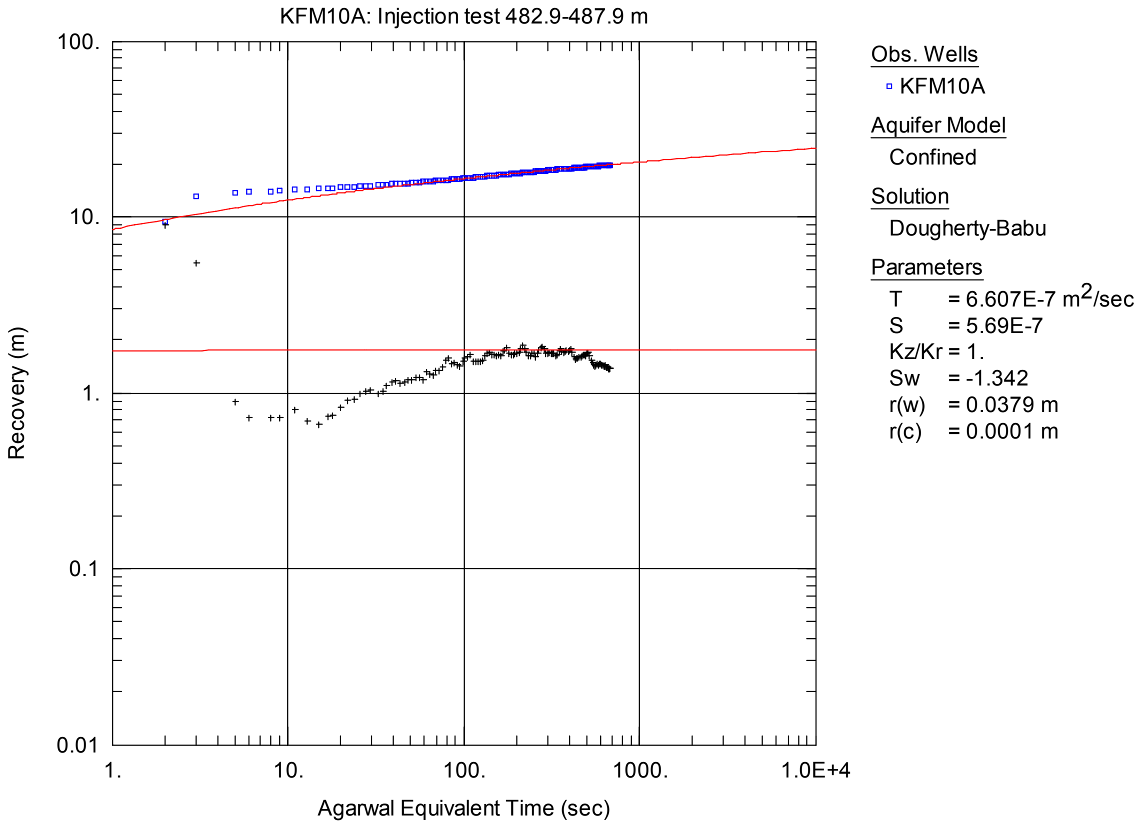


Figure A3-364. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 482.9-487.9 m in KFM10A.*

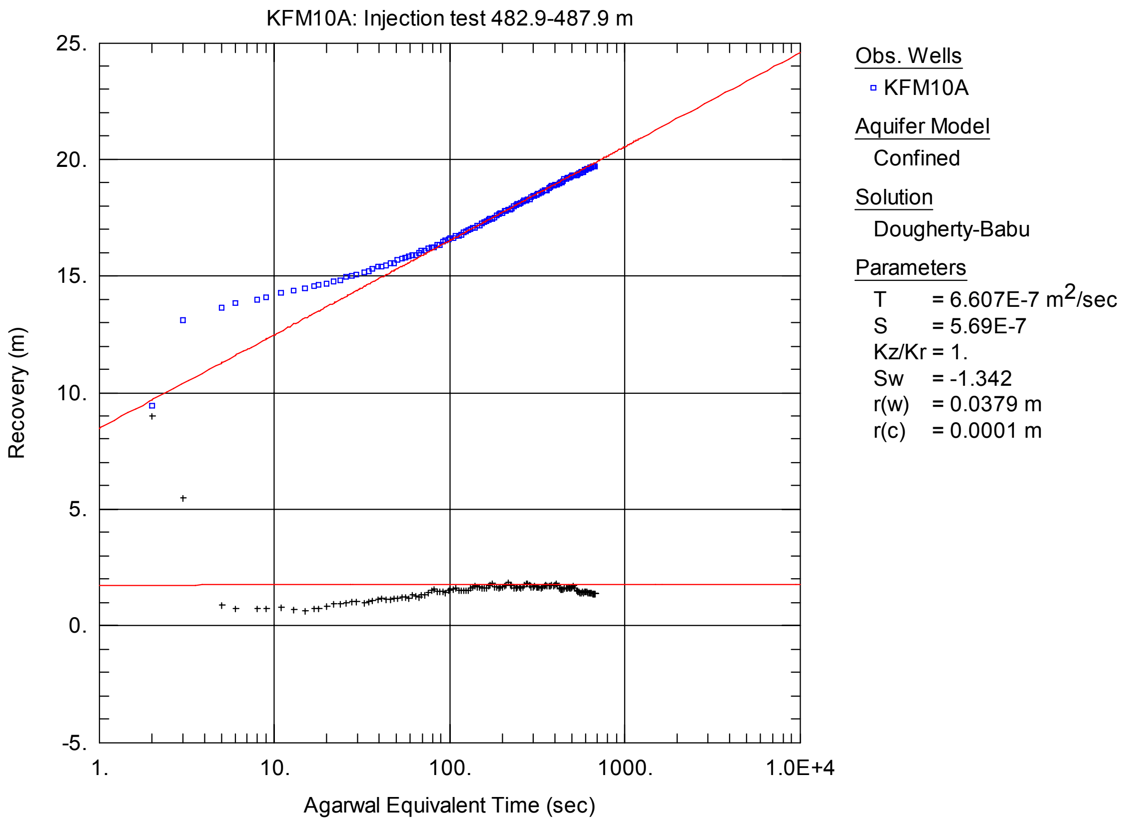


Figure A3-365. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 482.9-487.9 m in KFM10A.*

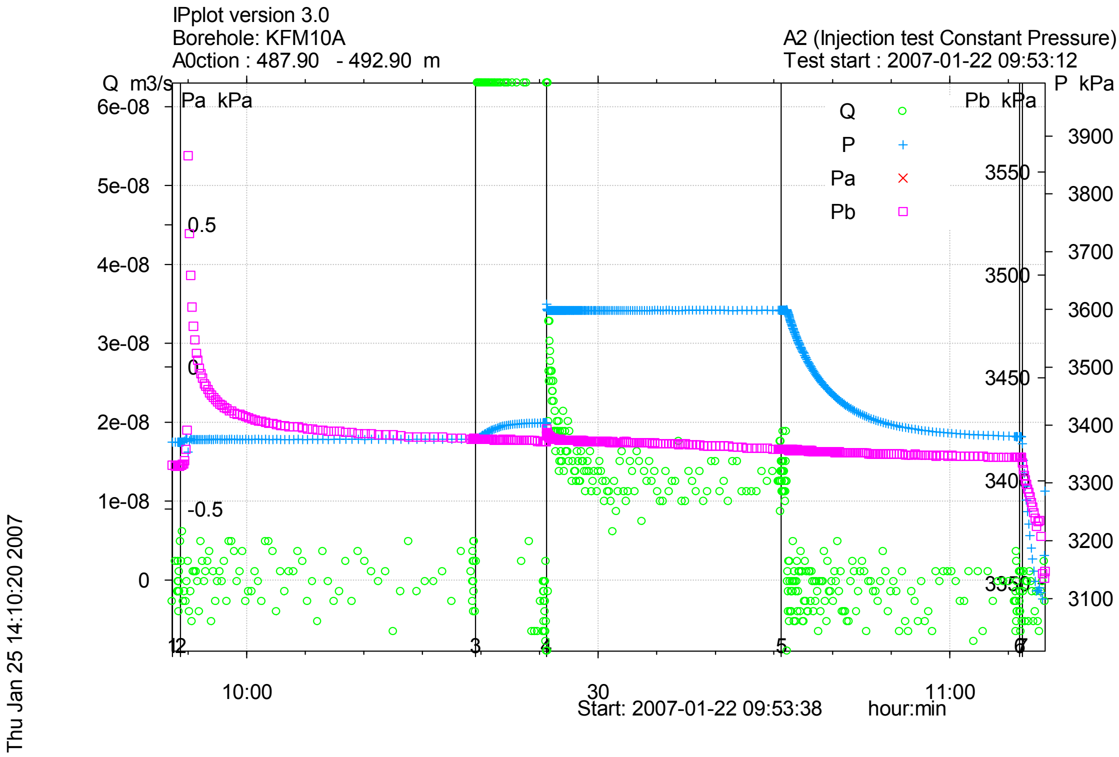


Figure A3-366. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 487.9-492.9 m in borehole KFM10A.

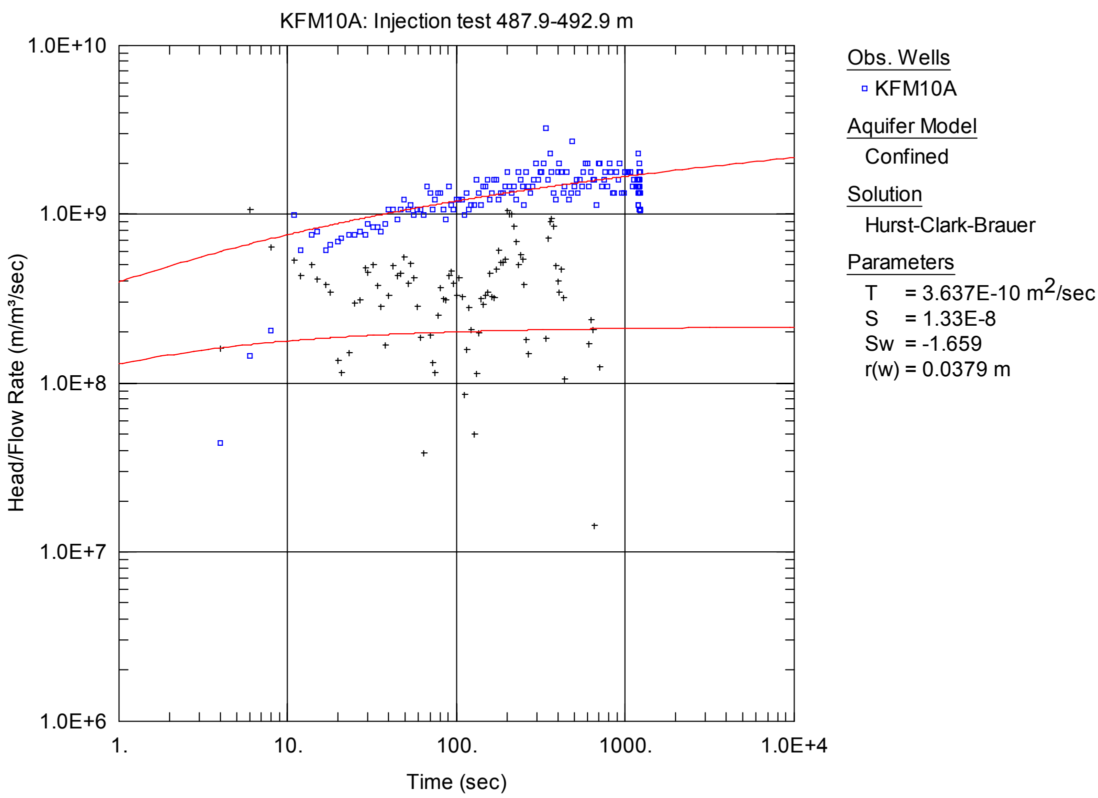


Figure A3-367. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 487.9-492.9 m in KFM10A.

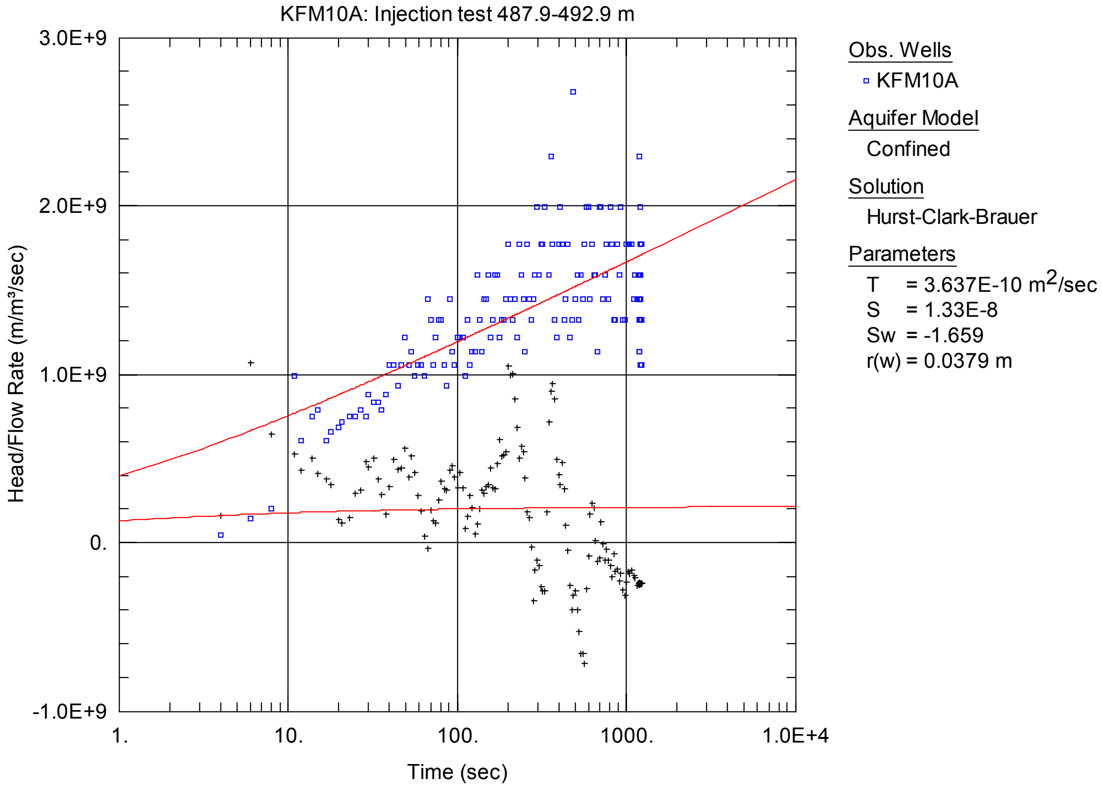


Figure A3-368. Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 487.9-492.9 m in KFM10A.

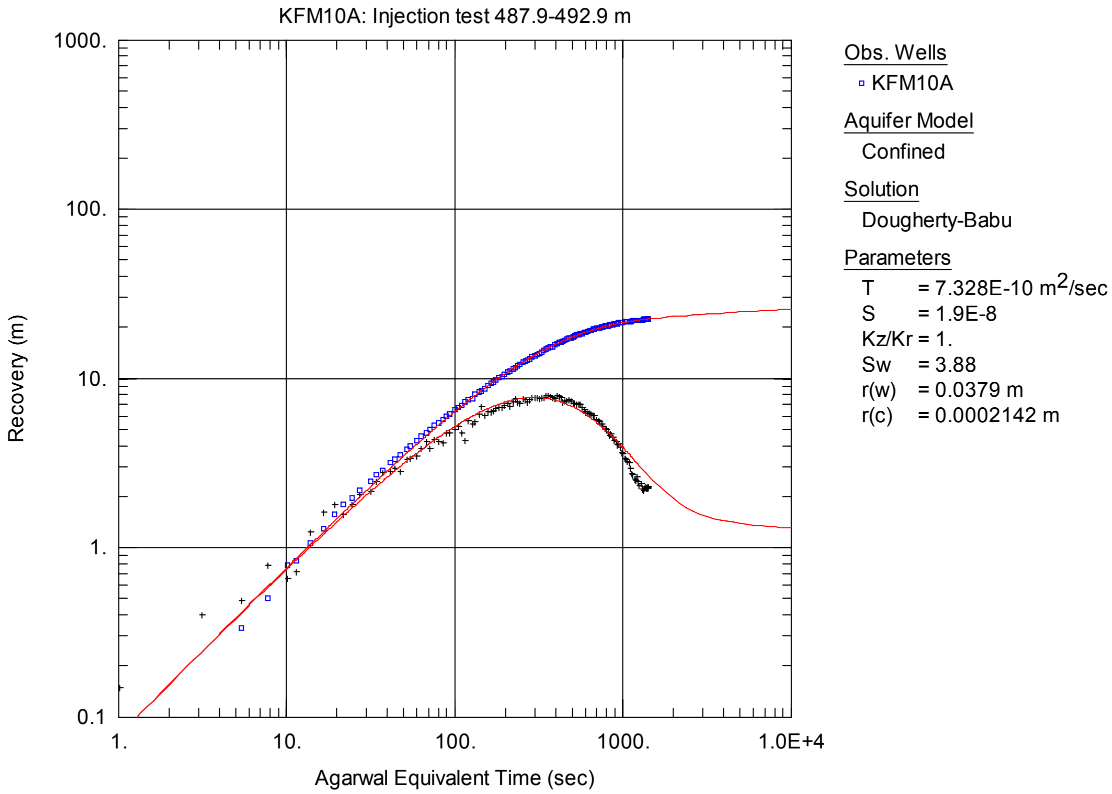


Figure A3-369. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 487.9-492.9 m in KFM10A.*

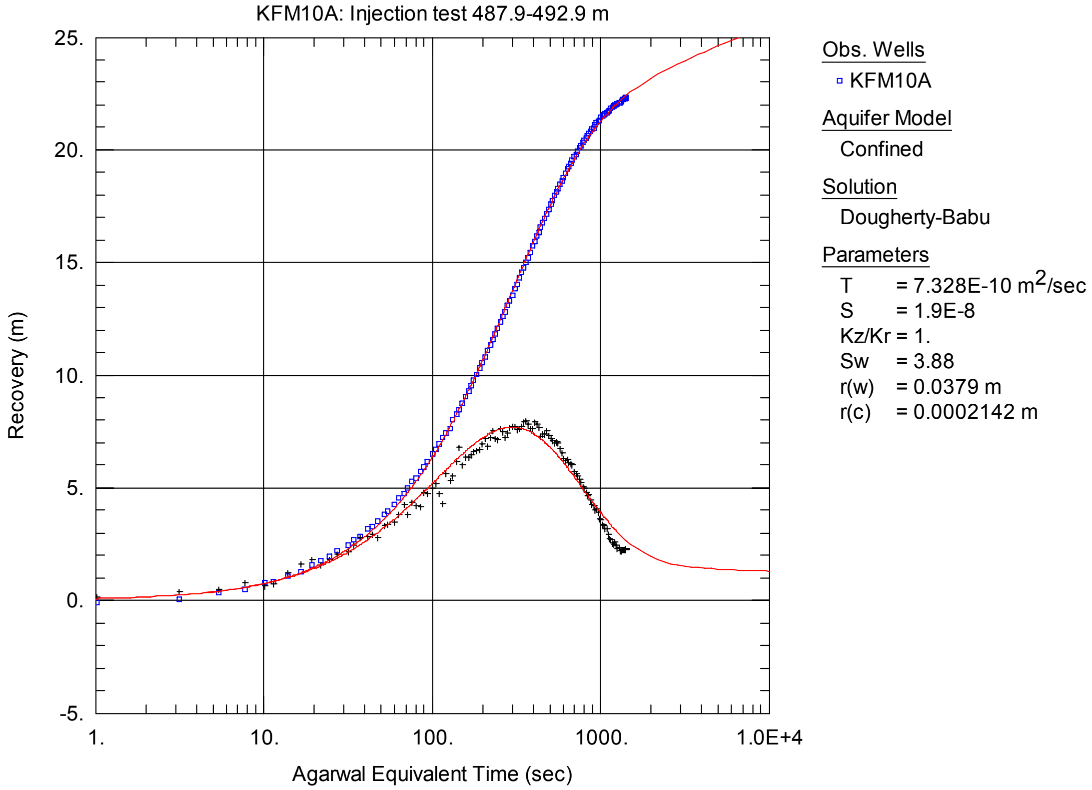
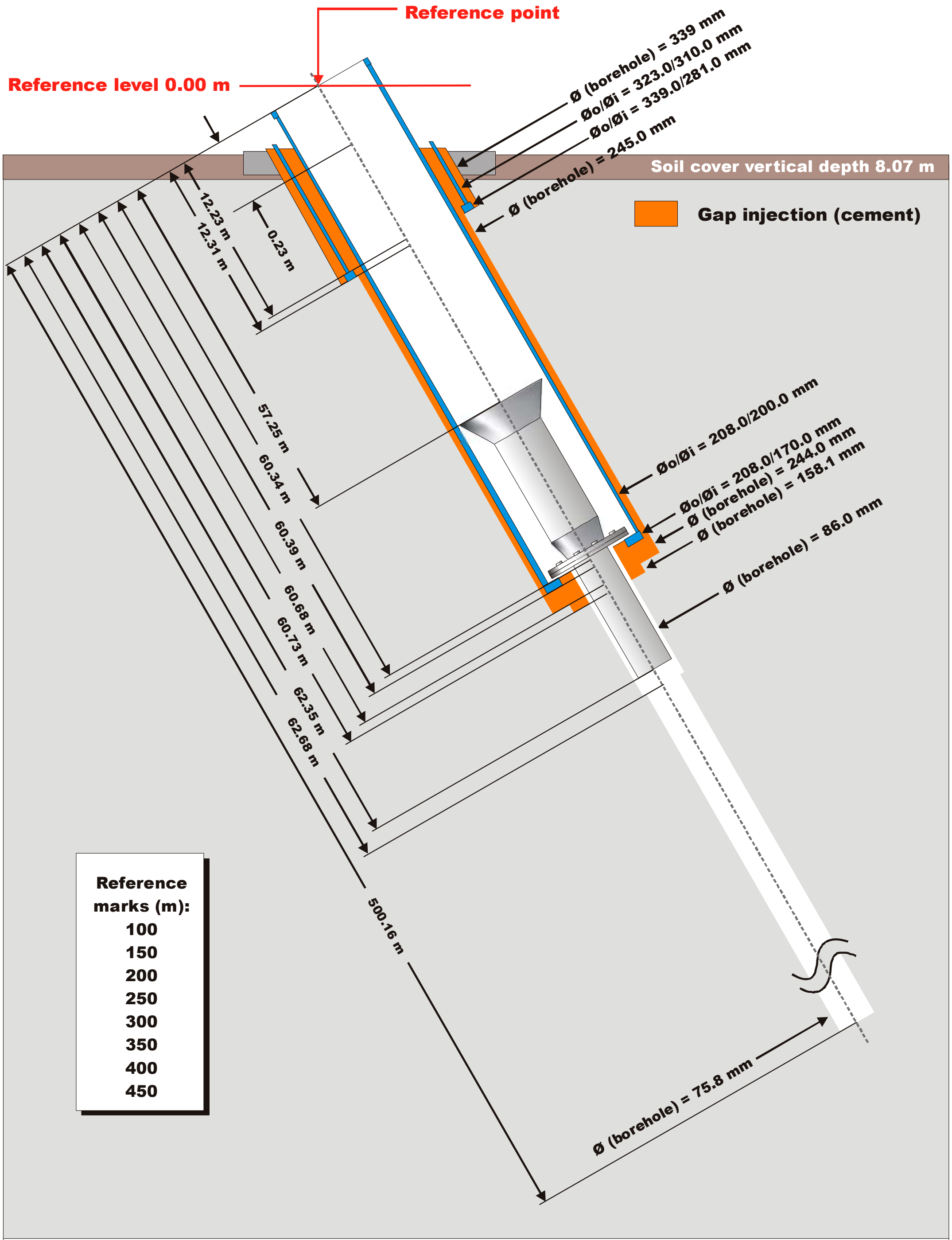


Figure A3-370. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 487.9-492.9 m in KFM10A.*

Appendix 4. Borehole technical data

Technical data

Borehole KFM10A



Drilling reference point

Northing:	**6698629.17 (m), RT90 2,5 gon V 0:-15**
Easting:	**1631715.90 (m), RT90 2,5 gon V 0:-15**
Elevation:	**4.51 (m), RHB 70**

Orientation

Bearing (degrees):	**10.42°**
Inclination (degrees):	**-50.05°**

Borehole

Length:	**500.16 m**

Percussion drilling period

Drilling start date: 2005-12-06
Drilling stop date: 2005-12-19

Core drilling period

Drilling start date: 2006-03-20
Drilling stop date: 2006-06-01

Ver 2006-08-25

Appendix 5. Sicada tables

Nomenclature plu_s_hole_test_d

Column	Datatype	Unit	Column Description	Alt. Symbol
site	CHAR		Investigation site name	
activity_type	CHAR		Activity type code	
start_date	DATE		Date (yymmdd hh:mm:ss)	
stop_date	DATE		Date (yymmdd hh:mm:ss)	
project	CHAR		project code	
idcode	CHAR		Object or borehole identification code	
secup	FLOAT	m	Upper section limit (m)	
seclow	FLOAT	m	Lower section limit (m)	
section_no	INTEGER	number	Section number	
test_type	CHAR		Test type code (1-7), see table description	
formation_type	CHAR		1: Rock, 2: Soil (superficial deposits)	
start_flow_period	DATE	yyyymmdd	Date & time of pumping/injection start (YYYY-MM-DD hh:mm:ss)	
stop_flow_period	DATE	yyyymmdd	Date & time of pumping/injection stop (YYYY-MM-DD hh:mm:ss)	
flow_rate_end_qp	FLOAT	m**3/s	Flow rate at the end of the flowing period	
value_type_qp	CHAR		0:true value,-1<lower meas.limit1:>upper meas.limit	
mean_flow_rate_qm	FLOAT	m**3/s	Arithmetic mean flow rate during flow period	
Q_measl__l	FLOAT	m**3/s	Estimated lower measurement limit of flow rate	**Q-measl-L**
Q_measl__u	FLOAT	m**3/s	Estimated upper measurement limit of flow rate	Q-measl-U
tot_volume_vp	FLOAT	m**3	Total volume of pumped or injected water	
dur_flow_phase_tp	FLOAT	s	Duration of the flowing period of the test	
dur_rec_phase_tf	FLOAT	s	Duration of the recovery period of the test	
initial_head_hi	FLOAT	m	Hydraulic head in test section at start of the flow period	
head_at_flow_end_hp	FLOAT	m	Hydraulic head in test section at stop of the flow period.	
final_head_hf	FLOAT	m	Hydraulic head in test section at stop of recovery period.	
initial_press_pi	FLOAT	kPa	Groundwater pressure in test section at start of flow period	
press_at_flow_end_pp	FLOAT	kPa	Groundwater pressure in test section at stop of flow period.	
final_press_pf	FLOAT	kPa	Ground water pressure at the end of the recovery period.	
fluid_temp_tew	FLOAT	oC	Measured section fluid temperature, see table description	
fluid_elcond_ecw	FLOAT	mS/m	Measured section fluid el. conductivity,see table descr.	
fluid_salinity_tdsw	FLOAT	mg/l	Total salinity of section fluid based on EC,see table descr.	
fluid_salinity_tdswm	FLOAT	mg/l	Tot. section fluid salinity based on water sampling,see...	
reference	CHAR		SKB report No for reports describing data and evaluation	
comments	VARCHAR		Short comment to data	
error_flag	CHAR		If error_flag = "*" then an error occured and an error	
In_use	CHAR		If in_use = "*" then the activity has been selected as	
sign	CHAR		Signature for QA data accknowledge (QA - OK)	
Lp	FLOAT	m	Hydraulic point of application	

Nomenclature plu_s_hole_test_ed1

Column	Datatype	Unit	Column Description	Alt. Symbol
site	CHAR		Investigation site name	
activity_type	CHAR		Activity type code	
start_date	DATE		Date (yymmdd hh:mm:ss)	
stop_date	DATE		Date (yymmdd hh:mm:ss)	
project	CHAR		project code	
idcode	CHAR		Object or borehole identification code	
secup	FLOAT	m	Upper section limit (m)	

Column	Datatype	Unit	Column Description	Alt. Symbol
seclow	FLOAT	m	Lower section limit (m)	
section_no	INTEGER	number	Section number	
test_type	CHAR		Test type code (1-7), see table description!	
formation_type	CHAR		Formation type code. 1: Rock, 2: Soil (superficial deposits)	
Lp	FLOAT	m	Hydraulic point of application for test section, see descr.	
seclen_class	FLOAT	m	Planned ordinary test interval during test campaign.	
spec_capacity_q_s	FLOAT	m**2/s	Specific capacity (Q/s) of test section, see table descript.	Q/s
value_type_q_s	CHAR		0:true value,-1:Q/s<lower meas.limit,1:Q/s>upper meas.limit	
transmissivity_tq	FLOAT	m**2/s	Tranmissivity based on Q/s, see table description	
value_type_tq	CHAR		0:true value,-1:TQ<lower meas.limit,1:TQ>upper meas.limit.	
bc_tq	CHAR		Best choice code. 1 means TQ is best choice of T, else 0	
transmissivity_moye	FLOAT	m**2/s	Transmissivity,TM, based on Moye (1967)	T_M
bc_tm	CHAR		Best choice code. 1 means Tmoye is best choice of T, else 0	
value_type_tm	CHAR		0:true value,-1:TM<lower meas.limit,1:TM>upper meas.limit.	
hydr_cond_moye	FLOAT	m/s	K_M: Hydraulic conductivity based on Moye (1967)	K_M
formation_width_b	FLOAT	m	b:Aquifer thickness repr. for T(generally b=Lw) ,see descr.	b
width_of_channel_b	FLOAT	m	B:Inferred width of formation for evaluated TB	
Tb	FLOAT	m**3/s	TB:Flow capacity in 1D formation of T & width B, see descr.	
l_measl_tb	FLOAT	m**3/s	Estimated lower meas. limit for evaluated TB,see description	
U_measl_tb	FLOAT	m**3/s	Estimated upper meas. limit of evaluated TB,see description	
sb	FLOAT	m	SB:S=storativity,B=width of formation,1D model,see descript.	
assumed_sb	FLOAT	m	SB* : Assumed SB,S=storativity,B=width of formation,see...	
leakage_factor_lf	FLOAT	m	Lf:1D model for evaluation of Leakage factor	
transmissivity_tt	FLOAT	m**2/s	TT:Transmissivity of formation, 2D radial flow model,see...	T_T
value_type_tt	CHAR		0:true value,-1:TT<lower meas.limit,1:TT>upper meas.limit,	
bc_tt	CHAR		Best choice code. 1 means TT is best choice of T, else 0	
l_measl_q_s	FLOAT	m**2/s	Estimated lower meas. limit for evaluated TT,see table descr	Q/s-measl-L
U_measl_q_s	FLOAT	m**2/s	Estimated upper meas. limit for evaluated TT,see description	Q/s-measl-U
storativity_s	FLOAT		S:Storativity of formation based on 2D rad flow,see descr.	
assumed_s	FLOAT		Assumed Storativity,2D model evaluation,see table descr.	
bc_s	FLOAT		Best choice of S (Storativity) ,see descr.	
Ri	FLOAT	m	Radius of influence	
Ri_index	CHAR		ri index=index of radius of influence :-1,0 or 1, see descr.	
leakage_coeff	FLOAT	1/s	K'/b':2D rad flow model evaluation of leakage coeff,see desc	
hydr_cond_ksf	FLOAT	m/s	Ksf:3D model evaluation of hydraulic conductivity,see desc.	
value_type_ksf	CHAR		0:true value,-1:Ksf<lower meas.limit,1:Ksf>upper meas.limit,	
l_measl_ksf	FLOAT	m/s	Estimated lower meas.limit for evaluated Ksf,see table desc.	
U_measl_ksf	FLOAT	m/s	Estimated upper meas.limit for evaluated Ksf,see table descr	
spec_storage_ssf	FLOAT	1/m	Ssf:Specific storage,3D model evaluation,see table descr.	
assumed_ssf	FLOAT	1/m	Ssf*:Assumed Spec.storage,3D model evaluation,see table des.	
C	FLOAT	m**3/pa	C: Wellbore storage coefficient; flow or recovery period	C
cd	FLOAT		CD: Dimensionless wellbore storage coefficient	
skin	FLOAT		Skin factor;best estimate of flow/recovery period,see descr.	ξ
dt1	FLOAT	s	Estimated start time of evaluation, see table description	
dt2	FLOAT	s	Estimated stop time of evaluation. see table description	
t1	FLOAT	s	Start time for evaluated parameter from start flow period	t_1
t2	FLOAT	s	Stop time for evaluated parameter from start of flow period	t_2
dte1	FLOAT	s	Start time for evaluated parameter from start of recovery	dte_1
dte2	FLOAT	s	Stop time for evaluated parameter from start of recovery	dte_2
P_horner	FLOAT	kPa	p*:Horner extrapolated pressure, see table description	
transmissivity_t_nlr	FLOAT	m**2/s	T_NLR Transmissivity based on None Linear Regression...	
storativity_s_nlr	FLOAT		S_NLR=storativity based on None Linear Regression,see..	
value_type_t_nlr	CHAR		0:true value,-1:T_NLR<lower meas.limit,1:>upper meas.limit	

Column	Datatype	Unit	Column Description	Alt. Symbol
bc_t_nlr	CHAR		Best choice code. 1 means T_NLR is best choice of T, else 0	
C_nlr	FLOAT	m**3/pa	Wellbore storage coefficient, based on NLR, see descr.	
cd_nlr	FLOAT		Dimensionless wellbore storage constant, see table descrip.	
skin_nlr	FLOAT		Skin factor based on Non Linear Regression,see desc.	
transmissivity_t_grf	FLOAT	m**2/s	T_GRF:Transmissivity based on Genelized Radial Flow,see...	
value_type_t_grf	CHAR		0:true value,-1:T_GRF<lower meas.limit,1:>upper meas.limit	
bc_t_grf	CHAR		Best choice code. 1 means T_GRF is best choice of T, else 0	
storativity_s_grf	FLOAT		S_GRF:Storativity based on Generalized Radial Flow, see des.	
flow_dim_grf	FLOAT		Inferred flow dimesion based on Generalized Rad. Flow model	
comment	VARCHAR	no_unit	Short comment to the evaluated parameters	
error_flag	CHAR		If error_flag = "*" then an error occured and an error	
In_use	CHAR		If in_use = "*" then the activity has been selected as	
sign	CHAR		Signature for QA data accknowledge (QA - OK)	

Nomenclature plu_s_hole_test_obs

Column	Datatype	Unit	Column Description
site	CHAR		Investigation site name
activity_type	CHAR		Activity type code
idcode	CHAR		Object or borehole identification code
start_date	DATE		Date (yymmdd hh:mm:ss)
secup	FLOAT	m	Upper section limit (m)
seclow	FLOAT	m	Lower section limit (m)
obs_secup	FLOAT	m	Upper limit of observation section
obs_seclow	FLOAT	m	Lower limit of observation section
pi_above	FLOAT	kPa	Groundwater pressure above test section,start of flow period
pp_above	FLOAT	kPa	Groundwater pressure above test section,at stop flow period
pf_above	FLOAT	kPa	Groundwater pressure above test section at stop recovery per
pi_below	FLOAT	kPa	Groundwater pressure below test section at start flow period
pp_below	FLOAT	kPa	Groundwater pressure below test section at stop flow period
pf_below	FLOAT	kPa	Groundwater pressure below test section at stop recovery per
comments	VARCHAR		Comment text row (unformatted text)

KFM10A plu_s_hole_test_d. Left (This result table to SICADA includes more columns which are empty, these columns are not presented here.)

idcode	start_date	stop_date	secup	seclow	test_type	Formation_type	start_flow_period	stop_flow_period	flow_rate_end_qp	Value_type_qp	mean_flow_rate_qm
KFM10A	20061214 11:23	20061214 14:01	62.90	162.90	3	1	20061214 12:58:36	20061214 13:28:37	7.03E-04	0	7.34E-04
KFM10A	20061214 15:59	20061214 17:48	162.90	262.90	3	1	20061214 16:46:29	20061214 17:16:51	6.90E-08	0	1.88E-07
KFM10A	20061215 09:55	20061215 11:44	262.90	362.90	3	1	20061215 10:42:07	20061215 11:12:00	2.95E-05	0	7.40E-05
KFM10A	20061215 13:33	20061215 15:22	362.90	462.90	3	1	20061215 14:20:19	20061215 14:50:17	3.96E-04	0	4.15E-04
KFM10A	20061219 12:53	20061219 16:02	62.90	82.90	3	1	20061219 15:19:46	20061219 15:39:51	9.37E-05	0	9.96E-05
KFM10A	20061220 13:05	20061220 14:24	84.00	104.00	3	1	20061220 13:41:45	20061220 14:01:53	6.28E-04	0	6.50E-04
KFM10A	20061220 14:59	20061220 16:15	102.90	122.90	3	1	20061220 15:32:49	20061220 15:52:57	3.98E-04	0	4.07E-04
KFM10A	20061220 17:03	20061221 09:18	122.90	142.90	3	1	20061221 08:35:54	20061221 08:56:14	5.77E-08	0	7.20E-08
KFM10A	20061221 09:42	20061221 10:57	142.90	162.90	3	1	20061221 10:14:43	20061221 10:35:03	1.67E-07	0	1.99E-07
KFM10A	20061221 11:13	20061221 13:19	162.90	182.90	3	1	20061221 12:37:13	20061221 12:57:33	8.65E-08	0	1.28E-07
KFM10A	20061221 13:41	20061221 14:32	182.90	202.90	3	1	20061221 14:13:26	20061221 14:25:20		-1	
KFM10A	20061221 14:48	20061221 15:33	202.90	222.90	3	1	20061221 15:19:21	20061221 15:26:07		-1	
KFM10A	20061221 15:49	20061221 17:05	222.90	242.90	3	1	20061221 16:23:05	20061221 16:43:27	1.03E-08	0	7.10E-08
KFM10A	20061222 09:02	20061222 09:49	242.90	262.90	3	1	20061222 09:37:21	20061222 09:41:42		-1	
KFM10A	20061222 10:13	20061222 11:32	262.90	282.90	3	1	20061222 10:49:44	20061222 11:10:04	1.86E-07	0	3.29E-07
KFM10A	20070104 10:36	20070104 11:51	282.90	302.90	3	1	20070104 11:08:40	20070104 11:28:47	2.99E-06	0	1.64E-05
KFM10A	20070102 08:29	20070102 10:01	302.90	322.90	3	1	20070102 09:18:44	20070102 09:38:46	2.91E-05	0	6.15E-05
KFM10A	20070102 10:26	20070102 11:40	322.90	342.90	3	1	20070102 10:58:14	20070102 11:18:17	1.55E-05	0	3.16E-05
KFM10A	20070102 12:46	20070102 14:06	342.90	362.90	3	1	20070102 13:23:37	20070102 13:44:02	2.25E-07	0	3.54E-07
KFM10A	20070102 14:21	20070102 15:36	362.90	382.90	3	1	20070102 14:53:36	20070102 15:14:01	2.96E-07	0	3.63E-07
KFM10A	20070102 15:58	20070102 16:49	382.90	402.90	3	1	20070102 16:33:05	20070102 16:42:12		-1	
KFM10A	20070103 08:57	20070103 09:46	402.90	422.90	3	1	20070103 09:32:38	20070103 09:38:30		-1	
KFM10A	20070103 10:03	20070103 11:18	422.90	442.90	3	1	20070103 10:36:14	20070103 10:56:14	4.16E-04	0	4.38E-04
KFM10A	20070103 11:39	20070103 13:48	442.90	462.90	3	1	20070103 13:05:34	20070103 13:25:58	6.70E-08	0	8.56E-08
KFM10A	20070103 14:06	20070103 15:20	462.90	482.90	3	1	20070103 14:37:56	20070103 14:58:06	1.61E-06	0	1.87E-06
KFM10A	20070103 15:38	20070103 16:53	472.90	492.90	3	1	20070103 16:10:30	20070103 16:30:40	1.87E-05	0	2.06E-05
KFM10A	20070105 13:55	20070105 15:12	62.90	67.90	3	1	20070105 14:30:16	20070105 14:50:37	2.44E-07	0	2.66E-07

idcode	start_date	stop_date	secup	seclow	test_type	Formation_type	start_flow_period	stop_flow_period	flow_rate_end_qp	Value_type_qp	mean_flow_rate_qm
KFM10A	20070105 15:24	20070105 16:45	67.90	72.90	3	1	20070105 16:02:25	20070105 16:22:36	3.71E-06	0	3.81E-06
KFM10A	20070108 08:35	20070108 09:49	72.90	77.90	3	1	20070108 09:07:20	20070108 09:27:38	2.50E-05	0	2.57E-05
KFM10A	20070108 10:00	20070108 11:14	77.90	82.90	3	1	20070108 10:32:00	20070108 10:52:18	5.92E-05	0	6.30E-05
KFM10A	20070108 11:20	20070108 13:32	79.00	84.00	3	1	20070108 12:49:37	20070108 13:09:52	4.19E-05	0	4.37E-05
KFM10A	20070108 13:46	20070108 14:59	84.00	89.00	3	1	20070108 14:17:14	20070108 14:37:31	2.47E-04	0	2.48E-04
KFM10A	20070108 15:13	20070108 16:27	89.00	94.00	3	1	20070108 15:44:59	20070108 16:05:09	3.94E-04	0	3.99E-04
KFM10A	20070108 16:41	20070108 17:55	94.00	99.00	3	1	20070108 17:12:53	20070108 17:33:02	9.82E-05	0	1.00E-04
KFM10A	20070108 18:07	20070108 19:21	99.00	104.00	3	1	20070108 18:39:14	20070108 18:59:20	2.87E-04	0	2.89E-04
KFM10A	20070108 19:39	20070108 20:52	102.90	107.90	3	1	20070108 20:10:20	20070108 20:30:30	3.45E-04	0	3.48E-04
KFM10A	20070109 07:34	20070109 08:50	107.90	112.90	3	1	20070109 08:08:05	20070109 08:28:26	3.53E-07	0	3.68E-07
KFM10A	20070109 09:05	20070109 10:22	112.90	117.90	3	1	20070109 09:39:44	20070109 10:00:07	9.16E-07	0	8.97E-07
KFM10A	20070109 10:45	20070109 12:00	117.90	122.90	3	1	20070109 11:17:57	20070109 11:38:15	1.60E-06	0	1.68E-06
KFM10A	20070109 13:06	20070109 14:47	122.90	127.90	3	1	20070109 14:04:24	20070109 14:24:48	2.36E-08	0	3.04E-08
KFM10A	20070110 08:23	20070110 09:14	127.90	132.90	3	1	20070110 08:55:00	20070110 09:06:45		-1	
KFM10A	20070110 09:31	20070110 10:46	132.90	137.90	3	1	20070110 10:03:30	20070110 10:23:54	2.04E-08	0	3.15E-08
KFM10A	20070123 10:51	20070123 13:09	137.90	142.90	3	1	20070123 12:26:53	20070123 12:47:23	9.88E-09	0	1.06E-08
KFM10A	20070110 12:51	20070110 14:05	142.90	147.90	3	1	20070110 13:22:39	20070110 13:42:59	1.05E-07	0	1.24E-07
KFM10A	20070110 14:16	20070110 15:40	145.00	150.00	3	1	20070110 14:58:11	20070110 15:18:33	9.00E-09	0	1.25E-08
KFM10A	20070110 15:51	20070110 16:31	150.00	155.00	3	1	20070110 16:22:30	20070110 16:24:23		-1	
KFM10A	20070111 08:27	20070111 09:10	155.00	160.00	3	1	20070111 09:01:03	20070111 09:03:27		-1	
KFM10A	20070111 09:20	20070111 10:03	157.90	162.90	3	1	20070111 09:53:30	20070111 09:55:52		-1	
KFM10A	20070111 10:17	20070111 11:33	162.90	167.90	3	1	20070111 10:50:45	20070111 11:11:07	5.94E-08	0	7.60E-08
KFM10A	20070111 12:36	20070111 13:53	167.90	172.90	3	1	20070111 13:11:13	20070111 13:31:35	1.82E-08	0	2.58E-08
KFM10A	20070111 14:09	20070111 15:24	172.90	177.90	3	1	20070111 14:41:41	20070111 15:02:06	4.20E-08	0	5.94E-08
KFM10A	20070111 15:37	20070111 16:20	177.90	182.90	3	1	20070111 16:10:55	20070111 16:12:59		-1	
KFM10A	20070112 08:40	20070112 09:21	262.90	267.90	3	1	20070112 09:12:27	20070112 09:14:13		-1	
KFM10A	20070112 09:35	20070112 10:49	267.90	272.90	3	1	20070112 10:07:20	20070112 10:27:45	7.60E-08	0	1.82E-07
KFM10A	20070112 11:02	20070112 12:49	272.90	277.90	3	1	20070112 12:07:15	20070112 12:27:35	8.30E-08	0	9.63E-08
KFM10A	20070112 13:01	20070112 13:59	277.90	282.90	3	1	20070112 13:35:21	20070112 13:43:37		-1	
KFM10A	20070112 14:10	20070112 15:01	282.90	287.90	3	1	20070112 14:42:46	20070112 14:54:20		-1	
KFM10A	20070112 15:11	20070112 15:50	287.90	292.90	3	1	20070112 15:42:09	20070112 15:43:14		-1	
KFM10A	20070112 16:05	20070112 17:21	292.90	297.90	3	1	20070112 16:38:52	20070112 16:59:18	4.28E-09	-1	

idcode	start_date	stop_date	secup	seclow	test_type	Formation_type	start_flow_period	stop_flow_period	flow_rate_end_qp	Value_type_qp	mean_flow_rate_qm
KFM10A	20070115 08:31	20070115 09:45	297.90	302.90	3	1	20070115 09:03:21	20070115 09:23:49	2.92E-06	0	1.59E-05
KFM10A	20070122 16:53	20070123 09:28	302.90	307.90	3	1	20070123 08:46:20	20070123 09:06:41	2.95E-07	0	3.25E-07
KFM10A	20070115 11:27	20070115 13:33	307.90	312.90	3	1	20070115 12:50:43	20070115 13:11:10	5.99E-07	0	3.82E-06
KFM10A	20070115 13:45	20070115 15:00	312.90	317.90	3	1	20070115 14:18:29	20070115 14:38:35	2.90E-05	0	6.33E-05
KFM10A	20070115 15:11	20070115 16:27	317.90	322.90	3	1	20070115 15:44:55	20070115 16:05:18	1.48E-06	0	1.55E-06
KFM10A	20070115 16:39	20070116 09:17	322.90	327.90	3	1	20070116 08:34:29	20070116 08:55:17	1.32E-05	0	1.88E-05
KFM10A	20070116 09:34	20070116 10:52	327.90	332.90	3	1	20070116 10:09:31	20070116 10:29:53	1.34E-05	0	1.78E-05
KFM10A	20070122 15:18	20070122 16:32	332.90	337.90	3	1	20070122 15:50:02	20070122 16:10:12	3.74E-06	0	1.55E-05
KFM10A	20070116 13:01	20070116 14:19	337.90	342.90	3	1	20070116 13:37:18	20070116 13:57:45	6.70E-08	0	9.87E-08
KFM10A	20070116 14:37	20070116 15:53	342.90	347.90	3	1	20070116 15:11:14	20070116 15:31:46	7.36E-08	0	2.02E-07
KFM10A	20070116 16:10	20070116 16:53	347.90	352.90	3	1	20070116 16:42:26	20070116 16:45:40		-1	
KFM10A	20070117 08:29	20070117 09:46	352.90	357.90	3	1	20070117 09:04:01	20070117 09:24:25	1.60E-07	0	1.73E-07
KFM10A	20070117 09:57	20070117 10:44	357.90	362.90	3	1	20070117 10:33:28	20070117 10:36:47		-1	
KFM10A	20070117 10:58	20070117 11:41	362.90	367.90	3	1	20070117 11:31:22	20070117 11:33:52		-1	
KFM10A	20070117 13:11	20070117 14:29	367.90	372.90	3	1	20070117 13:46:48	20070117 14:07:19	4.29E-08	0	4.94E-08
KFM10A	20070117 14:41	20070117 15:57	372.90	377.90	3	1	20070117 15:15:06	20070117 15:35:33	2.20E-07	0	2.61E-07
KFM10A	20070117 16:12	20070117 17:27	377.90	382.90	3	1	20070117 16:44:55	20070117 17:05:25	6.20E-09	0	1.96E-08
KFM10A	20070118 08:48	20070118 09:33	422.90	427.90	3	1	20070118 09:19:27	20070118 09:25:30		-1	
KFM10A	20070122 13:06	20070122 14:29	427.90	432.90	3	1	20070122 13:47:00	20070122 14:07:08	4.30E-04	0	4.52E-04
KFM10A	20070118 11:19	20070118 12:32	432.90	437.90	3	1	20070118 11:49:53	20070118 12:10:16	1.09E-05	0	1.18E-05
KFM10A	20070118 13:34	20070118 14:51	437.90	442.90	3	1	20070118 14:08:33	20070118 14:28:53	3.45E-07	0	3.68E-07
KFM10A	20070118 15:12	20070118 16:29	442.90	447.90	3	1	20070118 15:46:44	20070118 16:07:09	4.13E-08	0	4.73E-08
KFM10A	20070118 16:42	20070119 08:06	447.90	452.90	3	1	20070119 07:56:49	20070119 07:59:03		-1	
KFM10A	20070119 08:18	20070119 09:31	452.90	457.90	3	1	20070119 08:49:15	20070119 09:09:41	6.16E-09	0	9.43E-09
KFM10A	20070119 09:42	20070119 10:21	457.90	462.90	3	1	20070119 10:12:57	20070119 10:14:06		-1	
KFM10A	20070119 10:30	20070119 11:44	462.90	467.90	3	1	20070119 11:01:54	20070119 11:22:25	1.25E-08	0	1.79E-08
KFM10A	20070119 12:28	20070119 13:42	467.90	472.90	3	1	20070119 13:00:24	20070119 13:20:50	5.40E-08	0	1.28E-07
KFM10A	20070119 13:54	20070119 14:36	472.90	477.90			20070119 14:27:02	20070119 14:29:09		-1	
KFM10A	20070119 14:48	20070119 16:04	477.90	482.90	3	1	20070119 15:22:20	20070119 15:42:43	1.55E-06	0	1.72E-06
KFM10A	20070122 08:26	20070122 09:41	482.90	487.90	3	1	20070122 08:58:56	20070122 09:19:19	1.45E-05	0	1.62E-05
KFM10A	20070122 09:53	20070122 11:08	487.90	492.90	3	1	20070122 10:25:35	20070122 10:46:05	1.38E-08	0	1.54E-08

idcode	start_date	stop_date	secup	seclow	test_type	Formation_type	start_flow_period	stop_flow_period	flow_rate_end_ qp	Value_type_qp	mean_flow_rate_qm
KFM10A[1)]	20061222 11:57	20061222 13:56	282.90	302.90	3	1	20061222 13:14:14	20061222 13:34:47	1.20E-06	0	1.83E-05
KFM10A[2)]	20070110 10:58	20070110 12:39	137.90	142.90	3	1	20070110 12:28:29	20070110 12:36:46	1.22E-08	-1	
KFM10A[1)]	20070115 09:58	20070115 11:17	302.90	307.90	3	1	20070115 10:34:55	20070115 10:55:02	2.98E-07	1	3.07E-07
KFM10A[2)]	20070116 11:05	20070116 12:47	332.90	337.90	3	1	20070116 12:27:24	20070116 12:35:59	2.43E-07	0	3.22E-05
KFM10A[1)]	20070118 09:50	20070118 11:05	427.90	432.90	3	1	20070118 10:23:24	20070118 10:42:41	2.14E-04	0	2.10E-04

[1)] Complete test, re-performed later.
[2)] Incomplete test, interrupted and re-performed later.

KFM10A plu_s_hole_test_d. Right (This result table to SICADA includes more columns which are empty, these columns are not presented here.)

idcode	secup	seclow	q_measl__l	q_measl__u	tot_volume_vp	dur_flow_phase_tp	dur_rec_phase_tf	initial_press_pi	press_at_flow_end_pp	final_press_pf	fluid_temp_tew
KFM10A	62.90	162.90	1.7E-08	1.0E-03	1.32E+00	1801	1813	517.47	582.82	520.76	10.98
KFM10A	162.90	262.90	4.7E-09	1.0E-03	3.43E-04	1822	1789	1215.53	1412.16	1309.46	7.80
KFM10A	262.90	362.90	1.7E-08	1.0E-03	1.33E-01	1793	1810	1869.12	2053.12	1983.91	8.19
KFM10A	362.90	462.90	1.7E-08	1.0E-03	7.47E-01	1798	1814	2478.23	2625.47	2481.52	8.63
KFM10A	62.90	82.90	1.7E-08	1.0E-03	1.20E-01	1205	1213	538.16	750.30	538.30	7.04
KFM10A	84.00	104.00	1.7E-08	1.0E-03	7.84E-01	1208	1214	694.28	765.40	695.92	10.44
KFM10A	102.90	122.90	1.7E-08	1.0E-03	4.90E-01	1208	1215	833.24	1032.09	835.43	8.05
KFM10A	122.90	142.90	3.8E-09	1.0E-03	8.81E-05	1220	1202	977.95	1175.13	991.41	7.56
KFM10A	142.90	162.90	1.7E-08	1.0E-03	2.43E-04	1220	1202	1123.23	1321.51	1140.26	7.72
KFM10A	162.90	182.90	3.8E-09	1.0E-03	1.56E-04	1220	1202	1266.02	1466.36	1323.15	7.88
KFM10A	182.90	202.90	3.8E-09	1.0E-03		714	322	1414.87	1625.78	1616.99	8.04
KFM10A	202.90	222.90	6.3E-09	1.0E-03		406	322	1551.35	1766.38	1760.88	8.18
KFM10A	222.90	242.90	3.6E-09	1.0E-03	8.55E-05	1222	1221	1687.84	1905.34	1869.09	8.29
KFM10A	242.90	262.90	4.9E-09	1.0E-03		261	322	1834.47	2046.90	2043.19	8.45
KFM10A	262.90	282.90	7.6E-09	1.0E-03	4.02E-04	1220	1203	1956.55	2178.31	2071.20	8.57
KFM10A	282.90	302.90	1.7E-08	1.0E-03	2.00E-02	1207	1202	2086.85	2300.20	2264.53	8.64
KFM10A	302.90	322.90	1.7E-08	1.0E-03	7.39E-02	1202	1211	2217.85	2392.91	2318.36	8.56
KFM10A	322.90	342.90	1.7E-08	1.0E-03	3.81E-02	1203	1209	2346.92	2566.65	2449.63	8.78
KFM10A	342.90	362.90	1.7E-08	1.0E-03	4.34E-04	1225	1196	2473.25	2675.36	2507.29	9.02
KFM10A	362.90	382.90	1.7E-08	1.0E-03	4.46E-04	1225	1197	2599.01	2798.93	2604.51	9.10
KFM10A	382.90	402.90	4.9E-09	1.0E-03		547	321	2741.54	2941.19	2923.61	9.20
KFM10A	402.90	422.90	3.6E-09	1.0E-03		352	321	2874.73	3064.76	3063.12	9.30
KFM10A	422.90	442.90	1.7E-08	1.0E-03	5.26E-01	1200	1218	2965.21	3120.24	2969.20	9.01
KFM10A	442.90	462.90	1.7E-08	1.0E-03	1.05E-04	1224	1196	3086.73	3339.93	3092.77	9.52
KFM10A	462.90	482.90	1.7E-08	1.0E-03	2.27E-03	1210	1214	3198.78	3404.05	3204.26	9.64
KFM10A	472.90	492.90	1.7E-08	1.0E-03	2.50E-02	1210	1213	3255.75	3453.07	3263.04	9.57
KFM10A	62.90	67.90	1.7E-08	1.0E-03	3.26E-04	1221	1203	539.78	759.89	540.19	6.77

idcode	secup	seclow	q_measl__l	q_measl__u	tot_volume_vp	dur_flow_phase_tp	dur_rec_phase_tf	initial_press_pi	press_at_flow_end_pp	final_press_pf	fluid_temp_tew
KFM10A	67.90	72.90	1.7E-08	1.0E-03	4.62E-03	1211	1214	577.00	776.92	577.54	6.90
KFM10A	72.90	77.90	1.7E-08	1.0E-03	3.13E-02	1218	1206	613.52	813.17	613.25	6.78
KFM10A	77.90	82.90	1.7E-08	1.0E-03	7.67E-02	1218	1206	651.83	859.85	650.59	7.34
KFM10A	79.00	84.00	1.7E-08	1.0E-03	5.31E-02	1215	1205	661.03	807.25	658.28	7.34
KFM10A	84.00	89.00	1.7E-08	1.0E-03	3.02E-01	1217	1206	695.90	776.37	695.63	8.70
KFM10A	89.00	94.00	1.7E-08	1.0E-03	4.82E-01	1210	1216	731.88	868.37	733.52	9.29
KFM10A	94.00	99.00	1.7E-08	1.0E-03	1.21E-01	1209	1216	769.37	968.21	769.77	7.63
KFM10A	99.00	104.00	1.7E-08	1.0E-03	3.48E-01	1206	1216	806.02	953.42	807.12	9.40
KFM10A	102.90	107.90	1.7E-08	1.0E-03	4.21E-01	1210	1215	835.96	981.55	836.78	7.25
KFM10A	107.90	112.90	1.7E-08	1.0E-03	4.51E-04	1221	1202	871.39	1082.43	871.93	7.37
KFM10A	112.90	117.90	1.7E-08	1.0E-03	1.10E-03	1223	1202	908.18	1054.79	908.18	7.41
KFM10A	117.90	122.90	1.7E-08	1.0E-03	2.05E-03	1218	1203	944.43	1163.57	944.99	7.50
KFM10A	122.90	127.90	1.7E-08	1.0E-03	3.73E-05	1224	1200	981.78	1233.51	986.73	7.51
KFM10A	127.90	132.90	4.9E-09	1.0E-03		705	321	1065.12	1280.15	1224.54	7.54
KFM10A	132.90	137.90	1.7E-08	1.0E-03	3.81E-05	1224	1215	1063.61	1315.75	1109.75	7.58
KFM10A	137.90	142.90	6.1E-09	1.0E-03	1.28E-05	1230	1221	1105.90	1333.01	1136.12	7.71
KFM10A	142.90	147.90	1.7E-08	1.0E-03	1.52E-04	1220	1203	1127.33	1302.53	1142.71	7.67
KFM10A	145.00	150.00	4.9E-09	1.0E-03	1.50E-05	1222	1221	1151.50	1384.36	1161.38	7.69
KFM10A	150.00	155.00	5.0E-09	1.0E-03		113	321	1215.21	1421.17	1436.00	7.73
KFM10A	155.00	160.00	5.0E-09	1.0E-03		144	322	1259.97	1455.77	1469.50	7.78
KFM10A	157.90	162.90	5.0E-09	1.0E-03		142	321	1256.95	1477.74	1482.13	7.82
KFM10A	162.90	167.90	1.7E-08	1.0E-03	9.31E-05	1222	1200	1275.35	1513.02	1322.86	7.83
KFM10A	167.90	172.90	1.7E-08	1.0E-03	3.12E-05	1222	1219	1320.66	1548.58	1351.41	7.88
KFM10A	172.90	177.90	1.7E-08	1.0E-03	7.30E-05	1225	1197	1354.71	1583.33	1403.58	7.91
KFM10A	177.90	182.90	4.9E-09	1.0E-03		124	322	1418.97	1619.99	1634.26	7.95
KFM10A	262.90	267.90	6.1E-09	1.0E-03		106	321	2039.19	2208.21	2234.58	8.53
KFM10A	267.90	272.90	1.7E-08	1.0E-03	2.23E-04	1225	1197	2002.67	2240.61	2173.07	8.58
KFM10A	272.90	277.90	1.7E-08	1.0E-03	1.18E-04	1220	1200	2039.88	2275.80	2086.83	8.61
KFM10A	277.90	282.90	5.7E-09	1.0E-03		496	823	2073.38	2309.41	2263.14	8.61
KFM10A	282.90	287.90	5.7E-09	1.0E-03		694	321	2123.64	2344.43	2330.69	8.64
KFM10A	287.90	292.90	5.7E-09	1.0E-03		65	321	2166.47	2378.48	2400.99	8.66
KFM10A	292.90	297.90	6.3E-09	1.0E-03		1226	1221	2175.26	2411.33	2386.17	8.70

idcode	secup	seclow	q_measl__l	q_measl__u	tot_volume_vp	dur_flow_phase_tp	dur_rec_phase_tf	initial_press_pi	press_at_flow_end_pp	final_press_pf	fluid_temp_tew
KFM10A	297.90	302.90	1.7E-08	1.0E-03	1.98E-02	1228	1185	2202.17	2415.81	2380.67	8.71
KFM10A	302.90	307.90	1.7E-08	1.0E-03	3.98E-04	1221	1198	2234.85	2450.76	2267.54	8.80
KFM10A	307.90	312.90	1.7E-08	1.0E-03	4.74E-03	1227	1182	2269.18	2411.60	2392.21	8.83
KFM10A	312.90	317.90	1.7E-08	1.0E-03	7.66E-02	1206	1209	2300.63	2487.20	2411.43	8.60
KFM10A	317.90	322.90	1.7E-08	1.0E-03	1.90E-03	1223	1199	2331.79	2519.08	2333.44	8.91
KFM10A	322.90	327.90	1.7E-08	1.0E-03	2.35E-02	1248	1214	2363.10	2565.36	2426.81	8.82
KFM10A	327.90	332.90	1.7E-08	1.0E-03	2.17E-02	1222	1202	2404.70	2605.31	2447.68	8.87
KFM10A	332.90	337.90	1.7E-08	1.0E-03	1.90E-02	1210	1196	2431.62	2681.67	2628.37	8.91
KFM10A	337.90	342.90	4.9E-09	1.0E-03	1.22E-04	1227	1194	2458.25	2668.89	2517.43	9.01
KFM10A	342.90	347.90	3.6E-09	1.0E-03	2.49E-04	1232	1193	2494.91	2715.57	2599.28	8.96
KFM10A	347.90	352.90	4.9E-09	1.0E-03		194	321	2548.33	2749.62	2732.73	9.00
KFM10A	352.90	357.90	3.8E-09	1.0E-03	2.12E-04	1224	1197	2557.94	2785.73	2565.22	9.04
KFM10A	357.90	362.90	5.1E-09	1.0E-03		199	322	2618.63	2810.17	2801.93	9.05
KFM10A	362.90	367.90	4.9E-09	1.0E-03		150	321	2638.81	2844.37	2851.37	9.07
KFM10A	367.90	372.90	4.9E-09	1.0E-03	6.09E-05	1231	1194	2652.27	2879.65	2655.29	9.10
KFM10A	372.90	377.90	1.7E-08	1.0E-03	3.21E-04	1227	1194	2683.03	2882.15	2688.79	9.13
KFM10A	377.90	382.90	4.9E-09	1.0E-03	2.36E-05	1230	1221	2726.41	2932.12	2845.88	9.14
KFM10A	422.90	427.90	4.9E-09	1.0E-03		363	321	3030.28	3206.72	3188.05	9.35
KFM10A	427.90	432.90	1.7E-08	1.0E-03	5.46E-01	1208	1215	3019.70	3183.66	3024.37	8.87
KFM10A	432.90	437.90	1.7E-08	1.0E-03	1.45E-02	1223	1200	3046.48	3258.21	3046.34	9.34
KFM10A	437.90	442.90	1.7E-08	1.0E-03	4.50E-04	1220	1200	3076.55	3315.33	3076.55	9.46
KFM10A	442.90	447.90	1.7E-08	1.0E-03	5.80E-05	1225	1197	3113.90	3312.04	3115.55	9.48
KFM10A	447.90	452.90	4.9E-09	1.0E-03		134	321	3143.02	3346.77	3340.18	9.51
KFM10A	452.90	457.90	5.0E-09	1.0E-03	1.14E-05	1226	1221	3202.88	3373.69	3234.19	9.55
KFM10A	457.90	462.90	4.9E-09	1.0E-03		69	321	3299.95	3402.79	3475.84	9.58
KFM10A	462.90	467.90	5.0E-09	1.0E-03	2.16E-05	1231	1221	3240.78	3431.00	3248.46	9.60
KFM10A	467.90	472.90	1.7E-08	1.0E-03	1.57E-04	1226	1194	3258.35	3457.13	3371.49	9.62
KFM10A	472.90	477.90	5.7E-09	1.0E-03		127	321	3294.46	3485.73	3487.93	9.66
KFM10A	477.90	482.90	1.7E-08	1.0E-03	2.10E-03	1223	1200	3311.62	3506.19	3314.37	9.71
KFM10A	482.90	487.90	1.7E-08	1.0E-03	1.98E-02	1223	1200	3341.83	3541.20	3347.32	9.65
KFM10A	487.90	492.90	4.9E-09	1.0E-03	1.86E-05	1230	1221	3403.76	3598.60	3379.73	9.73

idcode	secup	seclow	q_measl__l	q_measl__u	tot_volume_vp	dur_flow_phase_tp	dur_rec_phase_tf	initial_press_pi	press_at_flow_end_pp	final_press_pf	fluid_temp_tew
KFM10A[1]	282.90	302.90	1.7E-08	1.0E-03	2.26E-02	1233	1191	2089.32	2321.93	2284.31	8.61
KFM10A[2]	137.90	142.90	1.7E-08	-2.0E+00		497	37	1092.18	1329.99	1323.96	7.64
KFM10A[1]	302.90	307.90	1.7E-08	-1.0E+00	3.74E-04	1207	1206	2223.56	2454.37	2257.10	8.76
KFM10A[2]	332.90	337.90	1.7E-08	1.0E-03	1.66E-02	515	400	2430.10	2683.44	2653.64	8.84
KFM10A[1]	427.90	432.90	1.7E-08	1.0E-03	2.53E-01	1157	1214	3016.68	3059.93	3018.33	8.83

1) Complete test, re-performed later.
2) Incomplete test, interrupted and re-performed later.

KFM10A plu_s_hole_test_ed1. Left (This result table to SICADA includes more columns which are empty, these columns are not presented here.)

idcode	start_date	stop_date	secup	seclow	test_type	formation_type	spec_capacity_q_s	value_type_q_s	transmissivity_moye	value_type_tm	bc_tm	hydr_cond_moye	formation_width_b
KFM10A	20061214 11:23	20061214 14:01	62.90	162.90	3	1	1.06E-04	0	1.37E-04	0	0	1.37E-06	100.00
KFM10A	20061214 15:59	20061214 17:48	162.90	262.90	3	1	3.44E-09	0	4.49E-09	0	0	4.49E-11	100.00
KFM10A	20061215 09:55	20061215 11:44	262.90	362.90	3	1	1.57E-06	0	2.05E-06	0	0	2.05E-08	100.00
KFM10A	20061215 13:33	20061215 15:22	362.90	462.90	3	1	2.64E-05	0	3.44E-05	0	0	3.44E-07	100.00
KFM10A	20061219 12:53	20061219 16:02	62.90	82.90	3	1	4.34E-06	0	4.54E-06	0	0	2.27E-07	20.00
KFM10A	20061220 13:05	20061220 14:24	84.00	104.00	3	1	8.67E-05	0	9.07E-05	0	0	4.54E-06	20.00
KFM10A	20061220 14:59	20061220 16:15	102.90	122.90	3	1	1.96E-05	0	2.06E-05	0	0	1.03E-06	20.00
KFM10A	20061220 17:03	20061221 09:18	122.90	142.90	3	1	2.87E-09	0	3.01E-09	0	0	1.50E-10	20.00
KFM10A	20061221 09:42	20061221 10:57	142.90	162.90	3	1	8.24E-09	0	8.62E-09	0	0	4.31E-10	20.00
KFM10A	20061221 11:13	20061221 13:19	162.90	182.90	3	1	4.24E-09	0	4.44E-09	0	0	2.22E-10	20.00
KFM10A	20061221 13:41	20061221 14:32	182.90	202.90	3	1	1.91E-10	-1	2.00E-10	-1	0	1.00E-11	20.00
KFM10A	20061221 14:48	20061221 15:33	202.90	222.90	3	1	3.16E-10	-1	3.31E-10	-1	0	1.65E-11	20.00
KFM10A	20061221 15:49	20061221 17:05	222.90	242.90	3	1	4.63E-10	0	4.84E-10	0	0	2.42E-11	20.00
KFM10A	20061222 09:02	20061222 09:49	242.90	262.90	3	1	2.44E-10	-1	2.55E-10	-1	0	1.28E-11	20.00
KFM10A	20061222 10:13	20061222 11:32	262.90	282.90	3	1	8.21E-09	0	8.59E-09	0	0	4.30E-10	20.00
KFM10A	20070104 10:36	20070104 11:51	282.90	302.90	3	1	1.38E-07	0	1.44E-07	0	0	7.20E-09	20.00
KFM10A	20070102 08:29	20070102 10:01	302.90	322.90	3	1	1.63E-06	0	1.70E-06	0	0	8.52E-08	20.00
KFM10A	20070102 10:26	20070102 11:40	322.90	342.90	3	1	6.94E-07	0	7.27E-07	0	0	3.63E-08	20.00
KFM10A	20070102 12:46	20070102 14:06	342.90	362.90	3	1	1.09E-08	0	1.14E-08	0	0	5.71E-10	20.00
KFM10A	20070102 14:21	20070102 15:36	362.90	382.90	3	1	1.45E-08	0	1.52E-08	0	0	7.60E-10	20.00
KFM10A	20070102 15:58	20070102 16:49	382.90	402.90	3	1	2.44E-10	-1	2.55E-10	-1	0	1.28E-11	20.00
KFM10A	20070103 08:57	20070103 09:46	402.90	422.90	3	1	1.80E-10	-1	1.88E-10	-1	0	9.40E-12	20.00
KFM10A	20070103 10:03	20070103 11:18	422.90	442.90	3	1	2.63E-05	0	2.75E-05	0	0	1.38E-06	20.00
KFM10A	20070103 11:39	20070103 13:48	442.90	462.90	3	1	2.60E-09	0	2.72E-09	0	0	1.36E-10	20.00
KFM10A	20070103 14:06	20070103 15:20	462.90	482.90	3	1	7.68E-08	0	8.04E-08	0	0	4.02E-09	20.00
KFM10A	20070103 15:38	20070103 16:53	472.90	492.90	3	1	9.30E-07	0	9.73E-07	0	0	4.87E-08	20.00
KFM10A	20070105 13:55	20070105 15:12	62.90	67.90	3	1	1.09E-08	0	8.98E-09	0	0	1.80E-09	5.00
KFM10A	20070105 15:24	20070105 16:45	67.90	72.90	3	1	1.82E-07	0	1.50E-07	0	0	3.01E-08	5.00
KFM10A	20070108 08:35	20070108 09:49	72.90	77.90	3	1	1.23E-06	0	1.01E-06	0	0	2.03E-07	5.00

idcode	start_date	stop_date	secup	seclow	test_type	formation_type	spec_capacity_q_s	value_type_q_s	transmissivity_moye	value_type_tm	bc_tm	hydr_cond_moye	formation_width_b
KFM10A	20070108 10:00	20070108 11:14	77.90	82.90	3	1	2.77E-06	0	2.29E-06	0	0	4.57E-07	5.00
KFM10A	20070108 11:20	20070108 13:32	79.00	84.00	3	1	2.81E-06	0	2.32E-06	0	0	4.65E-07	5.00
KFM10A	20070108 13:46	20070108 14:59	84.00	89.00	3	1	2.96E-05	0	2.45E-05	0	0	4.89E-06	5.00
KFM10A	20070108 15:13	20070108 16:27	89.00	94.00	3	1	2.83E-05	0	2.34E-05	0	0	4.68E-06	5.00
KFM10A	20070108 16:41	20070108 17:55	94.00	99.00	3	1	4.84E-06	0	4.00E-06	0	0	8.00E-07	5.00
KFM10A	20070108 18:07	20070108 19:21	99.00	104.00	3	1	1.91E-05	0	1.58E-05	0	0	3.15E-06	5.00
KFM10A	20070108 19:39	20070108 20:52	102.90	107.90	3	1	2.31E-05	0	1.91E-05	0	0	3.81E-06	5.00
KFM10A	20070109 07:34	20070109 08:50	107.90	112.90	3	1	1.64E-08	0	1.35E-08	0	0	2.71E-09	5.00
KFM10A	20070109 09:05	20070109 10:22	112.90	117.90	3	1	6.13E-08	0	5.06E-08	0	0	1.01E-08	5.00
KFM10A	20070109 10:45	20070109 12:00	117.90	122.90	3	1	7.15E-08	0	5.90E-08	0	0	1.18E-08	5.00
KFM10A	20070109 13:06	20070109 14:47	122.90	127.90	3	1	9.19E-10	0	7.59E-10	0	0	1.52E-10	5.00
KFM10A	20070110 08:23	20070110 09:14	127.90	132.90	3	1	2.44E-10	-1	2.02E-10	-1	0	4.03E-11	5.00
KFM10A	20070110 09:31	20070110 10:46	132.90	137.90	3	1	7.94E-10	0	6.56E-10	0	0	1.31E-10	5.00
KFM10A	20070123 10:51	20070123 13:09	137.90	142.90	3	1	4.27E-10	0	3.52E-10	0	0	7.05E-11	5.00
KFM10A	20070110 12:51	20070110 14:05	142.90	147.90	3	1	5.90E-09	0	4.87E-09	0	0	9.75E-10	5.00
KFM10A	20070110 14:16	20070110 15:40	145.00	150.00	3	1	3.79E-10	0	3.13E-10	0	0	6.26E-11	5.00
KFM10A	20070110 15:51	20070110 16:31	150.00	155.00	3	1	2.50E-10	-1	2.06E-10	-1	0	4.13E-11	5.00
KFM10A	20070111 08:27	20070111 09:10	155.00	160.00	3	1	2.50E-10	-1	2.06E-10	-1	0	4.13E-11	5.00
KFM10A	20070111 09:20	20070111 10:03	157.90	162.90	3	1	2.50E-10	-1	2.06E-10	-1	0	4.13E-11	5.00
KFM10A	20070111 10:17	20070111 11:33	162.90	167.90	3	1	2.45E-09	0	2.03E-09	0	0	4.05E-10	5.00
KFM10A	20070111 12:36	20070111 13:53	167.90	172.90	3	1	7.84E-10	0	6.47E-10	0	0	1.29E-10	5.00
KFM10A	20070111 14:09	20070111 15:24	172.90	177.90	3	1	1.80E-09	0	1.49E-09	0	0	2.98E-10	5.00
KFM10A	20070111 15:37	20070111 16:20	177.90	182.90	3	1	2.44E-10	-1	2.02E-10	-1	0	4.03E-11	5.00
KFM10A	20070112 08:40	20070112 09:21	262.90	267.90	3	1	3.06E-10	-1	2.53E-10	-1	0	5.06E-11	5.00
KFM10A	20070112 09:35	20070112 10:49	267.90	272.90	3	1	3.13E-09	0	2.59E-09	0	0	5.18E-10	5.00
KFM10A	20070112 11:02	20070112 12:49	272.90	277.90	3	1	3.45E-09	0	2.85E-09	0	0	5.70E-10	5.00
KFM10A	20070112 13:01	20070112 13:59	277.90	282.90	3	1	2.86E-10	-1	2.36E-10	-1	0	4.72E-11	5.00
KFM10A	20070112 14:10	20070112 15:01	282.90	287.90	3	1	2.86E-10	-1	2.36E-10	-1	0	4.72E-11	5.00
KFM10A	20070112 15:11	20070112 15:50	287.90	292.90	3	1	2.86E-10	-1	2.36E-10	-1	0	4.72E-11	5.00
KFM10A	20070112 16:05	20070112 17:21	292.90	297.90	3	1	3.13E-10	-1	2.58E-10	-1	0	5.16E-11	5.00
KFM10A	20070115 08:31	20070115 09:45	297.90	302.90	3	1	1.34E-07	0	1.11E-07	0	1	2.21E-08	5.00
KFM10A	20070122 16:53	20070123 09:28	302.90	307.90	3	1	1.34E-08	0	1.11E-08	0	0	2.22E-09	5.00
KFM10A	20070115 11:27	20070115 13:33	307.90	312.90	3	1	4.13E-08	0	3.41E-08	0	1	6.82E-09	5.00
KFM10A	20070115 13:45	20070115 15:00	312.90	317.90	3	1	1.52E-06	0	1.26E-06	0	0	2.52E-07	5.00

idcode	start_date	stop_date	secup	seclow	test_type	formation_type	spec_capacity_q_s	value_type_q_s	transmissivity_moye	value_type_tm	bc_tm	hydr_cond_moye	formation_width_b
KFM10A	20070115 15:11	20070115 16:27	317.90	322.90	3	1	7.73E-08	0	6.38E-08	0	0	1.28E-08	5.00
KFM10A	20070115 16:39	20070116 09:17	322.90	327.90	3	1	6.39E-07	0	5.28E-07	0	0	1.06E-07	5.00
KFM10A	20070116 09:34	20070116 10:52	327.90	332.90	3	1	6.57E-07	0	5.43E-07	0	0	1.09E-07	5.00
KFM10A	20070122 15:18	20070122 16:32	332.90	337.90	3	1	1.47E-07	0	1.21E-07	0	0	2.42E-08	5.00
KFM10A	20070116 13:01	20070116 14:19	337.90	342.90	3	1	3.12E-09	0	2.58E-09	0	0	5.16E-10	5.00
KFM10A	20070116 14:37	20070116 15:53	342.90	347.90	3	1	3.28E-09	0	2.70E-09	0	0	5.41E-10	5.00
KFM10A	20070116 16:10	20070116 16:53	347.90	352.90	3	1	2.44E-10	-1	2.02E-10	-1	0	4.03E-11	5.00
KFM10A	20070117 08:29	20070117 09:46	352.90	357.90	3	1	6.90E-09	0	5.70E-09	0	0	1.14E-09	5.00
KFM10A	20070117 09:57	20070117 10:44	357.90	362.90	3	1	2.54E-10	-1	2.09E-10	-1	0	4.19E-11	5.00
KFM10A	20070117 10:58	20070117 11:41	362.90	367.90	3	1	2.44E-10	-1	2.02E-10	-1	0	4.03E-11	5.00
KFM10A	20070117 13:11	20070117 14:29	367.90	372.90	3	1	1.85E-09	0	1.53E-09	0	0	3.06E-10	5.00
KFM10A	20070117 14:41	20070117 15:57	372.90	377.90	3	1	1.08E-08	0	8.95E-09	0	1	1.79E-09	5.00
KFM10A	20070117 16:12	20070117 17:27	377.90	382.90	3	1	2.96E-10	0	2.44E-10	0	1	4.89E-11	5.00
KFM10A	20070118 08:48	20070118 09:33	422.90	427.90	3	1	2.44E-10	-1	2.02E-10	-1	0	4.03E-11	5.00
KFM10A	20070122 13:06	20070122 14:29	427.90	432.90	3	1	2.57E-05	0	2.13E-05	0	0	4.25E-06	5.00
KFM10A	20070118 11:19	20070118 12:32	432.90	437.90	3	1	5.06E-07	0	4.18E-07	0	0	8.35E-08	5.00
KFM10A	20070118 13:34	20070118 14:51	437.90	442.90	3	1	1.42E-08	0	1.17E-08	0	0	2.34E-09	5.00
KFM10A	20070118 15:12	20070118 16:29	442.90	447.90	3	1	2.05E-09	0	1.69E-09	0	0	3.38E-10	5.00
KFM10A	20070118 16:42	20070119 08:06	447.90	452.90	3	1	2.44E-10	-1	2.02E-10	-1	0	4.03E-11	5.00
KFM10A	20070119 08:18	20070119 09:31	452.90	457.90	3	1	3.54E-10	0	2.92E-10	0	0	5.85E-11	5.00
KFM10A	20070119 09:42	20070119 10:21	457.90	462.90	3	1	2.44E-10	-1	2.02E-10	-1	0	4.03E-11	5.00
KFM10A	20070119 10:30	20070119 11:44	462.90	467.90	3	1	6.45E-10	0	5.33E-10	0	0	1.07E-10	5.00
KFM10A	20070119 12:28	20070119 13:42	467.90	472.90	3	1	2.67E-09	0	2.20E-09	0	0	4.40E-10	5.00
KFM10A	20070119 13:54	20070119 14:36	472.90	477.90	3	1	2.85E-10	-1	2.35E-10	-1	0	4.70E-11	5.00
KFM10A	20070119 14:48	20070119 16:04	477.90	482.90	3	1	7.79E-08	0	6.44E-08	0	0	1.29E-08	5.00
KFM10A	20070122 08:26	20070122 09:41	482.90	487.90	3	1	7.16E-07	0	5.91E-07	0	0	1.18E-07	5.00
KFM10A	20070122 09:53	20070122 11:08	487.90	492.90	3	1	6.93E-10	0	5.72E-10	0	0	1.14E-10	5.00
KFM10A[1)]	20061222 11:57	20061222 13:56	282.90	302.90	3	1	5.08E-08	0	5.32E-08	0	0	2.66E-09	20.00
KFM10A[2)]	20070110 10:58	20070110 12:39	137.90	142.90	3	1	8.33E-10	-1	6.88E-10	-1	0	1.38E-10	5.00
KFM10A[1)]	20070115 09:58	20070115 11:17	302.90	307.90	3	1	1.27E-08	0	1.05E-08	0	0	2.09E-09	5.00
KFM10A[2)]	20070116 11:05	20070116 12:47	332.90	337.90	3	1	9.41E-09	0	7.77E-09	0	0	1.55E-09	5.00
KFM10A[1)]	20070118 09:50	20070118 11:05	427.90	432.90	3	1	4.86E-05	0	4.01E-05	0	0	8.02E-06	5.00

[1)] Complete test, re-performed later.
[2)] Incomplete test, interrupted and re-performed later.

KFM10A plu_s_hole_test_ed1. Right (This result table to SICADA includes more columns which are empty, these columns are not presented here.)

idcode	secup	seclow	transmissivity_tt	value_type_tt	bc_tt	l_measl_q_s	u_measl_q_s	assumed_s	bc_s	ri	ri_index	c	skin	t1	t2	dte1	dte2
KFM10A	62.90	162.90	1.39E-04	0	1	2.5E-09	5.0E-04	8.24E-06	8.24E-06	261.11	0		-0.58	200	1801		
KFM10A	162.90	262.90	1.16E-09	0	1	2.3E-10	5.0E-04	2.38E-08	2.38E-08	13.98	1	2.73E-10	-5.60				
KFM10A	262.90	362.90	7.89E-07	0	1	8.9E-10	5.0E-04	6.22E-07	6.22E-07	71.90	1		-6.77				
KFM10A	362.90	462.90	2.57E-05	0	1	1.1E-09	5.0E-04	3.55E-06	3.55E-06	171.08	-1		-1.98				
KFM10A	62.90	82.90	5.19E-06	0	1	7.7E-10	5.0E-04	1.59E-06	1.59E-06	93.94	-1		-0.02				
KFM10A	84.00	104.00	1.67E-04	0	1	2.3E-09	5.0E-04	9.05E-06	9.05E-06	224.00	0		3.38	300	1208		
KFM10A	102.90	122.90	3.32E-05	0	1	8.2E-10	5.0E-04	4.03E-06	4.03E-06	149.58	-1		2.92				
KFM10A	122.90	142.90	1.59E-09	0	1	1.9E-10	5.0E-04	2.79E-08	2.79E-08	12.51	0	7.13E-11	-2.44	50	1220		
KFM10A	142.90	162.90	4.20E-09	0	1	8.2E-10	5.0E-04	4.54E-08	4.54E-08	15.94	0	8.61E-11	-2.87	100	1220		
KFM10A	162.90	182.90	3.33E-09	0	1	1.9E-10	5.0E-04	4.04E-08	4.04E-08	4.31	1		-2.43	10	100		
KFM10A	182.90	202.90		-1	0	1.9E-10	5.0E-04										
KFM10A	202.90	222.90		-1	0	3.2E-10	5.0E-04										
KFM10A	222.90	242.90	8.22E-10	0	1	1.6E-10	5.0E-04	2.01E-08	2.01E-08	10.61	1		-5.09				
KFM10A	242.90	262.90		-1	0	2.4E-10	5.0E-04										
KFM10A	262.90	282.90	8.23E-09	0	1	3.4E-10	5.0E-04	6.35E-08	6.35E-08	15.27	1	9.45E-11	-3.26			50	800
KFM10A	282.90	302.90	1.41E-07	0	1	7.7E-10	5.0E-04	2.63E-07	2.63E-07	38.09	1		-7.22				
KFM10A	302.90	322.90	7.09E-07	0	1	9.3E-10	5.0E-04	5.89E-07	5.89E-07	57.24	1						
KFM10A	322.90	342.90	1.22E-07	0	1	7.4E-10	5.0E-04	2.44E-07	2.44E-07	36.82	1		-6.72				
KFM10A	342.90	362.90	2.85E-09	0	1	8.1E-10	5.0E-04	3.73E-08	3.73E-08	14.49	-1	5.01E-10	-4.20				
KFM10A	362.90	382.90	3.07E-09	0	1	8.2E-10	5.0E-04	3.88E-08	3.88E-08	14.77	-1	2.46E-10	-4.11				
KFM10A	382.90	402.90		-1	0	2.4E-10	5.0E-04										
KFM10A	402.90	422.90		-1	0	1.8E-10	5.0E-04										
KFM10A	422.90	442.90	1.46E-05	0	1	1.1E-09	5.0E-04	2.67E-06	2.67E-06	121.40	-1		-4.16				
KFM10A	442.90	462.90	2.59E-09	0	1	6.5E-10	5.0E-04	3.56E-08	3.56E-08	14.15	0	5.56E-11	0.19	200	1224		
KFM10A	462.90	482.90	2.20E-08	0	1	8.0E-10	5.0E-04	1.04E-07	1.04E-07	11.96	-1		-4.44	80	300		
KFM10A	472.90	492.90	6.10E-07	0	1	8.3E-10	5.0E-04	5.47E-07	5.47E-07	44.81	-1		-3.05	100	800		

idcode	secup	seclow	transmissivity_tt	value_type_tt	bc_tt	l_measl_q_s	u_measl_q_s	assumed_s	bc_s	ri	ri_index	c	skin	t1	t2	dte1	dte2
KFM10A	62.90	67.90	6.01E-09	0	1	7.4E-10	5.0E-04	5.43E-08	5.43E-08	17.45	0		-1.95				
KFM10A	67.90	72.90	3.51E-07	0	1	8.2E-10	5.0E-04	4.15E-07	4.15E-07	48.02	0		5.24				
KFM10A	72.90	77.90	4.22E-06	0	1	8.2E-10	5.0E-04	1.44E-06	1.44E-06	89.70	0		13.73	100	1218		
KFM10A	77.90	82.90	3.45E-06	0	1	7.8E-10	5.0E-04	1.30E-06	1.30E-06	85.27	-1		0.56				
KFM10A	79.00	84.00	6.41E-06	0	1	1.1E-09	5.0E-04	1.77E-06	1.77E-06	99.44	-1		6.74				
KFM10A	84.00	89.00	1.06E-04	0	1	2.0E-09	5.0E-04	7.21E-06	7.21E-06	200.73	0		13.93	300	1217		
KFM10A	89.00	94.00	9.13E-05	0	1	1.2E-09	5.0E-04	6.69E-06	6.69E-06	192.78	0		11.69	200	1210		
KFM10A	94.00	99.00	1.43E-05	0	1	8.2E-10	5.0E-04	2.65E-06	2.65E-06	121.29	0		10.51	100	1209		
KFM10A	99.00	104.00	1.17E-04	0	1	1.1E-09	5.0E-04	7.57E-06	7.57E-06	204.77	0		29.99	300	1206		
KFM10A	102.90	107.90	5.93E-05	0	1	1.1E-09	5.0E-04	5.39E-06	5.39E-06	173.06	-1		8.13				
KFM10A	107.90	112.90	4.01E-08	0	1	7.8E-10	5.0E-04	1.40E-07	1.40E-07	28.03	0		8.70	150	1221		
KFM10A	112.90	117.90	1.23E-07	0	1	1.1E-09	5.0E-04	2.45E-07	2.45E-07	37.10	0		6.44	100	1223		
KFM10A	117.90	122.90	1.48E-07	0	1	7.5E-10	5.0E-04	2.69E-07	2.69E-07	38.78	0		5.97	80	1218		
KFM10A	122.90	127.90	8.00E-10	0	1	6.5E-10	5.0E-04	1.98E-08	1.98E-08	5.22	1	1.46E-11	-0.42	20	300		
KFM10A	127.90	132.90		-1	0	2.4E-10	5.0E-04										
KFM10A	132.90	137.90	1.74E-10	0	1	6.5E-10	5.0E-04	9.23E-09	9.23E-09	7.20	1	1.88E-11	-4.19				
KFM10A	137.90	142.90	1.20E-10	0	1	2.6E-10	5.0E-04	7.66E-09	7.66E-09	6.58	0	1.53E-11	-3.57	10	1230		
KFM10A	142.90	147.90	3.08E-09	0	1	9.3E-10	5.0E-04	3.88E-08	3.88E-08	14.75	0		-2.82	150	1220		
KFM10A	145.00	150.00	2.62E-10	0	1	2.1E-10	5.0E-04	1.13E-08	1.13E-08	7.98	0	1.63E-11	-1.03	20	1222		
KFM10A	150.00	155.00		-1	0	2.5E-10	5.0E-04										
KFM10A	155.00	160.00		-1	0	2.5E-10	5.0E-04										
KFM10A	157.90	162.90		-1	0	2.5E-10	5.0E-04										
KFM10A	162.90	167.90	2.82E-09	0	1	6.9E-10	5.0E-04	3.71E-08	3.71E-08	5.06	1	2.04E-11	-0.22	25	150		
KFM10A	167.90	172.90	3.75E-10	0	1	7.2E-10	5.0E-04	1.36E-08	1.36E-08	8.72	0	1.74E-11	-2.55	10	1222		
KFM10A	172.90	177.90	2.27E-09	0	1	7.2E-10	5.0E-04	3.34E-08	3.34E-08	2.77	1	1.90E-11	-1.12	15	50		
KFM10A	177.90	182.90		-1	0	2.4E-10	5.0E-04										
KFM10A	262.90	267.90		-1	0	3.1E-10	5.0E-04										
KFM10A	267.90	272.90	2.33E-09	0	1	6.9E-10	5.0E-04	3.38E-08	3.38E-08	3.29	1		-4.13	25	70		
KFM10A	272.90	277.90	4.92E-09	0	1	6.9E-10	5.0E-04	4.91E-08	4.91E-08	9.50	1	2.35E-11	2.01	10	400		
KFM10A	277.90	282.90		-1	0	2.9E-10	5.0E-04										
KFM10A	282.90	287.90		-1	0	2.9E-10	5.0E-04										

idcode	secup	seclow	transmissivity_tt	value_type_tt	bc_tt	l_measl_q_s	u_measl_q_s	assumed_s	bc_s	ri	ri_index	c	skin	t1	t2	dte1	dte2
KFM10A	287.90	292.90		-1	0	2.9E-10	5.0E-04										
KFM10A	292.90	297.90		-1	0	3.1E-10	5.0E-04										
KFM10A	297.90	302.90	1.45E-07	0	0	7.7E-10	5.0E-04	2.33E-07	2.33E-07	36.24	1		-7.19				
KFM10A	302.90	307.90	3.20E-08	0	1	7.6E-10	5.0E-04	1.25E-07	1.25E-07	26.50	1		7.89				
KFM10A	307.90	312.90	9.51E-08	0	0	1.1E-09	5.0E-04	1.29E-07	1.29E-07	26.99	1		-6.30				
KFM10A	312.90	317.90	6.14E-07	0	1	8.8E-10	5.0E-04	5.48E-07	5.48E-07	55.18	0		-6.61				
KFM10A	317.90	322.90	2.19E-07	0	1	8.7E-10	5.0E-04	3.27E-07	3.27E-07	42.87	0		10.70	80	1223		
KFM10A	322.90	327.90	3.35E-07	0	1	8.1E-10	5.0E-04	4.05E-07	4.05E-07	16.71	1		-4.75	30	150		
KFM10A	327.90	332.90	3.24E-07	0	1	8.2E-10	5.0E-04	3.98E-07	3.98E-07	23.43	1		-4.56	50	300		
KFM10A	332.90	337.90	5.14E-08	0	1	6.5E-10	5.0E-04	1.59E-07	1.59E-07	29.52	1		-7.40				
KFM10A	337.90	342.90	1.47E-09	0	1	2.3E-10	5.0E-04	2.68E-08	2.68E-08	10.52	0		-3.48			100	900
KFM10A	342.90	347.90	6.48E-10	0	1	1.6E-10	5.0E-04	1.78E-08	1.78E-08	10.04	-1	4.13E-10	-4.69				
KFM10A	347.90	352.90		-1	0	2.4E-10	5.0E-04										
KFM10A	352.90	357.90	6.79E-09	0	1	1.6E-10	5.0E-04	5.77E-08	5.77E-08	18.00	0		-0.02	30	1224		
KFM10A	357.90	362.90		-1	0	2.5E-10	5.0E-04										
KFM10A	362.90	367.90		-1	0	2.4E-10	5.0E-04										
KFM10A	367.90	372.90	9.96E-10	0	1	2.1E-10	5.0E-04	2.21E-08	2.21E-08	11.17	-1	1.99E-11	-1.21				
KFM10A	372.90	377.90		0	0	8.2E-10	5.0E-04	6.62E-08	6.62E-08	19.32		1.95E-10					
KFM10A	377.90	382.90		0	0	2.3E-10	5.0E-04	1.09E-08	1.09E-08	7.86							
KFM10A	422.90	427.90		-1	0	2.4E-10	5.0E-04										
KFM10A	427.90	432.90	2.55E-05	0	1	1.0E-09	5.0E-04	3.53E-06	3.53E-06	69.77	-1		-1.75	100	300		
KFM10A	432.90	437.90	1.19E-06	0	1	7.7E-10	5.0E-04	7.63E-07	7.63E-07	49.52	1		6.61	100	700		
KFM10A	437.90	442.90	2.23E-08	0	1	6.8E-10	5.0E-04	1.04E-07	1.04E-07	24.19	0		3.18	100	1220		
KFM10A	442.90	447.90	1.79E-09	0	1	8.3E-10	5.0E-04	2.96E-08	2.96E-08	12.91	0	1.66E-11	-0.25	20	1225		
KFM10A	447.90	452.90		-1	0	2.4E-10	5.0E-04										
KFM10A	452.90	457.90	2.07E-10	0	1	2.9E-10	5.0E-04	1.01E-08	1.01E-08	7.51	-1	1.22E-11	-1.69				
KFM10A	457.90	462.90		-1	0	2.4E-10	5.0E-04										
KFM10A	462.90	467.90	6.05E-10	0	1	2.6E-10	5.0E-04	1.72E-08	1.72E-08	9.87	0	1.27E-11	0.58	20	1231		
KFM10A	467.90	472.90	1.86E-09	0	1	8.2E-10	5.0E-04	3.02E-08	3.02E-08	2.88	1		-4.60	10	60		
KFM10A	472.90	477.90		-1	0	2.8E-10	5.0E-04										
KFM10A	477.90	482.90	3.09E-08	0	1	8.4E-10	5.0E-04	1.23E-07	1.23E-07	9.20	-1		-3.74	30	150		
KFM10A	482.90	487.90	5.10E-07	0	1	8.2E-10	5.0E-04	5.00E-07	5.00E-07	33.88	-1		-0.53	50	500		

idcode	secup	seclow	transmissivity_tt	value_type_tt	bc_tt	l_measl_q_s	u_measl_q_s	assumed_s	bc_s	ri	ri_index	c	skin	t1	t2	dte1	dte2
KFM10A	487.90	492.90	3.64E-10	0	1	2.5E-10	5.0E-04	1.33E-08	1.33E-08	6.55	-1	1.40E-11	-1.66	40	700		
KFM10A[1)]	282.90	302.90		0	0	7.0E-10	5.0E-04	0.00E+00	0.00E+00	0.00							
KFM10A[2)]	137.90	142.90		-1	0	8.3E-10	5.0E-04	0.00E+00	0.00E+00	0.00							
KFM10A[1)]	302.90	307.90		0	0	7.1E-10	5.0E-04	0.00E+00	0.00E+00	0.00							
KFM10A[2)]	332.90	337.90		0	0	6.5E-10	5.0E-04	0.00E+00	0.00E+00	0.00							
KFM10A[1)]	427.90	432.90		0	0	3.8E-09	5.0E-04	0.00E+00	0.00E+00	0.00							

[1)] Incomplete test, interrupted and re-performed later.
[2)] The test was performed at an incorrect position and therefore not evaluated.

KFM010A plu_s_hole_test_obs. Injection tests (This result table to SICADA includes more columns which are empty, these columns are not presented here.)

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM10A	20061214 11:23	20061214 14:01	62.90	162.90	60.73	61.90	542.80	538.03	541.31				
KFM10A	20061214 11:23	20061214 14:01	62.90	162.90	163.90	500.16				0.00	0.00	0.00	
KFM10A	20061214 15:59	20061214 17:48	162.90	262.90	60.73	161.90	524.53	524.67	524.53				
KFM10A	20061214 15:59	20061214 17:48	162.90	262.90	263.90	500.16				0.00	0.00	0.00	
KFM10A	20061215 09:55	20061215 11:44	262.90	362.90	60.73	261.90	469.53	469.67	469.53				
KFM10A	20061215 09:55	20061215 11:44	262.90	362.90	363.90	500.16				0.00	0.00	0.00	
KFM10A	20061215 13:33	20061215 15:22	362.90	462.90	60.73	361.90	378.35	378.49	378.49				
KFM10A	20061215 13:33	20061215 15:22	362.90	462.90	463.90	500.16				0.00	0.00	0.00	
KFM10A	20061219 12:53	20061219 16:02	62.90	82.90	60.73	61.90	546.70	546.14	546.14				
KFM10A	20061219 12:53	20061219 16:02	62.90	82.90	83.90	500.16				699.91	701.28	700.05	
KFM10A	20061221 13:41	20061221 14:32	182.90	202.90	60.73	181.90	519.35	519.35	519.35				
KFM10A	20061221 13:41	20061221 14:32	182.90	202.90	203.90	500.16				1562.27	1562.13	1562.27	
KFM10A	20061220 14:59	20061220 16:15	102.90	122.90	60.73	101.90	540.86	548.50	543.04				
KFM10A	20061220 14:59	20061220 16:15	102.90	122.90	123.90	500.16				990.38	989.98	990.38	
KFM10A	20061220 17:03	20061221 09:18	122.90	142.90	60.73	121.90	537.39	537.12	537.39				
KFM10A	20061220 17:03	20061221 09:18	122.90	142.90	143.90	500.16				1134.72	1134.72	1134.72	
KFM10A	20061221 09:42	20061221 10:57	142.90	162.90	60.73	141.90	532.42	532.70	532.84				
KFM10A	20061221 09:42	20061221 10:57	142.90	162.90	163.90	500.16				1278.80	1278.80	1278.52	
KFM10A	20061221 11:13	20061221 13:19	162.90	182.90	60.73	161.90	526.23	526.64	526.09				
KFM10A	20061221 11:13	20061221 13:19	162.90	182.90	183.90	500.16				1421.22	1421.22	1420.67	
KFM10A	20061221 13:41	20061221 14:32	182.90	202.90	60.73	181.90	519.35	519.35	519.35				
KFM10A	20061221 13:41	20061221 14:32	182.90	202.90	203.90	500.16				1562.27	1562.13	1562.27	
KFM10A	20061221 14:48	20061221 15:33	202.90	222.90	60.73	201.90	510.29	510.29	510.43				
KFM10A	20061221 14:48	20061221 15:33	202.90	222.90	223.90	500.16				1701.68	1701.27	1701.13	
KFM10A	20061221 15:49	20061221 17:05	222.90	242.90	60.73	221.90	500.00	499.86	499.86				
KFM10A	20061221 15:49	20061221 17:05	222.90	242.90	243.90	500.16				1839.02	1838.88	1838.88	
KFM10A	20061222 09:02	20061222 09:49	242.90	262.90	60.73	241.90	488.20	488.07	488.20				

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM10A	20061222 09:02	20061222 09:49	242.90	262.90	263.90	500.16				1975.55	1974.18	1972.80	
KFM10A	20061222 10:13	20061222 11:32	262.90	282.90	60.73	261.90	474.50	474.92	474.92				
KFM10A	20061222 10:13	20061222 11:32	262.90	282.90	283.90	500.16				2109.46	2110.01	2110.01	
KFM10A	20070104 10:36	20070104 11:51	282.90	302.90	60.73	281.90	458.89	458.34	458.34				
KFM10A	20070104 10:36	20070104 11:51	282.90	302.90	303.90	500.16				2237.34	2237.89	2237.89	
KFM10A	20070102 08:29	20070102 10:01	302.90	322.90	60.73	301.90	442.32	442.46	442.32				
KFM10A	20070102 08:29	20070102 10:01	302.90	322.90	323.90	500.16				2369.62	2370.30	2370.17	
KFM10A	20070102 10:26	20070102 11:40	322.90	342.90	60.73	321.90	423.30	423.57	423.57				
KFM10A	20070102 10:26	20070102 11:40	322.90	342.90	343.90	500.16				2498.59	2498.32	2498.59	
KFM10A	20070102 12:46	20070102 14:06	342.90	362.90	60.73	341.90	402.08	401.81	402.08				
KFM10A	20070102 12:46	20070102 14:06	342.90	362.90	363.90	500.16				2625.38	2625.38	2625.38	
KFM10A	20070102 14:21	20070102 15:36	362.90	382.90	60.73	361.90	378.96	379.23	379.50				
KFM10A	20070102 14:21	20070102 15:36	362.90	382.90	383.90	500.16				2750.23	2750.09	2750.51	
KFM10A	20070102 15:58	20070102 16:49	382.90	402.90	60.73	381.90	354.74	355.01	354.74				
KFM10A	20070102 15:58	20070102 16:49	382.90	402.90	403.90	500.16				2874.00	2874.00	2874.00	
KFM10A	20070103 08:57	20070103 09:46	402.90	422.90	60.73	401.90	329.30	329.43	329.43				
KFM10A	20070103 08:57	20070103 09:46	402.90	422.90	423.90	500.16				2996.26	2995.84	2995.84	
KFM10A	20070103 10:03	20070103 11:18	422.90	442.90	60.73	421.90	301.26	301.67	301.40				
KFM10A	20070103 10:03	20070103 11:18	422.90	442.90	443.90	500.16				3116.17	3137.58	3123.17	
KFM10A	20070103 11:39	20070103 13:48	442.90	462.90	60.73	441.90	271.17	271.03	271.17				
KFM10A	20070103 11:39	20070103 13:48	442.90	462.90	463.90	500.16				3233.49	3233.49	3232.94	
KFM10A	20070103 14:06	20070103 15:20	462.90	482.90	60.73	461.90	238.76	238.76	238.76				
KFM10A	20070103 14:06	20070103 15:20	462.90	482.90	483.90	500.16				3348.75	3349.02	3348.75	
KFM10A	20070103 15:38	20070103 16:53	472.90	492.90	60.73	471.90	222.16	222.02	222.02				
KFM10A	20070103 15:38	20070103 16:53	472.90	492.90	493.90	500.16				3408.57	3423.67	3416.81	
KFM10A	20070105 13:55	20070105 15:12	62.90	67.90	60.73	61.90	543.42	543.42	543.42				
KFM10A	20070105 13:55	20070105 15:12	62.90	67.90	68.90	500.16				581.57	581.57	581.57	
KFM10A	20070105 15:24	20070105 16:45	67.90	72.90	60.73	66.90	542.40	542.40	542.40				
KFM10A	20070105 15:24	20070105 16:45	67.90	72.90	73.90	500.16				618.76	618.76	618.34	
KFM10A	20070108 08:35	20070108 09:49	72.90	77.90	60.73	71.90	540.32	540.32	540.32				

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM10A	20070108 08:35	20070108 09:49	72.90	77.90	78.90	500.16				654.70	655.12	654.56	
KFM10A	20070108 10:00	20070108 11:14	77.90	82.90	60.73	76.90	540.27	539.87	539.87				
KFM10A	20070108 10:00	20070108 11:14	77.90	82.90	83.90	500.16				691.75	692.30	691.89	
KFM10A	20070108 11:20	20070108 13:32	79.00	84.00	60.73	78.00	539.78	539.78	539.78				
KFM10A	20070108 11:20	20070108 13:32	79.00	84.00	85.00	500.16				699.57	700.12	699.57	
KFM10A	20070108 13:46	20070108 14:59	84.00	89.00	60.73	83.00	538.78	538.24	539.33				
KFM10A	20070108 13:46	20070108 14:59	84.00	89.00	90.00	500.16				736.07	738.54	736.35	
KFM10A	20070108 15:13	20070108 16:27	89.00	94.00	60.73	88.00	538.32	546.79	541.60				
KFM10A	20070108 15:13	20070108 16:27	89.00	94.00	95.00	500.16				772.98	776.96	773.66	
KFM10A	20070108 16:41	20070108 17:55	94.00	99.00	60.73	93.00	538.41	540.46	538.41				
KFM10A	20070108 16:41	20070108 17:55	94.00	99.00	100.00	500.16				810.30	811.53	810.43	
KFM10A	20070108 18:07	20070108 19:21	99.00	104.00	60.73	98.00	537.55	540.14	537.95				
KFM10A	20070108 18:07	20070108 19:21	99.00	104.00	105.00	500.16				846.65	851.18	847.21	
KFM10A	20070108 19:39	20070108 20:52	102.90	107.90	60.73	101.90	536.76	544.13	538.67				
KFM10A	20070108 19:39	20070108 20:52	102.90	107.90	108.90	500.16				875.20	875.89	875.20	
KFM10A	20070109 07:34	20070109 08:50	107.90	112.90	60.73	106.90	536.44	536.30	536.57				
KFM10A	20070109 07:34	20070109 08:50	107.90	112.90	113.90	500.16				911.98	912.11	911.98	
KFM10A	20070109 09:05	20070109 10:22	112.90	117.90	60.73	111.90	535.44	535.44	535.02				
KFM10A	20070109 09:05	20070109 10:22	112.90	117.90	118.90	500.16				948.33	948.33	945.45	
KFM10A	20070109 10:45	20070109 12:00	117.90	122.90	60.73	116.90	534.03	534.03	533.48				
KFM10A	20070109 10:45	20070109 12:00	117.90	122.90	123.90	500.16				984.43	984.15	983.87	
KFM10A	20070109 13:06	20070109 14:47	122.90	127.90	60.73	121.90	532.20	531.93	531.93				
KFM10A	20070109 13:06	20070109 14:47	122.90	127.90	128.90	500.16				1019.55	1019.41	1019.55	
KFM10A	20070110 08:23	20070110 09:14	127.90	132.90	60.73	126.90	531.88	532.16	532.02				
KFM10A	20070110 08:23	20070110 09:14	127.90	132.90	133.90	500.16				1057.55	1056.87	1054.12	
KFM10A	20070110 09:31	20070110 10:46	132.90	137.90	60.73	131.90	531.02	530.88	531.02				
KFM10A	20070110 09:31	20070110 10:46	132.90	137.90	138.90	500.16				1093.09	1093.09	1093.09	
KFM10A	20070123 10:51	20070123 13:09	137.90	142.90	60.73	136.90	0.00	0.00	0.00				
KFM10A	20070123 10:51	20070123 13:09	137.90	142.90	143.90	500.16				1132.05	1132.05	1132.05	
KFM10A	20070110 12:51	20070110 14:05	142.90	147.90	60.73	141.90	528.47	528.47	528.47				
KFM10A	20070110 12:51	20070110 14:05	142.90	147.90	148.90	500.16				1165.27	1165.41	1165.55	
KFM10A	20070110 14:16	20070110 15:40	145.00	150.00	60.73	144.00	527.83	527.42	527.42				

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM10A	20070110 14:16	20070110 15:40	145.00	150.00	151.00	500.16				1180.36	1180.36	1180.36	
KFM10A	20070110 15:51	20070110 16:31	150.00	155.00	60.73	149.00	525.87	526.28	525.87				
KFM10A	20070110 15:51	20070110 16:31	150.00	155.00	156.00	500.16				1216.04	1216.04	1216.04	
KFM10A	20070111 08:27	20070111 09:10	155.00	160.00	60.73	154.00	524.88	524.88	524.88				
KFM10A	20070111 08:27	20070111 09:10	155.00	160.00	161.00	500.16				1252.26	1252.26	1252.26	
KFM10A	20070111 09:20	20070111 10:03	157.90	162.90	60.73	156.90	523.82	523.82	523.82				
KFM10A	20070111 09:20	20070111 10:03	157.90	162.90	163.90	500.16				1273.11	1273.11	1273.11	
KFM10A	20070111 10:17	20070111 11:33	162.90	167.90	60.73	161.90	522.27	522.27	522.27				
KFM10A	20070111 10:17	20070111 11:33	162.90	167.90	168.90	500.16				1309.34	1308.78	1308.78	
KFM10A	20070111 12:36	20070111 13:53	167.90	172.90	60.73	166.90	1831.33	1466.13	1453.99				
KFM10A	20070111 12:36	20070111 13:53	167.90	172.90	173.90	500.16				1344.46	1344.46	1344.46	
KFM10A	20070111 14:09	20070111 15:24	172.90	177.90	60.73	171.90	1497.76	1327.52	1428.96				
KFM10A	20070111 14:09	20070111 15:24	172.90	177.90	178.90	500.16				1380.13	1380.13	1379.58	
KFM10A	20070111 15:37	20070111 16:20	177.90	182.90	60.73	176.90	1589.73	1580.86	1620.17				
KFM10A	20070111 15:37	20070111 16:20	177.90	182.90	183.90	500.16				1415.26	1415.53	1415.26	
KFM10A	20070112 08:40	20070112 09:21	262.90	267.90	60.73	261.90	0.00	0.00	0.00				
KFM10A	20070112 08:40	20070112 09:21	262.90	267.90	268.90	500.16				2004.72	2004.58	2004.72	
KFM10A	20070112 09:35	20070112 10:49	267.90	272.90	60.73	266.90	0.00	0.00	0.00				
KFM10A	20070112 09:35	20070112 10:49	267.90	272.90	273.90	500.16				2038.60	2038.60	2038.19	
KFM10A	20070112 11:02	20070112 12:49	272.90	277.90	60.73	271.90	0.00	0.00	0.00				
KFM10A	20070112 11:02	20070112 12:49	272.90	277.90	278.90	500.16				2072.23	2072.23	2072.23	
KFM10A	20070112 13:01	20070112 13:59	277.90	282.90	60.73	276.90	0.00	0.00	0.00				
KFM10A	20070112 13:01	20070112 13:59	277.90	282.90	283.90	500.16				2105.70	2105.70	2105.70	
KFM10A	20070112 14:10	20070112 15:01	282.90	287.90	60.73	281.90	0.00	0.00	0.00				
KFM10A	20070112 14:10	20070112 15:01	282.90	287.90	288.90	500.16				2139.04	2139.18	2139.18	
KFM10A	20070112 15:11	20070112 15:50	287.90	292.90	60.73	286.90	0.00	0.00	0.00				
KFM10A	20070112 15:11	20070112 15:50	287.90	292.90	293.90	500.16				2172.11	2172.11	2172.11	
KFM10A	20070112 16:05	20070112 17:21	292.90	297.90	60.73	291.90	0.00	0.00	0.00				
KFM10A	20070112 16:05	20070112 17:21	292.90	297.90	298.90	500.16				2205.04	2205.04	2205.04	
KFM10A	20070115 08:31	20070115 09:45	297.90	302.90	60.73	296.90	0.00	0.00	0.00				
KFM10A	20070115 08:31	20070115 09:45	297.90	302.90	303.90	500.16				2239.75	2240.03	2239.61	
KFM10A	20070122 16:53	20070123 09:28	302.90	307.90	60.73	301.90	0.00	0.00	0.00				

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM10A	20070122 16:53	20070123 09:28	302.90	307.90	308.90	500.16				2274.19	2274.05	2274.19	
KFM10A	20070115 11:27	20070115 13:33	307.90	312.90	60.73	306.90	0.00	0.00	0.00				
KFM10A	20070115 11:27	20070115 13:33	307.90	312.90	313.90	500.16				2304.94	2304.94	2304.94	
KFM10A	20070115 13:45	20070115 15:00	312.90	317.90	60.73	311.90	0.00	0.00	0.00				
KFM10A	20070115 13:45	20070115 15:00	312.90	317.90	318.90	500.16				2337.58	2337.86	2337.86	
KFM10A	20070115 15:11	20070115 16:27	317.90	322.90	60.73	316.90	0.00	0.00	0.00				
KFM10A	20070115 15:11	20070115 16:27	317.90	322.90	323.90	500.16				2370.24	2370.38	2370.24	
KFM10A	20070115 16:39	20070116 09:17	322.90	327.90	60.73	321.90	0.00	0.00	0.00				
KFM10A	20070115 16:39	20070116 09:17	322.90	327.90	328.90	500.16				2401.67	2402.07	2401.53	
KFM10A	20070116 09:34	20070116 10:52	327.90	332.90	60.73	326.90	0.00	0.00	0.00				
KFM10A	20070116 09:34	20070116 10:52	327.90	332.90	333.90	500.16				2434.46	2434.59	2434.46	
KFM10A	20070122 15:18	20070122 16:32	332.90	337.90	60.73	331.90	0.00	0.00	0.00				
KFM10A	20070122 15:18	20070122 16:32	332.90	337.90	338.90	500.16				2469.17	2469.17	2469.58	
KFM10A	20070116 13:01	20070116 14:19	337.90	342.90	60.73	336.90	0.00	0.00	0.00				
KFM10A	20070116 13:01	20070116 14:19	337.90	342.90	343.90	500.16				2498.66	2498.66	2498.66	
KFM10A	20070116 14:37	20070116 15:53	342.90	347.90	60.73	341.90	0.00	0.00	0.00				
KFM10A	20070116 14:37	20070116 15:53	342.90	347.90	348.90	500.16				2530.49	2530.49	2530.49	
KFM10A	20070116 16:10	20070116 16:53	347.90	352.90	60.73	346.90	0.00	0.00	0.00				
KFM10A	20070116 16:10	20070116 16:53	347.90	352.90	353.90	500.16				2562.33	2562.47	2562.33	
KFM10A	20070117 08:29	20070117 09:46	352.90	357.90	60.73	351.90	0.00	0.00	0.00				
KFM10A	20070117 08:29	20070117 09:46	352.90	357.90	358.90	500.16				2594.17	2594.17	2594.72	
KFM10A	20070117 09:57	20070117 10:44	357.90	362.90	60.73	356.90	0.00	0.00	0.00				
KFM10A	20070117 09:57	20070117 10:44	357.90	362.90	363.90	500.16				2626.00	2626.00	2626.00	
KFM10A	20070117 10:58	20070117 11:41	362.90	367.90	60.73	361.90	0.00	0.00	0.00				
KFM10A	20070117 10:58	20070117 11:41	362.90	367.90	368.90	500.16				2657.29	2657.42	2660.58	
KFM10A	20070117 13:11	20070117 14:29	367.90	372.90	60.73	366.90	0.00	0.00	0.00				
KFM10A	20070117 13:11	20070117 14:29	367.90	372.90	373.90	500.16				2689.12	2689.12	2689.12	
KFM10A	20070117 14:41	20070117 15:57	372.90	377.90	60.73	371.90	0.00	0.00	0.00				
KFM10A	20070117 14:41	20070117 15:57	372.90	377.90	378.90	500.16				2719.99	2719.99	2719.86	
KFM10A	20070117 16:12	20070117 17:27	377.90	382.90	60.73	376.90	0.00	0.00	0.00				
KFM10A	20070117 16:12	20070117 17:27	377.90	382.90	383.90	500.16				2750.72	2749.90	2750.59	
KFM10A	20070118 08:48	20070118 09:33	422.90	427.90	60.73	421.90	0.00	0.00	0.00				

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM10A	20070118 08:48	20070118 09:33	422.90	427.90	428.90	500.16				3023.91	3023.91	3023.91	
KFM10A	20070122 13:06	20070122 14:29	427.90	432.90	60.73	426.90	0.00	0.00	0.00				
KFM10A	20070122 13:06	20070122 14:29	427.90	432.90	433.90	500.16				3057.39	3094.16	3062.88	
KFM10A	20070118 11:19	20070118 12:32	432.90	437.90	60.73	431.90	0.00	0.00	0.00				
KFM10A	20070118 11:19	20070118 12:32	432.90	437.90	438.90	500.16				3084.69	3084.69	3084.28	
KFM10A	20070118 13:34	20070118 14:51	437.90	442.90	60.73	436.90	0.00	0.00	0.00				
KFM10A	20070118 13:34	20070118 14:51	437.90	442.90	443.90	500.16				3113.51	3113.78	3113.37	
KFM10A	20070118 15:12	20070118 16:29	442.90	447.90	60.73	441.90	0.00	0.00	0.00				
KFM10A	20070118 15:12	20070118 16:29	442.90	447.90	448.90	500.16				3143.01	3143.01	3143.01	
KFM10A	20070118 16:42	20070119 08:06	447.90	452.90	60.73	446.90	0.00	0.00	0.00				
KFM10A	20070118 16:42	20070119 08:06	447.90	452.90	453.90	500.16				3173.61	3173.74	3173.74	
KFM10A	20070119 08:18	20070119 09:31	452.90	457.90	60.73	451.90	0.00	0.00	0.00				
KFM10A	20070119 08:18	20070119 09:31	452.90	457.90	458.90	500.16				3202.83	3203.37	3202.83	
KFM10A	20070119 09:42	20070119 10:21	457.90	462.90	60.73	456.90	0.00	0.00	0.00				
KFM10A	20070119 09:42	20070119 10:21	457.90	462.90	463.90	500.16				3232.47	3232.47	3232.47	
KFM10A	20070119 10:30	20070119 11:44	462.90	467.90	60.73	461.90	0.00	0.00	0.00				
KFM10A	20070119 10:30	20070119 11:44	462.90	467.90	468.90	500.16				3261.55	3261.55	3261.55	
KFM10A	20070119 12:28	20070119 13:42	467.90	472.90	60.73	466.90	0.00	0.00	0.00				
KFM10A	20070119 12:28	20070119 13:42	467.90	472.90	473.90	500.16				3290.51	3290.51	3290.65	
KFM10A	20070119 13:54	20070119 14:36	472.90	477.90	60.73	471.90	0.00	0.00	0.00				
KFM10A	20070119 13:54	20070119 14:36	472.90	477.90	478.90	500.16				3319.46	3319.18	3319.18	
KFM10A	20070119 14:48	20070119 16:04	477.90	482.90	60.73	476.90	0.00	0.00	0.00				
KFM10A	20070119 14:48	20070119 16:04	477.90	482.90	483.90	500.16				3347.73	3348.68	3348.27	
KFM10A	20070122 08:26	20070122 09:41	482.90	487.90	60.73	481.90	0.00	0.00	0.00				
KFM10A	20070122 08:26	20070122 09:41	482.90	487.90	488.90	500.16				3385.73	3397.66	3388.88	
KFM10A	20070122 09:53	20070122 11:08	487.90	492.90	60.73	486.90	0.00	0.00	0.00				
KFM10A	20070122 09:53	20070122 11:08	487.90	492.90	493.90	500.16				3419.76	3415.23	3411.39	
KFM10A	20061222 11:57	20061222 13:56	282.90	302.90	60.73	281.90	460.12	460.39	460.52				
KFM10A	20061222 11:57	20061222 13:56	282.90	302.90	303.90	500.16				2242.83	2242.83	2242.83	
KFM10A	20070110 10:58	20070110 12:39	137.90	142.90	60.73	136.90	529.60	529.60	529.47				

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM10A	20070110 10:58	20070110 12:39	137.90	142.90	143.90	500.16				1129.32	1129.32	1129.32	
KFM10A	20070115 09:58	20070115 11:17	302.90	307.90	60.73	301.90	0.00	0.00	0.00				
KFM10A	20070115 09:58	20070115 11:17	302.90	307.90	308.90	500.16				2272.68	2272.54	2272.54	
KFM10A	20070116 11:05	20070116 12:47	332.90	337.90	60.73	331.90	0.00	0.00	0.00				
KFM10A	20070116 11:05	20070116 12:47	332.90	337.90	338.90	500.16				2466.84	2466.70	2466.29	
KFM10A	20070118 09:50	20070118 11:05	427.90	432.90	60.73	426.90	0.00	0.00	0.00				
KFM10A	20070118 09:50	20070118 11:05	427.90	432.90	433.90	500.16				3053.68	3070.69	3055.74	
KFM10A	20061214 11:23	20061214 14:01	62.90	162.90	60.73	61.90	542.80	538.03	541.31				
KFM10A	20061214 11:23	20061214 14:01	62.90	162.90	163.90	500.16				0.00	0.00	0.00	
KFM10A	20061214 15:59	20061214 17:48	162.90	262.90	60.73	161.90	524.53	524.67	524.53				
KFM10A	20061214 15:59	20061214 17:48	162.90	262.90	263.90	500.16				0.00	0.00	0.00	
KFM10A	20061215 09:55	20061215 11:44	262.90	362.90	60.73	261.90	469.53	469.67	469.53				
KFM10A	20061215 09:55	20061215 11:44	262.90	362.90	363.90	500.16				0.00	0.00	0.00	
KFM10A	20061215 13:33	20061215 15:22	362.90	462.90	60.73	361.90	378.35	378.49	378.49				
KFM10A	20061215 13:33	20061215 15:22	362.90	462.90	463.90	500.16				0.00	0.00	0.00	
KFM10A	20061219 12:53	20061219 16:02	62.90	82.90	60.73	61.90	546.70	546.14	546.14				
KFM10A	20061219 12:53	20061219 16:02	62.90	82.90	83.90	500.16				699.91	701.28	700.05	
KFM10A	20061221 13:41	20061221 14:32	182.90	202.90	60.73	181.90	519.35	519.35	519.35				
KFM10A	20061221 13:41	20061221 14:32	182.90	202.90	203.90	500.16				1562.27	1562.13	1562.27	
KFM10A	20061220 14:59	20061220 16:15	102.90	122.90	60.73	101.90	540.86	548.50	543.04				
KFM10A	20061220 14:59	20061220 16:15	102.90	122.90	123.90	500.16				990.38	989.98	990.38	
KFM10A	20061220 17:03	20061221 09:18	122.90	142.90	60.73	121.90	537.39	537.12	537.39				
KFM10A	20061220 17:03	20061221 09:18	122.90	142.90	143.90	500.16				1134.72	1134.72	1134.72	
KFM10A	20061221 09:42	20061221 10:57	142.90	162.90	60.73	141.90	532.42	532.70	532.84				
KFM10A	20061221 09:42	20061221 10:57	142.90	162.90	163.90	500.16				1278.80	1278.80	1278.52	
KFM10A	20061221 11:13	20061221 13:19	162.90	182.90	60.73	161.90	526.23	526.64	526.09				
KFM10A	20061221 11:13	20061221 13:19	162.90	182.90	183.90	500.16				1421.22	1421.22	1420.67	
KFM10A	20061221 13:41	20061221 14:32	182.90	202.90	60.73	181.90	519.35	519.35	519.35				
KFM10A	20061221 13:41	20061221 14:32	182.90	202.90	203.90	500.16				1562.27	1562.13	1562.27	
KFM10A	20061221 14:48	20061221 15:33	202.90	222.90	60.73	201.90	510.29	510.29	510.43				

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM10A	20061221 14:48	20061221 15:33	202.90	222.90	223.90	500.16				1701.68	1701.27	1701.13	
KFM10A	20061221 15:49	20061221 17:05	222.90	242.90	60.73	221.90	500.00	499.86	499.86				
KFM10A	20061221 15:49	20061221 17:05	222.90	242.90	243.90	500.16				1839.02	1838.88	1838.88	
KFM10A	20061222 09:02	20061222 09:49	242.90	262.90	60.73	241.90	488.20	488.07	488.20				
KFM10A	20061222 09:02	20061222 09:49	242.90	262.90	263.90	500.16				1975.55	1974.18	1972.80	
KFM10A	20061222 10:13	20061222 11:32	262.90	282.90	60.73	261.90	474.50	474.92	474.92				
KFM10A	20061222 10:13	20061222 11:32	262.90	282.90	283.90	500.16				2109.46	2110.01	2110.01	
KFM10A	20070104 10:36	20070104 11:51	282.90	302.90	60.73	281.90	458.89	458.34	458.34				
KFM10A	20070104 10:36	20070104 11:51	282.90	302.90	303.90	500.16				2237.34	2237.89	2237.89	
KFM10A	20070102 08:29	20070102 10:01	302.90	322.90	60.73	301.90	442.32	442.46	442.32				
KFM10A	20070102 08:29	20070102 10:01	302.90	322.90	323.90	500.16				2369.62	2370.30	2370.17	
KFM10A	20070102 10:26	20070102 11:40	322.90	342.90	60.73	321.90	423.30	423.57	423.57				
KFM10A	20070102 10:26	20070102 11:40	322.90	342.90	343.90	500.16				2498.59	2498.32	2498.59	
KFM10A	20070102 12:46	20070102 14:06	342.90	362.90	60.73	341.90	402.08	401.81	402.08				
KFM10A	20070102 12:46	20070102 14:06	342.90	362.90	363.90	500.16				2625.38	2625.38	2625.38	
KFM10A	20070102 14:21	20070102 15:36	362.90	382.90	60.73	361.90	378.96	379.23	379.50				
KFM10A	20070102 14:21	20070102 15:36	362.90	382.90	383.90	500.16				2750.23	2750.09	2750.51	
KFM10A	20070102 15:58	20070102 16:49	382.90	402.90	60.73	381.90	354.74	355.01	354.74				
KFM10A	20070102 15:58	20070102 16:49	382.90	402.90	403.90	500.16				2874.00	2874.00	2874.00	
KFM10A	20070103 08:57	20070103 09:46	402.90	422.90	60.73	401.90	329.30	329.43	329.43				
KFM10A	20070103 08:57	20070103 09:46	402.90	422.90	423.90	500.16				2996.26	2995.84	2995.84	
KFM10A	20070103 10:03	20070103 11:18	422.90	442.90	60.73	421.90	301.26	301.67	301.40				
KFM10A	20070103 10:03	20070103 11:18	422.90	442.90	443.90	500.16				3116.17	3137.58	3123.17	
KFM10A	20070103 11:39	20070103 13:48	442.90	462.90	60.73	441.90	271.17	271.03	271.17				
KFM10A	20070103 11:39	20070103 13:48	442.90	462.90	463.90	500.16				3233.49	3233.49	3232.94	
KFM10A	20070103 14:06	20070103 15:20	462.90	482.90	60.73	461.90	238.76	238.76	238.76				
KFM10A	20070103 14:06	20070103 15:20	462.90	482.90	483.90	500.16				3348.75	3349.02	3348.75	
KFM10A	20070103 15:38	20070103 16:53	472.90	492.90	60.73	471.90	222.16	222.02	222.02				
KFM10A	20070103 15:38	20070103 16:53	472.90	492.90	493.90	500.16				3408.57	3423.67	3416.81	
KFM10A	20070105 13:55	20070105 15:12	62.90	67.90	60.73	61.90	543.42	543.42	543.42				Complete test, reperformed later.

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM10A	20070105 13:55	20070105 15:12	62.90	67.90	68.90	500.16				581.57	581.57	581.57	Complete test, reperformed later.
KFM10A	20070105 15:24	20070105 16:45	67.90	72.90	60.73	66.90	542.40	542.40	542.40				Incomplete test, interrupted and re-performed later.
KFM10A	20070105 15:24	20070105 16:45	67.90	72.90	73.90	500.16				618.76	618.76	618.34	Incomplete test, interrupted and re-performed later.
KFM10A	20070108 08:35	20070108 09:49	72.90	77.90	60.73	71.90	540.32	540.32	540.32				Complete test, reperformed later.
KFM10A	20070108 08:35	20070108 09:49	72.90	77.90	78.90	500.16				654.70	655.12	654.56	Complete test, reperformed later.
KFM10A	20070108 10:00	20070108 11:14	77.90	82.90	60.73	76.90	540.27	539.87	539.87				Incomplete test, interrupted and re-performed later.
KFM10A	20070108 10:00	20070108 11:14	77.90	82.90	83.90	500.16				691.75	692.30	691.89	Incomplete test, interrupted and re-performed later.
KFM10A	20070108 11:20	20070108 13:32	79.00	84.00	60.73	78.00	539.78	539.78	539.78				Complete test, reperformed later.
KFM10A	20070108 11:20	20070108 13:32	79.00	84.00	85.00	500.16				699.57	700.12	699.57	Complete test, reperformed later.
KFM10A	20070108 13:46	20070108 14:59	84.00	89.00	60.73	83.00	538.78	538.24	539.33				Complete test, reperformed later.
KFM10A	20070108 13:46	20070108 14:59	84.00	89.00	90.00	500.16				736.07	738.54	736.35	Complete test, reperformed later.
KFM10A	20070108 15:13	20070108 16:27	89.00	94.00	60.73	88.00	538.32	546.79	541.60				Incomplete test, interrupted and re-performed later.
KFM10A	20070108 15:13	20070108 16:27	89.00	94.00	95.00	500.16				772.98	776.96	773.66	Incomplete test, interrupted and re-performed later.
KFM10A	20070108 16:41	20070108 17:55	94.00	99.00	60.73	93.00	538.41	540.46	538.41				Complete test, reperformed later.
KFM10A	20070108 16:41	20070108 17:55	94.00	99.00	100.00	500.16				810.30	811.53	810.43	Complete test, reperformed later.
KFM10A	20070108 18:07	20070108 19:21	99.00	104.00	60.73	98.00	537.55	540.14	537.95				Incomplete test, interrupted and re-performed later.
KFM10A	20070108 18:07	20070108 19:21	99.00	104.00	105.00	500.16				846.65	851.18	847.21	Incomplete test, interrupted and re-performed later.